Wharf Resources
Postclosure Bond Summary

Inflation Rate = 3.5%
Interest Rate = 4.3%

Year	Postclosure Year No.	Project Year No.	Annual Cost	Escalated Cost	Present Value
	1	6	$966,207	$1,187,715	$922,585
	2	7	$966,207	$1,229,285	$915,509
	3	8	$966,207	$1,272,310	$908,486
	4	9	$966,207	$1,316,841	$901,518
	5	10	$1,067,687	$1,506,078	$988,563
	6	11	$950,751	$1,388,068	$873,541
	7	12	$950,751	$1,436,650	$866,841
	8	13	$1,100,241	$1,720,729	$995,443
	9	14	$1,100,241	$1,780,954	$987,808
	10	15	$1,026,201	$1,719,245	$914,267
	11	16	$774,555	$1,343,068	$684,777
	12	17	$774,555	$1,390,075	$679,524
	13	18	$774,555	$1,438,728	$674,312
	14	19	$774,555	$1,489,083	$669,140
	15	20	$876,035	$1,743,125	$751,004
	16	21	$766,855	$1,579,285	$652,364
	17	22	$766,855	$1,634,560	$647,360
	18	23	$766,855	$1,691,770	$642,395
	19	24	$766,855	$1,750,982	$637,468
	20	25	$827,255	$1,955,006	$682,402
	21	26	$672,050	$1,643,806	$550,121
	22	27	$653,057	$1,653,258	$530,474
	23	28	$653,057	$1,711,122	$526,405
	24	29	$653,057	$1,771,011	$522,368
	25	30	$754,537	$2,117,830	$598,910
	26	31	$650,726	$1,890,380	$512,549
	27	32	$650,726	$1,956,543	$508,618
	28	33	$650,726	$2,025,022	$504,717
	29	34	$650,726	$2,095,898	$500,845
	30	35	$713,071	$2,377,087	$544,621
	31	36	$650,726	$2,245,178	$493,192
	32	37	$650,726	$2,323,759	$489,409
	33	38	$650,726	$2,405,091	$485,655
	34	39	$650,726	$2,489,269	$481,930
	35	40	$752,206	$2,978,179	$552,813
	36	41	$650,726	$2,666,567	$474,565
	37	42	$650,726	$2,759,897	$470,925
	38	43	$650,726	$2,856,493	$467,313
	39	44	$650,726	$2,956,471	$463,729
	40	45	$711,126	$3,343,969	$502,885
	41	46	$649,937	$3,163,205	$456,089
	42	47	$649,937	$3,273,917	$452,590
	43	48	$649,937	$3,388,504	$449,119
	44	49	$649,937	$3,507,102	$445,674

45	50	$751,417	$4,196,609	$511,309
46	51	$649,937	$3,756,895	$438,863
47	52	$637,102	$3,811,599	$426,897
48	53	$637,102	$3,945,005	$423,623
49	54	$637,102	$4,083,080	$420,373
50	55	$887,246	$5,885,228	$580,933
51	56	$0	$0	$0
52	57	$0	$0	$0
53	58	$0	$0	$0
54	59	$0	$0	$0
55	60	$0	$0	$0
56	61	$0	$0	$0
57	62	$0	$0	$0
58	63	$0	$0	$0
59	64	$0	$0	$0
60	65	$0	$0	$0
61	66	$0	$0	$0
62	67	$0	$0	$0
63	68	$0	$0	$0
64	69	$0	$0	$0
65	70	$0	$0	$0
66	71	$0	$0	$0
67	72	$0	$0	$0
68	73	$0	$0	$0
69	74	$0	$0	$0
70	75	$0	$0	$0
71	76	$0	$0	$0
72	77	$0	$0	$0
73	78	$0	$0	$0
74	79	$0	$0	$0
75	80	$0	$0	$0
76	81	$0	$0	$0
77	82	$0	$0	$0
78	83	$0	$0	$0
79	84	$0	$0	$0
80	85	$0	$0	$0
81	86	$0	$0	$0
82	87	$0	$0	$0
83	88	$0	$0	$0
84	89	$0	$0	$0
85	90	$0	$0	$0
86	91	$0	$0	$0
87	92	$0	$0	$0
88	93	$0	$0	$0
89	94	$0	$0	$0
90	95	$0	$0	$0
91	96	$0	$0	$0
92	97	$0	$0	$0
93	98	$0	$0	$0
94	99	$0	$0	$0
95	100	$0	$0	$0
96	101	$0	$0	$0

	97	102	$0	$0	$0
	98	103	$0	$0	$0
	99	104	$0	$0	$0
	100	105	$0	$0	$0
Total			$38,100,157	$115,851,531	$30,782,821
				Round to	$30,783,000

WHARF RESOURCES
2011 WHARF EXPANSION POSTCLOSURE BOND
GENERAL INFORMATION & ASSUMPTIONS

General

1. The postclosure bond calculation is based on perpetual water treatment calculations developed by various state and federal agencies. Annual costs are first escalated at an annual inflation rate of 3.5 percent based on the Construction Cost Index in the Engineering News Record. The present worth of the escalated cost is then applied at an annual discount rate of 4.3 percent based on the South Dakota Treasury discount rate over the past 12 years. The total postclosure bond amount of $30,783,000 was calculated by adding together the present worths for each year.

2. The bond does not include acreage at the Golden Reward Mine. The Golden Reward acreage will be included at the beginning of Phase 3 of the expansion project which involves disturbance at the Golden Reward Mine.

3. A postclosure period of 50 years was used in the bond calculation. This is based on modeling provided by Wharf Resources and reviewed by department staff.

4. In the calculations, different indirect costs are applied separately to the direct operation and maintenance, water treatment, and miscellaneous costs instead of one indirect cost being applied to the sum of all three direct costs. Each indirect cost is explained further in the sections below. The escalation and present worth factors have been applied to the indirect costs.

5. Postclosure Year 1 begins at Year 6 of the total project time line. Years 1 though 5 of the total project timeline includes the five year reclamation period covered under the reclamation bond. In these bond assumptions, postclosure years are used.

Operation and Maintenance

1. An annual cost of $12,000 was calculated for road maintenance and snow removal for the 50 year postclosure period. This cost is based on the postclosure bond estimate developed by the Bureau of Reclamation.

2. An annual cost of $5,000 was calculated for vegetation maintenance and repair. This cost is based on the postclosure bond estimate developed by the Bureau of Reclamation. It is assumed that vegetation maintenance will not be needed after Year 15 in the postclosure period, or 20 years after the start of the reclamation project.

