MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

TECHNICAL FACT SHEET

June 12, 2024

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 No. APP-2022-0125 from FCA US LLC (FCA). The application is proposing to modify their current PTI 14-19A for the existing automotive manufacturing process at the Detroit Assembly Complex-Mack (Mack) facility. The changes are referred to as the RTO2 Project and include:

- Adding requirements for the installation and continuous operation of a second regenerative thermal oxidizer (RTO), referred to as RTO2.
- Modifying ductwork from existing equipment and routing to the RTO2 stack.
- Increases to emission limits for particulate matter (PM), PM less than 10 microns (PM10), and PM less than 2.5 microns (PM2.5), as a result of the RTO2 Project.

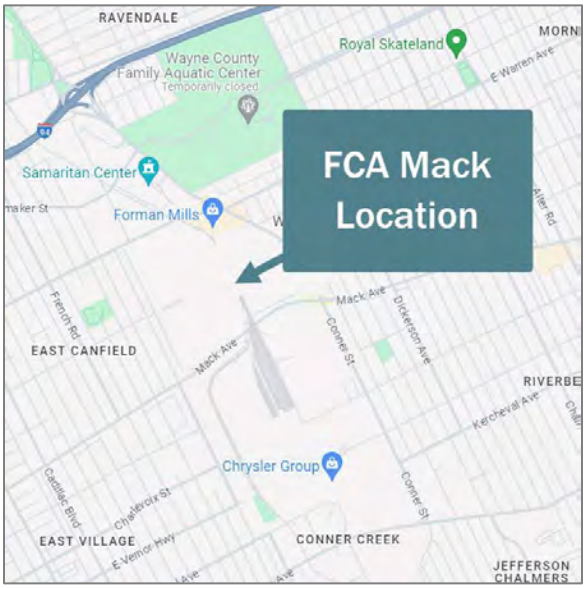

Figure 1: Location of FCA Detroit Assembly Plant – Mack

The proposed project is subject to permitting requirements of the Department's Rules for Air Pollution Control and state and federal Prevention of Significant Deterioration (PSD) regulations. Before acting on this application, we are holding a public comment period and a public hearing to allow all interested parties the opportunity to comment on the proposed PTI. All relevant information received during the comment period and hearing will be considered by the decision maker before taking final action on the application.

Background Information

FCA owns and operates an automotive manufacturing process at the Mack facility in Detroit, Wayne County, Michigan, and is located at 4000 Saint Jean Street.

The type of permit FCA is proposing to modify is called a flexible permit. The flexible permitting approach is typically made available only to the best-controlled facilities based on proposed environmental performance. This is determined through an analysis of a Best Available Control Technology (BACT) or Lowest Achievable Emission Rate (LAER) comparison and results in the establishment of an emission limit or limits. These limits were originally established in PTI No. 14-19, issued in 2019, as a result of a LAER analysis as set forth in Part 19 of the Michigan Air Pollution Control Rules. This review was re-established in PTI No. 14-19A, issued in 2020.

This application is proposing to modify PTI 14-19A as required by AQD Consent Order No. 2022-16. The proposed modification will incorporate the necessary requirements from the consent order. In the consent order, FCA legally agreed to install and continuously operate RTO2. They also agreed to change exhaust venting for certain equipment at the facility to be routed to the RTO2 stack to address odors. Operation of RTO2 began in July 2023.

FCA proposed increases to PM, PM10, and PM2.5 emission limits based on stack test results at the facility for a variety of sources associated with the painting of vehicles. However, only increases that are associated with the RTO2 project were reviewed and are included in the proposed permit. Although RTO2 was installed to address odors from portions of the paint shop, it is an additional source of PM, PM10, and PM2.5.

The proposed project was evaluated and determined to comply with the requirements of the rules and regulations as described throughout this document, as well as in Appendix 2 (PSD Applicability Analysis) and Appendix 3 (Rule 702 BACT Analysis). For more detail regarding flexible permits, please see Appendix 4, Background Information on the Flexible Permitting Initiative.

Present Air Quality

The Mack facility is in the portion of Wayne County which is currently meeting all the National Ambient Air Quality Standards (NAAQS) set by the United States Environmental Protection Agency (USEPA). The air quality standards are for PM, PM10, PM2.5, carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone, and lead. All the standards are set at levels designed to protect public health. Note: a portion of Wayne County has been designated by the USEPA as nonattainment for SO_2, but this FCA facility is not located within the SO_2 nonattainment area.

The AQD operates several air monitoring stations in Wayne County. The closest air monitoring station is located at Osborn High School on East 7 Mile Road. This site measures NO_2, PM2.5, ozone, and special ozone precursor compounds during the summer. Also, FCA operates an air monitoring station on the northeast corner of their property which measures PM2.5, NO_2, and volatile organic compounds (VOC) during the ozone season (March-October). Please note that the purpose of EGLE's air monitoring stations is to assess the regional or area-wide air quality and is not used to determine if a specific source is in compliance with their air permit.

Pollutant Emissions

The Mack facility has operated for over two years and is considered to be an existing major stationary source under the PSD regulations of the Michigan Air Pollution Control Rules and Title 40 of the Code of Federal Regulations (CFR) 52.21. Therefore, the proposed application would be subject to PSD for any regulated pollutant whose potential emissions increase exceeds its relevant Significant Emission Rate (SER). The potential emissions for all pollutants, with the exception of VOCs and Greenhouse Gases as Cardon Dioxide Equivalents (GHGs as CO_2e) are less than their respective SERs and are, therefore, not subject to PSD regulations.

