Plantwide Total Emissions

Baseline: August 2004 - July 2006

EU Description	PM tons/yr	PM_{10} tons/yr	$PM_{2.5}$ tons/yr	SO_2 tons/yr	NO_X tons/yr	CO tons/yr	VOC tons/yr	Lead tons/yr	Fluoride tons/yr
Kiln System	434.06	404.67	363.54	11,792.82	5,218.40	964.79	215.35	0.16	0.42
Kiln Preheaters & Coal Mill Booster Heaters	0.76	0.55	0.49	32.63	4.60	1.15	0.08		
Kiln System (Total)	434.82	405.22	364.03	11,825.45	5,223.00	965.94	215.43	0.16	0.42
Clinker Coolers	114.08	95.83	51.34						
Miscellaneous Point Sources	297.93	250.26	134.07						
Process Equipment Fugitives	24.07	11.31	1.76						
Storage Piles	6.68	3.34	0.50						
Quarry Operations	24.45	8.69	2.09						
Roads	166.99	46.32	5.01						
Total	**1,069.01**	**820.98**	**558.80**	**11,825.45**	**5,223.00**	**965.94**	**215.43**	**0.16**	**0.42**

Clinker production = **1,722,837 tons/yr**
1,562,948 metric

Notes
Actual emissions are shown above for all pollutants except SO2 and NOx emitted by the kiln system.
Kiln PM emissions include condensibles. See "Kiln System" sheet for details.

Operation/Material	Capacity tons/hr	Average tons/hr	Baseline Thruput[1] tons/yr	hrs/yr	%
Quarry					
Overburden moved			31,342		
New Scotland LS (to waste)			1,567,104		
Kalkberg			1,548,238		
Coeymans			2,057,119		
Becraft			41,427		
New Scotland LS (Callanan)			1,109,096		
Total			4,755,880		
Primary Crusher		1,231	4,755,880	3,863	
Raw Materials Used					
Kalkberg			448,316		
Aggregate (plant roads etc)			10,625		
Coeymans			2,174,988		
Becraft			24,939		
Subtotal LS reclaim			2,199,927		
Bauxite			41,694		
Gypsum			109,715		
Total (Belt 3/4)			2,351,336		
Secondary Crusher	1,250	309		7,618	
Iron			35,048		
Coke			46,012		
Subtotal (auxilliary hopper)			81,061		
Fly Ash transfer	33		82,353	8,760	
Total (Raw Mill Input)			2,359,023		
Raw Mill #1	300	240	1,362,500	5,688	
Raw Mill #2	300	236	1,392,613	5,898	
Raw mix produced	600	476	2,755,113		
Raw mix used			2,756,392		
Dry kiln feed			2,818,562		
Kiln #1 & Clinker Cooler #1	130	115	871,048	7,547	
Kiln #2 & Clinker Cooler #2	130	116	851,789	7,330	
Clinker produced	260	228	1,722,837	7,547	
Dust Scoop System	55			6,638	
Clinker Hall Silo #8			861,419	3,679	
Clinker Hall Silo #11			861,419	3,540	
Clinker Hall Storage Bins			516,851		30%
CKD Pugmill (Pelletizer)		53	128,453	2,424	
Dry basis			116,775		
Kiln Fuels Used					
Coal			255,221		
Coke			46,012		
Subtotal solid fuels			301,233		
Fuel oil (gallons)			459,639		
Natural gas (MMCF)			9.4		
Finish Materials					
Gypsum			109,715		6.1%
Finish Mills (Cement)					
Cement Mill #1	90	87	477,061	5,475	
Cement Mill #2	90	88	447,736	5,093	
Cement Mill #3	90	78	459,504	5,891	

Operation/Material	Capacity tons/hr	Average tons/hr	Baseline Thruput[1] tons/yr	hrs/yr	%
Cement Mill #4	90	76	428,568	5,610	
Total cement	360	329	1,812,868		
Customer Silos			366,730	8,760	
Masonry Fringe Silo				8,760	
Buffer Silos			1,356,753	8,760	
Buffer Silos Discharge			1,356,753	2,190	
Truck Loading					
Bulk cement			366,730		
Bulk masonry			Included		
Total			366,730	2,445	
Truck Loadout N/S (each)	214	150	183,365	1,222	
CKD truck loadout			33,039	1,664	
Rail Loading (cement)		500	16,867	34	
Packhouse			104,933	2,733	
Bags packed (number)			2,623,321	2,733	
Packing E/W (each)	70.5	38	52,466	1,366	
Vacuum system				1,366	
Bag shredder				0	
Barge Loading (cement)	1,000	620	1,356,753	2,190	
Rail Unloading					
Coal			212,223		
Coke			25,324		
Total			237,547	4,992	
Barge Unloading					
Gypsum			114,937	1,248	
Truck Unloading					
Fly Ash (silo)			86,112	8,760	
Bauxite			47,538		
Iron			64,926		
Total			198,577		
Miscellaneous					
Quarry Drilling (feet)			287,632		
Blasts (number)			103		

[1] Average annual throughput during the baseline period (8/04 - 7/06)

Kiln System (Main Stack)

