

**ENGINEERING EVALUATION
TESLA, INC.
PLANT #20459 (SITE #A1438)
APPLICATION #31592
45500 FRMONT BOULEVARD
FREMONT, CA 94538**

BACKGROUND:

Tesla, Inc. (Tesla) is applying for a Permit to Operate, Temporary Operation, in accordance with Regulation 2-1-302.3, for the following equipment:

S4045 Aluminum Melting Furnace #1

Temporary Maximum Operating Rate: 11,463 lb/hr (12,380 ton/90-day) of Aluminum
Make/Model: Striko Westofen Group, MH II-B 6000/4000 G
Maximum Natural Gas Firing Rate: 15.11 MMBtu/hr (Combined)
Melting Section: Three (3) 2.73 MMBtu/hr Burners
Holding Bath Section: Two (2) 1.71 MMBtu/hr Burners and
One (1) 3.5 MMBtu/hr Oxyfuel Burner
Abated by Furnace 1 Hi-Temp ASHRAE Filter, A30193

A30193 Furnace 1 Hi-Temp ASHRAE Filter

Model: MERV14 Exhaust Filters; Filter Efficiency: 97%; Flowrate: 15,545 cfm
Max Operating Temperature: 572 °F

On May 20, 2020, Tesla proposed to install Aluminum Melting Furnaces (S-4045 and S-4046) under Application #30523. The Air District issued an Authority to Construct (A/C) for S-4045 and S-4046 on October 13, 2020. A final initial compliance determination for the equipment, issued an A/C under Application #30523, is still pending. On December 28, 2020, Tesla proposed to install Furnace Hi-Temp ASHRAE Filters (A-30193 and A-30194) to control metal emissions from S-4045 and S-4046, respectively, under Application #30914. An A/C was issued on July 22, 2021.

In this application, Tesla is proposing to install and test the performance of a liquid oxygen fuel burner (Oxyfuel Burner) at S-4045 with the intent to reduce nitrogen oxides (NO_x) emissions from the combustion of natural gas at the burner, while having a higher heating capacity. The higher heating capacity will allow Tesla to melt more aluminum (increase throughput of aluminum). Maximum throughput of aluminum is expected to increase from 4.41 tons/hour to 5.73 tons/hour during testing for 90 days.

Currently, S-4045 consists of two sections, a melting section, and a holding bath section. The melting section includes three (3) burners, each rated at 2.73 million British thermal units (MMBtu)/hour. The holding bath section includes two (2) burners, each rated at 1.71 MMBtu/hour. The current total firing rate of all the burners combined at S-4045 is 11.61 MMBtu/hour. The exhaust from the natural gas burners is routed to one stack and is not abated.

During the temporary operation of the proposed Oxyfuel Burner, the number of burners at S-4045 will remain the same, except for the addition of one (1) Oxyfuel Burner to S-4045, which is rated at 3.5 MMBtu/hour. The temporary operation will result in a total firing rate of 15.11 MMBtu/hour at S-4045.

The proposed configuration and operation will only be allowed to operate for 90 days from the date the Permit to Operate, Temporary Operation is issued.

EMISSIONS SUMMARY

Criteria Air Pollutant Emissions

Emissions from S-4045 occur from both natural gas combustion and aluminum melting. Expected air pollutants from natural gas combustion are POC, NO_x, PM₁₀, PM_{2.5}, SO₂, and CO. Expected air pollutants from metal melting include PM₁₀ and PM_{2.5}.

The temporary operating parameters for S-4045 are listed in Table 1.

Table 1: Operating Parameters for Melting Furnace #1 (S-4045)		
Current Burner Configuration of Metal Furnace		
Natural Gas Gross Heating Value	1,020	Btu/standard cubic foot (scf)
Average Firing Rate for Furnaces	100	Percent of Firing Rate
Number of Burners in Melting Section	3	
Melting Section Rating per Burner	2.73	MMBtu/hour
Total Rating (Melting Section)	8.19	MMBtu/hour
Number of Burners in Holding Bath Section	2	
Holding Bath Section Rating per Burner	1.71	MMBtu/hour
Total Rating (Holding Bath Section)	3.42	MMBtu/hour
Temporary Oxyfuel Burner Addition		
Numbers of Oxy-Fuel Burners	1	Oxy-Fuel Burner
Oxy-Fuel Burner Firing Rate	3.5	MMBtu/hr
Temporary Aluminum Processing Throughput		
Maximum Hourly Aluminum Charge Rate	11,463	pounds/hour
Hourly Charge Rate in tons	5.73	tons/hr
Normal Operation 90-Day Average Feed Rate	97.5	% (time of total operation)
Abatement Bypass 90-Day Average Feed Rate	2.5	% (time of total operation)
Maximum 90-Day Operating Hours	2,160	hours/year
Maximum 90-Day Aluminum Charge Rate (Normal Operation)	12,380	tons/90-day
Maximum Aluminum Charge Rate for 90 days during bypass	315	tons/90-day
A-30193 Filter Abatement Efficiency	97	% (w/w)

Emission factors for combustion of natural gas are from EPA AP-42 Chapter 1.4; except for NO_x and CO. Under Application #30523 (Permit Condition #27327) the Air District limited NO_x and CO emissions to no more than 9 lbs/day, each, at S-4045, to keep the NO_x and CO daily emission rates below the Regulation 2-2-301 Best Available Control Technology (BACT) trigger level. PM₁₀ and PM_{2.5} emission factors from aluminum melting are from source test conducted by the facility. Table 2 summarizes emission factors used to estimate criteria pollutant emissions from the S-4045.

Table 2: Criteria Air Pollutant Emission Factors for Melting Furnace #1 (S-4045)			
Pollutant	Emission Factor		Emission Factor Data Source
	Value	Units	
POC	5.5	lb/MMscf	EPA AP-42 Chapter 1.4, Table 1.4-2
NO _x	9.0	lb/day	Permit Condition #27327 (Natural Gas Combustion)
PM ₁₀ ⁽¹⁾	7.6	lb/MMscf	EPA AP-42 Chapter 1.4, Table 1.4-2
PM _{2.5} ⁽¹⁾	7.6	lb/MMscf	EPA AP-42 Chapter 1.4, Table 1.4-2
PM ₁₀ ⁽²⁾	0.04	lb/ton	Permit Condition #27327 (Aluminum Processing)
SO ₂	0.6	lb/MMscf	EPA AP-42 Chapter 1.4, Table 1.4-2
CO	9.0	lb/day	Permit Condition #27327 (Natural Gas Combustion)
Notes:			
1. Emission factors are for combustion of natural gas only.			
2. Emission factors are for aluminum processing only.			

