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STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
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PHILLIP D. ROOS
DIRECTOR

October 16, 2023

VIA ELECTRONIC SUBMISSION

Debra Shore, Regional Administrator
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard (R-19J)
Chicago, Illinois 60604-3507

Dear Regional Administrator Shore:

SUBJECT: Submittal to Revise the Michigan State Implementation Plan (SIP) for
West Michigan Moderate Element Attainment Demonstration

Pursuant to Section 110 of the federal Clean Air Act (CAA) and the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) is submitting a request to revise Michigan's SIP to include the attached West Michigan Moderate Element Attainment Demonstration for the 2015 National Ambient Air Quality Standard (NAAQS).

This document contains numerous elements of a demonstration of Michigan's ability to achieve attainment of the 2015 ozone NAAQS. This revision of the SIP is required as part of CAA, 42 U.S.C. Chapter 85, and is intended to fulfill requirements of the CAA §182(b) for the NAAQS. This document sets forth an explanation of the regulatory reasons these rules impact West Michigan and explains how the area is addressing the requirements of federal rules and the CAA. The CAA addresses multiple criteria pollutants, including ozone, with Subchapter I, Part D, detailing most requirements needed for this submittal to the United States Environmental Protection Agency (USEPA).

An opportunity for public comment and hearing was provided for this proposed revision. Also, the USEPA has requested that a statement regarding the inclusion of a 110(l) demonstration be provided. In this case, a demonstration is not included because the additions are new and, therefore, are not a relaxation of existing rules.

An electronic version of the submittal, in PDF format, has been submitted to the USEPA, Region 5 office using the State Planning Electronic Collaboration System.

Debra Shore, Regional Administrator

Page 2

October 16, 2023

We ask that the USEPA approve these revisions to the Michigan SIP. Questions on this submittal may be directed to Robert Irvine, Supervisor, SIP Development Unit, Air Quality Division, at 517-648-7367; IrvineR@Michigan.gov; or EGLE, P.O. Box 30260, Lansing, Michigan 48909-7760; or you may contact me.

Sincerely,



Phillip D. Roos

Director

517-284-6700

Enclosure

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**West Michigan Attainment State Implementation Plan Elements
for the
2015 Ozone National Ambient Air Quality Standard
Moderate Element Attainment Demonstration**



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ENVIRONMENT, GREAT LAKES, AND ENERGY

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Table of Contents

	<u>Page</u>
1.0 Introduction	1
1.1 The 2015 Ozone National Ambient Air Quality Standard	1
1.2 Michigan and the 2015 Ozone NAAQS	1
1.3 Regulatory Requirements and Additional Materials	2
2.0 Attainment Demonstration (Modeling)	3
3.0 Emission Inventories – Base Year and Projection	8
3.1 Base Year (2017 original and updated)	9
3.2 Projected Inventory (2023)	11
3.3 Comparison to LADCO Modeling	11
4.0 RACT/RACM	12
4.1 CTG RACT (VOC RACT)	12
4.2 Non-CTG RACT (Including NOx RACT)	14
4.3 RACM	14
5.0 Control Strategies, RFP, and Contingency	15
5.1 Control Strategies	15
5.2 Reasonable Further Progress/Rate of Progress	19
5.3 Contingency Measures	20
6.0 Conformity Requirements	22
6.1 Transportation Conformity	22
6.2 General Conformity Requirements	23
7.0 Authority, Public Involvement, and Other Miscellaneous Items	24
7.1 Authorities	24
7.2 Public Notice and Hearing	24
7.3 Other Miscellaneous Materials	25
8.0 Other Requirements	26
8.1 Nonattainment New Source Review	26
8.2 Vehicle Inspection and Maintenance	26
9.0 Environmental Justice	26
10.0 Regulatory Applicability	32
11.0 Attachments	34

Table of Contents, Continued

Figures	<u>Page</u>
1.1 West Michigan Nonattainment Areas	1
2.1 Ozone Trends Allegan County	4
2.2 Ozone Trends Berrien County.....	4
2.3 Ozone Trends Muskegon County	4
9.1 Map of Labeled Census Tracts in Berrien County Nonattainment Area	30
9.2 Map of Labeled Census Tracts in Muskegon County Nonattainment Area	31
Tables	
1.1 4 th Highest Daily Max. 8-hour Average Monitor Values	2
1.2 3-Year Design Values	2
2.1 LADCO TSD Inventory of Allegan County	5
2.2 LADCO TSD Inventory of Berrien County	6
2.3 LADCO TSD Inventory of Muskegon County	6
2.4 2023 Ozone Design Values at Each Monitor in the 2015 Ozone NAAQS NAA, Calculated from the LADCO 4-km CAMx Modeling with Water Cells Included in the 3x3 Matrix Surrounding the Monitor	7
2.5 Comparison of LADCO 2023 4-km Ozone Design Values at Shoreline Nonattainment Area Monitors in West Michigan	7
2.6 2016 Ozone Design Value Contributions by Source Region	7
2.7 2016 Ozone Design Value Contributions by Inventory Source Category	8
2.8 LADCO and USEPA v2 2023 Average Ozone Design Values at all Monitors in West Michigan 2015 Ozone NAAQS Nonattainment Areas	8
3.1 2017 Base Year EI Summary of West Michigan (tons/ozone season day) – submitted December 2020	10
3.2 2017 Base Year EI Summary of West Michigan – updated 2022.....	10
3.3 2023 Projected EI Summary of West Michigan.....	11
3.4 Comparison of 2016 LADCO and AQD 2017 EI Source Emissions	12
5.1 Demonstration of RFP (emissions in tons VOC/ozone season day)	20
6.1 MOVES3 Base Year and Future Year On-road Emission Summary	23
6.2 Motor Vehicle Emissions Budget for Allegan County.....	23
6.3 Motor Vehicle Emissions Budget for Berrien County	23
6.4 Motor Vehicle Emissions Budget for Muskegon County	23
9.1 Overburdened and/or Vulnerable Communities in Muskegon County Nonattainment Area	28
9.2 Overburdened and/or Vulnerable Communities in Berrien County Nonattainment Area	28
9.3 Population Language Breakdown of Linguistically Isolated Census Tract Communities In Nonattainment Areas.....	28
9.4 Population in Berrien and Muskegon Counties by Tract that Speak English Less Than “Very Well” (5 Years and Older)	29

West Michigan Attainment State Implementation Plan Elements for the 2015 Ozone National Ambient Air Quality Standard Moderate Classification

1.0 Introduction

This document contains numerous elements of a demonstration of Michigan's ability to achieve attainment of the 2015 ozone National Ambient Air Quality Standard (NAAQS). This revision of the State Implementation Plan (SIP) is required as part of the federal Clean Air Act (CAA), 42 U.S.C. Chapter 85, and is guided by several federal rules. Specifically, it is intended to fulfill requirements of the CAA §182(b) for the NAAQS. This document sets forth an explanation of the regulatory reasons these rules impact West Michigan and explains how the area is addressing the requirements of federal rules and the CAA. The CAA addresses multiple criteria pollutants, including ozone, with Subchapter I, Part D, detailing most requirements needed for this submittal to the United States Environmental Protection Agency (USEPA).

1.1 The 2015 Ozone National Ambient Air Quality Standard

On October 1, 2015, the USEPA promulgated a revised NAAQS for ozone, referred to as the “2015 ozone NAAQS” in this document. The 2015 ozone NAAQS was revised to an 8-hour standard of 0.070 parts per million, which will be expressed as the equivalent of 70 parts per billion (ppb). Under the 2015 ozone NAAQS, areas that had a 3-year design value of 71 ppb or higher were considered nonattainment. A design value for the 2015 ozone NAAQS is the 3-year average of the 4th highest daily maximum 8-hour average ozone concentration. The 2015 ozone NAAQS classification level was determined by the amount the design value for an area was above 71 ppb. Design values equal to or above 71 ppb and below 81 ppb were identified as a marginal nonattainment classification.

1.2 Michigan and the 2015 Ozone NAAQS

The USEPA made initial attainment/unclassifiable designations for the 2015 ozone NAAQS for the state of Michigan based on air monitoring data from the 2014 through 2016 ozone seasons on November 16, 2017 (82 *Federal Register* [FR] 54232). On June 4, 2018 (83 FR 25776), the USEPA made the final designations and classifications for Michigan, including designating the following three West Michigan counties as marginal nonattainment, effective August 3, 2018: Berrien, the western half of Allegan County, and the western half of Muskegon County.

Figure 1.1 – West Michigan Nonattainment Areas



The USEPA made minor corrections to those designations on October 16, 2018 (83 FR 52157). Monitors with a 3-year design value for 2014-2016 above 70 ppb included the monitor located in Muskegon County (261210039) at 75 ppb, the Holland monitor located in Allegan County (260050003) at 75 ppb, and the Coloma monitor located in Berrien County (260210014) at 74 ppb.

Table 1.1 – 4th Highest Daily Max. 8-hour Average Monitor Values

Site	2014	2015	2016	2017	2018	2019	2020	2021	2022
Allegan Co	75	72	76	71	74	71	76	78	73
Berrien Co	74	72	78	69	73	66	78	69	74
Muskegon Co	74	74	76	74	80	68	80	75	82

Table 1.2 – 3-year Design Values

Site	2013-15	2014-16	2015-17	2016-18	2017-19	2018-20	2019-21	2020-22
Allegan Co	75	75	73	73	72	73	75	75
Berrien Co	73	74	73	73	69	72	71	73
Muskegon Co	74	75	74	76	74	76	74	79

At the conclusion of the 2019 ozone monitoring season, ambient monitoring data demonstrating attainment was achieved in Berrien County for the years spanning 2017 through 2019. A redesignation request was submitted to the USEPA on January 30, 2020, requesting Berrien County formally be redesignated to “attainment.” Monitoring data collected in 2020 no longer supported an attainment designation in Berrien County and so a letter was submitted on June 26, 2023, to withdraw the request.

As attainment was not achieved via redesignation by any of the three designated nonattainment areas (NAA) within the 3-year timeframe required for a marginal nonattainment classification (August 3, 2021), the areas are required by the CAA to have their classification elevated one level; in this case, from marginal to moderate. The process of reclassification is often referred to as a “bump-up.” This bump-up action was finalized on October 7, 2022 (87 FR 60897) and moves the deadline for attainment to August 3, 2024, along with additional requirements. A moderate classification requires the state to submit SIP revisions and is the reason for this document. It addresses all previously unaddressed moderate SIP elements required at this time.

1.3 Regulatory Requirements and Additional Materials

There are several sections of the CAA, the Code of Federal Regulations (CFR) and pertinent implementation rules that address required SIP revisions in the event an area is found to be in nonattainment. The CAA §110, Part A of Title I, lays out requirements for implementation plans to address the NAAQS, including §110(a)(2)(I), which indicates additional requirements needed for NAAs in Part D, which contains three relevant sections. Subpart 1 contains §172 and §176, and Subpart 2 contains §182. CAA §172 describes elements of an attainment plan for NAAs in general, while §182 details requirements specifically for ozone NAAs. CAA §176 places requirements on any projects that use federal funding. Beyond the CAA, there are also regulations in the CFR that detail requirements pertinent to attainment SIP submittals. 40 CFR 51 specifies many requirements for preparation, adoption, and submittal of implementation plans. Section 10 of this demonstration gives a more detailed enumeration of each requirement described in the CAA and CFR. It also lists any guidance documents referenced or utilized in this demonstration. The focus of this document is on the following:

- **Attainment Demonstration/Modeling** as required by CAA §172(c)(4) and 40 CFR 51.1308(c). More detail is provided in Section 2.
- **Emission Inventories** as required by CAA §172(c)(3) and 182(b) and 40 CFR 51.1315. More detail is provided in Section 3.
- **Reasonably Available Control Technology (RACT)/Reasonably Available Control Measures (RACM)** as required by CAA §172(c)(1), CAA §182(b)(2), and 40 CFR 51.1312(a) and (c). More detail is provided in Section 4.
- **Reasonable Further Progress with Contingency Measures** as required in CAA §172(c)(2), §172(c)(9), §182(b)(1), and 40 CFR 51.1310(a)(2)(i). More detail is provided in Section 5.
- **Transportation and General Conformity** as required by CAA §176(c)(4). More detail is provided in Section 6.
- **Authority, Public Involvement, and Necessary Programs** as required by CAA §172(c)(7) and 40 CFR 51, Appendix V. More detail is provided in Section 7.

Other components and requirements for an attainment SIP are necessary for a complete submittal. Some of these requirements will be acknowledged in this document, but for reasons described in Section 8, will not be discussed extensively. Those topics include the following:

- **General Offset Requirements** as required by CAA §182(a)(4) and §182(b)(5). Documentation was submitted on January 24, 2023, certifying Michigan’s existing Nonattainment New Source Review (NNSR) meets the requirements of CFR 51.165.
- **Vehicle Inspection and Maintenance** as required by CAA §182(b)(4). A vehicle inspection and maintenance program is required for moderate NAAs. However, timing and applicability thresholds affect the inclusion of this topic here. This program has a later timeline than the requirement for submittal of this document, and as discussed in Section 8, the population threshold is pertinent to its inclusion.