Pollutant	Emission Factor	lb/T basis	Note	Test lbs/hr	Total tons/yr	Average lbs/hr	Permit Limits				
PM (Filterable)	0.139	kiln feed	1	52.08	195.89	51.91	0.30	lb/T KF	Total Kiln Feed	2,818,562	TPY
PM10 (Filterable)	0.118	kiln feed	2	44.27	166.51	44.12			Total Clinker	1,722,837	TPY
PM2.5 (Filterable)	0.089	kiln feed	3	33.33	125.37	33.22			Operation	7,547	hrs/yr
Condensible PM	0.169	kiln feed	1	63.36	238.17	63.11					
PM (Total)				115.44	434.06	115.03					
PM10 (Total)				107.63	404.67	107.24					
PM2.5 (Total)				96.69	363.54	96.34					
SO2	13.69	clinker	4	3073	11792.82	3125.1					
NOX	6.06	clinker	5	NA	5218.40	1382.9					
CO	1.12	clinker	6	252.4	964.79	255.7	300	1,446.25	lbs/hr & tons/yr		
VOC	0.25	clinker	6	55.2	215.35	57.1					
Lead	1.13E-04	kiln feed	6	0.040	0.16	0.042					
Fluoride	3.01E-04	kiln feed	6,7	0.108	0.42	0.112					

Notes

1 Pollutant emissions derived from March 2005 kiln stack test
2 PM10 estimated at 85% of PM emissions for kilns with ESPs using AP-42 Table 11.6-5
3 PM2.5 estimated at 64% of PM emissions for kilns with ESPs using AP-42 Table 11.6-5
4 SO2 emissions derived from February 2004 kiln stack test
5 NOx annual emissions from CEMS data
6 Pollutant emissions derived from February 2004 kiln stack test
7 Fluoride emissions not detected. Emissions are shown at the detection limit.

Clinker Cooler #1 Stack

Pollutant	Emission Factor	lb/T basis	Note	Test lbs/hr	Total tons/yr	Average lbs/hr	Permit Limits				
PM	0.094	kiln feed	8	17.80	67.17	17.80	0.10	lb/T KF	Kiln Feed	1,425,034	TPY
PM10	0.079	kiln feed	9	14.95	56.42	14.95			Clinker	871,048	TPY
PM2.5	0.042	kiln feed	10	8.01	30.23	8.01			Operation	7,547	hrs/yr

Clinker Cooler #2 Stack

Pollutant	Emission Factor	lb/T basis	Note	Test lbs/hr	Total tons/yr	Average lbs/hr	Permit Limits				
PM	0.067	kiln feed	8	12.80	46.91	12.80	0.10	lb/T KF	Kiln Feed	1,393,527	TPY
PM10	0.057	kiln feed	9	10.75	39.41	10.75			Clinker	851,789	TPY
PM2.5	0.030	kiln feed	10	5.76	21.11	5.76			Operation	7,330	hrs/yr

Clinker Cooler #1 and #2 Total

Pollutant	Emission Factor	lb/T basis	Note	Test lbs/hr	Total tons/yr	Average lbs/hr	Permit Limits				
PM				30.60	114.08	30.23			Kiln Feed	2,818,562	TPY
PM10				25.70	95.83	25.39			Clinker	1,722,837	TPY
PM2.5				13.77	51.34	13.60			Operation	7,547	hrs/yr

Notes

8 Pollutant emissions derived from 2002 clinker cooler stack test
9 PM10 estimated at 84% of PM emissions with fabric filters using AP-42 Table 11.6-5
10 PM2.5 estimated at 45% of PM emissions with fabric filters using AP-42 Table 11.6-5

Kiln Preheaters & Booster Heaters (External Combustion)

Annual Emissions:

Unit ID	Exhaust Point ID	Description	Fuel	Fuel Rate 1000 gal/yr	PM tons/yr	PM10 tons/yr	PM2.5 tons/yr	SO2 tons/yr	NO_X tons/yr	CO tons/yr	VOC tons/yr
		Emissions w/ Filterable PM	No. 2 fuel oil	459.639	0.46	0.25	0.19	32.63	4.60	1.15	0.08
		Condensible PM	No. 2 fuel oil	459.639	0.30	0.30	0.30				
		Total Emissions			0.76	0.55	0.49	32.63	4.60	1.15	0.08

Notes:
Burner firing rate, each 6.1 MW/hr / 0.2931 MW/MMBtu = 20.8 MMBtu/hr (startup only)
Controlled PM emissions from natural gas combustion are negligible; PM emissions are included elsewhere in the finish mill baghouse emission estimates.

Emissions Basis:

Pollutant	Emission Factor	EF Units	Source of EF
PM	2	lb/1000gal	AP-42 Table 1.3-1
PM10	1.08	lb/1000gal	AP-42 Table 1.3-7
PM2.5	0.83	lb/1000gal	AP-42 Table 1.3-7
Condensible	1.3	lb/1000gal	AP-42 Table 1.3-2
SO_2	142	lb/1000gal	AP-42 Table 1.3-1
NO_X	20	lb/1000gal	AP-42 Table 1.3-1
CO	5	lb/1000gal	AP-42 Table 1.3-1
VOC	0.34	lb/1000gal	AP-42 Table 1.3-3

