

ECONOMIC ANALYSIS SUMMARY

Reid Gardner Unit 1

Boiler Design:

Foster Wheeler Wall-Fired PC

Parameter	Current Operation	NOx Control				
		LNB w/OFA	LNB w/OFA & SNCR	ROFA w/Rotamix	LNB w/OFA & SCR	ROFA w/SCR
Case	1	2	3	4	5	6
NOx Emission Control System	LNB	LNB w/OFA	LNB w/OFA & SNCR	ROFA w/Rotamix	LNB w/OFA & SCR	ROFA w/SCR
TOTAL INSTALLED CAPITAL COST (\$)	0	4,448,000	6,945,500	7,884,900	35,048,000	38,484,900
FIRST YEAR O&M COST (\$)						
Operating Labor (\$)	0	0	0	0	0	0
Maintenance Material (\$)	0	32,000	83,000	48,000	132,000	148,000
Maintenance Labor (\$)	0	48,000	124,500	72,000	198,000	222,000
Administrative Labor (\$)	0	0	0	0	0	0
TOTAL FIXED O&M COST	0	80,000	207,500	120,000	330,000	370,000
Makeup Water Cost	0	0	0	0	0	0
Reagent Cost	0	0	151,080	213,062	301,192	301,192
SCR Catalyst / FF Bag Cost	0	0	0	0	150,000	112,500
Electric Power Cost	0	0	37,668	280,890	248,609	529,499
TOTAL VARIABLE O&M COST	0	0	188,748	493,952	699,801	943,191
TOTAL FIRST YEAR O&M COST	0	80,000	396,248	613,952	1,029,801	1,313,191
FIRST YEAR DEBT SERVICE (\$)	0	471,737	736,612	836,241	3,717,051	4,081,555
TOTAL FIRST YEAR COST (\$)	0	551,737	1,132,860	1,450,193	4,746,852	5,394,746
Power Consumption (MW)	0.0	0.0	0.1	0.7	0.7	1.4
Annual Power Usage (Million kW-Hr/Yr)	0.0	0.0	0.8	5.6	5.0	10.6
CONTROL COST (\$/Ton Removed)						
NOx Removal Rate (%)	0.0%	21.3%	40.9%	57.7%	81.6%	81.6%
NOx Removed (Tons/Yr)	0	346	665	938	1,327	1,327
First Year Average Control Cost (\$/Ton NOx Rem.)	0	1,597	1,702	1,545	3,578	4,067
Incremental Control Cost (\$/Ton NOx Removed)	0	1,597	1,816	1,162	8,493	#DIV/0!

