TECHNICAL FACT SHEET

August 5, 2020

Purpose and Summary

The Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), is proposing to act on Permit to Install (PTI) application Nos. 14-19A and 33-20 from FCA US, LLC (FCA).

- PTI application No. 14-19A is for a proposed modification to an automotive assembly line permitted under PTI No. 14-19 and currently under construction at the Detroit Assembly Complex Mack Plant (Mack).
- PTI application No. 33-20 is for the proposed installation and operation of a tutone coating operation, relocation of the rapid reprocess operations, and various refurbishments to existing equipment at the Jefferson North Assembly Plant (JNAP).

The proposed projects are subject to permitting requirements of the Department's Rules for Air Pollution Control. PTI No. 14-19A is also subject to the State of Michigan Nonattainment New Source Review (NNSR) regulations.

Prior to acting on these applications, the AQD is holding a public comment period and a virtual public hearing to allow all interested parties the opportunity to comment on the proposed PTIs. All relevant information received during the comment period and virtual hearing will be considered by the decision maker prior to taking final action on the application.

Background Information on the Facility

FCA owns and operates both JNAP and Mack plants in Detroit, Wayne County, Michigan. The JNAP facility consists of an existing automotive assembly line and is located at 2101 Conner Street. The Mack facility plant is under construction to install an automotive assembly line and is located at 4000 Saint Jean Street. Both assembly plants are considered to be the same stationary source and will continue forward with the same State Registration Number (N2155).

The proposed permits for FCA JNAP and Mack are in the flexible permit format. Some key highlights of the flexible permit for an existing facility, such as JNAP, are to look at the facility's actual environmental performance (emissions per unit of production) as well as a total mass emission rate (tons per year) while operating a state-of-the-art control system when the flexible permit is established. The flexible permitting approach is typically made available only to the best controlled facilities based on proposed environmental performance resulting from operation in compliance with all applicable regulatory requirements. This is determined through an analysis of a Best Available Control Technology (BACT)- or Lowest Achievable Emission Rate (LAER)-type comparison made by establishing an emission limit.

For the proposed Mack project, PTI Application No. 14-19A, these limits are established by a LAER analysis as set forth in Part 19 of the Michigan Air Pollution Control Rules. This permit was established as a flexible permit in PTI No. 14-19, which was issued in 2019.

For the existing JNAP facility, incorporation of the proposed project for PTI Application No. 33-20, these limits are established by a BACT analysis as set forth in Part 7 of the Michigan Air Pollution Control Rules. PTI Application No. 33-20 is a modification to an existing flexible permit that was established in 2010.

The emission limits in the flexible permits comply with the requirements of the regulations as described in the LAER analysis discussion in Appendix 2 for Mack and the Rule 702 BACT analysis discussion for JNAP.

For more detail regarding flexible permits, please see Appendix 3, Background Information on the Flexible Permitting Initiative.

Project Aggregation

The Mack and JNAP projects must be evaluated as to whether they should be aggregated and reviewed as the same project. Based on the United States Environmental Protection Agency (USEPA) guidance 'Prevention of Significant Deterioration (PSD) and NNSR: Aggregation; Reconsideration, 83 Fed. Reg. 57,324 (Nov. 15, 2018)' (USEPA Aggregation Action), the projects must be evaluated on whether they are "substantially related," which includes taking several factors into consideration.

1. Projects occurring within a close time frame are more likely to be substantially related and merit further review (timing should not be the lone basis for aggregating projects).
2. Whether a physical or operational change is dependent on another for its viability (technically or economically).
3. Do the projects share an intrinsic relationship with each other (physical proximity, stages of production process, etc.).
4. Whether activities are jointly planned (i.e., part of the same capital improvement project or engineer study) and occur close in time and at components that are functionally interconnected.

The proposed JNAP and Mack projects are scheduled to occur within 18 months of one another, which merits looking closer at the two projects. However, Mack and JNAP each exist and operate independently. Although the physical proximity of the equipment is at the same stationary source, the Mack and JNAP assembly lines are entirely separate manufacturing operations with distinct emission units. In addition, the two projects were not jointly planned, and each have separate management personnel and financial centers. The activities were proposed, reviewed, and approved as separate capital appropriations in separate years and are not interdependent.

Based on these factors, Mack and JNAP are considered separate projects and have not been aggregated. The individual projects have been reviewed independently.

Proposed Projects

- **PTI Application No. 14-19A**

The proposed project for Mack is to modify the automotive assembly line currently under construction and permitted under PTI No. 14-19. These modifications include:

  - Three 770-horsepower (HP) natural gas-fired emergency engines would increase to a total of four emergency engines: two 850-HP emergency engines and two 350-HP emergency engines.
  - The number of hot water generators (HWGs) that would be installed has been reduced from ten 5 million British Thermal Units per hour (MMbtu/hr) to nine.
  - The plan to replace three existing emergency fire pump engines has been reduced to two.
  - Removal of the proposed sealer oven (total burner rating at 20 MMbtu/hr) from planned installations.
  - The existing air handling systems and space heaters for buildings Mack 1 and Mack 2, which predate PTI #14-19, would be updated to a greater extent than originally anticipated. The older equipment being removed totals approximately 106 MMbtu/hr, and the new equipment being added totals approximately 74 MMbtu/hr.

- The capacity and number of the above ground storage tanks that would be installed has been modified. The two permitted gasoline storage tanks would be reduced from 20,000 gallons to 12,000-gallons capacity each. The single 10,000-gallon capacity windshield washer tank would change to two 6,000-gallon capacity tanks.
- The space heating portion of new natural gas equipment would no longer take pre-filtering credit.
- Numerous above ground storage tanks used during the time of the former engine plant's operation have been removed from the facility.

- **PTI Application No. 33-20**

The proposed project for JNAP is to install a new tutone coating line consisting of a coating booth that applies a basecoat and clearcoat, observation zones for both basecoat and clearcoat areas, a heated flash-off area, and a curing oven. In order to accommodate the proposed tutone coating line, a building bump-out would be constructed and a rapid repair process would be moved to the new bump-out. After moving, the rapid repair process would be exhausted to the ambient air.

Supporting natural gas equipment is also proposed to be installed including: the tutone oven, rapid reprocess air supply units, air supply houses (ASH), air make-up units, space heaters, a concentrator, and two thermal oxidizers to control the tutone process.

There are other activities taking place, but none increase the existing assembly line's production rate of capacity, including:

- Coating applicators in the topcoat booths would be replaced with new units and automation to improve overall efficiency.
- Powder coating operations would receive new automation.
- The existing purfoam operation would be relocated to the paint shop, using the same exhaust design as the current operation (i.e, the process has no exhaust stacks and the minimal emissions would exhaust into the in-plant environment). There would be no change to material used or the per unit application rates.
- The sealer operations would include replacement of existing robotic sealer application equipment, but no new materials or exhaust systems are anticipated.
- Conveyor systems would be replaced or repaired

Current Air Quality

Both the Mack and JNAP assembly lines are located in Wayne County, which is currently meeting all of the National Ambient Air Quality Standards (NAAQS) set by the USEPA, except for ozone and sulfur dioxide (SO_2). The other air quality standards are for particulate matter less than 10 microns in diameter (PM10), particulate matter less than 2.5 microns in diameter (PM2.5), carbon monoxide (CO), oxides of nitrogen (NOx), and lead. All of the standards are set at levels designed to protect public health. Please note, a portion of Wayne County has been designated by the USEPA as nonattainment for SO_2, but the Mack and JNAP facilities are not located within the SO_2 nonattainment area.

PTI Application No. 14-19A

Because the two projects have been evaluated as separate projects, this document has been divided into two sections. The following section discusses PTI Application No. 14-19A for the proposed Mack project.

Pollutant Emissions

The Mack assembly plant is considered to be an existing major stationary source under the PSD Regulations of the Michigan Air Pollution Control Rules and 40 CFR 52.21, and an existing nonattainment source for volatile organic chemicals (VOCs) and NOx under Part 19 of the Michigan Air Pollution Control Rules. Therefore, the proposed application would be subject to PSD for any regulated pollutant whose potential emissions increase exceeds the respective significant emission rate (SER); however, the only regulated pollutant over its respective SER is VOCs. Since the Mack facility is in a nonattainment area for ozone and VOCs are a precursor for ozone, VOCs are evaluated under NNSR and not PSD.

Table 1 provides updated emission estimates and the respective SERs for each regulated NSR pollutant.

Table 1: Mack Project Potential Emissions Increase Summary

Pollutant	Estimated Emissions Tons per year (tpy)	SER (tpy)	Subject to PSD Review?	Subject to NNSR**?
NOx	37.5	40	No	No
CO	82.8	100	No	NA
Particulate Matter (PM)	5.68	25	No	NA
PM10	5.68	15	No	NA
PM2.5	5.68	10	No	NA
SO_2	0.6	40	No	NA
Lead	4.6×10^{-4}	0.6	No	NA
VOCs	382.1	40	No	Yes
GHGs as CO_2e*	107,068	75,000	No	NA

* A recent decision by the Supreme Court (*Utility Air Regulatory Group v. U.S. EPA), No. 12-1146 (June 23, 2014*) determined that PSD review for Green House Gases (GHG) is only required if one or more of the other regulated new source review pollutants exceeds a PSD threshold. VOCs are subject to NNSR review, not PSD; therefore, GHGs are not required to go through PSD review.

** The portion of Wayne County where Mack is located is designated as nonattainment for ozone; therefore, NOx and VOCs (because they are precursors for ozone) are the only pollutants that could be subject to NNSR.

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.

- **NNSR Regulations**

The NNSR major source threshold is 100 tpy for the nonattainment pollutants, or, in the case of ozone, its precursors, VOCs and NOx. To be subject to NNSR, a project can be major itself or a major modification at the respective significance level if the facility is an existing major NNSR source. The Mack project has not yet commenced and, based on the potential emissions, is subject to NNSR review for VOCs.

- **Minor/Major Modification Determination for Nonattainment Pollutants**

The Mack facility is located in the portion of Wayne County which is currently in nonattainment for ozone. For ozone, both NOx and VOCs are considered precursors and are evaluated to determine NNSR applicability. Since the stationary source is an existing major nonattainment source of NOx and VOCs, an increase in NOx or VOC emission above their respective significant levels of 40 tpy will result in the change being subject to NNSR. Although the assembly line at Mack is currently permitted and under construction, FCA is modifying a project that has yet to commence; therefore, the Mack project must go through NNSR again. The Mack project is subject to NNSR for VOCs and not subject to NNSR for NOx.

- **Minor/Major Modification Determination for Attainment Pollutants**

The Mack facility is an existing PSD major stationary source. A modification at the facility where the emissions of any regulated pollutant would increase by more than the significant level for that pollutant results in the modification being subject to PSD requirements for that pollutant. This stationary source is located in the portion of Wayne County which is currently in attainment for all pollutants except ozone.

The Mack project is not subject to PSD because the potential emissions increase for each PSD-regulated pollutant is less than the significant level for that pollutant.

- **Federal New Source Performance Standards Regulations (NSPS)**

NSPS were established under Title 40 of the Code of Federal Regulations (40 CFR) Part 60. The electrodeposition coat (E-Coat), guide coat, and topcoat operations for the Mack facility are subject to the NSPS for Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations, 40 CFR Part 60 Subpart MM.

The four natural gas-fired emergency engines are subject to the NSPS for Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, 40 CFR Part 60 Subpart JJJJ.

The two diesel-fired emergency fire pumps are subject to the NSPS for Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, 40 CFR Part 60 Subpart IIII.

- **Federal National Emission Standards for Hazardous Air Pollutants (NESHAP) Regulations**

NESHAP were established under 40 CFR Part 61 or Part 63. The automotive coating operations at Mack are subject to the NESHAP for Surface Coating of Automobiles and Light-Duty Trucks, 40 CFR Part 63 Subpart IIII based on the facility being a major source of Hazardous Air Pollutants (HAPs) and performing automotive surface coating as defined in the Subpart.

The nine natural gas-fired HWG are subject to the NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters, 40 CFR Part 63 Subpart DDDDD, also known as the Boiler MACT, based on the construction date beginning after June 4, 2010.

The two windshield wiper fluid storage tanks are subject to the NESHAP for Organic Liquids Distribution, (Non-Gasoline), 40 CFR 63 Subpart EEEE, based on windshield wiper fluid's primary component (methanol) and the size of the storage tank (6,000 gallons).

All four emergency generators and two emergency fire pumps are subject to the NESHAP for Stationary Reciprocating Internal Combustion Engines, 40 CFR 63 Subpart ZZZZ based on the date of commencing construction.

- **Rule 224 TBACT Analysis**

Michigan Air Pollution Control Rule R 336.1224 requires TBACT. However, the requirements of Rule 224 do not apply to any process subject to a federal NESHAP. As the proposed equipment is subject to one of the federal NESHAPs listed above, T-BACT is not applicable.

- **Rule 225 Toxics Analysis**

EGLE Rules for Air Pollution Control require the ambient air concentration of toxic air contaminants (TACs) be compared against health-based screening levels. Since the Mack and JNAP projects have been determined to be separate projects, the 225 toxics evaluations have been conducted independently.

FCA submitted a generic modeling analysis for Mack and generated a worst-case maximum point of impact for each emission point. These maximum points of impact were then added together to obtain a conservative total impact for each TAC, with the exception of formaldehyde. FCA submitted TAC-specific modeling for formaldehyde.

AQD staff reviewed FCA's air quality modeling and evaluation of TAC impacts. The review found that all TACs show impacts less than the established health-based screening levels and would comply with the requirements of Rule 225.

