

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

ENGINEERING AND COMPLIANCE

APPLICATION PROCESSING AND CALCULATION

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PERMIT TO CONSTRUCT

(FACILITY ID# 14495)

Applicant Name: VISTA METALS CORPORATION

Mailing Address: 13425 Whittram Ave.
Fontana, CA 92335

Equipment Location: 13425 Whittram Ave.
Fontana, CA 92335

EQUIPMENT DESCRIPTIONS:

APPLICATION NO. 530841

D94: FURNACE A, ALUMINUM MELTING, THORPE TECHNOLOGIES, NATURAL GAS, 16 MMBTU/HR, WITH TWO 15.2 MMBTU/HR BLOOM 1150+100 ULTRA LOW NOX REGENERATIVE BURNERS AND A 0.8 MMBTU/HR AUXILIARY BURNER.

APPLICATION NO. 530842

D95: FURNACE B, ALUMINUM MELTING, THORPE TECHNOLOGIES, NATURAL GAS, 16 MMBTU/HR, WITH TWO BLOOM 1150+100 ULTRA LOW NOX REGENERATIVE BURNERS, 15.2 MMBTU/HR TOTAL, AND A 0.8 MMBTU/HR AUXILIARY BURNER.

APPLICATION NO. 530840

TITLE V/RECLAIM REVISION

PERMIT CONDITIONS: (SEE TITLE V PERMIT)

BACKGROUND:

Vista Metals Corporation submitted A/N's 530841 and 530842 on December 22, 2011, for change of condition to increase throughput limit for two identical aluminum melting furnaces (D94 and D95). Identical fees were applied.

The facility also submitted A/N 530840 on December 22, 2011, for a Title V/RECLAIM Revision.

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Since the proposed change of condition will result in an emission increase, these applications are considered as "modification" for fee purposes. Since the proposed change of condition requires offsets, Vista Metals Corporation has acquired 3 lbs/day of PM10 ERC's.

PROCESS DESCRIPTION:

Vista Metals' operation consists of melting primary aluminum alloys and scrap aluminum and casting into billets and ingots. After the casting process, the billets are directed into the homogenizing furnace for heat treatment.

The company is operating six metal melting furnaces. When these furnaces are filled with melted aluminum, charging is stopped and a sample is drawn for quality assurance purposes. These particular aluminum furnaces (D94, D95) are operated by tilting the furnace and pouring out the molten metal into the casting pit. The advantage of the tilting design of the proposed furnace includes safety of not having to open and close the tap holes. Also, the quality of the molten metal is higher because of the less turbulence in pouring. These furnaces are equipped with electromagnetic pumps to improve temperature and alloy uniformity and to promote more efficient melting by the stirring action in the bath.

There are two separate combustion systems in these furnaces; 1) the Bloom Ultra Low NOx regenerative system, which is used to heat the furnaces with a maximum instantaneous capacity of 15.2 MMBtu/hr, and 2) the 0.8 MMBtu/hr auxiliary burner to keep the aluminum from freezing in the pump.

The regenerative burners provide the most efficient energy usage and lowest greenhouse gas emissions per unit work. These burners operate in pairs where, at any given time, one burner is firing while the other is exhausting the combustion products from the furnace and recovering energy to its regenerator. The burners switch roles every 30 to 90 seconds when the exhausting burner's regenerator has reached its capacity of recovered energy. During the firing cycle, the stored energy in the regenerator is used to preheat the combustion air going to the firing burners.

The maximum instantaneous firing rate of the regenerative burners is 15.2 MMBtu/hr, but the average firing rate over any period of time is 14.4 MMBtu/hr because there is a 2 to 5 seconds when neither of the burners are firing as the burners switch roles from firing to exhausting.

The furnace melts between 12,000 and 15,000 lb/hr depending on the type of charge. For a 60,000 lb charge, melting takes 4-5 hrs with the burners at high fire, which builds the

temperature up from 1600°F to 2000°F. The electromagnetic pump circulates the metal during the second half of the cycle.