3. An annual cost of $1,000 is assumed to maintain erosion control structures and replace riprap on channels for the first 15 years of the postclosure period. This cost is reduced to

$500 per year for the last 36 years of the project since a permanent vegetative cover will be well established and erosion should be less of a problem.

4. An annual cost of $5,000 is assumed for the first five years of the postclosure period for weed control. This annual cost decreases to $2,000 in years 6 through 15. After year 15, weed control will no longer be needed.

5. The following indirect costs were added to the direct operating and maintenance cost:

Mobilization	5%
Contractor Overhead	8%
State Excise Tax	2%
Contractor Profit	10%
Contingency	10%
Administration	5%
Total	40%

Water Treatment

1. Water treatment in the postclosure period will consist of treating effluent at the mine site for nitrates, arsenic, cyanide, and selenium for a period of 50 years. The effluent will be treated at the Ross Valley Denitrification Plant. The following annual costs used in the calculation were obtained from Wharf Resource:

Years 1 through 20

Nutrient	$ 55,000
Electricity	$ 30,255
Natural Gas	$ 38,117
Carbon Column Replacement	$130,400
Plant Maintenance	$ 10,000
Total	$263,722

Years 21 through 50

Nutrient	$ 36,850
Electricity	$ 20,271
Natural Gas	$ 25,538
Carbon Column Replacement	$130,400
Plant Maintenance	$ 10,000
Total	$223,059

2. A cost of $79,369 was calculated to demolish the Ross Valley Denitrification and Selenium Plant in Year 50.

3. Process area ground water remediation will continue for the first five years in the postclosure period. The annual $6,000 pumping cost and the annual $5,000 nutrient cost were obtained from Wharf. Monitoring and analysis testing in the process area will continue for the first 10 years of the postclosure period. The annual $35,000 monitoring cost and the annual $60,000 analysis testing cost were also obtained from Wharf.

4. It is assumed that two water treatment operators will be required to operate the Ross Valley Water Treatment Plant for the 50-year postclosure period. Two full time operators will be needed from Years 1 through 20. One full time and one ½ time operator will be needed from Year 21 through 50. The annual salary of each water treatment operator, including benefits, is $52,500.

5. An annual gas and diesel cost of $6,000 for the pickup and other equipment was assumed for years 1 through 46. In years 47 through 50 the annual gas and diesel cost was assumed to be $3,000 since site activities would be decreasing.

6. An annual equipment and vehicle maintenance cost of $10,000 was assumed for years 1 through 46. In years 47 through 50, an annual cost of $4,500 was assumed since site activities would be decreasing.

7. Beginning at Year 5, it is assumed that a pickup truck will need to be purchased every ten years at $25,000.

8. An annual cost of $100,272 was calculated to cover costs for water quality sampling and analysis for the first 10 years of the postclosure period. This annual cost is reduced to $78,585 for years 11 through 25, $77,041 for years 26 through 40, and $76,520 for years 41 through 50.

9. The following wells will be plugged in year 10 at a cost of $9,966:

   MW-60, MW-61, MW-62, MW63, MW-64, MW-42, and MW-43.

   The following wells will be plugged in year 30 at a cost of $1,289:

   MW-37, MW-40, and Joseph Well.

   The remaining wells at the site will be plugged in year 50 at a cost of $66,288.

10. A cost of $40,000 every five years was assumed to replace the pumps used in the water treatment process. These costs are based on the estimates provided by Wharf.

11. An annual cost of $20,000 was assumed for biological monitoring was assumed. These costs are based on estimates provided by Wharf.

12. Sludge from the Ross Valley Water Treatment Plant will be removed at an annual cost of $1,000.

13. The following indirect costs were added to the direct water treatment cost:

Contractor Overhead	8%
State Excise Tax	2%
Contractor Profit	10%
Contingency	25%
Administration	5%
Engineering/Consulting	1%
Total	51%

The 25% Contingency accounts for uncertainties in the current water treatment process.

Miscellaneous & Utilities

1. An annual electricity cost of $500 was assumed for the 50 year treatment period for general site office electrical needs.

2. The following annual utility costs for the 50 year treatment period were assumed:

Propane to heat office for treatment plant operators	$1,500
Phone, internet, and radios	$1,200
Garbage disposal	$ 250