- **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:

- BACT or a limit listed by the department on its own initiative.
- NSPS.
- VOC emission rate specified in another permit.
- VOC emission rate specified in the Part 6 rules for existing sources.

Although not always, the development of a LAER analysis for VOCs in a nonattainment area can also provide the basis for a demonstration of BACT. For this analysis, FCA has proposed a concentrator and a regenerative thermal oxidizer (RTO) on all coating operations, which satisfies BACT for the E-Coat and the primer/ topcoat application operations.

The LAER determination that all natural gas combustion sources only burn pipeline-quality natural gas satisfies the requirements of Rule 702 BACT for those sources. Please see the LAER analysis in Appendix 2 for additional discussion.

Purge solvents are used to clean various coating application equipment. Pollution prevention measures, such as work practices, are the most common emission control technique for reducing VOC emissions from cleaning materials. Work practice procedures reduce VOC emissions during cleaning operations by reducing the amount of VOC that can evaporate due to exposure to air. This may include efficiencies/reduction in the use of materials and capture of additional quantities for disposal/recycling. Product substitution/reformulation is another type of pollution prevention measure.

The Mack project has proposed incorporating all three emission reduction technologies into the proposed coating operations. Waterborne purge materials would be used in the primer and basecoat booths. FCA is not aware of other purge materials that are effective and would result in lower VOC emissions. A majority of solvent-borne purge materials would be collected in the collection/recycling system, with any remaining emissions going to the VOC add-on control equipment. The booth controls, along with implementation of sound solvent cleaning work practices and purge capture, would serve to minimize VOC emissions from purge and cleaning operations.

Body wipe materials are used to wipe vehicle surfaces to remove dust and debris prior to coating operations. Generally speaking, the wiping operations are conducted in enclosures that are not exhausted to emission controls or are conducted in the in-plant environment.

The process of body wiping is necessary to maintain vehicle coating integrity. When wiping vehicle surfaces, the specific physical characteristics and chemistry of the materials is important to the layering and coating profiles. As a result, wiping materials and systems are limited in VOC emission reduction potential. FCA is not aware of alternate wiping materials that can be relied upon for emission reduction.

Due to the various locations where solvent wiping occurs (open areas or sectioned areas of the plant) and the lack of exhaust points, VOC emission control equipment would not be feasible.

Sealers planned for the facility are low VOC containing sealers in the body shop, paint shop, and assembly areas. The sealers planned for use contain VOCs at levels below 0.25 pounds per gallon (lbs/gal). FCA is not aware of other materials that would serve to reduce the VOC content and resultant emissions from the various sealer operations.

Although sealers can be cured as they pass through various ovens, the nature of these operations is that they are completed in various sections of the manufacturing process and do not lend themselves to a main application point. Add-on VOC controls for sealers are difficult to rely on due to the distribution throughout the plant and are not technically feasible for sealer operations.

- **Criteria Pollutants Modeling Analysis**

PM2.5 and NOx

Computer dispersion modeling was performed to predict the impacts of air emissions from NOx and PM2.5. Emissions from the stationary source for each project were evaluated against both the NAAQS and the 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. FCA provided a separate modeling analyses for the Mack and JNAP projects. Although submitted separately with individual impact grids, both modeling analyses were evaluated with identical emission rates and had overlapping grids so that the entire area surrounding the stationary source was included.

Since PM2.5 and PM10 have been assumed to be the same for both projects, the modeling for PM2.5 can also be applied to PM10 since the PM10 NAAQS and Increments have higher thresholds than those for PM2.5.

Both modeling analyses had project impacts greater than the Significant Impact Levels (SILs) and were then evaluated against the respective NAAQS and PSD increment levels. The following two tables contain the modeling results for the Mack project:

Table 2: PSD Increment Modeling Results for Mack

Pollutant	Averaging Time	PSD Increment ($\mu g/m^3$)	Predicted Impact ($\mu g/m^3$)	Below Increment?
PM2.5	Annual	4	1.21	Yes
PM2.5	24-hr	9	5.96	Yes
NO2	Annual	25	10.69	Yes

Table 3: NAAQS Modeling Results for Mack

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)	Predicted Impact ($\mu g/m^3$)	Percent of NAAQS (%)
PM2.5	Annual	12	10.49	87.5%
PM2.5	24-hr	35	32.27	92.2%
NO2	Annual	100	39.69	39.7%
NO2	1-hr	188	185.4	98.6%

The modeling analyses show that the Mack project would meet all PSD increments and NAAQS.

- **Additional Criteria Pollutants Analysis**

Ozone

An ozone impact analysis is typically performed for projects subject to NNSR. FCA provided an ozone impact analysis for Mack via Tier I Modeled Emission Rates for Precursors (MERP) analysis. Based on the updated USEPA guidance, the AQD found that emissions of VOC and NOx would not significantly contribute to a violation of the ozone NAAQS.

The guidance calculates MERP values using the following methodology:

$$Impact = Critical\ Threshold\ (1\ ppb) * \left(\frac{Modeled\ Emission\ Rate\ from\ hypothetical\ source}{MERP}\right)$$

$$VOC\ MERP\ Ratio = \frac{ER}{1{,}560tpy} = \frac{382.1}{1{,}560} = 0.24$$

$$NOx\ MERP\ Ratio = \frac{ER}{125tpy} = \frac{37.5}{125} = 0.30$$

When adding the updated ratios together, the combined MERP ratio is 0.54. A combined MERP ratio of less than 1.0 indicates that the combined emissions would not cause or contribute to a violation of the ozone NAAQS.

CO and SO_2

The AQD's Policy and Procedure document, AQD-022, was evaluated with respect to Dispersion Modeling for Federally Regulated Pollutants. For SO_2, the emissions for each project are less than 25 percent of the SER and, therefore, are not expected to interfere with the PSD increment or NAAQS and no demonstration is required. Additionally, the emissions of CO for each project are less than its SER and are not expected to interfere with the PSD increment or NAAQS and no further analysis is required.

- **Emission Offsets**

One of the requirements of NNSR permitting for the Mack project is emission offsets. The seven-county southeast Michigan nonattainment area in which Wayne County is located is classified as a marginal nonattainment area. In marginal nonattainment areas, the required offset ratio is 1.1 to 1.

As the Mack project is a major nonattainment source of VOCs located in an ozone nonattainment area, a proposed increase in VOC emissions greater than 40 tpy will result in the need for VOC offsets. FCA is proposing an allowed increase in VOC emissions of 382.1 tpy, thus requiring the need for 420.31 tons of VOC offsets.

PTI No. 13-19 for the FCA Warren Truck Assembly Plant (Warren Truck) was evaluated simultaneously with PTI No. 14-19. The reduction in VOC emissions at Warren Truck will create 421.75 tons of VOC offsets. Of those 421.75 tons of VOC offsets created, 420.31 tons will be used by the Mack Project to meet the requirements of major source NNSR permitting outlined in Part 19 of the Michigan Air Pollution Control Rules.

The VOC offsets from Warren Truck were made enforceable via requirements in PTI No. 13-19. These requirements were carried forward into the modified PTI No. 13-19A.

- **Compliance Certification**

A second requirement of NNSR permitting is that all existing sources with a potential to emit (PTE) of 100 tpy or more of any air contaminant regulated under the Clean Air Act that is owned and operated by the permit applicant in Michigan, must be in compliance with legally enforceable permit conditions or an order of the Department specifying a plan and timetable for compliance. In addition to the Mack facility, FCA also owns and operates the following facilities that have the PTE of more than 100 tpy of air contaminants regulated under the Clean Air Act:

Table 4: Title V Major Sources in the State of Michigan Operated by FCA

Facility	SRN	ROP/PTI #
Chrysler Technology Center	N1436	MI-ROP-N1436-2018
Jefferson North Assembly Plant	N2155	MI-ROP-N2155-2017
Sterling Heights Assembly Plant	B7248	MI-ROP-B7248-2014a
Warren Stamping Plant	B2757	MI-ROP-B2757-2013
Warren Truck Assembly Plant	B2767	MI-ROP-B2767-2016
Trenton Engine Complex	B3350	MI-ROP-B3350-2014b
Dundee Engine Plant	N7228	MI-ROP-N7228-2018

All facilities are in compliance with these permits.

- **Alternative Sites Analysis**

Although already permitted and under construction, another requirement of NNSR permitting for the Mack project is an analysis of alternative sites, sizes, production process, and environmental control techniques to demonstrate that the benefits of the proposed source outweigh the environmental and social costs imposed as a result of its location and construction.

Alternative Site
When evaluating locations for a new automotive assembly plant, FCA considered various sites and locations for construction and/or development. They considered the following key elements that impact the decision for site location:

- Acquisition of property needed for development of the plant.
- Property Infrastructure, including deep water ports, freight rail access, trucking and highway connections, international airports, expediting and transshipment services, as well as Internet, communication, power, and reliable water utilities able to meet specified needs.
- Proximity to other FCA or supplier facilities that may provide support or parts (i.e., efficient, end-to-end supply chain).
- Impact of local, state, and national taxes and tariffs, including property-based taxes.
- Labor force, wages, population density, employment statistics, and union requirements/negotiations.
- Commitments (existing and new) to community development.

The Mack plant location is central to the City of Detroit and the local work force. FCA also considered other sites within Michigan and other states but recognized that the Detroit area is considered a global center for automotive engineering and manufacturing. The local labor force contains a large amount of applicable experience and building the plant elsewhere would require training and/or movement of workforce out of the area.

FCA also considered other locations and sites that are not yet developed and could be acquired. There are significant drawbacks to development of a new site. For example, additional roads, traffic, infrastructure, construction, and supplier location would result in increased emissions at sites that are not as developed as the planned location. Issues such as transporting parts and installation of rail spurs would also be required in addition to increases in population and relocation of supplier manufacturing facilities.

Alternative Size
The Mack plant has been designed for a production level of approximately 260,000 vehicles per year, which is comparable to other assembly plants that are typically based upon 300,000 vehicles per year or higher. The plant is sized to meet the market demand of the proposed vehicles and building a smaller facility would not allow FCA to meet its production targets.

Alternative Production Processes
Powder coatings are available as a primer and have been used in the automobile manufacturing industry. However, FCA has ruled out the use of powder coatings at Mack based upon background research and compatibility/quality concerns with the topcoat coating system. The planned vehicle is considered a higher-end, luxury vehicle that requires a higher quality coating. FCA has concluded that powder coatings do not provide the necessary quality required for this application.

Alternative Environmental Control Technologies
FCA evaluated whether the potential and real adverse environmental effects of the project have been avoided to the maximum extent possible.

In its application for the Mack plant, FCA identified criteria pollutant, HAPs, and TACs emissions, and analyzed each with respect to applicable regulations. As part of the air permit process, it is the adverse environmental effects of emissions to the ambient air that are assessed when determining whether the effects have been “avoided to the maximum extent possible.”

FCA reviewed other issued permits for similar sources and the USEPA's RACT/BACT/LAER Clearinghouse (RBLC) entries that would provide an indication of the lowest emitting sources for each process type (e.g., sealers). The lowest emitting sources for each process were identified and then combined (from various facilities throughout the United States (US)) into a single lowest emitting facility represented by Mack. This approach was then compared to other permitted facilities that rely on plant-wide limits such as Plantwide Applicability Limits (PALs) and Flexible Permit Initiatives (FPIs) to establish the lowest level on a plant-wide basis for criteria pollutants. The resultant emission levels for Mack are substantially below the lowest emitting facilities that FCA could identify on both a process specific basis and on a plantwide basis. The Mack plant includes abatement on the most significant VOC emissions sources and coating operations aimed at avoiding adverse effects to the maximum extent possible.

In addition, FCA completed dispersion modeling to evaluate the TAC impacts with respect to EGLE's acceptable ambient thresholds. The impacts under worst case assumptions are below the acceptable levels. Michigan's TACs also include HAPs which were, therefore, included in the analysis.

FCA has demonstrated that the Mack project would meet LAER for VOCs and is providing offsets at a rate of at least 1.1 to 1 for VOC emissions. The overall effect of the offsets is a reduction of VOC emissions in the non-attainment area. All other criteria pollutants were less than significant, but were also addressed as part of the plant-wide limits on emissions.

Accordingly, FCA's project would avoid real adverse environmental impacts to the maximum extent possible.

Key Aspects of Draft Permit Conditions

- **Emission Limits (By Pollutant)**
  The proposed permit includes the following emission limits:
  - Automotive stamping, assembly, and painting operations: VOC, PM, PM10, PM2.5, NOx, CO, SO_2, and GHGs as CO_2e.
  - Automotive coating operations: Organic HAPs.
  - Natural gas-fired Emergency Generators: NOx, CO, and VOC.
  - Diesel-fired Emergency Fire Pumps: Non-Methane Hydrocarbons (NMHC) + NOx, CO, PM, and VOCs.

The proposed emergency equipment at Mack (four natural gas-fired engines and two diesel-fired fire pumps) are not included in the proposed flexible permit limits. The emergency equipment is being installed to support the operation of essential equipment, such as emergency lighting and stirring of the E-Coat tank so that it does not solidify. As such, the emergency equipment is not part of the production of the automobile. It is not included in the flexible permit limit and have their own limits. The proposed flexible limits are:

Table 5: Proposed FPI Emission Limits for Mack

Pollutant	Proposed Flexible Emission Limit
VOCs	381.2 tpy
VOCs	3.0 pounds per job
PM	5.54 tpy
PM10	5.54 tpy
PM2.5	5.54 tpy
NOx	33.72 tpy
CO	76.47 tpy
SO_2	0.55 tpy
GHGs as CO_2e	106,518 tpy

- **Usage Limits**

The proposed permit includes the following usage limits:

- The total use of natural gas per 12-month rolling time period would be limited to 1,821 million standard cubic feet per year.
- The sulfur content of the diesel fuel burned in the emergency fire pumps.

