Technical Support Document:

Chapter 17
Intended Round 3 Area Designations for the 2010 1-Hour SO$_2$ Primary National Ambient Air Quality Standard for Maine

1. Summary

Pursuant to section 107(d) of the Clean Air Act (CAA), the U.S. Environmental Protection Agency (the EPA, we, or us) must designate areas as either "nonattainment," "attainment," or "unclassifiable" for the 2010 1-hour sulfur dioxide (SO$_2$) primary national ambient air quality standard (NAAQS) (2010 SO$_2$ NAAQS). The CAA defines a nonattainment area as an area that does not meet the NAAQS or that contributes to a nearby area that does not meet the NAAQS. An attainment area is defined by the CAA as any area that meets the NAAQS and does not contribute to a nearby area that does not meet the NAAQS. Unclassifiable areas are defined by the CAA as those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS. In this action, the EPA has defined a nonattainment area as an area that the EPA has determined violates the 2010 SO$_2$ NAAQS or contributes to a violation in a nearby area, based on the most recent 3 years of air quality monitoring data, appropriate dispersion modeling analysis, and any other relevant information. An unclassifiable/attainment area is defined by the EPA as an area that either: (1) based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined (i) meets the 2010 SO$_2$ NAAQS, and (ii) does not contribute to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS[1]. An unclassifiable area is defined by EPA as an area that either: (1) was required to be characterized by the state under 40 CFR 51.1203(c) or (d), has not been previously designated, and on the basis of available information cannot be classified as either: (i) meeting or not meeting the 2010 SO$_2$ NAAQS, or (ii) contributing or not contributing to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and EPA does have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.

This technical support document (TSD) addresses designations for all undesignated areas in Maine for the 2010 SO$_2$ NAAQS. In previous final actions, the EPA has issued designations for

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[1] The term "designated attainment area" is not used in this document because the EPA uses that term only to refer to a previous nonattainment area that has been redesignated to attainment as a result of the EPA's approval of a state-submitted maintenance plan.

the 2010 SO$_2$ NAAQS for selected areas of the country.[2] No areas in Maine were included in these prior actions. The EPA is under a December 31, 2017, deadline to designate the areas addressed in this TSD as required by the U.S. District Court for the Northern District of California.[3] We are referring to the set of designations being finalized by the December 31, 2017 deadline as "Round 3" of the designations process for the 2010 SO$_2$ NAAQS. After the Round 3 designations are completed, the only remaining undesignated areas will be those where a state has installed and begun timely operating a new SO$_2$ monitoring network meeting EPA specifications referenced in EPA's SO$_2$ Data Requirements Rule (DRR). (80 FR 51052). The EPA is required to designate those remaining undesignated areas by December 31, 2020.

Maine submitted its initial recommendation of "unclassifiable" for the entire state regarding designations for the 2010 1-hour SO$_2$ NAAQS on October 6, 2011. The state submitted an updated air quality analysis on January 11, 2017, and did not update its recommendation. In our intended designations, we have considered all the submissions from the state, except where a recommendation in a later submission regarding a particular area indicates that it replaces an earlier recommendation for that area we have considered the recommendation in the later submission.

For the areas in Maine that are part of the Round 3 designations process, Table 1 identifies the EPA's intended designations and the counties or portions of counties to which they would apply. It also lists Maine's current recommendations. The EPA's final designation for these areas will be based on an assessment and characterization of air quality through ambient air quality data, air dispersion modeling, other evidence and supporting information, or a combination of the above.

Table 1. Summary of the EPA's Intended Designations and the Designation Recommendations by Maine

Area/ County	Maine's Recommended Area Definition	Maine's Recommended Designation	EPA's Intended Area Definition	EPA's Intended Designation
Entire state of Maine*	Entire state of Maine	Unclassifiable	Entire state of Maine	Unclassifiable/ Attainment

* The EPA intends to designate the remaining undesignated counties in Maine as "unclassifiable/attainment" as these areas were not required to be characterized by the state under the DRR and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the areas may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS. These areas that we intend to designate as unclassifiable/attainment (those to which this row of this table is applicable) are identified more specifically in section 5 of this TSD.

There are no areas for which Maine elected to install and begin operation of a new, approved SO$_2$ monitoring network.

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[2] A total of 94 areas throughout the U.S. were previously designated in actions published on August 5, 2013 (78 FR 47191), July 12, 2016 (81 FR 45039), and December 13, 2016 (81 FR 89870).
[3] *Sierra Club v. McCarthy*, No. 3-13-cv-3953 (SI) (N.D. Cal. Mar. 2, 2015).

Areas that the EPA previously designated unclassifiable in Round 1 (*see* 78 FR 47191) and Round 2 (*see* 81 FR 45039 and 81 FR 89870) are not affected by the designations in Round 3. No areas of Maine were designated in Rounds 1 or 2, and because Maine has not installed a new network meeting EPA specifications referenced in EPA's SO_2 DRR for any sources of SO_2 emissions in Maine, no areas of Maine will remain undesignated.

2. General Approach and Schedule

Updated designations guidance documents were issued by the EPA through a July 22, 2016, memorandum and a March 20, 2015, memorandum from Stephen D. Page, Director, U.S. EPA, Office of Air Quality Planning and Standards, to Air Division Directors, U.S. EPA Regions I-X. These memoranda supersede earlier designation guidance for the 2010 SO_2 NAAQS, issued on March 24, 2011, and identify factors that the EPA intends to evaluate in determining whether areas are in violation of the 2010 SO_2 NAAQS. The documents also contain the factors that the EPA intends to evaluate in determining the boundaries for designated areas. These factors include: 1) air quality characterization via ambient monitoring or dispersion modeling results; 2) emissions-related data; 3) meteorology; 4) geography and topography; and 5) jurisdictional boundaries.

To assist states and other interested parties in their efforts to characterize air quality through air dispersion modeling for sources that emit SO_2, the EPA released its most recent version of a draft document titled, "SO_2 NAAQS Designations Modeling Technical Assistance Document" (Modeling TAD) in August 2016.[4]

Readers of this chapter of this TSD should refer to the additional general information for the EPA's Round 3 area designations in Chapter 1 (Background and History of the Intended Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard) and Chapter 2 (Intended Round 3 Area Designations for the 2010 1-Hour SO_2 Primary National Ambient Air Quality Standard for States with Sources Not Required to be Characterized).