3. The following miscellaneous costs for the 50 year treatment period were assumed:

Office supplies	$300
Computers (Every 10 years)	$3,000

4. The following indirect costs were added to the direct miscellaneous and utility cost:

Contingency	10%
Administration	1%
Total	11%

Wharf Postclosure Costs						
Post Closure Years (1-5)	Year 1	Year 2	Year 3	Year 4	Year 5	Total PC Years 1-5
Total Project Years (6-10)	Year 6	Year 7	Year 8	Year 9	Year 10	Total P Year 6-10
Item	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Cost
Operation & Maintenance						
Road Maintenance	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$60,000.00
Vegetation Maintenance/Repair	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$25,000.00
Erosion Control Maintenance	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$5,000.00
Weed Control	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$25,000.00
Subtotal Operation & Maintenance	**$23,000.00**	**$23,000.00**	**$23,000.00**	**$23,000.00**	**$23,000.00**	**$115,000.00**
Mobilization (5%)	$1,150.00	$1,150.00	$1,150.00	$1,150.00	$1,150.00	$5,750.00
Contractor Overhead (8%)	$1,840.00	$1,840.00	$1,840.00	$1,840.00	$1,840.00	$9,200.00
State Excise Tax (2%)	$460.00	$460.00	$460.00	$460.00	$460.00	$2,300.00
Contractor Profit (10%)	$2,300.00	$2,300.00	$2,300.00	$2,300.00	$2,300.00	$11,500.00
Contingency (10%)	$2,300.00	$2,300.00	$2,300.00	$2,300.00	$2,300.00	$11,500.00
Insp., Admin., & Maint. (5%)	$1,150.00	$1,150.00	$1,150.00	$1,150.00	$1,150.00	$5,750.00
Total Operation & Maintenance	**$32,200.00**	**$32,200.00**	**$32,200.00**	**$32,200.00**	**$32,200.00**	**$161,000.00**
Water Treatment						
RV Denitrification Plant						
Nutrient	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$275,000.00
Electricity	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$151,275.00
Natural Gas	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$190,585.00
Carbon Replacment	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$652,000.00
Plant Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$50,000.00
Water Treatment Total	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$1,318,860.00**
Process Area GW Remediation						
Pumping Cost	$600.00	$600.00	$600.00	$600.00	$600.00	$3,000.00
Nutrient	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$25,000.00
Monitoring	$35,000.00	$35,000.00	$35,000.00	$35,000.00	$35,000.00	$175,000.00
Analytical Testing	$60,000.00	$60,000.00	$60,000.00	$60,000.00	$60,000.00	$300,000.00
Process GW Remediate Total	**$100,600.00**	**$100,600.00**	**$100,600.00**	**$100,600.00**	**$100,600.00**	**$503,000.00**
Other Payroll						
Plant Operators	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$525,000.00
Gas & Diesel for Pickups/Equip.	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$30,000.00
Equipment/Vehicle Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$50,000.00
Pickup Truck					$25,000.00	$25,000.00
Water Sampling & Analysis	$100,272.00	$100,272.00	$100,272.00	$100,272.00	$100,272.00	$501,360.00
Replacement Pumps					$40,000.00	$40,000.00
Biological Monitoring	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$100,000.00
Sludge Removal	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$50,000.00
Subtotal Water Treatment	**$615,644.00**	**$615,644.00**	**$615,644.00**	**$615,644.00**	**$680,644.00**	**$3,143,220.00**
Contractor Overhead (8%)	$49,252.00	$49,252.00	$49,252.00	$49,252.00	$54,452.00	$251,460.00
State Excise Tax (2%)	$12,313.00	$12,313.00	$12,313.00	$12,313.00	$13,613.00	$62,865.00
Contractor Profit (10%)	$61,564.00	$61,564.00	$61,564.00	$61,564.00	$68,064.00	$314,320.00
Contingency (25%)	$153,911.00	$153,911.00	$153,911.00	$153,911.00	$170,161.00	$785,805.00
Insp., Admin., & Maint. (5%)	$30,782.00	$30,782.00	$30,782.00	$30,782.00	$34,032.00	$157,160.00
Engineering & Consulting (1%)	$6,156.00	$6,156.00	$6,156.00	$6,156.00	$6,806.00	$31,430.00
Total Water Treatment	**$929,622.00**	**$929,622.00**	**$929,622.00**	**$929,622.00**	**$1,027,772.00**	**$4,746,260.00**
Miscellaneous						
Office Supplies	$500.00	$500.00	$500.00	$500.00	$500.00	$2,500.00
Computers					$3,000.00	$3,000.00
Office Utilities						
Electricity	$500.00	$500.00	$500.00	$500.00	$500.00	$2,500.00
Garbage Disposal	$250.00	$250.00	$250.00	$250.00	$250.00	$1,250.00
Phone, Internet, & Radios	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$6,000.00
Propane	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$7,500.00
Subtotal Misc. & Utilities	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$6,950.00**	**$22,750.00**
Contingency (10%)	$395.00	$395.00	$395.00	$395.00	$695.00	$2,275.00
Insp., Admin., & Maint. (1%)	$40.00	$40.00	$40.00	$40.00	$70.00	$230.00
Total Misc. & Utilities	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$7,715.00**	**$25,255.00**
Total	**$966,207.00**	**$966,207.00**	**$966,207.00**	**$966,207.00**	**$1,067,687.00**	**$4,932,515.00**
Annual Inflation Rate	3.5%	3.5%	3.5%	3.5%	3.5%	
Project Year	6	7	8	9	10	
Escalation Factor	1.2293	1.2723	1.3168	1.3629	1.4106	
Escalated Amount	$1,187,715	$1,229,285	$1,272,310	$1,316,841	$1,506,078	**$6,512,229.00**
Annual Discount Rate	4.3%	4.3%	4.3%	4.3%	4.3%	
Present Worth Factor	0.7768	0.7447	0.7140	0.6846	0.6564	
Present Worth Amount	$922,585	$915,509	$908,486	$901,518	$988,563	**$4,636,661.00**
# of Water Treatment Employees	2	2	2	2	2	

