ENGINEERING ANALYSIS

PROJECT DESCRIPTION

On May 22, 2025, the Department received an air permit application from Premium Plate Supply, Inc. ("Premium Plate") for a paint line expansion to their steel plate processing operations located at the Port of Chickasaw at 750A Viaduct Road, Chickasaw, AL in Mobile County. A revised application proposing an increased variety of coatings and requesting SMOP limitations was submitted to the Department on June 19, 2025, but received July 1, 2025 due to limitations on attachment file sizes in the Department's email server. Correspondence with revised emissions was received July 16, 2025.

The Department had previously determined that Premium Plate's steel plate cutting and shaping operations did not require an air permit on March 25, 2025; however, with the proposed paint line expansion, Premium Plate anticipates an increase in potential emissions necessitating a Synthetic Minor Operating Permit.

Premium Plate states in the application that the Chickasaw operations are temporary, but in discussions with the Department clarified that their timeline transitioning from the Chickasaw site (note: the building at the port is rented) to the greenfield site they intend to construct at to-be-determined location could exceed twelve months. Therefore, the Department must treat the Chickasaw operations as a permanent source through the permitting process.

PROCESS DESCRIPTION

Purchased steel plates (including carbon, stainless, and alloy steels) are cut to customer specification on the plasma cutting table; the downdraft cutting table functions as a capture point for emissions generated from the plasma cutting, routing captured emissions to a dust collector for control. Plates can be further processed in the plate rolling machine and/or the press brake to add curvature to the plates through hydraulic pressure, such as when manufacturing segments of large tanks; emissions from the plate forming processes are negligible.

In the proposed expansion, plates would be surface conditioned by abrasive blasting and then coated. Blasting operations would use copper slag as abrasive and would be conducted in a booth located within and venting into the site's building; no filtration units are proposed, though particulate matter would be passively reduced to a degree via settling in the booth and the building. Coating operations would be conducted via manual use of Graco XTR7+ airless spray guns. Coating operations would also be located in a booth within the building, though it will be ventilated. Paint solids (expressed as particulate matter) would be controlled by in-line filters installed within the ventilation, though VOC and volatile HAP emissions from the paint and solvents would be uncontrolled.

EMISSIONS

The basis for the following calculations is 2 plates per hour of operation and 8,760 hours of operation per year unless otherwise specified. VOC and HAP values for coating and solvents used were detailed in SDS forms in the application.

The coating line's potential to emit (PTE) was calculated assuming 2.5 gal/hr of the coating with the highest-HAP content included in the revised application. Among the options, the Carboline Carbozinc 859 coating was determined to have the highest HAP content (primarily toluene). This analysis calculates chemical constituents of the mixed Carbozinc 859 coating from the values provided in the safety data sheets (SDS) for components A, B, & F and the mix ratios provided in the associated product data sheet (PDS). Premium plate estimated solvent usage to be 5.5% of paint usage based on their historical usage at their former Axis, Alabama operations, using the solvent with the highest HAP content (Carboline

Thinner 2). VOC and HAP emissions are assumed to equal VOC and HAP usage. The estimated PTE in this analysis does not match the calculations included in the application, which estimated emissions using a conglomeration of properties from the different solvents available; the Department's calculations are included in the appendix. PM emissions are estimated based on the solids content of the coating in question and assuming 50% spray transfer efficiency or equivalent 50% overspray, controlled by 90% via conventional filtration on the exhaust of the paint booth. Larger, simpler items such as plates present less opportunity for overspray, so this analysis assumes slightly better transfer efficiency than what AP-42 Ch. 4.2.2.12 assumes for surface coating of metal furniture via airless spray (25%) and what AP-42 Ch. 4.2.2.11 assumes for surface coating of large metal appliances via airless spray (45%). These calculations are purposefully more conservative than Premium Plate's calculations in the revised application, where they assume 70% transfer efficiency based on a statement in Graco's "Airless Spray Techniques" user guide suggesting that their spray guns have a transfer efficiency between 60 – 90%.