INPUT CALCULATIONS		Boiler Design: Foster Wheeler Wall-Fired PC				
Reid Gardner Unit 1						
Parameter	Current Operation	NOx Control				
		LNB w/OFA	LNB w/OFA & SNCR	ROFA w/Rotamix	LNB w/OFA & SCR	ROFA w/SCR
Case	1	2	3	4	5	6
NOx Emission Control System	LNB	LNB w/OFA	LNB w/OFA & SNCR	ROFA w/Rotamix	LNB w/OFA & SCR	ROFA w/SCR
Unit Design and Coal Characteristics						
Type of Unit	PC	PC	PC	PC	PC	PC
Net Power Output (kW)	100,000	100,000	100,000	100,000	100,000	100,000
Net Plant Heat Rate (Btu/kW-Hr)	11,324	11,324	11,324	11,324	11,324	11,324
Boiler Fuel	Bituminous Coal	Bituminous Coal	Bituminous Coal	Bituminous Coal	Bituminous Coal	Bituminous Coal
Coal Heating Value (Btu/Lb)	11,712	11,712	11,712	11,712	11,712	11,712
Coal Sulfur Content (wt.%)	0.570%	0.570%	0.570%	0.570%	0.570%	0.570%
Coal Ash Content (wt.%)	7.640%	7.640%	7.640%	7.640%	7.640%	7.640%
Boiler Heat Input, each (MMBtu/Hr)	1,132	1,132	1,132	1,132	1,132	1,132
Coal Flow Rate (Lb/Hr)	96,687	96,687	96,687	96,687	96,687	96,687
(Ton/Yr)	364,201	364,201	364,201	364,201	364,201	364,201
(MMBtu/Yr)	8,531,049	8,531,049	8,531,049	8,531,049	8,531,049	8,531,049
Emissions						
Uncontrolled NOx (Lb/Hr)	431	431	431	431	431	431
(Lb/MMBtu)	0.38	0.38	0.38	0.38	0.38	0.38
(Lb Moles/Hr)	14.38	14.38	14.38	14.38	14.38	14.38
(Tons/Yr)	1,625	1,625	1,625	1,625	1,625	1,625
NOx Removal Rate (%)	0.0%	21.3%	40.9%	57.7%	81.6%	81.6%
(Lb/Hr)	0	92	177	249	352	352
(Lb Moles/Hr)	0.00	3.06	5.89	8.30	11.74	11.74
(Ton/Yr)	0	346	665	938	1,327	1,327
NOx Emission Rate (Lb/Hr)	431	340	255	182	79	79
(Lb/MMBtu)	0.38	0.30	0.23	0.16	0.07	0.07
(Ton/Yr)	1,625	1,280	960	687	299	299
General Plant Data						
Annual Operation (Hours/Year)	7,534	7,534	7,534	7,534	7,534	7,534
Annual On-Site Power Plant Capacity Factor	86%	0.86	0.86	0.86	0.86	0.86
Economic Factors						
Interest Rate (%)	8.55%	8.55%	8.55%	8.55%	8.55%	8.55%
Discount Rate (%)	9.00%	9.00%	9.00%	9.00%	9.00%	9.00%
Plant Economic Life (Years)	20	20	20	20	20	20
Installed Capital Costs						
NOx Emission Control System (\$2007)	0	4,448,000	6,945,500	7,884,900	35,048,000	38,484,900
Total Emission Control Systems (\$2007)	0	4,448,000	6,945,500	7,884,900	35,048,000	38,484,900
NOx Emission Control System (\$/kW)	0	44	69	79	350	385
Total Emission Control Systems (\$/kW)	0	44	69	79	350	385
Total Fixed Operating & Maintenance Costs						
Operating Labor (\$)	0	0	0	0	0	0
Maintenance Material (\$)	0	32,000	83,000	48,000	132,000	148,000
Maintenance Labor (\$)	0	48,000	124,500	72,000	198,000	222,000
Administrative Labor (\$)	0	0	0	0	0	0
Total Fixed O&M Cost (\$)	0	80,000	207,500	120,000	330,000	370,000
Annual Fixed O&M Cost Escalation Rate (%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Reagent Cost						
Unit Cost (\$/Ton)	None	None	Anhydrous NH3	Anhydrous NH3	Anhydrous NH3	Anhydrous NH3
(\$/Lb)	0.00	0.00	400	400	400	400
Molar Stoichiometry	0.00	0.00	0.200	0.200	0.200	0.200
Reagent Purity (Wt.%)	100%	100%	100%	100%	100%	100%
Reagent Usage (Lb/Hr)	0	0	100	141	200	200
First Year Reagent Cost (\$)	0	0	151,080	213,062	301,192	301,192
Annual Reagent Cost Escalation Rate (%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
SCR Catalyst / FF Bag Replacement Cost						
Annual SCR Catalyst (m3) / No. FF Bags	0	0	0	0	50	38
SCR Catalyst (\$/m3) / Bag Cost (\$/ea.)	3,000	3,000	3,000	3,000	3,000	3,000
First Year SCR Catalyst / Bag Replace. Cost (\$)	0	0	0	0	150,000	112,500
Annual SCR Catalyst / Bag Cost Esc. Rate (%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
Auxiliary Power Cost						
Auxiliary Power Requirement (% of Plant Output)	0.00%	0.00%	0.10%	0.75%	0.66%	1.41%
(MW)	0.00	0.00	0.10	0.75	0.66	1.41
Unit Cost (\$2007/MW-Hr)	50.00	50.00	50.00	50.00	50.00	50.00
First Year Auxiliary Power Cost (\$)	0	0	37,668	280,890	248,609	529,499
Annual Power Cost Escalation Rate (%)	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%