Michigan Air Pollution Control Rule R 336.2802(4) allows an applicant to provide a demonstration that a project is not subject to PSD if it can be shown that the emissions change for an individual pollutant is less than its respective SER. The rules allow the applicant a variety of ways to demonstrate that the change in emissions is less than the SER. In this case, the applicant chose to submit an actual-to-projected actual (A2A) analysis for VOCs. The A2A

analysis also addressed GHG emissions with regards to PSD applicability (see How to evaluate this table beneath Table 1 for more discussion.

Table 1 provides the potential to emit (PTE) for each regulated pollutant for the modified automobile manufacturing process except for VOCs. For VOCs, Table 1 presents the final results of the A2A analysis.

Table 1: Project Potential Emissions Summary

Pollutant	Baseline Actual Emissions (tons per year, tpy)	PTE or Projected Actual Emissions (PAE) (tpy)	Excludable Emissions (tpy)	PTE or Projected Change in Emissions (tpy)	SER (tpy)	Greater than SER?
NO_x	NA	33.72 (PTE)	NA	33.72	40	No
CO	NA	76.47 (PTE)	NA	76.47	100	No
Particulate Matter (PM)	NA	9.20 (PTE)	NA	9.20	25	No
PM10*	NA	7.89 (PTE)	NA	7.89	15	No
PM2.5**	NA	6.14 (PTE)	NA	6.14	10	No
SO_2	NA	0.55 (PTE)	NA	0.55	40	No
Lead	NA	4.6×10^{-4} (PTE)	NA	4.6×10^{-4}	0.6	No
VOC	231.39	342.90 (PAE)	119.61	-8.10	40	No
GHGs as CO_2e	NA	106,518 (PTE)	NA	106,518	75,000	NA

* PM less than 10 microns in diameter
** PM less than 2.5 microns in diameter

How to evaluate this table: To help understand this table, first look at whether the project's PTE or PAE is greater than the SER. If it is not, then that pollutant is not subject to PSD and baseline actual emission calculations are not needed. Then look at whether the projected change in emissions is greater than the SER. If it is not, then that pollutant is not subject to PSD. As shown in Table 1, either the PTE or the projected change in emissions for each pollutant is less than its respective SER, except for GHGs as CO_2e. However, a decision by the Supreme Court (*Utility Air Regulatory Group v. U.S. EPA), No. 12-1146 (June 23, 2014*) determined that PSD review for GHGs is only required if one or more of the other regulated new source review pollutants exceeds a PSD threshold. No other pollutant exceeds its respective PSD threshold; therefore, GHGs are not required to go through PSD review.

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.

- **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 will increase by more than the significant

level for that pollutant results in the modification being subject to PSD requirements for that pollutant. The Mack facility is in the portion of Wayne County which is currently in attainment for all regulated pollutants. The proposed project is not subject to PSD because the emission increase for each regulated pollutant is less than the significant level for that pollutant. Table 1 above summarizes the potential emissions or projected emission changes of each regulated pollutant.

- **Federal New Source Performance Standards (NSPS) Regulations**
  The NSPS were established under 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.

  NSPS 40 CFR Part 60, Subpart MMa, was promulgated in 2022. After review of the project in this application and the definition of "Modification" in 40 CFR Part 60.2, it was determined that this project does not constitute a modification under the NSPS. Therefore, the applicable portions of the Mack facility continue to be subject to requirements in 40 CFR Part 60 Subpart MM. Although the AQD determined that the E-coat, guide coat, and topcoat operations are not subject to Subpart MMa, the development of the VOC annual tons per year (tpy) and pound per job (lb/job) emission limits are based on the original LAER analysis, in which the E-Coat, guide coat, and topcoat portions of this project meets or exceeds the lower VOC emission standard established in the new NSPS.

- **Federal National Emission Standards for Hazardous Air Pollutants (NESHAP) Regulations**
  The NESHAP regulations were established under 40 CFR Part 61 or Part 63. The automotive coating operations at the Mack facility 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 (HAP) and performing automotive surface coating as defined in the Subpart.

  The nine natural gas-fired Hot Water Generators (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).

- **Rule 224 T-BACT Analysis**
  State of Michigan Rule 224 requires that emissions of toxic air contaminants or TACs do not exceed the maximum allowable emission rate that results from the application of Best Available Control Technology for Toxics (T-BACT). The requirements of Rule 224 do not apply to HAP emissions from any process subject to a federal NESHAP. Therefore, HAP emissions from processes subject to 40 CFR Part 63, Subparts IIII, DDDDD, or EEEE are not subject to Rule 224.

  There are a few pollutants that must be addressed, including particulates and volatile non-VOC TACs.

The existing assembly line contains several types of particulate control. The incoming natural gas exhaust is filtered before being introduced to the surface coating process. There are waterwash particulate filters on all coating spray booths and fabric filters on all repair and sanding booths. In addition, all exhaust from the coating spray booths and flash-off areas will go through a filter bank system to further control PM emissions before entering the carbon adsorption concentrator. Proper operation of all the particulate controls, as required in the proposed permit, represents T-BACT for particulate TACs.

Acetone is a volatile solvent used in some coatings at the facility. By definition, acetone is not a VOC. FCA uses RTO1 to reduce emissions from the processes that will be emitting acetone, which represents T-BACT for acetone.