As specified by the March 2, 2015, court order, the EPA is required to designate by December 31, 2017, all "remaining undesignated areas in which, by January 1, 2017, states have not installed and begun operating a new SO_2 monitoring network meeting EPA specifications referenced in EPA's" SO_2 DRR. The EPA will therefore designate by December 31, 2017, areas of the country that are not, pursuant to the DRR, timely operating EPA-approved and valid monitoring networks. The areas to be designated by December 31, 2017, include the area associated with one source in Maine meeting DRR emissions criteria that Maine has chosen to characterize using air dispersion modeling and other areas not specifically required to be characterized by the state under the DRR.

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[2] https://www.epa.gov/sites/production/files/2016-06/documents/so2modelingtad.pdf. In addition to this TAD on modeling, the EPA also has released a technical assistance document addressing SO_2 monitoring network design, to advise states that have elected to install and begin operation of a new SO_2 monitoring network. See Draft SO_2 NAAQS Designations Source-Oriented Monitoring Technical Assistance Document, February 2016, https://www.epa.gov/sites/production/files/2016-06/documents/so2monitoringtad.pdf.

Because the intended designations for Cumberland and York Counties, Maine, have been informed by available modeling analyses, this preliminary TSD is structured based on the availability of such modeling information. There is a section for each county for which modeling information is available. The remaining to-be-designated counties are then addressed together in section 5.

The EPA does not plan to revise this TSD after consideration of state and public comment on our intended designation. A separate TSD will be prepared as necessary to document how we have addressed such comments in the final designations.

The following are definitions of important terms used in this document:
1) 2010 SO_2 NAAQS – The primary NAAQS for SO_2 promulgated in 2010. This NAAQS is 75 ppb, based on the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations. See 40 CFR 50.17.
2) Design Value - a statistic computed according to the data handling procedures of the NAAQS (in 40 CFR part 50 Appendix T) that, by comparison to the level of the NAAQS, indicates whether the area is violating the NAAQS.
3) Designated nonattainment area – an area that, based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined either: (1) does not meet the 2010 SO_2 NAAQS, or (2) contributes to ambient air quality in a nearby area that does not meet the NAAQS.
4) Designated unclassifiable/attainment area – an area that either: (1) based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined (i) meets the 2010 SO_2 NAAQS, and (ii) does not contribute to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.
5) Designated unclassifiable area – an area that either: (1) was required to be characterized by the state under 40 CFR 51.1203(c) or (d), has not been previously designated, and on the basis of available information cannot be classified as either: (i) meeting or not meeting the 2010 SO_2 NAAQS, or (ii) contributing or not contributing to ambient air quality in a nearby area that does not meet the NAAQS; or (2) was not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS.
6) Modeled violation – a violation of the SO_2 NAAQS demonstrated by air dispersion modeling.
7) Recommended attainment area – an area that a state, territory, or tribe has recommended that the EPA designate as attainment.
8) Recommended nonattainment area – an area that a state, territory, or tribe has recommended that the EPA designate as nonattainment.

9) Recommended unclassifiable area – an area that a state, territory, or tribe has recommended that the EPA designate as unclassifiable.
10) Recommended unclassifiable/attainment area – an area that a state, territory, or tribe has recommended that the EPA designate as unclassifiable/attainment.
11) Violating monitor – an ambient air monitor meeting 40 CFR parts 50, 53, and 58 requirements whose valid design value exceeds 75 ppb, based on data analysis conducted in accordance with Appendix T of 40 CFR part 50.
12) We, our, and us – these refer to the EPA.

3. Technical Analysis for the Cumberland County Area

3.1. Introduction

The EPA must designate the Cumberland County, Maine, area by December 31, 2017, because the area has not been previously designated and Maine has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Cumberland County.

3.2. Air Quality Monitoring Data for the Cumberland County Area

This factor considers the SO_2 air quality monitoring data in the area of Cumberland County. The state included monitoring data from the following monitor:

- Air Quality System monitor 23-005-0029. The Portland Deering Oaks monitor is located at 356 State Street, Portland, Maine, in Cumberland County, and is approximately 13.6 km to the southwest of William F Wyman Station. Data collected at this monitor indicates that the monitored SO_2 design value for the period from 2013 to 2015 is 12 parts per billion (ppb; equivalent to 31.4 micrograms per cubic meter, $\mu g/m^3$). Data collected from this monitor were used by Maine in the modeling to characterize background SO_2 concentrations.

The EPA agrees that the Portland Deering Oaks monitor is the most representative source of available background SO_2 data for input into the air quality modeling. The EPA does not have information to support that this monitor is located in maximum concentration for the area. The EPA has confirmed that there are no additional relevant data in the Air Quality System (AQS). For reference, see the annual air quality Design Values for SO_2 posted at our Air Quality Design Values website, https://www.epa.gov/air-trends/air-quality-design-values.

3.3. Air Quality Modeling Analysis for the Cumberland County Area Addressing William F Wyman Station

3.3.1. Introduction

This section presents all the available air quality modeling information for a portion of Cumberland County that includes William F Wyman Station (Wyman). (This portion of Cumberland County will often be referred to as "the Cumberland County area" within this section). This area contains Wyman, the source around which Maine is required by the DRR to characterize SO_2 air quality. Wyman does not emit 2,000 tons or more annually, but was added to the SO_2 DRR Source list by the EPA due to high month-to-month variability in its operating pattern. For example, Wyman emitted over 1,130 tons in February 2015, and had 22 days in 2015 with emissions greater than 40 tons per day. Maine has chosen to characterize Wyman via modeling.