Using the operating parameters from Table 1 and the emission factors in Table 2, criteria air pollutant emissions from the melting furnaces (S-4045) were estimated and are shown in Table 3. The detailed calculations are shown in Appendix A.

Table 3: Temporary Potential to Emit for Melting Furnace #1 (S-4045)			
Pollutant	Daily Emission Rate⁽¹⁾ (lbs/day)	Annual Emission Rate⁽²⁾ (lbs/year)	Annual Emission Rate (ton/year)
POC	1.96	589	0.295
NO _x	9.0	3,285	1.643
PM ₁₀ ⁽³⁾	2.70	814	0.407
PM _{2.5} ⁽³⁾	2.70	814	0.407
PM ₁₀ ⁽⁴⁾	5.50	98	0.049
SO ₂	0.21	64.27	0.032
CO	9.0	3,285.00	1.643

1. The daily emission rates for combustion will be based on the combined maximum input heat rating of the burners. The daily emission rate for aluminum processing will be based on emissions bypassing abatement device A-30193.
2. Annual emission rates are calculated summing the potential to emit (PTE) determined in Application #30914 and the increase in emissions from the proposed 90-day operation of the Permit to Operate, Temporary Operation.
3. Emission factors are for combustion of natural gas only.
4. Emission factors are for aluminum processing only.

Sample Calculation:

POC Emissions from Combustion:

POC Emissions for 90-Day from Oxyfuel R&D Trial Project:

$$\begin{aligned}
 &= (\text{Emission Factor/Natural Gas Heating Value}) \times \text{Maximum Hourly Firing Rate} \\
 &= (5.5 \text{ lb/MMcf} \div 1,020 \text{ MMBtu/MMcf}) \times 15.11 \text{ MMBtu/hr} \\
 &= \mathbf{0.08 \text{ lb/hour}} \\
 &= 0.08 \text{ lb/hr} \times 24 \text{ hr/day} \\
 &= 1.96 \text{ lb/day} \\
 &= 0.08145 \text{ lb/hr} \times 2160 \text{ hr/90 day} \\
 &= \mathbf{176 \text{ lbs/90-day}}
 \end{aligned}$$

POC Emissions Under Application #30914 = 0.06 lb/hr

POC Emissions for 90-Day from Application #30914 = 0.06 lb/hr x 2160 hr/90-day
 = **135 lbs/90-day**

POC Emission Increase During Oxyfuel R&D Trial Project
 = 176 lbs/90-day – 135 lbs/90-day
 = **41 lbs increase in any consecutive 12-month period**

Annual Emissions from Oxyfuel R&D Trial Project = (135 ÷ 90 x 365) + 41
 = **589 lbs/year**

Plant Cumulative Increase

Table 4: Cumulative Increase at Plant #20459			
Pollutant	Emission Increases Permitted Since April 5, 1991 (tons/year)	Emission Increase Associated with Application 31592 (tons/year)	Post-Project Cumulative Increase (tons/year)
POC	921.492	0.020	921.512
NO _x	78.040	0.000	78.04
PM ₁₀	48.820	0.079	48.899
PM _{2.5}	48.820	0.079	48.899
SO ₂	0.742	0.002	0.744
CO	175.379	0.000	175.379

Toxics Air Contaminant Emissions

S-4045 emits TACs from both combustion of natural gas and melting of aluminum ingots.

TAC emissions from natural gas combustion are estimated using emission factors provided in AP-42 Chapter 1.4 for benzene, formaldehyde, and toluene only. TAC emissions from metal melting are estimated using emission factors from a source test report. Lastly, it is assumed that respirable crystalline silica emissions constitute 7.25% by weight of the total PM₁₀ emission factor.

Table 5: Toxic Air Contaminant Emission Factors for Melting Furnace #1 (S-4045)			
Pollutant	Emission Factor	Units	Emission Factor Basis
Benzene	2.10E-03	lb/MMcf	EPA AP 42 Chapter 1.4, Table 1.4-3
Formaldehyde	7.50E-02	lb/MMcf	EPA AP 42 Chapter 1.4, Table 1.4-3
Toluene	3.40E-03	lb/MMcf	EPA AP 42 Chapter 1.4, Table 1.4-3
Arsenic	9.12E-07	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Beryllium	2.11E-07	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Cadmium	4.45E-06	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Chromium – Hexavalent ⁽¹⁾	3.50E-06	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Copper	9.75E-05	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Lead	1.92E-05	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Manganese	3.30E-04	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Mercury	1.24E-06	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Nickel	6.65E-05	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Selenium	3.74E-06	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Silica ⁽²⁾	2.90E-03	lb/ton of Al	Assume 7.25% by weight of PM ₁₀
Vanadium	1.16E-04	lb/ton of Al	OS-7733 FER-District Review Memo-ST-2020
Notes:			
1. Although chromium is not considered a TAC, hexavalent chromium is a TAC and may be formed and emitted.			
2. Although silicon is not considered a TAC, silica is a TAC and may be formed and emitted.			

Using the operating parameters listed in Table 1 and the TAC emission factors listed in Table 5, TAC emissions were estimated. The results are in Table 6.