PERMIT CONDITIONS: (SEE PERMIT CONDITION C1.23)

EMISSION CALCULATIONS

Two Aluminum Melting Furnaces (D94,95)

Increase in PM10 emissions expected. No change in combustion emissions are expected to occur since the gas fuel usage is limited by permit condition C1.24.

PRE-MODIFICATION:

Process Emissions:

Process PM emission factor = 0.04 lb/ton of clean aluminum melted (AQMD estimate. To be confirmed by source test).

Daily throughput for D94 and D95 = 818 tons/month/30 days
= 27.2 tons/day

Process PM emissions = 27.2 ton/day x .04 lb/ton
= 1.09 lb/day (Total D94 and D95), .545 lbs/day each
PM10 = PM = 1.09 lbs/day total

Combustion Emissions:

For reference purposes, combustion emissions are illustrated below. It is important to note that there is no change expected in combustion emissions.

Max Daily Combustion Emissions for each Melting Furnace

NOx emission factor :

DATA:

.071 lbs NOx/MMBtu (Manufacturer Data)

1,050 Btu/scf (Natural Gas hhv)

.071 lbs NOx/MMbtu x 1050 Btu/cf = 74.55 lb/mmscf

NOx = 27.97 lbs/day, 1.17 lbs/hr

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CO = 12.80 lb/day, 0.53 lb/hr

PM10 = 2.74 lb/day, .11 lbs/hr

ROG = 2.56 lb/day, 0.11 lb/hr

SOx = 0.30 lb/day, 0.01 lb/hr

30 day average for each Furnace (based on 5,814,800 cf/month limit)

NOx = 14.83 lbs/day

CO = 6.78 lbs/day

PM10 = 1.45 lb/day

ROG = 1.36 lb/day

SOx = 0.16 lb/day

POST MODIFICATION:

No change in combustion emissions. No change in ROG, NOx, SOx, and CO.

Default District Aluminum melting factor is 0.8 lb PM/ton, but clean scrap is expected to have emissions of .04 lb PM/ton (to be confirmed by source test). 100% PM expected to be PM10. Aluminum Furnace D72 was tested on January 16, 2012. D72 is an identical furnace at the facility. Total Particulate Matter Emission Factor = 0.0104 lb/ton. (See attached SCAQMD Method 5.2 Source Test). For calculation purposes, .04 lb PM/ton emission factor will be used.

Facility proposed to change individual permit unit limit of 414 tons/month each furnace to combined 2,950 month total for both. Therefore, the applicant has requested a combined or "bubbled" limit.

Process Emissions:

Process PM emission factor = 0.04 lb/ton of clean aluminum melted (AQMD estimate. To be reviewed by source test)

Daily throughput for D94 and D95 = 2,950 tons/month x 1month/30 days
= 98.3 tons/day

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Process PM10 emissions = 98.3 ton/day x .04 lb/ton
= 3.93 lbs/day (Total D94 and D95), 1.97 lbs/day each

PM10 Emissions	Pre-Mod Each Furnace (lbs/day)	Post Mod Combined (lbs/day)	Increase (lbs/day)
Furnace D94	0.55	1.97 lbs	1.42
Furnace D95	0.55	1.97 lbs	1.42
Total (D94,D95)	1.10	3.94	2.84

RULES EVALUATION:

RULE 212: (c) (1): This section requires a public notice for all new or modified permit units that emit air contaminants located within 1000 feet from the outer boundary of a school.

The nearest school is approximately 1.3 miles (about 6800 ft) from the boundary of the facility, therefore, public notice is not required.

(c)(2): This section requires a public notice for all new or modified facilities having onsite emission increases exceeding any of the daily maximums specified in Rule 212(g).

The change of condition will result in an increase in PM10 emissions, but is not expected to exceed the daily maximum thresholds. Public notice is not necessary.

(c)(3): This section requires a public notice for all new or modified permit unit with increases in emissions of toxic air contaminants listed in Table I of Rule 1401 resulting in MICR greater than 1E-6 per permit unit or greater than IOE-6 per facility.