- **Process/Operational Restrictions**

The proposed Mack permit includes the following restrictions:

- A Malfunction Abatement Plan (MAP) must be submitted for review and approval for the RTO, waterwash, and dry filter particulate system(s). The MAP shall include procedures for maintaining and operating the RTO, water wash systems, and dry filter particulate control systems in a satisfactory manner.
- The proposed permit restricts the fuel that may be burned in all natural gas sources to pipeline quality natural gas.

- **Federal Regulations**

The proposed permit contains requirements that will be used to demonstrate compliance with the following federal regulations:

- 40 CFR Part 60, Subpart MM, Automobile and Light Duty Truck Surface Coating Operations. Under the FPI format, the performance levels for the E-Coat, primer, and topcoat processes have been incorporated into the overall VOC and pounds of VOC per job (lbs VOC/job) limits for Mack. The permit specifies that compliance with these limits will constitute compliance with the NSPS.
- 40 CFR Part 60 Subpart JJJJ for Spark Ignition Internal Combustion Engines for the four natural gas-fired emergency engines.
- 40 CFR part 60 Subpart IIII for Stationary Compression Ignition Internal Combustion Engines for the two diesel-fired emergency fire pumps.
- 40 CFR Part 63 Subpart IIII for Surface Coating of Automobiles and Light Duty Trucks for the automotive surface coating operations. Based on the definition of “new” as written in the subpart and the combining of the JNAP and Mack assembly lines into the same stationary source, both JNAP and Mack are considered “existing” sources and will be subject to the HAP limits as designated for existing stationary sources. The proposed surface coating operations would comply with the standards for existing sources without the use of add-on control devices.
- 40 CFR Part 63 Subpart DDDDD for Industrial, Commercial, and Institutional Boilers and Process Heaters for the nine HWG.

- 40 CFR 63 Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines for the four natural gas-fired emergency generators and two diesel-fired emergency fire pumps.
- 40 CFR Part 63 Subpart EEEE for Organic Liquid Distribution for the two windshield wiper storage tanks.

- **Emission Control Device Requirements**

The proposed Mack permit includes the following emission control device requirements:

- RTO for the control of VOC emissions from the following equipment:
  - E-Coat tank and oven.
  - Solvent-borne purge materials used in the primer and topcoat spray booths and not captured in the purge recovery system.
  - Primer, basecoat, and clearcoat spray booths, flash-off zones, and curing ovens.
- Low NOx burners must be installed on all natural gas-fired units associated with the new paint shop, including the RTO to minimize NOx emissions.
- Water wash and/or dry filter particulate control systems to control PM, PM10, and PM2.5 emissions from:
  - Primer, basecoat, and clearcoat spray booths controlled by a water wash system and an additional dry filter abatement filter house before the concentrator.
  - Dry filter particulate control system on the E-Coat primer prep booth, the primer color prep and reprocess heavy sand booths, the rapid reprocess small repair booths, and the final repair booths. In addition, exhaust from the primer color prep and reprocess heavy sand booths and the final repair booths are recirculated.
  - Direct-fired natural gas units, including all ASH, air housing units (AHU), and all curing ovens are required to have filtration and temperature/humidification control units.

- **Testing & Monitoring Requirements**

The proposed Mack permit includes the following requirements:

- Verify VOC, PM, PM10, PM2.5, and NOx emission rates through performance testing from emission units associated with the proposed new paint line.
- Verify transfer efficiency (TE) of primer and topcoat coating applicators through testing.
- Monitor paint-coating-solvent usage on a monthly basis.
- Monitor natural gas usage on a monthly basis.
- Monitor the operating temperature of the RTO on a continuous basis.
- Monitor the number of vehicles produced on a monthly and 12-month rolling time period basis.

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The following section discusses the proposed JNAP project.

<u>Pollutant Emissions</u>

The JNAP facility is considered to be an existing major stationary source under the PSD Regulations of the Michigan Air Pollution Control Rules and 40 CFR 52.21, and an existing nonattainment source for VOCs and NOx under Part 19 of the Michigan Air Pollution Control Rules. Therefore, the proposed application would be subject to PSD for any regulated pollutant whose potential emissions increase exceeds its respective SER. Since the proposed facility is in a nonattainment area for ozone and VOCs are a precursor for ozone, VOCs are evaluated under NNSR and not PSD.

The potential emissions increase for CO and SO_2 are 50.07 and 3.0 tpy, respectively. The SERs are 100 tpy for CO and 40 tpy for SO_2; therefore, these pollutants are not subject to PSD or NNSR.

Michigan Air Pollution Control Rule R 336.2802(4) and R 336.2902(2) allow an applicant to provide a demonstration that a project is not subject to PSD or NNSR if it can be shown that the emissions change is less than significant. The applicant can use a variety of ways to demonstrate that the emissions change is less than significant, as allowed by the rules, and have chosen the hybrid test. The hybrid test includes an actual to the projected actual (A2A) evaluation for existing equipment and the PTE for newly installed equipment. Table 2 provides the results of the hybrid test demonstrations for the JNAP portion of the stationary source.

Table 6: JNAP PSD Applicability Determination Summary

Pollutant	Project Emission Increase (tpy)	SER (tpy)	Subject to PSD Review?	Subject to NNSR?
NOx	6.01	40	No	No
PM	4.42	25	No	NA
PM10	4.42	15	No	NA
PM2.5	4.42	10	No	NA
VOCs	-16.97	40	No	No

<u>Key Permit Review Issues</u>

AQD 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.

- **Flexible Permit Modification**

Although JNAP has an existing FPI permit, the proposed tutone coating process would be using control equipment for VOC emissions in the form of a concentrator and thermal oxidizers. Requirements for control equipment must be listed as enforceable conditions in a permit to be able to take credit for that control equipment. Therefore, the proposed JNAP project was required to go through permit review.

- **NNSR Regulations**

The NNSR major source threshold is 100 tpy for the nonattainment pollutants, or, in the case of ozone, its precursors, VOCs and NOx. To be subject to NNSR, a project can be major itself or a major modification at the respective significance level if the facility is an existing major NNSR source.

- **Minor/Major Modification Determination for Nonattainment Pollutants**

The JNAP facility is located in the portion of Wayne County which is currently in nonattainment for ozone. For ozone, both NOx and VOCs are considered precursors and are evaluated to determine NNSR applicability. Since the stationary source is an existing major nonattainment source of NOx and VOCs, an increase in NOx or VOC emission above their respective significant levels of 40 tpy will result in the change being subject to NNSR.

Based on the results from the hybrid applicability analysis performed for VOCs and NOx, (Table 2), the JNAP project does not exceed the SER for either of these pollutants. Therefore, the JNAP project is not a major modification and is not subject to NNSR.

- **Minor/Major Modification Determination for Attainment Pollutants**

The stationary source is an existing PSD major stationary source. A modification at the facility where the emissions of any regulated pollutant would increase by more than the significant level for that pollutant results in the modification being subject to PSD requirements for that pollutant. This stationary source is located in the portion of Wayne County which is currently in attainment for all pollutants except ozone.

For the JNAP project, an applicability analysis, called a hybrid test, was performed for NOx, PM, PM10, and PM2.5. The PTE was used for proposed new equipment and an actual-to-projected-actual evaluation was performed for existing equipment for this applicability analysis. Based on the hybrid test, the JNAP project is not subject to PSD for any pollutants.

- **Federal NSPS Regulations**

NSPS were established under Title 40 of the Code of Federal Regulations (40 CFR) Part 60. The existing E-Coat, guide coat, and topcoat operations, as well as the proposed tutone coating process, at JNAP are subject to the NSPS for Standards of Performance for Automobile and Light Duty Truck Surface Coating Operations, 40 CFR Part 60 Subpart MM.

- **Federal NESHAP Regulations**

NESHAP were established under 40 CFR Part 61 or Part 63. The existing automotive coating operations at JNAP, as well as the new tutone coating operation and rapid reprocess operations, are subject to the NESHAP for Surface Coating of Automobiles and Light-Duty Trucks, 40 CFR Part 63 Subpart IIII based on the facility being a major source of HAPs and performing automotive surface coating as defined in the Subpart.

- **Rule 224 TBACT Analysis**

Michigan Air Pollution Control Rule R 336.1224 requires TBACT. However, the requirements of Rule 224 do not apply to any process subject to a federal NESHAP. As the proposed equipment is subject to the federal NESHAP, T-BACT is not applicable.

- **Rule 225 Toxics Analysis**

EGLE Rules for Air Pollution Control require the ambient air concentration of TACs be compared against health-based screening levels. Since the Mack and JNAP projects have been determined to be separate projects, the 225 toxics evaluations have been conducted independently.

FCA submitted a generic modeling analysis for the operations being proposed for installation or modification (tutone booth, rapid reprocess, and associated natural gas equipment). Based on maximum operating capacity, worst-case maximum points of impact were generated for each emission point and added together to obtain a conservative total impact for each TAC.

AQD staff reviewed FCA's air quality modeling and evaluation of TAC impacts. The review found that all TACs show impacts less than the established health-based screening levels and would comply with the requirements of Rule 225.

- **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:

  - BACT or a limit listed by the department on its own initiative.
  - NSPS.

- VOC emission rate specified in another permit.
- VOC emission rate specified in the Part 6 rules for existing sources.

FCA submitted the following BACT analysis. The AQD reviewed the submitted analysis and concurs with the determination of BACT. Each of the areas were reviewed for BACT purposes.

Paint and Body Shop Sealers
The proposed upgrades to the sealer operations utilize low VOC containing materials with an average VOC content of less than 0.3 lbs/gal on a weighted average basis (not including glass sealers). FCA has not identified other available sealers with lower VOC contents that would substantially reduce VOC emissions from this operation (below the proposed level). FCA believes this to be the case due to the need for sealers to be viscous enough to be pump-able or hand applied to the vehicle body.
The materials at JNAP are similar to other assembly plants using low VOC materials. Due to the fact that the majority of other sealers applied throughout the facility are applied at stations on the plant floor and emissions tend to be fugitive in nature, there is essentially no opportunity to implement further emission reduction techniques such as add-control for sealer application stations. Based upon the above determinations, FCA has determined that BACT for the body and paint shop sealers and adhesives is the use of low VOC materials and the FPI limits should not be revised as the existing sealer operations continue to meet BACT for VOCs.

Electrodeposition Coating (E-Coat)
STEP 1: Identify All Control Technologies – E-Coat. The current JNAP E-Coat system utilizes thermal oxidation on the E-Coat oven portion of emissions. The sections that follow address the appropriateness of oxidation on the oven and provides an analysis of utilizing VOC emission reduction techniques for the existing dip tank, which is presently not controlled.

Emission reduction technologies:
1) Coating Materials.
2) Coating Application Methods.
3) VOC Control.

Each one of these is addressed below for the existing JNAP E-Coat operations:

1) E-Coat Materials. For E-Coat materials, low VOC waterborne materials are an industry standard and have been widely used across the US. FCA is not aware of any coating materials that would provide additional VOC reductions beyond those which are currently used in the industry.

2) E-Coat Coating Application Methods. The electro-deposition immersion process provides essentially 100 percent TE of the coating particles (resin and pigment) in the E-Coat materials. FCA did not identify any other application methods that could be implemented at JNAP that would provide a TE greater than that of immersion and reduce VOC emissions.

3) VOC Control. Add-on controls reduce the amount of VOC emissions by either destruction or recovery with or without recycling of VOC emission in the exhaust streams. FCA identified the following as available add-on control technologies for the control of VOCs from the E-Coat operations as well as typical control efficiencies for VOCs:

- Thermal Oxidation (90-99 percent).
- Catalytic Oxidation (90-99 percent).

- Carbon Adsorption (90-95 percent).
- Condensation (50-85 percent).

FCA believes that condensation technology is not technically feasible for this application due to the high humidity associated with a water-based dip tank, and the dilute nature of the exhaust streams (as a result of low emissions from E-Coat materials). FCA is not aware of any automotive surface coating operations that have successfully used condensation controls on E-Coat.

The two categories of add-on control devices typically used by the automobile and light-duty truck assembly coatings operations are: combustion (thermal or catalytic oxidation) and recovery (adsorption).

STEP 2: Eliminate Technically Infeasible Options.
Powder coatings and in general, spray application methods have been eliminated from this analysis due to the lack of a spray coating application that provides the coverage needed for corrosion protection at this stage in the vehicle body coating operation. Add-on condensation controls have also been eliminated due to the low exhaust concentrations from the E-Coat operations.

STEP 3: Rank Remaining Control Technologies by Control Effectiveness.
Of the remaining emission reduction technologies which are all add-on controls, the rankings are as follows:

- Thermal Oxidation (90-99 percent).
- Catalytic Oxidation (90-99 percent).
- Carbon Adsorption (90-95 percent).

Of the above control options, none add additional environmental impact that would exclude them from consideration or change the ranking.

STEP 4: Evaluate Most Effective Controls and Document Results.
FCA currently relies on thermal oxidation for control of VOCs from the E-Coat oven. Since this is the most effective control in terms of efficiency, there is no need to demonstrate or document the results any further.