Economic factors as per Sierra Pacific 2008 planning guidelines

CAPITAL COST

Reid Gardner Unit 1

Parameter	NOx Control									
	LNB w/OFA		LNB w/OFA & SNCR		ROFA w/Rotamix		LNB w/OFA & SCR		ROFA w/SCR	
Case	2		3		4		5		6	
NOx Emission Control System	LNB w/OFA		LNB w/OFA & SNCR		ROFA w/Rotamix		LNB w/OFA & SCR		ROFA w/SCR	
SO2 Emission Control System	Soda Ash Wet FGD		Soda Ash Wet FGD		Soda Ash Wet FGD		Soda Ash Wet FGD		Soda Ash Wet FGD	
PM Emission Control System	Fabric Filter		Fabric Filter		Fabric Filter		Fabric Filter		Fabric Filter	
CAPITAL COST COMPONENT	Factor/Source	Cost	Factor/Source	Cost	Factor/Source	Cost	Factor/Source	Cost	Factor/Source	Cost
LNB w/OFA or ROFA	LNB w/OFA		LNB w/OFA		ROFA		LNB w/OFA		ROFA	
Major Materials Design and Supply	Vendor	\$1,600,000	Vendor	\$1,600,000	Vendor	\$2,880,000	Vendor	\$1,600,000	Vendor	\$2,880,000
Construction	70.0%	\$1,120,000	70.0%	\$1,120,000	Vendor	\$742,500	70.0%	\$1,120,000	Vendor	\$742,500
Balance of Plant	50.0%	\$800,000	50.0%	\$800,000	50.0%	\$1,440,000	50.0%	\$800,000	50.0%	\$1,440,000
Electrical (Allowance)	5.0%	\$80,000	5.0%	\$80,000	30.0%	\$864,000	5.0%	\$80,000	30.0%	\$864,000
Owner's Costs	10.0%	\$160,000	10.0%	\$160,000	10.0%	\$288,000	10.0%	\$160,000	10.0%	\$288,000
Surcharge	16.0%	\$256,000	16.0%	\$256,000	16.0%	\$460,800	16.0%	\$256,000	16.0%	\$460,800
AFUDC	12.0%	\$192,000	12.0%	\$192,000	12.0%	\$345,600	12.0%	\$192,000	12.0%	\$345,600
Subtotal		\$4,208,000		\$4,208,000		\$7,020,900		\$4,208,000		\$7,020,900
Contingency	15.0%	\$240,000	15.0%	\$240,000	30.0%	\$864,000	15.0%	\$240,000	30.0%	\$864,000
Total Capital Cost for LNB w/OFA, ROFA/Rotamix		\$4,448,000		\$4,448,000		\$7,884,900		\$4,448,000		\$7,884,900
SNCR or SCR or Rotamix	SNCR		SNCR		Rotamix		SCR		SCR	
Major Materials Design and Supply	Vendor	\$0	Vendor	\$1,350,000	Vendor	\$1,029,000	Vendor	\$20,000,000	Vendor	\$20,000,000
Construction	0.0%	\$0	15.0%	\$202,500	Vendor	\$247,500	0.0%	\$0	0.0%	\$0
Balance of Plant	0.0%	\$0	12.0%	\$162,000	12.0%	\$123,480	0.0%	\$0	0.0%	\$0
Electrical (Allowance)	0.0%	\$0	5.0%	\$67,500	0.0%	\$0	0.0%	\$0	0.0%	\$0
Owner's Costs	0.0%	\$0	10.0%	\$135,000	10.0%	\$102,900	10.0%	\$2,000,000	10.0%	\$2,000,000
Surcharge	0.0%	\$0	16.0%	\$216,000	16.0%	\$164,640	16.0%	\$3,200,000	16.0%	\$3,200,000
AFUDC	0.0%	\$0	12.0%	\$162,000	12.0%	\$123,480	12.0%	\$2,400,000	12.0%	\$2,400,000
Subtotal		\$0		\$2,295,000		\$1,791,000		\$27,600,000		\$27,600,000
Contingency	0.0%	\$0	15.0%	\$202,500	15.0%	\$154,350	15.0%	\$3,000,000	15.0%	\$3,000,000
Total Capital Cost for SNCR or SCR or Rotamix		\$0		\$2,497,500		\$1,945,350		\$30,600,000		\$30,600,000

Reid Gardner Unit 1		Current Operation								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	-	-	-	-	-	-	-	-	-
2	2015	-	-	-	-	-	-	-	-	-
3	2016	-	-	-	-	-	-	-	-	-
4	2017	-	-	-	-	-	-	-	-	-
5	2018	-	-	-	-	-	-	-	-	-
6	2019	-	-	-	-	-	-	-	-	-
7	2020	-	-	-	-	-	-	-	-	-
8	2021	-	-	-	-	-	-	-	-	-
9	2022	-	-	-	-	-	-	-	-	-
10	2023	-	-	-	-	-	-	-	-	-
11	2024	-	-	-	-	-	-	-	-	-
12	2025	-	-	-	-	-	-	-	-	-
13	2026	-	-	-	-	-	-	-	-	-
14	2027	-	-	-	-	-	-	-	-	-
15	2028	-	-	-	-	-	-	-	-	-
16	2029	-	-	-	-	-	-	-	-	-
17	2030	-	-	-	-	-	-	-	-	-
18	2031	-	-	-	-	-	-	-	-	-
19	2032	-	-	-	-	-	-	-	-	-
20	2033	-	-	-	-	-	-	-	-	-

