

Middletown Coke Company - Emissions for Modeling

Case 0 - Typical operation; no HRSG or SD/BH maintenance. This case not modeled.

Case 1D - Operation during HRSG maintenance; ovens charged with 50 tons coal;
50 ovens charged per day (equivalent to 2500 wet tons coal/day);
March 2009 layout; 3-hr SO₂ = 550 lb/hour.

Case 2D - Worst case facility operation during HRSG maintenance; ovens charged with 50 tons coal;
75 ovens charged per day (equivalent to 3750 wet tons coal/day);
March 2009 layout; 3-hr SO₂ = 550 lb/hour SO₂.

Case 3D - SD/BH maintenance with emissions out main stack;
SO₂ from SD/BH Maintenance reduced 28% by reducing charges and/or coal sulfur.
ovens charged with 50 tons coal; 75 ovens charged per day;
(equivalent to 3750 wet tons coal/day); March 2009 layout.

Summary for all emissions units

Case	PM10 24-hr (g/sec)	SO ₂ 3-hr (g/sec)	SO ₂ 24-hr (g/sec)	CO 1-hr (g/sec)
Case 1D	5.8	145.9	89.2	4.2
Case 2D	6.4	150.8	89.8	4.6
Case 3D	15.6	232.2	228.0	4.0

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Case 3D - SD/BH Maintenance, 3750 tpd (emissions from charging, pushing, quenching, and material handling increase by

Emission Data for Case 3D

1.5) Top of concrete = 667 ft.

Source	UTM Easting NAD 83	UTM Northing NAD 83	Stack Height		Stack Diameter		Flowrate (acfm)	Stack Temp.		Stack Velocity		3-hr Averaging Period			24-hour Averaging Period																	
			(ft)	(meters)	(ft)	(m)		(F)	(K)	(ft/min)	(m/sec)	SO2		PM10 filterable			NOx			CO			HCl			Hg						
			(g/hr)	(g/sec)	(ppm)	(lbs/hr)		(g/sec)	(ppm)	(lbs/hr)	(g/sec)	(ppm)	(lbs/hr)	(g/sec)	(ppm)	(lbs/hr)	(g/sec)	(ppm)	(lbs/hr)	(g/sec)	(ppm)	(lbs/hr)	(g/sec)	(ppm)	(lbs/hr)	(g/sec)	(ppm)					
Main Stack	723661.2	4372312.5	210.0	64.0	13.0	3.96	465,000	375	464	3503	17.8	1794.0	226.0	720.1	1794.0	226.0	720.1	105.0	13.2	0.049	104.2	13.1	58.2	21.8	2.7	20.0	295.8	37.3	208.2	0.0344	0.0043	0.004
Individual Waste Gas Stacks																																
1[A, B]	723792.2	4372299.6	83.0	25.3	9.0	2.74	263,000	1900	1311	4134	21.0		0.0	0.0		0.0	0.000		0.0	0.000		0.0	0.0		0.0	0.0		0.0	0.0		0.0000	0.000
2	723711.8	4372344.4	83.0	25.3	9.0	2.74	263,000	1900	1311	4134	21.0		0.0	0.0		0.0	0.000		0.0	0.000		0.0	0.0		0.0	0.0		0.0	0.0		0.0000	0.000
3	723627.2	4372391.9	83.0	25.3	9.0	2.74	263,000	1900	1311	4134	21.0		0.0	0.0		0.0	0.000		0.0	0.000		0.0	0.0		0.0	0.0		0.0	0.0		0.0000	0.000
4	723506.0	4372459.2	83.0	25.3	9.0	2.74	263,000	1900	1311	4134	21.0		0.0	0.0		0.0	0.000		0.0	0.000		0.0	0.0		0.0	0.0		0.0	0.0		0.0000	0.000
5	723424.8	4372504.0	83.0	25.3	9.0	2.74	263,000	1900	1311	4134	21.0		0.0	0.0		0.0	0.000		0.0	0.000		0.0	0.0		0.0	0.0		0.0	0.0		0.0000	0.000
Pushing	723580.7	4372455.5	20.0	6.1	5.0	1.52	82,000	400	478	4176	21.2	49.0	6.2	98.3	15.3	1.93	30.7	4.5	0.6	0.010	3.0	0.4	8.3	9.8	1.2	45.2						
Charging (stack)	723598.1	4372485.3	25.7	7.8	4.5	1.37	65,000	300	422	4087	20.8	0.15	0.019	0.3	0.05	0.006	0.10	1.2	0.1	0.003				0.4	0.06	2.2			1.23E-07	0.00000002	8.782E-08	
Coke Screening	723620.1	4372282.9	32.8	10.0	4.2	1.28	50,000	amb + 10	amb + 6	3609	18.3																					
Quench Tower	723575.9	4372421.8	100.0	30.5	Rect.	Rect.	998,000	155	342	832	4.2																					
Total stack emissions												1843.2	232.2		1809.4	228.0		121.0	15.2		107.1	13.5		32.1	4.0		295.8	37.3		0.034	0.0043	