In its 2011 submission, Maine recommended the entire state be designated as unclassifiable based in part on a lack of modeling data to characterize areas around the state. On January 11, 2017, Maine submitted an assessment and characterization that relies principally on air quality modeling of the air quality impacts from this facility, which indicate that area is attaining the 2010 SO_2 NAAQS. Maine, however, did not update its recommendation for Cumberland County at that time. This assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing actual emissions. On June 23, 2017, Maine submitted an updated dispersion modeling analysis for this area responding to EPA comments on the original modeling. Specifically, the updated modeling analysis corrected coordinates for the surface meteorological station used in the modeling and used a more updated model version, as well as providing information on the appropriate stack height. In its June 2017 submittal, the state requested that the updated analysis and associated report serve as an addendum to its January 2017 DRR submittal; therefore, the EPA is treating both submissions as a single analysis, with the updated documents and files superseding the older documents and files, as applicable. After careful review of the state's assessment, supporting documentation, and all available data, the EPA intends to modify the state's recommendation and designate the area as unclassifiable/ attainment. Our reasoning for this conclusion is explained in a later section of this TSD, after all the available information is presented.
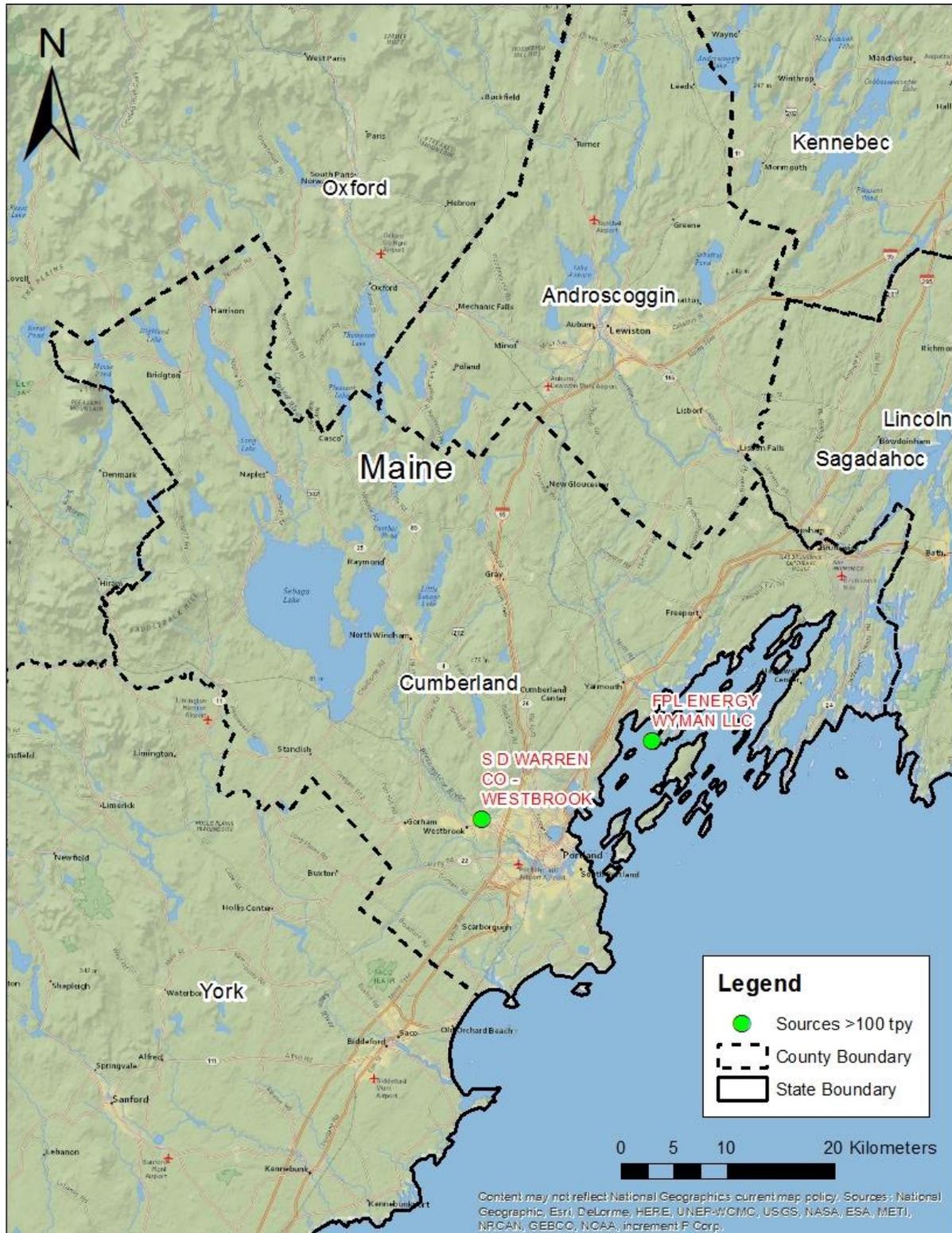
The area the state has assessed via air quality modeling is located in eastern Cumberland County, including Portland, Yarmouth, Gray, and portions of Brunswick.

As seen in Figure 1 below, the Wyman facility is located on Cousins Island on the Maine seacoast, approximately 10-12 km to the northeast of Portland. Also included in Figure 1 is one other nearby emitter of SO_2, which is S. D. Warren Company in Westbrook, Maine.[5]

The state's 2011 recommendation was for the entire state to be designated as unclassifiable. The EPA's intended unclassifiable/attainment designation boundary for the Cumberland County, Maine area is not shown in Figure 1, but is shown in Figure 7 in the section below that summarizes our intended designation.

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[5] The one other SO_2 emitter of 100 tpy or more (based on information in the EPA's 2014 National Emissions Inventory version 1) is shown in Figure 1. There are no additional SO_2 emitters above this emission level in the vicinity of the named source.

Figure 1. Map of the Cumberland County Area Addressing William F Wyman Station

The source of this map image is Esri, used by EPA with Esri's permission.

The discussion and analysis that follows below will reference the Modeling TAD and the factors for evaluation contained in the EPA's July 22, 2016, guidance and March 20, 2015, guidance, as appropriate.