Process Group	Emission Point ID	Description	Control Device	Material Processed	Oper-ation hrs/yr	Note	Flow ACFM	Grain Loading gr/acf	PM Emis lb/hr	PM Emis TPY	PM10 Fraction	PM10 Emis TPY	PM2.5 Fraction	PM2.5 Emis TPY	Future Source	PM BL Future Equip TPY	PM10 BL Future Equip TPY	PM2.5 BL Future Equip TPY
PCR	32002	Primary Crusher-Rock Box D/C	DC	Limestone	3,863		3,000	0.02	0.51	0.99	0.84	0.83	0.45	0.45	X	0.99	0.83	0.45
PCR	32002	Primary Crusher-Belt 1 D/C	DC	Limestone	3,863		4,500	0.02	0.77	1.49	0.84	1.25	0.45	0.67	X	1.49	1.25	0.67
LCR, RX1	34301	Secondary Crusher D/C	DC	Raw mix	7,618		15,000	0.02	2.57	9.79	0.84	8.23	0.45	4.41	X	9.79	8.23	4.41
RM1	35101	Raw Mill 1 Scrubber	IPS	Raw mix	0	2	10,000	0.02	1.71	0.00	0.84	0.00	0.45	0.00				
RM2	35201	Raw Mill 2 Scrubber	IPS	Raw mix	0	2	10,000	0.02	1.71	0.00	0.84	0.00	0.45	0.00				
K12	43101	Main Kiln Stack	ESPs	CKD	7,547		880,000	0.007	51.91	195.89	0.85	166.51	0.64	125.37				
CC1	45101	Kiln 1 Clinker Cooler D/C	DC	Clinker	7,547		137,500	0.015	17.80	67.17	0.84	56.42	0.45	30.23				
CC2	45201	Kiln 2 Clinker Cooler D/C	DC	Clinker	7,330		137,500	0.011	12.80	46.91	0.84	39.41	0.45	21.11	X	46.91	39.41	21.11
FAX	46012	Fly Ash Silo (W) D/C	DC	Fly ash	8,760		7,000	0.02	1.20	5.26	0.84	4.42	0.45	2.37				
FAX	46013	Fly Ash Transfer D/C	DC	Fly ash	8,760		2,500	0.02	0.43	1.88	0.84	1.58	0.45	0.84				
RX2	46017	Belt 7 Discharge D/C	DC	Raw mix	7,618		4,000	0.02	0.69	2.61	0.84	2.19	0.45	1.18	X	2.61	2.19	1.18
FX1	53102	CM 1 Separator D/C	DC	Cement	5,475		45,000	0.02	7.71	21.12	0.84	17.74	0.45	9.50				
FX2	53202	CM 2 Separator D/C	DC	Cement	5,093		45,000	0.02	7.71	19.64	0.84	16.50	0.45	8.84				
FX3	53302	CM 3 Separator D/C	DC	Cement	5,891		45,000	0.02	7.71	22.72	0.84	19.09	0.45	10.22				
FX4	53402	CM 4 West Separator D/C	DC	Cement	5,610		48,000	0.02	8.23	23.08	0.84	19.39	0.45	10.39				
FX5	53403	CM 4 East Separator D/C	DC	Cement	5,610		48,000	0.02	8.23	23.08	0.84	19.39	0.45	10.39				
DS1	43102	Kiln 1 Feed End D/C	DC	Raw mix	7,547		4,000	0.02	0.69	2.59	0.84	2.17	0.45	1.16				
DS1	43103	Dust Scoop D/C	DC	CKD	6,638		15,000	0.02	2.57	8.53	0.84	7.17	0.45	3.84				
CX1	46008	Silo 8 D/C	DC	Clinker	3,679		5,000	0.02	0.86	1.58	0.84	1.32	0.45	0.71	X	1.58	1.32	0.71
CX1	46011	Silo 11 D/C	DC	Clinker	3,540		5,000	0.02	0.86	1.52	0.84	1.27	0.45	0.68	X	1.52	1.27	0.68
CX2	46018	Kiln 1 Clinker Transport D/C	DC	Clinker	7,547		22,000	0.02	3.77	14.23	0.84	11.95	0.45	6.40				
CX2	46019	Kiln 2 Clinker Transport D/C	DC	Clinker	7,330		16,050	0.02	2.75	10.08	0.84	8.47	0.45	4.54				
CM1	52101	CM 1 Auxillary D/C	DC	Cement	5,475		10,200	0.02	1.75	4.79	0.84	4.02	0.45	2.15	X	4.79	4.02	2.15
CM2	52201	CM 2 Auxillary D/C	DC	Cement	5,093		10,200	0.02	1.75	4.45	0.84	3.74	0.45	2.00				
CM3	52301	CM 3 Auxillary D/C	DC	Cement	5,891		10,200	0.02	1.75	5.15	0.84	4.33	0.45	2.32	X	5.15	4.33	2.32
CM4	52401	CM 4 Auxillary D/C	DC	Cement	5,610		21,000	0.02	3.60	10.10	0.84	8.48	0.45	4.54				
	57001	Buffer Silo Trans. to Belt 8A	DC	Cement	2,190		5,000	0.02	0.86	0.94	0.84	0.79	0.45	0.42	X	0.94	0.79	0.42
	57002	Belt 8A/8B Transfer House	DC	Cement	2,190		6,000	0.02	1.03	1.13	0.84	0.95	0.45	0.51	X	1.13	0.95	0.51
	57003	Belt 8A/9 Transfer House	DC	Cement	2,190		3,000	0.02	0.51	0.56	0.84	0.47	0.45	0.25	X	0.56	0.47	0.25
CMX	62001	Transfer to/from Buffer Silo Belt	DC	Cement	8,760		5,660	0.02	0.97	4.25	0.84	3.57	0.45	1.91	X	4.25	3.57	1.91
CM1	53101	CM 1 Discharge D/C	DC	Cement	5,475		25,000	0.02	4.29	11.73	0.84	9.86	0.45	5.28	X	11.73	9.86	5.28
CM2	53201	CM 2 Discharge D/C	DC	Cement	5,093		25,000	0.02	4.29	10.91	0.84	9.17	0.45	4.91				
CM3	53301	CM 3 Discharge D/C	DC	Cement	5,891		25,000	0.02	4.29	12.62	0.84	10.60	0.45	5.68	X	12.62	10.60	5.68
CM4	53401	CM 4 Discharge D/C	DC	Cement	5,610		16,500	0.02	2.83	7.93	0.84	6.66	0.45	3.57				
CL1	62007	West Truck Loading D/C	DC	Cement	1,222		7,000	0.02	1.20	0.73	0.84	0.62	0.45	0.33	X	0.73	0.62	0.33
CL2	62008	East Truck Loading D/C	DC	Cement	1,222		7,000	0.02	1.20	0.73	0.84	0.62	0.45	0.33	X	0.73	0.62	0.33
CL3	62009	Railcar Loading D/C	DC	Cement	34		7,000	0.02	1.20	0.02	0.84	0.02	0.45	0.01	X	0.02	0.02	0.01
BAG	63001	Bagging D/C (West)	DC	Cement	1,366		6,000	0.02	1.03	0.70	0.84	0.59	0.45	0.32	X	0.70	0.59	0.32
BAG	63002	Bagging D/C (East)	DC	Cement	1,366		6,000	0.02	1.03	0.70	0.84	0.59	0.45	0.32	X	0.70	0.59	0.32
PVC	63003	Packhouse Vacuum	DC	Cement	1,366		120	0.02	0.02	0.01	0.84	0.01	0.45	0.01	X	0.01	0.01	0.01
PBS	63004	Bag Shredder D/C	DC	Cement	0		4,000	0.02	0.69	0.00	0.84	0.00	0.45	0.00	X	0.00	0.00	0.00
PUG	00100	CKD Pelletizer	DC	CKD	2,424	1	7,000	0.02	1.20	1.45	0.84	1.22	0.45	0.65	X	1.45	1.22	0.65
CMB	58001	Transfer from Belt 9 to Barge	DC	Cement	2,190		10,000	0.02	1.71	1.88	0.84	1.58	0.45	0.84	X	1.88	1.58	0.84
	46014	Masonry Silo D/C	DC	Cement	8,760		2,000	0.02	0.34	1.50	0.84	1.26	0.45	0.68	X	1.50	1.26	0.68
	55001	Buffer Silo #6 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86

