GEORGIA
DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION

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NARRATIVE

TO: Eric Cornwell

FROM: Ginger Payment

DATE: March 28, 2019

Facility Name:	**VMC Specialty Alloys**
AIRS No.:	015-00115
Location:	Adairsville, GA (Bartow County)
Application #:	26875
Date of Application:	December 5, 2018

Background Information

VMC Specialty Alloys is an existing facility which treats and recycles scrap aluminum and aluminum alloys by melting and casting the metal into billets and ingots. The facility is located at 800 Martin Luther King Jr. Drive in Adairsville (Bartow County). The facility was issued Permit No. 3341-015-0115-B-02-0 on September 29, 2015 for the operation of the facility and for the construction and operation of two new natural gas fired metal treating furnaces. Permit No. 3341-015-0115-B-02-1 was issued on January 12, 2018 for the construction of an aluminum homogenizing furnace and one cast house which includes two melting furnaces, two homogenizing furnaces and one preheater.

The scrap aluminum is loaded into the tilting, metal melting furnaces. After the furnace is filled, the charging is stopped and the alloy is checked for product quality and then the ingot casting is started. Chlorine may be used to remove impurities from the molten aluminum. After the melting and casting operations, billets are directed to one of the homogenizing furnaces for heat treatment. The homogenizing furnaces operate at a constant temperature during the setting process to maintain uniformity throughout the cast billets. No aluminum melting occurs at the homogenizing furnaces. The aluminum and aluminum alloys treated at the facility are limited to clean charge in order to avoid the requirements of 40 CFR 63 Subpart RRR - *National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production*.

Purpose of Application

Application No. 26875 was submitted on December 5, 2018 and received by the Division on December 12, 2018. The application requested the construction and operation of two aluminum homogenizing furnaces, two melting furnaces and one preheater. A public advisory (PA1218-3) was issued on December 18, 2018 and expired on January 18, 2019. Because required testing had not been completed at the time of the initial application, the Division requested a revised application be submitted after the completion of the testing (December 2018). The testing was necessary to verify NOx emission factors used for the calculations. Based on the revised calculations and additional equipment projected to be constructed in the next year, the facility has requested a synthetic minor permit with a 100 tpy limit for NOx emissions.

Updated Equipment List

Emission Units			Associated Control Devices	
Source Code	**Description**	**Installation Date**	**Source Code**	**Description**
FCE1	Melting Furnace 1 (16 MMBtu/hr)	2010	--	--
FCE2	Melting Furnace 2 (16 MMBtu/hr)	2010	--	--
FCE3	Melting Furnace 3 (16 MMBtu/hr)	2012	--	--
FCE4	Melting Furnace 4 (16 MMBtu/hr)	2014	--	--
FCE5	Melting Furnace 5 (16 MMBtu/hr)	2014	--	--
FCE6	Melting Furnace 6 (16 MMBtu/hr)	2015	--	--
FCE7	Melting Furnace 7 (16 MMBtu/hr)	2015	--	--
FCE8	Melting Furnace 8 (16 MMBtu/hr)	2018	--	--
FCE9	Melting Furnace 9 (16 MMBtu/hr)	2018	--	--
FCE10*	Melting Furnace 10 (16 MMBtu/hr)	2019*	--	--
FCE11*	Melting Furnace 11 (16 MMBtu/hr)	2019*	--	--
HO1	Homogenizing Furnace 1 (12.4 MMBtu/hr)	2010	--	--
HO2	Homogenizing Furnace 2 (12.4 MMBtu/hr)	2010	--	--
HO3	Homogenizing Furnace 3 (12.4 MMBtu/hr)	2011	--	--
HO4	Homogenizing Furnace 4 (12.4 MMBtu/hr)	2012	--	--
HO5	Homogenizing Furnace 5 (12.4 MMBtu/hr)	2014	--	--
HO6	Homogenizing Furnace 6 (12 MMBtu/hr)	2015	--	--
HO7	Homogenizing Furnace 7 (12 MMBtu/hr)	2018	--	--
HO8	Homogenizing Furnace 8 (12 MMBtu/hr)	2018	--	--
HO9	Homogenizing Furnace 9 (12 MMBtu/hr)	2018	--	--
HO10*	Homogenizing Furnace 10 (12 MMBtu/hr)	2019*	--	--
HO11*	Homogenizing Furnace 11 (12 MMBtu/hr)	2019*	--	--
Pre1	Pre-Heater 1 (4 MMBtu/hr)	2014	--	--
Pre2	Pre-Heater 2 (4 MMBtu/hr)	2014	--	--
Pre3	Pre-Heater 3 (4 MMBtu/hr)	2014	--	--
Pre4	Pre-Heater 4 (4 MMBtu/hr)	2015	--	--
Pre5	Pre-Heater 5 (4 MMBtu/hr)	2018	--	--
Pre6*	Pre-Heater 6 (4 MMBtu/hr)	2019*	--	--

The proposed melting furnaces are similar to the existing, tilting melting furnaces. Each 60,000-pound melting furnace is natural gas fired with a maximum heat input capacity of 16 MMBtu/hr. Each has ultra-low NOx burners (15.2 MMBtu/hr) and an auxiliary burner (0.8 MMBtu/hr).

The proposed homogenizing furnaces are similar to the existing, homogenizing furnaces. Each 200,000 pound homogenizing furnace will have a maximum heat input capacity of 12 MMBtu/hr, consisting of two 6 MMBtu/hr, zones per furnace.

