The State of Wisconsin's Attainment Demonstration for the Oneida County 2010 Sulfur Dioxide (SO_2) Nonattainment Area

A CAA-Required State Implementation Plan Addressing the 2010 SO_2 National Ambient Air Quality Standard

Prepared by the Wisconsin Department of Natural Resources

November 2015

TABLE of CONTENTS

I. EXECUTIVE SUMMARY 3
II. BACKGROUND 3
1. 2010 NAAQS 3
2. Historic NAAQS and Oneida County Nonattainment 4
3. Health Impacts 4
III. PLAN ELEMENTS OVERVIEW 5
IV. THE RHINELANDER AREA 2010 NAAQS ATTAINMENT PLAN 5
1. Stationary Emission Sources Contributing to SO_2 Nonattainment 6
2. Control Strategy 7
3. Attainment Demonstration 7
4. Enforceable Requirements 9
5. Reasonably Available Control Technology and Measures (RACT and RACM) 13
6. Rate of Further Progress 13
7. Base and Attainment Year Emission Inventories 13
A. 2011 Base Year Emissions 14
B. 2017 Attainment Year Emissions 15
8. Contingency Measure 16
9. New Source Review Program 17
10. Conformity 17
11. Maintaining Previous NAAQS requirements 18
V. PUBLIC PARTICIPATION 18
VI. CONCLUSION 19
APPENDIX A: Oneida County Nonattainment Area Air Quality Modeling Analysis 20
APPENDIX B: Expera Specialty Solutions LLC SO_2 Emission Limitations and Requirements Administrative Order AM-01-15 29
APPENDIX C: Analysis of the GEP Stack Height For Boiler B26, Stack S09 43
APPENDIX D: Base and Attainment Year Emission Inventories For the Oneida County Nonattainment Area 44

I. EXECUTIVE SUMMARY

This document presents Wisconsin Department of Natural Resources (Department) plan for demonstrating attainment of the 2010 Sulfur Dioxide (SO_2) NAAQS within the Oneida County nonattainment area. The plan describes a control strategy that reduces and limits SO_2 emitted by Expera Specialty Solutions LLC (Expera), the primary facility contributing to SO_2 nonattainment in this area. The SO_2 emitted by two other nearby facilities will continue to be regulated under current permit requirements.

Expera operates one coal-fired boiler designated as B26 and one gas-fired boiler with fuel oil backup designated as B28. Administrative Order AM-01-15 establishes permanent and enforceable SO_2 requirements for these boilers as a result of an agreement between the Department and Expera. The Administrative Order is submitted for incorporation into the state implementation plan as part for demonstrating attainment with the 2010 SO_2 NAAQS.

Administrative Order AM-01-15 establishes several requirements for boiler B26 at the Expera facility that must be met by January 1, 2017. The first requirement is to raise the flue gas stack height for boiler B26 to 296 feet above ground level. The Department determined that 296 feet is the good engineering practice (GEP) height for reducing negative plume dispersion impacts caused by nearby structures. The Order also limits boiler B26 SO_2 emissions to 3.00 pounds per mmBtu on a 24-hour basis and limits the maximum boiler load to 300 mmBtu per hour. The determination of GEP stack height is based on a wind-tunnel study conducted by Expera. The emission rate and boiler utilization limits are determined using U.S. Environmental Protection Agency's (EPA) air quality dispersion model AERMOD. The modeling performed, including Expera under the Order requirements and all other SO2 emissions sources within 50 kilometers under permitted conditions, shows attainment throughout the area.

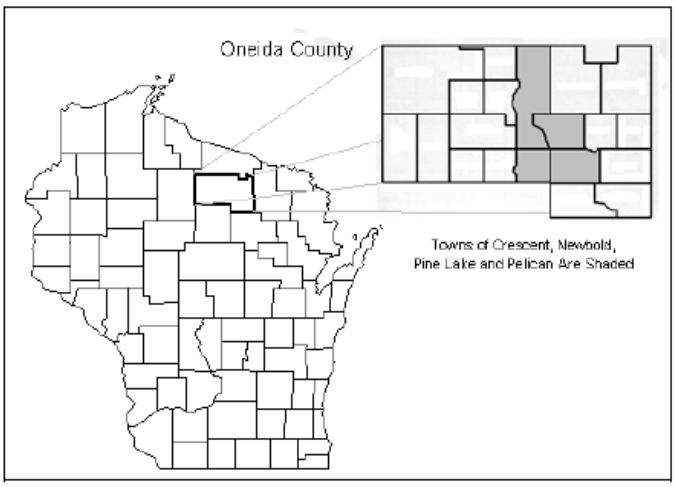
II. BACKGROUND

1. 2010 NAAQS

In 2010, the EPA lowered the primary SO_2 National Ambient Air Quality Standard (NAAQS), setting a 1-hour standard of 75 parts per billion (ppb), which is attained when the 3-year average of the 99th percentile of 1-hour daily maximum concentrations does not exceed 75 ppb. The standard replaced the two primary standards initially promulgated in 1971 and retained in a subsequent review of the standard in 1996. These previous NAAQS were 24-hour standard of 140 ppb and an annual standard of 30 ppb. EPA revoked both of these standards as part of the 2010 revision as the new 1-hour standard is more protective of human health.

On August 5th, 2013, (78 FR 150) EPA designated a portion of Oneida County as nonattainment under the 2010 SO_2 NAAQS (Figure 1). This nonattainment area consists of four townships within Oneida County, including the city of Rhinelander. The nonattainment designation was based on ambient air quality data collected at the Rhinelander municipal water tower (Water Tower) monitoring site from 2009 through 2011. The resulting design value for this 3-year period was 151 ppb which exceeded the 2010 NAAQS of 75 ppb.

Figure 1. Oneida County 2010 SO_2 NAAQS Nonattainment Area.



2. Historic NAAQS and Oneida County Nonattainment

The same portion of Oneida County was nonattainment under the 1971 primary 24-hour SO_2 standard. In order to monitor attainment status with the 1971 standard, the Department began operating several SO_2 air quality monitors in Oneida County in the early 1980s. The monitored air concentrations for the area showed that SO_2 concentrations at the Water Tower monitor were consistently among the highest measured. Therefore, monitoring at other locations was discontinued while operation of the Water Tower monitor has continued.

During the state's development of the plan demonstrating attainment with the 1971 standard, the Expera facility in Rhinelander was identified as the primary source contributing to high SO_2 ambient air concentrations in the Oneida County area. This analysis also established that air quality modeling consistently under-predicted SO_2 air concentrations compared to actual values measured by the Water Tower monitor. At that time, it was postulated that downwash from nearby buildings was causing emissions from the largest coal-fired boiler at the facility (boiler B26) to be concentrated when traveling towards the Water Tower monitor. To adjust for this effect, facility emission requirements were established by correlating real-time SO_2 emissions to the Water Tower monitored air concentrations. These emission requirements were made enforceable under Consent Order AM-94-38. EPA approved Consent Order AM-94-38 as part of the state attainment plan on December 7, 1994 (59 FR 63046). The 1971 and subsequent 1996 standard have been maintained since that time.

3. Health Impacts

The EPA states that current scientific evidence demonstrates that health effects result from SO_2 exposure ranging from five minutes to 24 hours. Adverse respiratory effects include narrowing of the airways, which causes difficulty breathing (bronchoconstriction), and increased asthma symptoms. People with asthma are particularly vulnerable to these effects during periods of faster or deeper breathing (e.g., while exercising or playing).

Studies also show an association between short-term SO_2 exposure and increased visits to emergency rooms and hospital admissions for respiratory illnesses, particularly in at-risk populations including children, the elderly, and people with asthma.

Emissions that lead to high concentrations of SO_2 generally also lead to the formation of other SO_x and fine sulfate particulates ($PM_{2.5}$). Control measures that reduce SO_2 can generally be expected to reduce exposure to all gaseous SO_x and $PM_{2.5}$. In particular, emphasis is placed on reducing $PM_{2.5}$, which penetrates deeply into sensitive parts of the lungs. $PM_{2.5}$ exposure can cause or worsen respiratory disease, such as emphysema and bronchitis, and can aggravate existing heart disease, leading to increased hospital admissions and premature death.

III. PLAN ELEMENTS OVERVIEW

The State of Wisconsin is required to develop a plan showing that the 2010 SO_2 NAAQS will be attained by January 1, 2017 in the Oneida County nonattainment area. EPA identifies a number of elements that must be addressed by a plan in the document "*Guidance for 1-Hour SO_2 Nonattainment Submissions"* as issued on April 23, 2014. These elements and where they are addressed in this plan are listed in Table 1.

Table 1. SO_2 Attainment Plan Elements Addressed in the Wisconsin Plan

Plan Element	Section
The identification of stationary emission sources contributing to SO_2 nonattainment	IV.1
Identification of the control strategy	IV.2
The demonstration of attainment	IV.3
Implementation of enforceable requirements	IV.4
Satisfaction of reasonably available control technology and measures (RACT and RACM)	IV.5
The fulfillment of reasonable further progress (RFP)	IV.6
The base year and attainment year projected emissions inventories	IV.7
The commitment of contingency measures in the event that the identified control strategy does not result in attainment	IV.8
The demonstration of a new source review (NSR) program meeting CAA requirements	IV.9
The demonstration of meeting CAA conformity requirements	IV.10
The demonstration that previous SO_2 NAAQS requirements are maintained	IV.11

This document presents Wisconsin's plan for demonstrating attainment with the 2010 SO_2 NAAQS in the Oneida County nonattainment area by January 1, 2017. The plan assesses emission sources contributing to nonattainment using EPA's air quality dispersion model AERMOD. One facility, Expera, is identified as the primary contributor to SO_2 nonattainment. Contribution from other facilities is minimal. The AERMOD modeling protocol and results are provided in Appendix A. The plan establishes permanent and enforceable emission limitations for Expera effective January 1, 2017 through Administrative Order AM-15-01 as provided in Appendix B. Attainment will be maintained by the permitting process, which addresses any increase in emissions at existing sources or the installation of new sources within the nonattainment area. This plan also satisfies RACT, RACM, and RFP requirements for the area by January 1, 2017 and provides information addressing the balance of plan requirements listed in Table 1.

IV. THE RHINELANDER AREA 2010 NAAQS ATTAINMENT PLAN

1. Stationary Emission Sources Contributing to SO_2 Nonattainment

The Department determined that Expera is the primary source causing nonattainment of the 2010 SO_2 NAAQS in the Oneida County area. This determination is based on AERMOD air quality modeling of all stationary sources within 50 kilometers of the Oneida County area under maximum emission conditions. This modeling scenario is referred to as the Base Case. The modeling protocol and detailed results are presented in Appendix A.

Review of the Department's emission inventory confirms that Expera, Red Arrow Products, and the Packaging Corporation of America (PCA) comprise all of the stationary source facilities within 50 kilometers of the nonattainment area:. Expera and Red Arrow Products are within the nonattainment area. PCA is located in Tomah, Wisconsin, outside of the nonattainment area. The facilities' distances to the Water Tower air quality monitor and the inventory of emission units operated or proposed for permitting by these facilities as of October, 2015 are summarized in Table 2. These are the facilities and emission sources modeled to determine contribution culpability.

Table 2. Facilities Modeled for Contribution to Nonattainment of the 2010 SO_2 NAAQS in the Oneida County Nonattainment Area

Parameter	Expera	Red Arrow	Packaging Corporation of America
Emission Sources	Boiler B26 - Coal Boiler B28 - Natural gas w/ distillate oil backup	Boiler B07 – Wood waste Boiler B10 - Wood waste	Boiler B24 - Coal Boiler B29 - Natural gas w/ distillate oil backup.
Modeled Fuel	B26 – Coal B28 – Distillate Oil	B07 – Wood waste B10 – Wood waste	B24 – Coal B29 – Distillate Oil
Maximum Potential SO_2 Emissions (lbs./hr.)	1,065.23	6.46	1,306.3
Distance to the Rhinelander Tower Monitor	< 1 kilometer	< 5 kilometers	53 kilometers
Maximum Modeled Contribution (ppb)	71.6 (88.4% of 81 ppb modeled for total impact)	< SIL	< SIL

Note: Background concentration for the modeling is 7 ppb.

The AERMOD modeling of the maximum potential emission levels for each facility predicted a high SO_2 ambient air concentration of 81 parts per billion (ppb) in the nonattainment area. The results of the modeling showed that the Expera facility is responsible for approximately 88.4 percent of the total 81 ppb modeled value. The modeling also shows that although PCA Tomahawk's potential emissions are greater than the Expera facility, the PCA Tomahawk facility is of sufficient distance

away to have minimum impact on Oneida County's attainment status. Therefore the primary facility contributing to nonattainment in Oneida County is the Expera facility. These modeling results are also summarized in Table 2. Note: The air quality values and contribution values for individual facilities presented in Table 2 are for the single grid point in the nonattainment area showing the highest modeled SO_2 concentration. The area within the grid showing the highest SO_2 concentrations is consistent with monitored air quality results.