Multiple non-VOC TACs will be emitted from natural gas combustion throughout the facility. The natural gas usage limit was used to calculate a combined non-VOC TAC emission rate of less than 1.0 tpy. AQD knowledge of similar instances in the past indicates that control equipment for this relatively low value would not be cost-effective. T-BACT for non-VOC TACs from natural gas combustion equipment is good combustion practices.

- **Rule 225 Toxics Analysis**
  EGLE Rules for Air Pollution Control require the ambient air concentration of TACs be compared against health-based screening levels.

  A generic modeling analysis was submitted for the proposed project 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.

  We 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:

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

  b. NSPS

  c. VOC emission rate specified in another permit

  d. VOC emission rate specified in the Part 6 rules for existing sources

  An evaluation of these four items determined that a BACT analysis performed via Rule 702(a) would dictate the lowest maximum allowable emission rate of VOC from the automotive manufacturing process.

  The BACT analysis evaluated the current level of control at the Mack facility and whether additional control was warranted. Based on the analysis, the current level of control was found to meet BACT for the proposed process. See Appendix 3 for additional discussion.

- **Criteria Pollutants Modeling Analysis**
  PM2.5 and NOx
  Computer dispersion modeling was performed to predict the impacts of air emissions from NO_x, PM10, and PM2.5. The modeling analysis has project impacts greater than the Significant Impact Levels. Emissions from the facility were then evaluated against the respective NAAQS and PSD increment levels. The NAAQS are intended to protect public health. The PSD increments are intended to allow industrial growth in an area, while ensuring that the area will continue to meet the NAAQS. The following two tables contain the modeling results for the proposed project:

Table 2: PSD Increment Modeling Results

Pollutant	Averaging Time	PSD Increment ($\mu g/m^3$)	Predicted Impact ($\mu g/m^3$)	Below PSD Increment?
PM2.5	Annual	4	1.19	Yes
PM2.5	24-hr	9	6.29	Yes
PM10	24-hour	30	14.74	Yes
PM10	Annual	17	2.65	Yes
NO_2	Annual	25	7.72	Yes

How to evaluate this table: In this table, it is important to compare the Predicted Impact column to the PSD Increment column. When the impact is below the increment, then industrial growth is allowed.

Table 3: NAAQS Modeling Results

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)	Predicted Impact ($\mu g/m^3$)	Percent of NAAQS (%)
PM2.5	Annual	9	8.84	98.2
PM2.5	24-hr	35	31.25	89.3
PM10	24-hr	150	45.83	30.6
NO_2	Annual	100	37.12	37.1
NO_2	1-hr	188	168.62	89.7

How to evaluate this table: In this table, it is important to compare the Predicted Impact column to the NAAQS column. When the impact is below the NAAQS, the project is not anticipated to exceed the NAAQS, which are intended to protect public health.

The modeling analyses shows the proposed 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 for Dispersion Modeling for Federally Regulated Pollutants. For SO_2, the potential emissions are less than 25 percent of its SER and, therefore, are not expected to interfere with the PSD increment or NAAQS and no demonstration is required. Additionally, the potential emissions of CO are less than its SER and are not expected to interfere with the PSD increment or NAAQS and no further analysis is required.

Key Aspects of Proposed 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.

  Table 4 below shows the proposed flexible permit emission limits:

Table 4: Proposed Flexible Permit Emission Limits

Pollutant	Limit
VOCs	381.2 tpy
VOCs	3.0 lb/job
PM	9.20 tpy
PM10	7.89 tpy
PM2.5	6.14 tpy
NOx	33.72 tpy
CO	76.47 tpy
SO_2	0.55 tpy
GHGs as CO_2e	106,518 tpy

There are also emission limits for existing emergency equipment, consisting of four natural gas-fired engines and two diesel-fired fire pumps. This existing equipment was permitted as part of PTI Nos. 14-19 and 14-19A but was not included in the flexible permit structure. The emergency equipment sections of this permit were brought forward into this proposed permit because PTI No. 14-19A has not been incorporated into the facility's Renewable Operating Permit.

Note: The emergency equipment was not modified as part of this application; therefore, those sections of the draft permit were not open for review in this application.

- **Usage Limits**
  The proposed permit includes the following usage limits. Neither limit has changed for this modification.
  - 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 permit includes the following restrictions:
  - A Malfunction Abatement Plan (MAP) must be submitted for review and approval for RTO1, RTO2, waterwash, and dry filter particulate system(s). The MAP shall include procedures for maintaining and operating these control devices to ensure proper operation.
  - 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 Flexible Permit Initiative 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 limits for the Mack facility. 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, the surface coating operations at FCA 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 HWGs.
- 40 CFR Part 63 Subpart EEEE for Organic Liquid Distribution for the two windshield wiper storage tanks.

The proposed permit also contains requirements for the following federal regulations. However, the equipment subject to these regulations is not being modified as part of this project and was not open for review. These regulations are being listed for reference only.

- 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 63 Subpart ZZZZ for Stationary Reciprocating Internal Combustion Engines for the four natural gas-fired emergency generators and two diesel-fired emergency fire pumps.

- **Emission Control Device Requirements**
  The proposed permit includes the following emission control device requirements:
  - RTO1 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 RTO1 and RTO2 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 air supply housing, air housing units, and all curing ovens are required to have filtration and temperature/humidification control units.
  - RTO2 to assist with odor mitigation for the clearcoat observation and flash-off areas.