Table 6: Toxic Air Contaminant Emissions from Melting Furnace #1 (S-4045)

Pollutant	CAS No.	Hourly Emission Rate (lb/hour)	Annual Emission Rate ⁽¹⁾ (lbs/year)	Acute Trigger Level (lbs/hour)	Exceeds Acute Trigger Level? (Yes/No)	Chronic Trigger Level (lbs/year)	Exceeds Chronic Trigger Level? (Yes/No)
Benzene	71-43-2	3.1E-05	2.3E-01	6.0E-02	No	2.9E+00	No
Formaldehyde	50-00-0	1.1E-03	7.9E+00	1.2E-01	No	1.4E+01	No
Toluene	108-88-3	5.0E-05	3.6E-01	8.2E+01	No	1.2E+04	No
Arsenic	7440-38-2	5.2E-06	2.1E-03	4.4E-04	No	1.6E-03	Yes
Beryllium	7440-41-7	1.2E-06	4.8E-04	--	--	3.4E-02	No
Cadmium	7440-43-9	2.6E-05	1.0E-02	--	--	1.9E-02	No
Chromium Hexavalent	18540-29-9	2.0E-05	8.0E-03	--	--	5.1E-04	Yes
Copper	7440-50-8	5.6E-04	2.2E-01	2.2E-01	No	--	--
Lead	7439-92-1	1.1E-04	4.4E-02	--	--	2.9E-01	No
Manganese	7439-96-5	1.9E-03	7.5E-01	--	--	3.5E+00	No
Mercury	7439-97-6	7.1E-06	2.8E-03	1.3E-03	No	2.1E-01	No
Nickel	7440-02-0	3.8E-04	1.5E-01	3.1E-05	Yes	3.1E-01	No
Selenium	7782-49-2	2.1E-05	8.5E-03	--	--	8.0E+00	No
Silica	7631-86-9	1.6E-02	7.1E+00	--	--	1.20E+02	No
Vanadium	7440-62-2	6.7E-04	2.6E-01	6.6E-02	No	--	--

Notes:
 1. Annual emissions are based on the sum of the 90-day increase and the PTE of S-4045 as determined in Application #30914

Sample Calculation:

Arsenic Emissions from Aluminum Processing:

Arsenic Hourly Emissions = Hourly charge rate x Emission factor
 = 5.73 ton/hr x 9.12E-07 lb/ton of Aluminum
 = **5.2E-06 lb/hour**

Arsenic Emissions per 90-Day = Hourly Emissions x Hr/90-Day x [(Average Time Feed Charge Rate x Control Efficiency) + Average Time Bypass Charge Rate]
 = 5.2E-06 lb/hr x 2,160 hr/90-day x [(0.975 x (1-0.97)) + 0.025]
 = **6.1E-04 lb/90-day**

HEALTH RISK ASSESSMENT

Pursuant to Regulation 2-5-110, a project shall not be subject to Regulation 2-5 if, for each TAC, the total project emissions are below the acute and chronic trigger levels listed in Table 2-5-1 of this regulation. A project includes all new or modified sources of TACs within a 3-year period.

Pursuant to Regulation 2-5-216, the temporary operation and testing of the oxy-fuel burner is neither a reasonably foreseeable consequence of a previous project, nor a critical element or integral part of a previous project. This project is to temporarily test the implementation of new technology. Therefore, TAC emissions will only include emissions from this application.

If testing is successful and Tesla decides to fully implement the use of Oxyfuel burners at furnaces, Tesla will be required to submit a permit application. The permit application to fully implement the use of Oxyfuel burners will be considered an integral part of the previous project.

Application Number #31592
Plant #20459

The TAC emission rates in Table 6 were compared to their corresponding acute and chronic trigger levels listed in Table 2-5-1. The project exceeds the acute trigger level for nickel, and chronic trigger levels for arsenic and hexavalent chromium. Therefore, the proposed project triggered a Health Risk Assessment (HRA).

HRA Results

The project has a maximum cancer risk of 0.032 in a million, a chronic hazard index of 0.00024, and an acute hazard index of 0.0075. Since the project is below a cancer risk of 10 in a million and a chronic hazard index of 1.0, the project risk is acceptable. Furthermore, S-4045 has a cancer risk less than 1.0 in a million and a chronic hazard index less than 0.2. Therefore, Best Available Control Technology for toxics (TBACT) does not apply. The project and source meet the requirements of Regulation 2-5.

BEST AVAILABLE CONTROL TECHNOLOGY

In accordance with Regulation 2-2-301, BACT is triggered for any new or modified source with the potential to emit 10 pounds or more per highest day of POC, NPOC, NO_x, PM₁₀, PM_{2.5}, SO₂, or CO. As shown in Table 3, estimated emissions do not exceed 10 pounds per day for any pollutant. Therefore, BACT is not triggered.

OFFSETS

Per Regulation 2-2-302, offsets must be provided for any new or modified source at a facility that emits or will be permitted to emit more than 10 ton/yr of POC or NO_x. The proposed project will result in an increase of 0.020 ton/yr of POC. Because Tesla's PTE for POC is greater than 35 tons per year, emission reduction credits (ERC) are required per Regulation 2-2-302, at a ratio of 1.15:1 for any un-offset cumulative increase at the facility. Tesla provided Banking Certificate #1738 for POC, which contains 582.932 ton/yr of POC offsets. After deducting 0.023 ton/yr (0.020 ton/yr x 1.15) of POC offset, Tesla will have 582.909 ton/yr of POC offset remaining.

The NO_x emissions will remain unchanged because the facility is limited to 9.0 lb/day of NO_x. Therefore, NO_x emissions will not increase and will not be subject to the requirements of this regulation.

Pursuant to Regulation 2-1-302.3, for a temporary permit to operate, an operator shall provide the offsets at a ratio of 1.15 to 1, for increased emissions of PM₁₀, PM_{2.5} and SO₂. The increase in PM₁₀, PM_{2.5}, and SO₂ emissions are 0.079 tons/year, 0.079 tons/year, and 0.002 tons/year, respectively. Tesla will provide 0.091 tons (0.079 tons/yr x 1.15) of PM₁₀ and PM_{2.5} and 0.002 tons (0.002 tons/yr x 1.15) of SO₂ offsets.

PREVENTION OF SIGNIFICANT DETERIORATION

As shown in Table 4, criteria air pollutant emissions for the project are not estimated to exceed any of the significance thresholds of Regulation 2-2-227. Therefore, Prevention of Significant Deterioration requirements are not triggered.

STATEMENT OF COMPLIANCE

Regulation 2, Rule 1 (General Requirements)

S-4045 is subject to the District Regulation 2-1-302.3 (Permit to Operate, Temporary Operation). Tesla will comply with all of the following requirements under Regulation 2-1-302.3:

1. The proposed operation complies with all the requirements of Regulation 1 and Regulations 5 through 12.
2. The temporary permit will expire 3-months after issuance.
3. The facility will provide POC offsets at a ratio of 1.15 to 1.
4. The facility will provide PM₁₀, PM_{2.5} and SO₂ offsets at a ratio of 1.15 to 1.
5. The temporary operation is for equipment and process testing.
6. The temporary operation will not emit more than 10 lbs per day of any BACT pollutant. Therefore, S-4045 is not subject to the requirements of Regulation 2-2-301.