2. Control Strategy

The control strategy for demonstrating attainment of the 2010 SO_2 NAAQS is to implement additional emission requirements and reductions at the Expera facility. The emissions for Red Arrow and PCA are accounted for at their currently permitted maximum allowable SO_2 emission levels. If these facilities seek to increase emissions, they will have to go through the permitting process and associated air quality modeling to ensure the NAAQS is maintained. This plan for attainment does not rely on any other emission reduction requirement or national program for controlling SO_2 emissions.

3. Attainment Demonstration

Expera SO_2 Emission Sources

As noted in Section 3, Expera is the primary facility contributing to nonattainment in Oneida County. Expera currently operates two boilers capable of emitting SO_2: boiler B26 and boiler B28. The characteristics and SO_2 emission requirements for these boilers prior to this plan are as follows:

1) Boiler B26 - Boiler B26 is a 300 mmBtu per hour cyclone boiler constructed in 1958. This boiler provides base load steam and power for the paper processes operated at the facility. This boiler is fired with bituminous coals or a mixture of bituminous and subbituminous coals. The mixture of coals is specific to maintain fusion and slagging characteristics necessary for firing in a cyclone boiler. Boiler gases and emissions are exhausted through stack S09. Particulate emissions are controlled by an electrostatic precipitator (ESP). Stack S09 was originally constructed with a height of 209 feet above ground level. Prior to this plan, the boiler was subject to a SO_2 emission limit of 3.5 pounds per hour averaged over 24 hours under Consent Order AM-94-38. The maximum allowable mass emissions under this emission rate limit was 1,050 pounds per hour. This emission limitation was established in order to demonstrate attainment with the 1971 SO_2 NAAQS.

2) Boiler B28 - Boiler B28 is a 280 mmBtu per hour natural gas boiler constructed in 1996. This boiler can be fired with distillate oil as a backup fuel to a capacity of 270 mmBtu per hour. The distillate oil is restricted to a maximum sulfur content of 0.05 percent by weight under Title I permit 95-SDD-048. The maximum allowable emissions while firing distillate oil is 15.3 pounds per hour.

3) Boilers B20, B21, B22, & B23 - Boilers B20, B21, B22, & B23 are four coal-fired stoker boilers that are each rated at 83.5 mmBtu per hour. These boilers were subject to SO_2 emission limitations under the Consent Order AM-94-38, but were retired in 2014 after designation of the Oneida County 2010 SO_2 NAAQS nonattainment area. The decommissioning of these boilers was made federally enforceable pursuant to condition ZZZ.12 of Title I permit 13-SDD-014. Retirement of the boilers is part of the control strategy of this plan.

Based on current permitted conditions, boiler B26 is responsible for the vast majority of SO_2 that could be emitted by the Expera facility. Therefore, the attainment strategy focuses on controlling emissions from this boiler.

Boiler B26 GEP Stack Height

Historic air quality modeling indicated that flue gas dispersion from boiler B26, the large coal-fired boiler, is negatively impacted in a manner which concentrates SO_2 emissions. Expera provided a study which evaluated the aerodynamic impacts of nearby structures on boiler B26 flue gas emissions through stack S09. This study is provided in Appendix C.

The study researchers measured plume downwash effects by using a scale model of the facility in a wind tunnel test. The tests were conducted to account for the wind direction, wind speed, and boiler load that result in worst case pollutant concentrations. During the wind tunnel tests, stack heights were increased progressively from the existing stack height of 209 feet (63.7 meters). At each stack height, surrogate pollutant concentrations were measured both with and without nearby buildings in place. This exercise demonstrated how plume effects caused by nearby structures are concentrating SO_2 emissions under certain conditions.

The stack height for achieving intended dispersion of air pollutants is termed the "Good Engineering Practice" (GEP) stack height. The GEP stack height is specific to each facility and is determined according to methods under 40 CFR 51.100. One method specifically allows for the GEP stack height to be determined based on a study or analysis of the specific facility characteristics such as the one conducted by Expera. Specifically, 40 CFR 51.100(ii) (3) provides that GEP can be determined by:

> *The height demonstrated by a fluid model or a field study approved by the EPA State or local control agency, which ensures that the emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures or nearby terrain features.*

According to 40 CFR 51.100 (kk) (1) "excessive concentrations" for purposes of determining GEP means:

> *For sources seeking credit for stack height exceeding that established under §51.100(ii)(2) a maximum ground-level concentration due to emissions from a stack due in whole or part to downwash, wakes, and eddy effects produced by nearby structures or nearby terrain features which individually is at least 40 percent in excess of the maximum concentration experienced in the absence of such downwash, wakes, or eddy effects and which contributes to a total concentration due to emissions from all sources that is greater than an ambient air quality standard.*

According to the definition of "excess concentrations", the maximum allowable GEP stack height in the study is reached when pollutant concentrations with structures present are 1.4 times the pollutant concentrations with no structures present. Based on this information, the Department is determining in this plan the that a stack height of 296 feet (90 meters) meets the GEP criteria under 40 CFR 51.100(K) for boiler B26. Further discussion of the technical basis for plume dynamics and the determination of stack S09 GEP stack height are provided under the modeling protocol discussion in Appendix A.

Boiler B26 Emission Requirements

The Department used the AERMOD air quality dispersion model to determine the amount of SO_2 emissions per hour that can be emitted from Expera boiler B26 while attaining the NAAQS. The modeling assumes emissions from PAC and Red Arrow and boiler B28 at the Expera facility remain at current maximum allowable emission levels.

For boiler B26, the modeling assumes the GEP stack height of 296 feet. Initial modeling runs were performed while operating the boiler at full and normal load conditions. When holding the emission rate constant, the modeling showed that the maximum air quality impact occurs while the boiler is at full load or 300 mmBtu per hour. Therefore, to determine the emission rate necessary for attainment, modeling runs were conducted with the boiler at full load while iteratively reducing the emission rate. The protocol and results of this modeling are provided in Appendix A.

To determine which modeling runs result in attainment, the 4^{th} highest value of SO_2 concentrations each year generated by the AERMOD runs are compared to the NAAQS value of 75 ppb. This approach mimics the methodology applied to determine attainment status from actual monitored air quality values.

The AERMOD modeling runs showed that SO_2 emissions from boiler B26 must be limited to 960 pounds per hour to reach attainment. This value of mass emissions per hour is equal to an emission rate of 3.20 pounds per hour while the boiler is operating at the full load capacity of 300 mmBtu per hour. These modeled operating criteria form the basis of enforceable requirements for Expera boiler B26 for attaining the SO_2 NAAQs.

4. Enforceable Requirements

For purposes of attaining the 2010 SO_2 NAAQS, emission requirements for the Expera facility will be made permanent and enforceable under Administrative Order AM-15-01 as presented in Appendix B. This Order is submitted for incorporation into the state implementation plan.

Emission requirements for the Red Arrow and PCA facilities are enforceable through Title I construction permits 15-JJW-058, 14-SDD-201, and 13-MDW-099, respectively.

Expera Boiler B28 Emission Requirements

As discussed, boiler B28 is modeled to emit SO_2 at current maximum allowable emission levels consistent with distillate fuel sulfur content of 0.05 percent by weight. Boiler B28 is currently limited to this fuel sulfur content level under construction permit 95-SDD-048. Compliance is demonstrated by fuel testing and record keeping under the permit. These same requirements are incorporated into Administrative Order AM-15-01.

Expera Boiler B26 Emission Requirements

Based on the air quality modeling, the boiler B26 emission requirements include the following:

1) A stack height of 296 feet
2) An emission rate limit of 3.20 pounds per hour

3) A boiler capacity firing limitation of 300 mmBtu per hour

The Expera Administrative Order adopts these requirements and the necessary methods to demonstrate compliance with each requirement. Under the Order, Expera must comply with these requirements by January 1, 2017. The emission limitation, boiler capacity limitation and compliance requirements for each are discussed in further detail below.

A. Emission Rate Limit

As stated, the modeled emission rate limit is 3.20 pounds per mmBtu on an hourly basis. EPA's SO_2 implementation guidance allows emissions averaging over extended periods. To incorporate this flexibility and to be consistent with practical fuel sampling methods, the Order implements an equivalent emission rate limit on a 24-hour average basis of 3.00 pounds per mmBtu.

EPA provides a methodology for converting applicable emission rate limits from shorter to longer averaging periods in the SO_2 implementation guidance. This method evaluates emissions from the source or a similar source to determine a conversion ratio for the two averaging times being compared. In this case, the method is used to convert the 1-hour emission rate limit determined by air quality modeling (based on the 1-hour NAAQS) into the equivalent 24-hour emission limit.

In determining the ratio used to convert the emission limit to different averaging times, the methodology relies on the availability of hourly emissions data, presumably from sources monitored with a continuous emissions monitoring system (CEMs). Expera does not have a CEM monitor in place and therefore this source-specific data is not available. However, the SO_2 SIP guidance states that CEMs data from other sources similar in fuel and control equipment can and should be used when CEMs data is not available for the source. In developing the guidance, EPA evaluated emission rates at different averaging times for coal-fired boilers using data reported by electric utilities to the Clean Air Markets Division (CAMD). This evaluation showed a ratio value of 0.93 percent for converting a 1-hour emission rate of an uncontrolled coal-fired boiler to a 24-hour emission rate. This data is provided in Table 1, Appendix D of the SO_2 guidance.

The Department believes that the CAMD emissions data is the best information available for sources similar to the Expera boiler B26. The CAMD database has tracked CEMs emissions data for a large population of coal-fired boilers over a long period. This database allows for a robust and sound analysis of emission rates over different averaging periods. In comparison, the CEMs SO_2 emissions data from uncontrolled industrial coal fired boilers is very limited. Therefore, the ratio of 0.93 percent derived from the CAMD database is the most appropriate value in converting the 1-hour emission rate limit to a 24-hour limit for Expera. Multiplying 0.93 times the 1-hour emission rate of 3.20 pounds per mmBtu equals 2.98 pounds per mmBtu averaged over 24 hours. For implementation purposes in the Order, the emission rate is rounded to 3.00 pounds averaged over 24 hours.

B. Emission Rate Limit Compliance Demonstration

To demonstrate compliance with the emission rate limit, the Administrative Order requires Expera to perform fuel monitoring for each 24 hour period. Expera is to demonstrate compliance by assuming that all sulfur in the fuel will be converted to SO_2. If control efficiency is applied, Expera must perform fuel monitoring as discussed in this section and follow requirements discussed in section C below.

The fuel monitoring method requires Expera to obtain a minimum of three fuel samples for each day (24-hour period) and generate a composite sample. This approach represents the average SO_2 fuel content over 24 hours which is consistent with demonstrating compliance with the 24 hour emission rate of 3.00 pounds per mmBtu.

Expera can collect more samples through each day in creating the composite sample and determining the 24 hour average emission rate. However, fewer samples mean that there is less ability to average out high values. Therefore fewer samples create a more stringent monitoring and compliance demonstration case. The only concern would be that enough samples are collected to ensure that the SO_2 fuel content is not under-biased due to one low value or sampling error or artifact. The Department believes a minimum of three samples through the day ensures the resulting SO_2 fuel content is not under-biased.

Expera will be required to randomly analyze one composite sample each week to determine compliance. Expera will also be required to analyze a composite sample on each day the air quality monitor registers a SO_2 ambient air concentration of 75 ppb or higher. Because Expera has composite samples for each day, the Department or EPA will be able to require Expera to analyze additional samples as needed to demonstrate compliance. The composite samples will be retained on site for a period of 90 days.

Fuel sampling, as outlined in this plan, is preferred for a number of reasons. Most critical is that the compliance methodology provides a form of continuous emissions monitoring in a reasonable manner. Collecting and analyzing fuel samples for enough individual hours to demonstrate compliance with a 1 hour limit would be overly-burdensome and costly. The 24-hour composite approach yields a reliable average emission rate that is consistent with demonstrating compliance with the 24 hour emission rate. Lastly, this fuel monitoring plan provides a mechanism for demonstrating compliance on a continuous basis whereas periodic performance testing as allowed under the guidance would be less robust in this regards.

Expera has historically only fired solid fossil fuel during the main operation of the boiler. The fuel monitoring required in the Order covers that operating fuel situation. However, in the case that Expera fires non-fossil solid fuel, liquid fuel, or gaseous fuel, the Administrative Order does require that Expera demonstrate compliance based on a heat input weighted basis. In addition, the Order requires that Expera must establish a separate fuel sampling plan for these additional fuels. This plan must be approved by the Department.

C. Compliance Demonstration if Applying a Control Efficiency

It is not currently anticipated, but control equipment could be required in the future to demonstrate compliance with the emission rate limit. In this case, the Administrative Order requires that the control efficiency be determined by performance stack testing. Compliance would be demonstrated by applying the control efficiency to the SO_2 values resulting from the fuel monitoring requirement as outlined in section B. The performance test shall be performed according to one of EPA Methods 6, 6A, 6B, 6C or 8 provided under 40 CFR 60 Appendix A and according to all applicable procedures and methods under s. NR 439.07, Wis. Adm. Code. The performance test shall be conducted according to a monitoring and compliance plan approved in writing by the Department.