Reid Gardner Unit 1		LNB w/OFA								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	80,000	-	-	-	-	-	471,737	551,737	1,597
2	2015	81,600	-	-	-	-	-	471,737	553,337	1,602
3	2016	83,232	-	-	-	-	-	471,737	554,969	1,606
4	2017	84,897	-	-	-	-	-	471,737	556,634	1,611
5	2018	86,595	-	-	-	-	-	471,737	558,332	1,616
6	2019	88,326	-	-	-	-	-	471,737	560,064	1,621
7	2020	90,093	-	-	-	-	-	471,737	561,830	1,626
8	2021	91,895	-	-	-	-	-	471,737	563,632	1,631
9	2022	93,733	-	-	-	-	-	471,737	565,470	1,637
10	2023	95,607	-	-	-	-	-	471,737	567,345	1,642
11	2024	97,520	-	-	-	-	-	471,737	569,257	1,648
12	2025	99,470	-	-	-	-	-	471,737	571,207	1,653
13	2026	101,459	-	-	-	-	-	471,737	573,196	1,659
14	2027	103,489	-	-	-	-	-	471,737	575,226	1,665
15	2028	105,558	-	-	-	-	-	471,737	577,295	1,671
16	2029	107,669	-	-	-	-	-	471,737	579,407	1,677
17	2030	109,823	-	-	-	-	-	471,737	581,560	1,683
18	2031	112,019	-	-	-	-	-	471,737	583,756	1,690
19	2032	114,260	-	-	-	-	-	471,737	585,997	1,696
20	2033	116,545	-	-	-	-	-	471,737	588,282	1,703

Reid Gardner Unit 1											ROFA w/Rotamix
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)	
0	2013										
1	2014	120,000	-	213,062	-	280,890	493,952	836,241	1,450,193	1,545	
2	2015	122,400	-	217,323	-	286,508	503,831	836,241	1,462,472	1,558	
3	2016	124,848	-	221,670	-	292,238	513,908	836,241	1,474,997	1,572	
4	2017	127,345	-	226,103	-	298,083	524,186	836,241	1,487,772	1,585	
5	2018	129,892	-	230,625	-	304,045	534,670	836,241	1,500,803	1,599	
6	2019	132,490	-	235,238	-	310,126	545,363	836,241	1,514,094	1,613	
7	2020	135,139	-	239,942	-	316,328	556,270	836,241	1,527,651	1,628	
8	2021	137,842	-	244,741	-	322,655	567,396	836,241	1,541,479	1,643	
9	2022	140,599	-	249,636	-	329,108	578,744	836,241	1,555,584	1,658	
10	2023	143,411	-	254,629	-	335,690	590,319	836,241	1,569,971	1,673	
11	2024	146,279	-	259,721	-	342,404	602,125	836,241	1,584,645	1,689	
12	2025	149,205	-	264,916	-	349,252	614,167	836,241	1,599,613	1,705	
13	2026	152,189	-	270,214	-	356,237	626,451	836,241	1,614,881	1,721	
14	2027	155,233	-	275,618	-	363,362	638,980	836,241	1,630,454	1,737	
15	2028	158,337	-	281,131	-	370,629	651,759	836,241	1,646,338	1,754	
16	2029	161,504	-	286,753	-	378,041	664,795	836,241	1,662,540	1,772	
17	2030	164,734	-	292,488	-	385,602	678,090	836,241	1,679,066	1,789	
18	2031	168,029	-	298,338	-	393,314	691,652	836,241	1,695,922	1,807	
19	2032	171,390	-	304,305	-	401,180	705,485	836,241	1,713,116	1,826	
20	2033	174,817	-	310,391	-	409,204	719,595	836,241	1,730,653	1,844	