Regulation 2, Rule 6 (Major Facility Review)

This regulation applies to major facilities, Phase II acid rain facilities, and any facility in a source category designated by the Administrator of the U.S. Environmental Protection Agency (EPA) in rulemaking as requiring a Title V permit. Tesla is a major facility and currently holds a Major Facility Review (MFR) operating permit; also referred to as a Title V operating permit. Pursuant to Regulation 2-6-215, this project is a minor modification

Application Number #31592
Plant #20459

because the project is neither a significant revision as defined in Regulation 2-6-226, or an administrative permit amendment as defined in Regulation 2-6-201.

Regulation 6, Rule 1 (Particulate Matter-General Requirements)

S-4045 is subject to District Regulation 6, Rule 1 (Particulate Matter- General Requirements), and is expected to comply with Sections 301, 302, 310 and 311. Tesla is expected to comply with the opacity and Ringelmann requirements of Regulation 6-1-301 and 302.

Section 6-1-310.1 limits total suspended particulate (TSP) emissions to 343 mg/dscm (or 0.15 gr/dscf). The facility will comply with this standard by meeting a volumetric concentration limit of 0.001 gr/dscf. The following demonstrates how this value was calculated.

$$[(5.73 \text{ ton Al/hr}) \times (0.04 \text{ lb PM}_{10}/\text{ton Al}) \times (7,000 \text{ gr/lb}) \times (\text{hr}/60 \text{ min})] \div (19,500 \text{ dscf/min}) = 0.001 \text{ gr/dscf.}$$

Section 6-1-311 limits the Total Suspended Particulates (TSP) weight limits. The TSP limit is calculated as follows:

Aluminum throughput = 5.73 ton Al/hour
PM emissions = 0.04 lb PM₁₀/ton of Al

$$[(5.73 \text{ ton Al/hour}) \times (0.04 \text{ lb PM}_{10}/\text{ton Al})] = 0.23 \text{ lb/hour.}$$

The maximum process rate of aluminum is 11,463 lbs/hour. Comparing with Regulation 6-1-311, Table 6-1-311.1 the TSP emission limit at 11,463 lbs/hour processing weight rate is 15 lbs/hour. As shown above, the estimated TSP emission rate of 0.23 lb/hour is below the TSP emission limit (15 lbs/hour) in Table 6-1-311.1. Therefore, S-4045 is expected to comply with Section 6-1-311 requirements.

Regulation 9, Rule 1 (Inorganic Gaseous Pollutant Sulfur Dioxide)

Regulation 9-1-302 limits the SO₂ concentration at an exhaust point to 300 ppmv. S-4045 is expected to emit less than 300 ppm of SO₂ from the combustion of natural gas. Therefore, S-4045 is expected to comply with the SO₂ limit of 9-1-302.

Regulation 9, Rule 7 (Nitrogen Oxides and Carbon Monoxide from Industrial, Institutional, and Commercial Boilers, Steam Generators, And Process Heaters)

Regulation 9, Rule 7 is not applicable to S-4045 because the aluminum melting furnace is not considered a commercial boiler, steam generator, or process heater.

Regulation 11, Rule 15 (Airborne Toxic Control Measure for Emissions of Toxic Metals from Non-ferrous Metal Melting)

S-4045 is subject to and expected to comply with the Metal or Alloy Purity exemption requirements of Section (c) (2) of Regulation 11, Rule 15 (Airborne Toxic Control Measure for Emissions of Toxic Metals from Non-Ferrous Metal Melting). A permit condition limiting cadmium content to no more than 0.004 percent and arsenic content to no more than 0.002 percent has been included.

Regulation 12, Rule 13 (Miscellaneous Standards of Performance: Foundry and Forging Operations)

Regulation 12, Rule 13 applies to any facility that has an Air District-permitted furnace or oven at a foundry or forge that processes at least one ton of metal per rolling twelve-month period. The proposed project would meet the definition of "foundry operations" within Section 12-13-213 and more than one ton per twelve-month period will be processed. As such, the melting furnaces (S-4045), associated holding furnace(s), die casting machine (S-4047), and associated quench tank are subject to Regulation 12, Rule 13.

Tesla has stated that S-4045 will not process aluminum with an arsenic content greater than 0.002 percent or a cadmium content greater than 0.004 percent. Therefore, aluminum feed to S-4045 would qualify for the Section 12-13-103.1 exemption that would exempt the operation to the standards (Sections 12-13-301 et seq.) and administrative requirements (Sections 12-13-401 et seq.) of Regulation 12, Rule 13. However, the operation would still be subject to the recordkeeping requirements of Section 12-13-501. Tesla is expected to comply with these requirements.

Application Number #31592
Plant #20459

NEW SOURCE PERFORMANCE STANDARDS

40 CFR Part 60, Subpart S (Standards of Performance for Primary Aluminum Reduction Plants)

Per 40 CFR 60.190, this standard applies to pot-room groups and anode bake plants. Per 40 CFR 60.191, a pot-room is “a building unit which houses a group of electrolytic cells in which aluminum is produced” while an anode bake plant is “a facility which produces carbon anodes for use in a primary aluminum reduction plant.” The proposed operation at Tesla does not fit either of these definitions and thus this standard would not be applicable.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

40 CFR Part 63 Subpart LL - National Emission Standards for Hazardous Air Pollutants for Primary Aluminum Reduction Plants

Per 40 CFR 63.840 the requirements of this subpart apply to the owner or operator of each new or existing pitch storage tank, potline, paste production plant and anode bake furnace associated with primary aluminum production. The proposed operation at Tesla does not use anode bake furnace. Therefore, this operation is not subject to this subpart.