D. Emission Rate Limit and Compliance Demonstration During Boiler Startup

For any non-fossil solid fuel or liquid fossil fuel fired in boiler B26 during startup, the operator shall demonstrate that the SO_2 content of the fuel does not exceed 3.20 pounds per mmBtu by sampling and analyzing fuels according to a plan approved by the Department in writing.

E. Boiler Firing Capacity Limitation and Compliance Demonstration

To demonstrate compliance with the firing capacity limit of 300 mmBtu per hour for boiler B26, Expera will be required to correlate the boiler's generated steam load to the firing capacity and continuously monitor hourly steam load. Expera will record the maximum hourly steam load for each day and the correlated firing capacity to determine compliance.

The correlation for converting steam load to heat input will be determined from twelve months of heat input and steam generation data. This factor represents the boiler efficiency rate. This rate will be updated yearly or as directed by the Department. The heat input is determined by monitoring the total amount of fuel burned each week and applying the fuel heat content from the composite samples analyzed each week to demonstrate compliance with the emission rate requirement. Using a weekly sample to determine fuel heat content is deemed appropriate because a review of 52 samples collected in 2014 shows that heat content only deviated by an average of 2.3 percent.

An alternative is allowed to determine monthly instead of weekly heat input. This is to address the case that Expera could use a CEMs in demonstrating compliance with the emission rate limit. Under this scenario, Expera would not have to analyze a composite fuel sample each week. Therefore, the option is allowed to collect one fuel sample each week and composite into a monthly sample. This monthly composite sample would be analyzed for heat content which is then used to determine the monthly heat input. Once again, this option for a monthly fuel sample is only for determining average fuel heat content for purposes of the steam load compliance methodology.

Lastly, the requirements allow the Department or EPA to require additional fuel sampling if necessary to determine an appropriate boiler efficiency factor.

F. Continuous Emissions Monitoring Systems

In lieu of fuel sampling or steam monitoring, Expera has the option to directly monitor the SO_2 emission rate or boiler firing capacity by using a Part 60 compliant CEMs.

G. Alternative Monitoring

The monitoring requirements allow Expera to use alternative methods if approved in writing by both the Department and EPA.

H. Additional Monitoring Requirements

The monitoring and compliance requirements provide that the Department or EPA can require performance stack testing at any time for purposes of demonstrating compliance. The stack testing would be performed according to one of the EPA methods 6, 6A, 6B, 6C or 8 provided under 40

CFR 60 Appendix A and according to all applicable procedures and methods under s. NR 439.07, Wis. Adm. Code.

If stack testing is required, compliance would be determined by comparing the average of three stack test performance runs to the SO_2 emission rate limit of 3.20 pounds per mmBtu instead of the 24-hour limit of 3.00 pounds per mmBtu.

5. Reasonably Available Control Technology and Measures (RACT and RACM)

As indicated in the SO_2 guidance, the control strategy should include all reasonably available control technology (RACT) and reasonably available control measures (RACM) that can be implemented as expeditiously as practical. This implementation is to occur no later than five years after designation.

EPA has determined that both RACT and RACM are the levels of emission reduction necessary to demonstrate attainment with the 2010 SO_2 NAAQS.[1] Since the emission requirements implemented for Expera under Administrative Order AM-15-01, along with current permanent permit requirements for Red Arrow and PCA RACT, are being implemented to demonstrate attainment, these same emission requirements (emission levels) fulfill RACT and RACM for the Oneida County SO_2 nonattainment area.

The Department has determined that the appropriate compliance schedule satisfying an expeditious compliance date for RACM is a compliance date of January 1, 2017, the same as the attainment deadline. This schedule is necessary because the control strategy relies on increasing the stack height from 209 feet to 269 feet above ground level. This project is anticipated to be completed in the fall of 2016. Therefore, it is reasonable to set the initial compliance date as January 1, 2017 to allow for contingencies.

6. Rate of Further Progress

The SIP for the SO_2 2010 NAAQS must fulfill requirements for Rate of Further Progress (RFP). The SIP guidance defines the RFP as the amount of incremental emission reductions required during interim years to ensure that attainment is reached by the attainment date of January 1, 2017.

In this case, SO_2 emitted by one facility, Expera Specialty Solutions, will be controlled as expeditiously as practical to the level necessary to reach attainment. Since there are no interim steps for controlling emissions from this source between now (October, 2015) and January 1, 2017, and attainment will be reached by the attainment date, all requirements for RFP are fulfilled.

7. Base and Attainment Year Emission Inventories

The Department is required to establish a base year inventory of emission sources of SO_2 within the Oneida County nonattainment area under this plan. The year 2011 is selected as base year inventory, as this base year is consistent with EPA's most recent emissions inventory data requirements as codified at 40 CFR subpart 51, Subpart A. The SO_2 implementation guidance also states that the inventory must account for any other sources outside of the nonattainment area contributing to

[1] (USEPA, 2014), page 14, Memorandum "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" from Stephen D. Page, Director to Regional Air Division Directors, Regions 1 – 10, April 23, 2014.

nonattainment. The analysis of contributing sources presented in section 1 establishes that no emission sources outside of the nonattainment area contribute and therefore no additional sources need to be included in the plan emissions inventory.

Under this plan, the Department must also establish an attainment year emissions inventory which includes the anticipated emission reductions from control requirements implemented under the attainment plan. The year of the attainment emissions inventory is 2017. The 2017 emissions inventory is projected from the 2011 base year inventory and includes emission reductions resulting from control programs and emission source shutdowns since 2011, and the Expera facility emission reductions required under this plan by January 1, 2017. For the source categories other than point sources, the 2017 attainment emissions inventory is derived by prorating projected county-wide emissions to the nonattainment area comprised of the four townships within Oneida County.

Both the 2011 and 2017 emissions inventories include all point (stationary source), area, on-road, mobile, and off-road mobile source categories in the Oneida County nonattainment area.

A. 2011 Base Year Emissions

This section provides a brief description of the methods for developing the 2011 base year emissions inventory and the summary of emissions. More detailed documentation of the development of the emissions inventories for point, area, on-road mobile and off-road mobile categories is in Appendix D.

SO_2 point source emissions in 2011 were compiled from Wisconsin's Air Reporting System (ARS) by using annually reported emissions. The review of the emissions inventory identified two point source facilities emitting SO_2. In 2011, Red Arrow reported emitting 8 tons and Expera reported 2,422 tons of SO_2. The total point source emissions in 2011 are 2,430 (rounded) tons.

Area sources collectively represent individual sources of emissions that have not been inventoried as having specific point or mobile sources. These individual sources are treated collectively as nonpoint sources that are typically too small, numerous, or difficult to inventory using the methods for other classes of sources. The 2011 area source emissions inventory for the Oneida County nonattainment area was created based on the Wisconsin 2011 base year emissions inventory submitted to the EPA in 2013. A table of 2011 area source emissions by county and source classification code (SCC) is located in Appendix B of the document submitted to EPA. SCC is a process-level code that describes the equipment and/or operation that is emitting pollutants (40 CFR 51.50).

On-road mobile source emissions were developed using MOVES2014. The key inputs used in the MOVES2014 model are as follows: vehicle age distributions based on registration data from the Wisconsin Department of Transportation (WisDOT), detailed transportation data (e.g., vehicle miles of travel [VMT] by vehicle class, road class and hour of day, and average speed distributions), and controls, including the use of reformulated gasoline.

All estimates were made in accordance with the *MOVES2014 User Guide* (U.S. EPA, Office of Transportation and Air Quality, Assessment and Standards Division, July 2014, EPA 420-B-14-055) and *Using MOVES to Prepare Emission Inventories in State Implementation Plans and Transportation Conformity: Technical Guidance for MOVES2010, 2010a and 2010b* (U.S. EPA, Office of Transportation and Air Quality, Transportation and Climate Division, April 2012, EPA-420-B-12-028).

Off-road mobile source emissions other than emissions from aircraft, commercial marine engines, and locomotives were also estimated using the MOVES2014 model (version 20141021). Emission estimates for aircraft, commercial marine engines, and locomotives were obtained from the U.S. EPA's 2011 National Emissions Inventory (NEI), version 1, or U.S. EPA's 2011 Emissions Modeling Platform (Modeling Platform), version 6. For aircraft and locomotive emissions, the estimates in the NEI and Modeling Platform are equal.

The base year 2011 emissions inventory for the Oneida nonattainment area is summarized in Table 3.

Table 3. 2011 SO_2 Emissions for SO_2 Nonattainment Area (Tons per Year)

Source Category	**SO_2**
Point Sources	2,430.47
Area Sources	12.79
On-Road Mobile Sources	2.59
Off-Road Mobile Sources	4.88
Total	2,450.73

B. 2017 Attainment Year Emissions

This section describes the development of the 2017 future year emissions inventory. Unless otherwise noted below, the projected point and area source emissions in the Wisconsin nonattainment areas for 2017 were estimated using growth factors appropriate for each source. To forecast point source emissions, the Department used a "zero growth" projection, but evaluated maximum demonstrated emissions.

The point source emissions inventory was developed by considering emissions from 2011 through 2014, the last year of available reported annual emissions. Once again, there are only two emission sources: Red Arrow and Expera. The highest emissions level during that time for each facility is 8 tons for Red Arrow and 2,665 for Expera. If both facilities operate at this maximum actual level in the same year, the resulting total emission level is 2,673 (rounded) tons. The Department is assuming this maximum actual value as the projected 2017 point source emissions level (zero additional growth).

Expera retired boilers B20, B21, B22, and B23 in 2014. The Department is assuming that emissions and load from the four retired boilers is picked up by the coal fired boiler B26 and/or the natural gas fired boiler B28. Therefore, annual emission levels are not anticipated to change; if anything, emissions will decrease if load is switched to the natural gas boiler.

The Department also evaluated the potential emission levels from boiler B26 due to the control requirements implemented under this plan. As stated, Expera will be required to operate boiler B26 at a SO_2 emission rate of 3.20 pounds per mmBtu or less. To assess the potential difference in emission levels, the historic emission rates are compared to the new requirement. Expera has been operating the boiler at or below an emission rate of 3.20 pounds per mmBtu in order to meet the emission rate limit of 3.5 pounds per mmBtu applicable under Consent Decree AM-94-38 since 1994. Based on this information, the Department expects that Expera will reduce emission levels further when complying with the new 3.20 pounds per mmBtu emission limit in order to maintain a

compliance margin. However, as a conservative estimate for purposes of this plan, the Department is assuming that the actual emission rate will not decrease. Therefore, assuming the same emission rate and that load from the recently retired boilers B20, B21, B22 and B23 is transferred to boiler B26, the Department is assuming no change in the attainment year emissions inventory compared to the maximum demonstrated annual emission level.

The 2017 area source emissions inventory was created by projecting the Wisconsin 2011 base year emissions inventory submitted to the U.S. EPA in 2014 for the NEI. The forecasting factors were primarily based on growth factors from the EGAS model. The "Default REMI 6.0 SCC Configuration" for EGAS was used. If growth factors were not available for a certain SCC, population based growth factors were derived from the Wisconsin Department of Administration's Demographic Services Center population reports.

On-road mobile source emissions for 2017 were developed using the MOVES2014 model. The transportation modeling inputs to MOVES2014 for the Oneida county nonattainment area are based on data provided by WisDOT on July 17, 2014. More information about the development of the 2017 on-road emissions inventory can be found in Appendix D.

Off-road mobile source emissions projections for 2017, other than aircraft, commercial marine engines, and locomotives, were developed using the MOVES2014 model. The MOVES2014 model includes control measures for promulgated federal control requirements. 2017 attainment year emissions projections for aircraft, commercial marine engine, and locomotive emissions were developed using EPA's 2018 modeling platform by interpolating the difference between the 2011 base year and 2018 emissions estimates. Detailed information about the development of the 2017 off-road emission inventory can be found in Appendix D.

The base year 2011 emissions inventory for the Oneida nonattainment area is summarized in Table 4.

Table 4. 2017 SO_2 Emissions for SO_2 Nonattainment Area (Tons per Year)

Source Category	**SO_2**
Point Sources	2,673.47
Area Sources	13.84
On-Road Mobile Sources	1.05
Off-Road Mobile Sources	4.34
Total	2,692.70

8. Contingency Measure

EPA's SO_2 implementation guidance states that because SO_2 attainment is source specific. As such U.S. EPA indicates that requirements provide a high degree of certainty that attainment will be achieved. If this is not the case and attainment is not measured, then the situation is complex and reevaluating facility emission requirements is a valid contingency measure. The guidance reads:

> *Since SO_2 control measures are by definition based on what is directly and quantifiably necessary to attain the SO_2 NAAQS, it would be unlikely for an area to implement the necessary emission controls yet fail to attain the NAAQS. Therefore, for SO_2 programs, the EPA; has explained that "contingency measures" can mean that the air agency has a comprehensive*

program to identify sources of violations of the SO_2 NAAQS and to undertake an "aggressive" follow-up for compliance and enforcement, including expedited procedures for establishing enforcement consent agreements pending the adoption of the revised SIP. 17 The EPA believes that this approach continues to be a valid approach for the implementation of contingency measures to address the 2010 SO_2 NAAQS.

