

Cement Kiln BART Controls Cost Effectiveness Analysis

Operating company

Facility

State

Lone Star Industry, Inc dba Buzzi Unicem

Greencastle Plant

IN

Proposed BART Control Option for Greencastle Long, Dry Process Kiln

Current Emissions (ton/yr)

Control Effectiveness

New Emission Rate (tons/yr)

Emission Reductions (tons/yr)

Capital Cost

O&M Cost

Total Annual Cost

Cost-Effectiveness (\$/ton)

NO_x Controls SNCR	SO₂ Controls DSI
1,713	104
40%	45%
1,028	57
685	47
\$ 1,724,229	\$ 908,461
\$ 408,822	\$ 282,403
\$ 598,142	\$ 382,152
\$ 873	\$ 8,142

Cement Kiln BART Controls Cost Estimate

Lone Star Industries Greencastle Plant

Cost Detail Description	SNCR	DSI	Reference
Total Direct Capital Cost (DCC)	766,324	412,937	
Total Indirect Capital Cost (IOC)	957,905	495,524	
Total Capital Cost (TCC)	1,724,229	908,461	
Capital Recovery Factor	10.98%	10.98%	
Total Annualized Capital Cost (7%, 15 yrs)	189,320	99,749	
Direct Operating Costs (DOC)			
Operating and Maintenance Labor	90,000	90,000	EPA Cost Control Manual
Supervision @20 Hours of Operating Labor	18,000	18,000	EPA Cost Control Manual
Maintenance Materials 5% of DCC	38,316	20,647	
Reagent	22,406	11,805.00	
Energy Penalty	3,700	1,950.00	
Electricity	42,126	22,195.00	
Gas Reheat and Heat Recovery	82,942	43,700.00	
Total Direct Operating Costs	279,490	190,297	
Indirect Operating Costs (IOC)			
Payroll Overhead (30% Oper/Labor/Sup)	27,000	27,000	
Plant Overhead (26% Total Labor/Material)	33,362	28,768	
Property Tax (1%TCC)	17,242	9,085	
Insurance (1%TCC)	17,242	9,085	
Administration (2% TCC)	34,485	18,169	
Total Indirect Operating Costs	129,331	92,107	
Total Annual Operating Costs	408,822	282,403	
Total Annual Cost (Capital and Operating)	598,142	382,152	