Wharf Postclosure Costs (Years 11-20)											
Post Closure Years (6-15)	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	
Total Project Years (11-20)	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Total Year 11-20
Item	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Cost
Operation & Maintenance											
Road Maintenance	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$120,000.00
Vegetation Maintenance/Repair	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$5,000.00	$50,000.00
Erosion Control Maintenance	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$10,000.00
Weed Control	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$2,000.00	$20,000.00
Subtotal Operation & Maintenance	**$18,000.00**	**$18,000.00**	**$18,000.00**	**$18,000.00**	**$18,000.00**	**$18,000.00**	**$18,000.00**	**$18,000.00**	**$18,000.00**	**$18,000.00**	**$180,000.00**
Mobilization (5%)	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$9,000.00
Contractor Overhead (8%)	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$1,440.00	$14,400.00
State Excise Tax (2%)	$360.00	$360.00	$360.00	$360.00	$360.00	$360.00	$360.00	$360.00	$360.00	$360.00	$3,600.00
Contractor Profit (10%)	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$18,000.00
Contingency (10%)	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$1,800.00	$18,000.00
Insp., Admin., & Maint. (5%)	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$900.00	$9,000.00
Total Operation & Maintenance	**$25,200.00**	**$25,200.00**	**$25,200.00**	**$25,200.00**	**$25,200.00**	**$25,200.00**	**$25,200.00**	**$25,200.00**	**$25,200.00**	**$25,200.00**	**$252,000.00**
Water Treatment											
Water Treatment											
RV Denitrification Plant											
Nutrient	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$550,000.00
Electricity	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$302,550.00
Natural Gas	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$381,170.00
Carbon Replacment	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$1,304,000.00
Plant Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Water Treatment Total	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$2,637,720.00**
Process Area GW Remediation											
Monitoring	$35,000.00	$35,000.00	$35,000.00	$35,000.00	$35,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$175,000.00
Analytical Testing	$60,000.00	$60,000.00	$60,000.00	$60,000.00	$60,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$300,000.00
Porcess GW Remediate Total	**$95,000.00**	**$95,000.00**	**$95,000.00**	**$95,000.00**	**$95,000.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$475,000.00**
Other Payroll											
Plant Operators	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$1,050,000.00
Gas & Diesel for Pickups/Equip.	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$60,000.00
Equipment/Vehicle Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Pickup Truck										$25,000.00	$25,000.00
Water Sampling & Analysis	$100,272.00	$100,272.00	$199,272.00	$199,272.00	$100,272.00	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$1,092,285.00
Plug Wells	$0.00	$0.00	$0.00	$0.00	$9,966.00	$0.00	$0.00	$0.00	$0.00	$0.00	$9,966.00
Replacement Pumps	$0.00	$0.00	$0.00	$0.00	$40,000.00	$0.00	$0.00	$0.00	$0.00	$40,000.00	$80,000.00
Biological Monitoring	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$200,000.00
Sludge Removal	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Subtotal Water Treatment	**$610,044.00**	**$610,044.00**	**$709,044.00**	**$709,044.00**	**$660,010.00**	**$493,357.00**	**$493,357.00**	**$493,357.00**	**$493,357.00**	**$558,357.00**	**$5,829,971.00**
Contractor Overhead (8%)	$48,804.00	$48,804.00	$56,724.00	$56,724.00	$52,801.00	$39,469.00	$39,469.00	$39,469.00	$39,469.00	$44,669.00	$466,402.00
State Excise Tax (2%)	$12,201.00	$12,201.00	$14,181.00	$14,181.00	$13,200.00	$9,867.00	$9,867.00	$9,867.00	$9,867.00	$11,167.00	$116,599.00
Contractor Profit (10%)	$61,004.00	$61,004.00	$70,904.00	$70,904.00	$66,001.00	$49,336.00	$49,336.00	$49,336.00	$49,336.00	$55,836.00	$582,997.00
Contingency (25%)	$152,511.00	$152,511.00	$177,261.00	$177,261.00	$165,003.00	$123,339.00	$123,339.00	$123,339.00	$123,339.00	$139,589.00	$1,457,492.00
Insp., Admin., & Maint. (5%)	$30,502.00	$30,502.00	$35,452.00	$35,452.00	$33,001.00	$24,668.00	$24,668.00	$24,668.00	$24,668.00	$27,918.00	$291,499.00
Engineering & Consulting (1%)	$6,100.00	$6,100.00	$7,090.00	$7,090.00	$6,600.00	$4,934.00	$4,934.00	$4,934.00	$4,934.00	$5,584.00	$58,300.00
Total Water Treatment	**$921,166.00**	**$921,166.00**	**$1,070,656.00**	**$1,070,656.00**	**$996,616.00**	**$744,970.00**	**$744,970.00**	**$744,970.00**	**$744,970.00**	**$843,120.00**	**$8,803,260.00**
Miscellaneous											
Office Supplies	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Computers										$3,000.00	$3,000.00
Office Utilities											
Electricity	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Garbage Disposal	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$2,500.00
Phone, Internet, & Radios	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$12,000.00
Propane	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$15,000.00
Subtotal Misc. & Utilities	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$6,950.00**	**$42,500.00**
Contingency (10%)	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$695.00	$4,250.00
Insp., Admin., & Maint. (1%)	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$70.00	$430.00
Total Misc. & Utilities	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$7,715.00**	**$47,180.00**
Total	**$950,751.00**	**$950,751.00**	**$1,100,241.00**	**$1,100,241.00**	**$1,026,201.00**	**$774,555.00**	**$774,555.00**	**$774,555.00**	**$774,555.00**	**$876,035.00**	**$9,102,440.00**
Annual Inflation Rate	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
Project Year	11	12	13	14	15	16	17	18	19	20	
Escalation Factor	1.4600	1.5111	1.5640	1.6187	1.6753	1.7340	1.7947	1.8575	1.9225	1.9898	
Escalated Amount	$1,388,068	$1,436,650	$1,720,729	$1,780,954	$1,719,245	$1,343,068	$1,390,075	$1,438,728	$1,489,083	$1,743,125	**$15,449,725.00**
Annual Discount Rate	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	
Present Worth Factor	0.6293	0.6034	0.5785	0.5547	0.5318	0.5099	0.4888	0.4687	0.4494	0.4308	
Present Worth Amount	$873,541	$866,841	$995,443	$987,808	$914,267	$684,777	$679,524	$674,312	$669,140	$751,004	**$8,096,657.00**
# of Water Treatment Employees	2	2	2	2	2	2	2	2	2	2	

Wharf Postclosure Costs (Years 21-30)											
Post Closure Years (16-25)	Year 16	Year 17	Year 18	Year 19	Year 20	Year 21	Year 22	Year 23	Year 24	Year 25	
Total Project Years (21-30)	Year 21	Year 22	Year 23	Year 24	Year 25	Year 26	Year 27	Year 28	Year 29	Year 30	Total Year 21-30
Item	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Cost
Operation & Maintenance											
Road Maintenance	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$120,000.00
Vegetation Maintenance/Repair	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Erosion Control Maintenance	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Subtotal Operation & Maintenance	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$125,000.00**
Mobilization (5%)	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$6,250.00
Contractor Overhead (8%)	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$10,000.00
State Excise Tax (2%)	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$2,500.00
Contractor Profit (10%)	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$12,500.00
Contingency (10%)	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$12,500.00
Insp., Admin., & Maint. (5%)	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$6,250.00
Total Operation & Maintenance	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$175,000.00**
Water Treatment											
Water Treatment											
RV Denitrification Plant											
Nutrient	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$55,000.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$459,250.00
Electricity	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$30,255.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$252,630.00
Natural Gas	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$38,117.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$330,854.00
Carbon Replacment	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$1,304,000.00
Plant Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Water Treatment Total	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$263,772.00**	**$235,638.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$2,446,734.00**
Other Payroll											
Plant Operators	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$105,000.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$876,750.00
Gas & Diesel for Pickups/Equip.	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$60,000.00
Equipment/Vehicle Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Pickup Truck										$25,000.00	$25,000.00
Water Sampling & Analysis	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$78,585.00	$785,850.00
Replacement Pumps					$40,000.00					$40,000.00	$80,000.00
Biological Monitoring	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	
Sludge Removal	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Subtotal Water Treatment	**$493,357.00**	**$493,357.00**	**$493,357.00**	**$493,357.00**	**$533,357.00**	**$430,573.00**	**$417,994.00**	**$417,994.00**	**$417,994.00**	**$482,994.00**	**$4,674,334.00**
Contractor Overhead (8%)	$39,469.00	$39,469.00	$39,469.00	$39,469.00	$42,669.00	$34,446.00	$33,440.00	$33,440.00	$33,440.00	$38,640.00	$373,951.00
State Excise Tax (2%)	$9,867.00	$9,867.00	$9,867.00	$9,867.00	$10,667.00	$8,611.00	$8,360.00	$8,360.00	$8,360.00	$9,660.00	$93,486.00
Contractor Profit (10%)	$49,336.00	$49,336.00	$49,336.00	$49,336.00	$53,336.00	$43,057.00	$41,799.00	$41,799.00	$41,799.00	$48,299.00	$467,433.00
Contingency (25%)	$123,339.00	$123,339.00	$123,339.00	$123,339.00	$133,339.00	$107,643.00	$104,499.00	$104,499.00	$104,499.00	$120,749.00	$1,168,584.00
Insp., Admin., & Maint. (5%)	$24,668.00	$24,668.00	$24,668.00	$24,668.00	$26,668.00	$21,529.00	$20,900.00	$20,900.00	$20,900.00	$24,150.00	$233,719.00
Engineering & Consulting (1%)	$4,934.00	$4,934.00	$4,934.00	$4,934.00	$5,334.00	$4,306.00	$4,180.00	$4,180.00	$4,180.00	$4,830.00	$46,746.00
Total Water Treatment	**$744,970.00**	**$744,970.00**	**$744,970.00**	**$744,970.00**	**$805,370.00**	**$650,165.00**	**$631,172.00**	**$631,172.00**	**$631,172.00**	**$729,322.00**	**$7,058,253.00**
Miscellaneous											
Office Supplies	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Computers										$3,000.00	$3,000.00
Office Utilities											
Electricity	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Garbage Disposal	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$2,500.00
Phone, Internet, & Radios	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$12,000.00
Propane	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$15,000.00
Subtotal Misc. & Utilities	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$6,950.00**	**$42,500.00**
Contingency (10%)	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$695.00	$4,250.00
Insp., Admin., & Maint. (1%)	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$70.00	$430.00
Total Misc. & Utilities	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$7,715.00**	**$47,180.00**
Total	**$766,855.00**	**$766,855.00**	**$766,855.00**	**$766,855.00**	**$827,255.00**	**$672,050.00**	**$653,057.00**	**$653,057.00**	**$653,057.00**	**$754,537.00**	**$7,280,433.00**
Annual Inflation Rate	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
	21	22	23	24	25	26	27	28	29	30	
Escalation Factor	2.0594	2.1315	2.2061	2.2833	2.3632	2.4460	2.5316	2.6202	2.7119	2.8068	
Escalated Amount	$1,579,285	$1,634,560	$1,691,770	$1,750,982	$1,955,006	$1,643,806	$1,653,258	$1,711,122	$1,771,011	$2,117,830	**$17,508,630.00**
Annual Discount Rate	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	
Present Worth Factor	0.4131	0.3960	0.3797	0.3641	0.3491	0.3347	0.3209	0.3076	0.2950	0.2828	
Present Worth Amount	$652,364	$647,360	$642,395	$637,468	$682,402	$550,121	$530,474	$526,405	$522,368	$598,910	**$5,990,267.00**
# of Water Treatment Employees	2	2	2	2	2	2	2	2	2	2	