Reid Gardner Unit 1											ROFA w/SCR
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)	
0	2013										
1	2014	370,000	-	301,192	112,500	529,499	943,191	4,081,555	5,394,746	4,067	
2	2015	377,400	-	307,216	114,750	540,089	962,055	4,081,555	5,421,010	4,086	
3	2016	384,948	-	313,360	117,045	550,891	981,296	4,081,555	5,447,799	4,107	
4	2017	392,647	-	319,627	119,386	561,909	1,000,922	4,081,555	5,475,124	4,127	
5	2018	400,500	-	326,020	121,774	573,147	1,020,940	4,081,555	5,502,995	4,148	
6	2019	408,510	-	332,540	124,209	584,610	1,041,359	4,081,555	5,531,424	4,170	
7	2020	416,680	-	339,191	126,693	596,302	1,062,186	4,081,555	5,560,421	4,192	
8	2021	425,014	-	345,975	129,227	608,228	1,083,430	4,081,555	5,589,999	4,214	
9	2022	433,514	-	352,894	131,812	620,393	1,105,099	4,081,555	5,620,167	4,237	
10	2023	442,184	-	359,952	134,448	632,800	1,127,201	4,081,555	5,650,940	4,260	
11	2024	451,028	-	367,151	137,137	645,456	1,149,745	4,081,555	5,682,327	4,283	
12	2025	460,048	-	374,494	139,880	658,366	1,172,740	4,081,555	5,714,343	4,308	
13	2026	469,249	-	381,984	142,677	671,533	1,196,194	4,081,555	5,746,999	4,332	
14	2027	478,634	-	389,624	145,531	684,964	1,220,118	4,081,555	5,780,307	4,357	
15	2028	488,207	-	397,416	148,441	698,663	1,244,521	4,081,555	5,814,282	4,383	
16	2029	497,971	-	405,365	151,410	712,636	1,269,411	4,081,555	5,848,937	4,409	
17	2030	507,931	-	413,472	154,438	726,889	1,294,799	4,081,555	5,884,285	4,436	
18	2031	518,089	-	421,742	157,527	741,427	1,320,695	4,081,555	5,920,339	4,463	
19	2032	528,451	-	430,176	160,678	756,255	1,347,109	4,081,555	5,957,115	4,491	
20	2033	539,020	-	438,780	163,891	771,380	1,374,051	4,081,555	5,994,626	4,519	

Reid Gardner Unit 1		LNB w/OFA & SNCR								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	207,500	-	151,080	-	37,668	188,748	736,612	1,132,860	1,702
2	2015	211,650	-	154,102	-	38,421	192,523	736,612	1,140,785	1,714
3	2016	215,883	-	157,184	-	39,190	196,374	736,612	1,148,869	1,727
4	2017	220,201	-	160,328	-	39,974	200,301	736,612	1,157,114	1,739
5	2018	224,605	-	163,534	-	40,773	204,307	736,612	1,165,524	1,752
6	2019	229,097	-	166,805	-	41,589	208,393	736,612	1,174,102	1,764
7	2020	233,679	-	170,141	-	42,420	212,561	736,612	1,182,852	1,778
8	2021	238,352	-	173,544	-	43,269	216,812	736,612	1,191,777	1,791
9	2022	243,119	-	177,015	-	44,134	221,149	736,612	1,200,880	1,805
10	2023	247,982	-	180,555	-	45,017	225,572	736,612	1,210,165	1,819
11	2024	252,941	-	184,166	-	45,917	230,083	736,612	1,219,636	1,833
12	2025	258,000	-	187,849	-	46,835	234,685	736,612	1,229,297	1,847
13	2026	263,160	-	191,606	-	47,772	239,378	736,612	1,239,151	1,862
14	2027	268,423	-	195,438	-	48,728	244,166	736,612	1,249,201	1,877
15	2028	273,792	-	199,347	-	49,702	249,049	736,612	1,259,453	1,893
16	2029	279,268	-	203,334	-	50,696	254,030	736,612	1,269,910	1,908
17	2030	284,853	-	207,401	-	51,710	259,111	736,612	1,280,576	1,924
18	2031	290,550	-	211,549	-	52,744	264,293	736,612	1,291,455	1,941
19	2032	296,361	-	215,780	-	53,799	269,579	736,612	1,302,552	1,957
20	2033	302,288	-	220,095	-	54,875	274,971	736,612	1,313,871	1,974