Process Group	Emission Point ID	Description	Control Device	Material Processed	Oper-ation hrs/yr	Note	Flow ACFM	Grain Loading gr/acf	PM Emis lb/hr	PM Emis TPY	PM10 Fraction	PM10 Emis TPY	PM2.5 Fraction	PM2.5 Emis TPY	Future Source	PM BL Future Equip TPY	PM10 BL Future Equip TPY	PM2.5 BL Future Equip TPY
	55002	Buffer Silo #5 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	55003	Buffer Silo #4 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	55004	Buffer Silo #3 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	55005	Buffer Silo #2 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	55006	Buffer Silo #1 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	62002	Customer Silos 1,9 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	62003	Customer Silos 2,10,11 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	62004	Customer Silos 3,4,12 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	62005	Customer Silos 5,13 D/C	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
	62006	Customer Silos 6,7,8,14,15,16	DC	Cement	8,760		5,500	0.02	0.94	4.13	0.84	3.47	0.45	1.86	X	4.13	3.47	1.86
KCM	62010	K-Cement Railcar Loading	DC	Cement	0	2	1,800	0.02	0.31	0.00	0.84	0.00	0.45	0.00				
		Grand Total							191.41	607.91		512.60		310.78		159.23	133.76	71.66
		Total Without Kilns & Coolers							108.90	297.93		250.26		134.07				
															Equipment to be shut down	138.70	116.51	62.41

Notes

1 CKD pelletizer was replaced with a pugmill and 4500 acfm DC in 2006
2 Equipment is not operational or does not exist
3 Exempt equipment is not included

Emission Factor Calculation Sheet (Fugitives)

Material Transfer Operations		**PM**	**PM-10**	**PM-2.5**
k (particle size multiplier)		0.74	0.35	0.053
Mean Wind Speed (mph) Albany, NY	8.9	**PM EF**	**PM-10 EF**	**PM-2.5 EF**
(Source: NCDC, long-term average)		**(lb/ton handled)**	**(lb/ton handled)**	**(lb/ton handled)**
Limestone Average Moisture Content (%)	3	2.84E-03	1.34E-03	2.03E-04
Bauxite Average Moisture Content (%)	12	4.08E-04	1.93E-04	2.92E-05
Coal Average Moisture Content (%) As Rcvd	3.2	2.60E-03	1.23E-03	1.86E-04
Coke Average Moisture Content (%)	3.3	2.49E-03	1.18E-03	1.78E-04
Gypsum Average Moisture Content (%)	15	2.98E-04	1.41E-04	2.14E-05
Iron Average Moisture Content (%)	9	6.10E-04	2.89E-04	4.37E-05
Clinker Average Moisture Content (%)	0.05	8.77E-01	4.15E-01	6.28E-02
Additives Average Moisture Content (%)	10	5.26E-04	2.49E-04	3.77E-05
Raw Mix Average Moisture Content (%)	4	1.90E-03	8.98E-04	1.36E-04
CKD (Dry) Moisture Content (%)	0.05	8.77E-01	4.15E-01	6.28E-02
CKD (Conditioned) Moisture Content (%)	10	5.26E-04	2.49E-04	3.77E-05
Overburden Average Moisture Content (%)	2.1	4.68E-03	2.21E-03	3.35E-04

Material transfer factors from AP-42 Section 13.2.4.3 (Aggregate Handling and Storage Piles, 11/06)

E = k * 0.0032 * (U/5)^1.3 / (M/2)^1.4

E = transfer emission factor (lb/ton)
k = particle size multiplier
U = mean wind speed (mph)
M = material moisture content (%)

Crushing Operations	**Reference**	**PM EF (lb/ton)**	**PM-10 EF (lb/ton)**	**PM-2.5 EF (lb/ton)**
Primary crusher	1	0.0012	0.00054	0.00010

1) AP-42 Table 11.19.2-2 (Crushed Stone Processing, 8/04) (wet crushing = controlled)