Wharf Postclosure Costs (Years 31-40) Post Closure Years (26-35) Total Project Years (31-40) Item	Year 26 Year 31 Annual Cost	Year 27 Year 32 Annual Cost	Year 28 Year 33 Annual Cost	Year 29 Year 34 Annual Cost	Year 30 Year 35 Annual Cost	Year 31 Year 36 Annual Cost	Year 32 Year 37 Annual Cost	Year 33 Year 38 Annual Cost	Year 34 Year 39 Annual Cost	Year 35 Year 40 Annual Cost	Total Year 31-40 Cost
Operation & Maintenance											
Road Maintenance	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$120,000.00
Erosion Control Maintenance	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Subtotal Operation & Maintenance	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$125,000.00**
Mobilization (5%)	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$6,250.00
Contractor Overhead (8%)	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$10,000.00
State Excise Tax (2%)	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$2,500.00
Contractor Profit (10%)	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$12,500.00
Contingency (10%)	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$12,500.00
Insp., Admin., & Maint. (5%)	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$6,250.00
Total Operation & Maintenance	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$175,000.00**
Water Treatment											
Water Treatment											
RV Denitrification Plant											
Nutrient	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$368,500.00
Electricity	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$202,710.00
Natural Gas	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$255,380.00
Carbon Replacment	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$1,304,000.00
Plant Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Water Treatment Total	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$2,230,590.00**
Other Payroll											
Plant Operators	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$703,500.00
Gas & Diesel for Pickups/Equip.	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$60,000.00
Equipment/Vehicle Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Pickup Truck										$25,000.00	$25,000.00
Water Sampling & Analysis	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$770,410.00
Plug Monitoring Wells	$0.00	$0.00	$0.00	$0.00	$1,289.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,289.00
Replacement Pumps	$0.00	$0.00	$0.00	$0.00	$40,000.00	$0.00	$0.00	$0.00	$0.00	$40,000.00	$80,000.00
Biological Monitoring	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$200,000.00
Sludge Removal	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Subtotal Water Treatment	**$416,450.00**	**$416,450.00**	**$416,450.00**	**$416,450.00**	**$457,739.00**	**$416,450.00**	**$416,450.00**	**$416,450.00**	**$416,450.00**	**$481,450.00**	**$4,270,789.00**
Contractor Overhead (8%)	$33,316.00	$33,316.00	$33,316.00	$33,316.00	$36,619.00	$33,316.00	$33,316.00	$33,316.00	$33,316.00	$38,516.00	$341,663.00
State Excise Tax (2%)	$8,329.00	$8,329.00	$8,329.00	$8,329.00	$9,155.00	$8,329.00	$8,329.00	$8,329.00	$8,329.00	$9,629.00	$85,416.00
Contractor Profit (10%)	$41,645.00	$41,645.00	$41,645.00	$41,645.00	$45,774.00	$41,645.00	$41,645.00	$41,645.00	$41,645.00	$48,145.00	$427,079.00
Contingency (25%)	$104,113.00	$104,113.00	$104,113.00	$104,113.00	$114,435.00	$104,113.00	$104,113.00	$104,113.00	$104,113.00	$120,363.00	$1,067,702.00
Insp., Admin., & Maint. (5%)	$20,823.00	$20,823.00	$20,823.00	$20,823.00	$22,887.00	$20,823.00	$20,823.00	$20,823.00	$20,823.00	$24,073.00	$213,544.00
Engineering & Consulting (1%)	$4,165.00	$4,165.00	$4,165.00	$4,165.00	$4,577.00	$4,165.00	$4,165.00	$4,165.00	$4,165.00	$4,815.00	$42,712.00
Total Water Treatment	**$628,841.00**	**$628,841.00**	**$628,841.00**	**$628,841.00**	**$691,186.00**	**$628,841.00**	**$628,841.00**	**$628,841.00**	**$628,841.00**	**$726,991.00**	**$6,448,905.00**
Miscellaneous											
Office Supplies	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Computers										$3,000.00	$3,000.00
Well Plugging											
Office Utilities											
Electricity	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Garbage Disposal	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$2,500.00
Phone, Internet, & Radios	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$12,000.00
Propane	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$15,000.00
Subtotal Misc. & Utilities	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$6,950.00**	**$42,500.00**
Contingency (10%)	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$695.00	$4,250.00
Insp., Admin., & Maint. (1%)	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$70.00	$430.00
Total Misc. & Utilities	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$7,715.00**	**$47,180.00**
Total	**$650,726.00**	**$650,726.00**	**$650,726.00**	**$650,726.00**	**$713,071.00**	**$650,726.00**	**$650,726.00**	**$650,726.00**	**$650,726.00**	**$752,206.00**	**$6,671,085.00**
Annual Inflation Rate	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
Project Year	31	32	33	34	35	36	37	38	39	40	
Escalation Factor	2.9050	3.0067	3.1119	3.2209	3.3336	3.4503	3.5710	3.6960	3.8254	3.9593	
Escalated Amount	$1,890,380	$1,956,543	$2,025,022	$2,095,898	$2,377,087	$2,245,178	$2,323,759	$2,405,091	$2,489,269	$2,978,179	**$22,786,406.00**
Annual Discount Rate	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	
Present Worth Factor	0.2711	0.2600	0.2492	0.2390	0.2291	0.2197	0.2106	0.2019	0.1936	0.1856	
Present Worth Amount	$512,549	$508,618	$504,717	$500,845	$544,621	$493,192	$489,409	$485,655	$481,930	$552,813	**$5,074,349.00**
# of Water Treatment Employees	2	2	2	2	2	2	2	2	2	2	