In addition to all required components, Section 9 contains a discussion meant to address a critical topic that informs the attainment status of the three West Michigan areas.

- **Environmental Justice** is not a required topic for an attainment SIP, but this document contains a discussion of the subject as applicable. More detail is provided in Section 9.

2.0 Attainment Demonstration (Modeling)

As described above, the CAA requires states to submit a plan showing the ability to attain the NAAQS by dates established based on the timing of designations and classifications of NAAs. One acceptable method of achieving this goal is to use specially designed models to make this demonstration. The Michigan Department of Environment, Great Lakes, and Energy (EGLE), through the Air Quality Division (AQD), in cooperation with air quality agencies from the states of Indiana, Illinois, Minnesota, Ohio, and Wisconsin, worked cooperatively with the Lake Michigan Air Directors Consortium (LADCO) to develop a photochemical modeling platform to simulate the formation and transport of ozone and its precursors in the Midwest. The modeling system is used to evaluate emissions reduction strategies for inclusion in the states’ attainment plans. A complete description of the modeling methodologies and results are contained in a document created by LADCO entitled “Attainment Demonstration Modeling for the 2015 Ozone National Ambient Air Quality Standard – Technical Support Document” (TSD) (September 21, 2022). It is included here as Attachment 11.1.

Section 1 of the TSD contains a brief history of the LADCO organization as well as steps to implement the 2015 ozone standard. A mission of LADCO is to provide technical assistance to member states. The states relied on LADCO to provide a conceptual model of ozone formation through the Ozone Synthesis Project. The ozone conceptual model is one of the major components of the attainment demonstration and is included in Section 1 of the TSD.

Section 2 of the TSD presents a full summary of the recent ozone monitoring values, ozone trends, transport, and meteorology. It contains a Classification and Regression Tree analysis that shows ozone design values have decreased since 2005 overall. It concludes that while ozone impacts can differ from one area to another, ozone generally increases due to high temperatures, southerly transport, and low relative humidity. Trends also indicate that continued reductions in ozone concentrations correlate with reduction of ozone precursors in most of the LADCO area. (Figures 2.1 through 2.3 are excerpts from the TSD. See TSD for more detail.)

Figure 2.1 – Ozone Trends Allegan County



Figure 2.2 – Ozone Trends Berrien County

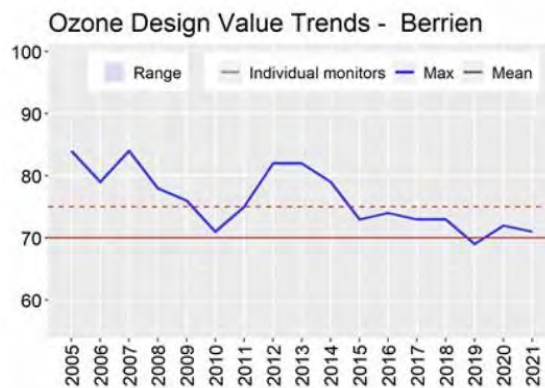
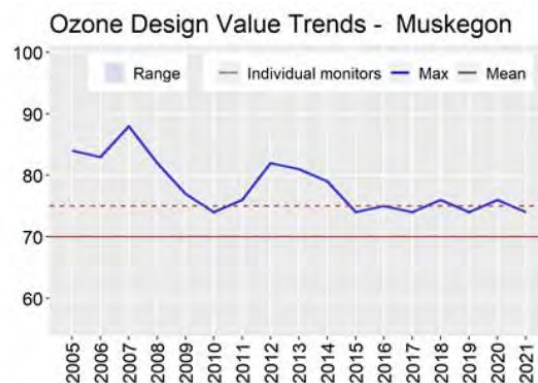


Figure 2.3 – Ozone Trends Muskegon County



Section 3 of the LADCO TSD describes methods and data that LADCO used for air quality modeling, model performance evaluation, and source apportionment modeling. The LADCO document describes the following:

- Emission inventories, modeling platforms, meteorology input files, and initial and boundary conditions;
- Rationale for why 2016 and 2023 modeling years were chosen;
- Reasons LADCO used CAMx;
- Sources of the 2016 and 2023 emissions data; and
- Source apportionment modeling.

Section 4 describes the 2016 and 2023 emissions used for the modeling and attainment test described in this TSD. Modeling was performed using a USEPA emission inventory based on the 2016fh modeling platform. The 2023 emission inventory created by LADCO used primarily two sources of data for each component of the modeling platform. The vast majority was the USEPA’s 2023fh data set. The only deviations from this data source included the following: electrical generating units (EGUs) used the Eastern Regional Technical Advisory Committee 16.2 modified data source; industrial point sources used a modified version of the 2023fh data set. The TSD also includes data on source apportionment, as well as evaluation methods for 2016 CAMx modeling. West Michigan-specific data was extracted from supporting information provided by LADCO.

Table 2.1 – LADCO TSD Inventory of Allegan County (note: full county)

Sector	Allegan (tons/day)			
	NOx		VOC	
	2016	2023	2016	2023
Agriculture	0.00	0.00	1.28	1.40
Airports	0.01	0.01	0.02	0.02
Biogenic	1.19	1.19	33.5	33.5
C1/C2 Commercial Marine	0.15	0.11	0.01	0.00
C3	0.06	0.07	0.00	0.00
Nonpoint	1.05	1.01	4.65	4.76
Offroad Mobile	1.58	1.04	1.24	0.88
Nonpoint Oil and Gas	0.16	0.15	0.51	0.48
On-road Mobile	4.95	2.38	2.84	1.62
Point Oil and Gas	1.18	1.58	0.05	0.07
Agricultural Fires	0.00	0.00	0.00	0.00
Electricity Generation	0.14	0.22	0.00	0.00
Wild and Prescribed Fires	0.02	0.02	0.28	0.28
Industrial Point	0.43	0.43	0.83	0.83
Rail	0.16	0.15	0.01	0.01
Res. Wood Combustion	0.06	0.06	0.49	0.48
Total	11.1	8.4	45.7	44.3
Percent Decrease	27%		4.3%	

Table 2.2 – LADCO TSD Inventory of Berrien County

Sector	Berrien (tons/day)			
	NOx		VOC	
	2016	2023	2016	2023
Agriculture	0.00	0.00	0.07	0.08
Airports	0.00	0.00	0.01	0.01
Biogenic	0.87	0.87	16.5	16.5
C1/C2 Commercial Marine	0.11	0.08	0.00	0.00
C3	0.10	0.11	0.00	0.01
Nonpoint	1.24	1.20	6.65	6.55
Offroad Mobile	1.17	0.82	1.40	1.04
Nonpoint Oil and Gas	0.00	0.00	0.00	0.00
On-road Mobile	6.25	2.82	3.69	2.03
Point Oil and Gas	1.17	1.75	0.06	0.10
Agricultural Fires	0.00	0.00	0.00	0.00
Electricity Generation	0.00	0.09	0.00	0.02
Wild and Prescribed Fires	0.01	0.01	0.21	0.21
Industrial Point	0.26	0.24	0.84	0.82
Rail	0.29	0.27	0.01	0.01
Res. Wood Combustion	0.05	0.06	0.45	0.45
Total	11.5	8.3	29.9	27.8
Percent Decrease	33%		7.1%	

Table 2.3 – LADCO TSD Inventory of Muskegon County (note: full county)

Sector	Muskegon (tons/day)			
	NOx		VOC	
	2016	2023	2016	2023
Agriculture	0.00	0.00	0.07	0.07
Airports	0.04	0.04	0.03	0.03
Biogenic	0.49	0.49	26.7	26.7
C1/C2 Commercial Marine	0.59	0.42	0.02	0.01
C3	0.29	0.31	0.01	0.02
Nonpoint	1.36	1.31	6.29	6.26
Offroad Mobile	1.09	0.79	1.60	1.13
Nonpoint Oil and Gas	0.01	0.01	0.03	0.03
On-road Mobile	4.54	1.97	3.47	1.91
Point Oil and Gas	0.00	0.00	0.00	0.00
Agricultural Fires	0.00	0.00	0.00	0.00
Electricity Generation	0.33	0.00	0.00	0.00
Wild and Prescribed Fires	0.02	0.02	0.28	0.28
Industrial Point	0.50	0.50	0.54	0.54
Rail	0.08	0.08	0.00	0.00
Res. Wood Combustion	0.07	0.07	0.53	0.53
Total	9.4	6.0	39.6	37.5
Percent Decrease	33%		7.5%	

Section 5 of the LADCO TSD discusses the CAMx modeling including results of the LADCO 2016 air quality model performance evaluation. For example, it summarizes the Weather Research and Forecasting (WRF) meteorology modeling used to support the CAMx simulations. LADCO states that, based on their analysis, the statistics and model performance presented in Section 5 demonstrate that the CAMx model platform is an acceptable model and valid for regulatory applications.

Section 6 describes LADCO’s model attainment testing methods and results for all NAAs in the LADCO region. This section also shows results from multiple alternative design values for each NAA using various modeling techniques.

Table 2.4 – 2023 Ozone Design Values at Each Monitor in the 2015 Ozone NAAQS NAA, Calculated from the LADCO 4-km CAMx Modeling with Water Cells Included in the 3x3 Matrix Surrounding the Monitor

NAA	AQS Site ID	Site Name	2021 DV (ppb)	2023 DV (ppb)	RRF
Allegan	260050003	Holland	75	66.9	0.9084
Berrien	260210014	Coloma	71	67.3	0.9185
Muskegon	261210039	Muskegon	74	68.6	0.9149

Table 2.5 – Comparison of LADCO 2023 4-km Ozone Design Values at Shoreline Nonattainment Area Monitors in West Michigan (ppb)

NAA	AQS Site ID	3x3		5x5		7x7	
		Water	No water	Water	No water	Water	No water
Allegan	260050003	66.9	66.9	67.6	67.2	67.5	67.2
Berrien	260210014	67.3	67.3	67.8	67.4	67.9	67.7
Muskegon	261210039	68.6	68.6	68.9	68.6	68.9	68.5

Section 7 of the LADCO document presents source apportionment modeling results that associate ozone precursor sources with ozone concentrations at NAA receptors in the region. This informs planners as to which drivers of ozone will be most effective to control, or, in many cases, when impacts from actions under state jurisdiction may not be consequential.

Table 2.6 – 2016 Ozone Design Value Contributions by Source Region (ppb)

	IL/Chicago	IN	MI*	WI	OH	Other States	ICBC**/ Biogenic	Misc.	NAA
Allegan	19.06	10.50	1.75	0.90	0.55	13.85	24.63	1.93	0.29
Berrien	14.98	12.45	1.24	1.02	1.46	11.41	26.10	2.02	2.3
Muskegon	20.13	7.97	1.53	3.36	0.60	13.42	24.69	2.47	0.08

*Not including NAA

** ICBC – Initial and Boundary conditions

Table 2.7 – 2016 Ozone Design Value Contributions by Inventory Source Category (ppb)

	Biogenic	Nonpoint	On-road	Non-road	EGU point	Non-EGU Point	ICBC	Other
Allegan	5.88	3.66	17.61	8.54	5.07	7.07	17.72	7.92
Berrien	5.34	3.52	17.58	8.08	4.68	7.87	18.42	7.50
Muskegon	5.86	4.10	17.58	8.66	5.27	7.30	17.37	8.12

Section 8 provides a justification for using the LADCO 2016v1-based modeling for the 2015 ozone NAAQS moderate area attainment demonstrations and, among other things, compares LADCO results to USEPA results.

Table 2.8 – LADCO and USEPA v2 2023 Average Ozone Design Values at all Monitors in West Michigan 2015 Ozone NAAQS Nonattainment Areas (ppb)

NAA	AQS Site ID	Site Name	LADCO 2023 DV	EPA 2023 DV
Allegan	26005003	Holland	67.5	67.8
Berrien	260210014	Coloma	67.7	68.7
Muskegon	261210039	Muskegon	68.9	69.1

Finally, in **Section 9**, the TSD ends with a brief statement of conclusions and significant findings by LADCO. It states that, within the TSD, LADCO produced regional air quality modeling with a goal of determining future year ozone concentrations in NAAs in the Great Lakes Basin. It established that the LADCO 2016-based modeling platform did an acceptable job of simulating regional ozone concentrations, and therefore can be used to produce data sufficient to calculate projected ozone design values for 2023. It concludes that, when this modeling began in Fall 2021, LADCO used the best data available to show attainment by 2023 in the three West Michigan NAAs addressed in this document.