3.3.2. Modeling Analysis Provided by the State

3.3.2.1. Model Selection and Modeling Components

The EPA's Modeling TAD notes that for area designations under the 2010 SO_2 NAAQS, the AERMOD modeling system should be used, unless use of an alternative model can be justified. The AERMOD modeling system contains the following components:
- AERMOD: the dispersion model
- AERMAP: the terrain processor for AERMOD
- AERMET: the meteorological data processor for AERMOD
- BPIPPRM: the building input processor
- AERMINUTE: a pre-processor to AERMET incorporating 1-minute automated surface observation system (ASOS) wind data
- AERSURFACE: the surface characteristics processor for AERMET
- AERSCREEN: a screening version of AERMOD

In its original January 11, 2017, submission, the state used AERMOD version 15181 in regulatory default mode. In its June 23, 2017, addendum, the state used AERMOD version 16216r in regulatory default mode. Per the state's June 2017 addendum, the EPA considers the updated analysis using AERMOD version 16216r to supersede the older modeling using version 15181. A discussion of the state's approach to the individual components is provided in the corresponding discussion that follows, as appropriate.

3.3.2.2. Modeling Parameter: Rural or Urban Dispersion

For any dispersion modeling exercise, the "urban" or "rural" determination of a source is important in determining the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 sources. Section 6.3 of the Modeling TAD details the procedures used to determine if a source is urban or rural based on land use or population density.

For the purpose of performing the modeling for the area of analysis, the state determined that it was most appropriate to run the model in rural mode due to the relatively isolated location of the modeled source on Cousins Island, and the relatively low population of the area. The EPA agrees with the selection of the rural operating mode for this assessment.

3.3.2.3. Modeling Parameter: Area of Analysis (Receptor Grid)

The TAD recommends that the first step towards characterization of air quality in the area around a source or group of sources is to determine the extent of the area of analysis and the

spacing of the receptor grid. Considerations presented in the Modeling TAD include but are not limited to: the location of the SO_2 emission sources or facilities considered for modeling; the extent of significant concentration gradients due to the influence of nearby sources; and sufficient receptor coverage and density to adequately capture and resolve the model predicted maximum SO_2 concentrations.

The source of SO_2 emissions subject to the DRR in this area is described in the introduction to this section. For the Cumberland County area, the state did not include any other emitters of SO_2 in the modeling domain around Wyman. The state determined that it was most appropriate to represent other sources of SO_2 in the monitored background to adequately characterize air quality through modeling to include the potential extent of any SO_2 NAAQS exceedances in the area of analysis.

The receptor placement for the area of analysis selected by the state is a nested Cartesian grid, as follows (distances are from the center of the facility property):
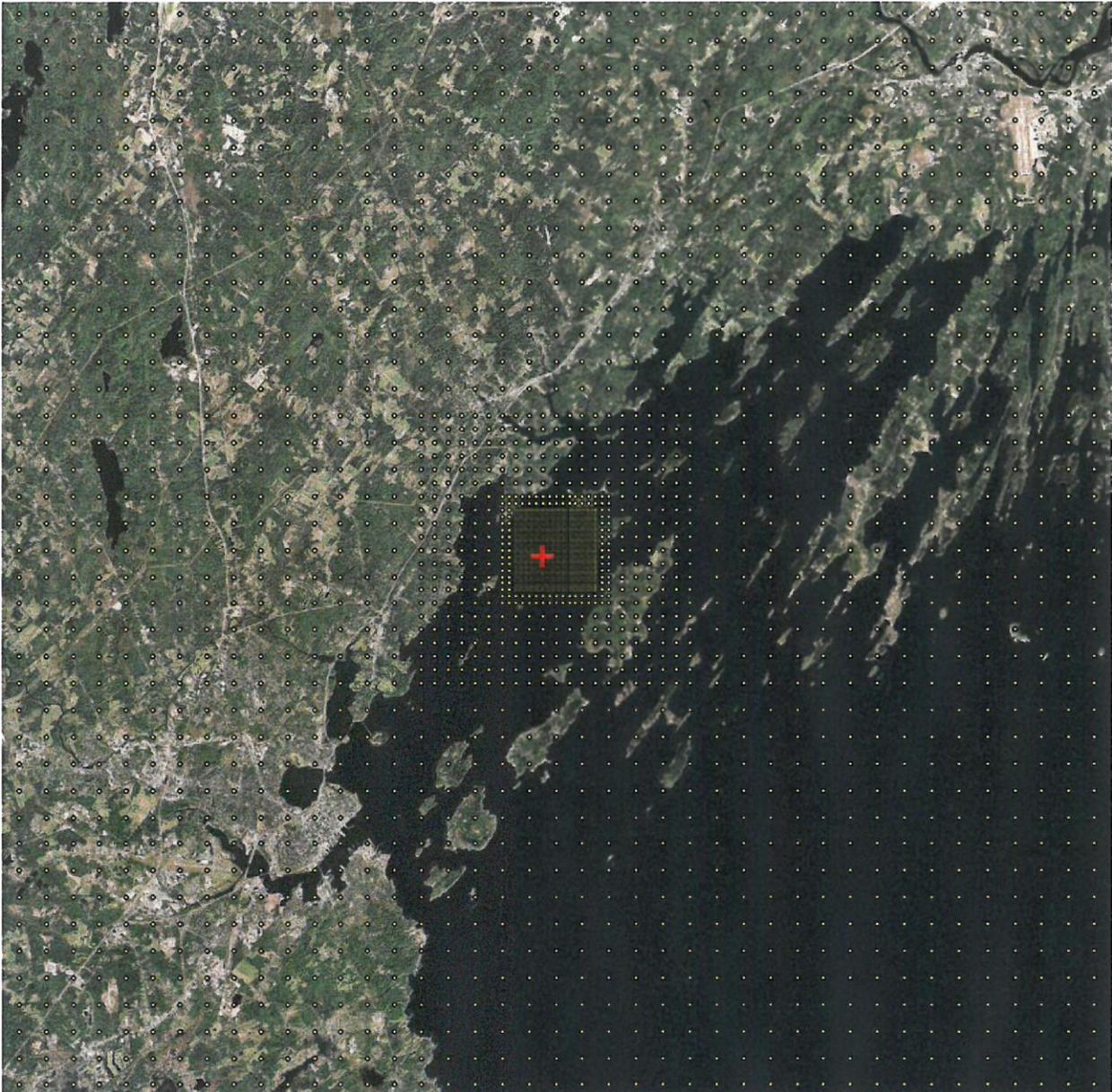- 25-meter fence-line spacing around the property boundary
- 100-meter spacing from the fence-line to 1.5 km from the source
- 250-meter spacing from 1.5 km to 2 km from the source
- 500-meter spacing from 2 km to 5 km from the source
- 1 km spacing from 5 km to 20 km from the source

The receptor network contained 3,213 receptors, and the network covered the eastern portion of Cumberland County, Maine.