The proposed pre-heater is similar to the existing preheaters and is natural gas fired with a maximum temperature rating of 500F. The pre-heater will have a 4 MMBtu/hr burner.

Emissions Summary

The facility calculated the emissions, except NOx and CO emissions, using the maximum heat input rating of each furnace and emission factors from South Coast Air Quality Management (SCAQMD). The emission factor for CO emissions is based on manufacturer's specifications. The NOx emissions are based on the performance tests conducted in December 2018. Though the performance tests confirmed the emission factor provided by the manufacturer for the melting furnaces and the homogenizing furnaces, the performance tests showed a higher emission factor for the preheater than what was provided by the manufacturer. As a result, the emissions from the preheater use the NOx emission factor based on the performance test.

Particulate matter emissions include emissions from natural gas combustion and emissions from smelting, pouring and casting. A source test performed in May 2007 on a similar-sized billet furnace provided the emission rate for smelting operations. AP-42 Section 12.11 emission factors were used to calculate the emissions from pouring and casting. The PM emissions from pouring and casting are based on a process rate of 20 tons/hr of metal throughput.

Chlorine is used in the process to remove impurities in the metals. The chlorine is injected below the metal and promotes separation of the aluminum oxide dross layer that forms on the surface of the melt from the molten metal. It is believed that the chlorine is fully consumed as the drossing fluxes react with aluminum oxides to recover the metal intermingled in the dross layer and often results in the formation of zinc chloride in the dross. Hydrochloric acid emissions of are not expected as a result of the operation of the melting furnaces.

Because the facility operates 24 hours per day, seven days per week, the actual emissions are approximately equal to the potential emissions.

Facility-Wide Emissions
(in tons per year)

Pollutant	Potential Emissions		
	Before Mod.	After Mod.	Emissions Change
PM	43.85	53.57	9.72
NOx	74.77	93.12	18.35
SO_2	0.69	0.84	0.15
CO	40.01	48.77	8.76
VOC	8	9.75	1.75

Max. Individual HAP	0.71	0.87	0.16
Total HAP	0.83	1.01	0.18
Total GHG (if applicable)	148,462	180,972	32,510

Regulatory Applicability

The facility will avoid major source requirements by limiting NOx emissions to less than 100 tpy.

The facility will continue to be subject to Georgia Rule (b) for Visible Emissions and Georgia Rule (e) for Particulate Emissions from Manufacturing Processes.

The facility will continue to avoid the requirements of 40 CFR 63 Subpart RRR - *National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production* by limiting the aluminum and aluminum alloys treated at the facility to only clean charge.

The proposed furnaces in addition to the existing furnaces will be limited to natural gas; therefore, avoiding the requirements of Georgia Rule (g) for Sulfur Dioxide.

The furnaces are not subject to Georgia Rule (d) – Fuel Burning Equipment or Georgia Rule (lll) – NOx Emissions from Fuel Burning Equipment because they do not meet the definition of fuel burning equipment.

Permit Conditions

- Condition 2.1 limits the NOx emissions to 100 tpy in order for the facility to avoid major source requirements.
- Condition 2.2 limits the fuel combusted in the furnaces to natural gas in order to avoid Georgia Rule (g).
- Condition 2.3 subjects the facility to Georgia Rule (b).
- Condition 2.4 subjects the facility to Georgia Rule (e).
- Condition 2.5 limits the aluminum and aluminum alloys treated at the facility to only clean charge in order to avoid the requirements of 40 CFR 63 Subpart RRR.
- Condition 2.6 requires the facility to maintain a Scrap Metal Inspection Program. This will ensure that all metal processed at the facility is clean charge.
- Condition 3.1 is a template condition concerning fugitive emissions.
- Condition 6.1 is a template condition concerning performance testing.
- Condition 7.1 requires the facility to maintain all records for the Scrap Metal Inspection Program including any revisions.
- Condition 7.2 requires the facility to maintain all records of natural gas usage at the facility.
- Conditions 7.3 through 7.5 provide guidance to calculate emissions from the Metal Melting Furnaces, Homogenizing Furnaces and the Pre-Heaters.
- Condition 7.6 requires the facility to sum the NOx emissions calculated in Conditions 7.3 through 7.5 and to notify the Division if any one month of total NOx emissions from the facility exceeds 8.3 tons during any one month.

- Condition 7.7 requires the facility calculate the 12-month rolling total using the monthly NOx emissions and to notify the Division if any 12-month rolling total exceeds 100 tpy.
- Condition 8.1 is a template condition concerning amendments to the permit.
- Condition 8.2 requires the facility to pay fees.
- Condition 8.3 revokes the previous permit and its amendments.

Toxic Impact Assessment

A toxic impact assessment was not performed for this application because the scrap aluminum is be clean and the only emissions are the combustion of natural gas in the furnaces.

Summary & Recommendations

I recommend issuance of Permit Amendment No. 3341-015-0115-S-03-0 to VMC Specialty Alloys for the operation of an aluminum alloying facility and for the construction and operation of two aluminum homogenizing furnaces (HO10 and HO11), two melting furnaces (FCE10 and FCE11) and one preheater (PRE6). VMC Specialty Alloys is located at 800 Martin Luther King Jr. Drive in Adairsville (Bartow County). The facility will be a synthetic minor source with a 100 tpy limit for NOx emissions. The SSCP will now be responsible for compliance of this facility. A public advisory was issued and expired January 18, 2019.