In addition to the TSD in Attachment 11.1, LADCO created supplementary information that can be provided to the USEPA upon request. This data includes:

- Additional TSD-related documents including supportive analysis for the TSD and response to comments on the TSD during the drafting process;
- Spreadsheets (Microsoft Excel) of 2016 and 2023 emission tables, SMAT-CE 2023 attainment test results, and CAMx Anthropogenic Precursor Culpability Assessment (APCA) source apportionment modeling results;
- CAMx daily maximum concentration tile plots and model performance evaluation plots, APCA receptor plots, APCA geographic region daily maximum tracer footprint plots, APCA inventory sector daily maximum tracer footprint plots, and emission tile plots; and
- LADCO 2016 WRF modeling.

3.0 Emission Inventories – Base Year and Projection

Much of the basis for an attainment SIP hinges on the use of emission inventories to substantiate the claim that steps being taken as part of the demonstration will result in reduced emissions and therefore lower ambient ozone concentrations. This section will focus on a base year inventory and projected emissions. Details involving the projected reductions will be discussed more in sections following this one.

In the case of the 2015 ozone standard, based on the timing of the regulation, it is commonly understood that an emission inventory from 2017 shall serve as the “base year” for all related analyses. Because attainment must be achieved by August 2024, which is in the middle of an ozone season, it is necessary to look at projected emissions for the 2023 ozone season to have a complete data set.

Required details for this element are contained in CAA §172(c)(3) and §182(b) and in 40 CFR 51.1315. In addition, a guidance document was provided by the USEPA in May 2017 entitled “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards and Regional Haze Regulations” (EI guidance). This describes in greater detail requirements addressing emission inventories for attainment SIPs for areas with a moderate classification. For an ozone standard, the expectation is that an emissions inventory should represent actual emissions of volatile organic compounds (VOC) and oxides of nitrogen (NOx) emitted within the NAAs. It should also be noted this emission inventory was assembled independently of the inventory discussed in the attainment modeling described in Section 2 of this document.

Generally, emission inventories source types are divided into multiple subcategories based on the source:

- Point – This is a list of all sources that are generally well characterized, discharge through stacks at facilities around the state, and are required to obtain permits from the State of Michigan and/or report to the emission reporting system.
- Nonpoint – This grouping consists of a wide variety of sources, sometimes referred to as area sources, but can include a wide variety of emission types including fugitive and volume sources or specific source categories. They often have no distinct discharge points or are comprised of a large number of small point sources that are difficult to describe separately, the emissions of which may not be well characterized. The nonpoint inventory is often generated through a wide variety of unique methods, but each is specific to the nonpoint source attempting to be quantified. These methodologies are frequently revisited for improvement.
- On-road – Mobile sources often make up a large percentage of NOx and, to a lesser extent, VOC sources. Examples of on-road sources include cars, trucks, buses, motorcycles, etc. Although there are alternatives, the primary resource for data from this category is software created by the USEPA called the Motor Vehicle Emission Simulator (MOVES).
- Non-road – Much like nonpoint, this includes a wide-ranging set of sources for which it is sometimes difficult to estimate emissions. These are also mobile sources but are not operated on roads. Examples include airplanes, trains, ships, and offroad vehicles. Again, there are multiple ways to make non-road estimates, but in the case of this document, once again, MOVES was utilized.
- Biogenic – A very large portion of VOC emissions and, to a lesser extent, NOx emissions, coming from natural sources such as vegetation and soils. Based on the USEPA’s EI guidance, biogenic emissions do not need to be included in this type of demonstration and are therefore not discussed to a great extent.
- Event – A smaller group of potential emissions falls into the broad category of events. These include sources such as forest fires and prescribed burns. Forest fires are unpredictable and difficult to quantify. Prescribed burns are conducted in Michigan, but are usually done very early in the spring, when ozone values are low, rurally, and the areas of the burns are relatively small. As with biogenics, the USEPA’s EI guidance document indicates it is not necessary to include these emissions in this analysis.

3.1 Base Year (2017 original and updated)

The State of Michigan submitted an emission inventory, as required by CAA §172(3) and §182(a)(1), on December 18, 2020. This was performed as a requirement for marginal nonattainment classifications. The data, submitted herein, is summarized below.

The December 2020 submittal followed the USEPA's 2017 EI guidance to determine the typical ozone season month to be July. The VOC and NOx values listed here are based on a combination of data sources, including the National Emissions Inventory (NEI) and MOVES.

Table 3.1 – 2017 Base Year EI Summary of West Michigan (tons/ozone season day) – submitted December 2020

County	Pollutant	Point	Nonpoint	On-road	Non-road	Total
Allegan*	NOx	1.76	0.73	2.83	0.83	6.15
	VOC	0.60	3.72	1.50	0.90	6.72
Berrien	NOx	2.09	1.11	6.70	1.35	11.25
	VOC	0.95	6.47	3.49	2.03	12.94
Muskegon*	NOx	0.19	1.01	2.91	0.79	4.9
	VOC	0.49	3.79	2.04	1.40	7.72

* Partial county based on geographic area, Allegan County NAA is 50% of full county, Muskegon County NAA is 58% of full county. Not used for point source data.

While the data submitted in December 2020 was the best available at that time, this submittal provides an opportunity to update or improve values to reflect the requirement for an emission inventory for a now moderate NAA. Also, this document can act as an updated submittal for the periodic inventory that must be supplied every 3 years under CAA §182(a)(3)(A). The 2017 and 2023 data were obtained by the following methods:

- **Modified 2017 Point and Nonpoint Source Inventory:** The NEI Collaborative 2016v2 modeling platform (2016v2) annual data was used in combination with the 2023v2 data. Consistent with accepted protocols, linear interpolation was used to generate the 2017 base year data. Attachment 11.2 contains additional information and data on this process. Generally, 2016v2 and 2023v2 were used to calculate an annual rate of change of NOx and VOC emissions. Next, the 2017 and 2023 data was scaled to a daily mass emission rate using 2016v2 conversion factors.
- **On-road and Non-road Inventory Projections:** The MOVES modeling software utilized to inform the NEI data at the time of the earlier submittal was named MOVES2014. Since then, an improved version of the model, called MOVES3, has been released and put in common use. Therefore, the on-road and non-road values have been modified to the values in Table 3.2. Attachment 11.5 contains additional information and data on this process.

After obtaining the updated annual values for 2017, the NOx and VOC annual values were converted to a ton/day value by using the ratio of July emissions to total annual emissions for each county based on the previous estimates. This ratio was then divided by 31 days in July to create a final daily scale factor applied to the new annual emissions estimates. Finally, the Allegan and Muskegon NAAs were then scaled down by 50 percent and 58 percent, respectively, to account for partial county NAAs for nonpoint and non-road values. These percentages are based on the geographic area in nonattainment relative to the area in attainment / unclassified status. On-road values used vehicle miles of travel (VMT) and vehicle hours of travel (VHT) for the partial county area. The source type was based on the reduction in VMT for the partial county versus the whole county. These modifications result in an improved 2017 base year inventory.

Table 3.2 – 2017 Base Year EI Summary of West Michigan (tons/day) – updated 2022

County	Pollutant	Point	Nonpoint	On-road	Non-road	Total
Allegan*	NOx	0.98	0.89	1.86	0.69	4.42
	VOC	0.40	3.18	0.93	0.84	5.35
Berrien	NOx	1.54	1.31	5.05	1.63	9.53
	VOC	0.79	5.85	2.66	1.57	10.87

County	Pollutant	Point	Nonpoint	On-road	Non-road	Total
Muskegon*	NOx	0.31	1.17	2.93	1.00	5.41
	VOC	0.30	3.09	2.26	0.71	6.36

* Partial county based on geographic area for nonpoint and non-road, Allegan County NAA is 50 percent of full county, Muskegon County NAA is 58 percent of full county. Not used for point source data. On-road used VMT and VHT ratios.

3.2 Projected Inventory (2023)

A projected inventory is necessary for evaluation of CAA-required reductions to ensure emissions growth in one source sector does not negate reductions in others. The following projected inventories were created using trends from existing inventories and modeling results for 2023 in the same manner as those used to establish the base year inventory. Once again, emissions were calculated in the form of tons per ozone season day using July as the month, which is presumed to be worst case.

- Point and Area Source Inventory Projections: Staff used the 2023v2 modeling inventory.
- On-road and Non-road Inventory Projections: MOVES3 was used to determine both on-road and non-road projections. A description of methodology and results is contained in Attachment 11.5. MOVES data was supplied by the Michigan Department of Transportation (MDOT) due to their expertise with the MOVES3 software.

Table 3.3 – 2023 Projected EI Summary of West Michigan (tons/day)

County	Pollutant	Point	Nonpoint	On-road	Non-road	Total
Allegan*	NOx	1.06	0.81	0.96	0.55	3.38
	VOC	0.44	3.32	0.67	0.59	5.02
Berrien	NOx	2.07	1.23	2.48	1.33	7.11
	VOC	1.11	5.79	1.80	1.12	9.82
Muskegon*	NOx	0.52	1.04	1.44	0.79	3.79
	VOC	0.11	3.08	1.58	0.53	5.30

*Partial county based on geographic area, Allegan County NAA is 50 percent of full county, Muskegon County NAA is 58 percent of full county. Not used for point source data.

3.3 Comparison to LADCO Modeling

LADCO modeling was based on 2016 for reasons described in Section 2. Because the attainment modeling being submitted was performed at an earlier date, 2017 emissions data now being used for more updated calculations differ from the earlier emissions data used by LADCO. For purposes of comparison, the following table shows the 2016 LADCO updated emissions side-by-side with the 2017 updated emissions. These two datasets represent two different years, and the 2017 dataset has the benefit of continued improvement, particularly point source data. Given trends and modifications/improvements there would be an expectation that the 2017 data would be lower than 2016, and this, overall, appears to be the case. Another example in variation are the values for the on-road emission category. It is reasonable to assume they vary due to the use of the newer MOVES3 modeling platform for the 2017 EI. We see the range of differences in Table 3.4 are as little as 4 percent, and as great as 55 percent, but less than an order of magnitude and no more than 21 percent overall for VOC in the NAA. This comparison is being made to establish that data used in the modeling did not differ significantly from data used for purposes of this document to establish Michigan's ability to meet the NAAQS.

Table 3.4 – Comparison of 2016 LADCO and AQD 2017 EI Source Emissions

County	Pollutant	Source	Point	Nonpoint	On-road	Non-road	Total
Allegan	VOC	2016 LADCO*	0.44	3.49	1.42	0.62	5.97
		2017 EI	0.40	3.18	0.93	0.84	5.35
		% Difference	-10%	-10%	-53%	26%	-11%
	NOx	2016 LADCO*	0.88	0.83	2.48	0.79	4.97
		2017 EI	0.98	0.89	1.86	0.69	4.42
		% Difference	11%	7%	-33%	-14%	-12%
Berrien	VOC	2016 LADCO	0.90	7.19	3.69	1.40	13.18
		2017 EI	0.79	5.85	2.66	1.57	10.87
		% Difference	-14%	-23%	-39%	11%	-21%
	NOx	2016 LADCO	1.43	1.79	6.25	1.17	10.64
		2017 EI	1.54	1.31	5.05	1.637	9.53
		% Difference	7%	-37%	-24%	28%	-12%
Muskegon	VOC	2016 LADCO*	0.31	4.05	2.01	0.93	7.30
		2017 EI	0.30	3.09	2.26	0.71	6.36
		% Difference	-4%	-31%	11%	-31%	-15%
	NOx	2016 LADCO*	0.48	1.42	2.63	0.63	5.16
		2017 EI	0.31	1.17	2.93	1.00	5.41
		% Difference	-55%	-21%	10%	37%	5%

* LADCO values were whole county values and were reduced in a manner similar to all other EI data: Allegan to 50 percent, and Muskegon to 58 percent of their whole county values.

4.0 RACT/RACM

Pursuant to CAA §172, §182(b), and §182(f), states are required to implement RACT for major sources located in the NAAs and all sources in specified categories established through Control Technique Guidelines (CTGs) for the applicable criteria pollutant and its precursors (VOC and NOx). The USEPA defines RACT as the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological feasibility and economic reasonableness. A source generally consists of several units that emit pollutants.

Historically, Michigan created VOC RACT rules for past NAAs while developing attainment plans for the 1979 and 1997 ozone standards. However, the RACT requirement for NOx was previously waived under both of the aforementioned ozone standards. Michigan didn't have any NAAs for the 2008 ozone standard.