- **Testing & Monitoring Requirements**

The proposed 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 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 temperatures of RTO1 and RTO2 on a continuous basis.
- Monitor the number of vehicles produced on a monthly and 12-month rolling time period basis.

Conclusion

Based on the analyses conducted to date of the application, AQD staff concludes the proposed project would comply with all applicable state and federal air quality requirements. We conclude that this project, as proposed, would not violate the federal National Ambient Air Quality Standards or the state and federal PSD Increments.

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

If you would like additional information about this proposal, please contact David Thompson, AQD, at 517-582-5095 or ThompsonD22@Michigan.gov.

Appendix 1

STATE AIR REGULATIONS

Citation	Description of Federal Air Regulations or Requirements
Section 109 of the Clean Air Act – National Ambient Air Quality Standards (NAAQS)	The United States Environmental Protection Agency has set maximum permissible levels for seven pollutants. These NAAQS are designed to protect the public health of everyone, including the most susceptible individuals, children, the elderly, and those with chronic respiratory ailments. The seven pollutants, called the criteria pollutants, are carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter less than 10 microns (PM10), particulate matter less than 2.5 microns (PM2.5), and sulfur dioxide (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 52.21 – Prevention of Significant Deterioration (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.
40 CFR 60 – New Source Performance Standards (NSPS)	The United States Environmental Protection Agency has set national standards for specific sources of pollutants. These New Source Performance Standards (NSPS) apply to new or modified equipment in a particular industrial category. These NSPS set emission limits or work practice standards for over 60 categories of sources.
40 CFR 63— National Emissions Standards for Hazardous Air Pollutants (NESHAP)	The United States Environmental Protection Agency has set national standards for specific sources of pollutants. The National Emissions Standards for Hazardous Air Pollutants (NESHAP) (a.k.a. Maximum Achievable Control Technology (MACT) standards) apply to new or modified equipment in a particular industrial category. These NESHAPs set emission limits or work practice standards for over 100 categories of sources.
Section 112 of the Clean Air Act **Maximum Achievable Control Technology (MACT)** **Section 112g**	In the Clean Air Act, Congress listed 189 compounds as Hazardous Air Pollutants (HAPS). For facilities which emit, or could emit, HAPS above a certain level, one of the following two requirements must be met: 1) The United States Environmental Protection Agency has established standards for specific types of sources. These Maximum Achievable Control Technology (MACT) standards are based upon the best-demonstrated control technology or practices found in similar sources. 2) For sources where a MACT standard has not been established, the level of control technology required is determined on a case-by-case basis.

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

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

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

Appendix 2

Actual-to-Projected-Actual (A2A) Applicability Analysis

(Michigan Rule 336.2802(4))

The application was initially received in May 2022, and the Air Quality Division (AQD) was approaching the application as subject to Nonattainment New Source Review (NANSR), similar to Permit to Install Nos. 14-19 and 14-19A. One NANSR requirement is that all major sources owned by the same company in the same state are in compliance with their respective permits. The FCA Warren Truck and Jefferson North Assembly plants were not in compliance with their respective permits and review of this application could not proceed.

In May 2023, the Southeast Michigan nonattainment area, where FCA Mack is located, was redesignated as being in attainment for ozone. As a result, the application would no longer be subject to NANSR. Instead, Prevention of Significant Deterioration (PSD) regulations would potentially be applicable.

The Mack facility has been in operation for over two years, establishing baseline emissions for the previous project. Therefore, FCA submitted an A2A applicability analysis to address state and federal PSD regulations.

The A2A analysis was developed consistently with the flexible permit structure, including equipment covered by the flexible mass and pound per job (lb/job) emission limits (designated in FGAUTOASSEMBLY in the proposed permit). The AQD reviewed and agreed with the A2A analysis as described below.

Baseline Actual Emissions (BAE) Determination

The lookback period for this type of process is 10 years; however, this facility has only operated for a little over two years. The selected 24-month consecutive BAE time period was July 2021 through June 2023.

Based on the emission reports of the facility during this time period, the BAE was determined to be 231.39 tons per year (tpy) of volatile organic compounds (VOC).

Projected Actual Emissions (PAE)

From the submitted analysis:

The projected actual VOC emissions from the proposed changes at Mack are based on the maximum projected annual production levels for any one of the 5 years following the proposed changes. Based on existing business-related marketing and product demand data, FCA estimates the projected maximum production of vehicles in the 5-year period following the proposed changes to be 261,870 vehicles per year. The projected emissions per vehicle is based on the average pounds of VOC per vehicle emitted during the most recent six months of production, which was 2.63 pounds of VOC/vehicle. Please note that the details of this calculation are in this document's Appendix. As a result, the PAE are as follows:

261,870 vehicles x 2.63 pounds of VOC/vehicle = 688,718.1 pounds of VOC / 2000 pounds per ton = 344.36 tons VOC

The methodology was acceptable to the AQD, with the exception of using a 6-month average pounds of VOC/vehicle factor. The AQD believes that, since the pound of VOC/vehicle limit is a rolling 12-month emission limit, the proper emission factor should be based on the highest 12-month rolling

pound of VOC/vehicle factor achieved during the baseline period. This was determined to be 2.62 pounds of VOC/vehicle, which resulted in a PAE of 342.90 tons.