Wharf Postclosure Costs (Years 41-50)											
Post Closure Years (36-45)	Year 36	Year 37	Year 38	Year 39	Year 40	Year 41	Year 42	Year 43	Year 44	Year 45	
Total Project Years (41-50)	Year 41	Year 42	Year 43	Year 44	Year 45	Year 46	Year 47	Year 48	Year 49	Year 50	Total Year 41-50
Item	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Cost
Operation & Maintenance											
Road Maintenance	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$120,000.00
Erosion Control Maintenance	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Subtotal Operation & Maintenance	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$125,000.00**
Mobilization (5%)	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$6,250.00
Contractor Overhead (8%)	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$10,000.00
State Excise Tax (2%)	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$2,500.00
Contractor Profit (10%)	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$12,500.00
Contingency (10%)	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$12,500.00
Insp., Admin., & Maint. (5%)	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$625.00	$6,250.00
Total Operation & Maintenance	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$175,000.00**
Water Treatment											
Water Treatment											
RV Denitrification Plant											
Nutrient	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$368,500.00
Electricity	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$202,710.00
Natural Gas	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$255,380.00
Carbon Replacment	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$1,304,000.00
Plant Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Water Treatment Total	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$2,230,590.00**
Other Payroll											
Plant Operators	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$703,500.00
Gas & Diesel for Pickups/Equip.	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$6,000.00	$60,000.00
Equipment/Vehicle Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Pickup Truck										$25,000.00	$25,000.00
Water Sampling & Analysis	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$77,041.00	$76,520.00	$76,520.00	$76,520.00	$76,520.00	$76,520.00	$767,805.00
Replacement Pumps					$40,000.00					$40,000.00	$80,000.00
Biological Monitoring	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$200,000.00
Sludge Removal	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$100,000.00
Subtotal Water Treatment	**$416,450.00**	**$416,450.00**	**$416,450.00**	**$416,450.00**	**$456,450.00**	**$415,929.00**	**$415,929.00**	**$415,929.00**	**$415,929.00**	**$480,929.00**	**$4,266,895.00**
Contractor Overhead (8%)	$33,316.00	$33,316.00	$33,316.00	$33,316.00	$36,516.00	$33,274.00	$33,274.00	$33,274.00	$33,274.00	$38,474.00	$341,350.00
State Excise Tax (2%)	$8,329.00	$8,329.00	$8,329.00	$8,329.00	$9,129.00	$8,319.00	$8,319.00	$8,319.00	$8,319.00	$9,619.00	$85,340.00
Contractor Profit (10%)	$41,645.00	$41,645.00	$41,645.00	$41,645.00	$45,645.00	$41,593.00	$41,593.00	$41,593.00	$41,593.00	$48,093.00	$426,690.00
Contingency (25%)	$104,113.00	$104,113.00	$104,113.00	$104,113.00	$114,113.00	$103,982.00	$103,982.00	$103,982.00	$103,982.00	$120,232.00	$1,066,725.00
Insp., Admin., & Maint. (5%)	$20,823.00	$20,823.00	$20,823.00	$20,823.00	$22,823.00	$20,796.00	$20,796.00	$20,796.00	$20,796.00	$24,046.00	$213,345.00
Engineering & Consulting (1%)	$4,165.00	$4,165.00	$4,165.00	$4,165.00	$4,565.00	$4,159.00	$4,159.00	$4,159.00	$4,159.00	$4,809.00	$42,670.00
Total Water Treatment	**$628,841.00**	**$628,841.00**	**$628,841.00**	**$628,841.00**	**$689,241.00**	**$628,052.00**	**$628,052.00**	**$628,052.00**	**$628,052.00**	**$726,202.00**	**$6,443,015.00**
Miscellaneous											
Office Supplies	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Computers										$3,000.00	$3,000.00
Office Utilities											
Electricity	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$500.00	$5,000.00
Garbage Disposal	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$250.00	$2,500.00
Phone, Internet, & Radios	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$12,000.00
Propane	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$15,000.00
Subtotal Misc. & Utilities	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$6,950.00**	**$42,500.00**
Contingency (10%)	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$395.00	$695.00	$4,250.00
Insp., Admin., & Maint. (1%)	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$40.00	$70.00	$430.00
Total Misc. & Utilities	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$7,715.00**	**$47,180.00**
Total	**$650,726.00**	**$650,726.00**	**$650,726.00**	**$650,726.00**	**$711,126.00**	**$649,937.00**	**$649,937.00**	**$649,937.00**	**$649,937.00**	**$751,417.00**	**$6,665,195.00**
Annual Inflation Rate	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
Project Year	41	42	43	44	45	46	47	48	49	50	
Escalation Factor	4.0978	4.2413	4.3897	4.5433	4.7024	4.8669	5.0373	5.2136	5.3961	5.5849	
Escalated Amount	$2,666,567	$2,759,897	$2,856,493	$2,956,471	$3,343,969	$3,163,205	$3,273,917	$3,388,504	$3,507,102	$4,196,609	**$32,112,734.00**
Annual Discount Rate	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	
Present Worth Factor	0.1780	0.1706	0.1636	0.1569	0.1504	0.1442	0.1382	0.1325	0.1271	0.1218	
Present Worth Amount	$474,565	$470,925	$467,313	$463,729	$502,885	$456,089	$452,590	$449,119	$445,674	$511,309	**$4,694,198.00**
# of Water Treatment Employees	2	2	2	2	2	2	2	2	2	2	