Reid Gardner Unit 1		LNB w/OFA & SCR								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	330,000	-	301,192	150,000	248,609	699,801	3,717,051	4,746,852	3,578
2	2015	336,600	-	307,216	153,000	253,581	713,797	3,717,051	4,767,448	3,594
3	2016	343,332	-	313,360	156,060	258,653	728,073	3,717,051	4,788,456	3,610
4	2017	350,199	-	319,627	159,181	263,826	742,634	3,717,051	4,809,884	3,626
5	2018	357,203	-	326,020	162,365	269,102	757,487	3,717,051	4,831,740	3,642
6	2019	364,347	-	332,540	165,612	274,484	772,637	3,717,051	4,854,034	3,659
7	2020	371,634	-	339,191	168,924	279,974	788,089	3,717,051	4,876,774	3,676
8	2021	379,066	-	345,975	172,303	285,573	803,851	3,717,051	4,899,968	3,694
9	2022	386,648	-	352,894	175,749	291,285	819,928	3,717,051	4,923,627	3,712
10	2023	394,381	-	359,952	179,264	297,111	836,327	3,717,051	4,947,758	3,730
11	2024	402,268	-	367,151	182,849	303,053	853,053	3,717,051	4,972,372	3,748
12	2025	410,314	-	374,494	186,506	309,114	870,114	3,717,051	4,997,479	3,767
13	2026	418,520	-	381,984	190,236	315,296	887,517	3,717,051	5,023,087	3,786
14	2027	426,890	-	389,624	194,041	321,602	905,267	3,717,051	5,049,208	3,806
15	2028	435,428	-	397,416	197,922	328,034	923,372	3,717,051	5,075,851	3,826
16	2029	444,137	-	405,365	201,880	334,595	941,840	3,717,051	5,103,027	3,847
17	2030	453,019	-	413,472	205,918	341,287	960,677	3,717,051	5,130,747	3,868
18	2031	462,080	-	421,742	210,036	348,112	979,890	3,717,051	5,159,021	3,889
19	2032	471,321	-	430,176	214,237	355,075	999,488	3,717,051	5,187,860	3,911
20	2033	480,748	-	438,780	218,522	362,176	1,019,478	3,717,051	5,217,276	3,933

Reid Gardner Unit 1		ROFA								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	80,000	-	-	-	280,890	280,890	836,241	1,197,131	1,799
2	2015	81,600	-	-	-	286,508	286,508	836,241	1,204,349	1,810
3	2016	83,232	-	-	-	292,238	292,238	836,241	1,211,711	1,821
4	2017	84,897	-	-	-	298,083	298,083	836,241	1,219,221	1,832
5	2018	86,595	-	-	-	304,045	304,045	836,241	1,226,880	1,844
6	2019	88,326	-	-	-	310,126	310,126	836,241	1,234,693	1,856
7	2020	90,093	-	-	-	316,328	316,328	836,241	1,242,662	1,867
8	2021	91,895	-	-	-	322,655	322,655	836,241	1,250,790	1,880
9	2022	93,733	-	-	-	329,108	329,108	836,241	1,259,081	1,892
10	2023	95,607	-	-	-	335,690	335,690	836,241	1,267,538	1,905
11	2024	97,520	-	-	-	342,404	342,404	836,241	1,276,164	1,918
12	2025	99,470	-	-	-	349,252	349,252	836,241	1,284,963	1,931
13	2026	101,459	-	-	-	356,237	356,237	836,241	1,293,937	1,945
14	2027	103,489	-	-	-	363,362	363,362	836,241	1,303,091	1,958
15	2028	105,558	-	-	-	370,629	370,629	836,241	1,312,428	1,972
16	2029	107,669	-	-	-	378,041	378,041	836,241	1,321,952	1,987
17	2030	109,823	-	-	-	385,602	385,602	836,241	1,331,666	2,001
18	2031	112,019	-	-	-	393,314	393,314	836,241	1,341,575	2,016
19	2032	114,260	-	-	-	401,180	401,180	836,241	1,351,681	2,031
20	2033	116,545	-	-	-	409,204	409,204	836,241	1,361,990	2,047

ECONOMIC ANALYSIS SUMMARY

Reid Gardner Unit 1

Boiler Design:

Parameter	Current Operation	PM Control
		Fabric Filter
Case	1	7
PM Emission Control System	Fabric Filter	Fabric Filter
TOTAL INSTALLED CAPITAL COST (\$)	0	23,520,000
FIRST YEAR O&M COST (\$)		
Operating Labor (\$)	0	0
Maintenance Material (\$)	0	128,000
Maintenance Labor (\$)	0	216,000
Administrative Labor (\$)	0	0
TOTAL FIXED O&M COST	0	344,000
Makeup Water Cost	0	0
Reagent Cost	0	0
SCR Catalyst / FF Bag Cost	0	54,080
Electric Power Cost	0	150,672
TOTAL VARIABLE O&M COST	0	204,752
TOTAL FIRST YEAR O&M COST	0	548,752
FIRST YEAR DEBT SERVICE (\$)	0	2,494,437
TOTAL FIRST YEAR COST (\$)	0	3,043,189
Power Consumption (MW)	0.0	0.4
Annual Power Usage (Million kW-Hr/Yr)	0.0	3.0
CONTROL COST (\$/Ton Removed)		
PM Removal Rate (%)	0.00%	0.0%
PM Removed (Tons/Yr)	0	0
First Year Average Control Cost (\$/Ton PM Rem.)	0	#DIV/0!
Incremental Control Cost (\$/Ton PM Removed)	Base	#DIV/0!
		7-1