Area	Emission Point ID	Description	Material	Control Type	Efficiency %	Throughput tons/yr	TSP Factor lbs/ton	TSP tons/yr	PM_{10} Factor lbs/ton	PM_{10} tons/yr	$PM_{2.5}$ Factor lbs/ton	$PM_{2.5}$ tons/yr
Primary Crushing		Truck unloading to crusher hopper	Limestone	None		4,755,880	2.84E-03	6.75	1.34E-03	3.19	2.03E-04	0.48
Primary Crushing		Primary crusher	Limestone	None		4,755,880	0.0012	2.85	0.00054	1.28	0.0001	0.24
Primary Crushing	NP20	Belt 1 to Belt 2 transfer point	Limestone	Covered	25	4,755,880	2.84E-03	5.07	1.34E-03	2.40	2.03E-04	0.36
Secondary Crushing	32001	Belt 2 drop to storage piles	Limestone	Spray system	50	4,755,880	2.84E-03	3.38	1.34E-03	1.60	2.03E-04	0.24
Secondary Crushing		Bauxite unloading	Bauxite	None		47,538	4.08E-04	0.01	1.93E-04	0.00	2.92E-05	0.00
Secondary Crushing		Gypsum unloading	Gypsum	None		109,715	2.98E-04	0.02	1.41E-04	0.01	2.14E-05	0.00
Secondary Crushing		Iron unloading	Iron Ore	None		64,926	6.10E-04	0.02	2.89E-04	0.01	4.37E-05	0.00
Secondary Crushing		Rock storage piles reclaim to Belt 3	Limestone	U/G Enclosure	90	2,199,927	2.84E-03	0.31	1.34E-03	0.15	2.03E-04	0.02
Secondary Crushing		Bauxite transfer to Stamler Feeder	Bauxite	None		41,694	4.08E-04	0.01	1.93E-04	0.00	2.92E-05	0.00
Secondary Crushing		Bauxite feeder to Belt 3	Bauxite	U/G Enclosure	90	41,694	4.08E-04	0.00	1.93E-04	0.00	2.92E-05	0.00
Secondary Crushing		Gypsum storage pile reclaim to Belt 3	Gypsum	U/G Enclosure	90	109,715	2.98E-04	0.00	1.41E-04	0.00	2.14E-05	0.00
Secondary Crushing	34101	Coal rail shaker/unloading hopper	Coal & Coke	Enclosure	50	237,547	2.60E-03	0.15	1.23E-03	0.07	1.86E-04	0.01
Secondary Crushing		Coal cracker	Coal & Coke	None		237,547	0.0012	0.14	0.00054	0.06	0.0001	0.01
Secondary Crushing	NP21	Coal Belt 4	Coal & Coke	None		237,547	2.60E-03	0.31	1.23E-03	0.15	1.86E-04	0.02
Secondary Crushing		Coal Belt 5	Coal	None		212,223	2.60E-03	0.28	1.23E-03	0.13	1.86E-04	0.02
Secondary Crushing	33005	Belt 5 drop to coal pile	Coal	Telescope chute	90	212,223	2.60E-03	0.03	1.23E-03	0.01	1.86E-04	0.00
Secondary Crushing		Coke Belt 6	Coke	None		25,324	2.49E-03	0.03	1.18E-03	0.01	1.78E-04	0.00
Secondary Crushing		Belt 6 drop to coke pile	Coke	None		25,324	2.49E-03	0.03	1.18E-03	0.01	1.78E-04	0.00
Secondary Crushing		Coal reclaim hopper	Coal	None		255,221	2.60E-03	0.33	1.23E-03	0.16	1.86E-04	0.02
Secondary Crushing	NP22	Coal Belt 6A	Coal	None		255,221	2.60E-03	0.33	1.23E-03	0.16	1.86E-04	0.02
Secondary Crushing	NP23	Auxilliary hopper/feeder (Coke & Iron)	Coke	None		81,061	2.49E-03	0.10	1.18E-03	0.05	1.78E-04	0.01
Secondary Crushing	NP24	Feeder to Belt 7 (Coke & Iron)	Coke	None		81,061	2.49E-03	0.10	1.18E-03	0.05	1.78E-04	0.01
Secondary Crushing		Raw Silos	Limestone	Enclosed in building	90	2,199,927	2.84E-03	0.31	1.34E-03	0.15	2.03E-04	0.02
Secondary Crushing		Raw Silos	Bauxite	Enclosed in building	90	41,694	4.08E-04	0.00	1.93E-04	0.00	2.92E-05	0.00
Secondary Crushing		Raw Silos	Iron Ore	Enclosed in building	90	35,048	6.10E-04	0.00	2.89E-04	0.00	4.37E-05	0.00
Secondary Crushing		Raw Silos	Gypsum	Enclosed in building	90	109,715	2.98E-04	0.00	1.41E-04	0.00	2.14E-05	0.00
Secondary Crushing		Coal Silos	Coal & Coke	Enclosed in building	90	301,233	2.60E-03	0.04	1.23E-03	0.02	1.86E-04	0.00
Secondary Crushing	50001	Conveyor 12 drop to aggregate surge pile	Limestone	Spray system	50	10,625	2.84E-03	0.01	1.34E-03	0.00	2.03E-04	0.00
Raw Mill 1		Raw Mill 1 additive belt	Additives	Enclosed in building	90	38,371	5.26E-04	0.00	2.49E-04	0.00	3.77E-05	0.00
Raw Mill 1		Raw Mill 1 feed belt	Raw Mix	Enclosed in building	90	1,362,500	1.90E-03	0.13	8.98E-04	0.06	1.36E-04	0.01
Raw Mill 2		Raw Mill 2 additive belt	Additives	Enclosed in building	90	38,371	5.26E-04	0.00	2.49E-04	0.00	3.77E-05	0.00
Raw Mill 2		Raw Mill 2 feed belt	Raw Mix	Enclosed in building	90	1,392,613	1.90E-03	0.13	8.98E-04	0.06	1.36E-04	0.01
CKD System	NP41	Waste dust silo truck loadout	CKD	Water spray	95	33,039	8.77E-01	0.72	4.15E-01	0.34	6.28E-02	0.05
CKD System		CKD Pugmill truck loading	CKD	None		128,453	5.26E-04	0.03	2.49E-04	0.02	3.77E-05	0.00