The contingency measure Wisconsin is adopting under this plan is a commitment to reevaluate stationary source SO_2 emission limit requirements in the event that SO_2 attainment is not measured in the Oneida County nonattainment area.

9. New Source Review Program

An approvable SO_2 plan requires a demonstration that Wisconsin has a New Source Review (NSR) program in place for permitting new sources in nonattainment areas as required under Clean Air Act (CAA) under sections 172(c)(5) and 173. The CAA mandates that the NSR program regulates permitting for the construction of new or modification of existing major stationary sources and require lowest achievable emission rates (LAER). In addition, the permitted source must provide offsets for the remaining balance of emissions beyond the LAER level of control.

The State of Wisconsin has implemented ch. NR 408, Wis. Adm. Code, to fulfill NSR program requirements for nonattainment areas including the implementation of LAER and offsets for new or modified stationary sources. U.S. EPA initially approved ch. NR 408, Wis. Adm. Code as part of Wisconsin's SIP on January 18, 1995 (60 FR 3538) and the last update was approved on November 5, 2014 (79 FR 193).

10. Conformity

As discussed in the SO_2 nonattainment area SIP guidance, CAA Section 176(c) requires that actions by federal agencies do not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS or interim reductions and milestones. General conformity applies to any federal action (e.g., funding, licensing, permitting or approving) taking place in a nonattainment area, other than certain highway and transportation projects.

EPA's General Conformity Rule establishes the criteria and procedures for determining if a federal action conforms to the SIP. The State of Wisconsin meets all of U.S. EPA's conformity procedures. The State of Wisconsin commits to following the general conformity requirements of 40 CFR 93.150 to 93.165. On July 25, 2013, 2014, the Department submitted signed Memorandums of Understanding (MOUs) to U.S. EPA establishing transportation conformity procedures for inclusion in Wisconsin's SIP. EPA issued a direct final rulemaking approving the MOUs on February 10, 2014 (79 FR 11050).

However, for purposes of the Oneida County SO_2 nonattainment area, conformity is not applicable. Section 176(c) of the CAA also addresses transportation conformity requirements that ensure that federally supported highway and transit project activities are consistent with the SIP. Transportation conformity applies to areas that are designated nonattainment for transportation-related criteria pollutants. However, in the SO_2 nonattainment area SIP guidance, EPA states that due to the relatively small, and decreasing, amounts of sulfur in gasoline and on-road diesel fuel, EPA's transportation conformity rules only apply to SO_2 in two cases: the Regional Administrator or the director of a state air agency has found that transportation-related emissions of SO_2 as a precursor are

a significant contributor to a $PM_{2.5}$ nonattainment problem, or the SIP has established an approved or adequate budget for such emissions as part of the RFP, attainment or maintenance strategy (40 CFR 93.102(b)(1), (2)(v)). Although Wisconsin has an SO_2 transportation conformity budget for the Three County (Milwaukee-Waukesha-Racine) 2006 $PM_{2.5}$ NAAQS Maintenance Area for the years 2020 and 2025, the Rhinelander area SO_2 nonattainment area is attaining the 2006 $PM_{2.5}$ NAAQS.

11. Maintaining Previous NAAQS requirements

The Oneida County area was previously designated nonattainment for the 1971 1-hour SO_2 standard. As a result, Expera was required to control SO_2 emissions under Consent Order AM-94-38. As previously described, boiler B26 is subject to an emission limitation of 3.5 pounds per mmBtu under this Order. Under this plan and Administrative Order AM-15-01, boiler B26 is subject to a more stringent emission rate limit of 3.00 pounds per mmBtu on a 24 hour basis (equivalent to 3.20 pounds per mmBtu on an hourly basis). In addition, boilers B20, B21, B22, & B23, which operated under the previous Consent Order AM-94-38, have been decommissioned. Therefore the emission requirements applicable under this plan are more restrictive than those implemented under the Consent Order AM-94-38. Thus, this plan and Administrative Order AM-15-01 will continue to maintain compliance with all previous SO_2 NAAQS requirements.

Because Administrative Order AM-15-01 is more restrictive than Consent Order AM-94-38 with respect to SO_2 emissions, the Department is requesting that Consent Order AM-94-38 be withdrawn from the State Implementation Plan.

V. PUBLIC PARTICIPATION

In accordance with section 110(a) (2) of the CAA, the Department is required to hold a public hearing prior to the adoption of this plan and subsequent submittal to the EPA. The Department will notify the public and other interested parties of an upcoming public hearing and public comment period 14 days prior to holding the hearing as follows:

- Notice of availability of the Wisconsin Attainment Demonstration for the 2010 SO_2 NAAQS in the Oneida County nonattainment area was posted on the Wisconsin Department of Natural Resources Air Management website on November 11, 2015: http://dnr.wi.gov./topic/AirQuality/Pollutants.html

- A public hearing was held on December 11, 2015 beginning at 2:30p.m. at the Wisconsin Department of Natural Resources Building, Conference Room 713, 101 South Webster Street, Madison, WI 53707

- A public comment period was provided from November 11, 2015 through December 15, 2015.

Response to Comments

[To be inserted]

VI. CONCLUSION

Through this submittal, Wisconsin has met the CAA section 191(a) obligation to submit a plan for the Oneida County SO_2 nonattainment area for the 2010 SO_2 NAAQS. Furthermore, this document demonstrates attainment of the 2010 SO_2 NAAQS through air dispersion modeling of an effective control strategy in accordance with the requirements of section 172(c).

APPENDIX A: Oneida County Nonattainment Area Air Quality Modeling Analysis

July 2015

INTRODUCTION

The Wisconsin Department of Natural Resources (Department) operates a sulfur dioxide (SO_2) ambient air monitor at a water tower in the City of Rhinelander, Oneida County. The monitor measured concentrations that were in excess of the 1-hour SO_2 National Ambient Air Quality Standards (NAAQS) for the period 2007-2009 such that the United States Environmental Protection Agency (USEPA) designated a portion of Oneida County Wisconsin as nonattainment. In the designation process one source at one facility, namely stack S09 at Expera Specialty Solutions in Rhinelander was identified by the Department as primarily culpable.

Analyzing ground level concentrations using the regulatory dispersion model AERMOD with aerodynamic building downwash effects resulted in modeled concentrations lower than monitored concentrations. Expera and their consultants embarked on a series of wind tunnel studies to examine the situation and to assess whether a viable solution could be found. The wind tunnel studies determined the Good Engineering Practice (GEP) stack height for S09 to be 90 meters (296 feet). Expera proposed to use the wind tunnel studies to predict ground level concentrations, but due to the unusual nature and limitations of wind tunnel studies and based on verbal comment from USEPA, the Department utilized the current regulatory dispersion model AERMOD in the attainment analysis.

AREA CHARACTERIZATION

The City of Rhinelander is located in north central Wisconsin, within Oneida County. The paper mill now owned by Expera has been a fixture in the middle of the city along the Wisconsin River since 1903. In the early 1980's, the Department began monitoring for SO_2 in Rhinelander at a variety of sites including at the municipal water tower. The water tower location recorded the highest concentrations, so monitoring has continued through the present day. In the mid-1980's, concentrations exceeded the 24-hour SO_2 standard (365 $\mu g/m^3$) but, as with the present day, modeling results were less than measured values. Although building downwash was suspected to be a major factor in the high measured concentrations, the Department and the facility negotiated reductions of emissions proportionate to the amount of exceedance.

Subsequent to the emission reductions, no further violations of SO_2 standards were recorded until the NAAQS was revised to the 1-hour time period in 2010 (0.075 ppm or 196 $\mu g/m^3$). Modeled results were less than the measured values, but the facility proposed to replace their stoker boilers (venting through S11) with small, natural gas fueled units and their cyclone boiler (venting through S09) with a moderate size natural gas and fuel oil boiler. This would have greatly reduced both the emission and ambient concentrations of SO_2 in the area.

The facility was purchased by Expera in 2013, and although remained committed to replacing the stoker units (S11), began evaluation on maintaining the coal fired cyclone boiler (S09). Expera hired Cermak Peterka Petersen (CPP) and Bob Paine from AECOM to study the building downwash

situation at Rhinelander and to propose a solution. Their wind tunnel studies demonstrated that the primary cause of the model to monitor discrepancy is a phenomenon called the corner vortex.

The corner vortex phenomenon is referenced in the USEPA document "*Guideline for Determination of Good Engineering Practice Stack Height (revised 1985)"*. Within Section 2 of the GEP document, it is stated that Peterka and Cermak in 1975 recognized that behind a rectangular building there were differences in the flow depending on the orientation of the structure to the wind. When oriented perpendicular to the wind (i.e. flow from face to face) the building effect "decayed fairly rapidly over the first 20 building heights." However, when the wind is oriented 47 degrees from perpendicular (i.e. flow from corner to corner) the building effect dropped from its maximum and then "remained constant to 80 building heights downwind." The GEP document continues to note that, "The existence of an (effect)… is believed evidence of a vortex pair with axes parallel to the flow direction which are a remnant of the corner vortices formed at the leading roof corner." Other researchers also noted that the flow around a building is highly dependent on orientation. The GEP document (p. 15) mentions a study by Robins and Castro in 1977 that found, "Strong vortices generated by the top leading edges were found for an approach flow at 45 degrees to the building edge."

As the ambient wind flow encounters the flat face of a building, the atmosphere is lifted up and over the building with strong descent and turbulence on the lee side. If the wind approaches from a building corner (especially of a building taller than it is wide), the corner knifes through the wind creating a pair of counter-rotating vortices (corner vortex) that act to enhance the descending air on the lee side. This leads to higher pollutant concentrations downwind of the building when the flow is oriented 45 degrees from perpendicular. More importantly, this feature of building downwash is not simulated in the regulatory dispersion models and this results in modeled concentrations being ***less*** than monitored concentrations.

AECOM and CPP provided two wind tunnel studies to the Department and USEPA to address the issue. In the first study, the GEP stack height for Expera S09 was shown to be taller than the regulatory formula height due to the effect of the corner vortex. After review and collaboration with USEPA, the revised GEP stack height of 90 meters (296 feet) above ground level for S09 was accepted.

In the second study, CPP produced simulated ground level concentrations from their wind tunnel data using their proprietary model called HYWINMOD. This model uses traditional air pollution meteorological formulas to simulate ground level concentrations using wind tunnel information. But due to the uncertainty of the technique, the regulatory time frame, and based on verbal comments from USEPA, the Department used the wind tunnel derived GEP stack height with AERMOD to demonstrate attainment with the NAAQS.

MODEL & METEOROLOGY

The Department used the current regulatory version of AERMOD (AMS/EPA Regulatory Model), version 15181. Rhinelander is a small (both geographically and in terms of population) city that straddles the Wisconsin River in northern Wisconsin. Following Section 7.2.3(c) of the *Guideline on Air Quality Models*, an assessment of the land use around Expera shows that less than 50% of the land area within 3 kilometers is industrial, commercial, or dense residential. Therefore, rural dispersion coefficients were used in AERMOD.

Meteorological data was processed from 2006-2010 data collected at Rhinelander-Oneida County Airport (KRHI) using Green Bay upper air data. The surface wind data at KRHI is 2-minute average speed and direction reported each minute. This minute-based wind information was processed with AERMINUTE version 14337. The meteorological data was processed with the current AERMOD meteorological processor AERMET version 15181. Processing assumed an anemometer height of 7.9 meters above ground.

The instrumentation tower at KRHI is 4.8 kilometers west of Expera and is considered representative of meteorological conditions around the facility. Surface characteristics around KRHI were generated using AERSURFACE version 13016 following the methods described in the *AERMOD Implementation Guide*. Specifically, snow cover for each month during the period 2006-2010 was derived from National Snow and Ice Center maps. AERSURFACE was run both for snow and no-snow conditions and the albedo adjusted based on the number of days with snow cover during each month. Soil moisture for each year was a weighted average of the long-term Palmer index data from the Climate Prediction Center. The months of May, June, July, and August were weighted twice as high as the other months to account for the importance of soil moisture during the traditional growing season.

The base input information for AERSURFACE was the 1992 National Land Cover Dataset (NLCD). For an area 10 kilometers by 10 kilometers centered on KRHI, there are little differences between NLCD and the 2006-2010 period. However, when examining the data within 1 kilometer of KRHI, there were differences in the location of trees between NLCD and aerial photos taken in 2005, 2008, and 2010. The open land paralleling the east-west runway is much broader than indicated on the 1992 NLCD. To continue using AERSURFACE with the 1992 NLCD, the radius of the roughness circle in AERSURFACE was reduced and the center point adjusted until a representative match was found to a 1-kilometer circle in the 2008 leaf-on aerial photo. An independent analysis performed by consultants for Expera confirms the representativeness of this approach.