FCA evaluated available add-on control options for the existing JNAP operation. The E-Coat system relies upon both the oven burners and heat from the existing oxidizers to de-humidify the air in the curing oven. Adding additional moisture from the tank system to the oven air would result in humidification, drying and curing problems. FCA professionals responsible for the E-Coat operation have indicated that this option is not technically feasible. The current thermal oxidizer used to abate the E-Coat oven also provides the heated air to dry the vehicles in the oven. The oven thermal oxidizer does not have the capacity to accommodate an increase in air flow from the tank exhaust and routing the moist tank air to the oven would tax the drying system and jeopardize energy efficiency.

On this basis, FCA determined that it is not technically feasible to rely on the existing control system for tank VOC emissions reductions and, therefore, the analysis requires the inclusion of a new oxidizer to realize such control. FCA completed a cost analysis to determine the dollar per ton value associated with a new thermal oxidizer. The VOC input used in the cost analysis was determined by looking at the VOC emissions contribution from E-Coat relative to the total facility wide emissions. E-Coat contributes approximately 2.45 percent of the total VOC emissions. Using this same percentage in relation to the proposed FPI allowable VOC emission level of

995.8 tpy, E-Coat's emissions available for control are 24.4 tons VOC/year. This value is considered conservative since it also includes the total VOC emissions from the E-Coat oven which are already controlled and would not be addressed with a new oxidizer. The BACT cost analysis indicates the annual cost per ton VOC control cost is $14,859, which is considered cost prohibitive.

STEP 5: Select BACT.
BACT for the existing E-Coat operation at JNAP has been determined to be operation with oxidation add-on control for the E-Coat oven. Based on the above cost, it was determined that add-on control on the E-Coat tank is cost prohibitive and the E-Coat tank will operate with no add-on control.

Tutone Operations
The tutone booth would apply both basecoat and clearcoat to a portion of the vehicles. The proposed booth would rely on VOC emission controls on both the booth and oven exhaust. Due to the limited number of tutone specific limits and the fact that tutone typically relies on the same basecoat and clearcoat technology employed by topcoat (it is typically considered part of topcoat in regulatory programs), FCA referred to the topcoat technologies and control profiles for this analysis.

STEP 1: Identify All Control Technologies.
There are three key aspects to defining BACT for emission reductions control technologies from tutone surface coating operations as follows:

1) Coating Materials. Through a review of the RBLC and recently issued permits for assembly plants, FCA has determined that evaluated topcoat (or tutone) materials have consisted of the following:

- Solvent-borne High Solids, Basecoat and Clearcoat.
- Solvent-borne Low Solids, Basecoat and Clearcoat.
- Water Borne, Basecoat and Clearcoat.
- Powder.

2) Topcoat/Tutone Coating Application Methods. Application technologies for topcoat/tutone materials consist of the following:

- High Volume (HV) Electrostatics.
- Low Volume (LV) Electrostatics.
- HV Low Pressure.
- LV Low Pressure.
- Air atomized.

The above application methods can be performed with either robotic or manual application methods. Coating technologies such as flow coating, dip coating, airless spray, roll coating, and thin film atomized technologies have all proven to be technically infeasible for spray application of topcoat materials to automobiles and light duty trucks primarily due to market driven quality objectives.

3) Topcoat/Tutone Add-on Controls. Add-on controls available for topcoat/tutone booths include the following:

- Thermal Oxidation (90-99 percent).
- Catalytic Oxidation (90-99 percent).

- Carbon Adsorption (or VOC concentrators) (90-95 percent).
- Condensation (50-85 percent).

STEP 2: Eliminate Technically Infeasible Options.
1) Materials. FCA is proposing to rely on solvent-borne basecoats and a solvent-borne clearcoat in the tutone booth to maintain consistency with the materials and coating quality from the current JNAP coating operations. Based upon the proposed coating materials, FCA considered whether there were technically feasible lower emitting materials that could be used in the proposed tutone operations. As described, FCA is proposing the use of a system which incorporates one or two basecoat colors and solvent-borne clear coat. The reason this system is being proposed is because the topcoat operations in the existing paint shop and proposed tutone coating line must produce a vehicle coating quality that is consistent. In order to accomplish this objective, the booth structure, paint delivery/application system, air handling and booth set up must be relatively close to the same as the current coating application equipment. As a result, no further consideration is given to coating material technology in this analysis.

2) Application Technologies. FCA is proposing to rely on robotically operated applicators with the majority being high volume electrostatics that includes some bell technology. There are currently no plans for routine use of manual application to address cut-ins etc. (i.e., the booth would be entirely automated) except for emergency circumstances. This application method provides the greatest TE of the available coating technologies within the automobile and light duty truck industry.

3) Add-on Controls. All add-on controls identified are technically feasible.

STEP 3: Rank Remaining Control Technologies by Control Effectiveness.
As noted, the topcoat materials must be identical to the current paint shop topcoat materials, and the most efficient application methods, robotic electrostatics, and bell technology, would be used. Hence, the only remaining step for ranking is related to the add-on controls. Thermal oxidation is considered the most efficient add-on control and the one that FCA is proposing for use on the tutone operation. Emissions from the booths would be cascaded/recirculated and the exhaust would be directed to a concentrator followed by a thermal oxidizer. The tutone oven exhaust would be routed directly to an oxidizer.

STEP 4: Evaluate Most Effective Controls and Document Results.
FCA would control the booth portions of the tutone application zone, the heated flash-off zones and tutone bake oven. Accordingly, since concentrator/thermal oxidation systems are the most efficient emission reduction technique available in terms of add-on controls, there is no need to consider BACT further for the tutone booth and oven.

Controlling the observation zones for the proposed tutone operation was also evaluated. The VOC emissions from the two observation zones in the proposed tutone line are 6.7 tpy and have exhaust flow rates in excess of 200,000 cfm. The proposed concentrator and oxidizers for the line do not have the capacity to accommodate this extra flow rate and are limited to the size based on the building infrastructure (an existing underground tunnel used by the former control system would be used to route the new tutone booth exhaust to the abatement building). Therefore, a separate concentrator/oxidizer would be required just for the exhaust of the 6.7 tpy of VOCs from the observation zones. The analysis demonstrated costs of $398,832/ton of VOCs controlled from the observation zones, which is considered cost prohibitive.

STEP 5: Select BACT.
FCA has determined the use of thermal oxidation control on the proposed tutone booth and oven represent BACT, followed by incorporation into the FPI limit applicable to JNAP (i.e., FCA is not requesting an increase to the FPI limits).

Existing Topcoat Color Lines
There are three existing topcoat Color lines at JNAP. Each spray booth relies on emission controls where bell applicators are used as well as VOC emission controls on the oven exhaust. For those portions of the spray booths that remain uncontrolled (the robotic zones that were formerly manual application zones), FCA evaluated whether additional emission reductions could be achieved through the use of add-on emission reduction technologies.

STEP 1: Identify All Control Technologies.
FCA recognizes that there are three key aspects to defining BACT for emission reductions control technologies from the existing topcoat operations as follows:

1) Coating Materials.
2) Coating Application Methods.
3) VOC Control.

Each one of these is addressed below for the existing topcoat operations at JNAP.

1) Topcoat Materials. Through a review of the RBLC and recently issued permits for assembly plants, FCA has determined that evaluated topcoat materials have consisted of the following:

- Solvent-borne High Solids – Basecoat and Clearcoat
- Solvent-borne Low Solids – Basecoat and Clearcoat
- Water Borne – Basecoat and Clearcoat
- Powder

2) Topcoat Application Methods. Application technologies for topcoat materials consist of the following:

- High Volume (HV) Electrostatics.
- Low Volume (LV) Electrostatics.
- HV Low Pressure.
- LV Low Pressure.
- Air atomized.

The above application methods can be done with either robotic or manual application methods. Coating technologies such as flow coating, dip coating, airless spray, roll coating, and thin film atomized technologies have all proven to be technically infeasible for spray application of topcoat materials to automobiles and light duty trucks primarily due to market driven quality objectives.

3) Topcoat Add-on Controls. Add-on controls available for topcoat booths include the following:

- Thermal Oxidation (90-99 percent).
- Catalytic Oxidation (90-99 percent).
- Carbon Adsorption (or VOC concentrators) (90-95 percent).
- Condensation (50-85 percent).

STEP 2: Eliminate Technically Infeasible Options.
1) Topcoat Materials. As noted above, FCA relies on solvent-borne basecoats and a solvent-borne clearcoat in the color booths at JNAP. This coating technology system is part of the overall design at JNAP and the paint shop is structured to accommodate the materials and coatings currently used in the paint shop. Emission reductions that could be achieved by converting the basecoat portion of the topcoat system to a waterborne system would require a complete replacement of the booths with structures and materials that would accommodate waterborne coatings. As such, no further consideration is given to the topcoat materials planned for use in the existing color lines as they are typical solvent-borne materials.

2) Application Technologies. FCA relies on robotically operated applicators with the majority being high volume electrostatics that includes bell technology. As noted, JNAP booths rely on robotic and reciprocating electrostatic bell applicators technology. FCA routinely updates coating applicators as coating quality and technology updates allow, for example, when technology issues warrant it (i.e., new software compatible systems are needed) or when improvements in efficiency can be realized. As part of the sustainment activities, FCA anticipates replacing the current coating applicators with what are anticipated to be more efficient applicators that rely on updated software systems. It should be noted that specific TE are dynamic in that each vehicle configuration (e.g., new model years) and coating may have slightly different overall TE. Hence, this analysis does not attempt to identify actual TE percentages at other facilities due to the variance that occurs in TE over time. Accordingly, there is no need to complete the remaining steps of the BACT analysis for coating application technology, as FCA employs equipment that is designed to yield surface coating's state of the art transfer efficiencies.

3) Add-on Controls. All of the add-on controls identified are technically feasible.

STEP 3: Rank Remaining Control Technologies by Control Effectiveness.
As noted, the topcoat materials in the existing booths will continue to use solvent-borne technology and the most efficient application methods, robotic electrostatics, and bell technology, will also be used. The remaining step for ranking is related to add-on controls. Whether there is an effective method to increase the emission reduction potential of the existing systems such that BACT would dictate a change and the FPI limits would need to be adjusted is the basis for considering control of the booth sections that are currently uncontrolled.

FCA evaluated the viability of using the current exhaust system in the topcoat booth and the current emission control system (concentrators/oxidizers for booths and oxidizers for ovens) to control the robot zones of the existing booths. The large exhaust air flow rates from the JNAP booths lends itself to using the concentrator/oxidizer type of control; however, the current system (both duct work and control equipment) do not have the capacity to accommodate the additional volume of air. In order to reduce these exhaust rates, the booths would require a complete reconfiguration to allow for recirculation of the air. Performing this reconfiguration would require a protracted production downtime, resulting in this option being so costly that FCA did not consider this option any further.

Therefore, controlling the robot zones of the booth exhaust directly with new thermal oxidation is considered the most efficient in terms of control. Considering the large air volume, it is much more cost effective to concentrate the VOCs and then route a smaller portion of air to an oxidizer, similar to the current system. Accordingly, FCA considered this approach in Step 4 below.

STEP 4: Evaluate Most Effective Controls and Document Results.
FCA evaluated the potential for routing the uncontrolled portions of the existing booth exhaust to VOC controls and determined that the costs associated with adding separate new controls would prove cost prohibitive. The analysis demonstrated costs of $22,626/ton of VOCs controlled.

The cost analysis is specific to JNAP and what would be involved to ensure that the existing booth configurations and the exhaust could be directed to new control devices on the roof and near the topcoat booths. The USEPA has provided spreadsheets used to perform the cost analysis. These spreadsheets have been used for the cost analysis for the scenario where the current uncontrolled exhaust is routed to a concentrator followed by an oxidizer. The capital costs included in these spreadsheets are based upon the estimates specific to JNAP. The key criteria used in this cost analysis are as follows:

- The VOC emissions available to be sent to abatement equipment were estimated to be 366 tpy.
- The exhaust flow rate of the uncontrolled portion of the booth is 626,000 cfm.
- A concentrator would be used to capture 90 percent of the VOCs (90 percent of 366 tpy) and reduce air flow to an oxidizer to 10 percent of the total exhaust (626,000 cfm to 62,600 cfm).
- The oxidizer would be capable of 95 percent destruction of the VOCs from the concentrator (95 percent of the 329.4 tpy).
- Each control device and associated equipment would have a 20-year life.

In addition to reviewing the control of <u>all</u> uncontrolled portions of the existing topcoat line, other control scenarios were evaluated, including:

1) Individual Topcoat color spray booths. The most cost effective scenario for controlling a single booth is to control the highest VOC tpy with the lowest flow rate, which is represented by controlling either the Color 1 or Color 2 booth zones that are currently uncontrolled. These have potential emissions of 91.13 tpy of VOC each and exhaust flow rates of 77,000 cfm. The analysis demonstrated costs of $23,090/ton of VOCs controlled for either of these zones individually, which is considered cost prohibitive.

2) Topcoat Color 1 and Color 2 spray booths combined. Combined, these spray booths have potential VOC emissions of 182.26 tpy and a combined exhausted flow rate of 154,000 cfm. The analysis demonstrated costs of $15,841/ton of VOCs controlled from the combined booths, which is considered cost prohibitive.

The exhaust flow rate for the Color 3 spray booth is higher (150,000 cfm) than for the other color booths; therefore, the cost to control Color 3 with either Color 1 or Color 2 would be higher than for the combined Color 1/Color 2 scenario and would also be cost prohibitive.

