



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY

Five-Year Progress Report for the Regional Haze Second Planning Period

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I. Executive Summary

The federal Clean Air Act (CAA) sections 169A and B (42 U.S.C. 7491 and 7492) require the protection of visibility in 156 mandatory federal Class I areas consisting of all international parks, national wilderness areas and national memorial parks exceeding 5,000 acres, and national parks exceeding 6,000 acres that were in existence on August 7, 1977, for which visibility was found to be an important value (CAA section 162(a) [42 U.S.C. 7472(a)]). The United States Environmental Protection Agency's (USEPA) 1999 Regional Haze Rule, Title 40 of the Code of Federal Regulations (CFR) 51.308, requires states to develop and implement State Implementation Plan (SIP) revisions on a periodic basis to reduce visibility impairment, known as regional haze, resulting from "manmade air pollution." See 82 Federal Register (FR) 3078, January 10, 2017.

On August 23, 2021, the Michigan Department of Environment, Great Lakes, and Energy (EGLE) submitted to the USEPA its Regional Haze SIP revision for the second planning period, which covers the 10-year period of 2019 to 2028. As of the date of this report, the USEPA has not yet taken final action on the State of Michigan's (State) Regional Haze SIP revision submittal for the second planning period. The USEPA is required to act on Michigan's Regional Haze SIP submittal by May 30, 2025, in accordance with a federal consent decree that was entered on July 12, 2024. See *Sierra Club, et al. v. United States Environmental Protection Agency, et al.*, No. 1:23-cv-01744-JDB (United States District Court for the District of Columbia).

In addition to periodic SIP revisions, the Regional Haze Rule requires states to provide interim progress reports outlining the status of required Regional Haze SIP elements. Following opportunities for Federal Land Management (FLM) consultation and public comment, the State submits this five-year progress report to document and evaluate implementation of the SIP requirements and the resulting reductions in haze-causing emissions and associated visibility improvements. This progress report also documents the State's decision to prepare a supplement to revise its 2021 Regional Haze SIP submittal, which provides additional information and justification to ensure the State achieves Michigan's reasonable progress goals for 2028 and meets the requirements specified under 40 CFR 51.308(f).

II. Introduction

A. Five-year Progress Report

The Regional Haze Rule requires states to submit a SIP revision to the USEPA generally every 10 years, evaluating satisfaction of the reasonable progress goals for each Class I area within the state, as well as each Class I area located outside the state that may be affected by emissions from within the state (40 CFR 51.308(g)). The Regional Haze Rule also requires the state to determine the adequacy of its existing Regional Haze SIP (40 CFR 51.308(h)). This document fulfills the applicable requirements of the five-year progress report. The State has also determined that it will produce a supplement to the August 23, 2021, Regional Haze SIP submittal, for which the USEPA has not yet taken action, to provide additional information to support its decisions on what control measures are

necessary to make reasonable progress, which can be found on page 22 of Michigan's 2021 Regional Haze SIP Submittal.¹

B. Summary of Progress Report Elements

This Progress Report was assembled by consulting the July 2024 USEPA regional haze progress report resource document ("Overview of Elements for the Regional Haze Second Planning Period State Implementation Plan Progress Reports Due in 2025," USEPA, Office of Air Quality Planning and Standards, July 2024).² Sections of this five-year progress report follow the required elements in the resource document based on 40 CFR 51.308(g). Summaries of each element in the State's five-year progress report follow.

Status of Control Strategies in the Regional Haze SIP, 40 CFR 51.308(g)(1)

This section provides a status update of all federal and state control measures, which were relied upon for reasonable progress to address regional haze at Class I areas both within and outside of the state during the period of 2019 to the most recent year prior to submittal of the report.

Emissions Reductions from Regional Haze SIP Strategies, 40 CFR 51.308(g)(2)

This section identifies and estimates the emissions reductions to date from the period of 2019 to the most recent year (2023) of fully reported emissions of visibility-impairing pollutants from the SIP measures implemented in accordance with 40 CFR 51.308(g)(1).

Visibility Progress, 40 CFR 51.308(g)(3)

This section evaluates relevant Interagency Monitoring of Protected Visual Environments (IMPROVE)³ data and offers a conclusion about the visibility conditions/changes for the Class I areas within Michigan.

Emissions Progress, 40 CFR 51.308(g)(4)

This element provides an analysis tracking changes in emissions of visibility-impairing pollutants (specifically oxides of nitrogen (NO_x) and sulfur dioxide (SO₂)) across the State's entire emissions inventory and between different source categories.

Assessment of Changes Impeding Visibility Progress, 40 CFR 51.308(g)(5)

This element of the Progress Report provides an indication on whether conditions may change to impede the progress currently being made in improving the visibility at the two Class I areas. The State does not currently anticipate any significant changes in either in-state or out-of-state emissions that would impede visibility progress.

¹ [State Implementation Plan Submittal for Regional Haze - Second Planning Period](#)

² Overview of Elements for the Regional Haze Second Planning Period State Implementation Plan Progress Reports Due in 2025," USEPA, July 2024 available at: epa.gov/system/files/documents/2024-07/final_rh_2025_progress_report_requirements_document_7-30-2024.pdf

³ Interagency Monitoring of Protected Visual Environments (IMPROVE). Background information can be found at <https://vista.cira.colostate.edu/Improve/improve-program/>

Assessment of Current Strategy, 40 CFR 51.308(g)(6)

This element of the Progress Report provides a final conclusion on the ability of the existing Regional Haze SIP and related control programs to achieve the 2028 reasonable progress goals at the two Class I areas, or whether more needs to be done.

In a review of EGLE’s visibility monitoring strategy, the State continues to rely upon participation in the IMPROVE Program to meet its monitoring strategy requirements with no modifications to the strategy determined necessary at this time.

Determination of Adequacy, 40 CFR 51.308(h)

With regard to Michigan’s August 23, 2021, Regional Haze SIP submittal for the second planning period, for which the USEPA has not yet taken final action, EGLE documents the State’s determination that the SIP submittal may be inadequate to ensure reasonable progress due to emissions from sources within the state per 40 CFR 51.308(h)(4). As such, EGLE has decided to prepare a supplement to the State’s 2021 SIP submittal to provide additional information and justification to ensure the State achieves Michigan’s reasonable progress goals for 2028 and meets the requirements specified under 40 CFR 51.308(f).

III. Status of Control Strategies in the Regional Haze SIP, 40 CFR 51.308(g)(1)

A. Haze SIP Control Measures/Limits and Status – First Planning Period

Non-Electric Generating Units (EGU) BART-Subject Sources

Five non-EGU sources in the state were identified in the 2010 Regional Haze SIP submittal as being subject to Best Available Retrofit Technology (BART). These sources are evaluated below in terms of Haze SIP control measures/limits and status relative to compliance deadlines. This part also describes how three of the five State BART sources are now required to apply additional or more stringent controls beyond those required in the Michigan BART determinations due to the USEPA’s disapprovals of the State BART determinations and issuance of Federal Implementation Plans (FIP).

1. Holcim (US), Inc. DBA Lafarge Alpena Plant (referenced in State 2010 Regional Haze SIP Submittal as Lafarge Midwest, Inc. – Alpena Plant)

A [federal Consent Decree](#) among Lafarge Midwest, Inc., the United States, the State of Michigan, and other states and jurisdictions (USA, the USEPA, Michigan, et al. 9th v. Lafarge; U.S. District Court Civil Action No. 3:10-cv-00044-JPG-CJP) was entered on March 18, 2010, requiring NO_x and SO₂ control for the Alpena plant and other Lafarge plants.

The Consent Decree allowed Lafarge to apply NO_x and SO₂ control measures or to retire or replace any of their five kilns according to a specified schedule to achieve specified facility-wide tons per year (tpy) limits. The control program also set demonstration-phase facility-wide, 12-month rolling limits of 4.89 pounds of NO_x per ton of clinker and 3.68 pounds of SO₂ per ton of clinker for a period during which

individual limits were also to be set for each kiln based on emission testing. These Consent Decree requirements had previously been accepted as BART in the 2010 Regional Haze SIP submittal.

Lafarge opted to install Selective Non-Catalytic Reduction (SNCR) NO_x control on each kiln, along with Dry Absorbent Addition (DAA) for SO₂ control on Kilns 19, 20, 21 (Kiln Group 5) and wet Flue Gas Desulfurization (FGD) SO₂ control on Kilns 22 and 23 (Kiln Group 6). The limits and other requirements of the Consent Decree and selected SO₂ and NO_x control systems were incorporated in the State Permit to Install (PTI) No. 195-10B (copy attached as Appendix A), issued on September 13, 2013.

The interim facility-wide, 12-month rolling limits of the Consent Decree are listed below. Annual actual facility-wide emission rates for 2022 (3,767 tpy NO_x and 2,287 tpy SO₂) were well below the Consent Decree 2011 interim 12-month rolling limits.

Consent Decree Deadlines/Limits - USA, the USEPA, Michigan, et al. 9th v. Lafarge; U.S. District Court Civil Action No. 3:10-cv-00044-JPG-CJP.

NO_x

- Interim Limit (facility-wide 12-month rolling): 8,650 tons by January 1, 2011
- Install SNCR Control on 3 Kiln Group 5 Kilns by December 1, 2011
- Install SNCR Control on 2 Kiln Group 6 Kilns by January 1, 2012

SO₂

- Interim Limit (facility-wide 12-month rolling): 13,100 tons by January 1, 2011
- Install DAA Control on 3 Kiln Group 5 Kilns by March 1, 2014
- Install Wet FGD on 2 Kiln Group 6 Kilns by March 1, 2014

Compliance Status: Current status as of May 19, 2022, listed in the Michigan Air Compliance and Enforcement System (MACES), indicates compliance with applicable permits, which include the Consent Decree requirements, and Michigan rules. Also, no current enforcement action was found in MACES.

2. Billerud Escanaba LLC (referenced in State 2010 Regional Haze SIP Submittal as New Page)

The 2010 Regional Haze SIP submittal indicated that the State had accepted Billerud Escanaba's existing particulate matter (PM), NO_x, and SO₂ emission limits as representing BART for their subject equipment. The USEPA later issued a final rule effective on January 2, 2013, disapproving the portion of the State's Regional Haze SIP that applied to the BART determination for Billerud Escanaba's Boilers 8 and 9 (77 FR 71533, December 3, 2012). The final rule also included a FIP for Billerud Escanaba's Boilers 8 and 9 that imposed NO_x BART limits.

The FR publication of the USEPA disapproval action and the FIP can be accessed at: [federalregister.gov/documents/2012/12/03/2012-29014/approval-and-promulgation-of-air-quality-implementation-plans-michigan-regional-haze-state](https://www.federalregister.gov/documents/2012/12/03/2012-29014/approval-and-promulgation-of-air-quality-implementation-plans-michigan-regional-haze-state).

The USEPA noted in their final rulemaking that Billerud Escanaba had already implemented improvements in combustion control for its boilers and that the limits in the FIP required the current levels of NO_x control be maintained.

The Boiler 8 NO_x limit was changed by the USEPA to a fixed, rolling 30-day average limit of 0.35 pound (lb.) of NO_x per Million British Thermal Units (MMBtu), rather than a weighted average of separate limits for oil firing and gas firing. A continuous emission monitor (CEM) system was the required means of compliance determination for Boiler 8. The Boiler 9 NO_x limit was set by the FIP at 0.27 lb. per MMBtu with compliance determination by means of emission testing.

Compliance Status: The most recent inspection that addressed Boilers 8 and 9 was completed on June 14, 2022, through which EGLE's Air Quality Division (AQD) determined Billerud Escanaba to be in compliance with the NO_x FIP limits adopted in the State PTI No. 127-11D (copy attached as Appendix B), as well as the other applicable Michigan Air Pollution Control Rules.

3. St. Marys Cement Charlevoix Plant

The State's 2010 Regional Haze SIP indicated that the State had accepted the St. Marys Cement (SMC) existing permitted PM, NO_x, and SO₂ emission limits as representing BART for their subject equipment. The USEPA later issued a final rule effective on January 2, 2013, disapproving the portion of the State's Regional Haze SIP that applied to the NO_x and SO₂ BART determination for the cement kiln and associated equipment at SMC. 77 FR 71533, December 3, 2012. The final rule also included a FIP for this equipment that imposed NO_x and SO₂ BART limits. The FR publication of the USEPA disapproval action and FIP can be accessed at: [federalregister.gov/documents/2012/12/03/2012-29014/approval-and-promulgation-of-air-quality-implementation-plans-michigan-regional-haze-state](https://www.federalregister.gov/documents/2012/12/03/2012-29014/approval-and-promulgation-of-air-quality-implementation-plans-michigan-regional-haze-state).