40 CFR Part 63, Subpart RRR (NESHAP for Secondary Aluminum Production)

S-4045 is not subject to 40 CFR Part 63, Subpart RRR because S-4045 is not considered to be a sweat furnace. Tesla’s casting operations do not meet the definition of a secondary aluminum production facility. For the purpose of this subpart, aluminum die casting facilities, aluminum foundries, and aluminum extrusion facilities are not considered to be a secondary aluminum production facility if only the material they melt are clean charge, customer returns, or internal scrap, and if they do not operate sweat furnace, thermal chip dryers, or thermal chip dryers, or scrap dryers, delacquering kilns/decoating kilns. Tesla is using clean charge and will not operate any equipment that meets the definition of sweat furnace.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

California Environmental Quality Act (CEQA) is a state law intended to inform government decision makers and the public of any potential adverse environmental effects of proposed discretionary projects.

For the projects notwithstanding ministerial classification, Regulation 2-1-312 provides eleven types of categorically exempt permits. Regulations 2-1-312.6 and 2-1-312.11 exempt the following types of projects:

Regulation 2-1-312.6: Permit applications relating exclusively to the repair, maintenance or minor alteration of existing facilities, equipment or sources involving negligible or no expansion of use beyond that previously existing.

Regulation 2-1-312.11: Permit applications for a new or modified source or sources or for process changes which will satisfy the “No Net Increase” provisions of District Regulation 2, Rule 2, and for which there is no possibility that the project may have any significant environmental effect in connection with any environmental media or resources other than on air quality.

The project is not expected to result in expansion of use beyond that previously existing and is not expected to result in significant impacts on non-air environmental media. The BAAQMD form and supplemental project information provided by Tesla, demonstrates that the proposed project meets the criteria for exemption under 2-1-312.

Application Number #31592
Plant #20459

California Health & Safety Code §42301.6 and Regulation 2-1-412

Pursuant to California Health & Safety Code §42301.6(a), prior to approving an application for a permit to construct or modification of a source of hazardous air emissions, which is located within 1,000 feet from the outer boundary of a school site, the District shall prepare a public notice as detailed in §42301.6. §42301.9(a) defines a “school” as any public or private school used for the purposes of the education of more than 12 children in kindergarten or any grades 1 to 12, inclusive, but does not include any private school in which education is primarily conducted in private homes.

The facility is within 1,000 feet from the nearest school Lila Bringhurst Elementary school. Therefore, this project is subject to the public notification requirements of Regulation 2-1-412.

PERMIT CONDITIONS

Condition #27327

For S-4045 and S-4046, Aluminum Melting Operation at Plant #20459

Amended under Application 30914 – added filters, increased maximum hourly and annual metal throughput.

S-4045 Aluminum Melting Furnace-1

Maximum Operating Rate: 4,000 kg/hour (8,818 lbs/hour), 38,625 tons/year of Aluminum,
Make/Model: Striko Westofen Group, MH II-B 6000/4000 G, Maximum Natural Gas Firing Rate: 11.61 MMBtu/hour

(Combined Unit - Melting Section: 3 burners total 8.19 MMBtu/hour and Holding Bath: 2 burners total 3.42 MMBtu/hour)

Abatement Device A-30193: Make: Hi-Temp ASHRAE Filter; Model: MERV14 Exhaust Filters

S-4046 Aluminum Melting Furnace-2

Maximum Operating Rate: 4,000 kg/hour (8,818 lbs/hour), 38,625 tons/year of Aluminum,
Make/Model: Striko Westofen Group, MH II-B 6000/4000 G, Maximum Natural Gas Firing Rate: 11.61 MMBtu/hour

(Combined Unit - Melting Section: 3 burners total 8.19 MMBtu/hour and Holding Bath: 2 burners total 3.42 MMBtu/hour)

Abatement Device A-30194: Make: Hi-Temp ASHRAE Filter; Model: MERV14 Exhaust Filters

1. The owner/operator shall not exceed the following material throughput limits at S-4045 and S-4046:
 - a. 4.41 tons of aluminum per hour at each furnace.
 - b. 38,625 tons of aluminum in a twelve-month period at each furnace.[Basis: Cumulative Increase, BACT, Toxics]

2. The owner/operator of S-4045 and S-4046 may use aluminum with different composition of compounds if the owner/operator can demonstrate that all of the following requirements are satisfied:
 - a. The use of these materials does not increase toxic emissions above any risk screening trigger levels in Table 2-5-1 of Regulation 2-5; and
 - b. The use of these materials does not increase criteria air pollutant emissions above 9.0 pounds per day.[Basis Cumulative Increase, BACT avoidance]

3. The owner/operator of S-4045 and S-4046 shall not emit more than following daily emission limits in any calendar day from either S-4045 or S-4046:

Pollutant Daily (pounds)

NOx 9.0

CO 9.0

[Basis: BACT Avoidance, Cumulative Increase]

Application Number #31592
Plant #20459

4. The owner/operator of S-4045 and S-4046 shall not emit more than 0.040 pounds of PM10 (both filterable and condensable) per ton of aluminum melted from each source and no more than 1,232 pounds of PM10 (both filterable and condensable) per year from each source.
[Basis: Cumulative Increase]

5. The owner/operator of S-4045 and S-4046 shall not emit more than the following hourly emission rates from S-4045, S-4046, associated holding furnace(s), bypass system, and associated quench tank(s) combined:

Pollutant Hourly (pounds)	
Arsenic	0.0000828
Copper	0.00088575
Nickel	0.00060413
Vanadium	0.00010538

[Basis: Regulation 2, Rule 5]

6. The owner/operator of S-4045 and S-4046 shall not emit more than the following annual emission rates from S-4045, S-4046, associated holding furnace(s), bypass system, and associated quench tank(s) combined:

Pollutant Annual (pounds)	
Arsenic	0.003883
Beryllium	0.000898
Cadmium	0.018947
Formaldehyde	13.86000
Hexavalent Chromium	0.014902
Lead	0.081751
Manganese	1.405107
Nickel	0.283150
Selenium	0.015924
Silica	15.456177

[Basis: Regulation 2, Rule 5]

7. To demonstrate compliance with Parts 3, 4, 5, and 6, the owner/operator of S-4045 and S-4046 shall use measurements from either Air District-certified continuous emissions monitors (if available) or Air District-approved source or laboratory tests in combination with records of activity (material usage, production) of S-4045, S-4046, associated holding furnace(s), bypass system, and associated quench tank(s). The owner/operator shall use Air District-approved calculation methodologies and assumptions.
[Basis: BACT Avoidance, Regulation 2, Rule 5, Cumulative Increase]