The proposed project is expected to result in increased toxic pollutant emissions from metal melting but not greater than the MICR threshold, therefore, public notice is not required.

(g): Project emissions do not exceed daily max thresholds. Public Notice is not required.

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RULE 401: Visible emissions are not expected with proper operation of this equipment.

RULE 402: Nuisance is not expected if equipment is properly operated and maintained.

RULE 403: Fugitive dust is not expected if equipment is properly operated and maintained.

RULE 404: Compliance is expected if equipment is properly operated and maintained.

RULE 1303:

OFFSETS: The throughput change of condition to the two aluminum melting furnaces (D94, D95) will require offsets.

(PRE VERSUS POST MODIFICATION)

The offset ratio for PM10 is 1.2 to 1.0.

Pre-Mod vs. Post-Mod

PM10 Emissions	Pre-Mod Each Furnace (lbs/day)	Post Mod Combined (lbs/day)	Increase (lbs/day)
Furnace D94	0.55	1.97 lbs	1.42
Furnace D95	0.55	1.97 lbs	1.42
Total (D94,D95)	1.10	3.94	2.84

PM10 Offsets required:

$$2.84 \text{ lbs/day} \times 1.2 = 3.408 \text{ lbs/day}$$

3 PM10 lbs/day ERCs are required for this project. Facility has authorized use of 3 lbs/day PM10.

BACT: The two melting furnaces (A/N's 516520 and 516521) carry Bloom burners ultra low NOx and are guaranteed to have NOx concentration of less

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than 60 ppmv at 3% O₂, which meets the BACT requirement of 60 ppmv. There is no BACT limit for CO.

MODELING: Modeling for VOC is not required. CO is in attainment. Modeling for CO not required. No increase in NO_x emissions. Modeling for NO_x not required. According to Table A-1 in Rule 1303, allowable PM₁₀ limit is .41 lbs/hr for non-combustion sources. PM₁₀ for new furnaces (D94,D95) is .17 lbs/hr each. Modeling passes.

RULE 2005: There is no net increase in NO_x. Additional NO_x allocation is not needed under the RECLAIM Rule 2002. No offset is needed.

REG XXX: Applications for Title V De minimis Significant Revision require EPA 45-day review.

RULE 1401: No increase in combustion emissions. Natural gas combustion expected to be negligible. Increase in toxics from aluminum melting expected. Health Risk Screening is increase of max hourly emission of each toxic air contaminant based on increase of 2,700 tons/month. Tier 1 Screening passed for the Hazard Index Acute and Chronic. Tier 3 screening passed for cancer risk. Maximum Individual Cancer Risk is 2.74E-07 for residential and 5.34E-08 for commercial. (See attached)

CONCLUSIONS AND RECOMMENDATIONS:

Based on the evaluation contained herein, the subject equipment will comply with all of the District's rules and regulations; therefore, I recommend a change of condition to the Title V permit to construct be issued to this equipment as described in this report.

TIER 3 SCREENING RISK ASSESSMENT REPORT

A/N:
 Fac:

Application deemed complete date:

2. Tier 2 Data

MET Factor	1.00
4 hr	0.92
6 or 7 hrs	0.78

Dispersion Factors tables

3	For Chronic X/Q
6	For Acute X/Q

Dilution Factors (ug/m3)/(tons/yr)

Receptor	X/Q	X/Qmax
Residential	0.203466937	11.13981481
Commercial	0.203466937	11.13981481

Adjustment and Intake Factors

	Afann	DBR	EVF
Residential	1	302	0.96
Worker	1	149	0.38

A/N:

Application deemed complete date: 02/03/11

TIER 3 RESULTS

5a. MICR

$MICR = CP \text{ (mg/(kg-day))}^{-1} * Q \text{ (ton/yr)} * (X/Q) * AFann * MET * DBR * EVF * 1E-6 * MP$