EMISSIONS INVENTORY

At Expera, the last stoker boiler venting through stack S11 was permanently shut down in April 2014, so emissions from the cyclone boiler (S09) and an existing natural gas and fuel oil boiler (S08) were analyzed using current permit allowable emission rates. Expera provided two operating conditions for stack S09, representing maximum heat input of 300 mmBtu per hour (millions of British Thermal Units per hour) and the average, or normal heat input of 265 mmBtu per hour. Both operating conditions have different mass emission rates, volumetric flow rates and exit velocity, and exit gas temperatures. The only other SO_2 emission sources considered in the City of Rhinelander is from combustion of wood waste at Red Arrow Products, located 4.0 kilometers west-southwest of Expera. In April 2015, Red Arrow submitted an air permit application to increase the combustion of wood waste and the proposed theoretical emissions of SO_2 after expansion were considered.

In the initial analysis to determine the scope of potential SO_2 exceedances, the major sources at Packaging Corporation of America (PCA) Tomahawk, 33.0 kilometers southwest of Expera were also included. Although these emissions were shown to have limited effect on the Rhinelander area, they represent the only other large SO_2 emissions within 50 km of Expera and so were included. PCA is constructing a natural gas and fuel oil boiler to replace two large coal fueled units (B27 & B28). As the facility is in the construction phase and the two coal units will be permanently shut down no later than July 2016, these emissions will not be considered in this analysis. PCA has also applied for another air pollution control permit in November 2014, to convert their final coal fueled

boiler (B10) into a mixed fuel (no coal) unit. As this action is still in the application phase and would not be operational until ~2018, the emissions from the boiler B10 when burning coal were considered.

INPUT PARAMETERS

Modeled stack parameters and building downwash data for Red Arrow, PCA, and Expera S08 were taken from the most recent Department analyses for those facilities. Modeled emission rates reflected the maximum short-term hourly rates with normal, or typical, exit velocity and gas temperature.

BPIP-PRIME was used to produce the building downwash information from facility provided plot plans, except for Expera stack S09. For Expera S09, due to the corner vortex issue, manual adjustments were made to the modeled input emissions data. The GEP stack height of 90 meters (296 feet) for S09 was assumed, along with flow, temp, and emission rates comparable to both maximum and nominal conditions. No building downwash was simulated for Expera S09 in AERMOD because of the model formulation. AERMOD does not consider the corner vortex and in not considering this unusual downwash, the model formulation could result in lower modeled concentrations compared to monitored values, even for stacks at GEP height.

Section 3 of the GEP document (p. 23) states that maximum ground-level concentrations from a GEP height stack downwind of a building 20 to 40 percent higher than without the building when the wind is oriented perpendicular to the structure. Pertinent to Expera, "The data for the same buildings oriented 45 degrees to the approach flow are found to have concentrations increased by roughly 40 to 80 percent. The differences are due to the presence of longitudinal vortices in the wake of buildings having a 45 degree orientation."

Section 3 of the GEP document (p. 27) also states, "The maximum ground-level concentrations downwind of building structures should not be increased by more than 40 to 80 percent if the stack is equal to 2.5 times the building height." For Expera, the 90 meter proposed GEP stack height is 2.6 times the influencing building height. Considering the corner vortex effect, it can be expected that ground level concentrations will be higher than if the influencing building was not present.

Further, the determination of GEP stack height in the wind tunnel also considers building downwash. In the determination, the stack height is increased in the wind tunnel until the ratio of concentrations with the building to concentrations without the building is ~1.4 (or 40 percent higher). Therefore, at 90 meters, emissions from Expera stack S09 would be expected to result in 40 percent higher concentration than if no building was present.

However, the wind tunnel studies performed for Expera demonstrate that the corner vortex downwash effects are not present for all wind speed conditions. According to the *Draft Recommended Approach for SO_2 Nonattainment Modeling: Expera Specialty Solutions, Rhinelander, WI* provided by the consulting firms AECOM and CPP, "The downwash effects do not exist at wind speeds below about 2 m/s, and increase to a maximum factor of approximately 1.5 at wind speeds above 8 m/s."

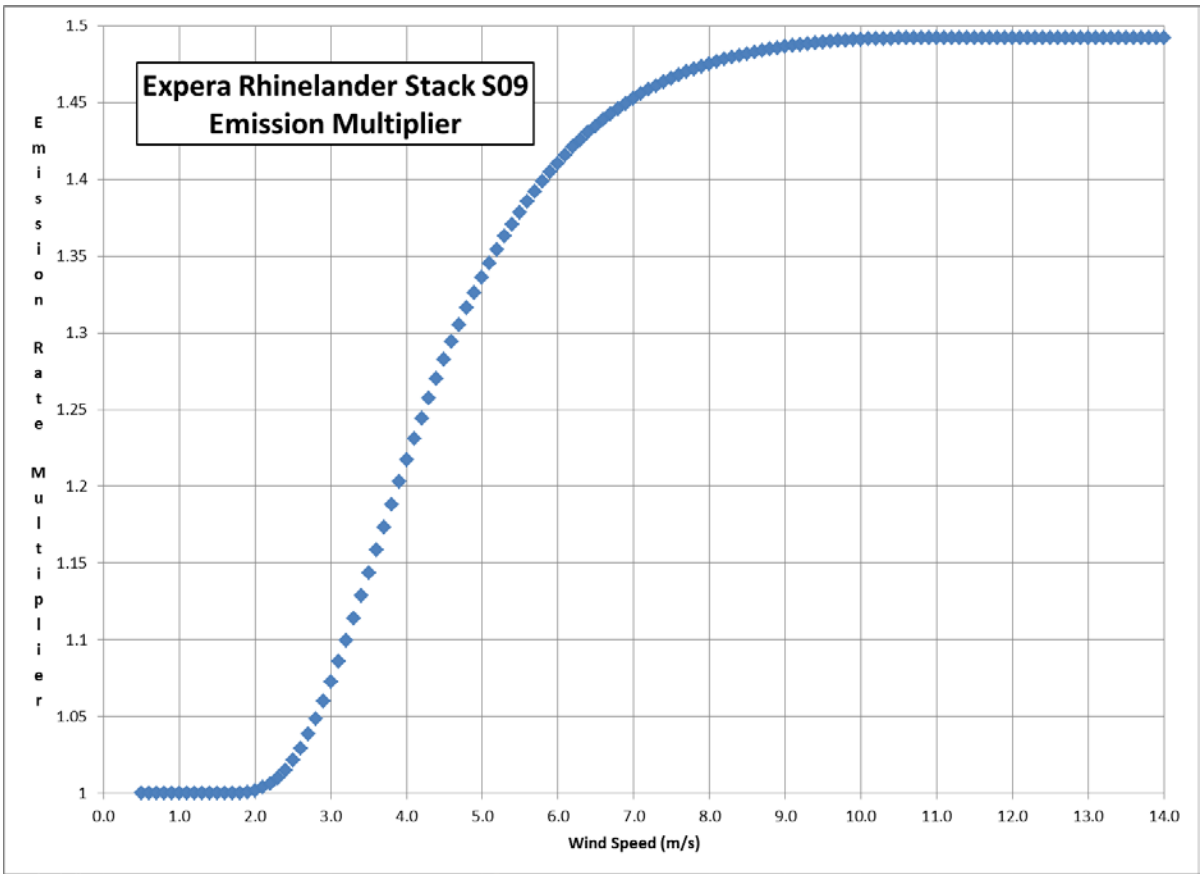
To accommodate for the variation with wind speed of the downwash, AECOM and CPP provided an equation to derive hourly ratios to apply to emission rates for each hour in the 2006-2010 KRHI meteorological data:

$$R = A \exp\left[-\frac{\left(\frac{1}{U_{airport}} - \frac{1}{U_{max}}\right)^2}{B^2}\right] + 1.0$$

Where $U_{airport}$ is the KRHI airport wind speed, U_{max} is assigned as the 1% wind speed of 10.8 m/s (exceeded less than 1% of the time), and A (0.492) and B (0.174) are best fit constants.

The equation produces a multiplier that varies with wind speed. For each hour of the 2006-2010 KRHI data sets, the emission rate was calculated by multiplying the factor times the emission limitation. The emission rate for stack S09 for each hour was captured in a text file used in the HOUREMIS keyword within AERMOD. For wind speeds in excess of 10.8 m/s, the equation results in a slight reduction in the factor R. It is reasonable to assume the maximum value of R (1.492) persists for higher wind speeds, so the value of R was set to 1.492 for wind speeds above 10.8 m/s.

As can be seen in the following graphic, the multiplier reaches 1.01 (or a 1% factor) at a wind speed of 2.2 m/s and reaches a value of 1.4 (or a 40% factor) at 5.8 m/s. Both values are consistent with the wind tunnel study reports and with general meteorological principles of building downwash.



RECEPTOR GRID

The receptor grid used in the analysis consisted of a series of nested rectangular grids with terrain derived from AERMAP using National Elevation Dataset information:

- 25 meter spacing out 500 meters from the sources
- 50 meter spacing to 1000 meters
- 100 meter spacing to 3 kilometers
- 250 meter spacing to 6 kilometers
- 500 meter spacing to 10 kilometers.

BACKGROUND CONCENTRATION

The closest representative monitoring location to Expera in Rhinelander is the Forest County Potawatomi site, located 48 kilometers east. The 2011-2013 design value (three-year average of the 99th percentile daily max-hour concentration) is 4 ppb. The 2012-2014 design value increased to 7 ppb due to higher values late in calendar year 2014. The increase in measured values at Forest County may be due to equipment issues as data from January 2015 have decreased to long term values.

The next closest representative monitoring location is the Horicon (Dodge County) monitor. While located 250 kilometers south of Rhinelander, there are no other SO_2 sources within 65 kilometers of the site, and the Horicon location utilizes the most technically sound measuring equipment. The 2012-2014 Horicon design value of 7 ppb (18.3 µg/m^3) was used as background concentration for this analysis.

The modeling analysis includes all known point sources of SO_2 within 50 kilometers of Rhinelander, and the monitor location is similarly affected by distant SO_2 sources (in central, southern, and eastern Wisconsin). Nationally, the impact from locomotives and trucks has been minimized as the sulfur content in diesel fuel has been reduced to 0.015%, and the local impact of these vehicles is even smaller as the total population of Rhinelander is ~7,500 residents.

BASE CASE MODELING RESULTS

The stack parameters and emission rates for the initial (base case) modeling analysis are provided.

EXPERA SPECIALTY SOLUTIONS - RHINELANDER
Base Case Emission Rates & Stack Parameters

ID	LOCATION (UTM83)	HEIGHT (M)	HEIGHT (ft.)	DIAM (M)	VELOCITY (M/S)	TEMP (K)	SO_2 Rate (lbs/HR)
S09M	311349, 5056895	90.0	296.0	2.13	12.30	434.8	*
S09N	311349, 5056895	90.0	296.0	2.13	9.60	427.6	*
S08	311338, 5056922	35.66	117.0	1.68	20.08	439.0	15.23
Red Arrow – Rhinelander Sources							
S07	307592, 5055164	15.24	50.0	1.167	11.02	344.8	3.23
S10	307628, 5055186	15.24	50.0	1.524	12.16	325.9	5.38
S11	307662, 5055154	15.24	50.0	1.829	8.44	325.9	8.96
PCA – Tomahawk Sources							
S14	285952, 5036176	46.60	153.0	1.37	4.64	470.4	140.3
S15	285952, 5036203	60.70	199.0	3.23	16.50	468.0	1166.0

The modeled hourly emission rate for stack S09 was calculated separately for each modeled hour. The current permit allowable SO_2 emission rate is 3.5 lbs. per mmBtu, and this converts to 1,050 lbs. per hour (assuming 300 mmBtu/hr. Maximum) and 927.5 lbs./hr. (assuming 265 mmBtu/hr. Normal). This allowable emission rate was then adjusted based on the multiplier 'R' calculated for each modeled hour.

For example, the modeled emission rate (in lbs./hr.) for S09 for a single day is provided.

EXPERA SPECIALTY SOLUTIONS – RHINELANDER
Example Modeled Hourly Emission Rates

	S09Max	***S09Norm***		***S09Max***	***S09Norm***
Hour 01	139.6	123.4	*Hour 13*	153.5	135.6
Hour 02	134.0	118.4	*Hour 14*	147.4	144.2
Hour 03	132.3	116.9	*Hour 15*	153.5	156.2
Hour 04	132.3	116.9	*Hour 16*	170.3	150.5
Hour 05	132.3	116.9	*Hour 17*	171.1	151.2
Hour 06	132.3	116.9	*Hour 18*	173.1	153.0
Hour 07	132.3	116.9	*Hour 19*	185.4	163.9
Hour 08	132.3	116.9	*Hour 20*	185.0	163.5
Hour 09	132.4	117.0	*Hour 21*	186.7	164.9
Hour 10	133.8	118.2	*Hour 22*	189.5	167.5
Hour 11	153.5	135.6	*Hour 23*	192.7	170.3
Hour 12	147.4	130.2	*Hour 24*	191.4	169.1

The result from the base case analysis shows concentrations above the NAAQS assuming either maximum or normal load conditions from Expera S09. Results are presented both in micrograms per cubic meter ($\mu g/m^3$) and in parts per billion (ppb), assuming a conversion factor (1 atm, 20^o C) of 1 ppb = 2.616 $\mu g/m^3$.