4.1 CTG RACT (VOC RACT)

CAA §172, §182(b)(2), and §182(f) require implementation of RACT for NAA sources that are subject to CTGs promulgated by the USEPA. The USEPA has issued CTGs defining RACT for those categories of sources that emit the greatest amounts of VOC emissions, and such sources are referred to as CTG sources. The Michigan Air Pollution Control Rules (MAPCR) (Part 6: Emission Limitations and Prohibitions – Existing Sources of Volatile Organic Compound Emissions; MAPCR R 336.1601 – R 336.1662), contain the applicable Michigan rules promulgated in response to the CTGs for the Michigan NAAs. On April 18, 2023, EGLE promulgated VOC rules addressing all CTG categories adopted by the USEPA through 2023 for which there

are existing sources in the NAAs. The CTGs can be summarized in the following groups or categories as follows:

CTGs that resulted in new rules:

Historically, Michigan went through the process of creating rules addressing VOC RACT, but since then, new CTGs have been published that require additional rules to be created to address them, or a facility came to the state that was subject to a CTG for which EGLE did not have a previously promulgated rule and would have been addressed using a negative declaration. Examples of these types include rules for industrial cleaning solvents (R 336.1634), miscellaneous industrial adhesives (R 336.1636), the oil and natural gas industry (R 336.1640 – R 336.1644), and several coatings processes.

CTGs that necessitated minor editing of existing rules:

In addition, several of Michigan's administrative rules were modified to ensure they were adequately meeting the newest CTG recommendations. Several of the rules also needed to be updated to address the discrepancy between current and previous NAAQS NAAs; the CTGs have not changed, but rules needed to be revised to apply to current NAAs. Some CTGs and rules include those for bulk gasoline plants (R 336.1606 – R 336.1609), surface coating of metal furniture (R 336.1610a), flexible package printing (R 336.1624a) and metal and plastic parts (R 336.1632).

Rules for CTGs that required no changes:

Some of Michigan's rules adequately addressed existing CTGs and therefore previously promulgated rules were sufficient to meet the CAA requirement, or, if modified, minor modifications were made for other reasons. Existing dates to these rules were not updated in some cases because sources beyond the existing dates set in the Part 6 rules are subject to the MAPCR, "Part 7: Emission Limitations and Prohibitions – New Sources of Volatile Organic Compound Emissions." Rule 702 under this Part requires new sources to limit VOC emissions at or below maximum allowable emission rates specified in Part 6, as applicable. These new sources are generally defined as any process or process equipment, which is either placed into operation or the subject of an application for a permit to install on or before July 1, 1979; or a process or process equipment operated after the existing dates established under the Part 6 rules. Thus, a new source in the state will always need to have equal or more stringent emission limits than an existing source subject to Part 6. Examples of these CTG and rules include storage of petroleum liquids in fixed roof tanks (R 336.1604 – R 336.1605), solvent metal cleaning (R 336.1611 – R 336.1614), perchloroethylene dry cleaning systems (R 336.1619), and leaks from synthetic organic chemical polymer and resin manufacturing equipment (R 336.1628).

Negative declarations for other CTG categories:

Lastly, if a state has no sources in the nonattainment areas subject to a CTG, it is unnecessary to adopt new state rules or submit SIP revisions to implement those guidelines, but rather states must submit what is referred to as a "negative declaration" to support this claim. For this attainment SIP, EGLE has attempted to evaluate all sources in the current nonattainment areas to determine which CTGs are unnecessary and support any previously submitted negative declarations that are still viable. While reviewing historic negative declarations, Michigan did not identify any current nonattainment area sources to which the CTGs would apply. This verifies that these negative declarations are still appropriate at this time, and there is no need for additional action or SIP revisions to implement those CTGs. Examples of these negative declarations include those CTGs addressing emissions from the manufacture of pneumatic rubber tires (1978), air oxidation processes in the synthetic organic chemical manufacturing industry (1984), and shipbuilding and ship repair operations (1996).

A more detailed analysis/summary of all CTG, rule, and source information will be included in a later RACT rule SIP submittal.

All relevant VOC RACT and other supporting rules discussed in this demonstration have been or will soon be incorporated into multiple Parts within the MAPCR. The VOC RACT rules were promulgated in April 2023 under Part 6 of the MAPCR. It is anticipated that some supporting rules, such as definitions, incorporations by

reference, and record keeping clarifications, as well as NOx RACT rules, are expected to be promulgated by early 2024. After they have been promulgated, EGLE intends to request SIP approval of those rules. A copy of any rules or draft rule packages are available upon request for USEPA review.

4.2 Non-CTG RACT (including NOx RACT)

Non-CTG sources are defined as major ozone precursor sources that are not subject to CTGs, but for which a RACT assessment is required. States can meet this requirement through creation of rules addressing remaining source types, or creation of rules requiring all major sources of these pollutants located in the ozone NAA, which are not subject to specific RACT rules, to take specific actions to notify the State of Michigan and submit sufficient materials to address this requirement, or a combination of both. Thus, Michigan is working to meet this obligation by implementing RACT for non-CTG sources in the NAA with the following rules in Parts 6 and 8 of the MAPCR:

- Part 6 – Emission Limitations and Prohibitions – Existing sources of Volatile Organic Compound Emissions. R 336.1602(4) addresses existing major sources of VOC emissions and requires such facilities within the NAAs that have VOC sources not subject to the RACT rules outlined within R 336.1604 through R 336.1644 to obtain site-specific RACT approval.
- Part 8 – Emission Limitations and Prohibitions – Oxides of Nitrogen. The AQD is working to promulgate R 336.1841 through R 336.1844, which impact common combustion sources of NOx such as engines, boilers, turbines, and various other source types. Proposed rules R 336.1845 and R 336.1846 contain requirements for certain large NOx sources to obtain site-specific RACT, or, if they have the aforementioned equipment with a unique need or process that inhibits them from meeting the requirements of R 336.1841 through R 336.1844, they can request and potentially receive SIP approval for alternative requirements. Once promulgated, a SIP approval request package will be submitted for all relevant rules. Draft materials are available upon request for USEPA review.

4.3 RACM

CAA §172(c)(1) requires that states implement any RACM necessary for attainment of the NAAQS. As detailed in 40 CFR 51.1308(d), any control measures needed for attainment must be implemented by the beginning of a full ozone season before the required attainment date (i.e., March 1, 2023, is the beginning of the 2023 ozone season, since the attainment date is in August 2024, before the 2024 ozone season is complete). With this submittal, Michigan is demonstrating that attainment is projected to be achieved and therefore no additional control measures are required for that purpose. However, additional control measures are required for RACM if they can advance the attainment date by a year or more. This means that any measures advancing the attainment date by a year would have needed to be in place by March 1, 2022. Since this date has already passed, EGLE has concluded there is no possibility of implementing any level of additional control prior to this date. Accordingly, no additional controls or emission reductions requirements in Western Allegan County, Berrien County, or Western Muskegon County are applicable for RACM under the 2015 ozone NAAQS.

As a resource for RACM evaluation, Michigan worked with LADCO and some of its other member states on two projects to identify and evaluate candidate emissions controls for reducing ozone precursor emissions in the region. Under contract to LADCO, Ramboll, Inc. completed two projects: one investigating potential control measures in all inventory sectors, and a second, which focused on NOx control options for industrial point sources, typically referred to as non-EGUs.

In the first project, Ramboll, Inc. conducted an analysis of more than 300 candidate control measures applicable to point, nonpoint, and mobile emission sources in the LADCO region. First, Ramboll, Inc. identified existing NOx and VOC control measures in the LADCO region to provide context for potential emissions reductions from control options. Ramboll, Inc. then compiled a comprehensive master list of potential control measures, which were screened based on potential emission reductions, cost effectiveness, and other factors

to develop a shortlist of candidate control measures for which they conducted a more detailed evaluation. The detailed evaluation was conducted for five source categories: locomotives, harbor craft, gasoline non-road small off-road equipment, heavy-duty trucks, and diesel non-road. This document, prepared for LADCO by Ramboll, Inc., entitled “Final Report: Control of Ozone Precursor Emissions in the Great Lakes Region” (March 2021) and any of its supporting documents, are available upon request.

In the second project, Ramboll, Inc. developed a master list of NO_x controls for stationary sources and evaluated potential emissions reductions and costs for 10 selected source categories under various scenarios. The source categories included cement kilns, coal non-EGUs, coke, glass sources, diesel-fired internal combustion engines, natural gas-fired internal combustion engines, iron and steel sources, lime kilns, and process heaters. The scenarios looked at a combination of three levels of control stringency (high, medium, and low stringency) and applicability to sources at four different levels based on an assumed potential-to-emit of 100 tons per year (tpy), 50 tpy, 25 tpy and 10 tpy. This document, prepared for LADCO by Ramboll, Inc., entitled “White Paper: NO_x Emission Controls for Stationary Sources in the LADCO Region” (February 2022) and any of its supporting documents, including the “Technical Support Document: NO_x Emission Controls for Non-EGU Stationary Sources in the LADCO Region” (February 2022), are available upon request.

As stated above, EGLE has concluded there is no possibility of implementing any level of additional control that could advance the attainment date by a year. Accordingly, no additional controls or emission reduction requirements in the West Michigan area are applicable for RACM.

5.0 Control Strategies, RFP, and Contingency

Pursuant to CAA §172(c)(2), (6), (9) and §182(b)(1), the following section describes rules and programs that are used to reduce emissions (control strategies), quantifies the effectiveness of various strategies (reasonable further progress (RFP)), and describes planned steps to address an outcome that doesn’t result in planned ozone reductions (contingency).

5.1 Control Strategies

As required in CAA §172(c), this section documents the permanent and enforceable control measures that have reduced emissions in West Michigan counties. Many of the control measures listed have been implemented under long-standing programs (that began prior to 2017). These measures will continue to contribute to emission reductions through the 2023 ozone season, facilitating attainment by the August 3, 2024, attainment date. However, this discussion highlights those control measures and emission reductions that have occurred since 2017. Other federal control programs reducing emissions in both the larger NAA and transport regions are also discussed.

- Federal on the Books
 - Cross State Air Pollution Rule (CSAPR) – As a result of the court ordered replacement of the Clean Air Interstate Rule, the CSAPR was created as a Cap-and-Trade program to reduce various pollutants, one of which is NO_x. It has been updated many times over the past several years and has successfully reduced NO_x emissions across the Midwest. Studies have shown that ozone concentration issues in West Michigan are largely a pollution transport issue.
 - NO_x SIP Call – A predecessor to CSAPR is the NO_x SIP Call. This regulation is also meant to address transport. It reduced NO_x emissions from sources when originally implemented and continues to provide incentives to sources to use fuels that create less NO_x.

- Tier 3 Emission Standards – In 2014, the USEPA finalized a federal rule to further strengthen Tier 2 vehicle emission and fuel standards. This Tier 3 rule requires automakers to produce cleaner vehicles and refineries to make cleaner, lower sulfur gasoline. This rule is being phased in between 2017 and 2025, and lowers NO_x emissions from passenger vehicles, lowers tailpipe standards for NO_x and VOCs for light-duty vehicles, and reduces VOC emissions by using onboard diagnostics to reduce evaporation.
- Heavy-duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements – In 2001, the USEPA issued a final rule for Highway Heavy-duty Engines that applies to heavy-duty gasoline and diesel trucks and buses. Fleet turnover will ensure continued reduction of NO_x emissions from all affected vehicles.
- Control of Emissions for Non-road Spark Ignition Engines and Equipment – Effective in 2003, this standard regulates NO_x, VOCs, and carbon monoxide (CO) for groups of previously unregulated non-road engines. It applies to large spark ignition (SI) recreational vehicles and recreational marine diesel engines sold and imported after the standards went into effect. In 2008, the USEPA set emission standards for new non-road SI engines. Exhaust emission standards applied starting in 2010 to new marine SI engines. Other exhaust emission standards also applied starting in 2011 and 2012 to different sizes of new, land-based SI engines. These small engines are used primarily in lawn and garden applications. The USEPA also adopted evaporative emission standards for vessels and equipment using any of these engines.
- Reciprocating Internal Combustion Engines (RICE) National Emission Standards for Hazardous Air Pollutants (NESHAP) – The USEPA has issued multiple regulations that cover several types of RICE: existing, new, and reconstructed stationary RICE greater than 500 horsepower (HP) located at major sources in 2004 (69 FR 33474); new and reconstructed stationary RICE located at area sources of hazardous air pollutants (HAP) emissions; new and reconstructed stationary RICE with a site rating of less than or equal to 500 HP located at major sources of HAP emissions (73 FR 3568); existing stationary compression ignition (CI) RICE with a site rating of less than or equal to 500 HP located at major sources; existing non-emergency CI engines with a site rating greater than 500 HP at major sources; existing stationary CI RICE of any site rating located at area sources (75 FR 9674); stationary SI RICE that are located at area sources of HAP or having a site rating of less than or equal to 500 brake HP located at major sources of HAP (75 FR 51570); and existing diesel-powered, stationary RICE that are typically used at industrial facilities (e.g., power, chemical, and manufacturing plants) to generate electricity for compressors and pumps, and to produce electricity to pump water for flood and fire control during emergencies. Although these standards do not directly target ozone precursors, NO_x and VOC emissions reductions were also likely realized as a co-benefit due to these standards.
- Category 3 Marine Diesel Engine Standards – This new standard, effective in 2010, promulgated more stringent exhaust emission standards for new, large marine diesel engines with per-cylinder displacement at or above 30 liters (commonly referred to as Category 3 CI marine engines). The emission standards apply in two stages: near-term standards, for newly built engines, which took effect in 2011, and long-term standards requiring reduction in NO_x emissions that began in 2016. The USEPA is adopting changes to the diesel fuel program. When this strategy is fully implemented in 2030, the USEPA estimates that NO_x and PM_{2.5} emissions in the United States will be reduced.
- Mercury and Toxic Standards – This new standard, effective in April 2012, regulates emissions of mercury, acid gases, and non-mercury metallic toxic pollutants from new and existing coal- and oil-fired EGUs. The USEPA estimated that this rule applied to approximately 1,100 coal-fired and 300 oil-fired EGUs at 600 power plants in the United States. According to the USEPA, most facilities comply with these standards through a range of strategies, including the use of existing emission controls, upgrades to existing emission controls, installation of new pollution controls, and fuel switching. Although these standards do not directly target ozone precursors, the reduction in air toxics and other pollutants indirectly influences ozone and improves air quality. NO_x and VOC emissions reductions were also likely realized as a co-benefit due to these standards.