The USEPA noted in their final rulemaking that their BART determination for the facility includes operation of SNCR and a 50 percent reduction in NO_x emissions. The following NO_x emission limits were set in the FIP effective January 1, 2017, along with testing, monitoring, recordkeeping, and reporting requirements:

- 2.80 lbs. NO_x per ton of clinker (30-day rolling average as NO₂);
- 2.40 lbs. NO_x per ton of clinker (12-month average as NO₂); and
- 7.50 lbs. SO₂ per ton of clinker (12-month average).

The USEPA also concluded in the rulemaking that add-on SO₂ control was not warranted as BART set an SO₂ limit of 7.5 lbs. per ton of clinker.

These NO_x and SO₂ BART limits were officially adopted into an approved PTI on September 22, 2022 (PTI No. 140-15C) (copy attached as Appendix C) but have been federally enforceable through SMC's most recently approved Renewable Operating Permit (ROP) since coming into effect on August 20, 2014 (MI-ROP-B1559-2014). MI-ROP-B1559-2014 includes a condition that specifies that the permittee shall comply

with all applicable requirements of the Regional Haze Regulations requiring BART, as specified through 40 CFR 52.1183(h), effective January 1, 2017.

Compliance Status: At the most recent inspection on November 2, 2022, SMC was determined to be in compliance with the applicable NO_x and SO₂ BART conditions under both MI-ROP-B1559-2014 and PTI No. 140-15C. No current enforcement action was found in MACES.

4. Smurfit-Stone Container Corporation

The State 2010 Regional Haze SIP indicated that the Smurfit-Stone Container Corporation plant had been shut down since February 2010. The company was listed as American Iron & Metal (SRN A5754) in the Michigan State and Local Emissions Inventory System (SLEIS) as of 2004. No emissions were recorded in SLEIS after 2010 and no active permits for the facility were found in the Michigan records of PTIs and ROPs. A report of an EGLE inspection on August 27, 2010, indicates the mill had been closed since autumn 2009. The Smurfit-Stone Ontonagon Mill was sold to Rock-Tenn Company effective May 27, 2011. The name of the new company will be RockTenn CP LLC, per a note in the MACES filed by the State district staff. No new air permits were found in the Michigan permit system for the new owner. As expected, there have been no reported emissions since the shutdown reported for late 2009 or early 2010.

5. Tilden Mining Company LC (TMC)

The State 2010 Regional Haze SIP indicated that the State had accepted the TMC existing permitted PM emission limits based on the taconite Maximum Achievable Control Technology as representing BART for the indurating furnace/grate-kiln (EUKILNI), EU PRIMARY CRUSHER, EU COOLER 1, EU DRYER 1, EU BOILER 1, and EU BOILER 2. The SIP submittal also accepted the TMC cost analysis showing that all technically feasible SO₂ control measures evaluated as BART were not cost-effective. Finally, the State's SIP submittal accepted a TMC proposal to set a BART NO_x limit for EUKILNI before December 31, 2012, based on "good combustion practices" and emission testing.

The USEPA subsequently issued a final rule effective on March 8, 2013, which specified a FIP for certain equipment that imposed NO_x limits for EUKILNI (78 FR 8706, February 6, 2013). The FR publication of the USEPA disapproval action and FIP can be accessed at: [federalregister.gov/documents/2013/02/06/2013-01473/approval-and-promulgation-of-air-quality-implementation-plans-states-of-minnesota-and-michigan](https://www.federalregister.gov/documents/2013/02/06/2013-01473/approval-and-promulgation-of-air-quality-implementation-plans-states-of-minnesota-and-michigan).

After subsequent litigation, a settlement was entered in April 2015. These changes to the limits were included in the proposed FIP Rule that was published in the FR on October 22, 2015 (80 FR 64160). The FR publication can be accessed at: [govinfo.gov/content/pkg/FR-2015-10-22/pdf/2015-25023.pdf](https://www.govinfo.gov/content/pkg/FR-2015-10-22/pdf/2015-25023.pdf).

On June 8, 2016, Cliffs Natural Resources, Inc. (owner of TMC) petitioned the U.S. Court of Appeals for review of the final rule ("Air Plan Approval; Minnesota and Michigan; Revision to 2013 Taconite Federal Implementation Plan Establishing BART for Taconite Plants")

promulgated by the USEPA (81 FR 21672, April 12, 2016). The FR publication can be accessed at: [govinfo.gov/content/pkg/FR-2016-04-12/pdf/2016-07818.pdf](https://www.govinfo.gov/content/pkg/FR-2016-04-12/pdf/2016-07818.pdf). The petition for review was consolidated in the U.S. Court of Appeals for the Eighth Circuit under lead Case No. 16-2643.

On April 23, 2024, the USEPA issued a Notice of Proposed Settlement Agreement. The proposed settlement agreement provided a process for resolving all of Cliffs' and Cliffs Steel's challenges to the SIP Rule and the Revised FIP Rule (89 FR 30360, April 23, 2024). The FR publication can be accessed at: [govinfo.gov/content/pkg/FR-2024-04-23/pdf/2024-08612.pdf](https://www.govinfo.gov/content/pkg/FR-2024-04-23/pdf/2024-08612.pdf). On December 4, 2024, the USEPA signed a proposed rulemaking (89 FR 96152, December 4, 2024) for changes to the Revised FIP Rule that are substantially consistent with and includes equations identical to those set forth in Attachment A to the Settlement Agreement. The newly proposed NO_x and SO₂ BART limits for the Grate Kiln Line 1 (EUKILN1) are shown below (as specified under Attachment A to the Settlement Agreement):

- NO_x Emission Limit: 3.0 lbs. NO_x/MMBtu, based on a 30-day rolling average
- SO₂ Emission Limit: 189.0 lbs. SO₂/hr., based on a 30-day rolling average

The emission limits (shown above) would apply to EUKILN1 beginning 30 days after the date of publication in the FR.

Compliance Status: Although the revised BART FIP limits set through the Settlement Agreement for NO_x and SO₂ have not yet come into effect, nor have they been incorporated into TMC's ROP as either enforceable limits or as placeholders for when the revised limits are published in the FR, TMC was determined to be in compliance with State PTI No. 148-12A (copy attached as Appendix D) and MI-ROP-B4885-2017b through the most recent onsite inspection that was conducted on February 2, 2023. No current enforcement action was found in MACES.

B. Haze SIP Control Measures/Limits and Status – Second Planning Period

It was determined in the 2021 Regional Haze SIP submittal for the Second Planning Period, for which the USEPA has not yet taken final action, that it would be unreasonable for EGLE to implement additional control measures for its selected sources beyond those already on the books and on the way, including the control measures discussed above. The long-term strategy in EGLE's 2021 Regional Haze SIP submittal relied upon on-the-books and on-the-way control measures for NO_x and SO₂ emissions reductions implemented through other programs as being adequate for achieving reasonable further progress toward natural visibility conditions. This determination was informed by years of monitoring values at the two Class 1 areas' monitoring sites well below the natural conditions' glidepath for the 20 percent most impaired days, as well as the 2016 Lake Michigan Air Directors Consortium (LADCO) modeling showing this to be the case in 2028. Allowing states to take into account the effect of other regulatory programs and integrating them into state planning was a reason behind the USEPA's delaying of the deadline for the

second planning period SIP revisions from 2018 to 2021. (82 FR [3078](#), January 10, 2017). EGLE's 2021 Regional Haze SIP submittal referenced the following federal programs for on-the-books and on-the-way control measures, which remain fully implemented.

- Cross-State Air Pollution Rule (CSAPR)
- New Source Review
- Prevention of Significant Deterioration (PSD)
- Federal General Conformity and Transportation Conformity Rules

IV. Emissions Reductions from Regional Haze SIP Strategies, 40 CFR 51.308(G)(2)

As in our 2021 Regional Haze SIP submittal, it was determined that SO₂ and NO_x emissions are the most important contributors to haze formation that impacts the Isle Royale and Seney Class I areas. As illustrated in Figures 4 and 9 under Section V (Visibility Progress) of this report, SO₂ and NO_x emissions lead to the formation of sulfate and nitrate that make up a significant portion of the contribution to visibility impairment at these Class I areas. Accordingly, the following evaluations of emission reductions from SIP and non-SIP long-term strategy control measures and programs have been limited to include only SO₂ and NO_x.

A. Emissions Reductions from SIP Control Measures

This part of the Progress Report addresses the facility-wide emissions reductions from the five first planning period BART sources over the years 2019-2022 resulting from the Regional Haze SIP control measures based on actual emission information and provides a comparison with the emissions from the actual facility-wide emissions from the evaluation done for the 2009-2013 period in the 2016 Progress Report. This evaluation is necessary to show the emissions reductions that have occurred since the majority of the compliance deadlines have been reached for the BART FIP limits from the first planning period (except for TMC). In the 2016 Progress Report, the emissions reductions that were demonstrated for the five first planning period BART sources were not entirely reflective of the BART limits due to the fact that a few of the sources' control measure implementation deadlines had not yet been reached.

1. Holcim (US), Inc. DBA Lafarge Alpena Plant

The interim, facility-wide 12-month rolling limits of the federal/state Consent Decree (Consent Decree Limits - USA, the USEPA, Michigan, et al. 9th v. Lafarge; U.S. District Court Civil Action No. 3:10-cv-00044-JPG-CJP) are listed below along with actual annual facility-wide emission estimates (Table 1, below) for the 2009-2013 and 2019-2022 periods. Annual actual facility-wide emission rates for 2011 (6,907 tpy NO_x and 10,905 tpy SO₂) were well below the Consent Decree 2011 interim, 12-month rolling limits. Annual actual facility-wide emission rates for 2013 were further reduced for NO_x (to 4,504 tpy); however, 2013 actual SO₂ emissions increased (10,087 tpy) while remaining below the Consent Decree interim limit. In 2019, actual facility-wide NO_x and

SO₂ emissions were reported to be 3,880 and 1,858 tons, respectively. While SO₂ emissions increased by 429 tons between 2019 (1,858 tons) and 2022 (2,287 tons), NO_x emissions were reduced by approximately 113 tons over the four-year time period. In an effort to understand how NO_x and SO₂ emissions have changed since the implementation of the selective non-catalytic reduction (NO_x abatement technology) and high-efficiency SO₂ controls on the kilns, EGLE calculated the difference between the four-year annual average NO_x/SO₂ emissions rates for the 2019-2022 evaluation period and the five-year annual average NO_x/SO₂ emissions rates for the 2009-2013 evaluation period. This comparison showed a relative reduction in emissions from the 2009-2013 period to the 2019-2022 period with NO_x emissions lower by 2,268 tpy and SO₂ emissions lower by 6,995 tpy.

- NO_x Interim Limit (facility-wide 12-Month Rolling): 8,650 tons by January 1, 2011.
- SO₂ Interim Limit (facility-wide 12-Month Rolling): 13,100 tons by January 1, 2011.

Table 1. Holcim (US), Inc. DBA Lafarge Alpena Plant Facility-wide Actual Emissions

Year	NO _x (tpy)	Evaluation Period Averages – NO _x Emissions (tpy)	SO ₂ (tpy)	Evaluation Period Averages – SO ₂ Emissions (tpy)
2022	3,767	3,668	2,287	1,954
2021	3,246	3,668	1,994	1,954
2020	3,778	3,668	1,680	1,954
2019	3,880	3,668	1,858	1,954
2018	3,825	4,349	1,994	2,298
2017	3,734	4,349	2,232	2,298
2016	4,834	4,349	2,397	2,298
2015	4,677	4,349	2,364	2,298
2014	4,673	4,349	2,504	2,298
2013	4,504	5,936	10,087	8,949
2012	5,102	5,936	7,820	8,949
2011	6,907	5,936	10,905	8,949
2010	6,894	5,936	8,466	8,949
2009	6,271	5,936	7,469	8,949

2. Billerud Escanaba LLC (referenced as Escanaba Paper Company in the 2021 Regional Haze SIP Submittal)

The USEPA issued a final rule effective on January 2, 2013, imposing a FIP for Billerud Escanaba’s Boilers 8 and 9 that specified NO_x BART limits (77 FR 71533, December 3, 2012). The Boiler 8 NO_x limit was changed by the USEPA to a fixed, rolling 30-day average limit of 0.35 lbs. of NO_x per MMBtu, rather than a weighted average of separate limits for oil-firing and gas-firing. A CEM system was the required means of

compliance determination for Boiler 8. The Boiler 9 NO_x limit was set by the FIP at 0.27 lbs. per MMBtu with compliance determination by means of emission testing.

Annual actual facility-wide emission rates for 2009 through 2013, as well as for 2019 through 2022, for NO_x and SO₂ are provided in Table 2. The annual emission data demonstrate significant reductions (on average) for NO_x and SO₂ between the two evaluation periods (2009-2013; 2019-2022).