Excludable Emissions (EE)

From the analysis:

In accordance with 40 CFR 52.21(b)(41)(ii)(c) as well as Michigan Air Rule 1801(ll)(ii)(C), the emissions from existing operations that could have been accommodated or were related to demand growth during the baseline period, and that are unrelated to the proposed project, are considered excludable emissions. The excludable portion of emissions for Mack on a plant-wide basis can be equated to VOC emissions that occurred during a 30-day period in the baseline period extrapolated to 12 months. As noted in the Appendix, May of 2023 resulted in 29.25 tons of VOC emissions. Accordingly, the facility could have emitted 351 tons VOC per year (29.25 tons per month x 12 months) prior to the change if that emission rate continued for a 12-month period. The 351 tons per year value was not limited by the permit, which includes an annual VOC limit of 381.2 tons per year. As a result, the excludable emissions, determined by the difference of what could have been emitted and the baseline emissions, are as follows:

351 tpy – 231.39 tpy = 119.61 tpy

The methodology was acceptable to the AQD.

Projected Emissions Increase (PEI)

PEI is calculated using the following formula: PEI = PAE – BAE – EE

The submitted analysis calculated a PEI of -6.27 tpy VOCs, but this was calculated using the original PAE value. Based on the AQD's methodology of using the worst-case rolling 12-month lb/job value, the PEI was calculated as:

Summary of Emissions (tons per year, tpy)

Pollutant	Baseline	Excludable Emissions	Projected Actual	Difference	Significance Level	Significance or Greater?
VOC	231.39	119.61	342.90	-8.10	40	No

The PEI is less than 40 tpy, indicating that this change is not subject to PSD regulations.

Appendix 3

Rule 702(a) Best Available Control Technology (BACT) Review

Volatile organic compound (VOC) emissions shall not exceed the lowest maximum allowable emission rate specified by the following:

- (a) BACT, or a rate specified by the department
- (b) specified by a New Source Performance Standard
- (c) specified as a condition in a permit
- (d) specified in part 6 rules

FCA submitted the following Rule 702(a) BACT analysis for the automotive manufacturing process. The Air Quality Division (AQD) evaluated the BACT analysis and concurred with the final determinations.

Surface coating operations include three types of emission reduction opportunities for VOCs: coating materials, coating application methods, and add-on VOC controls. The reduction options considered as potentially available, in each of these categories are listed as follows:

- Coating materials
    - Powder coating material
    - Low VOC coating material
    - Waterborne coating material
- Coating application methods
    - High volume electrostatic
    - Low volume electrostatic
    - High volume low pressure
    - Low volume low pressure
    - Air atomized
- Add-on controls
    - Regenerative Thermal Oxidizer (RTO) with or without concentrator
    - Regenerative Catalytic Oxidizer with or without concentrator

Coating Materials and Application Methods:
The current primer and topcoat coatings include lower VOC solvent borne primer, waterborne basecoat materials and solvent borne clearcoat which are consistent with other recently constructed or permitted facilities. Due to the vehicle finish coating quality requirements and the current use of state-of-the-art coatings and application methods in the coating booths (which are already controlled by an RTO and concentrator), FCA has not identified viable options to further reduce VOC emissions based upon coatings or application methods in the spraying areas of the primer and topcoat booths.

Add-on Controls:
The Mack facility has two RTOs and concentrators currently in operation. Each control unit was evaluated to determine if it could accommodate additional air flow volumes from the primer or basecoat observation zones. FCA confirmed that RTO1 and the associated concentrators do not have any extra air volume capacity. The capacity of RTO2 is designed to accommodate the maximum design flow rate from the clearcoat observation zones. A review of the current operation of RTO2 confirms that it is not operating at its maximum design volumes but could not accommodate the volume of air from either the primer observation zone or the basecoat observation zone. Therefore, neither existing RTO system can accommodate the air volume from the two uncontrolled observation zones to further reduce VOC emissions, leaving construction of a new, separate RTO as an option to evaluate as BACT.

The relevant equipment design and discharge flow rates are provided in the table below:

Equipment/Source	Design Air Volume (standard cubic feet per minute, scfm)	Is the Design Air Volume for Inlet or Outlet?
RTO1 – Total	76,484	Inlet
Concentrator 1	9,175	Outlet to RTO1
Concentrator 2	9,175	Outlet to RTO1
Ovens	53,548	Outlet to RTO1
RTO1 – Available	4,586	
	--	--
RTO2 – Total	60,300	Inlet
Clearcoat Observation	52,500	Outlet to RTO2
RTO2 – Available	7,800	
	--	--
Primer Observation	20,000	Outlet
Basecoat Observation	40,000	Outlet

How to evaluate this table: To help understand this table, the design air volumes must be evaluated. RTO1 has a design inlet air volume of 76,484 scfm, while the concentrator and oven outlets to RTO1 total 71,898 scfm. Therefore, RTO1 only has 4,586 scfm of capacity available to control other sources. RTO2 has a design inlet air volume of 60,300 scfm, while the clearcoat observation zone outlet is 52,500 scfm. Therefore, RTO2 only has 7,800 scfm of capacity available to control other sources. Since the primer and basecoat observation zones have outlet air volumes greater than 4,586 scfm, they cannot be directly routed to either RTO1 or RTO2 for control.