3) Tutone Booths and Observation Zones combined. Since the proposed concentrator/oven for the tutone booths cannot accommodate the additional flow rate of the observation zones, the alternative to controlling the combined emissions from the tutone booths and observation zones would be to install a system similar to that described for the topcoat system with a roof-mounted concentrator and an oxidizer. This design would require structural reinforcement of the roof and other additional installations (e.g., power feed lines, gas feed lines). The analysis demonstrated costs of $37,146/ton of VOCs controlled for this scenario, which is considered cost prohibitive.

4) Abate tutone booths, observation zones, and Color 1/Color 2 booth zones. The VOC emissions from all of the proposed tutone process and the Color 1/Color 2 booth zones is approximately

305 tpy. The least cost design for this scenario would be to use the existing infrastructure for the tutone booth & oven and locating concentrators for the tutone observation zones, Color 1, and Color 2 booth zones, and a separate oxidizer. The analysis demonstrated costs of $24,229/ton of VOCs controlled for this scenario, which is considered cost prohibitive.

Based on the above information and the cost analyses performed, FCA concluded that BACT for the topcoat at JNAP is the continued use of concentrators and thermal oxidation as they are currently configured to control VOCs.

Purge/Clean

Expected performance is measured in calculated tons of VOC emitted per 1,000 vehicles. Some have been evaluated as part of a facility's BACT review, but few are included as permit limits. Recent permitting actions for solvent cleaning and purge operations (i.e., recent BACT analyses in Michigan) for automotive assembly operations have suggested that the review include an evaluation of emission rates that represent tons or pounds of VOC per vehicle (or per 1,000 vehicles) produced.

Due to the uniqueness of each facility and the associated cleaning operations, FCA has concluded that the most appropriate approach for solvent cleaning and purge used in the tutone operation is based upon the use of low VOC materials (where applicable), implementation of appropriate work practices (including waste management practices) and capture of solvent based purge followed by controls being operated when purging occurs.

FCA also has determined that a pound per vehicle value varies widely because the emissions from solvent cleaning operations are not directly dependent upon vehicle production. Relatively constant amounts of booth and equipment cleaning are required whether production volume is high or low. Assembly plants also use production down time to perform deep cleaning operations. For the tutone and topcoat operations, cleaning would occur even when the demand for tutone or nontutone vehicles may be low. Historically, JNAP has VOC emissions in a range slightly less than 0.6 tons per 1,000 vehicles. While the additional tutone booth would impact this value, the fact that the tutone booth would essentially be 100 percent controlled would serve to reduce purge and cleaning emissions.

Accordingly, the BACT for purge and solvent cleaning at JNAP is best defined as reclaiming solvent-based purge materials, where appropriate, and implementing work practice standards to minimize VOC emissions from solvent cleaning operations. FCA currently implements work practice standards to minimize emissions and capture purge for reclamation. Therefore, the FPI limits do not require adjustment as a result of the above BACT demonstration for purge and cleaning operations at JNAP.

BACT for tutone purge/cleaning operations is to collect solvent-borne purge materials in the purge collection system, to control solvent-borne purge materials used in the booth portions during operation when not captured in the purge collection system, and work practice standards. BACT for existing purge/cleaning operations is to continue existing work practice standards and capturing solvent-borne purge materials for reclamation.

Rapid Reprocess Operations

The rapid reprocess operations are directly impacted by process quality assurance and quality control programs within the industry. VOC emissions from repair operations are dictated by the type of repair required (i.e., E-Coat repair versus topcoat) the size of repair, and the VOC content and usage rates of the repair materials. FCA did not identify any new technologies for repair operations that would lower VOC emissions beyond what is used in the current repair operations. Accordingly, the repairs to the vehicle must be identical in order to produce a quality coating on the vehicle planned for production. BACT for repair operations in many recent permits has been established as the use of coatings containing no more than 4.8 lbs VOC/gallon. The coatings used in the repair operations would have average VOC contents below the 4.8 lbs/gallon level and total emissions are expected to be approximately one tpy of VOCs. As a result, the rapid reprocess operation satisfies BACT and the current FPI VOC limits do not warrant adjustment to account for any changes to the rapid repair operation.

Fluid/Fuel Fill Operations

BACT for fuel fill operations is based upon the production levels for each facility since introduction of gasoline into fuel storage tanks followed by dispensing into vehicles are a function of stage I (storage tank filling) and stage II (vehicle dispensing) VOC emission controls. The majority of permits reviewed for gasoline fill operations did not contain specific limits since the majority of these operations are similar and emissions are dependent upon production levels. All of the most recent permits noted that Stage II emission controls have been replaced by the use of on-board recycling and vapor recovery (ORVR) systems. ORVR systems typically provide 95 percent or greater control of VOCs and nearly 100 percent of vehicles produced in the US now employ ORVR.

For gasoline storage tanks, BACT has been defined as the use of submerged fill and a vapor balance system. All of the permits reviewed suggested that this technology was being used and emission rates were not usually included (tank sizes were noted, but emission levels were not). FCA incorporates these technologies at JNAP for gasoline storage tanks as well as the ORVR system on the vehicles produced there. Based upon the above BACT demonstration for fuel filling operations, FCA believes that the FPI limits should not be reduced for fuel filling since the current system constitutes BACT.

Washer Fluids

Similar to gasoline fill, the VOC emissions from use of windshield washer fluid fill are a function of the vehicle production level. These operations are typically not controlled but will employ submerged fill for tank filling operations. A review of the various permits suggests that VOC emission limits are typically not included in permits and that BACT or LAER for fluid fill operations is essentially the same across the industry since the fluid is most often methanol and must meet certain physical parameters. Based upon the filling of small containers on the vehicle, FCA did not identify any emission reduction techniques that would constitute BACT beyond what FCA currently uses at JNAP. Accordingly, adjustment of the FPI VOC limits are not warranted as a result of washer fluids.

Tanks

Emissions of VOCs from storage tanks for gasoline used in vehicles are dependent upon the physical characteristics of the tank, the location of the tank (i.e., which part of the country) and the proposed throughput. Accordingly, emissions from storage tanks are not typically included as part of a BACT demonstration other than for the proposed vapor balance/control systems and the Reid Vapor Pressure (RVP) of the gasoline. The existing storage tanks all rely upon submerged fill and vapor balance in accordance with EGLE, AQD’s Part 7 regulations. As a result, FCA believes that for tanks of a similar size and in a similar location, BACT is the reliance on the Part 7 requirements. No other technologies or emission reduction techniques were identified for storage tanks. Other storage tanks are used for windshield washer fluid (methanol), brake fluid, engine coolant and refrigerants.

For the methanol storage, the same submerged fill and vapor balance system as gasoline is used. For those materials with low volatility (brake fluid and engine coolant) only submerged fill is relied upon since emissions will be minimal. Refrigerants are stored in pressurized containers which do not result in emissions. FCA requires all shipments be completed with tankers that are equipped with Stage I vapor controls.

For purposes of the BACT analysis related to storage tanks other than for gasoline, the same concepts apply in that the materials are relatively standard across the industry and emission levels are dependent upon the location of the facility geographically and the weather conditions throughout the year. Emissions from these tanks are in the pounds per year range and therefore, are typically not addressed in permits with specific limits.
Accordingly, FCA has stated that BACT is represented by the current tank systems and no adjustment to the FPI limits are warranted as a result of the tanks at JNAP.

Body Solvent Wipe
The body solvent wiping process involves pre-moistened wipes stored in containers that minimize evaporative losses of VOCs. These containers can be closed when not in use. Solvent wiping occurs in uncontrolled booths or areas of the facility and as a result, essentially all VOCs are assumed to evaporate. BACT for these operations are essentially the same across the industry and nearly all plants use containerized, single use wipes. FCA estimates wipe emissions at JNAP have historically been roughly 0.17-0.2 lbs/vehicle for solvent wipes. These materials are usually included in the purge and cleaning solvent category and could be considered part of the BACT demonstration identified for purge and cleaning materials as well. The sustainment operations and the addition of a tutone booth should have minimal impacts on the solvent wipe operations. Currently, FCA knows of no specific methods to reduce solvent wipe emissions beyond what is currently being done at the facility. Accordingly, BACT for solvent wipe does not warrant an adjustment of the current FPI levels.

Glass Installation
Glass installation involves the use of primer and wiping materials prior to installation with adhesives. Due to safety requirements, these materials are standard across the industry. The use of alternative materials is generally considered difficult if not impossible and, the use of emission controls is not warranted due to the low level of VOC emissions from this operation. As a result, FCA determined that BACT for VOCs is represented by the current materials and operation and the FPI limits should not be adjusted based upon glass installation.

VOCs from Natural Gas Combustion Sources
The natural gas combustion sources that are proposed to support the new automotive assembly line consist of:

- Tutone RTOs.
- Tutone Ovens.
- Tutone ASH and Heated Flash.
- Tutone Concentrator Desorption Heater.
- ASH for rapid reprocess and the new building bump-out.
- Air Handling Units for the new building bump-out.

VOCs generated from combustion sources are limited to products of combustion of natural gas. FCA did not identify any lower emitting fuels or burner configuration technologies that would reduce VOC emissions from the proposed and existing natural gas combustion sources, FCA has determined that the use of natural gas as fuel in these units constitutes BACT based upon USEPA's AP-42 Compilation of Air Emission Factors, which is considered a widely acceptable emission rate for VOCs from natural gas combustion. The FPI limits should not be adjusted based upon the fact that there are no further opportunities to reduce VOC emissions from natural gas combustion.

Flexible Permit BACT

The FPI limits are being amended to address the tutone VOC emission controls. Included in the application is a demonstration that the FPI limits are appropriate based upon the applicability of Rule 702 to both the new and existing emission sources. FCA's proposed sustainment activities and the addition of the tutone operation include the use of VOC emission reduction techniques that are equivalent to BACT for the existing operations and the new operations on an emission unit specific basis.

The following section provides a demonstration as to the continued applicability of the FPI limits from a facility wide basis. The current FPI emission limits applicable to the VOC sources at JNAP consist of a ton per year limit and a pound per job limit as noted below.

Table 7: Existing FPI Conditions for JNAP

Pollutant	Limit	Time Period/Operating Scenario
VOC	1085.8 tpy	12-month rolling time period as determined at the end of each calendar month
VOC	4.8 lb/job	12-month rolling time period as determined at the end of each calendar month

FCA evaluated the various FPIs from the most recent permits issued and the applicable annual and pounds VOC per job limits. The table below presents a summary of the various FPI limits FCA used for this comparison:

Table 8: Michigan FPI Limits

Source	Date of Permit Issuance	FPI Limit (lbs VOC/job)	VOC Emission Limit (tpy)
GM Lansing GR Assembly	3-13-06	5.73	264.3
GM Orion Assembly	2-26-10	4.6	748.5
GM Flint Assembly	3-31-14	4.8	649.6
FCA Sterling Heights	1-4-11	4.5	673.2
FCA JNAP	4-19-10	4.8	1085.8
Ford Dearborn Assembly	1-24-07	4.8	897
Ford Michigan Assembly	1-8-09	4.8	903
Ford Flat Rock Assembly	11-23-10	4.8	732
FCA Mack (DACM)	4-26-19	3.0	381.1
GM Detroit-Hamtramck	6-17-20	3.0	329.9

In addition, pound per job limits were identified for the Toyota facility in Georgetown, Kentucky and are included in the following table. Note that the limits add up to greater than the most recently issued FPI levels listed for Michigan and do not include all VOC sources.

Table 9: Toyota Georgetown Permit Limits

Source	Date of Permit Issuance	FPI Limit (lbs VOC/job)	VOC Emission Limit (tpy)
Topcoat	11-26-13	3.54	NA
E-Coat	11-26-13	0.116	NA
Primer (Guidecoat)	11-26-13	1.026	NA
Sealer	11-26-13	0.8	NA
TOTAL		5.482	

FCA also considered PAL permits which are included in the table below. As can be seem from the table, PAL permits are generally developed based upon historic baseline emission levels and are not necessarily driven by BACT or LAER. Therefore, the limits in PAL permits when compared on a pound per job basis, are generally higher.

Table 10: VOC PAL Permit Limits

Source	Date of Permit Issuance	PAL VOC Limit (tpy)	Equivalent lb VOC/job
Ford Kansas City Assembly	2009/renewed in 2018	2,353	NA
BMW South Carolina	9-8-09	855 tpy, <324,000 jobs	5.28

As can be seen from the above tables, the FPI VOC limits associated with the JNAP facility are in the range of those for existing sources. FCA recognizes that the most recent permitted facilities are Mack and GM Detroit-Hamtramck (Hamtramck) and that the FPI limits were established at 3.0 lbs/vehicle. However, these facilities are still under construction and will be water-based topcoat facilities with recirculated booths and full abatement of those booths. JNAP is an existing solvent-borne topcoat facility with three main coating lines and VOC controls on a significant portion of the booths and ovens. The booth air flow configuration and the topcoat chemistry employed at Mack and Hamtramck are not comparable to that of JNAP, and, therefore, the pounds per job limits are also not comparable (see the Topcoat BACT analysis for further discussion).

The highest VOC emission levels at the JNAP facility, based on the 12-month rolling average for the last four years are presented in the following table:

Table 11: JNAP Past Actual Emissions

Year	VOC (tpy)	VOC (lb/job)
2015	693.6	3.87
2016	733.3	4.06
2017	763.1	4.42
2018	809.3	4.33

Based on the BACT evaluation performed and the historical performance of the JNAP facility, the following VOC limits have been proposed as meeting BACT.