- Boiler and Commercial/Industrial Solid Waste Incinerators NESHAPS – In 2013, the USEPA finalized revisions to emissions standards for large boilers, small boilers, and incinerators (78 FR 7138, 78 FR 7488, 78 FR 9112). These standards cover boilers and incinerators that emit a variety of pollutants, including mercury, cadmium, and particulates. The combined rules will also lead to additional NO_x and VOC reductions as a co-benefit.
- New Source Performance Standards (NSPS) for Residential Wood Heaters – In March 2015, the USEPA finalized the residential wood heaters NSPS (80 FR 13672). It provides emissions standards for new woodstoves, outdoor hydronic heaters, and indoor wood-burning forced air furnaces. New “Phase 1” less-polluting heater standards began in 2015, with more stringent Phase 2 standards beginning in 2020. However, new units were assumed to replace retired units which began in 2015. The USEPA estimates VOC emissions reductions from this rule.
- Control of HAPs from Mobile Sources – This rule, also known as the Mobile Source Air Toxics rule, was revised in October 2008, requiring refiners and importers produce gasoline that has reduced benzene requirements (72 FR 8428, 73 FR 61358). The USEPA predicts VOC and air toxics emissions reductions from mobile sources as a result of this rule.
- SO₂ Data Requirements Rule – In 2015, the USEPA finalized the Data Requirements Rule for the 2010 1-hour SO₂ Primary NAAQS (80 FR 51052). Because of this rule, several facilities accepted restrictions to reduce SO₂ emissions and/or limits below regulatory thresholds. NO_x emissions reductions were also realized as a co-benefit of these restrictions.
- Oil and Natural Gas Standards – This new standard, issued in 2012, regulates VOC and air toxic emissions from hydraulically-fractured natural gas wells and several other sources of pollution in the oil and natural gas industry that were previously unregulated.
- Emission Standards for Locomotives and Marine Compression Ignition Engines – In 2008, the USEPA published a rule to reduce pollution from locomotives and marine diesel engines. The controls apply to all types of locomotives and marine diesel engines below 30 liters per cylinder displacement. The near-term emission standards for newly built engines were phased in starting in 2009. The near-term program also included new emission limits for existing locomotives and marine diesel engines that apply when they are remanufactured and take effect as soon as certified remanufacture systems are available, as early as 2008. The long-term emissions standards for newly built locomotives and marine diesel engines began to take effect in 2015 for locomotives and in 2014 for marine diesel engines. This program will reduce emissions of NO_x and PM.
- Tier 3 Tailpipe and Evaporative Emission and Vehicle Fuel Standards – In 2014, the USEPA finalized a program to reduce air pollution from passenger cars and trucks, referred to as “Tier 3” vehicle and fuel standards. Multiple air pollutants are addressed in this rule, including PM, VOCs, SO₂, and NO_x, through implementing closely coordinated requirements for both automakers and refiners in the same rulemaking action. NO_x and VOC emissions reductions occur as a result of cleaner vehicles entering the fleet.
- NO_x Emission Standards for New Commercial Aircraft Engines – In 2012, the USEPA finalized a rule to adopt NO_x emission standards for certain commercial passenger and freighter aircraft engines in use at airports. The rule contains six major provisions, two of which are new NO_x emission standards for newly certified engine models. Equipment turnover will ensure continued emissions reductions from this category for many years.
- Tier 2 Light-duty Vehicle Rule – In 2000, the USEPA finalized a federal rule to reduce emissions from cars and light trucks, including sport utility vehicles. Under this rule, automakers are required to sell cleaner cars, and refineries are required to make cleaner, lower sulfur gasoline. The federal rule was phased in between 2004 and 2009, but fleet turnover will ensure continued emissions reductions from this category for many years. The USEPA’s MOVES emissions model accounts for the continued emissions reductions from this program in future years due to fleet turnover.
- Clean Air Non-road Diesel Rule – In 2004, the USEPA issued the Clean Air Non-road Diesel Rule. This rule applies to diesel engines used in industries such as construction, agriculture, and mining. It contains a cleaner fuel standard, which was implemented in 2009, and new engine standards that took effect, based on engine horsepower, starting in 2008, being fully phased in for most engines by

2014. Equipment turnover will ensure continued emissions reductions from this category for many years.
- Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-duty Engines and Vehicles – Phase 2 – In 2016, the USEPA finalized updates to a federal rule to significantly reduce greenhouse gas (GHG) emissions from medium- and heavy-duty engines and vehicles (81 FR 73478). This rule sets GHG emissions standards for four regulatory categories of heavy-duty vehicles: combination tractors; trailers used in combination with those tractors, heavy-duty pickup trucks and vans, and vocational vehicles. The rule also includes separate standards for the engines that power combination tractors and vocational vehicles. Though this rule primarily targets GHG emissions, it has an added benefit of lowering NOx and VOC emissions over time due to fleet turnover.
 - Revised 2023 and Later Model Light-duty Vehicle Greenhouse Gas Emissions Standards – In 2021, the USEPA finalized updates to a federal rule to reduce GHG emissions from cars and light trucks, including sport utility vehicles (87 FR 74434). The rule will require manufacturers to manufacture vehicles that emit significantly less GHG starting with the model years of 2023 and beyond. Though this rule primarily targets GHG emissions, it does have an added benefit of lowering NOx and VOC emissions over time. This rule will ensure continued emissions reductions as the vehicle fleet turns over.
 - Heavy-duty Engine and Vehicle Standards for New Motor Vehicles - On December 20, 2022, the USEPA adopted a final rule, “Control of Air Pollution from New Motor Vehicles: Heavy-duty Engine and Vehicle Standards,” that sets stronger emissions standards to further reduce air pollution, including pollutants that create ozone from heavy-duty vehicles and engines starting in model year 2027. The final program includes new, more stringent emissions standards that cover a wider range of heavy-duty engine operating conditions compared to earlier standards, and it requires these more stringent emissions standards to be met for a longer period of time when these engines operate on the road. This rule will ensure continued emissions reductions as the vehicle fleet turns over.
- Michigan on the Books
 - Existing Source Volatile Organic Compound Rules – “Part 6: Emission Limitations and Prohibitions – Existing Sources of Volatile Organic Compound Emissions” of the AQD’s administrative air pollution control rules address VOC from existing sources. A large portion of the rules contained in this Part address RACT sources. These rules stem from previous NAAQS ozone standards. Additionally, there are some non-RACT rules that were created for a variety of reasons, which also reduce VOC emissions, or RACT rules that apply beyond those necessary for RACT obligations. A non-RACT rule includes one targeted at consumer products. Since 2007, Michigan has had a rule that adopts by reference the Ozone Transport Commission’s (OTC) Phase 2 version of their model Consumer Product Rules. This rule sets VOC content limits on numerous commercially available items manufactured, sold, and used throughout the state. Examples of the wide variety of affected products include automotive to antiperspirants to spot removers.
 - New Source Volatile Organic Compound Rules – “Part 7 – Emission Limitations and Prohibitions – New Sources of Volatile Organic Compound Emissions” of the AQD’s administrative air pollution control rules address VOCs from new sources. In addition to the Part 6 rules, for decades, Michigan has been applying Best Available Control Technology assessments to new VOC sources, which ensure, through time, most current VOC sources have been required to meet, at a minimum, existing source requirements equal to those in Part 6 or better.
 - Sources of Oxides of Nitrogen Rules – “Part 8 – Emission Limitations and Prohibitions – Oxides of Nitrogen” of the AQD’s administrative air pollution control rules address NOx sources. They were recently updated to establish requirements for any sources subject to the NOx SIP Call, but also contain requirements for specific large NOx sources elsewhere in the state.

- Federal on the Way
 - Good Neighbor Rule Provisions – A new rule has been finalized to address the transport of NO_x for the 2015 ozone standard. It will not only reduce emissions through a (reduced) Cap-and-Trade budget, but the rule contains minimum “backstops” for many units. These rules have been promulgated with requirements that apply to both EGUs and certain large industrial sources.
- Michigan on the Way
 - VOC RACT rules were promulgated in April 2023 and will result in reductions in multiple source categories previously not subject to RACT rules, in addition to an increase in stringency for several sources in other categories. Given the current implementation of Michigan’s rules, all new sources in the state (inside and outside the NAA) must, at a minimum, meet the same levels of control and emission limitations in RACT rules, thereby reducing emissions statewide and thus the transport of precursors.
 - NO_x RACT rules have not previously existed in Michigan but have begun the rulemaking process for the state. Major existing sources are required to follow NO_x RACT, as are any new units in the NAAs.
 - A new Architectural, Industrial, and Maintenance coatings rule (AIM) was promulgated in April 2023 as part of the Part 6 rules described above. The rule uses the OTC model AIM rule Phase II as reference. This rule is expected to reduce a source of VOCs throughout the state.
 - The state has a VOC rule on the books for consumer products mentioned previously. An update to this OTC model was promulgated in April 2023 as part of the Part 6 rules described above and will require additional VOC reductions by shifting from the Phase II version to the Phase IV version.
- Voluntary Programs – Three local organizations in the West Michigan area have devoted staff and resources to collectively encourage resident behavior, particularly on days anticipated to be high in ozone. The three planning organizations include the Macatawa Area Coordinating Council (MACC – Holland), the Grand Valley Metro Council (GVMC – Grand Rapids), and the West Michigan Shoreline Regional Development Commission (WMSRDC – Muskegon). Collectively, these three organizations formed the West Michigan Clean Air Coalition in 1995, which has a mission to present a unified voice of education and advocacy for the West Michigan area on issues of ground level ozone and particulate, including voluntary emission reduction activities.

5.2 Reasonable Further Progress/Rate of Progress

A rate of progress plan is required by CAA §172(c)(2), §182(b)(1) and CFR 51.1310. CAA §182(b)(1)(B) requires a base year emissions inventory for NO_x and VOC from all anthropogenic sources in the NAA to be included in ozone SIPs for purposes of rate of progress/reasonable further progress. This data was captured above in Section 3.

As mentioned as part of our control strategies, a wide variety of federal and state regulations contribute to reductions in emissions that have or should occur between the beginning of the 2018 and end of the 2023 ozone seasons. The values of these reductions are summarized in **Table 5.1**. Attachments 11.3 and 11.4 explain methodology and provide reductions per rule.

Table 5.1 – Demonstration of RFP (emissions in tons VOC/ozone season day)

Step	Description	W. Allegan	Berrien	W. Muskegon
1	2017 Base Year Inventory – Point, nonpoint, mobile on-road and non-road (updated 2022) (See Section 3.1)	5.35	10.87	6.36
2	Required RFR reductions – 15%	0.15	0.15	0.15
3	Emissions reductions required from 2017 base year (Step 2 x Step 1)	0.80	1.63	0.95
4	15% RFP Target levels for 2023 (Step 1 - Step 3)	4.55	9.24	5.41
5	Projected levels* for 2023 (See Section 3.2)	5.02	9.82	5.30
6	List of reductions between 2017 and 2023 already included in 2023 projection			
	a. Federal on-road control programs (See Section 6.1 and Attachment 11.5)	0.26	0.86	0.68
	b. Federal non-road control programs (See Attachment 11.5)	0.25	0.44	0.18
	Total (6a + 6b)	0.51	1.30	0.86
7	List of reductions between 2017 and 2023 NOT included in 2023 projection			
	a. VOC RACT (see Section 4.1 and Attachment 11.4 for details on Part 6 rule revisions and additions)	0.23	0.60	0.15
	b. Architectural and Industrial Maintenance Coatings Rule (see Section 5.1 and Attachment 11.4)	0.21	0.30	0.19
	c. Consumer Products (see Section 5.1 and Attachment 11.4)	0.07	0.10	0.06
	d. Voluntary Program – 3% of required reductions (See Section 5.1) (Step 3 x 0.03)	0.02	0.05	0.03
	Total (7a + 7b + 7c + 7d)	0.53	1.05	0.43
8	Motor Vehicle Budget Safety Factor (Allegan 5%, Berrien 3%, Muskegon 10%) (See Section 6.1)	(0.03)	(0.05)	(0.16)
9	Net emission reductions since base year inventory (Step 6 + Step 7 + Step 8)	1.01	2.30	1.13
	Is necessary 15% RFP reduction of 2017 base year achieved? (Step 9 >= Step 3)	Yes	Yes	Yes
10	Sum of reductions not included in 2023 projection (Step 7 + Step 8)	0.50	1.00	0.27
11	2023 projected levels – reductions NOT previously included in 2023 projection (Step 5 – Step 10)	4.52	8.82	5.03
	Is 2023 projected level – 15% of base year achieved? (Step 11 <= Step 4)	Yes	Yes	Yes

*Note: Uses MOVES3 for on-road and non-road projections, as is used in Step 6.