Annual actual facility-wide emission rates for 2013 were reported to be 2,549 tons for NO_x and 1,950 tons for SO₂. In 2019, actual facility-wide NO_x and SO₂ emissions were reported to be 1,605 and 865 tons, respectively. While SO₂ emissions decreased by 274 tons between 2019 (865 tons) and 2022 (591 tons), NO_x emissions were reduced by only 6 tons over the four-year time period. In an effort to understand how NO_x and SO₂ emissions have changed since implementation of the NO_x BART limits for these two boilers through the FIP, EGLE calculated the difference between the four-year annual average NO_x/SO₂ emissions rates for the 2019-2022 evaluation period and the five-year annual average NO_x/SO₂ emissions rates for the 2009-2013 evaluation period. This comparison showed a relative reduction in emissions from the 2009-2013 period to the 2019-2022 period with NO_x emissions lower by 901 tpy and SO₂ emissions lower by 1,292 tpy.

Table 2. Billerud Escanaba LLC Facility-wide Actual Emissions

Year	NO_x (tpy)	Evaluation Period Averages – NO_x Emissions (tpy)	SO₂ (tpy)	Evaluation Period Averages – SO₂ Emissions (tpy)
2022	1,599	1,493	591	682
2021	1,365	1,493	610	682
2020	1,403	1,493	661	682
2019	1,605	1,493	865	682
2018	1,564	1,896	742	1,056
2017	1,721	1,896	614	1,056
2016	1,699	1,896	727	1,056
2015	1,892	1,896	1,127	1,056
2014	2,605	1,896	2,069	1,056
2013	2,549	2,394	1,950	1,974
2012	2,160	2,394	1,210	1,974
2011	2,530	2,394	2,196	1,974
2010	2,428	2,394	2,309	1,974
2009	2,303	2,394	2,204	1,974

3. St. Marys Cement Charlevoix Plant

The USEPA imposed a FIP setting BART SO₂ and NO_x limits that became effective on January 1, 2017 (77 FR 71533, December 3, 2012). The ROP was then modified to add a requirement specifying that SMC must comply with applicable BART by the USEPA deadline. Following this, the State re-opened the ROP to incorporate specific FIP BART requirements.

Annual actual facility-wide emission rates for 2009 through 2013, as well as for 2019 through 2022, for NO_x and SO₂ are provided in Table 3. The annual emission data demonstrates a relatively minor reduction (on average) in NO_x emissions facility-wide, while also showing a minor increase (on average) in SO₂ emissions between the two evaluations periods (2009-2013; 2019-2022).

Annual actual facility-wide emission rates for 2013 were reported to be 2,369 tons for NO_x and 2,560 tons for SO₂. In 2019, actual facility-wide NO_x and SO₂ emissions were reported to be 1,782 and 2,525 tons, respectively. While SO₂ emissions decreased by 29 tons between 2019 (2,525 tons) and 2022 (2,496 tons), NO_x emissions increased by 152 tons over the four-year period. In an effort to understand how NO_x and SO₂ emissions have changed since implementation of the NO_x and SO₂ BART limits for this kiln through the FIP, EGLE calculated the difference between the four-year annual average NO_x/SO₂ emissions rates for the 2019-2022 evaluation period and the five-year annual average NO_x/SO₂ emissions rates the 2009-2013 evaluation period. This comparison showed the relative change in emissions from the 2009-2013 period to the 2019-2022 period with NO_x emissions lower by 369 tpy and SO₂ emissions higher by 45 tpy.

Table 3. St. Marys Cement – Charlevoix Plant Facility-wide Actual Emissions

Year	NO _x (tpy)	Evaluation Period	
		Averages – NO _x Emissions (tpy)	Averages – SO ₂ Emissions (tpy)
2022	1,934	1,864	2,496
2021	1,835	1,864	2,464
2020	1,904	1,864	2,271
2019	1,782	1,864	2,525
2018	1,322	1,903	2,031
2017	1,248	1,903	1,551
2016	2,063	1,903	1,179
2015	2,473	1,903	1,777
2014	2,408	1,903	614
2013	2,369	2,233	2,560
2012	2,369	2,233	2,560
2011	1,996	2,233	1,942
2010	2,251	2,233	2,045
2009	2,180	2,233	2,864

4. Smurfit-Stone Container Corporation

The 2010 Regional Haze SIP indicated that the Smurfit-Stone Container Corporation plant had been shut down since February 2010. No emissions were recorded in SLEIS after 2010, and no active permits for the facility were found in the Michigan records of PTIs and ROPs. A report of a State inspection on August 27, 2010, indicates the mill had been closed since autumn 2009.

Smurfit-Stone Container Corporation’s annual actual facility-wide emission rates for 2009 through 2013, as well as for 2019 through 2022, for NO_x and SO₂ are provided in Table 4. As expected, there have been no reported emissions since the shutdown reported for late 2009 or early 2010.

Table 4. Smurfit-Stone Container Corporation Facility-wide Actual Emissions

YEAR	NO _x (TPY)	SO ₂ (TPY)
2022		
2021		
2020		
2019		
2010	2.23	0.01
2009	208	1,231

5. Tilden Mining Company LC

The USEPA has not yet issued a proposed rulemaking for the implementation of the revised NO_x BART limits for the indurating furnace/grate-kiln (EUKILN1) and SO₂ BART limits for the EUKILN1, as well as other equipment established through the 2024 Settlement Agreement detailed in the ‘Status of Control Measures in the Regional Haze SIP’ section of this report. The ROP was modified to add a condition specifying that TMC must comply with the applicable requirements of 40 CFR Part 52, Approval and Promulgation of Implementation Plans, Subpart X–Michigan, Section 52.1183 Visibility Protection, which would include the newly proposed BART limits for EUKILN1 beginning 30 days after the date of publication in the FR. The State would then re-open the ROP and incorporate the FIP BART limits into the ROP in accordance with the renewal schedule.

Annual actual facility-wide emission rates for 2009 through 2013, as well as for 2019 through 2022, for NO_x and SO₂ are provided in Table 5. The annual emission data demonstrates a relatively significant increase (on average) in NO_x emissions facility wide, while also showing a reduction (on average) in SO₂ emissions between the two evaluations periods (2009-2013; 2019-2022). Annual actual facility-wide emission rates for 2013 were reported to be 6,142 tons for NO_x and 1,132 tons for SO₂. In

2019, actual facility-wide NO_x and SO₂ emissions were reported to be 10,379 and 501 tons, respectively. While SO₂ emissions decreased by 191 tons between 2019 (501 tons) and 2022 (310 tons), NO_x emissions decreased by 59 tons over the four-year period. In an effort to understand how NO_x and SO₂ emissions have changed since the implementation of NO_x and SO₂ BART limits for this kiln through the FIP, EGLE calculated the difference between the four-year annual average NO_x/SO₂ emissions rates for the 2019-2022 evaluation period and the five-year annual average NO_x/SO₂ emissions rates for the 2009-2013 evaluation period. This comparison showed a relative change in emissions from the 2009-2013 period to the 2019-2022 period with NO_x emissions higher by 5,357 tpy and SO₂ emissions lower by 796 tpy.

Table 5. Tilden Mining Company LC Facility-wide Actual Emissions

Year	NO _x (tpy)	Evaluation Period	
		Averages – NO _x Emissions (tpy)	Averages – SO ₂ Emissions (tpy)
2022	10,320	10,678	310
2021	12,051	10,678	19
2020	9,962	10,678	366
2019	10,379	10,678	501
2018	9,440	9,607	636
2017	13,741	9,607	575
2016	12,677	9,607	245
2015	6,097	9,607	1,412
2014	6,079	9,607	976
2013	6,142	5,321	1,132
2012	6,149	5,321	1,617
2011	5,535	5,321	1,036
2010	5,520	5,321	1,112
2009	3,260	5,321	580

B. Emissions Reductions from Visibility Impacting Sources Identified in Michigan’s 2021 Regional Haze SIP Submittal

This part of the Progress Report looks at the top 10 in-state EGU and non-EGU point sources that were predicted to have the highest impacts on visibility in the 2021 Regional Haze SIP submittal. It also evaluates the changes in NO_x and SO₂ emissions over the 2016 to 2022 time period for these sources. In the 2021 Regional Haze SIP submittal, Michigan relied upon a Q/d analysis produced by LADCO, which generated a ratio between the total NO_x, SO₂, VOCs, PM_{2.5}, and ammonia (NH₃) emissions output from a facility and the distance between the facility and the closest Class I Area to determine which point sources were likely to have the greatest impact on visibility impairment at in-state/out-of-state Class I Areas. The emissions data that was used to inform the Q/d analysis was taken from the National Emissions Inventory Collaborative 2016 alpha inventory.

To analyze the trend in NO_x and SO₂ emissions for the top 10 sources selected in the 2021 Regional Haze SIP submittal over the 2016 to 2022 period, EGLE chose to pull emissions data from the beginning year (2016), a middle year (2019), and ending year (2022) of the time period. Emissions data derived from [SLEIS](#) are presented in Table 6. All of the sources shown in Table 6 measured at or above a Q/d value of 4 for their 2016 emissions of visibility impacting pollutants (NO_x, SO₂, VOCs, PM_{2.5} and NH₃). Considering EGLE recognizes that emissions of NO_x and SO₂ from anthropogenic sources have the greatest impact on visibility impairment at its Class I Areas, Table 6 compares only annual emissions of NO_x and SO₂ across the three analysis years described above. Across the top ten Q/d sources (using 2016 emissions data) reflected in Table 6, approximately 21,956 tons of combined NO_x and SO₂ emissions were reduced between 2016 and 2022.

Table 6. NO_x and SO₂ Emissions Reductions from Selected Sources in the 2021 Regional Haze SIP Submittal between 2016 and 2022

Source Name	2016 NO _x (tons)	2019 NO _x (tons)	2022 NO _x (tons)	Change in NO _x (2016 to 2022)	2016 SO ₂ (tons)	2019 SO ₂ (tons)	2022 SO ₂ (tons)	Change in SO ₂ (2016 to 2022) (tons)	Change in NO _x + SO ₂ (2016 to 2022, tons)
Tilden Mining Company LC	12,677	10,379	10,320	-2,357	245	501	310	65	-2,292
St. Clair/Belle River Power Plant	13,294	10,212	9,249	-4,045	37,165	30,752	26,873	-10,292	-14,337
J. H. Campbell Plant	2,353	3,219	3,030	677	12,849	5,781	5,520	-7,329	-6,652
St. Marys Cement, Inc. (U.S.)	2,063	1,782	1,934	-129	1,179	2,525	2,496	1,317	1,188
Billerud Escanaba LLC	1,699	1,605	1,599	-100	727	865	591	-136	-236
Neenah Paper - Michigan, Inc.	265	145	136	-129	588	261	237	-351	-480
DTE Electric Company - Monroe Power Plant	4,136	5,747	4,972	836	2,343	3,960	3,585	1,242	2,078
Consumers Energy Karn-Weadock Facility	1,229	614	1,210	-19	2,229	569	992	-1,237	-1,256
Billerud Quinnesec LLC	1,087	1,188	1,085	-2	138	284	156	18	16
Graymont Western Lime, Inc.	254	256	270	16	20	19	19	-1	15

Net Change in NO_x+SO₂ Emissions for 2021 Regional Haze SIP Submittal Selected Sources from 2016 to 2022: **-21,956**

V. Visibility Progress, 40 CFR 51.308(g)(3)

A. Five-year Average Change in Visibility Impairment

The USEPA's regulations specify in 40 CFR Sections 51.308(g)(3) the following requirements on evaluation of visibility impairment for the five-year progress report. For each mandatory Class I federal area within the State, the State must assess the following visibility conditions and changes, with values for most impaired and least impaired (clearest) days expressed in terms of five-year averages of these annual values.

1. The current visibility conditions for the most impaired and clearest days;
2. The difference between current visibility conditions for the most impaired and clearest days and baseline visibility conditions; and
3. The change in visibility impairment for the most impaired and clearest days over the period since the period addressed in the most recent plan.

The AQD acquired IMPROVE Aerosol RHR II, New Equation visibility data from the FLM Environmental Database (<https://views.cira.colostate.edu/fed/>) for the Isle Royale and Seney Class I area sites. Five-year averages were computed from the Air Quality Related Values (AQRV) menu on the site, which provided time plots and data charts of the visibility Haze Index for the 2000-2022 period. Data was presented in terms of Haze Index in deciviews (dv) on an annual basis for the most impaired and least impaired (clearest) days.

The AQD computed five-year rolling averages of the data to provide the comparisons required in the USEPA's guidance for the progress report. The five-year 2018-2022 visibility trend was also computed in dv/year for each set of data. The annual data and five-year rolling average data are presented below in Tables 7 and 9 for Isle Royale and Seney, respectively, along with 2014-2018 rolling average baseline estimate and uniform rate of progress (URP) estimates from the 2021 Michigan Regional Haze SIP submittal.