Area	Emission Point ID	Description	Material	Control Type	Efficiency %	Throughput tons/yr	TSP Factor lbs/ton	TSP tons/yr	PM_{10} Factor lbs/ton	PM_{10} tons/yr	$PM_{2.5}$ Factor lbs/ton	$PM_{2.5}$ tons/yr
CKD System		CKD unloading (landfill)	CKD	None		128,453	5.26E-04	0.03	2.49E-04	0.02	3.77E-05	0.00
Fuel Preparation		Coal Silo 1 to Belt C235	Coal & Coke	Enclosed in building	90	150,616	2.60E-03	0.02	1.23E-03	0.01	1.86E-04	0.00
Fuel Preparation		Belt C235 to feeder (Coal Mill 2)	Coal & Coke	Enclosed in building	90	150,616	2.60E-03	0.02	1.23E-03	0.01	1.86E-04	0.00
Fuel Preparation		Coal Silo 2 to Belt C135	Coal & Coke	Enclosed in building	90	150,616	2.60E-03	0.02	1.23E-03	0.01	1.86E-04	0.00
Fuel Preparation		Belt C135 to feeder (Coal Mill 1)	Coal & Coke	Enclosed in building	90	150,616	2.60E-03	0.02	1.23E-03	0.01	1.86E-04	0.00
Clinker Handling	NP40	Clinker drop to storage hall	Clinker	Enclosed & vented*	99	516,851	8.77E-01	2.27	4.15E-01	1.07	6.28E-02	0.16
Barge Unloading		Gypsum barge unloading hopper	Gypsum	None		114,937	2.98E-04	0.02	1.41E-04	0.01	2.14E-05	0.00
Barge Unloading	34401	Gypsum unloading belt	Gypsum	Water spray	50	114,937	2.98E-04	0.01	1.41E-04	0.00	2.14E-05	0.00
Barge Unloading		Gypsum belt drop to pile	Gypsum	Water spray	50	114,937	2.98E-04	0.01	1.41E-04	0.00	2.14E-05	0.00
Barge Unloading		Gypsum truck loading	Gypsum	None		114,937	2.98E-04	0.02	1.41E-04	0.01	2.14E-05	0.00
							Totals:	24.07		11.31		1.76

Notes
* Clinker storage hall vented to clinker cooler air intake. Estimate 99% capture of fugitive emissions.

Storage Piles

Emission Point ID	Pile Material	Material Category	Moisture Content (%)	Throughput (tons/yr)	Storage Capacity (tons)	Active Days (n) (days/yr)	Silt Content (s) percent	Base Radius (ft)	Pile Height (ft)	PILE AREA (A) (acres)	Wind Speed > 12 mph (f) percent	Rain Days (p) (days/yr)	Control Efficiency (%)	TSP Emission Factor (lb/acre/day)	TSP Wind Emissions (T/yr)	PM10 Wind Emissions (T/yr)
NP01	Kalkberg	Limestone	3	1,548,238	150,000	365	1.6	162.5	127	2.42	10	146	0	1.13	0.50	0.25
NP02	Beecraft	Limestone	3	41,427	100,000	365	1.6	162.5	127	2.42	10	146	0	1.13	0.50	0.25
NP03	Coeymans	Limestone	3	2,057,119	300,000	365	1.6	162.5	127	2.42	10	146	0	1.13	0.50	0.25
NP04	Callanan Aggregate	Limestone	3	1,109,096	350,000	365	1.6	162.5	127	2.42	10	146	0	1.13	0.50	0.25
NP05	Aggregate (Surge)	Limestone	3	10,625	50,000	365	1.6	120	90	1.30	10	146	0	1.13	0.27	0.13
NP06	Gypsum	Gypsum	15	109,715	2,000	365	3.9	40	16	0.12	10	0	50	2.29	0.05	0.03
NP10	Bauxite	Bauxite	12	41,694	2,000	365	4	40	16	0.12	10	0	50	2.35	0.05	0.03
NP07	Iron	Iron ore	9	35,048	2,500	365	5.4	30	15	0.07	10	0	50	3.17	0.04	0.02
NP08	Coal	Coal	3	255,221	100,000	365	4.6	238	100	4.43	10	146	0	3.24	2.62	1.31
NP09	Coke	Coke	3	46,012	35,000	365	4.9	140	30	1.45	10	146	0	3.45	0.91	0.46
TBA	Gypsum (Barge)	Gypsum	15	114,937	60,000	365	3.9	140	45	1.48	10	146	0	2.75	0.74	0.37
	Totals														6.68	3.34

Equation for Wind Erosion:

Reference: Control of Open Fugitive Dust Sources, EPA-450/3-88-008, p. 4-17

Ef = 1.7*(s/1.5)*(f/15)*((365-p)/235)*(1-(C/100)) TSP (lbs/acre/day) PM10 fraction = 0.5

E = A*n*Ef/2000 TSP (tons/yr) PM2.5 fraction (AP-42) = 0.075

s =	Silt content of the aggregate (%)	Typical silt contents of materials from AP-42 Table 13.2.4-1
f =	Percent of time that the unobstructed wind speed exceeds 12 mph at the mean pile height	
p =	Number of days with >= 0.01 in. of precipitation per year	
C =	Overall control efficiency (%)	
A =	Size of the pile (acres)	
n =	Number of days per year the pile is continuously active	

Notes: Gypsum, iron, and bauxite piles are located under covered storage; wind effects are reduced by 50% due to partial enclosure; materials are not exposed to rain.