5.3 Contingency Measures

According to CAA §172(c)(9), the state must include contingency measures in this document representing one year of emissions reduction progress in case the area fails to attain the NAAQS by its attainment date or fails to meet RFP, often referred to as “One Year’s Worth of RFP.” Current guidance indicates these measures must be fully implemented within one year of a notice issued by the USEPA called a failure to achieve RFP. These additional conditional reductions are often calculated as being equivalent to an additional three percent reduction of precursors.

Although only a draft at the time of this document's creation, the USEPA's "Draft: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter," proposed in April 2023, will be used as a resource for this submittal. The draft guidance summarizes past contingency measure guidance, implementation rules and statutes, and addresses recent court actions and policy.

Numerous requirements concerning contingency measures are propounded by the USEPA draft guidance, including the following: contingency measures must be conditional and prospective, not already implemented, cannot be measures required to meet other legal requirements, take effect within specified timeframes, and require no further significant action by the state following a USEPA notification of a failure to meet RFP or attain, and generally occur within specified timeframes to be implemented.

To fulfill these requirements, if a failure to achieve RFP is issued by the USEPA, Michigan will select one or more of several contingency measures to address a failure in the proposed plan to meet the target goals for RFP. Due to the timing of the attainment date within an ozone season, Michigan will be able to anticipate its ability to achieve attainment by August 2024 and can therefore begin taking actions to evaluate and respond to a failure to achieve RFP before being issued a failure to achieve RFP, thus meeting the guidance requirement to take action before notification.

The following contingency measures will be considered and one or more taken if RFP is not achieved by the end of the 2023 ozone season:

- Increased methane leak monitoring and repair at oil and gas compressor stations;
- Phase 5 Consumer Products rules for VOC control;
- Reduced limits for stationary internal combustion sources such as boilers, engines, and process heaters for NOx reductions;
- Alternative fuel and diesel retrofit programs for fleet vehicle operations;
- VOC or NOx control on new minor sources;
- Increased VOC or NOx emission offsets for new and modified major sources;
- Reduced idling programs;
- Trip reduction programs; and
- Stationary engine controls to reduce formaldehyde and NOx emissions.

Continued assessment of potential sources of ozone precursors is ongoing, which may result in effective strategies after this document has been submitted to the USEPA. Anything learned from this assessment will be applied accordingly if contingency measures become required or appear to be destined based on observable data.

In Michigan's case, having never previously implemented RFP, the CAA requires that it must first be achieved with reductions of VOC precursors. With that obligation fulfilled, the state is then thereafter able to consider VOC and/or NOx reductions to address the RFP/contingency measure obligations. Therefore, Michigan has an opportunity to consider including language to address contingency measures in its forthcoming NOx RACT rules. These measures would only be implemented in the event of a USEPA formal notice of failure to meet RFP or formal determination of failure to attain for the three West Michigan NAAs.

The combination of the proposed contingency measures listed above and the automatically implemented rules addresses contingency measure obligations for the West Michigan NAAs.

6.0 Conformity Requirements

CAA §176(c) requires states to establish criteria and procedures to ensure that federally supported or funded activities, including highway projects, conform to the air quality planning goals in the applicable SIPs. The two types of conformity requirements and Michigan's demonstration of compliance with them are listed below.

6.1 Transportation Conformity

Transportation conformity under CAA §176(c) and the Transportation Conformity Rule (40 CFR Part 93) encompass the requirements to determine conformity for transportation plans, programs, and projects developed, funded, or approved under Section 134 of Title 23 of the United States Code. Conformity to a SIP means transportation activities will not produce new air quality violations, worsen existing violations, or delay timely attainment of the NAAQS.

Michigan's transportation conformity SIP was approved by the USEPA on December 18, 1996 (61 FR 66609) for ozone and CO, and was updated on April 10, 2017 (82 FR 17134) for particulate and CO. In addition, EGLE has a Memorandum of Agreement (MOA) with MDOT, the USEPA, the Federal Highway Administration, the Federal Transit Administration, and local metropolitan planning organizations involved in the transportation project planning process. The "2016 MOA Regarding Determination of Conformity of Transportation Plans, Programs, and Projects to State Implementation Plans" was signed on December 13, 2016, by the USEPA and is available upon request.

All agencies signing on to the MOA described above participate in an Interagency Workgroup (IAWG) process to determine whether proposed federally funded transportation projects conform to the requirements of the SIP. A project list is presented, and the IAWG evaluates which projects may be exempt from the rule based on the USEPA's criteria and which may need further air quality analysis (modeling) to determine whether they will conform to the motor vehicle emissions budgets in the SIP. Meeting summaries are provided in Attachment 11.5, Section 3, which summarize the negotiations and work done to ensure the budget presented in this document is known to all affected entities. The three transportation planning organizations involved in the West Michigan IAWG process are the Macatawa Area Coordinating Council within Allegan County, the West Michigan Shoreline Regional Development Commission within Muskegon County, and the Southwest Michigan Planning Commission within Berrien County. EGLE worked with representatives of MDOT to establish relevant budgets for conformity and inform the three municipal planning organizations of those new budgets.

On-road motor vehicle emissions are estimated for the base year period (Section 3.1, above) to assess emission trends and ensure continued compliance with the 2015 ozone NAAQS. On-road emissions include those from cars, buses, and trucks driven on public roadways. Colleagues at MDOT used their expertise with the MOVES3 modeling software to calculate on-road emissions. These modeled estimates are used to create a motor vehicle emissions budget (MVEB) to determine whether transportation plans and projects conform to the SIP, which is to say they will not interfere with Michigan's abilities to meet or maintain the NAAQS standard. Estimated on-road mobile emissions of VOCs and NO_x must not exceed the MVEBs contained in this submittal. Additional data and methodology are provided in Attachment 11.5, Section 2.

A safety margin is utilized to account for potential variations of forecast models used in the future such as different model versions or different travel demand models. A safety margin, as defined by the conformity rule, looks at the on-road emissions for purposes of an attainment SIP. States can apply a percentage of that safety margin to the mobile source categories when creating MVEBs .

Table 6.1 – MOVES3 Base Year and Future Year On-road Emission Summary

County	Pollutant	2017	2023	Difference
Allegan	NOx	1.86	0.96	-0.90
	VOC	0.93	0.67	-0.26
Berrien	NOx	5.05	2.48	-2.57
	VOC	2.66	1.80	-0.86
Muskegon	NOx	2.93	1.44	-1.49
	VOC	2.26	1.58	-0.68

Table 6.2 – Motor Vehicle Emissions Budget for Allegan County (tons/summer day)

	Allegan 2017 Partial County	Allegan 2023 Partial County	Safety Margin (% of 2023)	Safety Margin	Allegan Partial County MVEB	“Unused” 2017 VOC Emissions
NOx	1.86	0.96	20	0.19	1.15	N/A
VOCs	0.93	0.67	5	0.03	0.70	0.23

Table 6.3 – Motor Vehicle Emissions Budget for Berrien County (tons/summer day)

	Berrien County 2017	Berrien County 2023	Safety Margin (% of 2023)	Safety Margin	Berrien County MVEB	“Unused” 2017 VOC Emissions
NOx	5.05	2.48	20	0.50	2.98	N/A
VOCs	2.66	1.80	3	0.05	1.85	0.81

Table 6.4 – Motor Vehicle Emissions Budget for Muskegon County (tons/summer day)

	Muskegon 2017 Partial County	Muskegon 2023 Partial County	Safety Margin (% of 2023)	Safety Margin	Muskegon Partial County MVEB	“Unused” 2017 VOC Emissions
NOx	2.93	1.44	20	0.29	1.73	N/A
VOCs	2.26	1.58	10	0.16	1.74	0.52

6.2 General Conformity Requirements

Like transportation conformity, general conformity under CAA §176(c) ensures that all federally funded non-transportation projects such as airport construction (for example) do not hinder the state’s ability to attain or maintain compliance with the NAAQS. General conformity covers most federally funded or approved actions not already covered by the transportation conformity program and is applicable to nonattainment and maintenance areas for any NAAQS criteria pollutant. These regulations ensure that other (non-transportation) federal actions conform to each state’s SIP (58 FR 63214). General conformity determinations are made at the project level; however, the USEPA incorporated de minimis levels into the rule to serve as cutoff points to keep the focus on those federal actions anticipated to have the most significant impacts on air quality. Michigan’s general conformity SIP was approved by the USEPA on December 18, 1996 (61 FR 66607) and incorporates verbatim, in accordance with guidance from the USEPA, the general conformity criteria and procedures provided in 40 CFR Part 93 Subpart B. Michigan continues to operate under this rule and, therefore, no more

actions are required as part of this submittal. Documentation of Michigan's general conformity SIP is available upon request.

7.0 Authority, Public Involvement, and Other Miscellaneous Items

Various elements are required to submit a complete SIP approval request as described in CAA §172(c) and 110(a)(2) as well as 40 CFR 51, Appendix V. They require that there is authority to enforce this SIP, that the public has had ample opportunity to comment, and that the state responds to those comments appropriately, in addition to other requirements.

7.1 Authorities

This section provides that the infrastructure SIP submitted by a state must have been adopted by the state after reasonable public notice and hearing, and among other things, it must:

- include enforceable emission limitations and other control measures (other than nonattainment emission limitations and measures, which are a part of NAA plans and are subject to the timing requirements of CAA §172);
- include means or techniques necessary to meet the requirements of the CAA;
- provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to monitor ambient air quality;
- provide for implementation of a source permit program to regulate the modification and construction of any stationary source within the areas covered by the plan;
- include provisions for the implementation of Part C, prevention of significant deterioration and Part D, NNSR permit programs;
- include criteria for stationary source emission control measures, monitoring, and reporting;
- include provisions for air quality modeling; and
- provide for public and local agency participation in planning and emission control rule development.

Michigan verified that the state fulfills the requirements of CAA §110(a)(2) through the 2015 ozone NAAQS infrastructure SIP submitted to the USEPA on March 5, 2019. The USEPA approved all infrastructure SIP elements, with the following exceptions, effective October 28, 2021 (86 FR 53550): the USEPA disapproved element (D)4 because the State of Michigan is under a federal implementation plan for regional haze; the USEPA took no action on elements (I) and (J)4 because they are not germane to infrastructure SIPs; and the USEPA took no action and will make a separate rulemaking on elements (D)1, (D)2, and (E)2.

7.2 Public Notice and Hearing

All submittals and/or changes to the SIP are first made available for public input in the form of notices, hearings, and comment periods. These are conducted as required by state statute and have been reviewed and approved as part of the 2015 ozone infrastructure SIP. A brief description of the main components of this process follows:

- Public notice of the SIP document – A 30-day public notice was provided in EGLE's Environmental Calendar on July 10, 2023. A copy of that notice is provided in Attachment 11.6. In addition, the EGLE website posted similar information through several links at the time of the comment period. A copy of the website is also provided in Attachment 11.6.
- Public hearing – As part of the public notification, a public hearing is offered on request as illustrated in the documents above. There were no requests for a public hearing, so a hearing was not held.

- Public comments – As part of the public notice, the public is invited to provide comments for 30 days. A compilation and summary of the public comments received, and the AQD responses are provided in Attachment 11.6
- Although they are not conducted as part of this SIP approval process, rule packages related to this submittal underwent and/or are undergoing the full state rule promulgation process, which includes a public notice, hearing, and comment process. The inclusion of most of the rules in these packages into Michigan’s SIP is a necessary step to the approval of the attainment SIP. The following rule packages are in the process of being promulgated or are being requested to be approved into Michigan’s SIP, or have recently been approved into the SIP:
 - Part 1 – Definitions
 - Part 6 – VOC RACT
 - Part 7 – VOC BACT
 - Part 8 – NOx RACT
 - Part 9 – Miscellaneous
 - Part 10 – Testing

7.3 Other Miscellaneous Materials

Several administrative materials are required as described in 40 CFR 51 Appendix V. While some are addressed at various locations throughout this document, the following items are addressed here:

- Formal Request – A cover letter will be sent with this document.
- Adoption in State Regulations – as described in Section 5, the VOC RACT, AIM, and Consumer Products rules were promulgated into the MAPCR in April 2023, while the NOx RACT rules are expected to be promulgated by early 2024. Copies of these rules will be submitted separately as part of another SIP approval request. These submittals will contain their own public notice, hearing, comment period, and comment response documents that were created as part of our state rulemaking process.
- Necessary Legal Authority – See Section 7.1.
- Copy of Rule or Regulation – This document serves as such.
- Requirement to Follow State Laws – This document does not fall under the requirements of state law except to provide public notice according to state procedures. Some components of this document (ex. rulemaking) are being addressed as separate submittals.
- Sufficient Public Notice, Valid Public Hearing, and Public Comments and Responses – See Section 7.2.