Blasting emissions were estimated on a 1448 lb/hr abrasive usage basis (updated from 100 lb/hr in the June revision) using factors from AP-42 Ch. 13.2.6 factor. Emissions are uncontrolled but are located within a booth within a building, so some amount of settling of particulate matter within the booth/building would be expected. The set of assumptions that Premium Plate used in estimating emissions differ from those used in this analysis as follows: Premium Plate used the AP-42 factor for sand-blasting under low windspeed conditions to be conservative while assuming a combined 90% settling factor for the booth and the building. This analysis, however, multiplies the sand-blasting factor by a factor of 0.24 to represent the relatively lower emissions grit blasting per the text of section 13.2.6.3, but applies a more conservative 75% settling factor. The SDS for the copper slag abrasive provided in the application did not cite any HAP content.

Emissions for the steel plate cutting operations were originally evaluated given an expected throughput of 15,000 plates per year. The proposed paint line is stated to have a design capacity of 17,520 plates per year; accordingly, this analysis reevaluates cutting emissions in the March 25, 2025 analysis on the 17,520 plate per year basis. To be conservative, plasma cutting emissions do not account for the dust collector installed on the cutting table and assume that all plates are stainless steel.

Pollutant (TPY)	Plasma Cutting	Blasting	Coating Line	Total Emissions	PTE with Limit
PM_{total}	3.09	10.27	11.31	24.67	24.67
PM_{10}	2.36	4.95	11.31	18.62	18.62
$PM_{2.5}$	1.31	0.49	11.31	13.11	13.11
SO_2	-	-	-	0.00	0.00
NO_X	1.94	-	-	1.94	1.94
CO	-	-	-	0.00	0.00
VOC	-	-	50.66	50.66	50.66
HAP: Toluene	-	-	24.36	24.36	***9.5***
Total HAPs	0.96	-	26.40	27.36	***24.50***
CO_{2e}	-	-	-	0.00	0.00

Table 1 – Facility PTE

LIMITS

Per Premium Plate's application, at maximum usage of the most emissive proposed coating, the facility would exceed the major source single-species HAP threshold of 10 TPY Toluene as well as the overall HAP threshold of 25 TPY. Because of this, Premium Plate has proposed a <10 TPY SMOP limit on any single HAP species and <25 TPY SMOP limit on all HAP species, which the Department will enforce as

9.5 TPY and 24.5 TPY limits, respectively, with compliance shown by semiannual coating/solvent usage reports. Additionally, these limits will serve as anti-MACT limits to keep the facility an area source with respect to any applicable Part 63 rules.

Although the facility's potential emissions would not be expected to exceed either the 100 TPY criteria pollutant (VOC) major source threshold under current assumptions for maximum usage levels and product formulations, Premium Plate has also proposed a <100 TPY SMOP limit on VOC to be safe. The Department will implement a 95 TPY VOC SMOP limit alongside the HAP SMOP limits with compliance shown by the same semiannual report.

These facility-wide limits shown by monthly calculations (as-used/as-purchased basis) submitted semiannually to the Department would allow for operational flexibility should product formulations or usage levels vary in the future.

REGULATIONS

STATE REGULATIONS

ADEM Admin. Code r. 335-3-4-.01, "Control of Particulate Emissions – Visible Emissions"

Rule 335-3-4-.01(1)(a) states that no person shall emit to the atmosphere from any source of emissions, particulate matter of an opacity greater than twenty percent (20%), as determined by a six (6) minute average. **Rule 335-3-4-.01(1)(b)** states that during one six-minute period in any sixty minute period a person may discharge into the atmosphere from any source of emissions, particulate of an opacity not greater than forty percent (40%) opacity. All sources at the facility will be subject to this regulation; compliance shall be determined in accordance with Method 9 of 40 CFR Part 60, Appendix A-4. Compliance would be shown by conducting weekly VE checks of the coating operations vent and the building openings or doors nearest the blasting operations.