Figures 2 and 3, reproduced from the state's June 2016 modeling protocol, show the state's chosen area of analysis surrounding Wyman with the receptor grid for the area of analysis.

Consistent with the Modeling TAD, the state placed receptors for the purposes of this designation effort in locations that would be considered ambient air relative to each modeled facility, including other facilities' property. The state opted to apply a regular grid of receptors without excluding any receptor locations, including over water bodies and on the facility's own fenced-in property, though Section 4.2 of the Modeling TAD allows removal of receptors in such locations.

Figure 2. Area of Analysis and Full Receptor Grid for the Cumberland County Area

Note: Figure reproduced from the state's submission.

Figure 3. Near-Source Receptor Grid for the Cumberland County Area

Note: Figure reproduced from the state's submission.

The EPA finds that the modeling domain and placement of receptors are appropriate for adequately characterizing the area around Wyman.

3.3.2.4.   Modeling Parameter: Source Characterization

Section 6 of the Modeling TAD offers recommendations on source characterization including source types, use of accurate stack parameters, inclusion of building dimensions for building downwash (if warranted), and the use of actual stack heights with actual emissions or following GEP policy with allowable emissions.

The state explicitly included Wyman for modeling because this source is the largest in the area, and the source was required for characterization as a listed source under the DRR. Other sources in or near the area are adequately characterized by the monitored background levels included in the modeling because the monitor used to assess background levels is located 7 km from the only other large source in the area, SD Warren Co, which emitted approximately 427 tons in 2014, in Westbrook, Maine, in an area approximately between the source and Wyman.

The state characterized this source within the area of analysis in accordance with the best practices outlined in the Modeling TAD. Specifically, the state used actual stack heights in conjunction with actual emissions. The state also adequately characterized the source's building layout and location, as well as the stack parameters, e.g., exit temperature, exit velocity, location, and diameter. The AERMOD component BPIPPRM was used to assist in addressing building downwash.

Based on comparisons between the modeling source characterization, including building and stack parameters, against publicly available information in permits and maps, the EPA concludes that the state's source characterization is appropriate.

3.3.2.5. Modeling Parameter: Emissions

The EPA's Modeling TAD notes that for the purpose of modeling to characterize air quality for use in designations, the recommended approach is to use the most recent 3 years of actual emissions data and concurrent meteorological data. However, the TAD also indicates that it would be acceptable to use allowable emissions in the form of the most recently permitted (referred to as PTE or allowable) emissions rate that is federally enforceable and effective.

The EPA believes that continuous emissions monitoring systems (CEMS) data provide acceptable historical emissions information, when they are available. These data are available for many electric generating units. In the absence of CEMS data, the EPA's Modeling TAD highly encourages the use of AERMOD's hourly varying emissions keyword HOUREMIS, or through the use of AERMOD's variable emissions factors keyword EMISFACT. When choosing one of these methods, the EPA recommends using detailed throughput, operating schedules, and emissions information from the impacted source(s).

In certain instances, states and other interested parties may find that it is more advantageous or simpler to use PTE rates as part of their modeling runs. For example, where a facility has recently adopted a new federally enforceable emissions limit or implemented other federally enforceable mechanisms and control technologies to limit SO_2 emissions to a level that indicates compliance with the NAAQS, the state may choose to model PTE rates. These new limits or conditions may be used in the application of AERMOD for the purposes of modeling for designations, even if the source has not been subject to these limits for the entirety of the most recent 3 calendar years. In these cases, the Modeling TAD notes that a state should be able to find the necessary emissions information for designations-related modeling in the existing SO_2 emissions inventories used for permitting or SIP planning demonstrations. In the event that these

short-term emissions are not readily available, they may be calculated using the methodology in Table 8-1 of Appendix W to 40 CFR Part 51 titled, "Guideline on Air Quality Models."

As previously noted, the state included emissions from Wyman in the area of analysis. The state has opted to use a hybrid approach, where emissions from Wyman Units 1 through 4 are expressed as actual emissions, and those from Wyman Unit 5 are conservatively (i.e., unlikely to underestimate emissions) expressed as a PTE rate. Emissions from Units 1 and 2 (combined actual) and Unit 5 (PTE) are exhausted through a single flue in one stack. The state did not artificially increase gas exit velocity for the Units 1 and 2 emissions due to emissions from Unit 5, or vice-versa. Furthermore, the state used actual stack height, which is below the GEP stack height, for both Units 1 and 2 and Unit 5. Unit 4 is also exhausted from a separate flue in the same stack as Units 1, 2, and 5. Similarly, the state did not artificially increase gas exit velocity for Unit 4 due to emissions from Units 1, 2, and 5, that are released in a separate flue but the same stack. The highest emitting unit, Unit 3, vents through a single dedicated stack. For the reasons explained above, the dispersion characteristics are modeled conservatively and the EPA does not have concerns about the modeling underestimating impacts from the combined actual and PTE emissions. The units in the state's modeling analysis and their associated actual or PTE rates are summarized below.

For Units 1 through 4, the state provided annual actual SO_2 emissions between 2013 and 2015 in model data input files. This information is summarized in Table 2. A description of how the state obtained hourly emission rates is given below this table.

Table 2. Actual SO₂ Emissions Between 2013 – 2015 from Facilities in the Cumberland County Area

Facility Name	SO₂ Emissions (tpy)		
	2013	2014	2015
William F Wyman	868	848	1,756
Units 1 and 2 (combined)	83	38	156
Unit 3	114	119	257
Unit 4	671	692	1,343
Total Emissions from All Modeled Facilities in the State's Area of Analysis*	868	848	1,756

*Annual emissions totals for all units may differ slightly from the sum of annual individual unit emissions due to rounding.