There is also a requirement in Appendix V to have sufficient technical support for the submittal including such items as “Continued Protection of Federal Standards.” Material generated to address these requirements is provided throughout this document and its appendices.

- Affected Regulated Pollutants
- Affected Sources
- Quantification of Emission Changes
- Continued Protection of Federal Standards
- Modeling Information
- Continuous Emission Reduction Technology
- Ensuring Emissions Levels
- Compliance and Enforcement Strategies
- Required Economic and Technological Justifications.

8.0 Other Requirements

8.1 Nonattainment New Source Review

Pursuant to the CAA §172(c)(5), a complete attainment SIP submittal must contain an element addressing NNSR. This document was submitted to the USEPA for approval on January 24, 2023. It was proposed for direct final approval on June 9, 2023 (88 FR 37766).

8.2 Vehicle Inspection and Maintenance

Vehicle Inspection and Maintenance (I/M) programs are a requirement pursuant to the CAA §182(b)(4). However, not all NAAs are required to have an I/M program. The CAA requires a “Basic” I/M program for ozone NAAs classified as moderate with an urbanized population over 200,000 in 1990 for light-duty cars, and an “Enhanced” I/M program for areas with serious, severe, and extreme classifications with populations over 200,000 in 1980. The historical, approximate population of each of the three NAAs is as follows:

- Allegan County: 90,509 in 1990 and 81,555 in 1980
- Berrien County: 161,378 in 1990 and 171,276 in 1980
- Muskegon County: 158,983 in 1990 and 157,589 in 1980

Because all these areas are below the 200,000-person threshold described in CAA §182(c)(3)(A), there are no requirements to have a vehicle I/M program in these areas.

9.0 Environmental Justice

Environmental justice is an important topic to consider when addressing ozone issues in the state. EGLE decided to include the following analysis and evaluation, although not a required element for this submittal by the USEPA or the CAA. EGLE used Michigan’s draft environmental justice screening and mapping tool (MiEJScreen) to identify potentially overburdened communities in the three NAAs (Allegan, Berrien, and Muskegon Counties) to help assess whether this plan would exacerbate or reduce existing exposure to pollution in those communities. The assessment also looked at whether additional measures or steps should be taken to better ensure communities can participate in a meaningful way in this process. MiEJScreen was modeled closely after California’s environmental justice screening tool (CalEnviroScreen Version 3.0). Data from the USEPA’s Environmental Justice Screening and Mapping Tool (EJScreen) was also incorporated into MiEJScreen.

The USEPA’s “EJScreen Technical Documentation” (October 2022) indicates that an area with a generalized score at or above the 80th percentile nationally should be considered as a potential candidate for further consideration, analysis, or outreach. EGLE finds the 80th percentile metric to be reasonable for the current statewide application of MiEJScreen, established by Michigan’s Office of the Environmental Justice Public Advocate, as a starting point to screen for potentially overburdened and/or vulnerable communities. The MiEJScreen Score (or MiEJ Score) percentiles are different than the indexes associated with the USEPA’s EJScreen due to: (1) the MiEJScreen’s comparison of statewide census tracts to develop scores; and (2) the multiple indicators factored into the overall MiEJ Score.

EGLE utilized MiEJScreen to generate reports for the three West Michigan NAAs for the 2015 ozone standard. The reports identified three types of variables for the screened areas: MiEJ Overall Scores, Environmental Conditions Indicators, and Population Characteristic Indicators. The MiEJ Score is a summarized combination of environmental, health, and socioeconomic factors. The MiEJ Score percentiles are designed to allow for comparison across census tracts throughout the state of Michigan. Environmental Conditions Indicators are a quantification of the proximity, concentration, and/or exposure potential to certain types of environmental

pollutants. Population Characteristic Indicators are factors that may increase susceptibility to environmental health risk related to health conditions and socioeconomic factors.

The census tracts in each NAA were analyzed separately prior to a more detailed screening to identify the tracts with overall MiEJ Score with an 80th percentile or above. This data is included in Tables 9.1 and 9.2. Maps of overburdened and surrounding census tracts in Berrien and Muskegon Counties were included in Figures 9.1 and 9.2 to provide a visual representation and to give a locational context for members of these communities. The screening results indicated 12 census tracts across the three counties at or above the 80th percentile threshold for the overall MIEJ Score. Data collected from Allegan County is not shown as it did not contain any census tracts that met or surpassed the 80th percentile threshold for the overall MIEJ Score. A selection of additional demographic and environmental indicators are included in Tables 9.1 and 9.2 to highlight contributing factors to the overall MiEJ Score percentiles for the identified census tracts in Muskegon and Berrien Counties.

MiEJScreen has the capacity to calculate Linguistic Isolation Percentiles for census tracts throughout the state. This data, included in Tables 9.1 through 9.3, is significant in terms of comparative analysis. The Linguistic Isolation Percentiles data, in combination with the established guidance in EGLE's Limited English Proficiency (LEP) Plan, indicates to EGLE staff the communities that are potentially in need of translated information. The LEP assists policymakers on the need for translation of public outreach materials. The LEP specifies that providing written translations of vital documents for each eligible LEP language group constituting 5 percent or 1,000 people of the population that speaks English less than "very well" should be a standard procedure. Table 9.4 indicates that only census tract 22 of Berrien County requires materials to be translated to Spanish based on this criterion. Translation also better ensures that all populations can meaningfully engage in public participation opportunities. Therefore, as part of the public comment process, EGLE will offer to translate this attainment SIP and any related public outreach materials to Spanish to increase awareness in this community. In addition to potentially translating documents into Spanish, EGLE can provide information in other ways, if requested. This includes, but is not limited to other written languages, and accessible documents for the visually impaired. Members of the public can also contact EGLE-Accessibility@Michigan.gov or call the Environmental Assistance Center at 800-662-9278.

The identified overburdened and/or vulnerable communities in the NAAs are expected to incur socioeconomic, environmental, and health benefits as an outcome of the NO_x and VOC emissions reduction and control measure requirements provided in the attainment SIP. It should be noted, however, that the implementation of more stringent emissions limits on facilities within the West Michigan NAAs may have a limited ability to reduce ozone levels. The potential transport from other upwind states could obscure and/or eliminate the effectiveness of the emission reductions from Michigan-based emitters and impose additional negative health, environmental, and socioeconomic impacts on currently overburdened and/or vulnerable populations. Existing and "on-the-books" transport rules such as the CSAPR and the Good Neighbor Rule have the potential to reduce NO_x emissions allowances to Michigan and upwind states. This could potentially have an impact across the NAAs. The extent to which NO_x emission offsets and allowances will be traded is uncertain, yet it can be inferred that some of the identified overburdened and/or vulnerable populations may be subject to reduced exposures to ground-level ozone while others may experience heightened exposures due to NO_x trading. However, large-scale ozone transport, the dominant reason for nonattainment in West Michigan, is not expected to create disparities in ozone exposure among socioeconomic subpopulations.

Table 9.1 – Overburdened and/or Vulnerable Communities in Muskegon County Nonattainment Area

Tract Name	MiEJ Score Percentile*	Total Population	Unemployed (%)	Ozone Percentile	Asthma Percentile	Life Expectancy Percentile	Low Income Percentile	BIPOC** (%)	Linguistic Isolation Percentile
Census Tract 3	81	4,887	11	59	90	81	86	84	0
Census Tract 5	81	4,747	13	68	98	94	92	85	50
Census Tract 6.01	81	1,557	16	75	95	86	91	82	54
Census Tract 10	84	4,074	14	83	94	88	86	87	0
Census Tract 42	82	3,545	16	63	89	81	97	83	57
Census Tract 43	87	1,888	24	78	95	87	96	90	65

*Only communities measuring at or above the 80th percentile threshold for the MiEJ Score Percentile are shown.

**BIPOC – Black, Indigenous, People of Color Population.

Table 9.2 – Overburdened and/or Vulnerable Communities in Berrien County Nonattainment Area

Tract Name	MiEJ Score Percentile*	Total Population	Unemployed (%)	Ozone Percentile	Asthma Percentile	Life Expectancy Percentile	Poverty Percentile	BIPOC** (%)	Linguistic Isolation Percentile
Census Tract 4	87	2,515	14	99	95	93	99	93	67
Census Tract 5	80	1,627	13	99	98	96	92	91	0
Census Tract 6	85	3,414	16	99	93	87	86	90	83
Census Tract 20	80	3,354	6	99	84	90	83	85	0
Census Tract 21	89	2,310	19	99	90	99	93	83	70
Census Tract 22	83	3,050	18	99	97	97	100	92	0

*Only communities measuring at or above the 80th percentile threshold for the MiEJ Score Percentile are shown.

**BIPOC – Black, Indigenous, People of Color Population

Table 9.3 – Population Language Breakdown of Linguistically Isolated Census Tract Communities in Nonattainment Areas

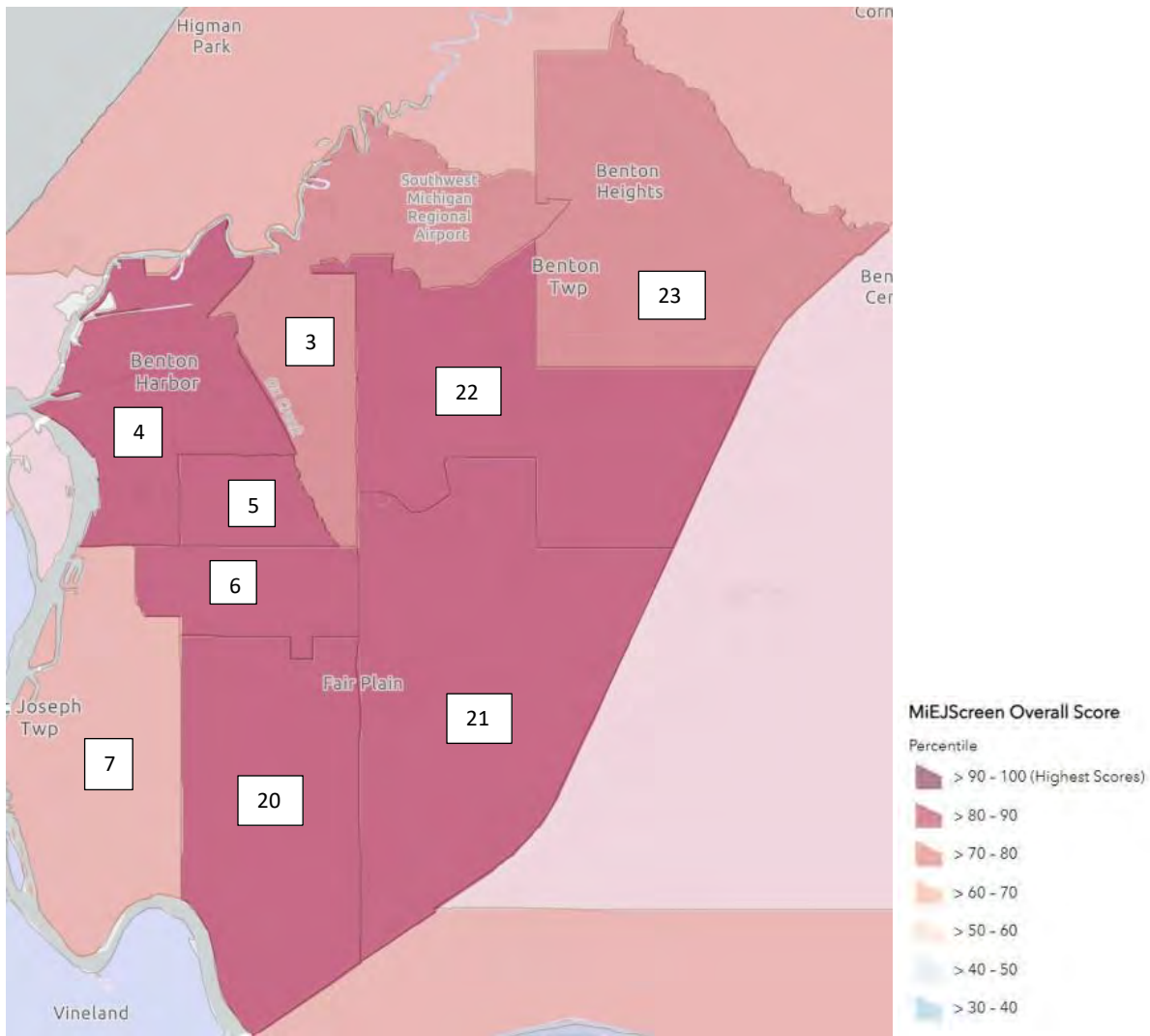
County	Tract Name	Total Population (5 years and older)	English (only)	Spanish	Indo-European	Other
Berrien	Census Tract 4	1822	1693	105	24	0
	Census Tract 6	2708	2381	310	17	0
	Census Tract 21	2051	1945	95	11	0
Muskegon	Census Tract 5	4242	3897	339	6	0
	Census Tract 6.01	1469	1435	25	9	0
	Census Tract 42	3386	3118	238	8	22
	Census Tract 43	1589	1513	76	0	0