Use of a concentrator to reduce the air volume flow rate from the primer and basecoat observation zones prior to routing to an RTO was also considered as a potential abatement option. If use of a concentrator is assumed to reduce the air volume by 90%, then RTO2 could potentially accommodate the reduced air flow from primer and basecoat observation zones (if RTO2 is operated at the current volumetric flow rate). Therefore, use of a concentrator routed to existing RTO2 to reduce VOCs from the observation zones is also included in this BACT analysis.

FCA also performed a BACT cost effectiveness analysis for VOCs from the clearcoat observation zones routed to RTO2 to determine whether RTO2 would have been considered BACT for the clearcoat observation zone.

The analyses herein include the following abatement scenarios:

- Clearcoat observation zone to RTO2
- Primer Observation Zone to new RTO
- Basecoat Observation Zone to new RTO
- Primer/Basecoat Observation Zones combined to new RTO
- Primer/Basecoat Observation Zones combined to new Concentrator (to RTO2)

The BACT analysis was completed based upon the original PTI application calculations of potential VOC emissions from the proposed operations. In Appendix B of the 2020 Permit to Install (PTI) application for Mack, FCA estimated the following VOC emissions from the topcoat and primer observation zones based upon the maximum production levels.

Observation Zone	Pounds	Tons
Basecoat	29,617	14.8
Clearcoat	99,266	49.6
Primer	31,665	15.8

These uncontrolled VOC emission rates were used to determine the cost effectiveness for each of the abatement scenarios noted above, and as described in further detail below.

Cost Effectiveness - Clearcoat Observation to RTO2
As noted, the clearcoat observation zone is currently controlled by RTO2. FCA evaluated the cost of RTO2 on a dollar per ton ($/ton) basis for the clearcoat observation zone consistent with the United States Environmental Protection Agency's (USEPA) Control Cost Manual and the CO$TAIR worksheet. However, RTO2 was installed for the purposes of addressing Rule 901 odor issues at the facility, and was not installed as BACT. The question for this analysis is whether it was or was not cost effective to install RTO2 on the clearcoat observation zone. The following assumptions were included in the cost analyses.

- The cost of RTO2 for odor control of the clearcoat observation zone incurred by FCA was $15,889,072.
- Annualized costs included the following:
    - Prime Bank Interest Rate – 8.5%
    - Natural Gas – $0.00842 per standard cubic feet ($/scf)
    - Electricity Cost - $0.19 per kilowatt ($/kWh)
    - CEPCI Index – 803.3 (June 2023)
    - Same hourly labor rate as used in 2018

Based upon the cost of RTO2, 47.1 tons per year (tpy) of VOC controlled, the annualized cost would be $3,211,330, equating to $68,181/ton for this control scenario. The controlled VOCs assume 100% capture efficiency and 95% destruction efficiency of the available 49.6 tpy of VOC emissions from the clearcoat observation zone.

Although FCA provided support information for the stated RTO2 cost, the AQD performed a more conservative cost analysis for this scenario using the USEPA oxidizer spreadsheet and assuming installation of a brand-new oxidizer. This is considered a more conservative cost analysis because it does not take any retrofitting of equipment or supporting structure into account. The AQD calculated a VOC control cost of $21,379/ton for this conservative scenario, which is a value that is not considered to be cost effective to install additional control.

In addition, the AQD performed an analysis assuming that RTO2 was installed for BACT purposes. Under this scenario, the capital costs for RTO2 would not be taken into account and only operating costs moving forward would be used for calculating the cost effectiveness. The AQD calculated a VOC control cost of $11,867/ton for this scenario, which is a value that is not considered to be cost effective.

Based on these cost analyses, operation of RTO2 for the purposes of VOC BACT is not cost effective.

Cost Effectiveness – Primer and Basecoat Observation to new RTO
FCA evaluated the costs associated with the use of a new RTO (without a concentrator) to control each of the basecoat and primer observation zones separately. In addition, the combined primer observation and basecoat observation zones was evaluated to see if the logical grouping of these two zones resulted in a cost-effective use of a new RTO. The cost of RTO2 was used as the basis for establishing the cost of new RTOs for these scenarios. The cost of the controls on a $/ton basis was established consistent with USEPA's Control Cost Manual and the CO$TAIR worksheets. The following assumptions were included in the cost analyses.

- The cost for RTO2 was $15,889,072.
- If air flow rates for certain zones were lower than the clearcoat observation zone airflow, the cost was adjusted downward proportionately; if air flow rates were higher, no adjustment to cost was made.
- Annualized costs are as noted above, included the following:
- Prime Bank Interest Rate – 8.5%
- Natural Gas – $0.00842/scf
- Electricity Cost - $0.19/kWh
- CEPCI Index – 803.3 (June 2023)
- Same hourly labor rate as used in 2018.

Based upon installation of a new RTO, using the scaled cost of RTO2 and control of 29.1 tons of VOC, the annualized cost would be $3,211,330, equaling to $110,355/ton for this control scenario. The controlled VOCs assume 100% capture efficiency and 95% destruction efficiency of the available 30.6 tpy of VOC emissions from the primer and basecoat observation zones combined.

Again, the AQD performed a more conservative cost analysis for this scenario using the USEPA oxidizer spreadsheet and assuming installation of a brand-new oxidizer. The AQD calculated a VOC control cost of $38,717/ton for this conservative scenario, which is a value that is not considered to be cost effective to install additional control.