For Wyman Units 1 through 4, the actual hourly emissions data were obtained from the EPA's Clean Air Markets Division (CAMD) Air Markets Program Data. Hourly stack temperature and stack gas exit velocity parameters for Units 1 and 2 are not available through the Acid Rain Program data in CAMD, so continuous emissions monitoring systems (CEMS) data maintained by Wyman Station's in-house monitoring instrumentation were utilized for stack temperature. Maine performed simple linear regression analyses to generate hourly estimated stack exit temperature and velocity values based on unit load level, with equations based on data from recent stack emissions tests and/or permits.

For Wyman Unit 5, the state provided PTE values. This information is summarized in Table 3. A description of how the state obtained hourly emission rates is given below this table.

Table 3. SO₂ Emissions based on PTE from Facilities in the Area of Analysis for the Cumberland County Area

Facility Name	SO₂ Emissions (tpy, based on PTE)
William F Wyman	243
Unit 5	243
Total Emissions from Facilities in the Area of Analysis Modeled Based on PTE	243

Hourly operation data for Wyman Unit 5 were not available because it is not subject to Acid Rain Program data collection and reporting requirements, so it was modeled conservatively (i.e., overestimating). The PTE in tons per year for Wyman Unit 5 was determined by the state by assuming a continuous maximum design heat input load level for all modeled hours. Emissions were assumed to be the same in each modeled year. In its June 2017 addendum, the state indicated that the stack height used for Unit 5 was consistent with GEP stack height policy.

Based on the available evidence, the EPA concurs with Maine in its selections of emissions parameters and emissions rates for the sources included in the modeling because the emissions accurately represent actual and PTE emissions during the time period modeled.

3.3.2.6.   *Modeling Parameter: Meteorology and Surface Characteristics*

As noted in the Modeling TAD, the most recent 3 years of meteorological data (concurrent with the most recent 3 years of emissions data) should be used in designations efforts. The selection of data should be based on spatial and climatological (temporal) representativeness. The representativeness of the data is determined based on: 1) the proximity of the meteorological monitoring site to the area under consideration, 2) the complexity of terrain, 3) the exposure of the meteorological site, and 4) the period of time during which data are collected. Sources of meteorological data include National Weather Service (NWS) stations, site-specific or onsite data, and other sources such as universities, Federal Aviation Administration (FAA), and military stations.

For the area of analysis for the Cumberland County area, the state selected the following meteorological inputs:
- for surface meteorology, data collected at the National Weather Service (NWS) Portland Jetport Automated Surface Observing Systems (ASOS) site, located around 17 km to the southwest of Wyman; and
- coincident upper air observations collected at the NWS site in Gray, located around 17 km due north-northwest from Wyman as best representative of meteorological conditions within the area of analysis.

The state used AERSURFACE version 13016 using land cover data from the 1992 National Land Cover Dataset, the most recent data available for use with this version of AERSURFACE, representative of the Portland Jetport ASOS site and Gray NWS site to estimate the surface characteristics (albedo, Bowen ratio, and surface roughness (z_o)) of the area of analysis. The State estimated surface roughness values for 12 spatial sectors out to the default and recommended radius of 1 km at an annual temporal resolution for average conditions. AERSURFACE derives Bowen ratio and albedo based on a 10 km by 10 km area and sectors do not apply. The EPA notes that the location of the Portland Jetport ASOS site is actually 1.3 km from the location used in the original January 2017 modeling to estimate surface characteristics. The differing land use characteristics around the actual versus modeled locations suggest that surface roughness may have been overestimated at the site. This inaccuracy in meteorological site location may result in mischaracterization of land surface properties, which may further lead to inaccurate estimates of meteorological parameters and pollutant concentrations. In its June 2017 addendum, in response to comments from the EPA, the state corrected the modeled location of the Portland Jetport ASOS site to the actual location. The actual versus modeled locations of the Portland Jetport ASOS station are shown in Figure 4 below.
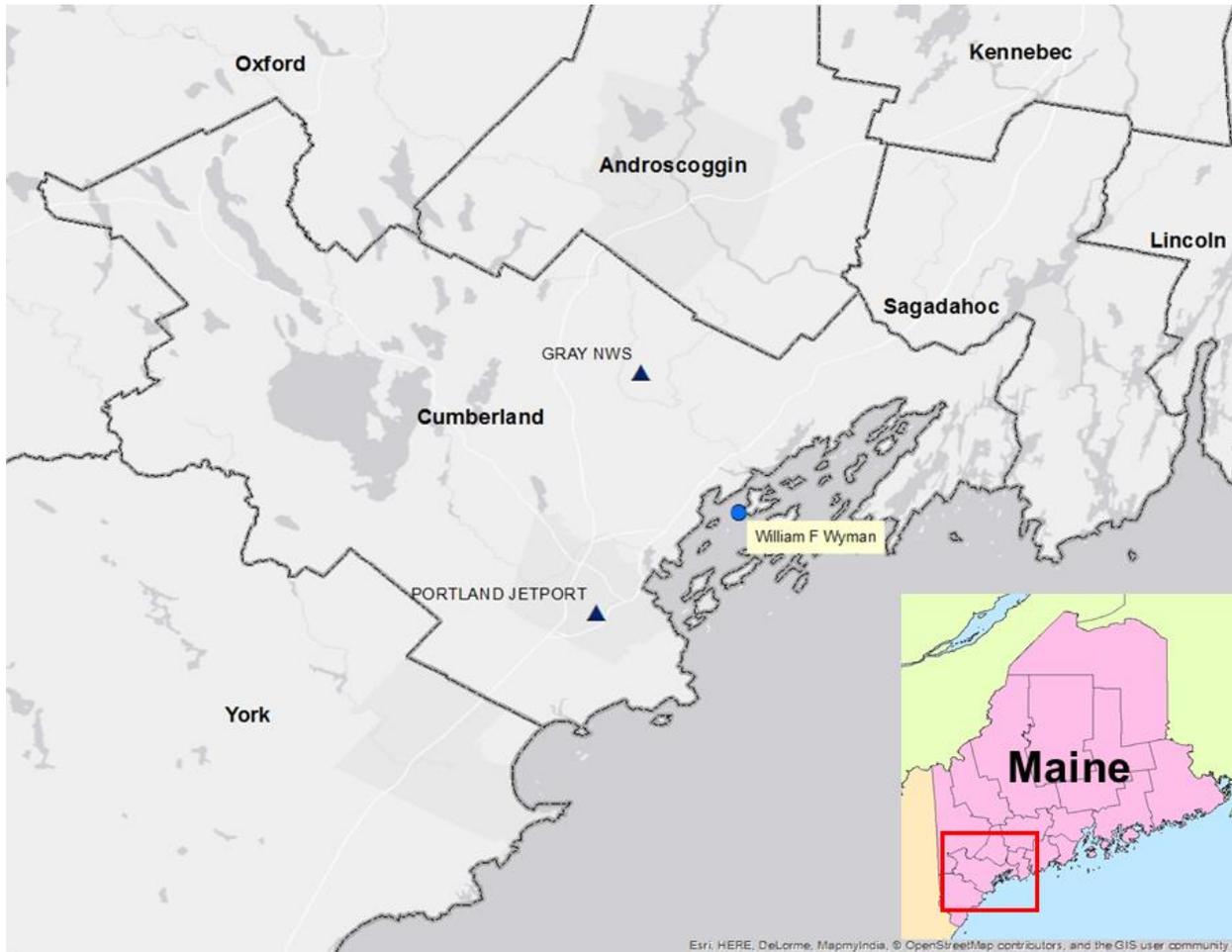
Figure 4. Modeled and Actual Locations of the Portland Jetport ASOS Site for Modeling of the Cumberland County Area

