

STATE OF MICHIGAN

Rick Snyder, Governor



DEPARTMENT OF ENVIRONMENTAL QUALITY

AIR QUALITY DIVISION

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PUBLIC PARTICIPATION DOCUMENTS

For

Sakthi Automotive Group USA, Inc.
Detroit, Michigan

PERMIT APPLICATION NUMBER

92-16

September 14, 2016

FACT SHEET

September 14, 2016

Purpose and Summary

The Michigan Department of Environmental Quality (MDEQ), Air Quality Division (AQD), is proposing to act on Permit to Install (PTI) application No. 92-16 from Sakthi Automotive Group USA, Inc. (Sakthi). The permit application is for the proposed installation and operation of a new aluminum die casting facility. The proposed project is subject to permitting requirements of the MDEQ's Rules for Air Pollution Control. Prior to acting on this application, the AQD is holding a public comment period and a public hearing, if requested in writing, to allow all interested parties the opportunity to comment on the proposed PTI. All relevant information received during the comment period and hearing if held, will be considered by the decision maker prior to taking final action on the application.

Background Information

Sakthi is proposing to install a new aluminum die casting facility on the south side of the vacant Southwestern High School at 201 Waterman Street, Detroit, Michigan. The facility will produce lightweight aluminum castings used for automotive parts.

Sakthi has two other buildings in the area — one at 6401 West Fort Street, northeast of the high school and the other south of West Fort Street to the west of the high school on American Way. For air permitting purposes, AQD has determined that the three Sakthi buildings are considered to be one stationary source and they share a common State Registration Number (SRN), P0380. None of the equipment in either the West Fort Street building or the American Way building requires a PTI.

Proposed Facility and Present Air Quality

The proposed facility will consist of three natural gas-fired melting furnaces with low-NOx burners rated at 6.7 million British thermal units per hour (MMBtu/hr) each, two natural gas-fired heat treat furnaces with low-NOx burners rated at 6.2 MMBtu/hr each, and 30 electrically heated crucible holding furnaces. Additional facility support processes will include aluminum receiving and storage, dross storage and handling, a die cleaning enclosure, casting inspection, and facility heating, ventilation and air conditioning.

The melting furnaces will be charged with only clean ingots of aluminum, clean scrap produced within the facility, customer returns, and flux material (chloride and fluoride salts). The flux materials are used to remove impurities from the aluminum and also for weekly cleanings of the furnaces. The flux bonds with non-aluminum material in the melt, creating dross which rises to the surface where it is removed before casting. The melting furnaces will operate in melting mode five days per week and remain idle in heated standby mode for two days per week.

The crucible furnaces will be mobile units within the facility. Melted aluminum tapped from the melting furnaces will be transferred to the crucibles. Additional flux will be added while the crucible is under the melting furnace hood and/or after the tapping process step when the crucibles are outside the hood. The crucible furnaces will then transport the metal to the casting machines.

Completed castings will undergo a heat treat process to meet customer specifications. Heat treating can require more time than melting, so the two heat treat furnaces may need to be operated six days per week to process the throughput from five days of melting and casting production.

The United States Environmental Protection Agency (USEPA) has set maximum permissible levels, referred to as National Ambient Air Quality Standards (or NAAQS), for seven criteria pollutants. The NAAQS are designed to protect the public health of everyone, including the most susceptible individuals, children, the elderly, and those with chronic respiratory ailments. The seven pollutants are carbon monoxide (CO), lead, nitrogen dioxide (NO₂), ozone, particulate matter less than or equal to 10 microns in size (PM₁₀), particulate matter less than or equal to 2.5 microns in size (PM_{2.5}), and sulfur dioxide (SO₂). The proposed facility location is in an attainment area for all criteria pollutants, except for SO₂.

It should be noted that on October 26, 2015, the USEPA revised the 8-hour ozone NAAQS from 0.075 parts per million (ppm) to 0.070 ppm. The MDEQ anticipates that the USEPA will designate Wayne County as nonattainment for this pollutant by October 2017.

Adjacent to the site of the proposed die casting facility, AQD operates an air monitoring station that monitors levels of PM_{2.5}, PM₁₀, SO₂, manganese, arsenic, cadmium, and nickel, volatile organic compounds (VOCs), Carbonyl compounds, and meteorological data.

Also in Michigan, State Air Pollution Control Rules R 336.1225 to R 336.1232 (Rules 225 to 232) are used to ensure the public health is protected from other pollutants.

