

**Table C1-2: Boiler NOx Control Cost Calculations**

Boiler Capacity	Hrs of Operation	Heat Release	LNB/FGR/SCR Cost	Annual Operating Costs						Total
				(MMBtu/hr)	(hr/yr)	(MMBtu/yr)	Annualized	NH3 Cost*	SCR	
			Capital (\$/yr)		Heater/Pump**		Consumption	*****	Maintenance	Cost (\$/yr)
50	8760	438000	\$110,270	\$1,314	\$549	\$28,742	\$17,520	\$17,964	\$10,000	\$186,359
50	6570	328500	\$110,270	\$986	\$412	\$21,557	\$13,140	\$13,473	\$10,000	\$169,837
50	4380	219000	\$110,270	\$657	\$275	\$14,371	\$8,760	\$8,982	\$10,000	\$153,315
<b>50</b>	<b>2454</b>	<b>122700</b>	<b>\$110,270</b>	<b>\$368</b>	<b>\$154</b>	<b>\$8,052</b>	<b>\$4,908</b>	<b>\$5,032</b>	<b>\$10,000</b>	<b>\$138,784</b>
50	2190	109500	\$110,270	\$329	\$137	\$7,186	\$4,380	\$8,084	\$10,000	\$140,385
50	876	43800	\$110,270	\$131	\$55	\$2,874	\$1,752	\$2,156	\$10,000	\$127,238
70	8760	613200	\$115,531	\$1,840	\$769	\$35,928	\$24,528	\$28,742	\$12,600	\$219,938
70	6570	459900	\$115,531	\$1,380	\$577	\$26,946	\$18,396	\$21,557	\$12,600	\$196,986
70	4380	306600	\$115,531	\$920	\$384	\$17,964	\$12,264	\$14,371	\$12,600	\$174,034
70	2190	153300	\$115,531	\$460	\$192	\$8,982	\$6,132	\$7,186	\$12,600	\$151,083
<b>70</b>	<b>1865</b>	<b>130550</b>	<b>\$115,531</b>	<b>\$392</b>	<b>\$164</b>	<b>\$7,649</b>	<b>\$5,222</b>	<b>\$6,119</b>	<b>\$12,600</b>	<b>\$147,677</b>
70	876	61320	\$115,531	\$184	\$77	\$3,593	\$2,453	\$2,874	\$12,600	\$137,312
80	8760	700800	\$125,625	\$2,102	\$879	\$35,928	\$28,032	\$28,742	\$13,800	\$235,108
80	6570	525600	\$125,625	\$1,577	\$659	\$26,946	\$21,024	\$21,557	\$13,800	\$211,187
80	4380	350400	\$125,625	\$1,051	\$439	\$17,964	\$14,016	\$14,371	\$13,800	\$187,267
80	2190	175200	\$125,625	\$526	\$220	\$8,982	\$7,008	\$7,186	\$13,800	\$163,346
<b>80</b>	<b>1752</b>	<b>140160</b>	<b>\$125,625</b>	<b>\$420</b>	<b>\$176</b>	<b>\$7,186</b>	<b>\$5,606</b>	<b>\$5,748</b>	<b>\$13,800</b>	<b>\$158,562</b>
80	876	70080	\$125,625	\$210	\$88	\$3,593	\$2,803	\$2,874	\$13,800	\$148,993
100	8760	876000	\$134,443	\$2,759	\$1,153	\$43,113	\$35,040	\$17,964	\$16,100	\$250,573
100	6570	657000	\$134,443	\$2,070	\$865	\$32,335	\$26,280	\$13,473	\$16,100	\$225,566
100	4380	438000	\$134,443	\$1,380	\$577	\$21,557	\$17,520	\$8,982	\$16,100	\$200,558
100	2190	219000	\$134,443	\$690	\$288	\$10,778	\$8,760	\$4,491	\$16,100	\$175,551
<b>100</b>	<b>1480</b>	<b>148000</b>	<b>\$134,443</b>	<b>\$466</b>	<b>\$195</b>	<b>\$7,284</b>	<b>\$5,920</b>	<b>\$3,035</b>	<b>\$16,100</b>	<b>\$167,443</b>