Table 12: Proposed FPI Conditions for JNAP

Pollutant	Limit	Time Period/Operating Scenario
VOC	995.3 tpy	12-month rolling time period as determined at the end of each calendar month
VOC	4.4 lb/job	12-month rolling time period as determined at the end of each calendar month

- **Criteria Pollutants Modeling Analysis**

PM2.5 and NOx

Computer dispersion modeling was performed to predict the impacts of air emissions from NOx and PM2.5. Emissions from the stationary source for each project were evaluated against both the NAAQS and the 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. FCA provided a separate modeling analysis for the Mack and JNAP projects. Although submitted separately with individual impact grids, both modeling analyses were evaluated with identical emission rates and had overlapping grids so that the entire area surrounding the stationary source was included.

Since PM2.5 and PM10 have been assumed to be the same for both projects, the modeling for PM2.5 can also be applied to PM10 since the PM10 NAAQS and increments have higher thresholds than those for PM2.5.

Both modeling analyses had project impacts greater than the SILs and were then evaluated against the respective NAAQS and PSD increment levels. The following two tables contain the modeling results for JNAP:

Table 13: PSD Increment Modeling Results for JNAP

Pollutant	Averaging Time	PSD Increment ($\mu g/m^3$)	Predicted Impact ($\mu g/m^3$)	Below Increment?
PM2.5	Annual	4	1.05	Yes
PM2.5	24-hr	9	3.93	Yes
NO2	Annual	25	12.96	Yes

Table 14: NAAQS Modeling Results for JNAP

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)	Predicted Impact ($\mu g/m^3$)	Percent of NAAQS (%)
PM2.5	Annual	12	10.80	90.0%
PM2.5	24-hr	35	32.40	92.6%
NO2	Annual	100	41.96	42.0%
NO2	1-hr	188	181.82	96.7%

The modeling analyses show that each project would meet all PSD increments and NAAQS.

- **Additional Criteria Pollutants Analysis**

CO and SO_2

The AQD's Policy and Procedure document, AQD-022, was evaluated with respect to Dispersion Modeling for Federally Regulated Pollutants. For SO_2, the emissions for each project are less than 25 percent of the SER and, therefore, are not expected to have any impact on the PSD increment or NAAQS and no demonstration is required. Additionally, the emissions of CO for each project are less than its SER and are not expected to have any impact on the PSD increment of NAAQS and no further analysis is required.

Key Aspects of Draft Permit Conditions

- **Emission Limits (By Pollutant)**

The proposed JNAP permit includes the following emission limits:

- Automotive stamping, assembly, and painting operations: VOC, PM, PM10, PM2.5, NOx, CO, and SO_2.
- Automotive coating operations: Organic HAPs.

The proposed flexible limits are in Table 15 below.

Table 15: Proposed FPI Emission Limits for JNAP

Pollutant	Proposed Flexible Emission Limit
VOCs	995.3 tpy
VOCs	4.4 pounds per job
PM10	42.4 tpy
PM2.5	42.4 tpy
NOx	133.4 tpy
CO	97.0 tpy
SO_2	3.4 tpy

In addition to the reduction in VOCs discussed in the BACT section of this document, FCA has proposed decreased NOx and CO emissions based on a reduction in natural gas usage at the facility.

- **Usage Limits**

The proposed JNAP permit includes the following usage limits:

- The total use of natural gas per 12-month rolling time period would be limited to 3,000 million standard cubic feet per year.
- Existing limits for No. 2 fuel oil (160,340 gallons per 12-month rolling time period) and sulfur content of No. 2 fuel oil (0.3 percent by weight) have been carried forward.

- **Process/Operational Restrictions**

The proposed JNAP permit includes the following restrictions:

- The tutone process must be added to the existing Operation and Maintenance Plan.
- The proposed permit restricts the fuel that may be burned in all new natural gas sources to pipeline quality natural gas.

- **Federal Regulations**

The proposed permit contains requirements that will be used to demonstrate compliance with the following federal regulations:

- 40 CFR Part 60, Subpart MM, Automobile and Light Duty Truck Surface Coating Operations. Under the FPI format, the performance levels for the E-Coat, primer, and topcoat (including the proposed tutone) processes have been incorporated into the overall VOC and pounds of VOC per job limits for Mack. The permit specifies that compliance with these limits will constitute compliance with the NSPS.
- 40 CFR Part 63 Subpart IIII for Surface Coating of Automobiles and Light Duty Trucks for the automotive surface coating operations. Based on the definition of "new" as written in

the subpart and the combining of the JNAP and Mack assembly lines into the same stationary source, both JNAP and Mack are considered “existing” sources and will be subject to the HAP limits as designated for existing stationary sources. The proposed surface coating operations would comply with the standards for existing sources without the use of add-on control devices.

- **Emission Control Device Requirements**

The proposed JNAP permit includes the following emission control device requirements:

- RTO for the control of VOC emissions from the following equipment:
  - Tutone spray booths, flash-off zones, and curing ovens.
  - Solvent-borne purge materials used in the primer and topcoat spray booths and not captured in the purge recovery system.
- Low NOx burners must be installed on all natural gas-fired units associated with the new tutone operation, rapid repair operation, and building additions, to minimize NOx emissions.
- Water wash and/or dry filter particulate control systems to control PM, PM10, and PM2.5 emissions from:
  - Tutone spray booths controlled by a water wash system and an additional dry filter abatement filter house before the concentrator
  - Dry filter particulate control system on the rapid reprocess repair booths

- **Testing & Monitoring Requirements**

The proposed JNAP permit includes testing requirements for the following:

- VOC, PM, PM10, PM2.5, and NOx emission rates from emission units associated with the proposed new tutone line.
- PM, PM10, and PM2.5 emission rates from the rapid reprocess operation.
- Transfer, capture, removal, and destruction efficiencies of the tutone coating operation.
- PM, PM10, and PM2.5 from existing sources.
- NOx and CO from the existing boilers.
- Transfer, capture, removal, and destruction efficiencies of existing coating operations.

The proposed permit includes monitoring requirements for the following:

- Desorption gas inlet temperature of the concentrator and the operating temperature of the RTO associated with the tutone operation on a continuous basis.
- Paint-coating-solvent usage and natural gas usage on a monthly basis as part of the flexible permit recordkeeping requirements.
- Natural gas and No. 2 fuel oil usage as part of the flexible permit recordkeeping requirements.

<u>Conclusion for PTI Application Nos. 14-19A and 33-20</u>

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

Based on these conclusions, AQD staff has developed proposed 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 applications are 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 Thompson, AQD, at 517-582-5095 regarding either application.

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 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 TAC must use 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 USEPA risk assessment guidance.
R 336.1279 to R 336.1291	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 336.1301	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	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 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.
R 336.1911	When requested by the Department, a facility must develop and submit a MAP. This plan is to prevent, detect, and correct malfunctions and equipment failures.

State Rule	Description of State Air Regulations
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.
R 336.2801 to R 336.2804 PSD Regulations **Best Available Control Technology (BACT)**	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 NAAQS. The regulations define what is considered a large or significant source, or modification. 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. 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.
R 336.2901 to R 336.2903 and R 336.2908	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 PTE TE large amounts of air pollutants. To help the area meet the NAAQS, the applicant must install equipment that achieves the 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. 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.

FEDERAL AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
Section 109 of the Clean Air Act – NAAQS	The USEPA 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 CO, lead, nitrogen dioxide, ozone, PM10, PM2.5, and SO_2. Portions of Michigan are currently non-attainment for either ozone or SO_2. 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 State Implementation Plan (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.
40 CFR 52.21 – PSD Regulations **Best Available Control Technology (BACT)**	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. 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. 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.

Citation	Description of Federal Air Regulations or Requirements
40 CFR 60 – NSPS	The USEPA has set national standards for specific sources of pollutants. These 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.
40 CFR 63— NESHAP	The USEPA has set national standards for specific sources of pollutants. The 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.
Section 112 of the Clean Air Act **Maximum Achievable Control Technology (MACT)** **Section 112g**	In the Clean Air Act, Congress listed 189 compounds as HAPS. For facilities which emit, or could emit, HAPS above a certain level, one of the following two requirements must be met: 1) The USEPA 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 "PTI," 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.

Appendix 2
Lowest Achievable Emission Rate (LAER) Analysis
(Michigan Rule 336.2908(3))

A requirement of Major Source NNSR is a LAER analysis. LAER is normally expressed as an emission limit. The limit is arrived at through an evaluation of materials used, operating practices, and potential add-on air pollution control equipment. Unlike a BACT review, a LAER analysis does not typically include an energy and economic evaluation component. LAER is defined as the most stringent emission limit either achieved in practice by a similar source or contained in a State Implementation Plan (SIP) for a similar source category.

The LAER analysis was updated by FCA for the proposed modifications. One new determination was made as a result of the updated analysis; the two 350-HP emergency engines were evaluated for LAER as there are categorical differences between emergency engines less than 500-HP and emergency engines greater than 500-HP. The remaining LAER analyses resulted in the same determinations as from the previous evaluation for PTI No. 14-19.

LAER is normally expressed as an emission limit. The limit is arrived at through an evaluation of materials used, operating practices, and potential add-on air pollution control equipment. LAER is defined as the most stringent emission limit either achieved in practice by a similar source or contained in a SIP for a similar source category.

FCA completed a review of all 50 states' SIPs, state permits issued for similar sources, and the USEPA's RBLC.

FCA addressed the main coating operations in a similar manner to previous BACT analyses, with the emphasis on emission rates from the same type of coating operation and less emphasis on the specific emission reduction technologies used. Please note that FCA proposed to install a RTO for control of a large majority of the coating operations for the assembly line. Below is the LAER demonstration for the various VOC sources planned for the project.

- **E-Coat**

The proposed E-Coats are low VOC waterborne materials, which are the industry standard. FCA is not aware of any coating materials that would provide additional VOC reductions beyond those which are currently used in the industry. Powder coatings applied via spray technology would be lower emitting, but this type of application does not provide the overall coverage of recessed areas that is needed for the protective, corrosion resistant initial coating of the vehicle body. No other types of coatings are available that would reduce VOC emissions further than what FCA is proposing to use in the E-Coat process.

FCA reviewed the various SIPs and state regulations and did not find any limit more stringent than were included in previous automotive assembly line permits. Based on those permits, FCA has determined that LAER for E-Coat processes is the use of thermal oxidation to control VOCs from the E-Coat tank and oven with a resultant emission rate of 0.04 lbs VOC per gallons of applied coating solids (GACS). This emission rate has been established in multiple previous automotive assembly line permits, as listed in the following table:

Historical RBLC and Permit Limits for E-Coat Operations with 0.04 lbs VOC/GACS Limits

Source	Control	Date of Permit Issuance
GM Delta Assembly	Oxidation	9/26/2001
GM Lansing Craft Center	Oxidation	4/2/2002
GM Lansing Craft	Oxidation	2/11/2003
Ford Michigan Truck	Oxidation	4/3/2003
Toledo Supplier Park	Oxidation	9/7/2004
FCA SHAP	Oxidation	4/6/2018
FCA Warren Truck	Oxidation	8/26/2019

The two types of categories of add-on control devices used by automotive and light-duty truck assembly coating operations are combustion (thermal and catalytic oxidation) and recovery (adsorption) to control VOC emissions. FCA has elected thermal oxidation, which is typically considered the most effective control option for VOCs.

FCA is proposing to use waterborne, low-VOC materials and an emission rate for the E-Coat process of 0.04 lb VOC/GACS, with VOC emissions from both the tank and oven portions of the E-Coat process being controlled by a RTO. Based on these values, a proposed annual emission rate of 1.6 tpy of VOCs for E-Coat operations has been calculated. This emission rate is LAER for the E-Coat process and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Primer**

FCA recognized that powder coatings are available for use as primers and have been used with success in the automotive manufacturing industry resulting in essentially zero VOC emissions from this operation. However, based upon extensive experience and various compatibility/quality concerns with the proposed coating system (water and solvent based topcoats) and a lack of compatibility with the proposed coating system, FCA has determined that powder coatings are not feasible for use in this automotive assembly line. The planned vehicle is considered a higher-end, luxury vehicle that requires a higher quality coating. FCA has concluded that the quality coating required is an impediment to the use of powder coatings for this operation. In addition, powder coatings can sometimes result in additional repairs, additional wiping, and film build issues, all of which may result in increased VOC emissions from these other sources.