Pollutant Emissions

The primary pollutants that will be emitted from the proposed facility are oxides of nitrogen (NO_x), CO, VOCs, SO₂, particulate matter (PM) PM₁₀, PM_{2.5}, and two hazardous air pollutants (HAPs): hydrogen chloride (HCl), and hydrogen fluoride (HF).

Per state and federal regulations, the proposed facility is defined as a "minor" source of both criteria pollutant and HAPs emissions. The potential to emit is limited by a permit restriction of 27,158 tons per year on the amount of metal that may be charged to the furnaces. Emissions HCl and HF will be limited by the flux injection rate which accounts for the chlorine and/or fluorine composition of the flux material. The flux injection rate is also proportional to the amount of metal processed.

The following table provides the estimated emissions for each pollutant:

EMISSION SUMMARY

Pollutant	Estimated Emissions (tpy)
PM	1.6
PM10	1.6
PM2.5	1.6
SO ₂	0.1
CO	18.0
NO _x	10.7
VOCs	1.2
Lead	1.07E-04
Fluorides	1.04 (HF)
Sulfuric Acid Mist	not applicable

Key Permit Review Issues

Staff evaluated the proposed project to identify all state rules and federal regulations which are, or may be, applicable. The tables in Appendix 1 summarize these rules and regulations. The proposed facility will be a minor source of criteria pollutant emissions and an area source of HAPs. For the proposed facility, there are no applicable New Source Performance Standards (NSPS) established under Title 40 of the Code of Federal Regulations (40 CFR) Part 60 or National Emission Standards for Hazardous Air Pollutants (NESHAP) established under 40 CFR Part 61 or Part 63.

- **Rule 224 TBACT Analysis** – This rule is applicable to the proposed facility. Emissions of toxic air contaminants are restricted by limiting the amount of metal melted and flux material used.
- **Rule 225 Toxics Analysis** – The MDEQ Rules for Air Pollution Control require the ambient air concentration of toxic air contaminants (TACs) be compared against health-based screening levels. AQD staff reviewed Sakthi’s air quality evaluation of TAC impacts. The review found that all TACs show impacts less than the established health-based screening levels and will comply with the requirements of Rule 225. For TACs with an annual averaging time, this was demonstrated using the methodology in Rule 227(1)(a). For TACs with a 1-hour averaging time, this was demonstrated using dispersion modeling. The following two tables show the results of the Rule 225 toxics analysis.

Toxic Air Contaminant Impacts, Rule 227(1)(a) (Annual Impacts)

CAS No.	Toxic Air Contaminant	Proposed Emission Rate				Initial Threshold Screening Level (ITSL)		Allowable Emission Rate (calculated using the ITSL)	
		lb per hour	lb per 8 hrs	lb per 24 hrs	lb per month	ITSL ($\mu\text{g}/\text{m}^3$)	Averaging Time		
7647010	hydrogen chloride	0.76	6.08	18.24	565.44	20	annual	800 lb/month	10.80 lb/hr
7664393	hydrogen fluoride	0.238	1.90	15.23	472.20	14	annual	560 lb/month	7.56 lb/hr

Toxic Air Contaminant Impacts, Rule 225 (1 hour impacts)

CAS No.	Toxic Air Contaminant	Proposed Emission Rate		Combined Predicted Ambient Impact ($\mu\text{g}/\text{m}^3$)	Initial Threshold Screening Level (ITSL)		% of the ITSL
		Melting Furnaces lb/hr	Roof Vents lb/hr		ITSL ($\mu\text{g}/\text{m}^3$)	Averaging Time	
7647010	hydrogen chloride	18.34	0.51	293.65	2100	1 hour	13.98%
7664393	hydrogen fluoride	5.72	0.16	91.62	240	1 hour	38.18%

- **Rule 702 VOC Emissions** – This rule requires an evaluation of the following four items to determine what will result in the lowest maximum allowable emission rate of VOCs:
 - a. BACT or a limit listed by the department on its own initiative
 - b. New Source Performance Standards (NSPS)
 - c. VOC emission rate specified in another permit
 - d. VOC emission rate specified in the Part 6 rules for existing sources

An evaluation of these four items determined that a VOC BACT limit (702(a)) analysis would dictate the lowest maximum allowable emission rate of VOC from the furnaces based on the use of natural gas as a fuel.

- **Criteria Pollutants Modeling Analysis** – Computer dispersion modeling was performed to predict the impacts of air emissions of NO_2 and $\text{PM}_{2.5}$. Emissions were evaluated against both the NAAQS and the Prevention of Significant Deterioration (PSD) increments. The NAAQS are intended to protect public health. The PSD increments are intended to allow industrial growth in an area, while ensuring that the area will continue to meet the NAAQS.