EXPERA SPECIALTY SOLUTIONS - RHINELANDER
Base Case Modeling Results & Culpability
(Concentrations in $\mu g/m^3$)

	1-Hour SO_2 Sources plus S09M	1-Hour SO_2 Sources plus S09N
Modeled Impact	189.5	188.8
Background Concentration	18.3	18.3
Total Impact	207.8	207.1
NAAQS	196	196
S09 Contribution to Total	183.1 (88.1%)	182.7 (88.2%)

EXPERA SPECIALTY SOLUTIONS - RHINELANDER **Base Case Modeling Results & Culpability** (Concentrations in ppb)		
	1-Hour SO_2 Sources plus S09M	1-Hour SO_2 Sources plus S09N
Modeled Impact	72.4	72.2
Background Concentration	7	7
Total Impact	79.4	79.2
NAAQS	75.0	75.0
S09 Contribution to Total	70.0 (88.1%)	69.8 (88.2%)

The maximum impact occurs assuming the maximum load condition (300 mmBtu/hr.) of the boiler venting through S09. In addition stack S09, when operating either at maximum or at normal load, is the largest contributor to the highest total modeled impact. Therefore, the most effective way to reduce the 1-hour SO_2 concentrations further would be to reduce the allowable emission rate of the boiler venting through S09.

FINAL MODELING RESULTS

Considering the result of the base case analysis, the emission rate from stack S09 was reduced to an allowable level of 3.2 lbs. per mmBtu. The same stack parameters and emission rates for other sources were used.

EXPERA SPECIALTY SOLUTIONS - RHINELANDER **Final Emission Rates & Stack Parameters**							
ID	LOCATION (UTM83)	HEIGHT (M)	HEIGHT (ft.)	DIAM (M)	VELOCITY (M/S)	TEMP (K)	SO_2 Rate (lbs./HR)
S09M	311349, 5056895	90.0	296.0	2.13	12.30	434.8	*
S09N	311349, 5056895	90.0	296.0	2.13	9.60	427.6	*
S08	311338, 5056922	35.66	117.0	1.68	20.08	439.0	15.23
Red Arrow – Rhinelander Sources							
S07	307592, 5055164	15.24	50.0	1.167	11.02	344.8	3.23
S10	307628, 5055186	15.24	50.0	1.524	12.16	325.9	5.38
S11	307662, 5055154	15.24	50.0	1.829	8.44	325.9	8.96
PCA – Tomahawk Sources							
S14	285952, 5036176	46.60	153.0	1.37	4.64	470.4	140.3
S15	285952, 5036203	60.70	199.0	3.23	16.50	468.0	1166.0

The modeled hourly emission rate for stack S09 was calculated separately for each modeled hour. The assumed permit allowable SO_2 emission rate is 3.2 lbs. per mmBtu, and this converts to 960 lbs.

per hour (assuming 300 mmBtu/hr. Maximum) and 848 lbs. per hour (assuming 265 mmBtu/hr. Normal). This proposed allowable emission rate was then adjusted based on the multiplier 'R' calculated for each modeled hour.

The result from the final analysis shows concentrations below the NAAQS assuming either maximum or normal load conditions from Expera S09. Results are presented both in micrograms per cubic meter ($\mu g/m^3$) and in parts per billion (ppb), assuming a conversion factor (1 atm, 20^o C) of 1 ppb = 2.616 ($\mu g/m^3$).

EXPERA SPECIALTY SOLUTIONS - RHINELANDER **Final Modeling Results & Culpability** (Concentrations in $\mu g/m^3$)		
	1-Hour SO_2 Sources plus S09M	1-Hour SO_2 Sources plus S09N
Modeled Impact	173.8	173.0
Background Concentration	18.3	18.3
Total Impact	192.1	191.3
NAAQS	196	196
S09 Contribution to Total	165.6 (86.2%)	166.9 (87.2%)

EXPERA SPECIALTY SOLUTIONS - RHINELANDER **Final Modeling Results & Culpability** (Concentrations in ppb)		
	1-Hour SO_2 Sources plus S09M	1-Hour SO_2 Sources plus S09N
Modeled Impact	66.4	66.1
Background Concentration	7	7
Total Impact	73.4	73.1
NAAQS	75.0	75.0
S09 Contribution to Total	63.3 (86.2%)	63.8 (87.2%)

APPENDIX B: Expera Specialty Solutions LLC SO_2 Emission Limitations and Requirements Administrative Order AM-01-15

BEFORE THE STATE OF
WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

In the Matter of Expera Specialty Solutions LLC, located at 515 W. Davenport St. Rhinelander, Wisconsin 54304)

Administrative Order: AM-15-01

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND ADMINISTRATIVE CONSENT ORDER

Section I. Findings of Fact

The Wisconsin Department of Natural Resources (Department) finds that:

A) Expera Specialty Solutions LLC, the "operator," operates a manufacturing facility located at 515 W. Davenport St., Rhinelander, Wisconsin (hereinafter, the "facility") which is a "stationary source" as defined in s. 285.01(41), Wis. Stat.

B) The facility identification (FID) number is 744008100.

Section II. Background of Applicable Sulfur Dioxide (SO_2) National Ambient Air Quality Standards (NAAQS) and Requirements

A) Consent Order AM-94-38 was approved as a part of the Wisconsin state implementation plan (SIP) in 1994 (59 Fed. Reg. 63046) in order to demonstrate attainment and maintenance in the Rhinelander, Oneida County nonattainment area with the 1971 24-Hour SO_2 NAAQS of 140 parts per billion (ppb). 40 C.F.R. s. 52.2575(c).

B) Consent Order AM-94-38 established emission limitations regulating the amount of SO_2 emitted by coal-fired boilers operated by the facility.

C) The Department began operating a SO_2 ambient air quality monitor in the early 1980's at the City of Rhinelander's municipal water tower. This monitor is referred to as the "Water Tower" monitor or monitoring site. The Water Tower monitor was sited to coincide with high SO_2 concentration values registered from previous monitoring in the area.

D) On June 2, 2010, the U.S. Environmental Protection Agency (U.S. EPA) established a 1-Hour SO_2 standard of 75 ppb (75 Fed. Reg. 35,520, June 2, 2010) as codified at 40 C.F.R. s. 50.17. This 1-Hour NAAQS subsumes the previous 24-Hour NAAQS.

E) The U.S. EPA designated four townships in Oneida County, centering on the City of

Rhinelander, as nonattainment for the 2010 1-Hour SO_2 NAAQS (77 Fed. Reg. 47,191, Aug. 5, 2013) based on the Rhinelander Water Tower monitoring data for 2009 through 2011. The nonattainment designation is codified under 40 CFR Part 81, Subpart C. These four townships are referred to in this Administrative Order as the Oneida County nonattainment area.

F) The State of Wisconsin must develop a plan that attains and maintains the 2010 1-Hour SO_2 NAAQS in the Oneida County nonattainment area as expeditiously as practicable, but no later than five years after nonattainment designation. Five years after designation is October 4, 2018. The plan must be approved by the U.S. EPA as a revision to Wisconsin's State Implementation Plan (SIP) set forth at 40 CFR Part 52, Subpart YY.

G) U.S. EPA guidance requires that an approvable plan will implement enforceable emission control requirements and result in monitored ambient air quality values which show compliance with the 2010 NAAQS one full calendar year prior to the attainment date[2]. Consistent with this guidance, the SO_2 emission limitation requirements under this Administrative Order become applicable beginning January 1, 2017.

H) The approved attainment and maintenance plan must include enforceable control requirements which satisfy Clean Air Act (CAA) requirements for implementing Reasonably Available Control Technology (RACT) and Reasonably Available Control Measures (RACM) at facilities within the nonattainment area. EPA's implementation plan guidance for the 2010 SO_2 NAAQS establishes that RACT and RACM are the level of emission controls necessary to show attainment of the SO_2 NAAQS.[3]

I) This Administrative Order, AM-15-01, implements enforceable emission limitations by January 1, 2017 that fulfill the Oneida County attainment demonstration for the 2010 1-Hour NAAQS and which satisfy RACT and RACM requirements for the Expera Specialty Solutions LLC facility in Rhinelander Wisconsin, FID 744008100.

Section III. Facility Information

A) *SO_2 emission sources*. As of November, 2015, the facility operated the following SO_2 emission sources:

1. Boiler B26, Stack S09: A 300 mmBtu per hour coal fired cyclone boiler with an electrostatic particulate (ESP) device for controlling particulate emissions. Under Consent Order AM-94-38, the SO_2 emissions from boiler B26 could not exceed 3.5 pounds of SO_2 per mmBtu heat input averaged over a 24-hour period.

2. Boiler B28, Stack S08: A 280 mmBtu per hour natural gas boiler with the capacity to fire 270 mmBtu heat input of distillate oil per hour. Distillate oil is used as a back-up fuel.

[2] (USEPA, 2014), page 10, Memorandum "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" from Stephen D. Page, Director to Regional Air Division Directors, Regions 1 – 10, April 23, 2014.
[3] (USEPA, 2014) Memorandum "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" from Stephen D. Page, Director to Regional Air Division Directors, Regions 1 – 10, April 23, 2014.

According to construction permit 95-SDD-048, the sulfur content of the distillate fuel oil fired in boiler B28 may not exceed 0.05 percent by weight.

3. Boilers B20, B21, B22 and B23 were four 83.5 mmbtu per hour underfeed stoker coal fired boilers located at the facility. These boilers were subject to SO_2 emission limitations under the Consent Order AM-94-38, but were retired in 2014 after designation of the Oneida County 2010 SO_2 NAAQS nonattainment area. The decommissioning of boilers B20, B21, B22, and B23 was made federally enforceable under condition ZZZ.12 of construction permit 13-SDD-014.

B) *Stack S09 serving boiler B26.* Stack S09 was originally constructed at a height of 209 feet above ground level. In this Administrative Order, the Department is determining that Good Engineering Practice (GEP) height for stack S09 is 296 feet (90 meters) above ground level. This GEP height is the maximum height for stack S09 that is creditable towards modeling attainment of the NAAQS. The Department is making this determination in accordance with 40 C.F.R. s. 51.100(ii) based on fluid dynamic modeling results submitted by Expera Specialty Solutions LLC to the Department and U.S. EPA.[4]

Section IV. Conclusions of Law

The Department concludes that:

A) The Department has authority under ss. 285.11(6) and 285.13(2), Wis. Stats., to implement stationary source emission limitations for purposes of demonstrating and maintaining attainment for the 2010 1-Hour SO_2 NAAQS.

B) The Department has authority under ss. 285.11(6) and 285.13(2), Wis. Stats., to implement stationary source emission limitations for purposes of fulfilling RACT and RACM requirements for the 2010 SO_2 NAAQS.

C) This Administrative Order, AM-15-01, accomplishes the purposes set forth in chapter 285, Wis. Stats., and is enforceable under ss. 299.95 and 299.97, Wis. Stats.

D) This Administrative Order, AM-15-01, satisfies RACT and RACM requirements under the 2010 1-Hour SO_2 NAAQS for the facility, FID 744008100.

Section V. Administrative Order

The parties to this Administrative Order hereby agree to the following provisions:

A) For boiler B26, stack S09; the operator shall meet all of the following requirements on and after January 1, 2017 unless otherwise specified:

1. <u>Boiler Operating Requirements</u>

[4] (CPP, 2014), *Fluid Modeling Good Engineering Practice Stack Height Determination for the Rhinelander Mill Stack S09*, Report prepared for Expera Specialty Solutions, October 2014, CCP project 7835.

a. *Stack Height* – The height of stack S09 shall be a minimum of 296 feet above ground level and the flue gas shall be discharged vertically and without obstruction.

Note: The Department determined, as documented in section III, (B), that the good engineering practice (GEP) stack height for exhausting boiler B26 flue gas is 296 feet above ground level.

b. *Emission Rate Limit* – Except as provided in subd. d, the operator shall not allow SO_2 emissions to exceed 3.00 pounds per mmBtu heat input on a 24-hour average basis[5]. Compliance with this emission limit shall be determined according to par. 2 or 4 of section V, par. (A).

c. *Boiler Utilization Limit* - The operator shall not allow the operating capacity of boiler B26 to exceed 300 mmBtu heat input per hour. Compliance with this emission utilization limit shall be determined according to par. 3 or 4.

d. *Emission Limitation for Start-up Fuels* - For any non-fossil solid fuel, liquid fuel, or gaseous fuel fired in boiler B26 during startup, the operator shall demonstrate that the SO_2 content of the fuel does not exceed 3.20 pounds per mmBtu by sampling and analyzing fuels according to a plan approved by the Department in writing.