INPUT CALCULATIONS			
Reid Gardner Unit 1		Boiler Design:	
Parameter	Current Operation	PM Control	Comments
		Fabric Filter	
Case	1	7	
PM Emission Control System	Fabric Filter	Fabric Filter	
Unit Design and Coal Characteristics			
Type of Unit	PC	PC	
Net Power Output (kW)	100,000	100,000	
Net Plant Heat Rate (Btu/kW-Hr)	11,324	11,324	
Boiler Fuel	Bituminous	Bituminous Coal	
Coal Heating Value (Btu/Lb)	11,712	11,712	
Coal Sulfur Content (wt.%)	0.570%	0.570%	
Coal Ash Content (wt.%)	7.640%	7.640%	
Boiler Heat Input, each (MMBtu/Hr)	1,132	1,132	
Coal Flow Rate (Lb/Hr)	96,687	96,687	
(Ton/Yr)	364,201	364,201	
(MMBtu/Yr)	8,531,049	8,531,049	
Emissions			
Uncontrolled Fly Ash (Lb/Hr)	5,910	17	
(Lb/MMBtu)	5.219	0.015	
(Lb Moles/Hr)	196.9	0.6	
(Tons/Yr)	22,260	64	
Fly Ash Removal Rate (%)	99.71%	0.00%	
(Lb/Hr)	5,893	0	
(Ton/Yr)	22,196	0	
Fly Ash Emission Rate (Lb/Hr)	17	17	
(Lb/MMBtu)	0.015	0.015	
(Ton/Yr)	64	64	
General Plant Data			
Annual Operation (Hours/Year)	7,534	7,534	
Annual On-Site Power Plant Capacity Factor	86%	0.86	
Economic Factors			
Interest Rate (%)	8.55%	8.55%	
Discount Rate (%)	9.00%	9.00%	
Plant Economic Life (Years)	20	20	
Installed Capital Costs			
PM Emission Control System (\$2007)	0	23,520,000	
Total Emission Control Systems (\$2007)	0	23,520,000	
PM Emission Control System (\$/kW)	0	235	
Total Emission Control Systems (\$/kW)	0	235	
Total Fixed Operating & Maintenance Costs			
Operating Labor (\$)	0	0	
Maintenance Material (\$)	0	128,000	
Maintenance Labor (\$)	0	216,000	
Administrative Labor (\$)	0	0	
Total Fixed O&M Cost (\$)	0	344,000	
Annual Fixed O&M Cost Escalation Rate (%)	2.00%	2.00%	
Reagent Cost			
Unit Cost (\$/Ton)	None	None	
(\$/Lb)	0.00	0.00	
Molar Stoichiometry	0.00	0.00	
Reagent Purity (Wt.%)	100%	200%	
Reagent Usage (Lb/Hr)	0	0	
First Year Reagent Cost (\$)	0	0	
Annual Reagent Cost Escalation Rate (%)	2.00%	2.00%	
SCR Catalyst / FF Bag Replacement Cost			
Annual SCR Catalyst (m3) / No. FF Bags	0	520	
SCR Catalyst (\$/m3) / Bag Cost (\$/ea.)	3,000	104	
First Year SCR Catalyst / Bag Replace. Cost (\$)	0	54,080	
Annual SCR Catalyst / Bag Cost Esc. Rate (%)	2.00%	2.00%	
Auxiliary Power Cost			
Auxiliary Power Requirement (% of Plant Output)	0.00%	0.40%	
(MW)	0.00	0.40	
Unit Cost (\$2007/MW-Hr)	50.00	50.00	
First Year Auxiliary Power Cost (\$)	0	150,672	
Annual Power Cost Escalation Rate (%)	2.00%	2.00%	