Wharf Postclosure Costs (Years 51-60)											
Post Closure Years (46-55)	Year 46	Year 47	Year 48	Year 49	Year 50	Year 51	Year 52	Year 53	Year 54	Year 55	
Total Project Years (51-60)	Year 51	Year 52	Year 53	Year 54	Year 55	Year 56	Year 57	Year 58	Year 59	Year 60	Total Year 51-60
Item	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Annual Cost	Cost
Operation & Maintenance											
Road Maintenance	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$12,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$60,000.00
Erosion Control Maintenance	$500.00	$500.00	$500.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,500.00
Subtotal Operation & Maintenance	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$12,500.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	$62,500.00
Mobilization (5%)	$625.00	$625.00	$625.00	$625.00	$625.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,125.00
Contractor Overhead (8%)	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$1,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$5,000.00
State Excise Tax (2%)	$250.00	$250.00	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,250.00
Contractor Profit (10%)	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6,250.00
Contingency (10%)	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$1,250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6,250.00
Insp., Admin., & Maint. (5%)	$625.00	$625.00	$625.00	$625.00	$625.00	$0.00	$0.00	$0.00	$0.00	$0.00	$3,125.00
Total Operation & Maintenance	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$17,500.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	$87,500.00
Water Treatment											
Water Treatment											
RV Denitrification Plant											
Nutrient	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$36,850.00	$0.00	$0.00	$0.00	$0.00	$0.00	$184,250.00
Electricity	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$20,271.00	$0.00	$0.00	$0.00	$0.00	$0.00	$101,355.00
Natural Gas	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$25,538.00	$0.00	$0.00	$0.00	$0.00	$0.00	$127,690.00
Carbon Replacment	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$130,400.00	$0.00	$0.00	$0.00	$0.00	$0.00	$652,000.00
Plant Maintenance	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00						
Plant Demolition	$0.00	$0.00	$0.00	$0.00	$79,369.00	$0.00	$0.00	$0.00	$0.00	$0.00	$79,369.00
Water Treatment Total	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$223,059.00**	**$302,428.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$1,194,664.00**
Other Payroll											
Plant Operators	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$70,350.00	$0.00	$0.00	$0.00	$0.00	$0.00	$351,750.00
Gas & Diesel for Pickups/Equip.	$6,000.00	$3,000.00	$3,000.00	$3,000.00	$3,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$18,000.00
Equipment/Vehicle Maintenance	$10,000.00	$4,500.00	$4,500.00	$4,500.00	$4,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$28,000.00
Water Sampling & Analysis	$76,520.00	$76,520.00	$76,520.00	$76,520.00	$76,520.00	$0.00	$0.00	$0.00	$0.00	$0.00	$382,600.00
Ross Valley Pond Removal	$0.00	$0.00	$0.00	$0.00	$20,000.00	$0.00	$0.00	$0.00	$0.00	$0.00	$20,000.00
Well Plugging	$0.00	$0.00	$0.00	$0.00	$66,288.00	$0.00	$0.00	$0.00	$0.00	$0.00	$66,288.00
Biological Monitoring	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$20,000.00	$0.00					
Sludge Removal	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$10,000.00	$0.00					$50,000.00
Subtotal Water Treatment	**$415,929.00**	**$407,429.00**	**$407,429.00**	**$407,429.00**	**$573,086.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$2,211,302.00**
Contractor Overhead (8%)	$33,274.00	$32,594.00	$32,594.00	$32,594.00	$45,847.00	$0.00	$0.00	$0.00	$0.00	$0.00	$176,903.00
State Excise Tax (2%)	$8,319.00	$8,149.00	$8,149.00	$8,149.00	$11,462.00	$0.00	$0.00	$0.00	$0.00	$0.00	$44,228.00
Contractor Profit (10%)	$41,593.00	$40,743.00	$40,743.00	$40,743.00	$57,309.00	$0.00	$0.00	$0.00	$0.00	$0.00	$221,131.00
Contingency (25%)	$103,982.00	$101,857.00	$101,857.00	$101,857.00	$143,272.00	$0.00	$0.00	$0.00	$0.00	$0.00	$552,825.00
Insp., Admin., & Maint. (5%)	$20,796.00	$20,371.00	$20,371.00	$20,371.00	$28,654.00	$0.00	$0.00	$0.00	$0.00	$0.00	$110,563.00
Engineering & Consulting (1%)	$4,159.00	$4,074.00	$4,074.00	$4,074.00	$5,731.00	$0.00	$0.00	$0.00	$0.00	$0.00	$22,112.00
Total Water Treatment	**$628,052.00**	**$615,217.00**	**$615,217.00**	**$615,217.00**	**$865,361.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$3,339,064.00**
Miscellaneous											
Office Supplies	$500.00	$500.00	$500.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,500.00
Office Utilities											
Electricity	$500.00	$500.00	$500.00	$500.00	$500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$2,500.00
Garbage Disposal	$250.00	$250.00	$250.00	$250.00	$250.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,250.00
Phone, Internet, & Radios	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$1,200.00	$0.00	$0.00	$0.00	$0.00	$0.00	$6,000.00
Propane	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$1,500.00	$0.00	$0.00	$0.00	$0.00	$0.00	$7,500.00
Subtotal Misc. & Utilities	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$3,950.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$19,750.00**
Contingency (10%)	$395.00	$395.00	$395.00	$395.00	$395.00	$0.00	$0.00	$0.00	$0.00	$0.00	$1,975.00
Insp., Admin., & Maint. (1%)	$40.00	$40.00	$40.00	$40.00	$40.00	$0.00	$0.00	$0.00	$0.00	$0.00	$200.00
Total Misc. & Utilities	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$4,385.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$21,925.00**
Total	**$649,937.00**	**$637,102.00**	**$637,102.00**	**$637,102.00**	**$887,246.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$3,448,489.00**
Annual Inflation Rate	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%	
Project Year	51	52	53	54	55	56	57	58	59	60	
Escalation Factor	5.7804	5.9827	6.1921	6.4088	6.6331	6.8653	7.1056	7.3543	7.6117	7.8781	
Escalated Amount	$3,756,895	$3,811,599	$3,945,005	$4,083,080	$5,885,228	$0	$0	$0	$0	$0	**$21,481,807.00**
Annual Discount Rate	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	4.3%	
Present Worth Factor	0.1168	0.1120	0.1074	0.1030	0.0987	0.0946	0.0907	0.0870	0.0834	0.0800	
Present Worth Amount	$438,863	$426,897	$423,623	$420,373	$580,933	$0	$0	$0	$0	$0	**$2,290,689.00**
# of Water Treatment Employees	2	2	2	2	2	0	0	0	0	0	