The source of this map image is Esri, used by EPA with Esri's permission.

In the figure below, generated by the EPA, the locations of these NWS stations are shown relative to the area of analysis.

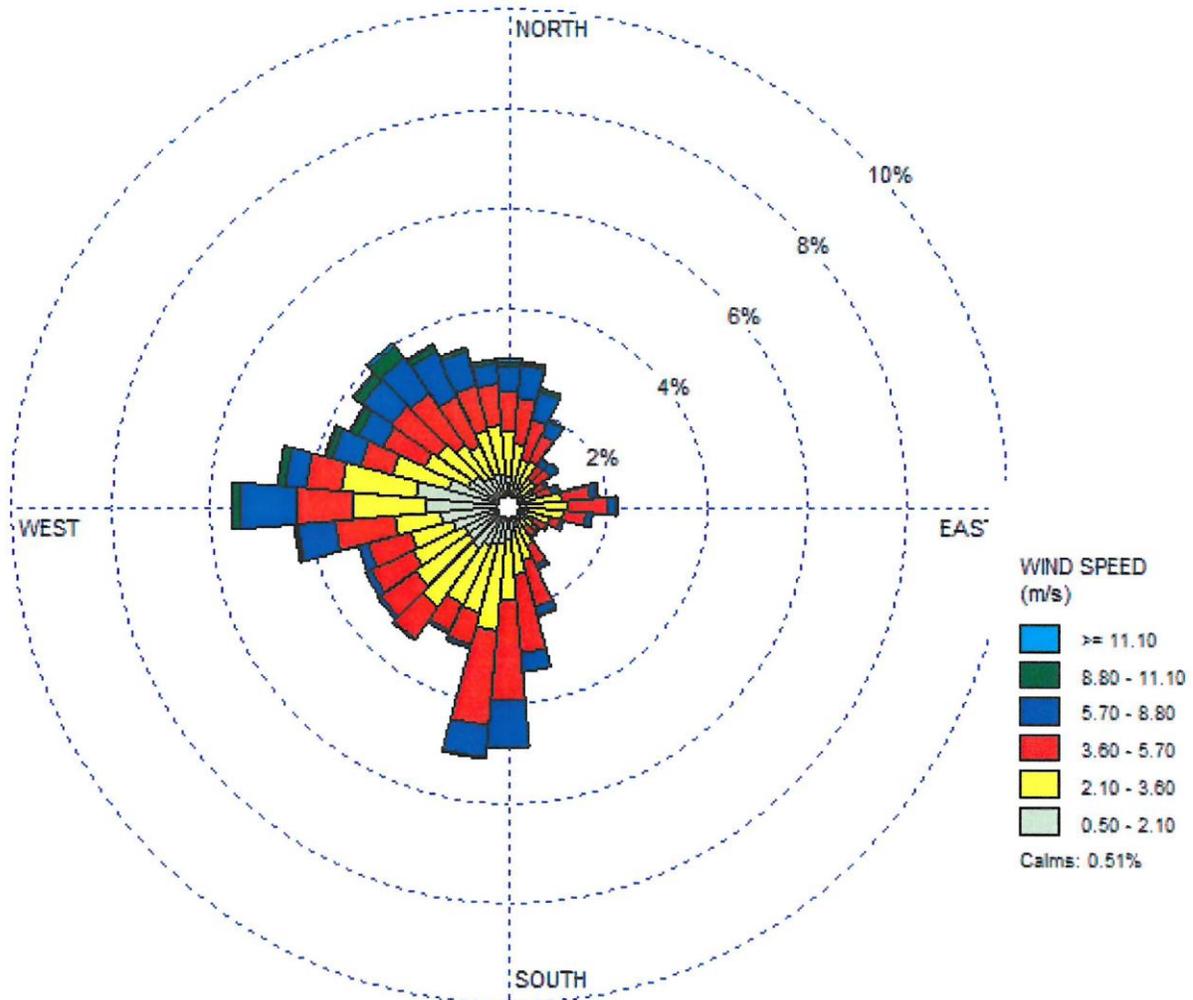**Figure 5. Area of Analysis and the NWS stations in the Cumberland County Area**

The source of this map image is Esri, used by EPA with Esri's permission.

As part of its June 2016 modeling protocol, which applied to meteorology for both the original and updated modeling analyses, the state provided the 3-year surface wind rose for the Portland Jetport ASOS site. In Figure 6, the frequency and magnitude of wind speed and direction are defined in terms of from where the wind is blowing. During the three-year period, the prevailing wind directions tended to be from the south through the north northwest quadrants, with much lower prevalence of wind from the east.