Economic factors as per Sierra Pacific 2008 planning guidelines

CAPITAL COST

Reid Gardner Unit 1

Parameter	PM Control	
	Fabric Filter	
Case NOx Emission Control System SO2 Emission Control System PM Emission Control System	7 LNB Soda Ash Wet FGD Fabric Filter	
CAPITAL COST COMPONENT	Factor/Source	Cost
Fabric Filter		
Major Materials Design and Supply	Vendor	\$21,000,000
Construction	0.0%	\$0
Balance of Plant	0.0%	\$0
Electrical (Allowance)	0.0%	\$0
Owner's Costs	0.0%	\$0
Surcharge	0.0%	\$0
AFUDC	12.0%	\$2,520,000
Subtotal		\$23,520,000
Contingency	0.0%	\$0
Total Capital Cost for Fabric Filter		\$23,520,000

Reid Gardner Unit 1		Current Operation								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton NOx Removed)
0	2013									
1	2014	-	-	-	-	-	-	-	-	-
2	2015	-	-	-	-	-	-	-	-	-
3	2016	-	-	-	-	-	-	-	-	-
4	2017	-	-	-	-	-	-	-	-	-
5	2018	-	-	-	-	-	-	-	-	-
6	2019	-	-	-	-	-	-	-	-	-
7	2020	-	-	-	-	-	-	-	-	-
8	2021	-	-	-	-	-	-	-	-	-
9	2022	-	-	-	-	-	-	-	-	-
10	2023	-	-	-	-	-	-	-	-	-
11	2024	-	-	-	-	-	-	-	-	-
12	2025	-	-	-	-	-	-	-	-	-
13	2026	-	-	-	-	-	-	-	-	-
14	2027	-	-	-	-	-	-	-	-	-
15	2028	-	-	-	-	-	-	-	-	-
16	2029	-	-	-	-	-	-	-	-	-
17	2030	-	-	-	-	-	-	-	-	-
18	2031	-	-	-	-	-	-	-	-	-
19	2032	-	-	-	-	-	-	-	-	-
20	2033	-	-	-	-	-	-	-	-	-

Reid Gardner Unit 1		Fabric Filter								
Year	Date	TOTAL FIXED O&M COST	Makeup Water Cost	Reagent Cost	SCR Catalyst / FF Bag Cost	Electric Power Cost	TOTAL VARIABLE O&M COST	DEBT SERVICE	TOTAL ANNUAL COST	Control Cost (\$/Ton PM Removed)
0	2013									
1	2014	344,000	-	-	54,080	150,672	204,752	2,494,437	3,043,189	#DIV/0!
2	2015	350,880	-	-	55,162	153,685	208,847	2,494,437	3,054,164	#DIV/0!
3	2016	357,898	-	-	56,265	156,759	213,024	2,494,437	3,065,359	#DIV/0!
4	2017	365,056	-	-	57,390	159,894	217,284	2,494,437	3,076,777	#DIV/0!
5	2018	372,357	-	-	58,538	163,092	221,630	2,494,437	3,088,424	#DIV/0!
6	2019	379,804	-	-	59,709	166,354	226,063	2,494,437	3,100,304	#DIV/0!
7	2020	387,400	-	-	60,903	169,681	230,584	2,494,437	3,112,421	#DIV/0!
8	2021	395,148	-	-	62,121	173,075	235,196	2,494,437	3,124,781	#DIV/0!
9	2022	403,051	-	-	63,363	176,536	239,900	2,494,437	3,137,388	#DIV/0!
10	2023	411,112	-	-	64,631	180,067	244,698	2,494,437	3,150,247	#DIV/0!
11	2024	419,334	-	-	65,923	183,668	249,592	2,494,437	3,163,363	#DIV/0!
12	2025	427,721	-	-	67,242	187,342	254,583	2,494,437	3,176,741	#DIV/0!
13	2026	436,275	-	-	68,587	191,089	259,675	2,494,437	3,190,387	#DIV/0!
14	2027	445,001	-	-	69,958	194,910	264,869	2,494,437	3,204,306	#DIV/0!
15	2028	453,901	-	-	71,357	198,809	270,166	2,494,437	3,218,504	#DIV/0!
16	2029	462,979	-	-	72,785	202,785	275,569	2,494,437	3,232,985	#DIV/0!
17	2030	472,238	-	-	74,240	206,840	281,081	2,494,437	3,247,756	#DIV/0!
18	2031	481,683	-	-	75,725	210,977	286,702	2,494,437	3,262,823	#DIV/0!
19	2032	491,317	-	-	77,240	215,197	292,436	2,494,437	3,278,190	#DIV/0!
20	2033	501,143	-	-	78,784	219,501	298,285	2,494,437	3,293,865	#DIV/0!