1. Isle Royale National Park - Visibility Progress

The Isle Royale five-year rolling average comparison (Table 7) for the most impaired days shows a reduction in light extinction from 15.5 dv to 14.2 dv over the 2018-2022 period. This comparison also results in an annual average change rate of -0.26 dv per year. The 2022 five-year rolling average for Isle Royale (14.2 dv) was already below the 2028 Reasonable Progress Goal (RPG) (14.97 dv) and the 2028 adjusted glide path uniform URP estimate (16.98 dv) as show in Figure 1 below. The Michigan 2028 RPG and 2028 adjusted URP estimates for Isle Royale were taken from and/or calculated using the data in Figure 2 and Tables 4 and 5 of the 2021 Regional Haze SIP submittal.

The Isle Royale five-year rolling average comparison (Table 8) for the least impaired days also shows a reduction from 5.3 dv to 4.7 dv over the 2018-2022 period. This reduction results in an annual average change rate of -0.12 dv per year over the five-year period. The five-year rolling average Haze Index for 2022 remains well below the 2000-2004 baseline Haze Index value (6.8 dv). Through 2064, the baseline five-year

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rolling average Haze Index Value for the least impaired days must not be degraded per the USEPA Regional Haze regulations.

Time plots of the measured Isle Royale annual and five-year rolling average Haze Index values (in deciviews) for both most impaired and least impaired (clearest) days are provided in Figure 1 for the 2000-2022 period. Figure 1 also depicts the 2028 RPG (14.97 dv) for the most impaired days.

Table 7. Visibility Trends – 20% Most Impaired Days (MIDs) at Isle Royale National Park (ISLE1)

Year	Annual Avg Haze Index (dv)	5-yr Rolling Avg (dv)	Trend (2018-2022)	2028 RPG	2028 Adjusted URP or Max Allowed	2028 Unadjusted URP or Max Allowed	Baseline 2018 Five-Year Rolling Avg (dv)
2000	18.9						
2001	22						
2002	19.2						
2003	19						
2004	19	19.6					
2005	22.3	20.3					
2006	20.7	20.0					
2007	20.5	20.3					
2008	20.3	20.6					
2009	20.1	20.8					
2010	17.8	19.9					
2011	17.6	19.3					
2012	16.5	18.5					
2013	16.2	17.6					
2014	18.3	17.3					
2015	15.6	16.8					
2016	13.6	16.0					
2017	15.5	15.8					
2018	14.7	15.5	-0.26				15.5
2019	15	14.9	-0.26				
2020	13.8	14.5	-0.26				
2021	15.1	14.8	-0.26				
2022	12.6	14.2	-0.26				
2028				14.97	16.98	15.85	

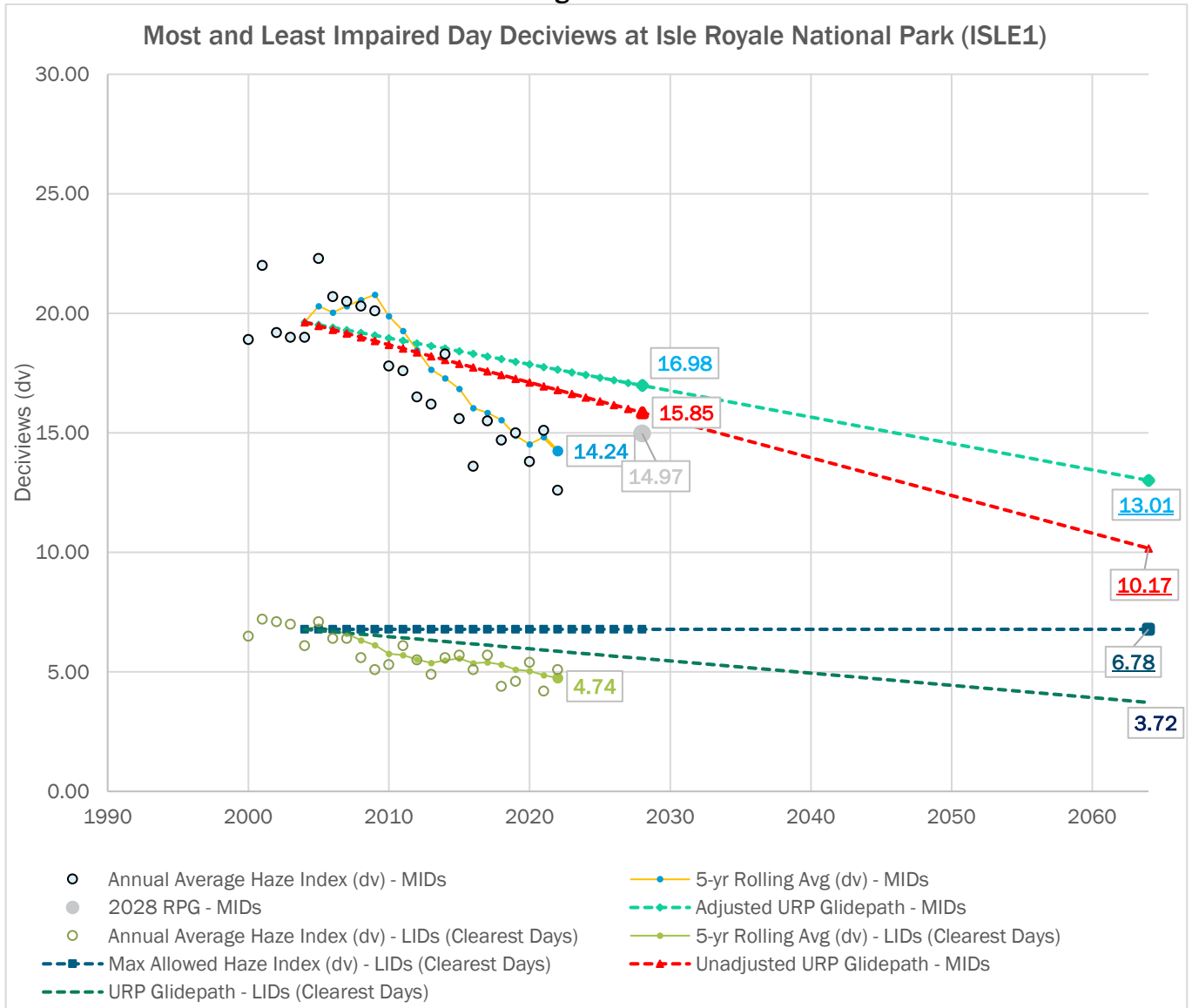
Natural conditions, most impaired days (Adjusted URP Glidepath) 13.01
 Natural conditions, most impaired days (Unadjusted URP Glidepath) 10.17

Table 8. Visibility Trends – 20% Clearest Days – Least Impaired Days at Isle Royale National Park (ISLE1)

Year	Annual Avg Haze Index (dv)	Five-Year Rolling Avg (dv)	Trend (2018-2022)	2028 RPG	2028 URP or Max Allowed	Baseline 2004 Five-Year Rolling Avg (dv)
2000	6.50					
2001	7.20					
2002	7.10					
2003	7.00					
2004	6.10	6.78				6.78
2005	7.10	6.90				
2006	6.40	6.74				
2007	6.40	6.60				
2008	5.60	6.32				
2009	5.10	6.12				
2010	5.30	5.76				
2011	6.10	5.70				
2012	5.50	5.52				
2013	4.90	5.38				
2014	5.60	5.48				
2015	5.70	5.56				
2016	5.10	5.36				
2017	5.70	5.40				
2018	4.40	5.30	-0.14			
2019	4.60	5.10	-0.14			
2020	5.40	5.04	-0.14			
2021	4.20	4.86	-0.14			
2022	5.10	4.74	-0.14			
2028					6.78	

Natural conditions, least impaired (clearest) days 3.72

Figure 1



Below are plots from the [FLM Environmental Database Web site \(views.cira.colostate.edu/fed/\)](https://views.cira.colostate.edu/fed/) showing visibility long-term trends (2000-2022) for both the most impaired and least impaired (clearest) days for Isle Royale. (See Figures 2 and 3).

The long-term trend line shown on Figure 2 for the most impaired days has a slope of -0.3962 dv/year. This trend line slope is better than the glide path slope from 2004 to 2028 needed to meet the 2028 RPG (-0.1942 dv/year) and the adjusted glide path/URP to meet natural conditions in 2064 (-0.1103 dv/year) for Isle Royale.

Figure 3 shows a long-term trend line for the least impaired days with a slope of -0.1135 dv/year. This trend line slope is better than the glide path/URP slope from 2004 needed to meet natural conditions (3.72 dv) in 2064 (-0.051 dv/yr) for Isle Royale.

Figure 2

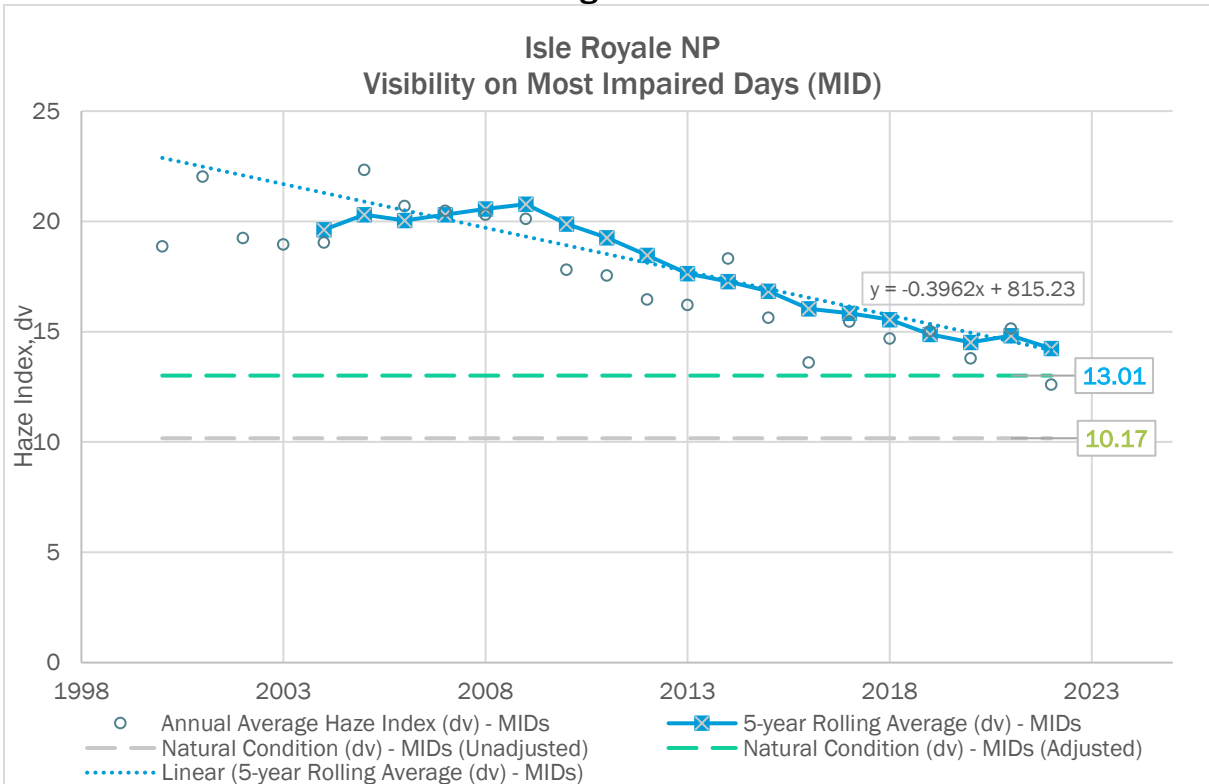
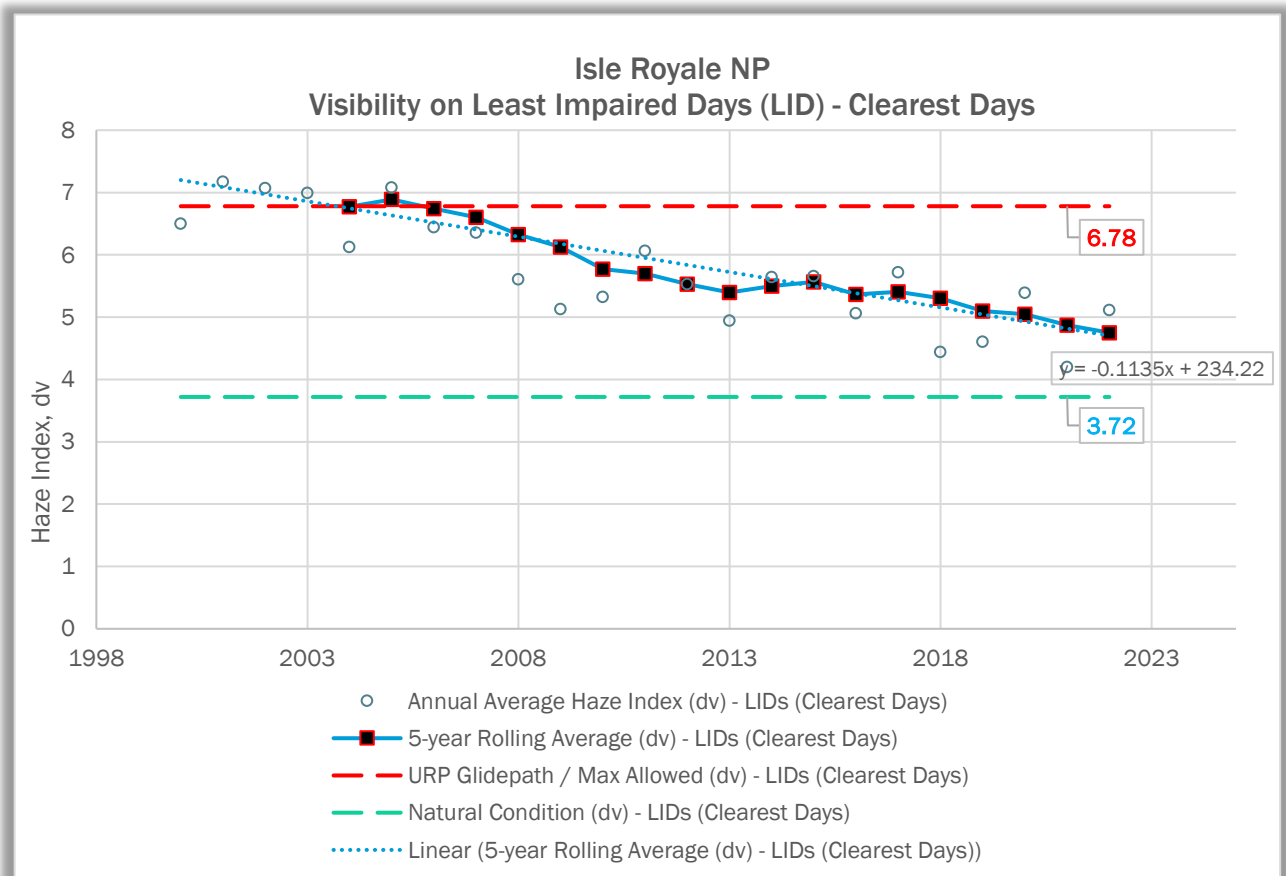