2. Emission Rate Limitation Compliance Demonstration

Except as provided in par. 4, the operator shall monitor emissions and demonstrate compliance with the emission rate limitation in par. 1.b according to the methods and procedures of this paragraph.

a. The operator shall collect a composite fuel sample for all solid fossil fuels fired each day (24-hour period) in boiler B26. The composite sample shall be comprised of a minimum of three samples obtained at two hour or longer intervals at locations representative of the solid fossil fuels entering the boiler. The number of samples collected and location for sampling shall be established in the monitoring plan required under subd. f.

b. The operator shall record any change in the type of coal or mixture of coal fired in boiler B26 during the 24-hour sampling period that may affect the SO_2 fuel content.

c. The composited daily sample shall be analyzed for compliance for any day when the Rhinelander Water Tower ambient air quality monitor measures an SO_2 concentration of 75 ppb or greater on an hourly basis. If the monitor does not equal or exceed 75 ppb, then one composited daily sample each week shall be randomly analyzed for

[5] The emission limitation for complying on a 24-hour basis is determined by multiplying the 1-hour emission limitation of 3.20 by a factor of 0.93. This factor was derived by U.S. EPA for relating emission limitations between 1-hour to 24-hour timeframes for uncontrolled coal-fired boilers. The U.S. EPA presented this factor in Appendix D of the Memorandum "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" from Stephen D. Page, Director to Regional Air Division Directors, Regions 1 – 10, April 23, 2014.

compliance. The Department shall determine the sample to be randomly analyzed each week. The Department may require additional samples to be analyzed at any time for purposes of demonstrating compliance.

d. The composited daily samples shall be retained on site for a period of at least 90 days.

e. Analysis for compliance means the requisite daily composite sample shall be analyzed for percent sulfur content by weight and heat content in mmBtu per ton and the SO_2 fuel concentration determined in pounds per mmBtu heat content.

f. The operator shall submit a fuel monitoring plan to the Department for written approval which meets the requirements of subd. a through e. The plan shall identify the location and number of samples to be collected each day that will be used in creating the requisite composite sample. The plan shall also provide a method for substituting data in the event that fuel samples or analysis information is not available due to circumstances beyond Expera's control.

g. If control equipment is operated in order to meet the emission limitation in par. 1.b, the operator must conduct a performance stack test. The performance test shall determine control efficiency and associated minimum operating parameters for the control equipment. The control efficiency shall be used in conjunction with the requisite composite daily samples analyzed under subd. c to determine the compliance emission rate. The performance test shall be performed according to one of EPA Methods 6, 6A, 6B, 6C or 8 provided under 40 CFR 60 Appendix A and according to all applicable procedures and methods under s. NR 439.07, Wis. Adm. Code. The performance test shall be conducted according to a monitoring and compliance plan approved in writing by the Department.

h. If non-fossil solid fuel, liquid fuel, or gaseous fuel is fired in boiler B26 other than for boiler startup, the operator shall demonstrate compliance with the 24-hour emission limitation on a heat input weighted basis for all fuels. The operator shall sample and analyze any non-fossil solid fuel, liquid fuel, or gaseous fuel according to a fuel monitoring plan approved by the Department in writing.

3. <u>Boiler Utilization Compliance Demonstration</u>

Except as provided in par. 4, the operator shall demonstrate compliance with the boiler B26 utilization limit in par. 1.c according to the following methods and procedures.

a. The operator shall maintain and operate a steam load monitoring and data recorder system capable of determining the hourly average steam load generated by boiler B26.

b. The operator shall continuously monitor and record the hourly steam load generated by boiler B26 in thousand pounds of steam per hour (klbs per hour). The maximum hourly steam load for each operating day shall be converted to an hourly boiler utilization rate in mmBtu heat input per hour according to the following equation:

$$Eq.1:\ Boiler\ Utilization\ \left(\frac{mmBtu}{hr}\right) = Hourly\ Steam\ Load\ \left(\frac{Klbs}{hr}\right) x\ Boiler\ Efficiency\ (\frac{mmBtu}{Klbs})$$

c. The boiler efficiency factor applied in equation 1 shall be determined for each calendar year compliance period beginning January 1, 2017. This boiler efficiency factor shall be updated for each subsequent calendar year compliance period that spans January 1st to December 31st.

d. The boiler efficiency factor for each calendar year compliance period shall be determined using the total heat input and steam load for the twelve month period ending on September 30th of the year preceding the applicable compliance period. The operator may use an alternative period of heat input and steam load data with written approval by the Department. The request for an alternative period must be due to changes in boiler operation or fuel which have affected the boiler efficiency. The boiler efficiency is calculated as follows:

$$Eq.2:\ Boiler\ Efficiency\ \left(\frac{mmBtu}{Klbs}\right) = Total\ Heat\ Input\ (mmBtu)\ \div Total\ Steam\ Load\ (Klbs)$$

e. Except as provided in subd. f, the operator shall determine the total heat input by summing the weekly heat input over the applicable twelve month period. The weekly heat input shall be determined by measuring and recording the tons of each fuel fired each week during the applicable twelve month period. The weekly heat input shall be calculated by multiplying the weekly tons of each fuel fired by the weekly heat content of each fuel. The weekly heat content will be the value determined from the analyzed daily composited solid fossil fuel sample for that week and, as applicable, the samples for solid non-fossil fuels or liquid fossil fuels, as required under par. 2. The calculation of the total heat input is as follows:

$$Eq.3:\ Total\ Heat\ Input\ (mmBtu) = \sum \left[Weekly\ Fuel\ Consumption\ (tons) \times Weekly\ Fuel\ Heat\ Content\ \left(\frac{mmBtu}{ton}\right)\right]$$

f. If fuel monitoring is not performed to fulfill requirements of par. 2 in order to demonstrate compliance with the emission rate limitation, the operator may determine total heat input by summing the heat input determined on a monthly basis. The heat input for each month is determined by applying the monthly fuel heat content to the monthly fuel consumption. The monthly fuel heat content for solid fossil fuels will be determined by obtaining one fuel sample each week which is composited into a monthly fuel sample and analyzed for heat content. All fuel sampling shall be conducted in accordance with applicable methods and procedures under par. 8. If solid non-fossil

fuels are fired other than for startup, the operator shall determine fuel heat content according to a sampling plan approved in writing by the Department. The calculation of the total heat input using this approach is as follows:

$$Eq.4:\ Total\ Heat\ Input\ (mmBtu) = \sum \left[Monthly\ Fuel\ Consumption\ (tons) \times Monthly\ Fuel\ Heat\ Content\ \left(\frac{mmBtu}{ton}\right) \right]$$

g. The operator shall determine the total steam load in thousand pounds by summing the measured hourly average steam load over the applicable twelve month period.

h. The operator shall submit a boiler utilization and steam generation monitoring plan to the Department for written approval which meets the requirements of this subd. a. through g. The plan shall describe the steam load monitoring and data recording system, identify any steam loss points between the boiler and steam load monitor and any additional monitoring needed at these points to determine boiler efficiency, a method for determining periods of time when the steam monitoring and recording system are unavailable, provide a method for substituting data for determining compliance in the event that the steam monitoring system is not available, and establish the fuel sampling and consumption monitoring plan used in determining total heat input.

i. The Department or U.S. EPA may require the operator to update the boiler efficiency value at any time based on information indicating a change may have occurred in actual boiler operating efficiency. The update may require use of heat input and steam load data from a time period other than that required under subd. d. The Department or U.S. EPA may also require additional analysis of fuel samples in determining fuel heat input as necessary to characterize the representative boiler efficiency.

4. Continuous Emissions Monitoring (CEM) Compliance Demonstration

The operator may elect to demonstrate compliance with the SO_2 emission rate or the boiler utilization limitation in par. 1 by monitoring SO_2 emissions or heat input, respectively for each requirement, with a continuous emissions monitoring (CEM) system according to the following methods and procedures.

a. If determining compliance with the emission rate limit in par 1.b, the operator shall install, certify, and operate a CEM system which measures and records the hourly average SO_2 emission rate in pounds per mmBtu heat input for each hour boiler B26 is operating. The CEM shall at a minimum include a SO_2 continuous emissions analyzer, a data recording system and, as applicable, a moisture analyzer.

b. If determining compliance with the boiler utilization limit in par. 1.c, the operator shall install, certify, and operate a CEM system which measures and records the hourly heat

input for each hour boiler B26 is operating. The emissions monitoring system shall at a minimum include a data recording system, a volumetric flow monitor, a diluent monitor, and as applicable a moisture analyzer.

c. The SO_2 CEM shall be calibrated, maintained, and operated according to the applicable methods and procedures of s. NR 439.09, Wis. Adm. Code and 40 CFR 60.13, and the applicable performance, quality assurance, and data management and calculation procedures of Specification 2 of 40 CFR Part 60 Appendix B and 40 CFR Part 60 appendix F.

d. The operator shall submit a CEM quality assurance/quality control plan for approval by the Department in accordance with NR 439.095(6), Wis. Adm. Code.

e. If applicable, the SO_2 emission rate in pounds per mmBtu heat input shall be determined using the F-factor method according to procedures in Method 19 of 40 CFR Part 60, Appendix A.

f. If the CEM system is not operating for a continuous period of 48 hours, the facility operator shall comply, as applicable, with the fuel monitoring procedures in par. 2 and the boiler utilization monitoring procedures in par. 3 within 60 hours of the CEM discontinuing operation. The operator shall notify the Department of a CEM outage lasting longer than 48 hours and shall return the CEM system to operation as expeditiously as practical.

g. The operator shall submit a CEM monitoring plan to the Department for written approval which incorporates and meets the requirements of this paragraph.

5. Required Continuous Emissions Monitoring (CEM)

Within twelve months of the Department determining that CEM monitoring is required according to subd. a. and b., the operator shall begin CEM emission monitoring in order to determine the SO_2 emission rate for compliance purposes. The applicable CEM monitoring shall be performed in accordance with all applicable requirements under par. 4. The operator shall continue to monitoring emissions and boiler utilization according to par. 2 and 3 until the applicable CEM monitoring is fully implemented.

a. If the operator is complying with the emission rate limit by following the fuel monitoring methods under par. 2 and three of the requisite analyzed composite fuel samples have exceeded 3.00 pounds per mmBtu heat input during any twelve month rolling period, the operator is required to implement CEM emissions monitoring.

b. If the Rhinelander Water Tower ambient air quality monitor measures SO_2 concentrations exceeding 75 ppb on an hourly basis during four or more individual days over any twelve month rolling period, the operator is required to implement CEM emissions monitoring.

6. Emission Monitoring Plan Submittals and Deadlines

   The operator shall comply with the following plan submittal requirements:

   a. Except as provided in subd. a., the operator shall submit a monitoring plan by October 1, 2016 to the Department for written approval. The plan shall identify whether the operator will demonstrate compliance according to par. 2, 3, or 4, as allowed for the boiler limitations in par. 1. The plan shall provide all information required under par. 2, 3, or 4 regarding plan content.

   b. After January 1, 2017, the operator shall comply with approved monitoring plans until a different monitoring plan is approved in writing by the Department or until alternative monitoring requirements are approved under par. 11.

7. Performance Stack Testing

   The Department or U.S. EPA may require the operator to conduct performance testing at any time to demonstrate compliance with the emission rate or boiler utilization limitations in par. 1. Performance testing for SO_2 emissions shall be conducted according to one of EPA Method 6, 6A, 6B, 6C or 8 under 40 CFR 60 Appendix A and all applicable procedures and methods under s. NR 439.07, Wis. Adm. Code. The performance stack testing shall demonstrate compliance with the 1-hour emission rate limit of 3.20 pounds per mmBtu.

8. Fuel Collection and Analysis Methods

   All fuel sampling and analyses required under this Administrative Order shall be performed according to the methods specified below or their future updated or replacement methods.

   a. The grab sampling of each as-fired solid fossil fuel sample shall be performed according to ASTM D2234-89, Collection of a Gross Sample of Coal or other method that results in data at least as reliable as classification I-B-1, defined in ASTM D2234-04 as automatic sampling --- full stream cut – systemic spacing.

   b. The individual grab solid fossil fuel samples shall be prepared and composited according to ASTM D2013-86, Preparing Coal Samples for Analysis.

   c. The solid fossil fuel sample shall be analyzed for sulfur content according to ASTM D3177-89, Total Sulfur in the Analysis of Sample of Coal and Coke, or ASTM D4239-85, Sulfur in the Analysis Sample of Coal and Coke using High Temperature Tune Furnace Combustion Methods.

   d. The solid fossil fuel sample shall be analyzed for heat content according to ASTM D2015-85, Gross Calorific Value of Solid Fuel by the Adiabatic Bomb Calorimeter.

9. Recordkeeping

The operator shall maintain the following records on site for a period of five years:

a. The compliance reports as required under par. 10.

b. During periods when complying with the emission rate limitation according to par. 2, the fuel analysis records for heat and sulfur content and the SO_2 emission rate in pounds per mmBtu for each requisite composite daily sample analyzed or other fuels analyzed according to an approved plan.

c. During periods when complying with the boiler utilization limitation according to par. 3, the maximum daily steam load and boiler utilization and the boiler efficiency factors and supporting information used in determining the boiler efficiency factor.

d. During periods when complying with CEM monitoring according to par. 4, the hourly SO_2 emission rate in pounds per mmBtu and heat input in mmBtu.

e. Records of any additional analysis or performance testing required by the Department or U.S. EPA for purposes of determining compliance with the requirements of this Administrative Order.