ADEM Admin. Code r. 335-3-4-.04, "Control of Particulate Emissions – Process Industries – General"

Rule 335-3-4-.04 states that no source in a Class I county, and no new source in a Class II county, shall emit particulate matter in any one hour exceeding the rates derived from the following equations: $E = 3.59P^{0.62}$ for process weights less than 30 TPH and $E = 17.31P^{0.16}$ for process weights greater than or equal to 30 TPH, where E is the emissions limit in pounds per hour and P is the process weight in tons per hour. Additionally, r. 335-3-1-.02(1)(hhh) states that "Process Weight shall mean the total weight in pounds of all materials introduced into any specific process which may cause any discharge into the atmosphere." This rule would apply to the coating and blasting operations. Compliance would be met by operating within their respective booths, controlled by conventional filters in the case of the coating operations.

ADEM Admin. Code r. 335-3-6-.11 "Surface Coating" and 335-3-6-.01 "Applicability"

Rule 335-3-6-.11(11) applies to the coating of miscellaneous metal parts. However, because the paint line has potential to emit less than 100 TPY VOC in addition to taking a 95 TPY VOC SMOP limit, the exception in **Rule 335-3-6-.01(1)(b)** applies. Therefore, the proposed coating operations at Premium Plate would not be subject to this rule.

ADEM Admin. Code r. 335-3-14-.04*, *"Prevention of Significant Deterioration (PSD) Permitting"

The proposed facility will not have the potential to emit 250 tons per year or more of a regulated NSR pollutant, so it will not be considered a new major stationary source per ADEM Admin. Code r. 335-3-14-.04(2).

ADEM Admin. Code r. 335-3-15, "Synthetic Minor Operating Permits" and
ADEM Admin. Code r. 335-3-16, "Major Source Operating Permits"

Emissions from the facility, while operating at maximum expected throughput for coating and solvent usage, could exceed the major source threshold of 10 TPY single HAP and 25 TPY total HAP unless restricted. To avoid applicability to the Title V Major Source Operating Permit program under Chapter 16, Premium Plate has requested <100 TPY VOC, <10 TPY HAP, and <25 TPY Total HAPs limits as shown by semiannual VOC/HAP usage/purchase reporting and monthly calculations and associated recordkeeping. The Department will impose 95 TPY VOC, 9.5 TPY HAP, and 24.5 TPY Total HAPs limits, in the form of rolling twelve-month totals, to facilitate practical enforcement with protective buffer from the regulatory thresholds.

The required monthly calculations of VOC/HAP emissions via monthly paint/solvent usage will allow for operational flexibility to vary different coatings at different rates while being frequent enough to give the facility sufficient time to react and change coatings before exceeding any rolling-twelve-month limit. The facility will be required to maintain records of these calculations as well as coating and solvent safety data sheets and usage/purchase records.

Class I Area

The nearest Class I Area to the plant, the Breton Wildlife Refuge, is more than 100 kilometers away from this facility. Emissions from the project are not expected to have an impact on the Class I Area.

FEDERAL REGULATIONS

40 CFR 60 Subpart A, "New Source Performance Standards"

This subpart is applicable provided that the facility is subject to one of the applicable subparts found under 40 CFR Part 60, "New Source Performance Standards". The proposed operations are not subject to any NSPS.

40 CFR 63 Subpart A, "General Provisions"

This subpart is applicable provided that the facility is subject to one of the applicable subparts found under 40 CFR Part 63, "National Emission Standards for Hazardous Air Pollutants" as discussed below.

40 CFR 63 Subpart MMMM, "National Emission Standards for Hazardous Air Pollutant for Surface Coating of Miscellaneous Metal Parts and Products"

This regulation is applicable to any new, reconstructed, or existing source that uses 250 gallons per year, or more, of coatings that contain hazardous air pollutants (HAP) in the surface coating of miscellaneous metal parts or products and that is located at a major source of HAP emissions. Since this facility is taking limits to avoid being a major source of HAP emissions, this subpart would not apply.

40 CFR 63 Subpart HHHHHH, "National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources"

This subpart is applicable to certain paint-stripping and coating facilities at area sources of HAPs. Though Premium Plate is an area source, because the paint line would not include stripping paint with methyl chloride [§63.11170(a)(1)], would not apply any coatings to motor vehicles or other mobile equipment [§63.11170(a)(2)], and would not apply coatings containing this subpart's target HAPs (Cr, Pb, Mn, Ni, & Cd) above the defined threshold to any other equipment [§63.11170(a)(3)], this subpart is not applicable.