Figure 3



The relative chemical speciation of contributions to visibility impairment at Isle Royale for the 2018-2022 period are shown in Figure 4 (Extinction Composition on the Most Impaired Days) and Figure 5 (Extinction Composition on the Clearest Days). This information was obtained from the FLM Environmental Database Website (<https://views.cira.colostate.edu/fed/>).

It is evident from the figures that the most significant chemical species contributing to visibility extinction at Isle Royale on the most impaired days is Ammonium Nitrate (46.3 percent contribution), while the chemical species contributing the most to visibility extinction on least impaired (clearest) days is Ammonium Sulfate (47.1 percent contribution). Ammonium Sulfate also contributes significantly to visibility extinction on the most impaired days (31.6 percent contribution). Organic carbon is the next largest contributor to visibility impairment (11-22 percent) and makes up a larger percentage of the total visibility extinction composition than Ammonium Nitrate on the least impaired (clearest) days.

Figure 4

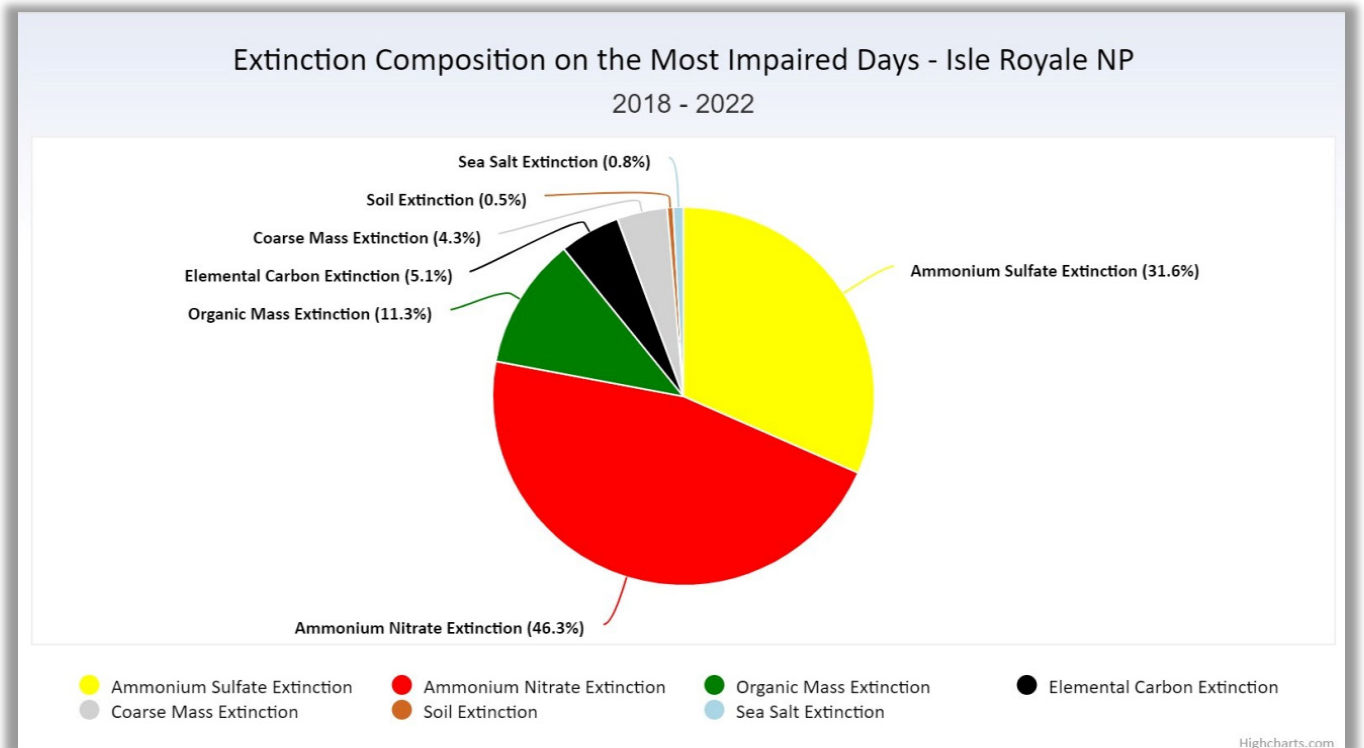
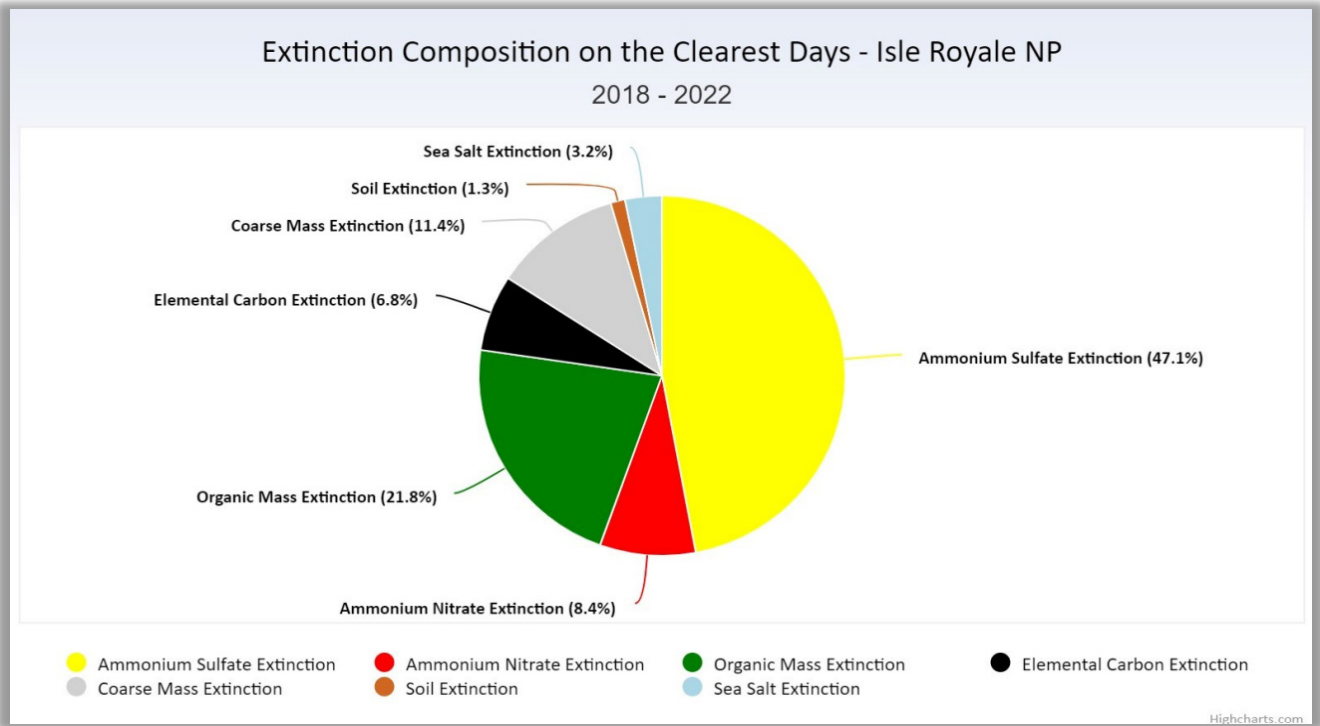


Figure 5



2. Seney National Wildlife Refuge - Visibility Progress

The Seney five-year rolling average comparison (Table 9) for the most impaired days shows a reduction from 17.6 dv to 16.2 dv over the 2018-2022 period. This comparison also results in an annual average reduction of -0.28 dv per year. The 2022 five-year rolling average for Seney (16.2 dv) was already below the 2028 RPG (16.94 dv) and the 2028 adjusted glide path uniform URP estimate (19.78 dv) as shown in Figure 6. The Michigan 2028 RPG and 2028 URP estimates for Seney were taken from and/or calculated using the data in Figure 3 and Tables 4 and 5 of the 2021 Regional Haze SIP submittal.

Similarly, a reduction from 5.26 dv to 4.86 dv over the 2018-2022 time period was determined for the least impaired (clearest) days, along with an annual average reduction of -0.08 dv per year. The five-year rolling average Haze Index for 2022 for the least impaired days remains below the 2000-2004 baseline Haze Index value (7.14 dv) that must not be degraded through 2064 per the USEPA Regional Haze regulations.

Time plots of the measured Seney annual and five-year rolling average Haze Index values (in deciviews) for both most impaired and least impaired days are provided in Figure 6 for the 2000-2022 period. Figure 6 also depicts the 2028 RPG (14.97 dv) for the most impaired days.

Table 9. Seney Five-Year Rolling Average Comparison for Most Impaired Days (MID)

Year	Annual Average Haze Index (dv)	5-yr Rolling Avg (dv)	Trend (2018-2022)	2028 RPG	2028 Adjusted URP or Max Allowed	2028 Unadjusted URP or Max Allowed	Baseline (2018) 5-yr Rolling Avg (dv)
2000	22.6						
2001	24.9						
2002	24						
2003	23.7						
2004	22.7	23.6					
2005	25.1	24.1					
2006	23.6	23.8					
2007	25	24.0					
2008	21.7	23.6					
2009	21	23.3					
2010	21.3	22.5					
2011	19.7	21.7					
2012	19.3	20.6					
2013	18.4	19.9					
2014	18.9	19.5					
2015	19.8	19.2					
2016	16.1	18.5					
2017	16.2	17.9					
2018	16.8	17.6	-0.28				17.6
2019	16.3	17.0	-0.28				
2020	15.5	16.2	-0.28				
2021	17	16.4	-0.28				
2022	15.3	16.2	-0.28				
2028				16.94	19.78	18.59	