Cost Effectiveness – Primer and Basecoat Observation to Concentrator to RTO2

FCA also evaluated the costs of a concentrator that would reduce air flow volumes from the combined observation zones to levels that could be accommodated by the existing RTO2. The capital cost for the fans, filter house, concentrator, desorb heater/loop and all ductwork would be approximately $5,000,000, and the cost for reinforcing the building, penthouse, ceiling, including the grillage steel and enclosure would be an additional $3,000,000. The cost to reduce VOCs from the primer and basecoat observation zones by using a new concentrator on a $/ton basis was established consistent with the USEPA's Control Cost Manual and the CO$TAIR worksheets.

Based upon the cost of a new concentrator, routing the treated air, and control of 29.1 tons of VOC, the annualized cost would be $1,407,052, equaling to $51,165/ton for this control scenario. The controlled VOCs assume 100% capture efficiency of the available 30.6 tpy of VOC emissions from the primer and basecoat observation zones combined.

Although the total capital investment stated in FCA's analysis appears to be relatively consistent with historic concentrator and retrofit quotes, the AQD performed two more conservative cost analyses for this scenario.

For the first analysis, the AQD used the USEPA's Cost Analysis spreadsheet for carbon adsorbers and assumed that retrofit costs were only $1,000,000 (not $3,000,000 as estimated). The AQD calculated a VOC control cost of $16,316/ton for this analysis, which is a value that is not considered to be cost effective to install additional control.

For the second analysis, the AQD used the USEPA's Cost Analysis spreadsheet for oxidizers and assumed that the concentrator and retrofit capital investment would be 50% lower than provided in FCA's analysis. The natural gas and electricity cost calculations are not representative for a concentrator, as the spreadsheet is designed for oxidizers. Therefore, the AQD set both annual electricity and natural gas costs to $0, which is extremely conservative and not representative of actual operations. The AQD calculated a VOC control cost of $22,884/ton for this scenario, which is a value that is not considered to be cost effective to install additional control.

FCA noted that the individual contribution of VOCs and air flow rate from each of the primer and basecoat observation zones are comparable, and, therefore, the costs to control each zone

separately with a concentrator would likely be the same or higher than the combined cost. The AQD agreed that this was most likely the case but performed a cost analysis for the primer observation zone using the USEPA's Cost Analysis for carbon adsorbers, which resulted in a VOC control cost of $24,254/ton. Since the basecoat observation zone has a higher exhaust flow rate and similar VOC emission rate, the VOC control cost would be higher than that for the primer observation zone and a separate analysis was not necessary.

Recently Issued Permits
FCA is aware that since Mack's PTI 14-19A was issued, there have been other permits issued for new or upgraded assembly plants.

These permits include:
- GM Hamtramck Assembly Plant in Southeast Michigan
- The Ford Blue Oval Plant in Stanton, Tennessee
- The Canoo Assembly Plant in Oklahoma City, Oklahoma
- The Scout Motors Assembly Plant in Blythewood, South Carolina

The GM Hamtramck Assembly Plant was issued PTI # 209-19 in June of 2020 and revised to 209-19A in April of 2022. The GM PTI is a flexible permit (FPI) similar to Mack's, and the pounds of VOC per job limit is the same as Mack's (3.0 pounds of VOC/job). Note, however, that the observation zones in the main coating operations at the Hamtramck facility are included in the PTI as being routed to an RTO. The other three permits are silent on the observation zones but appear to use similar coatings and control profiles as Mack.

Despite the GM facilities control of the observation zones, FCA has demonstrated that the costs associated with controlling the relatively low amount of VOCs from the Mack facility observation zones would result in costs (including retrofit costs) that would be considered significantly cost prohibitive and therefore control of the primer and basecoat observations zones does not represent BACT for the Mack facility.

Other VOC Sources at FCA Mack - BACT
Electrodeposition Coat (E-coat)
The E-coat operation at the Mack facility includes controls on both the tank and the oven. Low VOC materials and dip operation with 100% transfer efficiency are consistently used throughout the industry and these materials are relatively consistent in terms of VOC and solids content from facility to facility. FCA believes the current operation is representative of BACT. The AQD agrees with this analysis.

Sealers
Sealers in use at the Mack facility consist of very low VOC materials used in the body shop, paint shop, and assembly areas. As a result, the VOC content of the sealer profile has reached levels where many of the sealers are essentially VOC free. FCA is not aware of other materials that would serve to reduce the VOC content and resultant emissions from the various sealer operations.

The sealers are typically applied as a pumpable material where a bead is imparted on a vehicle body seam or other location either manually or via a sealer robot. As a result, deadener is the only sealer that is spray applied. However, the VOC content of the spray deadener is less than 0.1 pound per gallon as well. FCA is not aware of other processes or application methods that would serve to reduce VOC emissions from sealers.

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

applications is not technically feasible. Recent permits have included sealer VOC contents that are consistent with those at the Mack facility. FCA believes the current sealer operations are representative of BACT. The AQD agrees with this analysis.

Repair

Repair operations are relatively consistent among various assembly plants including those recently permitted. In general, VOC content is the basis for BACT demonstrations related to repair and FCA did not identify any repair operations that rely on add-on controls. Accordingly, FCA believes the current repair operation represents BACT. The AQD agrees with this analysis.

Body Wipe

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

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 terms of VOC emission reduction potential. As a result, FCA is not aware of other wiping materials that can be relied upon for emission reduction from solvent wiping.

The process of solvent wiping is necessary to maintain vehicle coating integrity. FCA knows of no process or wiping alternative that would be effective at maintaining coating quality while reducing VOC emissions.