[A] 3-hour SO2 rates: main stack = 1794.0 lb/hour (226.0 g/sec); ind wh stacks = 0.0 lb/hour (0.00 g/sec)
 [B] All waste heat stacks will be open for up to 5 days

Stack Flowrates	dscfm	moist (%)	Temp. (F)	acfm
Individual Waste He	50,000	15%	1900	263,000
Main Stack	250,000	20%	240	414,000
Pushing	50,000	1%	400	82,000
Charging	45,000	1%	300	65,000
Coke Crushing	50,000	0%	amb + 10	50,000
Quench Tower	600,000	30%	155	998,000

Main stack flow during SD/BH maint. W emissions from main stack

Stack Flow	dscfm	moist (%)	Temp. (F)	acfm
Main Stack	250,000	15%	375	465,000

Fugitive	UTM Easting	UTM Northing	Height (meters)	24-hour Averaging Period											
				SO2		PM10		NOx		CO		HCl		Hg	
(lbs/hr)	(g/sec)	(lbs/hr)	(g/sec)	(lbs/hr)	(g/sec)	(lbs/hr)	(g/sec)	(lbs/hr)	(g/sec)	(lbs/hr)	(g/sec)	(ppm)	(lbs/hr)	(g/sec)	(ppm)
Coal Unloading	722852.2	4372719.0	0			0.0125	0.0016								
To Unloader Conveyor	722851.2	4372713.5	0			0.0062	0.0008								
Coal Transfer #1	722837.6	4372653.8	5			0.0062	0.0008								
Coke Transfer #2/Transfer to Stacker Conveyor	722891.3	4372566.8	2			0.1249	0.0157								
Transfer to Stacker	722891.3	4372566.8	15			0.1249	0.0157								
Coal Storage Pile #1 In	722936.1	4372581.1	15			0.0624	0.0079								
Coal Storage Pile #1 (Dead Pile)	722936.1	4372581.1	7.5			0.1260	0.0159								
Coal Storage Pile#2 Out	722936.1	4372581.1	2			0.0624	0.0079								
Coal Transfer from Storage Pile #1 to Storage Pile #2	722920.8	4372529.1	2			0.0624	0.0079								
Coal Storage Pile In	722844.4	4372563.4	15			0.0624	0.0079								
Coal Storage Pile #2 (Live Pile)	722844.4	4372563.4	7.5			0.1365	0.0172								
Coal Storage Pile Out	722844.4	4372563.4	0			0.0062	0.0008								
Stacker (Front End Loadout)	722879.8	4372521.7	2			0.0250	0.0031								
Transfer to Stacker Reclaim Hopper	722879.8	4372521.7	2			0.0250	0.0031								
Transfer to Coal Crushing Tower	723341.6	4372416.4	15			0.0062	0.0008								
Coal Crushing	723341.9	4372418.4	9			0.1250	0.0158								
Transfer to Silo Feed Conveyor	723346.7	4372436.4	4			0.0062	0.0008								
Transfer to Silo	723387.8	4372619.8	40			0.0062	0.0008								
Transfer to Batch Bin	723387.8	4372619.8	20			0.0062	0.0008								
Transfer to tripper conveyor	723640.1	4372478.4	2			0.1249	0.0157								
Tripper point 1	723598.1	4372485.3	7			0.1249	0.0157								
Tripper point 2	723598.1	4372485.3	7			0.1249	0.0157								
Tripper point 3	723598.1	4372485.3	7			0.1249	0.0157								