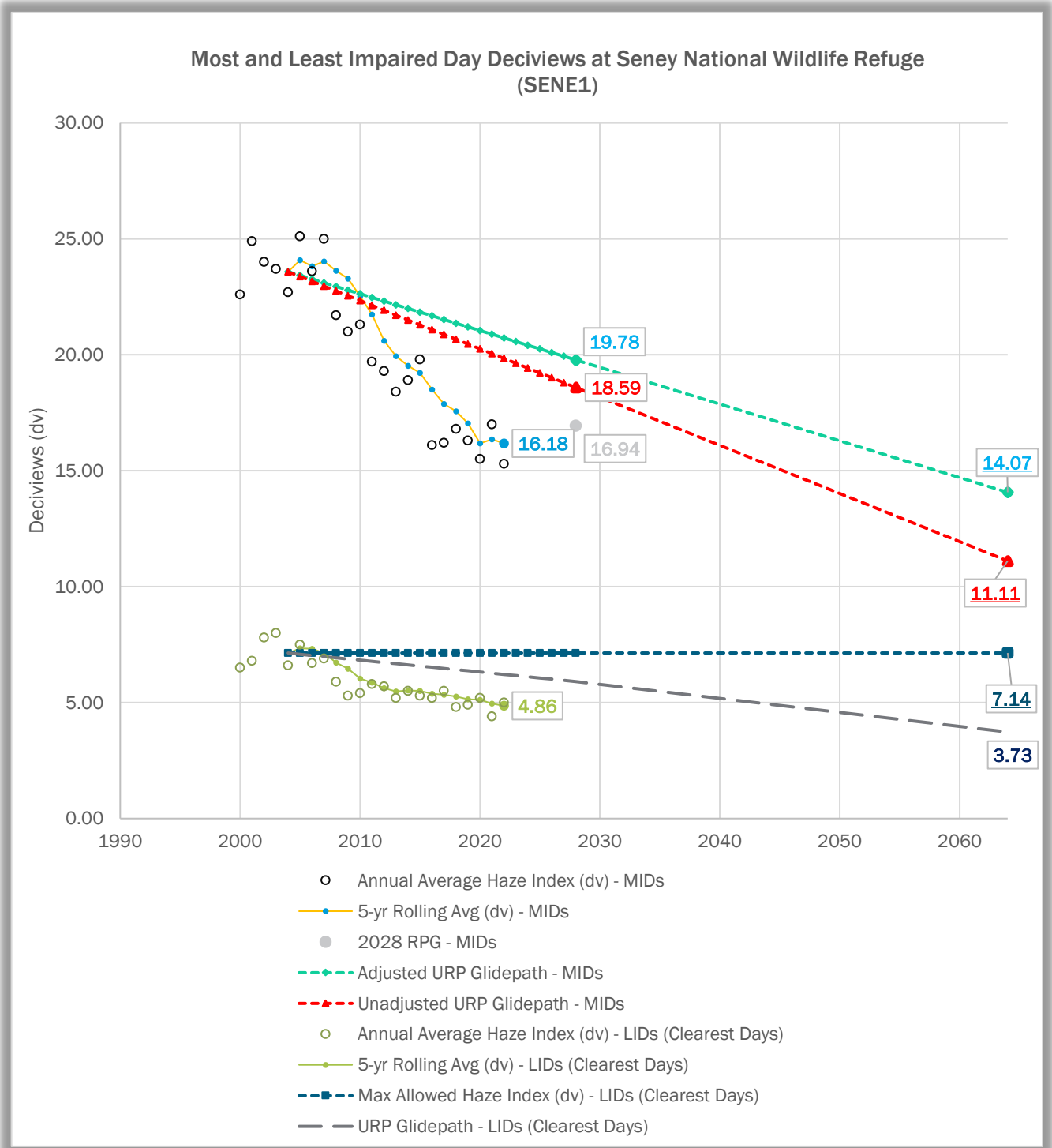
Natural conditions, most impaired days (Adjusted URP Glidepath) 14.07
 Natural conditions, most impaired days (Unadjusted URP Glidepath) 11.11

Table 10. Seney Five-Year Rolling Average Comparison for Clearest Days – Least Impaired Days

Year	Annual Average Haze Index (dv)	5-yr Rolling Avg (dv)	Trend (2018-2022)	2028 RPG	2028 URP or Max Allowed	Baseline (2004) 5-yr Rolling Avg (dv)
2000	6.5					
2001	6.8					
2002	7.8					
2003	8					
2004	6.6	7.14				7.14
2005	7.5	7.34				
2006	6.7	7.32				
2007	6.9	7.14				
2008	5.9	6.72				
2009	5.3	6.46				
2010	5.4	6.04				
2011	5.8	5.86				
2012	5.7	5.62				
2013	5.2	5.48				
2014	5.5	5.52				
2015	5.3	5.50				
2016	5.2	5.38				
2017	5.5	5.34				
2018	4.8	5.26	-0.08			
2019	4.9	5.14	-0.08			
2020	5.2	5.12	-0.08			
2021	4.4	4.96	-0.08			
2022	5	4.86	-0.08			
2028					7.14	

Natural conditions, most impaired days 3.73

Figure 6



Below are plots from the FLM Environmental Database Website showing visibility long-term trends (2000-2022) for both the most impaired and least impaired days for Seney (see Figures 7 and 8).

The long-term trend line shown in Figure 7 for the most impaired days has a slope of -0.5156 dv/year. This trend line slope is better than the glide path slope from 2004 to 2028 needed to meet the 2028 RPG (-0.2775 dv/year), or the adjusted glide path/URP to meet natural conditions in 2064 (-0.1588 dv/year) for Seney.

Figure 8 shows a long-term trend line for the least impaired days with a slope of -0.1432 dv/year. This trend line slope is better than the glide path/URP slope from 2004 needed to meet natural conditions (3.73 dv) in 2064 (-0.0568 dv/year) for Seney.

Figure 7

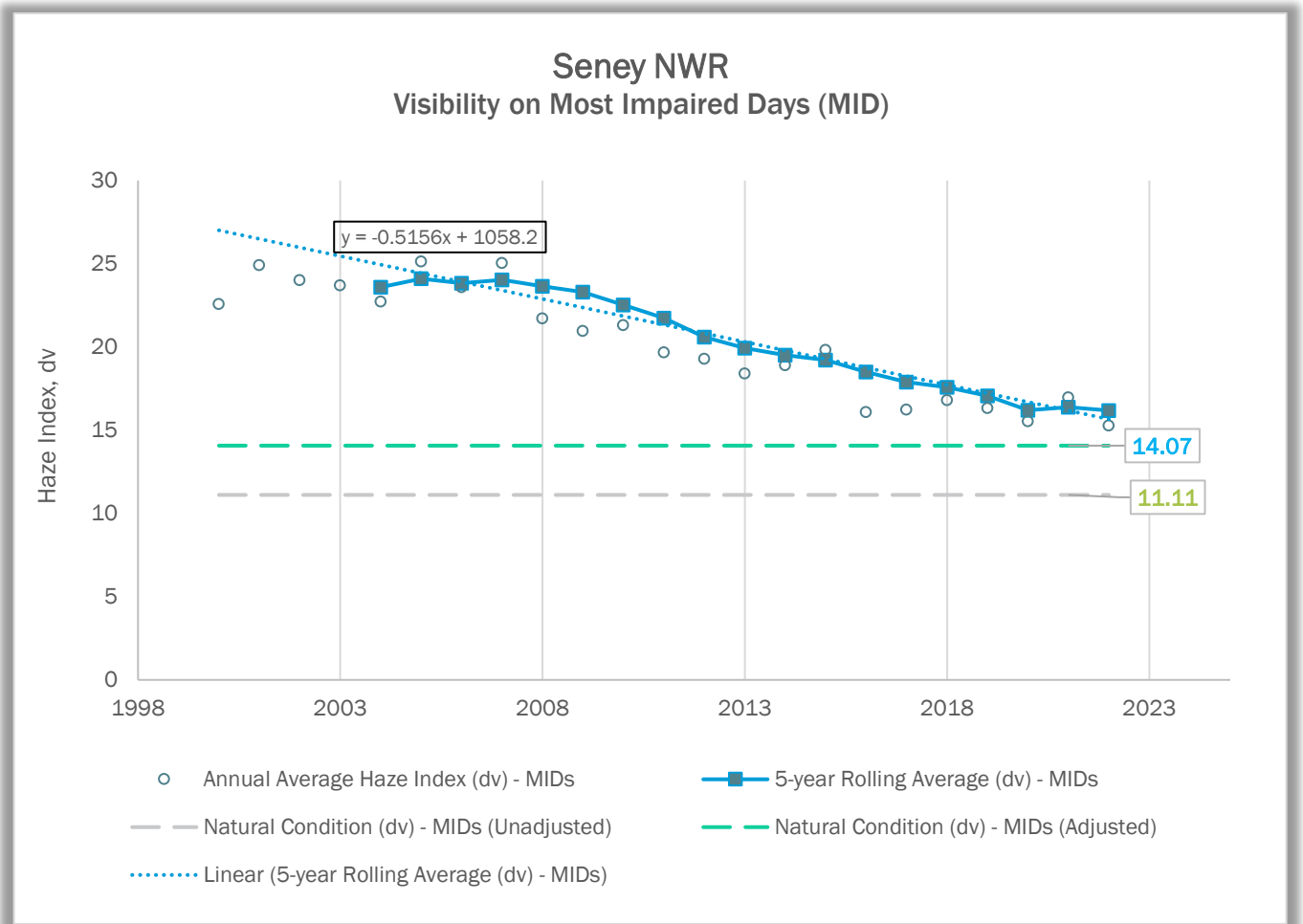
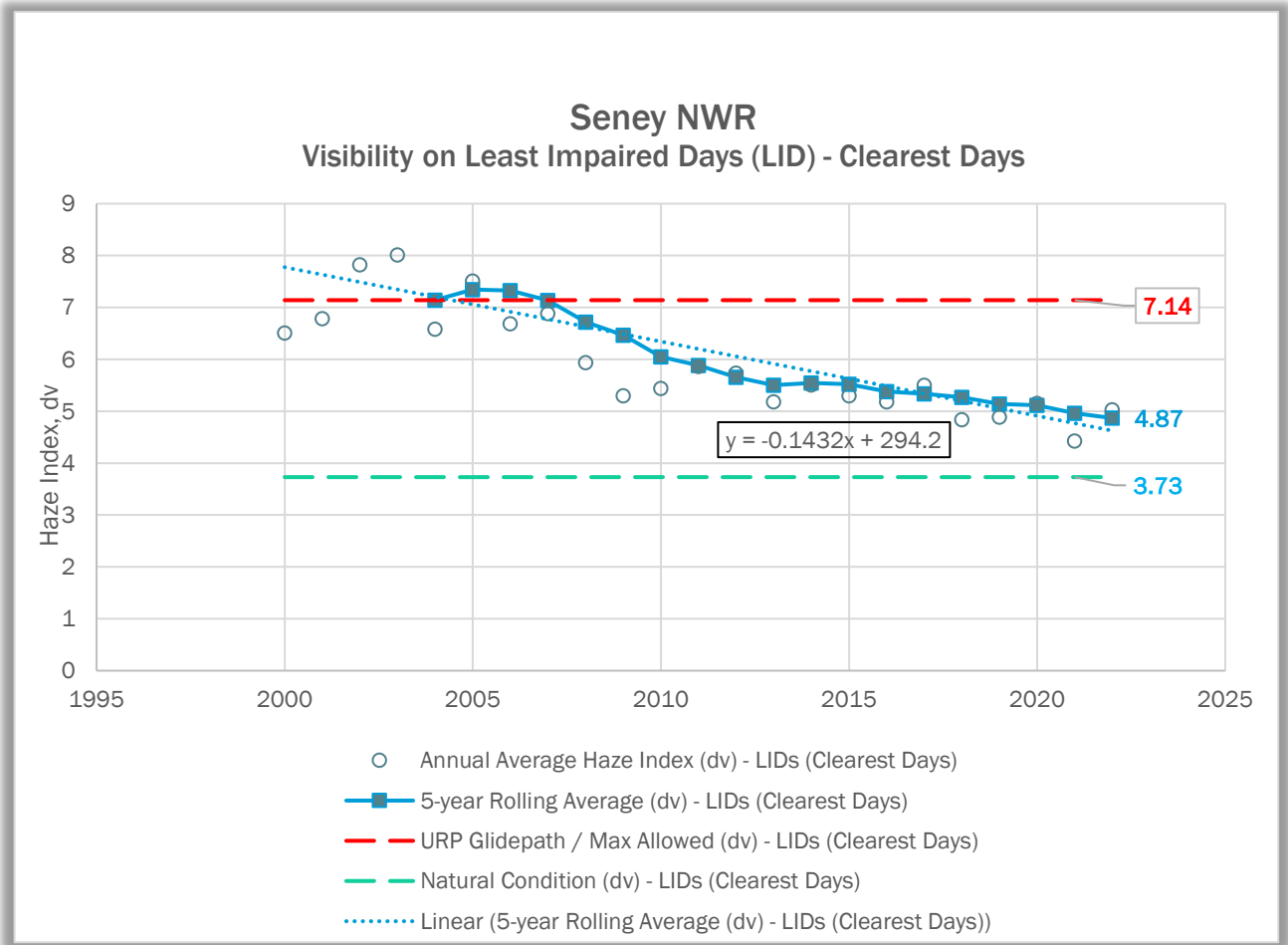


Figure 8



The relative chemical speciation of contributions to visibility impairment at Seney for the 2018-2022 period are shown in Figure 9 (Most Impaired Days) and Figure 10 (Least Impaired Days). This information was obtained from the FLM Environmental Database Website (<https://views.cira.colostate.edu/fed/>). It is evident from the figures that the most significant chemical species contributing to visibility extinction at Isle Royale on the most impaired days is Ammonium Nitrate (52.1 percent contribution), while the chemical species contributing the most to visibility extinction on least impaired (clearest) days is Ammonium Sulfate (47.8 percent contribution). Ammonium Sulfate also contributes significantly to visibility extinction on the most impaired days (28.5 percent contribution). Organic carbon is the next largest contributor to visibility impairment (11-22 percent) and makes up a larger percentage of the total visibility extinction composition than Ammonium Nitrate on the least impaired (clearest) days.