10. Reporting

The operator shall submit to the Department a quarterly report no later than 60 days after the end of each calendar quarter. The report shall provide the following:

a. The date and the maximum monitored SO_2 ambient air concentration value for days during which the Water Tower monitor registered an ambient air quality concentration equal of 75.0 ppb or greater on an hourly basis.

b. The SO_2 emission rate in pounds per mmBtu and maximum boiler utilization in mmBtu per hour determined during days when the Rhinelander Water Tower Monitor registers an SO_2 ambient air concentration of 75 ppb or greater on an hourly basis.

c. Any SO_2 emission rate value, in pounds per mmBtu, or boiler utilization value, in mmBtu per hour, determined for compliance purposes under this Administrative Order which exceeds the emission rate limit or boiler utilization limit, respectively.

d. The identification of any periods when fuel samples could not be obtained or the applicable monitoring systems were not operating and the reasons why.

e. The period of use and value of alternative data used in determining compliance when fuel samples could not be obtained or the required monitoring systems were not operating.

11. Alternative Monitoring, Compliance Determination, Recordkeeping, or Reporting

The operator may use alternative methods and procedures to any monitoring, compliance demonstration, recordkeeping, or reporting requirement in par 2, 3, 4, 6, 8, 9, or 10 with written approval by both the Department and U.S. EPA.

B) For boiler B28, stack S08. The operator shall meet the following requirements for boiler B28 when fuel oil is fired.

1. Emission Limitation - The sulfur content of distillate fuel fired in boiler B28 shall not exceed 0.05 percent by weight.

2. Compliance Demonstration - The operator shall demonstrate compliance with the fuel sulfur content by obtaining fuel supplier certifications pursuant to 40 CFR section 60.45. The facility operator shall obtain certification that the supplier determined fuel sulfur and heat content according to applicable procedures under s. NR 439.08(2), Wis. Adm. Code.

3. Recordkeeping - The operator shall retain records of the certifications required under par. 2 on site for a period of 5 years.

C) This Administrative Order, AM-15-01, may require modification in satisfying facility RACT and RACM requirements if additional SO_2 emission sources other than those specified under section V. (A) are proposed for operation in a construction permit for the facility and if the revisions to the requirements of this Administrative Order are determined through air quality modeling analysis to be required in order to ensure that the proposed additional sources do not cause an exceedance of the 2010 SO_2 NAAQS.

D) The operator shall submit an application to incorporate the requirements of this Administrative Order into the facility's applicable operating permit no later than December 31, 2016.

Section VI. Disposition of Consent Order AM-94-38

Consent Order AM-94-38 was established and entered for the purpose of demonstrating and maintaining attainment of the 1992 24-Hour SO_2 standard. EPA has established that requirements for the 24-Hour SO_2 NAAQS will be subsumed when all requirements for the 2010 SO_2 NAAQS are satisfied and approved to the SIP[6]. Therefore, demonstrating compliance with Administrative Order AM-15-01 constitutes fulfillment and compliance with the emission reduction achieved under Consent Order AM-94-38. Further, Consent Order AM-94-38 is withdrawn from the SIP upon federal approval of Administrative Order AM-15-01 and Wisconsin's plan for attaining the 2010 SO_2 NAAQS.

Section VII. Waiver and Stipulation

[6] (USEPA, 2014) Memorandum "Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions" from Stephen D. Page, Director to Regional Air Division Directors, Regions 1 – 10, April 23, 2014.

Expera Specialty Solutions LLC consents to, and agrees not to contest, the Department's jurisdiction to issue this Administrative Order and to enforce its terms. To that end Expera Specialty Solutions LLC stipulates to the issuance of this Administrative Order and hereby waives further notice or hearing before the Department regarding the foregoing Findings of Fact, Conclusions of Law and Administrative Order, and waives its rights, if any, to challenge this Administrative Order in circuit court under ss. 227.52 and 227.53, Stat., or any other provision of law. Expera Specialty Solutions LLC further stipulates and agrees that this Administrative Order is effective and enforceable after being signed by both parties and that it may be enforced in accordance with ss. 299.95, and 299.97, Stat. Expera Specialty Solutions LLC understands that the Department intends to submit this Administrative Order to EPA for purposes of satisfying Wisconsin SIP requirements, and Expera Specialty Solutions LLC stipulates and agrees that this Administrative Order is federally enforceable by EPA upon EPA approval and incorporation of this Administrative Order into the Wisconsin SIP. The undersigned further certifies that he or she is authorized to execute such Administrative Order, Waiver and Stipulation on behalf of Expera Specialty Products.

Nothing in this Administrative Order, however, shall be construed as an admission on the part of Expera Specialty Solutions for any purpose other than for an action taken by the Department or the U.S. EPA for failure to comply with the terms of this Order. This stipulation and waiver does not affect the right of Expera Specialty Solutions LLC to assert any equitable or legal defense or to challenge the interpretation or application of this Administrative Order in any challenge or alleging of violation brought by a party other than the Wisconsin Department of Natural Resources or the U.S. EPA.

STATE OF WISCONSIN DEPARTMENT OF NATURAL RESOURCES For the Secretary

By:

_____ _____

Gail Good Date
Air Management Bureau Director

EXPERA SPECIALTY PRODUCTS LLC

By:

_____ _____

Russ Wanke Date
Chief Executive Officer

APPENDIX C: Analysis of the GEP Stack Height for Boiler B26, Stack S09

Prepared for
Expera Specialty Solutions

APPENDIX D: Base and Attainment Year Emission Inventories for the Oneida County Nonattainment Area

Oneida County SO_2 emissions from nonpoint sources

					Annual emissions (tons)				
SCC	**SCC Level One**	**SCC Level Two**	**SCC Level Three**	**SCC Level Four**	**2011 whole county**	**2011 partial county (NAA)**	**2018 whole county**	**2018 partial county (NAA)**	**2017 partial county (NAA)**
2103004001	Stationary source fuel combustion	Commercial/ institutional	Distillate oil	Boilers	0.6289	0.3149	0.6289	0.3115	0.3120
2104002000	Stationary source fuel combustion	Residential	Bituminous/ subbituminous coal	Total: all combustor types	1.1365	0.5691	1.1365	0.5629	0.5638
2810060100	Miscellaneous area sources	Other combustion	Cremation	Humans	0.0182	0.0091	0.0182	0.0090	0.0090
2103002000	Stationary source fuel combustion	Commercial/ institutional	Bituminous/ subbituminous coal	Total: all boiler types	2.2738	1.1385	2.2738	1.1261	1.1279
2102011000	Stationary source fuel combustion	Industrial	Kerosene	Total: all boiler types	0.0002	0.0001	0.0002	0.0001	0.0001
2104006000	Stationary source fuel combustion	Residential	Natural gas	Total: all combustor types	0.2630	0.1317	0.2630	0.1302	0.1304
2102006000	Stationary source fuel combustion	Industrial	Natural gas	Total: boilers and IC engines	0.0190	0.0095	0.0190	0.0094	0.0094
2103006000	Stationary source fuel combustion	Commercial/ institutional	Natural gas	Total: boilers and IC engines	0.1394	0.0698	0.1394	0.0691	0.0692
2102005000	Stationary source fuel combustion	Industrial	Residual oil	Total: all boiler types	0.0631	0.0316	0.0631	0.0313	0.0313
2103005000	Stationary source fuel combustion	Commercial/ institutional	Residual oil	Total: all boiler types	0.0000	0.0000	0.0000	0.0000	0.0000
2104001000	Stationary source fuel combustion	Residential	Anthracite coal	Total: all combustor types	0.0116	0.0058	0.0116	0.0057	0.0057
2610000400	Waste disposal, treatment, and recovery	Open burning	All categories	Yard waste - brush species unspecified	0.1018	0.0510	0.1018	0.0504	0.0505
2102004001	Stationary source fuel combustion	Industrial	Distillate oil	All boiler types	0.1276	0.0639	0.1276	0.0632	0.0633

SCC	SCC Level One	SCC Level Two	SCC Level Three	SCC Level Four	Annual emissions (tons)				
					2011 whole county	2011 partial county (NAA)	2018 whole county	2018 partial county (NAA)	2017 partial county (NAA)
2102008000	Stationary source fuel combustion	Industrial	Wood	Total: all boiler types	0.0000	0.0000	0.0000	0.0000	0.0000
2103011000	Stationary source fuel combustion	Commercial/ institutional	Kerosene	Total: all combustor types	0.0000	0.0000	0.0000	0.0000	0.0000
2103008000	Stationary source fuel combustion	Commercial/ institutional	Wood	Total: all boiler types	0.0018	0.0009	0.0018	0.0009	0.0009
2104011000	Stationary source fuel combustion	Residential	Kerosene	Total: all heater types	0.0855	0.0428	0.0855	0.0423	0.0424
2104004000	Stationary source fuel combustion	Residential	Distillate oil	Total: all combustor types	4.1441	2.0750	4.1441	2.0524	2.0557
2610000100	Waste disposal, treatment, and recovery	Open burning	All categories	Yard waste - leaf species unspecified	0.0466	0.0233	0.0466	0.0231	0.0231
2102007000	Stationary source fuel combustion	Industrial	Liquefied petroleum gas (LPG)	Total: all boiler types	0.0000	0.0000	0.0000	0.0000	0.0000
2102002000	Stationary source fuel combustion	Industrial	Bituminous/ subbituminous coal	Total: all boiler types	0.0000	0.0000	0.0000	0.0000	0.0000
2104007000	Stationary source fuel combustion	Residential	Liquefied petroleum gas (LPG)	Total: all combustor types	0.1203	0.0602	0.1203	0.0596	0.0597
2610030000	Waste disposal, treatment, and recovery	Open burning	Residential	Household waste (use 26-10-000-xxx for yard wastes)	1.3401	0.6710	1.3401	0.6637	0.6648
2103007000	Stationary source fuel combustion	Commercial/ institutional	Liquefied petroleum gas (LPG)	Total: all combustor types	0.0080	0.0040	0.0080	0.0040	0.0040
2104008230	Stationary source fuel combustion	Residential	Wood	Woodstove: fireplace inserts, EPA certified, catalytic	0.0212	0.0106	0.0250	0.0124	0.0122
2104008330	Stationary source fuel combustion	Residential	Wood	Woodstove: freestanding, EPA certified, catalytic	0.2384	0.1194	0.2816	0.1394	0.1366
2104008310	Stationary source fuel combustion	Residential	Wood	Woodstove: freestanding, non-EPA certified	0.6822	0.3416	0.6685	0.3311	0.3326

					Annual emissions (tons)				
SCC	**SCC Level One**	**SCC Level Two**	**SCC Level Three**	**SCC Level Four**	**2011 whole county**	**2011 partial county (NAA)**	**2018 whole county**	**2018 partial county (NAA)**	**2017 partial county (NAA)**
2104008400	Stationary source fuel combustion	Residential	Wood	Woodstove: pellet-fired, general (freestanding or FP insert)	0.0417	0.0209	0.0685	0.0339	0.0321
2104008610	Stationary source fuel combustion	Residential	Wood	Hydronic heater: outdoor	9.3825	4.6978	11.6061	5.7482	5.5981
2104008210	Stationary source fuel combustion	Residential	Wood	Woodstove: fireplace inserts, non-EPA certified	0.1555	0.0779	0.1395	0.0691	0.0703
2104008100	Stationary source fuel combustion	Residential	Wood	Fireplace: general	0.2507	0.1255	0.2688	0.1331	0.1320
2104008220	Stationary source fuel combustion	Residential	Wood	Woodstove: fireplace inserts, EPA certified, non-catalytic	0.0661	0.0331	0.0781	0.0387	0.0379
2104008510	Stationary source fuel combustion	Residential	Wood	Furnace: Indoor, cordwood-fired, non-EPA certified	3.5563	1.7806	3.9226	1.9427	1.9196
2104008320	Stationary source fuel combustion	Residential	Wood	Woodstove: freestanding, EPA certified, non-catalytic	0.2159	0.1081	0.2550	0.1263	0.1237
2104008700	Stationary source fuel combustion	Residential	Wood	Outdoor wood burning device, NEC (fire-pits, chimneys, etc.)	0.4202	0.2104	0.4505	0.2231	0.2213
				Total annual emissions (tons):	**25.5601**	**12.7980**	**28.2936**	**14.0130**	**13.8395**

2011 Oneida County SO_2 emissions from mobile sources

Sector	Emissions (tons per year)	Source
On road	5.179	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/onroad_by_state/
Commercial marine	0.000	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonpoint_by_state/
Aircraft	3.378	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/point_by_state/
Railroad	0.062	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonpoint_by_state/
All other nonroad	1.442	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2011emissions/nonroad_by_state/
Total	**10.061**	

Note: Emissions were estimated using U.S. EPA's emissions modeling platform (2011v6/v1platform).

2018 Oneida County SO_2 emissions from mobile sources

Sector	Emissions (tons per year)	Source
On road	2.053	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/onroad_by_state/
Commercial marine	0.000	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonpoint_by_state/
Aircraft	3.673	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/point_by_state/
Railroad	0.002	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonpoint_by_state/
All other nonroad	0.663	ftp://ftp.epa.gov/EmisInventory/2011v6/v1platform/2018emissions/nonroad_by_state/
Total	**6.392**	

Note: Emissions were estimated using U.S. EPA's emissions modeling platform (2011v6/v1platform).