Postclosure Bond

Wharf Expansion
Bond Calculation
Plugging of Seven Monitor Wells

Labor: $200.00 per hour
Cement: $9.00 per sack (1.28 ft^3 per sack)

$$Volume(ft^3) = D_I(in)^2 \cdot 0.005454 \cdot L(ft)$$

D_I = 4.5 inch PVC

Monitor Well	Total Length (ft) [1]	Length to be Cemented (ft) [1]	Volume (ft^3)
MW-37	725	725	80.07
MW-40	300	300	33.13
			0.00
		Total:	113.20

[1] Lengths are shown in attached well completion logs.

$$Cement = \frac{113.20\,ft^3}{1.28\,ft^3} = 88.43 \approx 89 sacks$$

89 sacks of cement * $9.00 = $80 $801.00

*** Estimated Time for Plugging of Each Well = 6 Hours**

6 Hours * 2 Wells * $200.00 = $2,400.00

Total for Supplies and Labor: $3,201.00

Joseph well

1089
+200
$1289

Postclosure Bond

Wharf Expansion
Bond Calculation
Plugging of Seven Monitor Wells

Labor: $200.00 per hour
Cement: $9.00 per sack (1.28 ft^3 per sack)

$$Volume(ft^3) = D_I(in)^2 \cdot 0.005454 \cdot L(ft)$$

D_I = 10.75 inch PVC

Monitor Well	Total Length (ft) [1]	Length to be Cemented (ft) [1]	Volume (ft^3)
Pw1	520	510	321.44

Number of Wells 1

Total: 321.44 ft^3

Cement = 251.13 sacks

Cost of Cement	$2,260
Labor Cost	$1,200
Total	$3,460

Wharf Expansion

Bond Calculation

Plugging of Seven Monitor Wells

Labor: $200.00 per hour

Cement: $9.00 per sack (1.28 ft^3 per sack)

$$Volume(ft^3) = D_I(in)^2 \cdot 0.005454 \cdot L(ft)$$

D_I = 8.5 inch PVC

Monitor Well	Total Length (ft) [1]	Length to be Cemented (ft) [1]	Volume (ft^3)
Iw1	178	178	70.14
IW2	385	385	151.71

Number of Wells 2

Total: 221.85 ft^3

Cement = 173.32 sacks

Cost of Cement	$1,560
Labor Cost	$2,400
Total	$3,960

Wharf Expansion
Bond Calculation
Plugging of Seven Monitor Wells

Labor: $200.00 per hour
Cement: $9.00 per sack (1.28 ft^3 per sack)

$$Volume(ft^3) = D_1(in)^2 \cdot 0.005454 \cdot L(ft)$$

D_1 = 6 inch PVC

Monitor Well	Total Length (ft) (1)	Length to be Cemented (ft) (1)	Volume (ft^3)
HDH8a	390	315	61.85
MW1b	220	205	40.25

Number of Wells 2

Total: 102.10 ft^3

Cement = 79.76 sacks

Cost of Cement	$718
Labor Cost	$2,400
Total	$3,118

Wharf Expansion
Bond Calculation
Plugging of Seven Monitor Wells

Labor: $200.00 per hour
Cement: $9.00 per sack (1.28 ft^3 per sack)

$$Volume(ft^3) = D_1(in)^2 \cdot 0.005454 \cdot L(ft)$$

D_1 = 2 inch PVC

Monitor Well	Total Length (ft) [1]	Length to be Cemented (ft) [1]	Volume (ft^3)
GWAC6	34	34	0.74
MW9	265	265	5.78
MW9a	240	240	5.24
MW10	158	158	3.45
MW10a	133	133	2.90

Number of Wells 5

Total: 18.11 ft^3

Cement = 14.15 sacks

Cost of Cement	$127
Labor Cost	$6,000
Total	$6,127

Wharf Expansion

Bond Calculation

Plugging of Seven Monitor Wells

Labor: $200.00 per hour

Cement: $9.00 per sack (1.28 ft^3 per sack)

$$Volume(ft^3) = D_I(in)^2 \cdot 0.005454 \cdot L(ft)$$

D_I = 5 inch PVC

Monitor Well	Total Length (ft) [1]	Length to be Cemented (ft) [1]	Volume (ft^3)
MW53	200	200	27.27
MW54	200	200	27.27
MW55	500	500	68.18
MW56	260	260	35.45
MW57	180	180	24.54
MW58	600	600	81.81

Number of Wells 6

Total: 264.52 ft^3

Cement = 206.66 sacks

Cost of Cement	$1,860
Labor Cost	$7,200
Total	$9,060

Wharf Expansion

Bond Calculation

Plugging of Seven Monitor Wells

Labor: $200.00 per hour

Cement: $9.00 per sack (1.28 ft^3 per sack)

$$Volume(ft^3) = D_I(in)^2 \cdot 0.005454 \cdot L(ft)$$

D_I = 4.5 inch PVC

Monitor Well	Total Length (ft) [1]	Length to be Cemented (ft) [1]	Volume (ft^3)
HDH 10A	340	300	33.13
HDH11	475	475	52.46
HDH12	78	66	7.29
IW-3	200	180	19.88
IW4	150	140	15.46
MW1	305	290	32.03
MW1a	170	156	17.23
MW1c	200	165	18.22
MW2	304	304	33.57
MW2a	67	67	7.40
MW2b	70	70	7.73
Mw13	45	45	4.97
MW13a	170	164	18.11
MW14	425	425	46.94
MW15	165	155	17.12
MW17	125	110	12.15
Mw18	73	73	8.06
Mw19	270	270	29.82
MW31	91	91	10.05

Mw33	230	230	25.40
Mw39	115.4	115.4	12.75
MW41	240	238	26.29
Mw44	90	87	9.61
MW46	70	70	7.73
MW47	180	170	18.78
MW48	300	300	33.13
Mw49	300	300	33.13
MW50	150	140	15.46
Mw51	200	180	19.88
Mw52	250	250	27.61
MW59	250	250	27.61

Number of Wells 30

Total: 649.01 ft^3

Cement = 507.04 sacks

Cost of Cement	$4,563
Labor Cost	$36,000
Total	$40,563