The results of the modeling, as shown in the tables below, indicates that the $\text{PM}_{2.5}$ and NO_2 emissions from the proposed facility will not interfere with maintenance of the NAAQS or cause or contribute to an exceedance of the PSD increment.

PSD Increment Modeling – Impacts in $\mu\text{g}/\text{m}^3$ annual impacts are five year maximum					
Pollutant	Averaging Time	2011-2015	PSD	% of PSD	Year
PM2.5	24-hr	4.16	9	46.2%	2011
	annual	1.11	4	27.9%	2011
NO ₂	Annual	10.25	25	41.0%	2012

NAAQS Modeling – Impacts in $\mu\text{g}/\text{m}^3$ annual NO ₂ is five year maximum							
Pollutant	Averaging Time	2011-2015	Background	Combined Impact Level	NAAQS	% of NAAQS	Year
PM2.5	24-hr	4.03	24	28.03	35	80.1%	5 year avg
	Annual	1.08	10.8	11.88	12	99.0%	5 year avg
NO ₂	1-hr	92.32	86.5	178.82	188	95.12%	5 year avg
	Annual	11.11	22.4	33.51	100	33.51%	2012

Key Aspects of Draft Permit Conditions

- **Emission Limits (By Pollutant)** – The draft permit includes PM, PM10, PM2.5, and visible emissions limits for the melting furnaces.
- **Usage Limits** - The draft permit includes limits on the amount and composition of flux used and the amount of metal charged. The amount of chlorine and fluorine in the flux is limited by the flux injection rate limit (explained below under “Other”). The metal charge limit restricts throughput for the entire facility which in turn limits emissions from all processes. The flux injection limits formally limit the emissions of HCl and HF, thereby assuring that the facility will be a minor source of HAPs.
- **Process/Operational Restrictions** – The facility will be limited to only burning natural gas in the three melting furnaces and the two heat treat furnaces.
- **Emission Control Device Requirements** – Low NOx burners will be required for all natural gas combustion in process equipment.
- **Testing & Monitoring Requirements** – The draft permit includes the following requirements for the melting furnaces:
 - Emissions testing is not commonly required at a die casting facility of the capacity Sakthi proposes to install. However, the draft permit includes emissions testing for the melting furnaces which may be required at the discretion of the AQD District Supervisor for PM, PM10, PM2.5, HCl, and HF.
 - Sakthi is required to keep records of the flux material usage rate and the amount of metal charged to the melting furnaces.
 - Sakthi shall maintain a current listing from the manufacturer of the chemical composition of each flux material used, including the weight percent of each component. The data

may consist of Material Safety Data Sheets, manufacturer's formulation data, or both as deemed acceptable by the AQD District Supervisor.

- **Other** – Although the proposed die casting facility is not subject to the NESHAP for Secondary Aluminum Processing Facilities (40 CFR Part 63, Subpart RRR), the draft permit requires a calculation of the chlorine and fluorine flux injection rate using a method modified from the method included in the NESHAP.

Conclusion

Based on the analyses conducted to date, staff concludes that the proposed project would comply with all applicable state and federal air quality requirements. Staff also concludes that this project, as proposed, would not violate the federal NAAQS or the federal PSD increments.

Based on these conclusions, staff has developed draft permit terms and conditions which would ensure that the proposed facility design and operation are enforceable and that sufficient monitoring, recordkeeping, and reporting would be performed by the applicant to determine compliance with these terms and conditions. If the permit application is deemed approvable, the delegated decision maker may determine a need for additional or revised conditions to address issues raised during the public participation process.

If you would like additional information about this proposal, please contact Mr. David K. Riddle, AQD, at 517-284-6798.