8. To demonstrate compliance with Parts 5 and 6 when Air District-approved source test data is unavailable, the owner/operator shall use material composition of aluminum feed to S-4045 and S-4046 in conjunction with aluminum activity (tons) and an Air District-approved PM10 emission rate (lb/ton of aluminum feed) by assuming the same weight fraction within the aluminum feed is emitted as PM10. The owner/operator shall use the maximum weight percentage of a constituent if a range is provided within a compositional report. If a constituent is not specifically tested and reported within a compositional report, the owner/operator shall use the remaining balance (may be listed as "other" or "not specified").
[Basis: Regulation 2, Rule 5]

9. The owner/operator of S-4045 and S-4046 shall ensure that aluminum ingots melted at S-4045 and S-4046 have a cadmium content of no more than 0.004 percent, a nickel content of no more than 0.050 percent, and an arsenic content of no more than 0.002 percent.
[Basis: Cumulative Increase, Regulation 11, Rule 15(c)(2)]

10. The owner/operator of S-4045 and S-4046 shall only use aluminum alloys complying with the definition of clean charge. Clean charge means furnace charge materials, including molten aluminum; T-bar; sow; ingot;

Application Number #31592
Plant #20459

- billet; pig; alloying elements; aluminum scrap known by the owner or operator to be entirely free of paints, coatings, and lubricants; uncoated/unpainted aluminum chips that have been thermally dried or treated by a centrifugal cleaner; aluminum scrap dried at 343 °C (650 °F) or higher; aluminum scrap delacquered/decoated at 482 °C (900 °F) or higher, and runaround scrap.
[Basis: BACT Avoidance, Toxics, 40 CFR Subpart RRR, Section 63.1503]
11. The owner/operator shall ensure that S-4045 and S-4046 be fired exclusively with natural gas.
[Basis: Cumulative Increase, Toxics]
 12. The owner/operator shall not exceed the following natural gas throughput limits at S-4045 and S-4046:
 - a. 11.61 MMBtu/hour/furnace (11,382 standard cubic feet/hour/furnace)
 - b. 101,700 MMBtu/year/furnace (99,705,882 standard cubic feet/year/furnace)
 - c. 187,130 MMBtu/year total for both furnaces (183,460,784 standard cubic feet/year/combined)[Basis: Cumulative Increase, Toxic]
 13. The owner/operator shall abate S-4045 and S-4046 with properly maintained, properly operated, and properly installed PM filters (A-30193 and A-30194, respectively) with minimum 97% abatement efficiency for PM10, all metals, and silica at all times of operation, unless the owner/operator can demonstrate compliance with the emission limits of Parts 5 and 6.
[Basis: Cumulative Increase, Toxic]
 14. In order to demonstrate compliance with Parts 3, 4, 5, and 6 of this permit condition, the owner/operator shall conduct an Air District approved source test in accordance with the Air District's Manual of Procedures at S-4045 and S-4046 for criteria air pollutants (Nox, CO, PM10), silica, and the full set of metals (arsenic, beryllium, cadmium, total chromium, hexavalent chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, vanadium, and zinc) within 60 days after installing PM filters and once per calendar year thereafter. The owner/operator shall conduct source tests required by this Permit Condition at the representative production rate at which the system is typically operated unless other conditions are required by the applicable test method. The owner/operator shall conduct an additional source test within 90 days of the production rate exceeding 20 percent of the production rate achieved during the initial source test. The owner/operator shall conduct additional source tests for every 20 percent increase in production rate until such time that a source test is conducted at the highest production rate that the system is capable of operating at, and at the highest emission rate that the system can emit during the highest production rate, upon which the source test frequency will revert to once every year. The owner/operator shall provide the aluminum feed rate, aluminum feed composition, and natural gas consumption of S-4045 and S-4046 during each source test. The owner/operator shall close all the valves leading to bypass system during the source test at the main stack of the furnace. The owner/operator shall conduct an Air District approved source test in accordance with the Air District's Manual of Procedures at S-4045 and S-4046 within 60-days of a change in the material composition of aluminum feed to S-4045 or S-4046 that results in an increase in the content of one of the metals listed in Parts 5 or 6.
[Basis: BACT Avoidance, Cumulative Increase, Regulation 2, Rule 5]
 15. Prior to conducting a source test required by Part 14, the owner/operator shall consult with the Air District's Source Test Section regarding the appropriate test approach and methodologies.
[Basis: BACT Avoidance, Cumulative Increase, Regulation 2, Rule 5]
 16. The owner/operator shall notify the Manager of the Air District's Source Test Section at least seven (7) days prior to the test, to provide the Air District staff the option of observing the testing. Within 60 days of test completion, a comprehensive report of the test results shall be submitted to the Manager of the District's Source Test Section for review and disposition.
[Basis: Cumulative Increase, BACT, Reg 2-5]
 17. If aluminum is melted within any holding furnace associated with S-4045 and S-4046, the owner/operator shall estimate criteria air pollutant and toxic air contaminant emissions from the associated holding furnace(s) using Air District approved source test data, methodologies, calculations, and assumptions. These emissions estimates shall be used to determine compliance with Parts 5 and 6. In the absence of

specific source test data, any associated holding furnaces are assumed to emit at the same pre-abatement rate basis (lb pollutant per ton aluminum melted) as S-4045 and S-4046.

[Basis: Regulation 2, Rule 5, Cumulative Increase]

