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west virginia department of environmental protection

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## ENGINEERING EVALUATION/FACT SHEET

### B BACKGROUND INFORMATION

Application No.:	R13-3075
Plant ID No.:	029-00001
Applicant:	ArcelorMittal-Weirton, LLC
Facility Name:	Works
Location:	Weirton
NAICS Code:	331111
Application Type:	Modification
Received Date:	April 29, 2013
Engineer Assigned:	Edward S. Andrews, P.E.
Fee Amount:	\$2000.00
Date Received:	May 3, 2013
Complete Date:	May 29, 2013
Due Date:	August 28, 2013
Applicant Ad Date:	May 14, 2013
Newspaper:	<i>The Weirton Daily Times</i>
UTM's:	Easting: 534.3 km      Northing: 4,474.6 km      Zone: 17
Description:	The application is for the installation of five 99 MM Btu/hr boiler to replace the 3 existing ones.

### DESCRIPTION OF PROCESS

ArcelorMittal-Weirton, LLC (Arcelor) owns and operates the Weirton Works (Works) in Weirton West Virginia, which is a finishing steel mill. The Works currently configured to finish flat sheets or coiled steel by applying a chrome or tin finish to the steel. To support this manufacturing operation, the Works has three boilers at the facility to provide process heat energy required by these manufacturing operations. These units were installed to meet the facility's needs when the Works was being operated as a "fully integrated steel mill", which means the Works convert iron ore into finish steel products (slabs, ingots, coils & sheets).

The works originally need these three existing boilers to support the steel manufacturing operations, which are listed in the following table.

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Boiler No./Emission Unit ID	Description of the unit	Year Installed	Design Capacity (MMBtu/hr)
Boiler 3/089	High Pressured Boiler; Natural Gas or mixture of gas and fuel oil	1940	540
Boiler 4/090	High Pressured Boiler; Natural Gas or mixture of gas and fuel oil	1947	540
Boiler 5/091	High Pressured Boiler; Natural Gas or mixture of gas and fuel oil	1952	600

Manufacturing operations at the Works has significantly diminished over the last decade. Current operations center on tin mill production, and steel pickling. These reduced operations at the works have also diminished the demand for steam (heat energy). Acelor has proposed to shut down these existing boilers and replace them with five smaller, natural gas-fired, packaged-type boilers.

The existing boilers were centrally located at the works. These replacement units will be located based on estimated steam demand. One unit will be located on the Strip Mill and the other four units being installed at the Tin Mill. The total design heat input of these units will be 99.9 MMBtu/hr.

#### SITE INSPECTION

On July 20, 2012, Mr. Alford Carducci, an inspector assigned to the Compliance and Enforcement Section for the Northern Panhandle Regional Office, inspected the facility as part of a targeted inspection. In conclusion, Mr. Carducci determined that the facility has been operating in compliance of the applicable rules & regulations and permits. The writer concluded that a site visit was not necessary for this permitting action.

#### ESTIMATE OF EMISSION BY REVIEWING ENGINEER

The applicant used pollutant specific emissions factors from Chapter 1.4 of AP-42 and manufacturer's data to estimate emissions from the replacement boilers. The writer reproduces the estimated emissions from one replacement boiler, which are presented in the following table:

**Table #1 – Emissions from One Replacement Boiler**

<b>Pollutant</b>	<b>Emission Factor</b>	<b>Hourly Rate (lb/hr)</b>	<b>Annual Rate (TPY)</b>	<b>Annual Rate w/5 units (TPY)</b>
PM/PM <sub>10</sub> /PM <sub>2.5</sub> Filterable	1.9 lb/MMcf	0.19	0.83	4.15
PM Condensable Fraction	5.7 lb/MMcf	0.56	2.45	12.25
Total PM	7.6 lb/MMcf	0.74	3.24	16.2
Sulfur Dioxide (SO <sub>2</sub> )	0.6 lb/MMcf	0.06	0.26	1.3
Oxides of Nitrogen (NO <sub>x</sub> )	37.2lb/MMcf	3.64	15.94	79.7
Carbon Dioxide (CO)	37.7 lb/MMcf	3.69	16.16	80.8
Volatile Organic Compounds (VOCs)	5.5 lb/MMcf	0.54	2.37	11.85
Total Hazardous Air Pollutants (HAPs)	--	0.18	0.81	4.05
Carbon Dioxide (CO <sub>2</sub> )	120,000 lb/MMcf	11,752.94	51,477.88	257,389.40

The following table presents the change in potential emissions as result of this project.