40 CFR 63 Subpart XXXXXX, "National Emission Standards for Hazardous Air Pollutants Area Source Standards for Nine Metal Fabrication and Finishing Source Categories"

This subpart is applicable to area sources of HAP emissions that are primarily engaged in operations in one of the nine source categories listed in §63.11514(a), including "Fabricated Plate Work (Boiler Shops)". Table 1 to Subpart XXXXXX includes broad descriptions of the nine source categories, and EPA maintains a "Questions & Answers" document on their website, excerpted below, linking these nine source categories listed in the rule to industrial SIC codes and NAICS codes.

Table 1. Nine Metal Fabrication and Finishing NESHAP Area Source Categories: Potential SIC/NAICS Codes

	EPA Source Category	SIC Description	SIC Code	NAICS Code	NAICS Description
1	Electrical & Electronic Equipment Finishing Ops	Motors and Generators Manufacturing	3621	335312	Motor and Generator Manufacturing
		Electrical Machinery, Equipment, & Supplies, NEC	3699	335999	All Other Misc. Electrical Equipment & Component Mfg.
2	Fabricated Metal Products, NEC	Fabricated Metal Products, NEC	3499	332117	Powder Metallurgy Part Manufacturing
		Fabricated Metal Products, NEC	3499	332999	All Other Miscellaneous Fabricated Metal Product Mfg.
3	Fabricated Plate Work(Boiler Shops)	Fabricated Plate Work and Boiler Shops	3443	332313	Plate Work Manufacturing
				332410	Power Boiler and Heat Exchanger Manufacturing
				332420	Metal Tank (Heavy Gauge) Manufacturing
4	Fabricated Structural Metal Manufacturing	Fabricated Structural Metal Fabrication	3441	332312	Fabricated Structural Metal Manufacturing
5	Heating Equipment, except Electric	Heating Equipment, except electric	3433	333414	Heating Equipment (except Warm Air Furnaces) Mfg.
6	Industrial Machinery &Equipment: Finishing Ops	Construction Machinery Manufacturing	3531	333120	Construction Machinery Manufacturing
		Oil and Gas Field Machinery Equipment Mfg.	3533	333132	Oil and Gas Field Machinery and Equipment Mfg.
		Pumps and Pumping Equipment Mfg.	3561	333911	Pump and Pumping Equipment Manufacturing
7	Iron and Steel Forging	Iron and Steel Forging	3462	332111	Iron and Steel Forging
8	Primary Metals Products Manufacturing	Primary Metals Products Manufacturing	3399	332618	Other Fabricated Wire Product Manufacturing
9	Valves and Pipe Fittings, NEC	Valves and Pipe Fittings, NEC	3494	332919	Other Metal Valve and Pipe Fitting Manufacturing

The facility will primarily cut and bend purchased steel plate into shapes for the customer, largely but not exclusively for the construction of large storage vessels. The proposed operations would not include the fabrication of finished storage vessels. This falls under NAICS Code 332313 "Plate Work Manufacturing". The 2007 definition of this industrial group is "establishments primarily engaged in manufacturing fabricated metal plate work by cutting, punching, bending, shaping, and welding purchased metal plate." According to EPA's supplemental table included above, this is one of the NAICS codes that EPA guidance includes in the "Fabricated Plate Work (Boiler Shops)" category of §63.11514(a)(3). This was a point of discussion with Premium Plate in the previous application; in this application, Premium Plate has concurred with the Department's position.

For facilities falling under one of the nine source categories subject to Subpart XXXXXX, such as Premium Plate, there are five categories of operations that could potentially be considered *affected sources* under this rule per §63.11514(b)—dry abrasive blasting, machining, dry grinding/polishing, spray painting, and welding operations—if they "use materials that contain MFHAP or that have the potential to emit MFHAP." In §63.11522, *metal fabrication HAP (MFHAP)* are defined as cadmium, chromium, lead, manganese, and

nickel. The phrase *material containing MFHAP* is defined as "Any material that contains cadmium, chromium, lead, or nickel in amounts greater than or equal to 0.1 percent by weight (as the metal), and contains manganese in amounts greater than or equal to 1.0 percent by weight (as the metal), as shown in formulation data provided by the manufacturer or supplier, such as the Material Safety Data Sheet for the material."