FCA reviewed the various SIPs and state regulations and did not find any limit more stringent than the limits in RBLC entries and the previous permits reviewed. Based on those permits, including those listed in the RBLC, FCA tabulated the following limits established in automotive assembly line permits:

Historical RBLC Entries and Permit Limits for Primer (Guidecoat) Operations

Source & Location	Date of Permit Issuance	Material(s)	Booth/Oven Control Technology	Permit Limits (lbs VOC/GACS)
Nissan North America (BACT)-Mississippi	4-4-01	Solvent-borne Primer	Oven only – Oxidation	4.1
GM Delta Assembly (BACT) – Michigan	9-26-01	Powder	None	0.10
GM Grand River Michigan	04-2002	Solvent-borne Primer	Oven only – Oxidation	4.1 (converted to 5.2 in 2004)
GM-Lansing Craft Center-Michigan	4-2-02	Solvent-borne Primer	Oven only – Oxidation	5.29
Honda Manufacturing Alabama	10-18-02	Solvent-borne Primer	Oven only – Oxidation	4.1
GM Lordstown Ohio	2-12-04	Powder	None	0.13
Ford Wixom Assembly – Michigan	2-26-04	Solvent-borne Primer	Oven only – Oxidation	7.5
Toyota – San Antonio Texas	6-12-04	Solvent-borne Primer	Oven only – Oxidation	3.46
Nissan – Canton Mississippi	12-1-05	Waterborne Primer	Oven only – Oxidation	4.1
Kia Motors Georgia	6-20-07	Waterborne Primer	Oven only – Oxidation	2.92
Hyundai, Alabama	6-12-12	Solvent-borne Primer	Oxidation on automatics and oven	4.1
Subaru of Indiana	5-19-14	Waterborne Primer	Waterborne Materials – no controls	4.8 lbs/gal
Ford Kentucky Truck	2-19-14	Solvent-borne Primer	Oxidation on Booth and Oven	4.9
Tesla Fremont California	7-9-15	Solvent-borne Primer	Oxidation on Booth and Oven	4.8 (combined guidecoat and topcoat)
Ford Chicago Assembly	6-30-17	Solvent-borne Primer	Booth exterior automatic and oven oxidation	12.0
FCA Warren Truck	8-26-19	Solvent-borne Primer	Oxidation on booth and oven	2.92

FCA has proposed to meet the emission limit of 2.92 lbs VOC/GACS established by Kia Motors Georgia. This will be achieved through the use of high solids solvent-borne materials; robotic electrostatic and bell application technology; and RTO control on the spray booth flash-off area and curing oven portions of the primer application process. FCA has developed a proposed annual emission rate of 41.25 tpy for primer application based on 2.92 lbs VOC/GACS (See the attached emission calculation page). This emission rate is LAER for the primer operations and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Topcoat**

FCA tabulated the following limits established in automotive assembly line permits for the topcoat application process:

Historical RBLC and Permit Limits for Topcoat Operations

Source & Location	Date of Permit Issuance	Booth Control Technology	Oven Controls	Permit Limits (lbs VOC/GACS)
Nissan North America (BACT)-Mississippi	4-4-01	Concentrator & Oxidation on Clearcoat automatic sections	Oxidation	5.2
GM Delta Assembly – Michigan	9-26-01	Oxidation on Clearcoat automatic sections	Oxidation	5.42
GM Grand River Michigan	04-02	Concentrator & Oxidation on Clearcoat automatic sections	Oxidation	5.2
GM-Lansing Craft Center-Michigan	4-2-02	Concentrator & Oxidation on Clearcoat automatic sections	Oxidation	6.6
Honda Manufacturing Alabama	10-18-02	Oxidation on Clearcoat automatic sections	Oxidation	5.2
GM Lordstown – Ohio	2-12-04	Concentrator & Oxidation on Clearcoat automatic sections	Oxidation	6.07
Ford Wixom Assembly – Michigan	2-26-04	Oxidation on Clearcoat automatics	Oxidation	8.00
Hyundai Motor-Alabama	3-3-04	Oxidation on Clearcoat automatics	Oxidation	5.29
Toyota-San Antonio Texas	6-21-04	Carbon followed by Oxidation on Clearcoat automatics	Oxidation	5.2
FCA Supplier Park – Toledo, Ohio	9-3-04	Oxidation on Basecoat Flash Zones and Clearcoat automatics	Oxidation	5.42
GM Flint Assembly	8-29-05	Waterborne Basecoat/Oxidation on Clearcoat automatics	Oxidation	5.5
Nissan – Canton Mississippi	12-1-05	Waterborne Basecoat/Oxidation on Clearcoat automatics	Oxidation	5.2

Source & Location	Date of Permit Issuance	Booth Control Technology	Oven Controls	Permit Limits (lbs VOC/GACS)
Volkswagen, Tennessee	10-10-08	Waterborne Basecoat/Oxidation on Clearcoat automatics	Oxidation	5.2
Kia Motors Georgia	6-20-07	Waterborne Basecoat/Oxidation on Clearcoat automatics	Oxidation	5.2
Hyundai Alabama	6-12-12	WB Basecoat/Oxidation on CC automatics	Oxidation	5.2
Ford Kentucky Truck	2-19-14	3-Wet – Oxidation on Booths and Ovens	Oxidation	3.53
Subaru Indiana	5-19-14	Oven Oxidation Only	Oxidation	10.96 lbs/gal; 10.41 lbs/gal
Tesla Fremont California	7-9-15	Solvent Basecoat & Clearcoat / Oxidation on booths and ovens	Oxidation	4.8 (combined primer and topcoat)
Ford Chicago Assembly	6-30-17	Exterior automatics routed to oxidizer	Oxidation	12.0
FCA SHAP*	4-6-18	Waterborne Basecoat / Solvent Clearcoat / Oxidation on Booths and Ovens	Oxidation	2.32
FCA Warren Truck	8-26-19	Waterborne Basecoat / Solvent Clearcoat / Oxidation on Booths and Ovens	Oxidation	3.53
**lbs VOC/GACS value applies only to coating a truck bed, not the entire vehicle.*				

Based on these values, FCA continued the LAER analysis by reviewing the two lowest values. The Ford Kentucky Truck facility was issued a permit for a new paint shop which included a limit of 3.53 lbs VOC/GACS for topcoat operations and the FCA SHAP facility was issued a permit for a new truck bed coating line with a limit of 2.32 lbs VOC/GACS.

The 2.32 lbs VOC/GACS limit in the FCA SHAP permit was for a new truck bed coating line. Note that this limit applies only to the coating operation for the truck bed, which allows for the use of more efficient application technology in a simpler substrate configuration. It is not a direct comparison to the proposed new assembly line, which will require a more complicated configuration for coating operations due to the application of coatings to the entire vehicle. In addition, the FCA SHAP truck bed coating line is part of a two-paint shop facility, one for the cab of the truck and one for the truck bed. While the cab paint shop is a well-controlled operation for VOC emissions, due to the more complex configuration of the cab in comparison to the box, if the cab and box were considered as one painted unit in terms of lbs VOC/GACS, the value would be higher than the 2.32 limit that applies to the box only.

Based on the lowest value of the most comparable operation, FCA is proposing the new topcoat operation to meet the value of 3.53 lbs VOC/GACS. This value will be achieved by the use of waterborne basecoats and solvent-borne clearcoats, the use of robotic electrostatic and bell application technology coupled with RTO control on the spray booth, flash-off, and curing oven portions of the topcoat application process. FCA has developed a proposed annual emission rate of 137.6 tpy for topcoat application based on 3.53 lbs VOC/GACS (See the attached emission calculations). This emission rate is LAER for the topcoat operations and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Sealers and Adhesives**

Sealer and adhesive materials are generally very low VOC containing materials that are hand applied or pumped from a robotic nozzle applicator to specific locations on the vehicle body. Sealers, low VOC, and waterborne materials are an industry standard and have been widely used across the US.

The various SIPs were reviewed, as well as the Control Techniques Guideline (CTG) for Automobile and Light Duty Trucks issued by the USEPA under Section 183e of the Clean Air Act in September 2008 for existing sources. The SIPs and the CTG did not identify any more stringent limitations for sealers than those identified in RBLC entries or issued permits with specific limits for sealers.

The proposed sealers and adhesives for the new assembly line are low VOC materials. FCA has not identified other available sealers with lower VOC contents that would substantially reduce VOC emissions from this operation. FCA believes this to be the case due to the need for sealers to be viscous enough to be pump-able or hand applied to the vehicle body.

The following table is a summary of the recent RBLC entries, permit limits, and related determinations applicable to sealers:

Historical RBLC Entries and Permit Limits for Sealers

Source & Location	Date	Permit Limits (lbs VOC/Gallon (minus water))
GM Shreveport Assembly – Louisiana	3-24-00	0.5
GM Lansing GR Assembly – Michigan	2-27-00	0.3
Nissan North America - Mississippi	4-4-01	0.3
GM Delta Assembly – Michigan	9-26-01	0.3
FCA Jefferson North – Michigan	12-17-01	0.3
GM-Lansing Craft Center – Michigan	4-2-02	0.3
Honda Manufacturing – Alabama	10-18-02	0.3
GM Lordstown Ohio	2-12-04	0.3
Toledo Supplier Park	9-3-04	0.3
Toyota Texas	6-6-04	0.3
Kia Motors Georgia	6-20-07	0.45
FCA Belvidere Assembly (body shop only) Illinois	9-16-11	0.16 automatic application and 0.25 manual (monthly avg)
Hyundai Motor Alabama	6-12-12	0.3
Ford Kentucky Truck	2-19-14	0.3
Subaru of Indiana	5-19-14	0.38
GM Delta Township – Michigan	5-9-14	0.3
Tesla Fremont California	7-9-15	Included in guidecoat limits for ovens
FCA SHAP (truck bed only) - Michigan	4-16-18	0.25
FCA Warren Truck	8-26-19	0.25 (monthly average)

Based on the above determinations, FCA has determined that LAER for the body and paint shop sealers and adhesives is a VOC content of 0.25 lbs/gal, minus water.

Due to the fact that sealers are low VOC materials and are applied at various stations on the plant floor and/or a variety of areas in the other locations of the facility, emissions tend to be fugitive in nature and it is not technically feasible to control them; thus, there are no add-on VOC controls in previous reviews for this emission source. FCA has developed a proposed annual emission rate of 28.89 tpy for sealer and adhesive operations based on 0.25 lbs VOC/gal, minus water. This emission rate is LAER for the sealer and adhesive operations and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Purge/Clean Materials**

After review of the various SIPs and state regulations with VOC emission limits for purge and cleaning operations, FCA did not identify a SIP limit that was more stringent than the limits contained within the various permits reviewed. The following table provides a summary of RBLC determinations and permit VOC emission limits and control technologies for purge/clean operations.

Historical RBLC and Permit Limits for Purge/Clean Materials

Source & Location	Date of Permit Issuance	Tons VOC per 1000 Vehicles	VOC Emission Limit in Permit (tpy)
GM Lansing GR Assembly	2-27-00	NA	127
GM Delta Assembly	9-26-01	0.55	161.9
Honda Manufacturing Alabama	10-18-02	NA	100
Toyota-Princeton, Indiana	6-27-03	1.85	836.3
GM Lordstown Ohio	2-12-04	0.53	266.7
Toyota San Antonio Texas	6-21-04	1.74	348.4
FCA Toledo Supplier Park	9-3-04	1.18	237.6
Nissan North America	12-1-05	0.75	372.57
Kia Motors Georgia	6-20-07	0.6	NA
VW Tennessee	10-10-08	NA	391
Hyundai Alabama	6-12-12	NA	150
FCA SHAP*	4-6-18	0.2	82.6
Ford Michigan Truck	8-15-18	NA	FPI Limit
FCA Mack (DACM) – Michigan	4-26-19	NA	FPI Limit
FCA Warren Truck New Paint Shop***	8-26-19		69.3
FCA Warren Truck Refurbished Line 1 – Michigan***	8-26-19	1.10	245.1
GM Detroit-Hamtramck – Michigan***	6-17-20		FPI Limit
** The SHAP facility was a truck bed only paint shop*			

The tons of VOC emitted per 1,000 vehicles are calculated values of expected performance. Some have been evaluated as part of a facility's BACT review, but none are included as permit limits except for the FCA SHAP facility.

Due to the uniqueness of each facility and the associated cleaning operations, FCA has concluded that pollution prevention measures, such as in the following list, are more indicative of the approach to lowering emissions from purge/cleaning materials:

- The use of low VOC materials (where applicable).
- Implementation of appropriate work practices (including waste management practices).
- Capture of solvent based purge in a purge collection system.
- RTO control on solvent based purge materials not captured in the purge collection system.

The recently issued PTI for FCA SHAP does include an emission limit of 0.2 tons of VOC per 1,000 vehicles; however, this value is not a direct comparison due to the fact that this limit only addresses the truck bed paint portion of the vehicle, whereas the proposed new assembly line will be for the entire vehicle and will require additional cleaning.

FCA has determined that LAER for purge and solvent cleaning is best defined as using waterborne materials in the basecoat operations, reclaiming solvent-borne purge materials, where appropriate, and implementing work practice standards to minimize VOC emissions from solvent cleaning operations. Solvent-based purge materials will be captured at approximately 60 percent of usage, and any of these materials not captured will be controlled by the RTO control equipment. FCA is not aware of any recycling or collection systems that are more effective at reducing emissions from purge operations.

FCA has developed a proposed annual emission rate of 129.38 tpy based on these pollution prevention measures. This emission rate is LAER for the purge and cleaning operations and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Repair Operations**

FCA reviewed the various SIPs and also the CTG for Automobile and Light Duty Trucks issued by the USEPA under Section 183e of the Clean Air Act in September 2008 for existing sources. The SIPs reviewed and the CTG did not identify any more stringent limitations for repair than those identified in the RBLC or issued permits with specific limits for repair.

Repair operations are directly impacted by process quality assurance and quality control programs within the industry. FCA strives to minimize repairs and believes that the proposed new assembly line will allow for increased control over issues typically resulting in repair. Nevertheless, VOC emissions from repair operations are dictated by the type of repair required (i.e., E-Coat repair versus topcoat), the size of repair required and the VOC content and usage rates of the repair materials. FCA did not identify any new technologies for repair operations that would lower VOC emissions beyond what is used in the current process operations. Accordingly, the repairs to the vehicle must be identical in order to produce a quality coating on the vehicle planned for production. LAER for repair operations is somewhat undefined, but the use of coatings containing no more than 4.8 lbs VOC/gal, minus water as applied for any coatings used has been established as BACT in many recent permits. Nothing more stringent has been identified that would establish LAER beyond this level. FCA has developed a proposed annual emission rate of 2.49 tpy for repair operations based on 4.8 lbs VOC/gal, minus water. This emission rate is LAER for repair operations and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Fluid Fill Operations**

FCA reviewed the various SIPs and also the CTG for Automobile and Light Duty Trucks issued by the USEPA under Section 183e of the Clean Air Act in September 2008 for existing sources. The SIPs reviewed and the CTG did not identify any more stringent limitations for fluid fill operations than those identified in the RBLC or issued permits with specific limits for these operations.