Compound	Residential	Commercial
Beryllium (and beryllium compounds)	3.42E-09	6.68E-10
Chromium, hexavalent	4.94E-09	9.65E-10
Copper and copper compounds		
Lead and lead compounds (inorganic, including elements)	2.45E-10	3.35E-11
Manganese and manganese compounds		
Nickel & nickel compounds (except nickel oxide):	2.65E-07	5.17E-08
Total	2.74E-07	5.34E-08
	PASS	PASS

No Cancer Burden, MICR < 1.0E-6

5b. Cancer Burden	NO
X/Q for one-in-a-million:	
Distance (meter)	2773.11
Area (km2):	2.41E+01
Population:	169,029
Cancer Burden:	4.62E-02

6. Hazard Index

HIA = [Q(lb/hr) * (X/Q)max] * AF / Acute REL

HIC = [Q(ton/yr) * (X/Q) * MET * MP] / Chronic REL

Target Organs	Acute	Chronic	Acute Pass/Fail	Chronic Pass/Fail
Alimentary system (liver) - AL			Pass	Pass
Bones and teeth - BN			Pass	Pass
Cardiovascular system - CV			Pass	Pass
Developmental - DEV			Pass	Pass
Endocrine system - END			Pass	Pass
Eye			Pass	Pass
Hematopoietic system - HEM		2.01E-02	Pass	Pass
Immune system - IMM	2.10E-03	2.01E-04	Pass	Pass
Kidney - KID			Pass	Pass
Nervous system - NS		8.52E-03	Pass	Pass
Reproductive system - REP			Pass	Pass
Respiratory system - RES	2.64E-03	2.03E-02	Pass	Pass
Skin			Pass	Pass

A/N:

Application deemed complete date:

6a. Hazard Index Acute

$HIA = [Q(\text{lb/hr}) * (X/Q)_{\text{max}}] * AF / \text{Acute REL}$

Compound	HIA - Residential									
	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Beryllium (and beryllium compounds)										
Chromium, hexavalent										
Copper and copper compounds									5.47E-04	
Lead and lead compounds (inorganic, including elements)										
Manganese and manganese compounds										
Nickel & nickel compounds (except nickel oxide):						2.10E-03			2.10E-03	
Total						2.10E-03			2.64E-03	

HIA - Commercial										
Compound	AL	CV	DEV	EYE	HEM	IMM	NS	REP	RESP	SKIN
Beryllium (and beryllium compounds)										
Chromium, hexavalent										
Copper and copper compounds									5.47E-04	
Lead and lead compounds (inorganic, including elements)										
Manganese and manganese compounds										
Nickel & nickel compounds (except nickel oxide):						2.10E-03			2.10E-03	
Total						2.10E-03			2.64E-03	

6b. Hazard Index Chronic

$$HIC = [Q(\text{ton/yr}) * (X/Q) * MET * MP] / \text{Chronic REL}$$

Compound	HIC - Residential												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Beryllium (and beryllium compounds)								2.01E-04				2.01E-04	
Chromium, hexavalent												1.67E-07	
Copper and copper compounds													
Lead and lead compounds (inorganic, including elements)													
Manganese and manganese compounds										8.52E-03			
Nickel & nickel compounds (except nickel oxide):							2.01E-02					2.01E-02	
Total							2.01E-02	2.01E-04		8.52E-03		2.03E-02	

6b. Hazard Index Chronic (cont.)

A/N:

Application deemed complete date:

Compound	HIC - Commercial												
	AL	BN	CV	DEV	END	EYE	HEM	IMM	KID	NS	REP	RESP	SKIN
Beryllium (and beryllium compounds)								2.01E-04				2.01E-04	
Chromium, hexavalent												1.67E-07	
Copper and copper compounds													
Lead and lead compounds (inorganic, including elements)													
Manganese and manganese compounds										8.52E-03			
Nickel & nickel compounds (except nickel oxide):							2.01E-02					2.01E-02	
Total							2.01E-02	2.01E-04		8.52E-03		2.03E-02	