Figure 9

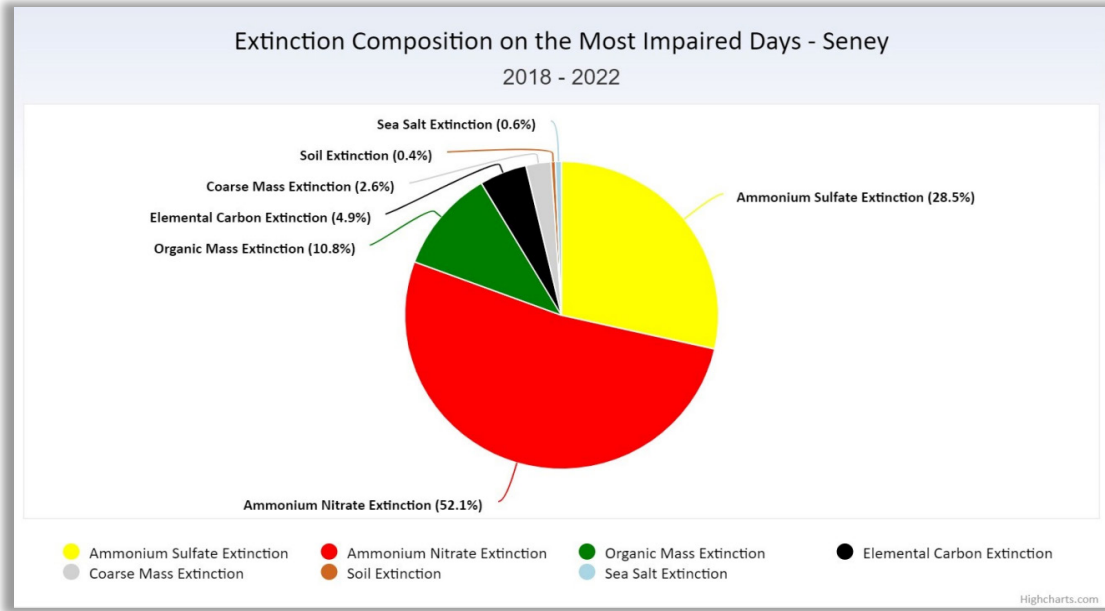
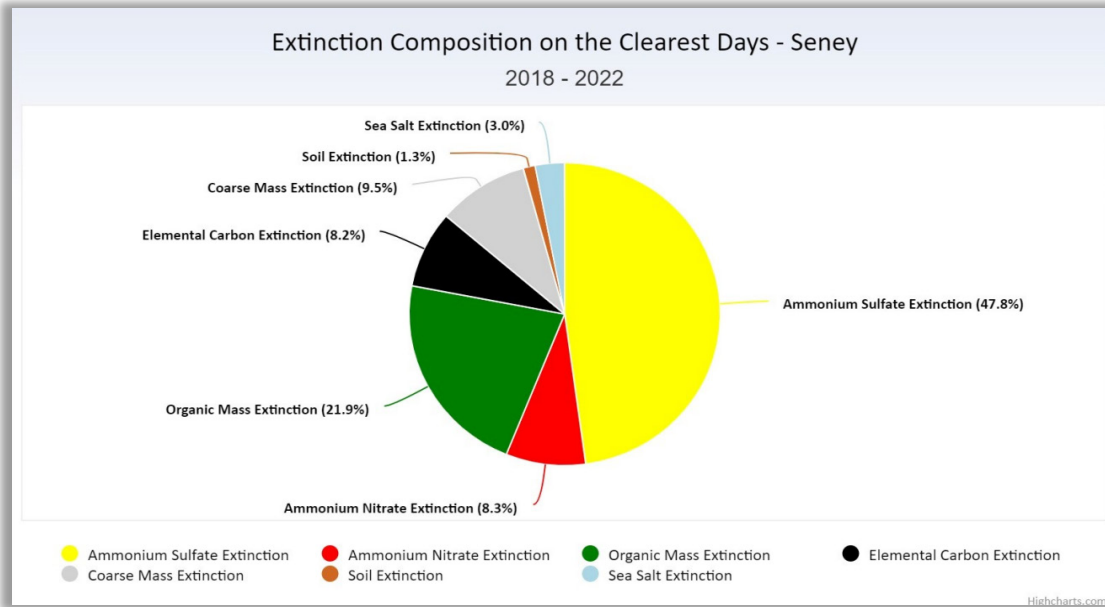


Figure 10



In summary, the Haze Index data presented in Tables 7 and 9 for the most impaired days demonstrates that visibility levels for both Isle Royale and Seney as of 2022 had already been reduced to below both the Michigan 2028 RPG and the 2028 glide path/URP levels, showing good progress towards meeting the 2064 natural background goals. In addition, the data presented for the least impaired days shows that the visibility levels for both Isle Royale and Seney as of 2022 had not degraded to the 2000-2004 baseline levels and had improved to further below baseline levels. Further, the long-term trend lines for the most impaired and least impaired days for both Isle Royale and Seney are more than sufficient when compared to the glide path/URP slopes needed to meet natural conditions in 2064 (assuming these rates of progress continue).

VI. Emissions Progress, 40 CFR 51.308(g)(4)

A. NO_x and SO₂ Statewide Point Source Emissions

Statewide point source emissions for Michigan were determined for both 2017 and 2022 for the five-year progress report. Actual NO_x and SO₂ emission data for this comparison was derived from [SLEIS](#).

The 2017 and 2022 actual NO_x and SO₂ data are summarized in Table 11. The data indicates substantial reductions over the five-year evaluation period for both NO_x (17,783 tons) and SO₂ (23,580 tons).

Table 11. 2017 v. 2022 Statewide Actual NOX and SO2 Emissions for Michigan Point Sources

Source Category	2017 NO _x Actual Emissions (tons)	2022 NO _x Actual Emissions (tons)	NO _x Emissions Change: 2017 vs 2022 tons	2017 SO ₂ Actual Emissions (tons)	2022 SO ₂ Actual Emissions (tons)	SO ₂ Emissions Change: 2017 vs 2022 tons
All Michigan Point Sources, Statewide*	89,017	71,234	-17,783	80,736	57,156	-23,580

*Does not include transportation, residential, and small stationary sources.

B. NO_x and SO₂ Total Statewide Emissions

The 2022 (version 1) Emissions Modeling Platform (EMP) emissions data for NO_x and SO₂ was acquired from the [USEPA Air Emissions Modeling Website \(epa.gov/air-emissions-modeling\)](http://epa.gov/air-emissions-modeling). The emissions data included the following source categories: EGU, non-EGU, on-road, non-road; marine, air, and rail (MAR) area, and event (prescribed fires and wildfires). This data was tabulated together with similar data from the 2020 and 2017 National Emissions Inventory (NEI) Tier 1/Tier 2 emissions inventory data to compare total statewide emissions from a beginning and additional middle year of the emissions tracking analysis period with the statewide emissions from a more recent emissions year within the second planning period under the regional haze rule. The 2022 EMP data was used since this is the most current data that includes the various non-point source emission categories. The 2017 NEI data was relied upon as the baseline emissions dataset for this emissions tracking analysis period.

As expected, and depicted in Table 12, the 2022 totals for NO_x and SO₂ show downward trends compared to the 2017 data for all categories. The most substantial decrease across all source emissions categories is for NO_x emissions from the on-road category (59,235 tons). SO₂ emissions from EGU sources also showed a large decrease across the 6-year timespan (22,254 tons). Overall total reductions were large for both NO_x (100,184 tons) and SO₂ (23,226 tons). Total NO_x emissions were reduced by 33.8 percent and SO₂ emissions by 27.9 percent over the 2017 to 2022 period.

Table 12. NO_x and SO₂ Statewide Emissions Trends (tpy)

2017	NO_x	SO₂
EGU	40,155	66,182
Non-EGU	68,643	14,766
On-road	105,628	616
Non-road	24,624	53
MAR*	17,237	504
Area	39,783	1,239
Total	296,070	83,360
2020	NO_x	SO₂
EGU	27,159	35,720
Non-EGU	59,162	11,636
On-road	53,210	255
Non-road	21,326	14
MAR*	13,730	288
Area	41,575	1,745
Total	216,162	49,658
2022	NO_x	SO₂
EGU	29,095	43,928
Non-EGU	41,985	13,450
On-road	46,393	231
Non-road	19,653	25
MAR*	14,289	371
Area	44,471	2,129
Total	195,886	60,134

*MAR = Marine, Air and Rail

C. NO_x and SO₂ Total EGU Emissions

Annual NO_x and SO₂ emissions data from EGU sources in Michigan that are subject and report to the Clean Air Markets Program were obtained from [Clean Air Markets Program Database \(CAMPD\)](#). Michigan relied on the most recent year (2023) of available NO_x and SO₂ emissions data from CAMPD and compared it with CAMPD data from the end year of the first planning period for the regional haze program.

As shown in Table 13, the 2023 totals for NO_x and SO₂ show downward trends compared to the 2017 CAMPD data. Overall total emissions reductions from EGU sources were large for NO_x (16,304 tons) and SO₂ (39,705 tons). Total NO_x emissions across all EGU sources reporting to CAMPD were reduced by 43 percent and SO₂ emissions by 61 percent over the 2017 to 2023 period.

Table 13. NO_x and SO₂ Emissions Trends – EGUs (tpy)

Year	NO_x	SO₂
2017	38,104	65,401
2023	21,800	25,696
Emissions Change (2017-2023)	-16,304	-39,705
% Change (2017–2023)	-43	-61

In addition to the NO_x/SO₂ annual emissions comparison for the Michigan EGU source category (as shown in Table 13), Table 14 provides a breakdown of the change in NO_x and SO₂ emissions at the facility-level over the 2017 to 2023 period.

Table 14. Change in SO₂ and NO_x Emissions from EGUs Reporting to the USEPA's Clean Air

Facility Name	SO ₂ Mass (short tons) 2017	SO ₂ Mass (short tons) 2023	% Change (2017 to 2023)	NO _x Mass (short tons) 2017	NO _x Mass (short tons) 2023	% Change (2017 to 2023)
Dan E Karn	845.37	240.82	-72%	787.84	260.53	-67%
J H Campbell	4904.87	4220.54	-14%	3020.60	2533.85	-16%
Thetford	0.00		-100%	3.69		-100%
Delray	0.09	0.08	-15%	6.53	4.87	-25%
Hancock Peakers	0.01	0.01	-29%	17.49	12.26	-30%
Monroe	3076.69	2835.87	-8%	4914.23	3824.88	-22%
River Rouge	2504.08		-100%	1505.56		-100%
St. Clair	14358.59		-100%	5400.22		-100%
Trenton Channel	6178.23		-100%	1802.35		-100%
Presque Isle	4674.93		-100%	2926.78		-100%
J B Sims	331.91		-100%	442.05		-100%
James De Young	0.00			0.01		-100%
Eckert Station	1217.63		-100%	566.27		-100%
Erickson	3033.22		-100%	1290.88		-100%
Shiras	186.46		-100%	292.43		-100%
Wyandotte	0.02		-100%	8.47		-100%
Michigan Hub Plant						
Belle River	22559.54	16792.96	-26%	7751.09	6586.38	-15%
Greenwood	2.75	4.05	47%	323.80	714.12	121%
48th Street Peaking Station	0.28	0.22	-23%	39.93	18.20	-54%
Sumpter Plant	0.68	0.44	-36%	38.25	22.05	-42%
Kalkaska CT Project #1	0.06	0.18	203%	7.60	25.58	237%
DTE Pontiac North LLC						
T B Simon Power Plant				104.80	130.99	25%
Graphic Packaging International, Inc.				41.85		-100%
Midland Cogeneration Venture	17.77	25.83	45%	2968.61	3571.04	20%
Grayling Generating Station	7.60	11.80	55%	171.63	134.05	-22%
TES Filer City Station	439.48	142.63	-68%	1287.64	841.55	-35%