Extra Coal Transfer Point #1						0.0062	0.0008								
Extra Coal Transfer Point #2						0.0062	0.0008								
Extra Coal Transfer Point #3						0.0062	0.0008								
Coke from Hot Car to Quench Car	723576.6	4372446.3	2			0.0448	0.0056								
Coke from Quench Car to Wharf	723575.9	4372421.8	0			0.0895	0.0113								
Transfer to Wharf conveyor	723571.9	4372399.7	0			0.0895	0.0113								
Coke Transfer #1	723524.3	4372318.6	2			0.0045	0.0006								
Coke Transfer (Stacking Conveyor)	723524.3	4372318.6	2			0.0134	0.0017								
Coke emergency storage pile in	723473.4	4372317.6	14			0.0895	0.0113								
Coke emergency storage pile wind	723473.4	4372317.6	7			0.0895	0.0113								
Coke emergency storage pile out	723473.4	4372317.6	2			0.0895	0.0113								
Unloading to Coke Reclaim Hopper	723542.3	4372350.5	2			0.0895	0.0113								
Coke Transfer (Plant Feed Conveyor)	723524.0	4372318.6	20			0.0161	0.0020								
Transfer to Screening Station	723620.1	4372282.9	25			0.0161	0.0020								
Transfer to Recirculating Conveyor	723620.1	4372282.9	12			0.0027	0.0003								
Recirculating Transfer to Plant Feed Conveyor	723527.4	4372316.9	12			0.0027	0.0003								
Transfer Breeze to Bunker	723620.1	4372282.9	5			0.0008	0.0001								
Breeze loadout at bunker	723620.1	4372282.9	5			0.0008	0.0001								
Emergency Breeze Pile In	723555.9	4372331.5	2			0.0056	0.0007								
Emergency Breeze Pile	723555.9	4372331.5	2			0.0447	0.0056								
Emergency Breeze Pile Out	723555.9	4372331.5	2			0.0056	0.0007								
Transfer to coke product conveyor	723620.1	4372282.9	12			0.0134	0.0017								
Coke Transfer #2	723781.7	4372221.8	12			0.0045	0.0006								
Transfer to screened coke stacker conveyor	723781.7	4372221.8	12			0.0134	0.0017								
Emergency Screened coke storage pile in	723749.1	4372254.4	12			0.0840	0.0106								
Emergency Screened coke storage pile	723749.1	4372254.4	6			0.0137	0.0017								
Emergency Screened coke storage pile out	723749.1	4372254.4	2			0.0840	0.0106								
Unloading to Screened Coke Reclaim Hopper	723790.6	4372228.2	2			0.0895	0.0113								
Coke Transfer #3	723907.7	4372321.0	9			0.0045	0.0006								
Coke Transfer #4	724197.0	4372316.9	9			0.0045	0.0006								
Coke Rail Loadout Transfer #1	723347.0	4372322.0	9			0.0045	0.0006								
Coke Rail Loadout Transfer #2	723050.9	4372344.4	9			0.0045	0.0006								
Coke Rail Loadout Transfer #3	723047.5	4372308.1	9			0.0045	0.0006								