**Table #2 – Change in Potential Emissions**

<b>Pollutant</b>	<b>Potential of Boilers 3, 4, and 5 (tpy)</b>	<b>Potential from replacement Boilers (tpy)</b>	<b>Change in Potential Emissions (TPY)</b>
PM/PM <sub>10</sub> /PM <sub>2.5</sub> Filterable	397.6	4.15	-393.5
PM Condensable Fraction	542.9	12.3	-530.6
Total PM	746.6	16.2	-730.4
Sulfur Dioxide (SO <sub>2</sub> )	11,351	1.3	-11,349.7
Oxides of Nitrogen (NO <sub>x</sub> )	1,873	79.7	1,793.3
Carbon Dioxide (CO)	562	80.8	- 481.20
Volatile Organic Compounds (VOCs)	37	11.9	25.2
Total Hazardous Air Pollutants (HAPs)	16	4.1	11.9

### REGULATORY APPLICABLILITY

The Works is a major source under Title V (45CSR30) and currently possesses a valid Title V Operating Permit. Under this program, new emission units have 12 months upon start-up to be incorporated in the facility's operating permit. The Works is currently classified as major

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source for PM/PM<sub>10</sub>/PM<sub>2.5</sub>, NO<sub>x</sub>, SO<sub>2</sub>, CO, and CO<sub>2e</sub> under Prevention of Significant Deterioration (PSD) and for HAPs.

First Step in determining major source applicability is to determine which pollutants that the project is major for, which is illustrated in the following table.

Pollutant	New Potential from the 5 Boilers (tpy)	Significance Threshold (tpy)	Significance Trigger (Yes/No)
PM	16.2	25	No
PM <sub>10</sub>	16.2	15	Yes
PM <sub>2.5</sub> Direct	16.2	10	Yes
NO <sub>x</sub> (precursor of Ozone and PM <sub>2.5</sub> )	79.7	40	Yes
SO <sub>2</sub>	1.3	40	NO
CO	80.8	100	NO
VOCs	11.9	40	NO
CO <sub>2</sub> equivalent (CO <sub>2e</sub> )	257,919	75,000	Yes

This project represents a “significant emission increase” (45CSR§14-2.75) for PM<sub>10</sub>, PM<sub>2.5</sub> direct, NO<sub>x</sub> (includes precursor for ozone and PM<sub>2.5</sub>) and CO<sub>2e</sub>. The next step is to determine if this project results in a “net significant emission increase” pursuant to 45CSR§§14-2.64 and 2.74.

Arcelor preformed a netting analysis for PM<sub>10</sub>/PM<sub>2.5</sub>, NO<sub>x</sub>, and CO<sub>2e</sub> (which includes mass emissions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O). 45CSR§14-2.8.b. defines “baseline actual emissions” for existing emissions units other than electric utility steam generating units as the average rate, in tons per year (tpy), at which the emissions unit actually emitted the pollutant during the any consecutive 24-month period within the 10 year period immediately preceding either the date the begin construction or upon receipt of a a complete permit application by the Secretary (which was May 29, 2013), whichever is earlier. Arcelor selected the baseline period of 2005-2006. Emission generator by Boilers 3, 4 and 5 during this time represent the baseline actual emission for the netting analysis.

These boilers discharged an average of 126.8 tpy of PM<sub>10</sub>/PM<sub>2.5</sub>, 505.7 tpy of NO<sub>x</sub> and 297,830 tpy of CO<sub>2e</sub> during the baseline period. These emissions are representing a decrease in emissions in this netting analysis because these boilers will be shut-down as result of the project.

In addition, Arcelor reviewed the past five years from the expected construction date of the project (contemporaneous period) of the facility’s activities to determine if any other increases or decreases occurred, which is 2008 to 2012. Arcelor determined that the only changes in activities that resulted in either emission increases or decreases were the shutdown of the Hot Strip Mill, HCL Plant, scarfing operations that occurred within the contemporaneous period. The following table summarized the netting analysis for this project.

Pollutant	New Potential from the New Boilers (tpy)	Baseline Decreases from Boilers 3, 4, & 5 (tpy)	Other changes in the Cotemporaneous Period (tpy)	Net Change (- decrease) (tpy)	Significance Threshold (TPY)	Net Significant Emission Increase (yes/no)
PM <sub>10</sub> /PM <sub>2.5</sub> *	16.2	-126.8	-0.3	-110.9	15/10	No
NO <sub>x</sub>	79.7	-505.7	-4.0	-430	40	No
CO <sub>2e</sub>	257,919	-298,758	-4,871.8	-45,710.8	75,000	No

\* - Includes both the condensable and filterable portions.