18. If aluminum is melted within any holding furnace associated with S-4045 and S-4046, the owner/operator shall use Air District-approved emissions estimated per Part 17 to determine whether the holding furnace is required to be permitted per Regulation 2, Rule 1.
[Basis: Regulation 2-1-302, Regulation 2-1-403]
19. At a minimum of once every three months, the owner/operator of any quench tank(s) associated with S-4045 and S-4046 shall conduct a representative sample of the quench medium for those compounds listed in Parts 5 and 6. The owner/operator shall use sample results in conjunction with Air District-approved methodologies, assumptions, and calculations to demonstrate compliance with Parts 5 and 6.
[Basis: Regulation 2, Rule 5]
20. The owner/operator shall use emissions estimated per Part 19 to determine whether any quench tank associated with the operation of S-4045 and S-4046 is required to be permitted per Regulation 2, Rule 1.
[Basis: Regulation 2-1-302, Regulation 2-1-403]
21. To demonstrate compliance with parts 1 through 20 of this permit condition the owner/operator shall maintain the following records, including but not necessarily limited to the following information:
 - a. For each batch delivered to the owner/operator, Certificates of Analysis for all aluminum ingots used showing the cadmium, nickel, and arsenic contents in weight percent or ppm and the test method used for the analysis. The owner/operator shall ensure that metal contents listed on each Certificate of Analysis are determined per ASTM methods ASTM E406, ASTM E1251, and ASTM E716 (or other method determined by the BAAQMD to be equivalent to the above methods);
 - b. Hourly, daily, monthly, and rolling twelve-month throughput of aluminum ingots processed at each of S-4045 and S-4046;
 - c. The type of fuel used and the hourly and annual fuel usage at each of S-4045 and S-4046.
 - d. Daily, monthly, and annual hours of operation of each S-4045 and S-4046.
 - e. Calculations of hourly, daily, and rolling 12-month total emissions for S-4045, S-4046, associated holding furnace(s), and associated quench tank(s) per Parts 2 (if applicable), 7, 8, 9, 13 (if applicable), 17 and 19.
 - f. Hourly, daily, monthly, and rolling twelve-month amount of aluminum melted at any holding furnace associated with S-4045 and S-4046.
 - g. Any analyses done per Part 18 or Part 20.
[Basis: Regulation 2-5, BACT Avoidance, Cumulative Increase, Regulation 2-1-302, Regulation 2-1-403]

Condition for Bypass System:

Definition of Emergency: "emergency" shall mean a situation that poses an immediate risk to health, life, property, or the environment.

22. The owner/operator shall install an Air District-approved Continuous Parameter Monitoring System (CPMS) on each bypass damper to determine the start and duration of each abatement system bypass event. The annual (Toxic and Combustion) emissions from each bypass shall be totaled and added to its respective furnace main filter stack emissions. The total combined annual emissions from S-4045 and S-4046 main filter stacks and emergency bypass stacks shall not exceed Parts 3, 4, 5, 6, & 7 emissions of this permit condition.
[Basis: Regulation 2-1-403, Cumulative Increase, Toxic]
23. Whenever there is a bypass event at either S-4045 or S-4046, the owner/operator shall estimate emissions of criteria air pollutants and toxic air contaminants (as defined in Regulation 2, Rule 5) associated with the bypass event using Air District-approved monitoring, source tests, methodologies, and assumptions.
[Basis: TBACT, Regulation 2, Rule 5; Regulation 2-1-403, Cumulative Increase]

Application Number #31592
Plant #20459

24. The owner/operator shall total the hourly and annual criteria air pollutant and toxic air contaminant (as defined in Regulation 2, Rule 5) emissions from each bypass event with Air District-approved emissions estimates of normal operation of S-4045 and S-4046 for determining compliance with the emissions limits in Parts 3, 4, 5, and 6 of this permit condition.
[Basis: Regulation 2-1-403, Cumulative Increase, Regulation 2, Rule 5, TBACT]
25. The owner/operator shall notify the Air District APCO of each emergency bypass event at S-4045 and S-4046 while the sources are in operation, as soon as practical, with due regard for public and employee safety. Reporting should occur no later than the following working day.
[Basis: Regulation 2-1-403, Cumulative Increase, Regulation 2, Rule 5, TBACT]
26. The owner/operator shall ensure that all bypass valves are in the closed or off position during all times of operations except during emergency and/or abatement system (A-30193, A-30194) maintenance events.
[Basis: Cumulative Increase, Regulation 2, Rule 5, TBACT]
27. The owner/operator shall use the bypass system only in case of emergency or abatement system (A-30193, A-30194) maintenance periods. Whenever the bypass system is used, the owner/operator shall submit a report to the Air District within 10 days after each event with the reasoning for the bypass and a demonstration of compliance with all applicable emissions limits. Such reporting shall include the event details, total time event lasted, toxic air contaminant (as defined in Regulation 2, Rule 5) and criteria pollutant emission estimates during the event.
[Basis: Regulation 2-1-403, Regulation 2, Rule 5, TBACT]
28. The owner/operator shall ensure that all bypass line valves, or dampers are in the closed position through monitoring of the valve or damper position at least once every 15 minutes. The owner/operator shall inspect the valve or damper monitoring system at least once every week to verify that the monitor will indicate valve position.
[Basis: Regulation 2-1-403, Regulation 2, Rule 5, TBACT]
29. To demonstrate compliance with Parts 22 through 28 of this permit condition, the owner/operator shall maintain the following records, including but not necessarily limited to the following information:
 - a. The date, duration, and reason for each bypass event.
 - b. The criteria air pollutant and toxic air contaminant emissions estimates for each bypass event.
 - c. The supporting calculations and documentation for each bypass event emissions estimates.
 - d. A demonstration of compliance with the emissions limits of Parts 3, 4, 5, and 6 of this permit condition after each bypass event.

All records shall be retained on-site for five years from the date of entry and shall be made available for inspection to District staff upon request. The records may be in the form of computer-generated data, which is available to the District personnel on short notice (rather than actual paper copies). These recordkeeping requirements shall not replace the recordkeeping requirements contained in any applicable Air District regulations.

[Basis: Record Keeping, Cumulative Increase, Toxic]

Temporary Permit Condition for S-4045 (Application #31592):

The following parts are to allow for the temporary testing of a new technology at S-4045 and will expire after 90 days from the issuance of a Permit to Operate, pursuant to Regulation 2-1-302.3, Temporary Operation. The following parts temporarily supersede the limits in Parts 1, 2, 3, 4, and 12 above. The annual limits contained in the following parts are valid for the consecutive 9-month period after the expiration of the parts below. All other parts above will remain in effect, this includes the recordkeeping and reporting requirements above to demonstrate compliance with the limits in the following part.