LAER for fluid filling operations is based upon the production levels for each facility since introduction of gasoline into fuel storage tanks followed by dispensing into vehicles are a function of Stage I (storage tank filling) and Stage II (vehicle dispensing) VOC emission controls. The majority of permits reviewed for gasoline fill operations did not contain specific limits since the majority of these operations are similar and emissions are dependent upon production levels. All of the most recent permits noted that Stage II emission controls have been replaced by the use of ORVR systems. ORVR systems typically provide 95 percent or greater control of VOCs and are employed in nearly 100 percent of vehicles produced in the US. FCA used standard emission factors for the vehicle filling operations and has estimated that roughly 0.002 lbs VOC/vehicle will be emitted, based upon historic fill rates at the existing JNAP facility. This value is consistent with one of the more recent permits issued in Michigan for the GM Delta Township facility which includes an emission limit for VOCs of 0.5 tpy. FCA has proposed the requirement of ORVR systems on any vehicle fueled at the proposed assembly line. FCA has developed a proposed annual emission rate of 0.34 tpy for fuel fill operations. This emission rate is LAER for fuel fill operations and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Tanks**

Emissions of VOCs from storage tanks for fluids used in vehicles are dependent upon the physical characteristics of the tank, the location of the tank (i.e., which part of the country), and the proposed throughput. Accordingly, emissions from storage tanks are not typically included as part of a LAER demonstration other than for the proposed vapor balance/control systems and the RVP of the gasoline. FCA completed an emissions estimate using the USEPA's TANKS program. The proposed storage tanks will operate at ambient pressure and temperature, so the TANKS emissions are acceptable. The tanks will rely upon submerged fill and vapor balance in accordance with the EGLE AQD's Part 7 regulations. FCA has proposed a VOC emission rate of 1.33 tpy from the gasoline and windshield washer fluid tanks. This emission rate is LAER for the storage tanks and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Body Solvent Wipe**

FCA reviewed the various SIPs and also the CTG for Automobile and Light Duty Trucks issued by the USEPA under Section 183e of the Clean Air Act in September 2008 for existing sources. The SIPs reviewed and the CTG did not identify any more stringent limitations for solvent wiping than those identified in the RBLC or issued permits with specific limits for these operations.

The body solvent wiping process involves pre-moistened wipes stored in containers that minimize evaporative losses of VOCs. These containers can be closed when not in use. Typically, body wiping occurs in uncontrolled booths or areas of the facility and, as a result, essentially all VOCs are assumed to evaporate. LAER for these operations are essentially the same across the industry and nearly all plants use single use wipes. FCA estimated wipe emissions based upon a facility producing a similar vehicle which resulted in roughly 0.162 lbs VOC/vehicle for solvent wipe. This factor was adjusted to account for primer booth wiping operations and results in 32.7 tpy of VOC emissions from solvent wiping based upon projected production rates. This emission rate is LAER for the body solvent wiping process and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **Glass Installation**

FCA reviewed the various SIPs and also the CTG for Automobile and Light Duty Trucks issued by the USEPA under Section 183e of the Clean Air Act in September 2008 for existing sources. The SIPs reviewed and the CTG did not identify any more stringent limitations for glass installation than those identified in the RBLC or issued permits with specific limits for these operations.

Glass installation involves the use of primer and wiping materials prior to installation with adhesives. Due to safety requirements, these materials are standardized across the industry. Also, due to the safety requirements for glass in vehicles, the use of alternative materials is generally considered difficult if not impossible.

A recent permit issued for Toyota Motors in Texas established a window install limit of 0.065 lb/gal. However, the assembly line associated with this limit has not been constructed. Therefore, the limit has not been achieved in practice and is not considered a value that must be met in a LAER analysis.

FCA has calculated VOC emissions of 1.7 tpy that was included as part of the sealer and adhesive emissions stated earlier. This emission rate is LAER for the glass installation operations and is incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **VOCs from natural gas combustion sources**

The natural gas combustion sources that are proposed to support the new automotive assembly line consist of:
- HWGs.
- Direct-Fire and Indirect-Fire Ovens.
- AHU and ASH.
- Space Heaters.
- Concentrator Heaters.
- RTO.

VOCs generated from combustion sources are limited to the products of combustion of natural gas. FCA did not identify any lower emitting fuels or burner configuration technologies that would reduce VOC emissions from the proposed natural gas combustion sources. Due to the multiple locations of emission sources and the projected VOC emission level of 5.0 tpy, FCA did not pursue consideration of add-on control technologies as part of this LAER analysis. FCA has determined that the use of natural gas as fuel in these units constitutes LAER at an emission rate of 5.5 pounds of VOC per million standard cubic feet of natural gas consumed based upon the USEPA's AP-42 Compilation of Air Emission Factors, which is considered a widely accepted emission rate for VOCs from natural gas combustion. The emission rate of 5.05 tpy is LAER for the natural gas combustion units and incorporated into the proposed VOC FPI limit of 3.0 lbs VOC/job.

- **VOCs from natural gas emergency engines**

FCA reviewed the RBLC for emergency engines utilizing natural gas as fuel that have ratings greater than 500-HP. Increasing the capacities from 770-HP to 850-HP does not change the source category. The following table summarizes the findings from that search.

Historical RBLC Permit Limits for Natural Gas Emergency Engines > 500-HP

Source & Location	Size (HP)	Date of Permit Issuance	Control Technology	VOC Emission Limit
Holland Board of Public Works (Michigan)	1,462	12-5-16	Oxidation Catalyst and GCP*	0.5 gram per horsepower-hour (g/HP-hr)
Mid Kansas Electric (Kansas)	604	3-31-16	None	1.0 g/HP-hr
SEMGAS LP-Rose Valley (Oklahoma)	2,889	3-1-13	Oxidation Catalyst	0.44 g/HP-hr over a 3-hr average
Consumers Energy	1,818	10-14-10	None	0.81 g/HP-hr

Based on this information, there are natural gas-fired emergency engines that rely on oxidation catalysts to control VOCs. Those units relying on oxidation catalysts all have a much larger HP rating/capacity than the 850-HP engines proposed for use by FCA in the Mack Avenue project. Holland Board of Public Works has the lowest emission limit based on an hourly value and FCA is proposing to meet 0.5 g/HP-hr on the 850-HP emergency engines. This is acceptable as the SEMGAS limit is a three-hour average, and an hourly average is typically the reviewed time period for these types of units and a shorter averaging time is considered more stringent than a longer one. This emission rate is LAER for the 850-HP natural gas emergency engines and is permitted separately from the proposed VOC FPI limit.

FCA reviewed the RBLC for emergency engines utilizing natural gas as fuel that have ratings less than 500-HP. The following table summarizes the findings from that search.

Historical RBLC Permit Limits for Natural Gas Emergency Engines < 500 HP

Source & Location	Size (HP)	Date of Permit Issuance	Control Technology	VOC Emission Limit
Virginia Electric Power IA-0102	150 kW Propane	2/1/2012	None	1.0 g/HP-hr
Fiber Industries – SC-0182*	NA	10/13/2017	None	Meet JJJJ requirements
Waupaca Foundry	100 kW (1.2 MMBTU/hr)	6/25/2018	None	1.35 g/HP-hr

Based on the above information, VOC emissions from natural gas-fired emergency engines rated less than 500 HP are either not regulated/addressed, subject to the NSPS standard of 1 g/HP-hr or limited based upon hours of operation. FCA did not identify other permits with VOC limits that are more stringent than the applicable NSPS limit. FCA is proposing to meet 1.0 gm/HP-hr on the 350-HP emergency engines. This emission rate is LAER for the 350-HP natural gas emergency engines and is permitted separately from the proposed VOC FPI limit.

- **VOCs From Diesel Combustion Sources**

FCA reviewed the RBLC for emergency fire pumps utilizing diesel as fuel. The following table summarizes the findings from that search.

Historical RBLC Permit Limits for Diesel-Fired Emergency Fire Pumps

Source & Location	Size (HP)	Date of Permit Issuance	VOC Emission Limit
Toyota Motors (Texas)	287 (214 KW)	9-23-18	0.19 g/KW-hr
DTE Belle River (Michigan)	604	3-31-16	0.13 lb/hr
Marshall Energy (Michigan)	300	6-29-18	0.75 lb/hr
Shintech (Louisiana)	375	5-2-18	4.0 g/HP-hr
Steel Dynamics (Indiana)	250	2-23-18	1.13 g/HP-hr
Indeck Niles (Michigan)	260	1-4-17	0.64 lb/hr
Cricket Valley Energy (New York)	460	2-3-16	0.1 g/HP-hr
Holland Board of Public Works (Michigan)	165	12-5-16	0.47 lb/hr
Forsyth Energy Plant (North Carolina)	11.40 MMBtu/hr	9-29-05	1.04 lb/hr

The entries were noted for small internal combustion engines less than 500-HP relying on liquid fuels that are not gasoline. There are several entries for diesel fired emergency engines but none of them indicate the use of controls on the engines for reduction of VOCs. Some of the entries note a filter system for PM, but there are no VOC controls noted in any of the entries. The VOC emission level from the proposed fire pumps (0.10 g/HP-hr) meets the lowest value found in the search.

FCA also considered whether emergency engines using lower emitting fuel could establish LAER. However, safety issues associated with the fact that fire pumps need to start and respond quickly dictates that the use of diesel fuel is necessary as it responds faster than other fuels such as natural gas. Accordingly, FCA believes the emergency fire pumps demonstrate LAER for VOCs. The VOC emissions were calculated from the manufacturer-provided emission factor of 0.10 g/HP-hr and result in 0.06 tpy of VOC emissions. This emission rate is LAER for the diesel-fired emergency fire pumps and is permitted separately from the proposed VOC FPI limit.

- **LAER Conclusion**

AQD reviewed the proposed LAER analysis and concurred with FCA's findings regarding the LAER analysis. As shown in the above review, FCA has proposed performance standards that meet what has been achieved in practice for other similar sources. Those performance standards are used to calculate a tpy emission rate for VOCs for each process and incorporated those tpy values, with the exception of the emergency engines and fire pumps, into an annual flexible VOC tpy limit of 381.2 tpy and 3.0 lbs VOC/job. The AQD concurs with FCA's determination of LAER for the proposed automotive assembly line and ancillary equipment. Compliance with the LAER limit will be demonstrated via monitoring, testing, and recordkeeping requirements.

Appendix 3
Background on the Flexible Permit Initiative (FPI)

This section includes background information on flexible permits, as well as their history.

The AQD has evaluated current permitting practices and environmental statutes to identify potential ways to satisfy industry's need for increased operational flexibility while simultaneously ensuring environmental protection.

With this in mind, the AQD developed the flexible permit format. The key to the AQD's approach is to base the flexible permit on a facility's actual environmental performance (emissions per unit of production) as well as a total mass emission rate (tons per year) while operating a state-of-the-art control system. The flexible permitting approach is typically made available only to the best controlled facilities based on proposed environmental performance resulting from operation in compliance with all applicable regulatory requirements, at the time that the flexible permit is established. This is determined through an analysis of a BACT or LAER-type comparison made by establishing an emission limit. The measure of environmental performance in flexible permits is a pounds of pollutant emitted per job limit together with a facility-wide yearly mass limit.

Under this approach, a facility can operate a specific function, such as automotive assembly and painting operations. Modifications to the existing process equipment are within the scope of the flexible permit as long as the facility continues to comply with the environmental performance standards (both the facility wide mass tons per year VOC limit and the pounds of VOC per vehicle produced limit) and continues the same specific function (i.e., remains an automotive assembly and painting facility).

The AQD has determined that modifications involving the installation of new emission units can be divided into two categories, those that require an increase in the flexible permit emission limits and those that do not. Activities that require an increase in the permitted emission limits must first go through a pre-construction permit review process, either major NSR or Michigan's minor source permitting. The installation of new emission units that do not require increasing the flexible permit emission limits are allowed if:

- The new emission unit will not result in a meaningful change in the nature or quantity of TAC emitted from the stationary source.
- The new emission unit will not be a newly constructed or reconstructed major source of HAPs as defined in and subject to Title 40 of the Code of Federal Regulations 40 CFR §63.2 and §63.5(b)(3), NESHAP.
- The installation of the new emission unit will not cause the violation of any other applicable requirement.

A demonstration that any new installation meets these criteria is required to be kept on site for the life of the new emission unit and made available to EGLE upon request. Furthermore, a notification of the installation of the new emission unit must be made to EGLE prior to beginning the installation. The notification must follow the procedures specified in Michigan Air Pollution Control Rule R 336.1215(3)(c)(i) through (v). Once the notification is sent, construction of the new emission unit may commence.

The notification procedure allows the facility to proceed with the modification after identifying and determining compliance with all applicable requirements. This notification procedure is similar to procedures allowed under Michigan Air Pollution Control Rules R 336.1215 and R 336.2823(15). The notification procedure also provides the AQD the opportunity to review the applicable requirements and determinations made by the facility. In this system, the facility accepts all risks associated with construction or installation for which additional requirements are later determined to apply.