Due to the various locations where solvent wiping occurs (some occurs in open areas or sectioned areas of the plant) and the lack of exhaust points, FCA does not believe these operations lend themselves to be controlled with VOC emission control equipment. Accordingly, FCA believes the current wiping operation represents BACT. The AQD agrees with this analysis.

Purge/Clean

Purge materials are used to purge coating lines and spray guns either when changing coatings or when build-up occurs and requires flushing. These materials are generally used when production is ongoing and are therefore, exposed to the VOC control systems. Furthermore, the materials used for the clearcoat (solvent purge) are purged into a capture/collection system and disposed of as part of the waste that is shipped offsite. FCA evaluated the various materials used in the purge system and notes that the amount of purge solvent used for both the primer application and the clearcoat application is minimized since it is a single color or single material system. The physical properties of the purge are critical to the success of the cleaning process, as the purging process must be completed in a timely manner to avoid production interruptions due to clogging of paint lines/spray guns, etc. The purge product used must satisfy all process related requirements. Accordingly, FCA is not aware of other purge materials that are effective and would result in less VOC emissions from the primer and clearcoat applications.

For basecoat, which is a waterborne material, a water-based purge is used. Due to the number of color changes that occur in the basecoat booth and the need to avoid interruptions, the basecoat purge contains a small amount of VOCs (0.04 pound/gallon). FCA is not aware of purge materials that are effective and would result in less VOC emissions from the basecoat applications.

As noted, purging of the paint lines into a collection system captures approximately 60 % of the purge solvent which is ultimately reclaimed for reuse or disposed of offsite. FCA is not aware of other recycling systems or collection systems that are more effective at reducing emissions from purge. As noted previously, the purge operations occur when the booth recirculation and VOC emission controls are operating. As a result, the remaining 40% of purge materials in the booths (primer, basecoat, and clearcoat), which is quickly evaporated, are routed to concentrator(s) and the subsequent thermal

oxidizer. FCA is not aware of other more effective emission reduction controls for purposes of purge operations. Therefore, the current operation and management system represents BACT. The AQD agrees with this analysis.

Fluid Fill

Fluid fill operations includes gasoline and windshield washer fluids. For gasoline or fuel fill, vehicles have relied upon On-Board Refueling and Vapor Recovery (ORVR) for many years and these systems are effective at reducing the VOC emissions from fluid fill at rates greater than 95%. FCA is not aware of any technologies being used that would reduce emissions beyond what the ORVR system provides and therefore believes ORVR represents BACT for fuel fill. The AQD agrees with this analysis.

Similarly, windshield washer fluid tends to be consistent across the industry and typically does not evaporate readily during fill of the windshield fluid container. FCA did not identify any lower VOC washer materials or controlled washer fill operations and therefore, the current system represents BACT.

Glass Install

Materials used for glass installation are typically consistent between assembly plants due to safety requirements associated with windshield and window installation. As a result, nearly all assembly plants use similar low VOC materials to prime and seal the glass to the vehicle. FCA is not aware of any new materials or facilities that control emissions of VOC from glass installation and therefore believes the glass installation process at the Mack facility represents BACT. The AQD agrees with this analysis.

BACT SUMMARY

Below is a summary of the BACT determinations included in this application. Note that the uncontrolled zones of the primer and topcoat operations have been evaluated from a cost perspective and determined to be cost prohibitive to control beyond the current abatement measures.

BACT Summary Table

Process/Equipment	Application Methods / Materials Used	Type of Controls	Comment
E-Coat	Dip application	Tank and Oven controlled by RTO1*	No changes to BACT identified
Paint Shop Sealers	Robotic pump/manual application	None	No changes to BACT identified
Primer (Guidecoat)	High efficiency applicators/Low VOC materials	Booth/Ambient Flash/Oven areas controlled by RTO	Uncontrolled zones not cost effective to control
Topcoat	High efficiency applicators/Waterborne BC**/Low VOC CC***	BC/CC Booth, BC Flash, and Oven to RTO1	Uncontrolled zones not cost effective to control
Purge/Clean	NA	Purge Capture and work practices	No changes to BACT identified
Repair	Manual	None	No changes to BACT identified
Fuel Fill/Tanks	Gasoline	Submerged Fill/ORVR	No changes to BACT identified
Washer Fill	Standard Material	None	No changes to BACT identified
Solvent Wipe	Manual	Work Practices	No changes to BACT identified

Glass Installation	Safety Based Materials	None	No changes to BACT identified

*RTO = Regenerative Thermal Oxidizer

**BC = Basecoat

***CC = Clearcoat

Appendix 4

Background on the Flexible Permit Initiative

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

The Air Quality Division (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 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 Best Available Control Technology or Lowest Available Emission Rate type comparison made by establishing an emission limit.

The key to the AQD's approach is to base the flexible permit on a facility's environmental performance while operating a state-of-the-art control system. The measure of environmental performance in flexible permits is a pounds of pollutant emitted per unit of production limit together with an operation-wide yearly mass limit. For an existing facility, the environmental performance is based on actual operations; for a proposed new facility, it is based on the operation evaluated during the pre-construction permit review process.

Under this approach, a facility can operate a specific function, such as automotive assembly and painting operations. Activities that result in a change in the specific function at a facility or require an increase in the flexible permit emission limits, must first go through a pre-construction permit review process, either major New Source Review or Michigan's minor source permitting.