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Facility Name	SO₂ Mass (short tons) 2017	SO₂ Mass (short tons) 2023	% Change (2017 to 2023)	NO_x Mass (short tons) 2017	NO_x Mass (short tons) 2023	% Change (2017 to 2023)
Cadillac Renewable Energy	58.96	63.03	7%	183.57	196.32	7%
Genesee Power Station	55.64	78.16	40%	107.83	178.63	66%
Michigan Power Limited Partnership	2.75	2.96	7%	116.98	135.28	16%
Zeeland Generating Station	7.46	12.13	63%	161.91	368.70	128%
Dearborn Industrial Generation	880.94	1229.54	40%	464.98	603.52	30%
Kalamazoo River Generating Station	0.03	0.69	2200%	1.97	51.98	2539%
Livingston Generating Station	0.03	0.05	68%	11.58	22.21	92%
Jackson Generating Station	4.59	4.96	8%	467.33	535.17	15%
Covert Generating Station	13.34	16.40	23%	179.69	187.82	5%
Renaissance Power	0.94	5.00	430%	68.09	410.31	503%
Indeck-Niles Energy Center	14.59		-100%	113.84		-100%
Dean Peakers	0.44	2.13	383%	19.45	90.84	367%
Otsego Paper, Inc.				14.38	25.05	74%
Lansing BWL REO Town Plant	1.15	1.29	12%	64.67	135.77	110%
Holland Energy Park	0.74	2.09	183%	19.97	35.87	80%
Alpine Power Plant	1.74	2.68	54%	94.80	117.34	24%
Blue Water Energy Center	15.41		-100%	170.03		-100%
Delta Energy Park	2.19		-100%	81.38		-100%
Marathon Petroleum Company, LP				23.90	20.28	-15%
Corteva Agriscience LLC				0.24	0.18	-25%
University of Michigan				17.02	4.69	-72%
TOTAL OVERALL	65401.20	25696.53	-61%	38104.19	21800.30	-43%

Source: Clean Air Markets Program Data, <https://campd.epa.gov/>

VII. Assessment of Changes Impeding Visibility Progress, 40 CFR 51.308(G)(5)

The State does not currently anticipate any significant changes in either in-state or out-of-state emissions that would impede visibility progress. Similar to what was addressed in EGLE's 2016 Regional Haze Progress Report, on-road NO_x emissions have a relatively large remaining reduction needed to achieve the projected 2028 emission level for this source category listed in the Michigan 2021 Regional Haze SIP submittal. Table 4-9 of the 2021 LADCO Regional Haze Technical Support Document (TSD) (<https://www.ladco.org/reports/technical-support/ladco-regional-haze-tsd-second-implementation-period/>), which was incorporated into Michigan's 2021 Regional Haze SIP submittal, demonstrates that the on-road source category in Michigan in 2028 is expected to emit 31,924 tons of NO_x. In 2022, on-road sources in Michigan emitted approximately 46,393 tons of NO_x, which indicates that 14,000 tons of NO_x may need to be reduced over the span of six years from this source category to meet the anticipated 2028 emissions target specified in the 2021 LADCO's Regional Haze TSD.

While this is an issue that merits further investigation, EGLE does not consider this a significant issue impeding visibility progress for the Michigan Regional Haze SIP for two primary reasons. First, visibility trends for 2018 through 2022 for Seney and Isle Royale have shown that the trend for each area is already below both the RPG and the glide path/URP for 2028 for the most impaired days at each site. Also, visibility trends are downward and below the "no degradation" trend line for each site for the least impaired days. Secondly, substantial NO_x and SO₂ reductions have occurred for those point sources predicted by the Q/d analysis to have the largest impacts on visibility at Seney and Isle Royale.

VIII. Assessment of Current Strategy, 40 CFR 51.308(G)(6)

A. Assessment of Current Strategy

As noted in the Emissions Progress section of this report, and shown in Tables 11 and 12, EGLE has demonstrated that total statewide SO₂ and NO_x emissions have declined substantially over the 2017-2023 emissions tracking timeframe for this second planning period. These reductions can be attributed to a variety of more stringent federal and state-level air pollution control regulations and programs that have gone into effect since the start of the second planning period – some of which were addressed in Michigan's 2021 Regional Haze SIP Long-term Strategy for achieving "reasonable further progress" towards improving visibility. Several previously coal-fired EGUs throughout the state have either been shut down or have switched to burning natural gas through enforceable consent decrees since the start of the planning period as well, which has contributed to the almost 40,000-ton decrease in SO₂ emissions for EGUs reporting to CAMPD between 2018 and 2023.

In addition, as highlighted under the [Visibility Progress](#) section of this report, the analysis of visibility trends for Seney and Isle Royale has shown that the trend for each Class I area is already well below both the RPG and the glide path/URP for 2028 for the most impaired

days at each site. Also, visibility trends are improving and below the “no degradation” trend line for each site for the least impaired days.

In the 2021 Regional Haze SIP submittal for the second planning period, which included LADCO’s Region 5 states’ source contribution estimates to visibility impairment at out-of-state IMPROVE Sites, the data suggested that emissions from Michigan sources impact distant Class I areas in the states of Kentucky, Tennessee, West Virginia, Virginia, New Jersey, New Hampshire, Vermont, and Maine in the 1 to 3 percent range of total visibility impairment. Given that Michigan statewide sources of interstate transport and haze-causing pollutants (NO_x and SO₂) experienced significant emissions reductions of approximately 113,610 tons (combined NO_x and SO₂) between 2017 and 2020, as shown in Table 12, which continue to be on the decline, it is unlikely that Michigan sources will negatively affect the achievement of the 2028 reasonable progress goals for those out-of-state Class I areas. Similarly, under the Determination of Affected Class I Areas in Other States section of Michigan’s 2021 Regional Haze SIP submittal, EGLE states that the Mid-Atlantic/Northeast Visibility Union (MANE-VU) organization identified and expressed in an August 25, 2017, letter to Michigan that the Belle River and St. Clair Power Plants in St. Clair County as being significant contributors to visibility impairment at the MANE-VU states’ Class I areas. This request from MANE-VU has been fulfilled through the shutdown of six coal-fired boilers at the St. Clair Power Plant and through the upcoming fuel conversion to natural gas for two of Michigan’s remaining operating coal-fired boilers at the Belle River Power Plant, which is set to occur starting in 2025.

As a result of these considerations, EGLE has concluded and presented information that the State of Michigan is on track to meet both the RPG and the glide path/URP for 2028 for both Seney and Isle Royale for the most impaired days; and both sites are expected to remain below the “no degradation” trend lines through 2028 and beyond.

B. Review of Visibility Monitoring Strategy

Visibility is monitored for both Isle Royale National Park and Seney National Wildlife Refuge. The monitoring sites are part of the IMPROVE monitoring network. IMPROVE monitoring for both sites began in 1999 and continues today. The Seney monitoring site is operated by the U.S. Fish and Wildlife Service, and the Isle Royale site is operated by the National Park Service (NPS) as part of the USEPA’s Integrated Air Deposition Network. The Isle Royale monitor (ISLE1) is located on the Keweenaw Peninsula in Eagle Harbor in Keweenaw County, and the Seney monitor (SENE1) is located in Schoolcraft County.

EGLE will continue to rely on the IMPROVE monitoring network to provide visibility data for Michigan’s Class I areas. EGLE is not aware of a need for changes in the monitoring network.

IX. Determination of Adequacy, 40 CFR 51.308(H)

Although the USEPA has not taken final action on EGLE’s 2021 Regional Haze SIP submittal for the second planning period as of the date of this 5-Year Progress Report, EGLE has determined that the 2021 Regional Haze SIP submittal could be enhanced with additional analyses of potentially reasonable NO_x and SO₂ emission controls using the four evaluation factors required under 40 CFR 51.308(f)(2)(i). These include costs of compliance, time necessary for compliance, energy and non-air quality environmental impacts of compliance, and the remaining useful life for the affected sources within the state per 40 CFR 51.308(h)(4). As such, EGLE recognizes that the State should pursue a supplement to provide additional technical information and further analyses to bolster its conclusions within the 2021 Regional Haze SIP Submittal.

This will enable EGLE to ensure reasonable progress and control measures and strategies are fully evaluated as potential components of Michigan’s Long-term Strategy. EGLE’s Regional Haze SIP supplement will undergo the FLM consultation process and be subject to a public comment period. EGLE plans to submit the supplement to its 2021 Regional Haze SIP submittal to the USEPA in early 2025 so the USEPA will have adequate time to take final action by the deadline of May 30, 2025, under the Consent Decree between Sierra Club, et al., and the USEPA that was entered on July 24, 2024.

X. FLM Consultation And Public Comment, 40 CFR 51.308(I)

A. FLM Consultation

As required by 40 CFR 51.308(i), EGLE provided an opportunity for FLM consultation no less than 60 days before a public hearing or public comment process on this 5-Year Progress Report. The FLM consultation provided the opportunity for the FLMs to discuss their assessment of the visibility impairment in the Class I areas and their recommendations on the development and implementation of strategies to address visibility impairment.

- EGLE communicated with the FLMs on October 10, 2024, and provided a draft of the 5-Year Progress Report on that same date. Only one written comment was provided via email by the U.S. Forest Service (FS) on November 15, 2024. The NPS and Fish and Wildlife Service sent an email to EGLE on October 10, 2024, stating that they would be opting out of the FLM comment period for the 2025 Michigan Regional Haze Progress Report.

The comment from the FS:

The only comment I have on the 5-year progress report is on page 7 you state “It was determined in the 2021 Regional Haze SIP submittal for the Second Planning Period, for which USEPA has not yet taken final action, that it would be unreasonable for EGLE to implement additional control measures for its selected sources beyond those already on the books and on the way, including the control measures discussed above” We disagree with this position as expressed in our 5/4/21 comment letter.

EGLE’s response to the comment from the FS:

EGLE recognizes that U.S. Forest Service disagrees with EGLE’s additional control measures determination and lack of updates to Michigan’s long-term strategy in its 2021 Regional Haze SIP Submittal. EGLE intends to put together a supplement to this SIP in an effort to provide clarifying technical information and further analyses that were not included in the 2021 submittal to help bolster its decision-making process.

B. Public Comment Period

EGLE published a notice of the public comment period and availability of public hearing on February 24, 2025, for the proposed version of this 5-Year Progress Report. The notice is provided as Appendix E. EGLE did not receive any comments from the public (Appendix F).

XI. Submittal Checklist for the Second Planning Period 5-Year Progress Report

The following checklist was provided in the July 2025 USEPA regional haze progress report’s guidance. EGLE has completed Table 16 to ensure the 5-Year Progress Report is complete.

Table 15. Checklist for Progress Reports Submitted under 40 CFR 51.308(g) – (h) and 40 CFR 51.308(i)

Y/N	Regulation Citation (40 CFR)	Regulation Summary (not verbatim)	Location in Progress Report	Comments
		Report Requirements		
Y	51.308(i)	Consultation with FLMs: Did the state provide documentation of and address all comments made by the FLMs from the consultation period, which must take place no less than 60 days before the public hearing or public comment opportunity? <i>(all states)</i>	38	
Y	51.308(g)	Public Inspection and Comment: Was the draft report made available for public inspection and comment for at least 30 days before submission to the USEPA? Does the report contain all comments received from the public? If the public comments received resulted in changes made to the progress report, does the report contain an explanation as to why changes were made? <i>(all states)</i>	38	
Y	51.308(g)(1)	Status of Control Measures in the RH SIP: Does the report contain a list of all measures the state relied upon in the Second Planning Period? <i>(all states)</i>	3	

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Y/N	Regulation Citation (40 CFR)	Regulation Summary (not verbatim) Report Requirements	Location in Progress Report	Comments
Y	51.308(g)(2)	Emissions Reductions from RH SIP Strategies: Does the report include estimated emissions reductions from the measures provided under (g)(1)? <i>(all states)</i>	9	
Y	51.308(g)(3)	Visibility Progress: Does the report contain a summary of monitored visibility data as required by the RHR? <i>(only states with CIAs)</i>	17	
Y	51.308(g)(4)	Emissions Progress: Does the report provide an analysis of emissions trends as applicable to the current period? <i>(all states)</i>	31	
Y	51.308(g)(5)	Assessment of Changes Impeding Visibility Progress: Does the report contain an assessment of and statement if anthropogenic emissions have impeded visibility progress? <i>(all states)</i>	36	
Y	51.308(g)(6)	Assessment of Current Strategy: Does the report assess whether current implementation plan strategies are sufficient to meet the RPGs described in the SIP? <i>(all states)</i>	36	
N/A	51.308(g)(8)	Long-term Strategy Containing a Smoke Management Program: Does the report address the smoke management program's impact on the LTS? <i>(states with a LTS containing a permanent and federally enforceable smoke management program that also contains a periodic assessment element of the SMP)</i>		
Y	51.308(h)	Determination of Adequacy: Does the report determine the adequacy of the current implementation of measures incorporated into the SIP? <i>((h)(1) and (h)(4) = all states, (h)(2) and (h)(3) = available to states with CIAs)</i>	38	

Appendices

Appendix A: Holcim (US), Inc. DBA Lafarge Alpena Plant, PTI No. 195-10B

Appendix B: Billerud Escanaba LLC, PTI No. 127-11D

Appendix C: St Marys Cement Charlevoix Plant, PTI No. 140-15C

Appendix D: Tilden Mining Company LC, PTI No. 148-12A

Appendix E: Notice of Public Comment Period and Availability of Public Hearing

Appendix F: Public Comments Received