Premium Plate's application does not indicate that any machining, dry grinding/polishing, or welding operations will be in use at the source. The definition of *machining* in §63.11522 includes "dry metal turning, milling, drilling, boring, tapping, planing, broaching, sawing, cutting, shaving, shearing, threading, reaming, shaping, slotting, hobbing, and chamfering with machines." The existing plate bending operations are not *shaping* in the machining sense, as *shaping* refers to cutting linear grooves or slots into metal. The plasma cutting operations would not qualify as *dry metal cutting*.

Premium Plate has proposed to conduct spray painting, but not using paints that contain MFHAP, per the §63.11522 definition above; the SDS for the zinc powder component of the PPG Dimetcote 9 paint states that it has less than 0.10% lead, and the mixed paint would necessarily have even less. Therefore, the proposed coating operations do not qualify as a "spray painting affected source" under §63.11514(b)(4). Premium Plate will be restricted, as an anti-MACT limitation, from using any coatings that do contain enough MFHAP to qualify under the §63.11522 definition. The requirement to maintain an SDS of each coating as a record will serve as recordkeeping for this anti-MACT limitation as well.

Premium Plate has proposed to conduct dry abrasive blasting operations. However, the SDS provided for the copper slag abrasive intended to be used at the site does not list cadmium, chromium, lead, nickel, or manganese in section 3 of the SDS. The phrases "as shown in formulation data provided by the manufacturer or supplier, such as the Material Safety Data Sheet for the material" are included in the definition of *material containing MFHAP* because OSHA rules in 29 CFR §1920.1200 require that section 3 of any SDS to list lead, chromium, lead, and nickel and other carcinogens if they are present at levels above their cut-off value/concentration limit of >0.1% by weight. Premium Plate will be restricted, as an anti-MACT limitation, from using any abrasives that do contain enough MFHAP to qualify under the §63.11522 definition. They will be required to maintain an up-to-date SDS of any abrasive used on site as a record for this limitation.

Without any affected sources under this rule, there are no requirements in Subpart XXXXXX that apply to Premium Plate's operations as applied for, including the notification requirements of §63.11519(a).

RECOMMENDATIONS

This analysis indicates that the proposed emission sources would meet the requirements of all federal and state rules and regulations. Based on the expected emissions from the facility, I recommend that Premium Plate Supply, Inc. be issued Synthetic Minor Operating Permit No. 503-0160-X001.

R. Jackson Rogers, Jr.

Jackson Rogers
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Air Division
ADEM

July 16, 2025
Date

APPENDIX A: CALCULATIONS & REFERENCES

Coating/Solvent/Other Material Properties

Material Description	Density (lb/gal)	Solids Content (%)	VOC Content (%)	HAP Content (%)	Xylenes Content (%)	Ethylbenzene Content (%)	Tolune Content (%)	Notes
Other Solvent (for reference	6.76	0.00%	30.00%	30.00%	10.00%	3.33%	16.67%	Mobile Solvents BT 2020
Solvent	7.09	0.00%	100.00%	90.00%			90.00%	Carboline Thinner 2
Coating	24.89	83.0%	17.02%	8.28%	0.00%	0.00%	7.53%	Carboline Carbozinc 859

Process Parameters

Process	Material	Application Rate (gal/hr)	Operation (hr/yr)	Operation (gal/yr)	Spray Transfer Efficiency (%)	PM Control	PM Efficiency (%)	VOC/HAP Volatilization	VOC/HAP Control	VOC/HAP Efficiency (%)
Solvent Use	Solvent	0.1375	8760	1205				100%		
Coating (worst case product)	Coating	2.5	8760	21900	50%	Filter	90%	100%		

