

1.0 INTRODUCTION/OVERVIEW

Middletown Coke Company (MCC) plans to construct a heat recovery coke making facility adjacent to AK Steel Corporation's (AK's) Middletown Works in Middletown, Ohio. This application package contains information required by the Ohio Environmental Protection Agency (EPA) to evaluate the project and issue an air pollution control permit-to-install (PTI) for the project.

The proposed operation will consist of 100 heat recovery coke ovens in three batteries. Operations at the facility will include coal handling, charging, heat recovery coking, pushing, quenching, coke handling, and coke storage. Heat recovery steam generators (HRSGs) will recover waste heat from the ovens to produce steam and electricity. At design capacity, the facility will coke 910,000 tons /year of coal and produce up to 614,000 tons/year of furnace coke. A nominal 52 megawatts of electricity will be produced from the waste heat. All the power produced will go to AK through the grid under a bilateral trade agreement.

A netting analysis was performed for emissions increases from the heat recovery coke plant and emissions decreases from shutdown of the AK Sinter Plant. In addition, AK will install a flame management system at the No. 2 Boiler House that will reduce the amount of gas required by the pilot burners. Reduced natural gas usage will reduce emissions from natural gas combustion. Table 1-1 lists the emission increases from the heat recovery coke plant and the emission decreases from shutting down the Sinter Plant and installing the flame management system. Table 1-2 demonstrates that the heat recovery coke plant project should be treated as a minor modification because there will not be a significant net emissions increase [Ohio Administrative Code 3745-31-01 (KKKKK)].

Section 2.0 includes a more detailed discussion of the heat recovery coke plant. Section 3.0 discusses the coke plant air pollution controls. Section 4.0 presents the air pollutant emission analysis. Regulatory requirements for the new facility are discussed in Section 5.0. Ohio EPA permit application forms are included in Appendix A. Appendix B contains supporting calculations for the coke plant emissions. Appendix C contains a Compliance Assurance

Monitoring (CAM) Plan. Appendix D contains supporting information related to AK's emission reductions.

Table 1-1
Heat Recovery Coke Plant and Related Projects at AK Steel

	PM	PM ₁₀	SO ₂	NO _x	CO	VOC	Lead	H ₂ SO ₄ ^a
Emissions Increases								
Heat Recovery Coke Plant	301.8	244.08	1584.7	484.7	130.3	31.4	0.24	36.3
Emissions Reductions from Sinter Plant Shutdown								
Raw Materials Unloading (F009)	-104.55	-26.14						
Windbox (P908)	-184.11	-176.68	-1615.43	-395.46	-14536.2	-164.71	-2.58	-48.5
Breaker End (P936)	-155.23	-49.67						
Cold Sinter Screening (F007)	-68.66	-17.16						
Subtotal	-512.55	-269.65	-1615.43	-395.46	-14536.2	-164.71	-2.58	-48.5
Other Emissions Increases and Reductions								
No. 2 Boiler House Flame Safety Management Project				-49.5				
Increases minus Reductions	-210.8	-25.6	-30.7	39.7	-14406	-133.3	-2.3	-12.2

^a Estimated as 3% of SO₂.

CO = Carbon Monoxide
H₂SO₄ = Sulfuric Acid Mist
NO_x = Nitrogen Oxides
PM = Particulate Matter
PM₁₀ = Particulate matter less than 10 micrometers in diameter
SO₂ = Sulfur Dioxide
VOC = Volatile Organic Compound

Table 1-2
Comparison of Net Air Emissions Change with Significant Emission Rates

Pollutant	Net Emissions Change (tons/year)	Significant Threshold (tons/year)	Significant? (Yes/No)
PM	-211.5	25	No
PM ₁₀ /PM _{2.5} ^a	-25.9	15	No
SO ₂	-30.7	40	No
NO _x	39.7	40	No
CO	-14,406	100	No
VOCs	-133.3	40	No
Lead	-2.3	0.6	No
H ₂ SO ₄	-12.2	7	No

^a PM₁₀ is currently a surrogate for PM_{2.5}. Page, Stephen 2005. "Implementation of New Source Review Requirements in PM_{2.5} Nonattainment Areas," memo, EPA, April.

CO = Carbon Monoxide
H₂SO₄ = Sulfuric Acid Mist
NO_x = Nitrogen Oxides
PM = Particulate Matter
PM_{2.5} = Particulate matter less than 2.5 micrometers in diameter
PM₁₀ = Particulate matter less than 10 micrometers in diameter
SO₂ = Sulfur Dioxide
VOC = Volatile Organic Compound