Appendix 1
STATE AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.1201	Requires an Air Use Permit for new or modified equipment that emits, or could emit, an air pollutant or contaminant. However, there are other rules that allow smaller emission sources to be installed without a permit (see Rules 336.1279 through 336.1290 below). Rule 336.1201 also states that the Department can add conditions to a permit to assure the air laws are met.
R 336.1205	Outlines the permit conditions that are required by the federal Prevention of Significant Deterioration (PSD) Regulations and/or Section 112 of the Clean Air Act. Also, the same types of conditions are added to their permit when a plant is limiting their air emissions to legally avoid these federal requirements. (See the Federal Regulations table for more details on PSD.)
R 336.1224	New or modified equipment that emits toxic air contaminants must use the Best Available Control Technology for Toxics (T-BACT). The T-BACT review determines what control technology must be applied to the equipment. A T-BACT review considers energy needs, environmental and economic impacts, and other costs. T-BACT may include a change in the raw materials used, the design of the process, or add-on air pollution control equipment. This rule also includes a list of instances where other regulations apply and T-BACT is not required.
R 336.1225 to R 336.1232	The ambient air concentration of each toxic air contaminant emitted from the project must not exceed health-based screening levels. Initial Risk Screening Levels (IRSL) apply to cancer-causing effects of air contaminants and Initial Threshold Screening Levels (ITSL) apply to non-cancer effects of air contaminants. These screening levels, designed to protect public health and the environment, are developed by Air Quality Division toxicologists following methods in the rules and U.S. EPA risk assessment guidance.
R 336.1279 to R 336.1290	These rules list equipment to processes that have very low emissions and do not need to get an Air Use permit. However, these sources must meet all requirements identified in the specific rule and other rules that apply.
R 336.1299(2)(b)	Adopts by reference the provisions of 40 CFR 63.40 to 63.44 (2002) and 40 CFR 63.50 to 63.56 (2002), the federal hazardous air pollutant regulations governing constructed or reconstructed major sources.
R 336.1301	Limits how air emissions are allowed to look at the end of a stack. The color and intensity of the color of the emissions is called opacity.
R 336.1331	The particulate emission limits for certain sources are listed. These limits apply to both new and existing equipment.
R 336.1370	Material collected by air pollution control equipment, such as dust, must be disposed of in a manner, which does not cause more air emissions.
R 336.1401 and R 336.1402	Limit the sulfur dioxide emissions from power plants and other fuel burning equipment.
R 336.1601 to R 336.1651	Volatile organic compounds (VOCs) are a group of chemicals found in such things as paint solvents, degreasing materials, and gasoline. VOCs contribute to the formation of smog. The rules set VOC limits or work practice standards for existing equipment. The limits are based upon Reasonably Available Control Technology (RACT). RACT is required for all equipment listed in Rules 336.1601 through 336.1651.
R 336.1702	New equipment that emits VOCs is required to install the Best Available Control Technology (BACT). The technology is reviewed on a case-by-case basis. The VOC limits and/or work practice standards set for a particular piece of new equipment cannot be less restrictive than the Reasonably Available Control Technology limits for existing equipment outlined in Rules 336.1601 through 336.1651.
R 336.1801	Nitrogen oxide emission limits for larger boilers and stationary internal combustion engines are listed.
R 336.1901	Prohibits the emission of an air contaminant in quantities that cause injurious effects to human health and welfare, or prevent the comfortable enjoyment of life and property. As an example, a violation may be cited if excessive amounts of odor emissions were found to be preventing residents from enjoying outdoor activities.
R 336.1910	Air pollution control equipment must be installed, maintained, and operated properly.

STATE AIR REGULATIONS

State Rule	Description of State Air Regulations
R 336.1911	When requested by the Department, a facility must develop and submit a malfunction abatement plan (MAP). This plan is to prevent, detect, and correct malfunctions and equipment failures.
R 336.1912	A facility is required to notify the Department if a condition arises which causes emissions that exceed the allowable emission rate in a rule and/or permit.
R 336.2001 to R 336.2060	Allow the Department to request that a facility test its emissions and to approve the protocol used for these tests.
<p>R 336.2801 to R 336.2804 Prevention of Significant Deterioration (PSD) Regulations</p> <p>Best Available Control Technology (BACT)</p>	<p>The PSD rules allow the installation and operation of large, new sources and the modification of existing large sources in areas that are meeting the National Ambient Air Quality Standards (NAAQS). The regulations define what is considered a large or significant source, or modification.</p> <p>In order to assure that the area will continue to meet the NAAQS, the permit applicant must demonstrate that it is installing the BACT. By law, BACT must consider the economic, environmental, and energy impacts of each installation on a case-by-case basis. As a result, BACT can be different for similar facilities.</p> <p>In its permit application, the applicant identifies all air pollution control options available, the feasibility of these options, the effectiveness of each option, and why the option proposed represents BACT. As part of its evaluation, the Air Quality Division verifies the applicant's determination and reviews BACT determinations made for similar facilities in Michigan and throughout the nation.</p>
R 336.2901 to R 336.2903 and R 336.2908	<p>Applies to new "major stationary sources" and "major modifications" as defined in R 336.2901. These rules contain the permitting requirements for sources located in nonattainment areas that have the potential to emit large amounts of air pollutants. To help the area meet the NAAQS, the applicant must install equipment that achieves the Lowest Achievable Emission Rate (LAER). LAER is the lowest emission rate required by a federal rule, state rule, or by a previously issued construction permit. The applicant must also provide emission offsets, which means the applicant must remove more pollutants from the air than the proposed equipment will emit. This can be done by reducing emissions at other existing facilities.</p> <p>As part of its evaluation, the AQD verifies that no other similar equipment throughout the nation is required to meet a lower emission rate and verifies that proposed emission offsets are permanent and enforceable.</p>