Emissions

Process	PM lb/hr	PM TPY	VOC lb/hr	VOC TPY	HAP lb/hr	HAP TPY	Xylenes lb/hr	Xylenes Tpy	Ethylbenzene lb/hr	Ethylbenzene TPY	Toluene lb/hr	Toluene TPY
Solvent Use	0.00	0.00	0.98	4.27	0.88	3.85					0.88	3.85
Coating (worst case product)	2.58	11.31	10.59	46.39	5.15	22.55					4.68	20.51
Total	2.58	11.31	11.57	50.66	6.03	26.40	0.00	0.00	0.00	0.00	5.56	24.36
	2.581278828		0.031107952	0.42								

Carbozinc 859 Mixture[1]

	gal	SG	lb/gal	lb	%toluene[2]	lb toluene	lb/gal tol	%HAP[2,4]	lb HAP	lb/gal HAP	%VOC[2,3]	lb VOC	lb/gal VOC	solids %[2]	lb solids
A	1.77	1.30	10.85	19.20	21.5%	4.12		24.6%	4.71		*50.0%*	9.60		*50.0%*	9.60
B	1.00	0.88	7.34	7.34	45.9%	3.37		48.0%	3.52		100.0%	7.34			
F (Zinc powder)				73.00										100.0%	73.00
mix	4.00		24.89	99.55	7.5%	7.49	1.87	8.3%	8.24	2.06	17.0%	16.94	4.24	83.0%	82.60

[1]see PDS for ratios for 4 gallon batch and optional 10% dilution with thinner

[2]see SDS items 3 & 15 for mass % of constituents

[3]Carbozinc 859 Part A mixture %VOC & %solid is an estimate from SDS item 3 given constituent ranges of resins

[4]Carbozinc 859 Part A mixture contains "Modified Urea-Formaldehyde Resin"; assuming F/U molar ratio of 1.3 in this resin and conservatively counting all F as emittable HAP

Note: Carboline claims on VOC content in SDS and PDS appeared to be at odds with provided constitutent mass % values in the Part A & Part B SDS and were disregarded in this analysis. For example, while Carboline Carbozinc 859 Part B was purported to have "VOC Content 326 g/l" (i.e. 2.72 lb/gal) out of overall 7.34 lb/gal (SG=0.88), all constituents appeared to be potential VOC, with toluene alone stated to be 25-50% and 45.87% in SDS sections 3 and 15 respectively.

Abrasive Blasting Emissions					
1448	lb/hr abrasive usage			8760	hr/yr
Uncontrolled emissions					
6	lb PM per 1000 lb abrasive[1]	9.38	lb/hr PM_{filt}	41.10	TPY PM_{filt}
3	lb PM10 per 1000 lb abrasive[1]	4.52	lb/hr $PM_{10,filt}$	19.79	TPY $PM_{10,filt}$
0.3	lb PM2.5 per 1000 lb abrasive[1]	0.45	lb/hr $PM_{2.5,filt}$	1.98	TPY $PM_{2.5,filt}$
PTE with settling factor					
50%	Building settling factor	2.35	lb/hr PM_{filt}	10.27	TPY PM_{filt}
50%	Booth settling factor	1.13	lb/hr $PM_{10,filt}$	4.95	TPY $PM_{10,filt}$
75%	Combined settling factor	0.11	lb/hr $PM_{2.5,filt}$	0.49	TPY $PM_{2.5,filt}$

[1] *AP-42 Chapter 13.2.6 for Sand-blasting under 5 MPH wind speed conditions*

Plates/yr	Avg Plate Thickness (inches)	Kerf Width (inches	Max cut length per plate (inches)	typical steel density (lb/cu_in)	Mass of kerf (lb/yr)
17520	1.5	0.34	122	0.284	309,112
% kerf as airborne PM	Annual PM (tons)	% kerf as respirable PM10	Annual PM10 (tons)	% PM as PM2.5	Annual PM2.5 (tons
2%	3.09	1.53%	2.36	42.4%	1.31
IPM	L/min NOX from dry cutting	molar vol. (L/gmol) @STP	lbmol/gmol	NO2 lb/lbmol	NOX TPY
20	8	22.4	0.002205	46.0055	1.94