Pile Material	PM2.5 Wind Emissions (T/yr)
Kalkberg	0.04
Beecraft	0.04
Coeymans	0.04
Callanan Aggregate	0.04
Aggregate (Surge)	0.02
Gypsum	0.00
Bauxite	0.00
Iron	0.00
Coal	0.20
Coke	0.07
Gypsum (Barge)	0.06
Totals	0.50

Equation for Wind E

Reference: Control c

Ef = 1.7*(s/1.5)*(f/15)

E = A*n*Ef/2000

s =

f =

p =

C =

A =

n =

Gypsum, iron, and ba

Quarry Miscellaneous Emissions Summary

Operation	Annual Emissions TSP Emissions (Ton/yr)	PM10 Emissions (Ton/yr)	PM2.5 Emissions (Ton/yr)
Drilling	0.37	0.19	0.01
Blasting	0.95	0.49	0.03
Bulldozing	11.77	2.63	1.24
Loading/Unloading	11.35	5.37	0.81
Total	24.45	8.69	2.09

Quarry Drilling

Emission Point ID	Material	Drill Footage (ft/yr)	Average Depth (ft/hole)	Number of Holes (holes/yr)	TSP Emission Factor (lb/hole)	Control Efficiency (%)	TSP Emissions (T/yr)	PM10 Emissions (T/yr)	PM2.5 Emissions (T/yr)
NP92	Limestone	287,632	50	5,753	1.3	90	0.37	0.19	0.01

Notes
TSP emission factor from AP-42 Table 11.9-4
Assume PM10 and PM2.5 fractions are similar to emissions from blasting given below
Control efficiency based on drill rigs using dust collectors or water/methanol dust suppression

Quarry Blasting

Emission Point ID	Material	Number of Blasts (blasts/yr)	Average Blast Area, A (sq ft)	TSP Emission Factor (lb/blast)	Control Efficiency (%)	TSP Emissions (T/yr)	PM10 Emissions (T/yr)	PM2.5 Emissions (T/yr)
NP93	Limestone	152	9,250	12.45	0	0.95	0.49	0.03

Notes
TSP emission factor (lb/blast) from AP-42 Table 11.9-1
0.000014 x (A)^1.5
PM10 fraction is 0.52 from AP-42 Table 11.9-1
PM2.5 fraction is 0.03 from AP-42 Table 11.9-1

Bulldozing Overburden

Emission Point ID	Material	Silt Contents (%)	Moisture Content M (%)	Dozing Hours (hrs/yr)	TSP Emission Factor (lb/hr)	TSP Emission Factor (lb/hr)	Control Efficiency (%)	TSP Emissions (T/yr)	PM10 Emissions (T/yr)	PM2.5 Emissions (T/yr)
NP94	Overburden	7.5	2.1	3,863	24.38	5.45	75	11.77	2.63	1.24

Notes
Assume overburden bulldozing hours are approximately the same as hours for primary crusher operation
Assume 75% dust control with watering
TSP emission factor (lb/hr) from AP-42 Table 11.9-1
5.7 x (s)^1.2 / (M)^1.3
PM10 emission factor (lb/hr) from AP-42 Table 11.9-1
0.75 x 1.0 x (s)^1.5 / (M)^1.4
PM2.5 fraction of TSP is 0.105 from AP-42 Table 11.9-1

Truck Loading & Unloading

Emission			Control	Throughput	TSP		PM_{10}		$PM_{2.5}$	
Point ID	Description	Material	%	tons/yr	Factor lbs/ton	tons/yr	Factor lbs/ton	tons/yr	Factor lbs/ton	tons/yr
NP94	Truck loading	Overburden		31,342	4.68E-03	0.07	2.21E-03	0.03	3.35E-04	0.01
	Truck unloading	Overburden		31,342	4.68E-03	0.07	2.21E-03	0.03	3.35E-04	0.01
NP95	Truck loading	Limestone (total)		6,322,984	2.84E-03	8.98	1.34E-03	4.25	2.03E-04	0.64
NP95	Truck unloading	Limestone (waste)		1,567,104	2.84E-03	2.23	1.34E-03	1.05	2.03E-04	0.16
	Total					11.35		5.37		0.81

Note
Truck unloading of limestone to be crushed is included with emissions at primary crusher hopper

Location	Material	Quantity Transported (tons/yr)	Vehicle Type	Vehicle Weight (Empty)	Load Capacity (tons)	Total Trips
Quarry	New Scotland	1,567,104	Truck	68	91	17,221
Quarry	Coeymans	2,057,119	Truck	68	91	22,606
Quarry	Kalkberg	1,548,238	Truck	68	91	17,014
Quarry	Callanan Aggregate	1,109,096	Truck	68	91	12,188
Quarry	Beecraft	41,427	Truck	68	91	455
Quarry	Overburden	31,342	Truck	68	91	344
Plant	Fly Ash	86,112	Truck	20	25	3,444
Plant	Iron	64,926	Truck	20	25	2,597
Plant	Bauxite	47,538	Truck	20	25	1,902
Barge/Plant	Gypsum	114,937	Truck	93	50	2,299
Plant	Cement bulk	366,730	Truck	20	25	14,669
Plant	Cement bags	104,933	Truck	20	25	4,197
Plant	CKD (sales)	33,039	Truck	20	25	1,322
Plant	CKD (landfill)	128,453	Truck	20	25	5,138

All Roads Emission Summary

Road Type	Area	Total Mileage (Mi/yr)	Annual Emissions TSP Emissions (Ton/yr)	PM10 Emissions (Ton/yr)	PM2.5 Emissions (Ton/yr)
Paved	Plant	39,344	13.05	2.55	0.64
Unpaved	Quarry	87,779	133.66	38.01	3.80
Unpaved	Plant	17,047	20.28	5.77	0.58
Total			166.99	46.32	5.01