FEDERAL AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
Section 109 of the Clean Air Act – National Ambient Air Quality Standards (NAAQS)	The United States Environmental Protection Agency has set maximum permissible levels for seven pollutants. These NAAQS are designed to protect the public health of everyone, including the most susceptible individuals, children, the elderly, and those with chronic respiratory ailments. The seven pollutants, called the criteria pollutants, are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), and sulfur dioxide. Portions of Michigan are currently non-attainment for sulfur dioxide and lead. Further, in Michigan, State Rules 336.1225 to 336.1232 are used to ensure the public health is protected from other compounds.
40 CFR 51 Appendix S Emission Offset Interpretive Ruling	Appendix S applies during the interim period between nonattainment designation and EPA approval of a SIP that satisfies nonattainment requirements specified in Part D of the Clean Air Act. Appendix S would apply in nonattainment areas where either no nonattainment permit rules apply or where the existing state rules are less stringent than Appendix S.

FEDERAL AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
<p>40 CFR 52.21 – Prevention of Significant Deterioration (PSD) Regulations</p> <p>Best Available Control Technology (BACT)</p>	<p>The PSD regulations allow the installation and operation of large, new sources and the modification of existing large sources in areas that are meeting the NAAQS. The regulations define what is considered a large or significant source, or modification.</p> <p>In order to assure that the area will continue to meet the NAAQS, the permit applicant must demonstrate that it is installing BACT. By law, BACT must consider the economic, environmental, and energy impacts of each installation on a case-by-case basis. As a result, BACT can be different for similar facilities.</p> <p>In its permit application, the applicant identifies all air pollution control options available, the feasibility of these options, the effectiveness of each option, and why the option proposed represents BACT. As part of its evaluation, the Air Quality Division verifies the applicant's determination and reviews BACT determinations made for similar facilities in Michigan and throughout the nation.</p>
<p>40 CFR 60 – New Source Performance Standards (NSPS)</p>	<p>The United States Environmental Protection Agency has set national standards for specific sources of pollutants. These New Source Performance Standards (NSPS) apply to new or modified equipment in a particular industrial category. These NSPS set emission limits or work practice standards for over 60 categories of sources.</p>
<p>40 CFR 63— National Emissions Standards for Hazardous Air Pollutants (NESHAP)</p>	<p>The United States Environmental Protection Agency has set national standards for specific sources of pollutants. The National Emissions Standards for Hazardous Air Pollutants (NESHAP) (a.k.a. Maximum Achievable Control Technology (MACT) standards) apply to new or modified equipment in a particular industrial category. These NESHAPs set emission limits or work practice standards for over 100 categories of sources.</p>
<p>Section 112 of the Clean Air Act</p> <p>Maximum Achievable Control Technology (MACT)</p> <p>Section 112g</p>	<p>In the Clean Air Act, Congress listed 189 compounds as Hazardous Air Pollutants (HAPS). For facilities which emit, or could emit, HAPS above a certain level, one of the following two requirements must be met:</p> <ol style="list-style-type: none"> 1) The United States Environmental Protection Agency has established standards for specific types of sources. These Maximum Achievable Control Technology (MACT) standards are based upon the best-demonstrated control technology or practices found in similar sources. 2) For sources where a MACT standard has not been established, the level of control technology required is determined on a case-by-case basis.

Notes: An “Air Use Permit,” sometimes called a “Permit to Install,” provides permission to emit air contaminants up to certain specified levels. These levels are set by state and federal law, and are set to protect health and welfare. By staying within the levels set by the permit, a facility is operating lawfully, and public health and air quality are protected.

The Air Quality Division does not have the authority to regulate noise, local zoning, property values, off-site truck traffic, or lighting.

These tables list the most frequently applied state and federal regulations. Not all regulations listed may be applicable in each case. Please refer to the draft permit conditions provided to determine which regulations apply.