Boiler Capacity	Hrs of Operation	Heat Release	LNB/FGR/SCR Cost	Annual Operating Costs						Total
100	876	87600	\$134,443	\$276	\$115	\$4,311	\$3,504	\$1,796	\$16,100	\$160,546
130	8760	1138800	\$151,560	\$3,679	\$1,538	\$43,113	\$45,552	\$32,335	\$19,300	\$297,078
130	6570	854100	\$151,560	\$2,759	\$1,153	\$32,335	\$34,164	\$24,251	\$19,300	\$265,523
130	4380	569400	\$151,560	\$1,840	\$769	\$21,557	\$22,776	\$16,168	\$19,300	\$233,969
130	2190	284700	\$151,560	\$920	\$384	\$10,778	\$11,388	\$8,084	\$19,300	\$202,414
<b>130</b>	<b>1288</b>	<b>167440</b>	<b>\$151,560</b>	<b>\$541</b>	<b>\$226</b>	<b>\$6,339</b>	<b>\$6,698</b>	<b>\$4,754</b>	<b>\$19,300</b>	<b>\$189,418</b>
130	876	113880	\$151,560	\$368	\$154	\$4,311	\$4,555	\$3,234	\$19,300	\$183,482
150	8760	1314000	\$161,190	\$4,336	\$1,813	\$53,892	\$52,560	\$21,557	\$21,300	\$316,647
150	6570	985500	\$161,190	\$3,252	\$1,359	\$40,419	\$39,420	\$16,168	\$21,300	\$283,108
150	4380	657000	\$161,190	\$2,168	\$906	\$26,946	\$26,280	\$10,778	\$21,300	\$249,569
150	2190	328500	\$161,190	\$1,084	\$453	\$13,473	\$13,140	\$5,389	\$21,300	\$216,029
<b>150</b>	<b>1182</b>	<b>177300</b>	<b>\$161,190</b>	<b>\$585</b>	<b>\$245</b>	<b>\$7,272</b>	<b>\$7,092</b>	<b>\$2,909</b>	<b>\$21,300</b>	<b>\$200,592</b>
150	876	131400	\$161,190	\$434	\$181	\$5,389	\$5,256	\$2,156	\$21,300	\$195,906
175	8760	1533000	\$173,053	\$4,993	\$2,087	\$71,856	\$61,320	\$35,928	\$23,700	\$372,937
175	6570	1149750	\$173,053	\$3,745	\$1,565	\$53,892	\$45,990	\$26,946	\$23,700	\$328,429
175	4380	766500	\$173,053	\$2,497	\$1,044	\$35,928	\$30,660	\$17,964	\$23,700	\$284,383
175	2190	383250	\$173,053	\$1,248	\$522	\$17,964	\$15,330	\$8,982	\$23,700	\$240,337
<b>175</b>	<b>1104</b>	<b>193200</b>	<b>\$173,053</b>	<b>\$629</b>	<b>\$263</b>	<b>\$9,056</b>	<b>\$7,728</b>	<b>\$4,528</b>	<b>\$23,700</b>	<b>\$218,495</b>
175	876	153300	\$173,053	\$499	\$209	\$7,186	\$6,132	\$3,593	\$23,700	\$213,909
200	8760	1752000	\$192,022	\$5,782	\$2,417	\$89,820	\$70,080	\$35,928	\$26,000	\$422,048
200	6570	1314000	\$192,022	\$4,336	\$1,813	\$67,365	\$52,560	\$26,946	\$26,000	\$371,041
200	4380	876000	\$192,022	\$2,891	\$1,208	\$44,910	\$35,040	\$17,964	\$26,000	\$320,035
200	2190	438000	\$192,022	\$1,445	\$604	\$22,455	\$17,520	\$8,982	\$26,000	\$269,028
<b>200</b>	<b>1074</b>	<b>214800</b>	<b>\$192,022</b>	<b>\$709</b>	<b>\$296</b>	<b>\$11,012</b>	<b>\$8,592</b>	<b>\$4,405</b>	<b>\$26,000</b>	<b>\$243,036</b>
200	876	175200	\$192,022	\$578	\$242	\$8,982	\$7,008	\$3,593	\$26,000	\$238,425
230	8760	2014800	\$203,584	\$6,701	\$2,801	\$89,820	\$80,592	\$53,892	\$28,700	\$466,090
230	6570	1511100	\$203,584	\$5,026	\$2,101	\$67,365	\$60,444	\$40,419	\$28,700	\$407,638

Boiler Capacity	Hrs of Operation	Heat Release	LNB/FGR/SCR Cost	Annual Operating Costs						Total
230	4380	1007400	\$203,584	\$3,351	\$1,401	\$44,910	\$40,296	\$26,946	\$28,700	\$349,187
230	2190	503700	\$203,584	\$1,675	\$700	\$22,455	\$20,148	\$13,473	\$28,700	\$290,735
<b>230</b>	<b>995</b>	<b>228850</b>	<b>\$203,584</b>	<b>\$761</b>	<b>\$318</b>	<b>\$10,202</b>	<b>\$9,154</b>	<b>\$6,121</b>	<b>\$28,700</b>	<b>\$258,841</b>
230	876	201480	\$203,584	\$670	\$280	\$8,982	\$8,059	\$5,389	\$28,700	\$255,665
250	8760	2190000	\$214,855	\$7,227	\$3,021	\$89,820	\$87,600	\$53,892	\$30,400	\$486,814
250	6570	1642500	\$214,855	\$5,420	\$2,266	\$67,365	\$65,700	\$40,419	\$30,400	\$426,424
250	4380	1095000	\$214,855	\$3,614	\$1,510	\$44,910	\$43,800	\$26,946	\$30,400	\$366,035
250	2190	547500	\$214,855	\$1,807	\$755	\$22,455	\$21,900	\$13,473	\$30,400	\$305,645
<b>250</b>	<b>961</b>	<b>240250</b>	<b>\$214,855</b>	<b>\$793</b>	<b>\$331</b>	<b>\$9,853</b>	<b>\$9,610</b>	<b>\$5,912</b>	<b>\$30,400</b>	<b>\$271,755</b>
250	876	219000	\$214,855	\$723	\$302	\$8,982	\$8,760	\$5,389	\$30,400	\$269,411

	Capacity	NH3 Consumption	FGR Fan	FD HP increase
* NH3 Cost = (lb NH3/hr)(hr/yr)(\$0.15/lb NH3)	50	1.0 lb/hr	40 HP	25
** SCR Heater/pump cost = (lb NH3/yr)(0.57 kW/lb NH3)(\$0.11/kW)	70	1.4	50	40
*** FGR Fan cost = (HP)(0.7457 kW/HP)(\$0.11/kW hr)(hr/yr)	80	1.6	50	40
	100	2.1	60	25
	130	2.8	60	45
**** Fuel Consumption cost = (0.01)(MMBtu/yr)(\$4/MMBtu)	150	3.3	75	30
	175	3.8	100	50
***** FD Fan Cost = (incremental HP incr)(0.7457 kW/HP)(0.11/kW hr)(hr/yr)	200	4.4	125	50
	230	5.1	125	75
	250	5.5	125	75