Paved Roads

Route No.	Material Hauled	Round Trip (mi)	Silt Loading (g/m2)	Truck Weight Empty (Tons)	Truck Weight Load (Tons)	Truck Weight Loaded (Tons)	Avg Weight (Tons)	Material Thruput (T/yr)	Material Trips (#/yr)	Total Mileage (Mi/yr)	TSP E Factor lb/VMT	PM10 E Factor lb/VMT	PM2.5 E Factor lb/VMT	Control Efficiency (%)	TSP Emissions (Ton/yr)	PM10 Emissions (Ton/yr)	PM2.5 Emissions (Ton/yr)
PR1	Fly Ash	1.5	8.2	20	25	45	32.5	86,112	3,444	5,167	6.63	1.29	0.32	90	1.71	0.33	0.08
PR2	Iron	1.5	8.2	20	25	45	32.5	64,926	2,597	3,896	6.63	1.29	0.32	90	1.29	0.25	0.06
PR3	Cement bulk	1.5	8.2	20	25	45	32.5	366,730	14,669	22,004	6.63	1.29	0.32	90	7.30	1.42	0.36
PR4	Cement bags	1.5	8.2	20	25	45	32.5	104,933	4,197	6,296	6.63	1.29	0.32	90	2.09	0.41	0.10
PR5	CKD sales	1.5	8.2	20	25	45	32.5	33,039	1,322	1,982	6.63	1.29	0.32	90	0.66	0.13	0.03
	Total									39,344					13.05	2.55	0.64

Notes:

Emissions based on AP-42 Section 13.2.1 (11/06), Equation (2).

$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] * (1 - P/4N)$

where

E = emission factor, lb/VMT	k (PM-30) =	0.082	lb/VMT
k = particle size multiplier	k (PM-10) =	0.016	lb/VMT
sL = road surface silt loading, g/m^2	k (PM-2.5) =	0.0024	lb/VMT
W = average vehicle weight, tons	C (PM-30) =	0.00047	lb/VMT
C = 1980's vehicle exhaust, brake & tire wear, lb/VMT	C (PM-10) =	0.00047	lb/VMT
P = number of days with >= 0.01 in precipitation	C (PM-2.5) =	0.00036	lb/VMT
N = number of days in the averaging period (365)	P =	136	days (Albany average)

ASSUMPTION: 90% control efficiency assumed due to watering and sweeping (per Fugitive Dust Plan).

Unpaved Roads

Route No.	Material Hauled	Round Trip (mi)	Surface Silt Content (%)	Truck Weights Empty (Tons)	Capacity (Tons)	Loaded (Tons)	Truck Weight	Material Thruput (T/yr)	Material Trips (#/yr)	Total Mileage (Mi/yr)	TSP E Factor lb/VMT	PM10 E Factor lb/VMT	PM2.5 E Factor lb/VMT	Control Efficiency (%)	TSP Emissions (Ton/yr)	PM10 Emissions (Ton/yr)	PM2.5 Emissions (Ton/yr)
UR1	New Scotland	1.6	8.3	68	91	159	113.5	1,567,104	17,221	27,553	12.18	3.46	0.35	75	41.96	11.93	1.19
UR2	Coeymans	1.0	8.3	68	91	159	113.5	2,057,119	22,606	22,606	12.18	3.46	0.35	75	34.42	9.79	0.98
UR3	Kalkberg	1.25	8.3	68	91	159	113.5	1,548,238	17,014	21,267	12.18	3.46	0.35	75	32.38	9.21	0.92
UR4	Callanan Aggregate	1.25	8.3	68	91	159	113.5	1,109,096	12,188	15,235	12.18	3.46	0.35	75	23.20	6.60	0.66
UR5	Beecraft	1.6	8.3	68	91	159	113.5	41,427	455	728	12.18	3.46	0.35	75	1.11	0.32	0.03
UR6	Overburden	1.13	8.3	68	91	159	113.5	31,342	344	389	12.18	3.46	0.35	75	0.59	0.17	0.02
	Subtotal (Quarry)									87,779					133.66	38.01	3.80
UR7	Gypsum	3.5	8.3	93	50	143	118.0	114,937	2,299	8,046	12.40	3.53	0.35	75	12.47	3.55	0.35
UR8	CKD (landfill)	0.5	8.3	20	25	45	32.5	128,453	5,138	2,569	6.94	1.97	0.20	75	2.23	0.63	0.06
UR9	Bauxite	2.7	8.3	20	25	45	32.5	47,538	1,902	5,134	6.94	1.97	0.20	75	4.45	1.27	0.13
UR10	Iron	0.5	8.3	20	25	45	32.5	64,926	2,597	1,299	6.94	1.97	0.20	75	1.13	0.32	0.03
	Subtotal (Plant)									17,047					20.28	5.77	0.58
	TOTAL									104,826					153.94	43.77	4.38

Notes:

E = k * (s/12)^a * (W/3)^b * (365 - P)/365 for industrial unpaved roads

where

E = emission factor, lb/VMT
k = particle size multiplier
s = surface material silt content, %
W = average vehicle weight, tons
P = number of days with >= 0.01 in precipitation
a, b = constants for specific partical size

Constant	PM-30	PM-10	PM-2.5
k	4.9	1.5	0.15
a	0.7	0.9	0.9
b	0.45	0.45	0.45
P =	136	days (Albany average)	

Emission factors from AP-42 Section 13.2.2 (11/06), Equations (1a) & (2). Silt content based on stone quarrying haul road (Table 13.2.2-1). A control efficiency of 75% was used to account for natural surface moisure or watering as needed at an equivalent surface moisture ratio of 2 (Figure 13.2.2-2).