Table 9.4 – Population in Berrien and Muskegon Counties by Tract that Speak English Less Than “Very Well” (5 Years and Older)

County	Census Tract	People that speak English less than “very well” (%)	Speak Spanish and speak English less than “very well” (%)	Speak other Indo-European Languages and speak English less than “very well” (%)
Berrien	4	5.3	4.4	0.9
	5	0.4	0.4	0.0
	6	2.2	1.8	0.4
	20	0.3	0.3	0.0
	21	3.3	3.3	0.0
	22	5.1	5.1	0.0
Muskegon	3	2.9	2.9	0.0
	5	3.3	3	0.3
	6.01	2.9	2.9	0.0
	10	1	0.5	0.5
	42	0.9	0.5	0.4
	43	2.9	2.9	0.0

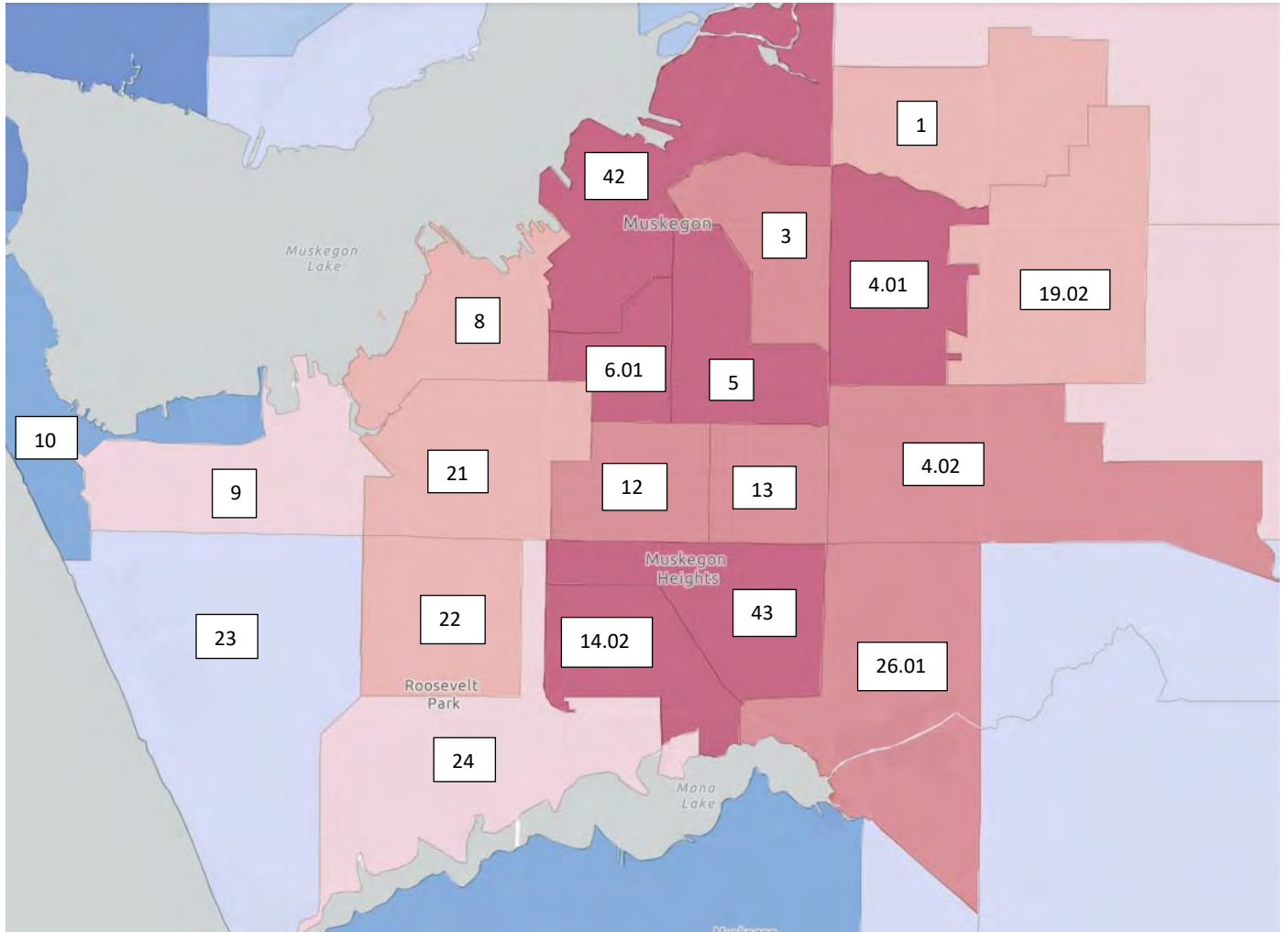
(United States Census Bureau – 2020 Census Tract Reference Data – People That Speak English Less Than “Very Well”)

Figure 9.1 – Map of Labeled Census Tracts in Berrien County Nonattainment Area with MiEJ Score Overlay – MiEJScreen

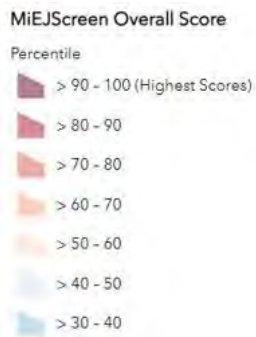


(Overburdened and/or Vulnerable Census Tracts in Berrien County: 4-6, 20-22)

Figure 9.2 – Map of Labeled Census Tracts in Muskegon County Nonattainment Area with MiEJ Score Overlay – MiEJScreen



(Overburdened and/or Vulnerable Census Tracts in Muskegon County: 3, 5-6.01, 10, 42-43)



10.0 Regulatory Applicability

Clean Air Act – Part 110 and Part D (§172, 176 and 182)

Citation	Regulation Description	Comment
172 gives nonattainment plan provisions, in general.		
172(c)(1)	In General	RACT and RACM are covered in Section 4 of this document. Control measures are described in Section 5.
172(c)(2)	RFP	This requirement is addressed in Section 5 of this document.
172(c)(3)	Inventory	A portion of this requirement has been previously addressed as a submittal made to the USEPA on December 18, 2020. The previous submitted inventory has been updated and an attainment year inventory is presented in Section 3.
172(c)(4)	Identification and Quantification	Sector specific VOC emission estimates are considered part of the modeling attainment demonstration described in Section 2. In addition, sources were examined as part of the RFP analysis performed as described in Section 5.2.
172(c)(5)	Permit for new and modified major stationary source	Michigan has SIP approved rules that address nonattainment NSR permitting. We submitted an NNSR certification request that was proposed for direct final approval on June 9, 2023.
172(c)(6)	Other measures	Other measures taken to achieve attainment are described in Section 5.1.
172(c)(7)	Compliance with §110(a)(2)	All materials and descriptions of public involvement, authority, and programs are described in Section 8 of this document.
172(c)(8)	Equivalent Techniques	No equivalent techniques are being requested in this submittal.
172(c)(9)	Contingency measures	Contingency measures are addressed in Section 5.3 of this document.
176 places limits on certain types of federal assistance.		
176(c)	Conformity	Requires that the state submit revisions to its implementation plan to address conformity, which is done in Section 6 of this document under the heading "Conformity Requirements."
182(a) details requirements for plan submissions specifically for ozone nonattainment areas with a marginal classification.		
182(a)(1)	Inventory	Submitted December 18, 2020
182(a)(2)	Corrections to the SIP	The requirements of this section were not applicable due to a lack of corrections, a lack of I/M applicability, and timing of the requirement.
182(a)(3)	Periodic inventory	Emissions Statement – submitted December 18, 2020
182(a)(4)	General offset requirement	The offset requirement is addressed in SIP-approved Part 19 rules.

182(b) details requirements for plan submissions specifically for ozone nonattainment areas with a moderate classification.		
182(b)(1)	Plan provisions for RFP	The details of this topic are addressed in Section 5 of this document.
182(b)(2)	RACT	The details of this topic are addressed in Section 4 of this document.
182(b)(3)	Gasoline Vapor Recovery	States are not required to implement Stage II programs in their SIPs per 77 FR 28772. No additional materials will be provided as part of this submittal.
182(b)(4)	Motor Vehicle Inspection and Maintenance	Not required as described in Section 8 of this document.
182(b)(5)	General Offset Requirement	Michigan currently has sufficient SIP-approved (May 12, 2021, 86 FR 25954) NNSR permitting rules that address the emission offset requirement of 1.15 to 1 as Michigan Rule 336.2908(6)(a)(ii). No additional materials will be provided as part of this submittal.
182(f) details NOx requirements		
182(f)(1)	NOx/VOC limited	Michigan does not seek to avoid/reduce NOx regulatory applicability.
182(f)(2)	Excess reductions	
182(f)(3)	Petition	

40 CFR 51 gives requirements for preparation, adoption, and submittal of implementation plans.

Subpart I Review of New Sources and Modifications		
51.165	Permit requirements	Certification existing NNSR program is sufficient
Subpart T Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects Developed, Funded, or Approved Under Title 23 U.S.C or the Federal Transit Laws.		
51.390	Implementation plan revision	The details of this topic are addressed in Section 6 of this document.
Subpart AA contains provisions for implementing the 2008 ozone NAAQS, i.e., the 2008 ozone NAAQS implementation rule.		
51.1100 – 51.1119	Implementation plan revision	Reference for Subpart CC.
Subpart CC contains provisions for implementing the 2015 ozone NAAQS, i.e., the 2015 ozone NAAQS implementation rule.		
51.1306	Redesignation	Not applicable
51.1307	1-year extensions	Not applicable
51.1308	Attainment Demonstration and Implementation of control measures	The details of this topic are addressed in Section 2 of this document.
51.1310	Requirements for reasonable further progress	The details of this topic are addressed in Section 5 of this document.
51.1312	Requirements for reasonable available control technology	The details of this topic are addressed in Section 4 of this document.
51.1313	Section 182(f) NOx exemption provisions	Not applicable
51.1314	New source review requirements	The details of this topic are addressed in Section 8 of this document.
51.1315	Emissions inventory requirements	The details of this topic are addressed in Section 3 of this document.
51.1316	Ozone Transport Regions	Not applicable

51.1317	Fee programs for Severe and Extreme NAA.	Not applicable
51.1318	Clean Data	Not applicable
Appendix V gives criteria for determining if a plan submission is complete. Where applicable, these topics are addressed throughout this document, but with special emphasis on Section 7 titled “Public comments” and, for some components described below, in Section 2.		
Sections 2.1 – 2.3	Administrative materials	Such as, requirement of formal requests, proof of adoption into state regulations, necessary legal authority, a copy of rules and regulations, evidence the state followed their own rules, proof of sufficient public notice, public comments and responses, and a valid public hearing.
	Technical support	Listing the affected regulated pollutants, affected sources, quantification of emission changes, the continued protection of federal standards, modeling information, continuous emission reduction technology, ensuring emissions levels, compliance, and enforcement strategies, and required economic and technological justifications.
	Exceptions	Not applicable to this submittal

40 CFR 93 Conformity

Subpart		
93.100 – 160	Transportation Conformity	Details of this topic are addressed in Section 6 of this document.

USEPA Guidance Documents

“Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations” – May 2017
“Draft: Guidance on the Preparation of State Implementation Plan Provisions that Address the Nonattainment Area Contingency Measure Requirements for Ozone and Particulate Matter” – April 2023
“EJSCREEN – Environmental Justice Mapping and Screen Tool, Technical Documentation” – September 2019
“RACT Qs & As – Reasonably Available Control Technology (RACT): Questions and Answers” – 2006
“Control Techniques Guidelines for the Oil and Natural Gas Industry” EPA-453/B-16-001 – 2016

11.0 Attachments

11.1 LADCO Modeling

11.2 Emission Inventory Calculations/Data

11.3 RFP Calculation Methodology

11.4 RFP Rule Reduction Totals

11.5 Mobile Emission and Transportation Conformity Supporting Documentation

11.6 Public Notice Materials