S-4045 Aluminum Melting Furnace-1 (Temporary Configuration)

Maximum Operating Rate: 5,210 kg/hour (11,463 lbs/hour), 41,476 tons/year of Aluminum,

Make/Model: Striko Westofen Group, MH II-B 6000/4000 G, Maximum Natural Gas Firing Rate: 15.11

MMBtu/hour

Application Number #31592
Plant #20459

(Combined Unit - Melting Section: 3 burners total 8.19 MMBtu/hour and Holding Bath: 2 burners total 3.42 MMBtu/hour and 1 oxyfuel burner total 3.5 MMBtu/hour)
Abatement Device A-30193: Make: Hi-Temp ASHRAE Filter; Model: MERV14 Exhaust Filters

30. The owner/operator shall not exceed the following material throughput limits at S-4045:
- a. 5.73 tons of aluminum per hour.
 - b. 41,476 tons of aluminum in a twelve-month period.
- [Basis: Cumulative Increase, BACT, Toxics]
31. The owner/operator of S-4045 may use aluminum with different composition of compounds if the owner/operator can demonstrate that all of the following requirements are satisfied:
- a. The use of these materials does not increase toxic emissions above any risk screening trigger levels in Table 2-5-1 of Regulation 2-5; and
 - b. The use of these materials does not increase criteria air pollutant emissions above 9.0 pounds per day.
- [Basis Cumulative Increase, BACT avoidance]
32. The owner/operator of S-4045 shall not emit more than following daily emission limits in any calendar day:
- Pollutant Daily (pounds)
- | | |
|-----|-----|
| NOx | 9.0 |
| CO | 9.0 |
- [Basis: BACT Avoidance, Cumulative Increase]
33. The owner/operator of S-4045 shall not emit more than 0.040 pounds of PM10 (both filterable and condensable) per ton of aluminum melted and no more than 1,654 pounds of PM10 (both filterable and condensable) per year from aluminum processed, to the atmosphere.
- [Basis: Cumulative Increase]
34. The owner/operator of S-4045 shall not emit more than the following hourly emission rates from S-4045, associated holding furnace(s), bypass system, and associated quench tank(s) combined:
- Pollutant Hourly (pounds)
- | | |
|----------|---------|
| Arsenic | 5.2E-06 |
| Copper | 5.6E-04 |
| Mercury | 7.1E-06 |
| Nickel | 3.8E-04 |
| Vanadium | 6.7E-04 |
- [Basis: Regulation 2, Rule 5]
35. The owner/operator of S-4045 shall not emit more than the following annual emission rates from S-4045, associated holding furnace(s), bypass system, and associated quench tank(s) combined:
- Pollutant Annual (pounds)
- | | |
|---------------------|---------|
| Arsenic | 2.1E-03 |
| Beryllium | 4.8E-04 |
| Cadmium | 1.0E-02 |
| Chromium Hexavalent | 8.0E-03 |
| Lead | 4.4E-02 |
| Manganese | 7.5E-01 |
| Mercury | 2.8E-03 |
| Nickel | 1.5E-01 |
| Selenium | 8.5E-03 |
| Silica | 7.1E+00 |
- [Basis: Regulation 2, Rule 5]

36. The owner/operator shall not exceed the following natural gas throughput limits at S-4045:
- a. 15.11 MMBtu/hour/furnace (11,382 standard cubic feet/hour/furnace)
 - b. 109,260 MMBtu/year/furnace (99,705,882 standard cubic feet/year/furnace)
 - c. 194,690 MMBtu/year total for both furnaces (183,460,784 standard cubic feet/year/combined)
- [Basis: Cumulative Increase, Toxic]
37. In order to demonstrate compliance with Parts 32, 33, 34, and 35 of this permit condition, the owner/operator shall conduct an Air District approved source test in accordance with the Air District's Manual of Procedures at S-4045 for criteria air pollutants (NOx, CO, PM10), silica, and the full set of metals (arsenic, beryllium, cadmium, total chromium, hexavalent chromium, cobalt, copper, lead, manganese, mercury, nickel, selenium, vanadium, and zinc) within 30 days after the installation of the oxyfuel burner. The owner/operator shall conduct source tests required by this Permit Condition at the representative production rate at which the system is typically operated unless other conditions are required by the applicable test method. The owner/operator shall provide the aluminum feed rate, aluminum feed composition, and natural gas consumption of S-4045 during each source test. The owner/operator shall close all the valves leading to bypass system during the source test at the main stack of the furnace. The owner/operator shall conduct an Air District approved source test in accordance with the Air District's Manual of Procedures at S-4045 within 60-days of a change in the material composition of aluminum feed to S-4045 that results in an increase in the content of one of the metals listed in Parts 34 or 35.
[Basis: BACT Avoidance, Cumulative Increase, Regulation 2, Rule 5]
38. The owner/operator shall notify the Manager of the Air District's Source Test Section at least seven (7) days prior to the test, to provide the Air District staff the option of observing the testing. Within 60 days of test completion, a comprehensive report of the test results shall be submitted to the Manager of the District's Source Test Section for review and disposition.
[Basis: Cumulative Increase, BACT, Reg 2-5]

End of Conditions

RECOMMENDATION

The District has reviewed the material contained in the permit application for the proposed project and has made a preliminary determination that the project is expected to comply with all applicable requirements of District, state, and federal air quality related regulations. The preliminary recommendation is to issue a Permit to Operate, Temporary Operation, in accordance with, Regulation 2-1-302.3, for the proposed temporary modification listed below. However, the proposed source will be located within 1,000 feet of a school, which triggers the public notification requirement of District Regulation 2-1-412. After the comments are received and reviewed, the District will make a final determination on the permit.

I recommend that the District initiate a public notice and consider any comments received prior to taking any final action on the issuance of a Permit to Operate, Temporary Operation for the following equipment:

S4045 Aluminum Melting Furnace #1
Temporary Maximum Operating Rate: 11,463 lb/hr (12,380 ton/90-day) of Aluminum
Make/Model: Striko Westofen Group, MH II-B 6000/4000 G
Maximum Natural Gas Firing Rate: 15.11 MMBtu/hr (Combined)
Melting Section: Three (3) 2.73 MMBtu/hr Burners
Holding Bath Section: Two (2) 1.71 MMBtu/hr Burners and
One (1) 3.5 MMBtu/hr Oxyfuel Burner
Abated by Furnace 1 Hi-Temp ASHRAE Filter, A30193

A30193 Furnace 1 Hi-Temp ASHRAE Filter
Model: MERV14 Exhaust Filters; Filter Efficiency: 97%; Flowrate: 15,545 cfm
Max Operating Temperature: 572 °F

Application Number #31592
Plant #20459

By: Madhav Patil
Air Quality Engineer

Date:

DRAFT