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Judson H. Turner, Director

NARRATIVE

TO: Manny Patel

FROM: Ginger Payment

DATE: May 19, 2014

Facility Name:	**VMC Specialty Alloys**
AIRS No.:	015-00115
Location:	Adairsville, GA (Bartow County)
Application #:	22545
Date of Application:	April 11, 2014

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-B-01-0 on July 19, 2010 for the construction and operation of the facility and required only clean scrap to be melted. An NPR letter was issued on December 9, 2010 for the operation of etching tanks for quality control. Permit No. 3341-015-0115-B-01-1 was issued on October 18, 2011 for the construction and operation of an additional homogenizing furnace. Permit No. 3341-015-0115-B-01-2 was issued on June 18, 2012 for the construction and operation of an additional melting furnace and an additional homogenizing furnace.

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. 22545 was submitted on April 11, 2014 and received by the Division on April 15, 2014. The application requested the construction and operation of two additional melting furnaces, one additional homogenizing furnace and three pre-heaters. A public advisory (PA0414-4) was issued on April 21, 2014 and expires on May 23, 2014.

Updated Equipment List

Emission Units			Associated Control Devices	
Source Code	Description	Installation Date	Source Code	Description
FCE1	Melting Furnace 1	2010	--	--
FCE2	Melting Furnace 2	2010	--	--
FCE3	Melting Furnace 3	2012	--	--
FCE4*	Melting Furnace 4	2014*	--	--
FCE5*	Melting Furnace 5	2014*	--	--
HO1	Homogenizing Furnace 1	2010	--	--
HO2	Homogenizing Furnace 2	2010	--	--
HO3	Homogenizing Furnace 3	2011	--	--
HO4	Homogenizing Furnace 4	2012	--	--
HO5*	Homogenizing Furnace 5	2014*	--	--
Pre1*	Pre-Heater 1	2014*	--	--
Pre2*	Pre-Heater 2	2014*	--	--
Pre3*	Pre-Heater 3	2014*	--	--

*proposed within current application

The proposed melting furnaces are similar to the existing 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 furnace is also similar to the existing homogenizing furnaces. Each 110,000 pound homogenizing furnace is natural gas fired with a maximum heat input capacity of 12.4 MMBtu/hr consisting of two zones per furnace. Each zone has one 4.9 MMBtu/hr burner and one 1.3 MMBtu/hr burner.

The pre-heaters are natural gas fired that have a maximum temperature rating of 500F. Each pre-heater has a 4 MMBtu/hr burner.

Emissions Summary

The facility calculated the emissions, except NOx emissions, using the maximum heat input rating of each furnace and emission factors from South Coast Air Quality Management (SCAQMD). The emission factor for NOx emissions is based on manufacturer's specifications. These emissions are shown in Application No. 22545.

The emissions from combustion were also calculated by the Division using AP-42 emission factors. The table below includes the emissions calculated using AP-42 emission factors for the combustion of natural gas rather than the factors used by the facility.

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 will be operating 24 hours per day, seven days per week, the actual emissions will also be approximately equal the potential emissions.

Facility-Wide Emissions
(in tons per year)

Pollutant	Potential Emissions		
	Before Mod.	After Mod.	Emissions Change
PM	14.8	24.4	39.2
NOx	40.71	64.24	23.53
SO_2	0.24	0.39	0.15
CO	34.2	53.96	19.76
VOC	2.24	3.53	1.29
Max. Individual HAP	<1	<1	<1
Total HAP	<1	<1	<1
Total GHG (if applicable)	49,153	77,557	28,404

Regulatory Applicability

There are no changes to the applicable rules for this application.

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

No additional permit conditions were required for this application.

Toxic Impact Assessment

A toxic impact assessment was not performed for this application because the scrap aluminum will 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-B-01-3 to VMC Specialty Alloys for construction and operation of two additional melting furnaces, one additional homogenizing furnace and three pre-heaters. VMC Specialty Alloys is an aluminum alloying facility located at 800 Martin Luther King Jr. Drive in Adairsville (Bartow County). The facility will continue to be a minor source. A public advisory was issued and expires May 23, 2014.