With regards to the National Ambient Air Quality Standards, Hancock County is classified as non-attainment for PM<sub>2.5</sub>. The Works has the potential to emit nearly 1,080 tpy of PM<sub>2.5</sub>, which means that the works is classified as a major source of PM<sub>2.5</sub> direct. Thus, it must be determined if this project will result in a “significant emissions increase” and a “significant net emissions increase” in accordance with 45CSR§19-3.4.

The applicability test is for Non-Attainment Permitting (45CSR19) is nearly the same as PSD except the test is only conducted for the pollutant that the area is classified as non-attainment, which is PM<sub>2.5</sub> and its precursors (SO<sub>2</sub> and NO<sub>x</sub> for PM<sub>2.5</sub>). This project would represent a significant increase of PM<sub>2.5</sub> direct and NO<sub>x</sub>. However, the shutdown of Boilers 3, 4, and 5 as part of this project would not result in a “significant net emission increase”. Therefore, this proposed project does not require a permit under PSD and/or Non-Attainment New Source Review.

The 5 replacement boilers are subject to Rules 2 & 10 (WV State Rules on PM and SO<sub>2</sub>) and 40 CFR 60 – Subpart Dc. The requirements from these rules and regulations are very minimal for natural gas fired boilers to comply with the applicable emission standards (See Policy on Rule 13 Guidance for Natural Gas Combustion Sources).

The Works is currently classified as a major source of HAPs, which means the facility has at the least the potential to emit 10 tons per year of a single HAP or 25 tpy of total HAPs. Within the application, Arcelor has not elected to determine if this project would change the Works major source status for HAPs. Thus, the replacement boilers are subject to 40 CFR 63, Subpart DDDDD – National Emission Standard for Hazardous Air Pollutants (NESHAP) for Major Sources: Industrial Commercial, and Institutional Boilers and Process Heaters.

This regulation establishes work practices as a means to comply with the emission standards (see Item 3 of Table 3 to Subpart DDDDD of Part 63). The applicable would require annual tune-up in accordance with 40 CFR §63.7540 for each of the new boilers.

These units are only capable of consuming natural gas. It is understood that sources burning this fuel are significantly below the applicable allowable limitations in Rule 2 and Rule 10, which are the State of West Virginia's rules addressing particulate matter (PM) and sulfur dioxide (SO<sub>2</sub>) from boilers, regardless of the size of the unit. This understanding is confirmed with the provisions in Rules 2A and 10A, which exempts such sources for conducting periodic testing and monitoring for the purpose of demonstrating compliance with the limitations under these rules.

Weirton prepared and submitted a complete application, paid the filing fee, and published a Class I Legal ad in *The Weirton Daily Times* on May 14, 2013. This project requires that the Boilers 3, 4, and 5 to be shut down to avoid triggering permitting requirements under Rules 14 and 19, then the Notice Level C of 45CSR§13-8.5 must be followed. This requires a sign be posted at the facility and commercial display ad published in conjunction with the Secretary's "notice of intent to approve".

This does not trigger any new regulations that the facility is subject to other than Subpart Dc for these replacement boilers. Again, this NSPS standard does not establish any emission standard for these new units since they will only burn natural gas. The existing boilers (Boiler 3, 4, and 5) are subject to the Boiler MACT and this proposed change does not affect the applicability status or the facility's ability to comply with it. The facility currently poses a valid Title V Operating Permit and included Attachment S of the application for a minor modification of this operating permit.

#### TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The new replacement boilers will not emit any pollutants that aren't already being emitted by another emission source at the facility. Therefore, no information about the toxicity of the hazardous air pollutants (HAPs) is presented in this evaluation. Further the applicant estimates that the potential to emit of HAPs will be reduced by 12 tpy.

#### AIR QUALITY IMPACT ANALYSIS

The writer deemed that an air dispersion modeling study or analysis was not necessary, because the proposed modification does not meet the definition of a major modification of a major source as defined in 45CSR14.

#### MONITORING OF OPERATIONS

Rules 2, 10, and Subpart Dc only require recording of the amount of natural gas consumed each month for natural gas fired boilers. As noted earlier, these units are subject to the Boiler MACT which requires annual tune-up for each boiler. The permit will require that the tune-up verify that the optimization of CO must be consistent with the manufacturer's

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specification and that the NO<sub>x</sub> concentrations are at or within the manufacturer's setting of 30 ppm.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates the proposed modification of the facility will meet all the requirements of the application rules and regulations when operated in accordance to the permit application. Therefore, this writer recommends granting ArcelorMittal-Weirton LLC a Rule 13 modification permit for their facility located in Weirton, WV.

Edward S. Andrews, P.E.  
Engineer

July 5, 2013  
Date

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