Figure 6. Cumberland County, Maine, Cumulative Annual Wind Rose for Years 2013 – 2015.

Note: Figure reproduced from the state's submission.

Meteorological data from the above surface and upper air NWS stations were used in generating AERMOD-ready files with the AERMET processor version 15181 in its January 2017 submission, and version 16216 in its June 2017 addendum. The EPA considers the updated meteorological modeling to supersede the original modeling per the state's request. The output meteorological data created by the AERMET processor is suitable for being applied with AERMOD input files for AERMOD modeling runs. The state followed the methodology and settings presented in the AERMET version 15181 User's Guide and Addendum in its original submission, and version 16216 User's Guide in its addendum, as clarified in the March 8, 2013, memorandum from Tyler Fox "Use of ASOS meteorological data in AERMOD dispersion modeling," in the processing raw meteorological data into an AERMOD-ready format, and used AERSURFACE to best represent surface characteristics.

Hourly surface meteorological data records are read by AERMET, and include all the necessary elements for data processing. However, wind data taken at hourly intervals may not always portray wind conditions for the entire hour, which can be variable in nature. Hourly wind data may also be overly prone to indicate calm conditions, which are not modeled by AERMOD. In order to better represent actual wind conditions at the meteorological tower, wind data of 1-minute duration was provided from the Portland Jetport ASOS site, but in a different formatted file to be processed by a separate preprocessor, AERMINUTE version 15272. These data were subsequently integrated into the AERMET processing to produce final hourly wind records of AERMOD-ready meteorological data that better estimate actual hourly average conditions and that are less prone to over-report calm wind conditions. This allows AERMOD to apply more hours of meteorology to modeled inputs, and therefore produce a more complete set of concentration estimates. As a guard against excessively high concentrations that could be produced by AERMOD in very light wind conditions, the state set a minimum threshold of 0.5 meters per second in processing meteorological data for use in AERMOD. In setting this threshold, no wind speeds lower than this value would be used for determining concentrations. This threshold was specifically applied to the 1-minute wind data.

Both NWS stations used in the development of meteorological inputs to AERMOD are located within the modeling domain, and are suitably representative of the meteorological conditions at Wyman. The meteorological data may have been improperly treated in its original submission because of an inadvertent error in meteorological site location. However, the state corrected the error in its June 2017 addendum. Therefore, the EPA concludes from the information at hand that the meteorological data were selected and treated appropriately in the state's June 2017 addendum, and are suitable for the current assessment.

3.3.2.7.   Modeling Parameter: Geography, Topography (Mountain Ranges or Other Air Basin Boundaries) and Terrain

The terrain in the area of analysis is best described as generally sloping from the northwest to the seacoast near the center of the area, and flat in the southeastern portion of the area (ocean). To account for this terrain, the AERMAP terrain program version 11103 within AERMOD was used to specify terrain elevations for all the receptors. The source of the elevation data incorporated into the model is from the US Geological Survey's National Elevation Dataset at 30-meter resolution.

Based on the submission, the EPA concludes the State's approach in specifying terrain elevations is appropriate.

3.3.2.8.   Modeling Parameter: Background Concentrations of SO_2

The Modeling TAD offers two mechanisms for characterizing background concentrations of SO_2 that are ultimately added to the modeled design values: 1) a "tier 1" approach, based on a

monitored design value, or 2) a temporally varying "tier 2" approach, based on the 99th percentile monitored concentrations by hour of day and season or month. For this area of analysis, the State used the tier 1 monitored design value from 2013-2015 for the Portland Deering Oaks site (AQS site number 23-005-0029) as reported by the EPA at our Air Quality Design Values website, https://www.epa.gov/air-trends/air-quality-design-values. The single value of the background concentration for this area of analysis was determined by the State to be 31.4 micrograms per cubic meter ($\mu g/m^3$), equivalent to 12 ppb when expressed in 2 significant figures,[6] and that value was incorporated into the final AERMOD results.

In its modeling protocol, the state indicated its rationale for selecting the Portland Deering Oaks monitor as the basis for its background concentrations. The reasons indicated by the state are:
- The monitor is close proximity to Wyman (~13.5 km).
- The monitor is located upwind from Wyman, which limits Wyman's direct contribution.
- Data concurrent with meteorological dataset (2013-2015) are available from the monitor.
- The monitor dataset for the period meets all minimum recovery criteria.
- The monitor conservatively (i.e., may overestimate) represents background concentrations due to its proximity to downtown Portland, Maine.

The EPA believes the background value of 31.4 $\mu g/m^3$ used for the assessment of Wyman station is appropriate, based on the data and reasoning provided by the state, and also because the only other large nearby source (i.e., SD Warren Co) is adequately represented in the monitored background levels due to its proximity, as discussed previously.

3.3.2.9.   Summary of Modeling Inputs and Results

The AERMOD modeling input parameters for the Cumberland County area of analysis are summarized below in Table 4. Note that this summary includes the most recent information contained in the June 2017 addendum.

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[6] The SO_2 NAAQS level is expressed in ppb but AERMOD gives results in $\mu g/m^3$. The conversion factor for SO_2 (at the standard conditions applied in the ambient SO_2 reference method) is 1ppb = approximately 2.619 $\mu g/m^3$.

Table 4. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the Cumberland County Area

Input Parameter	Value
AERMOD Version	16216r
Dispersion Characteristics	Rural
Modeled Sources	1 (with 5 emission units)
Modeled Stacks	2
Modeled Structures	9
Modeled Fencelines	1
Total receptors	3,213
Emissions Type	Hybrid (both actual and PTE)
Emissions Years	2013-2015
Meteorology Years	2013-2015
NWS Station for Surface Meteorology	Portland Jetport
NWS Station Upper Air Meteorology	Gray NWS
NWS Station for Calculating Surface Characteristics	Portland Jetport
Methodology for Calculating Background SO_2 Concentration	AQS site number 23-005-0029, Tier 1 design value
Calculated Background SO_2 Concentration	12 ppb (31.4 $\mu g/m^3$)

The results presented below in Table 5 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters for the June 2017 addendum.
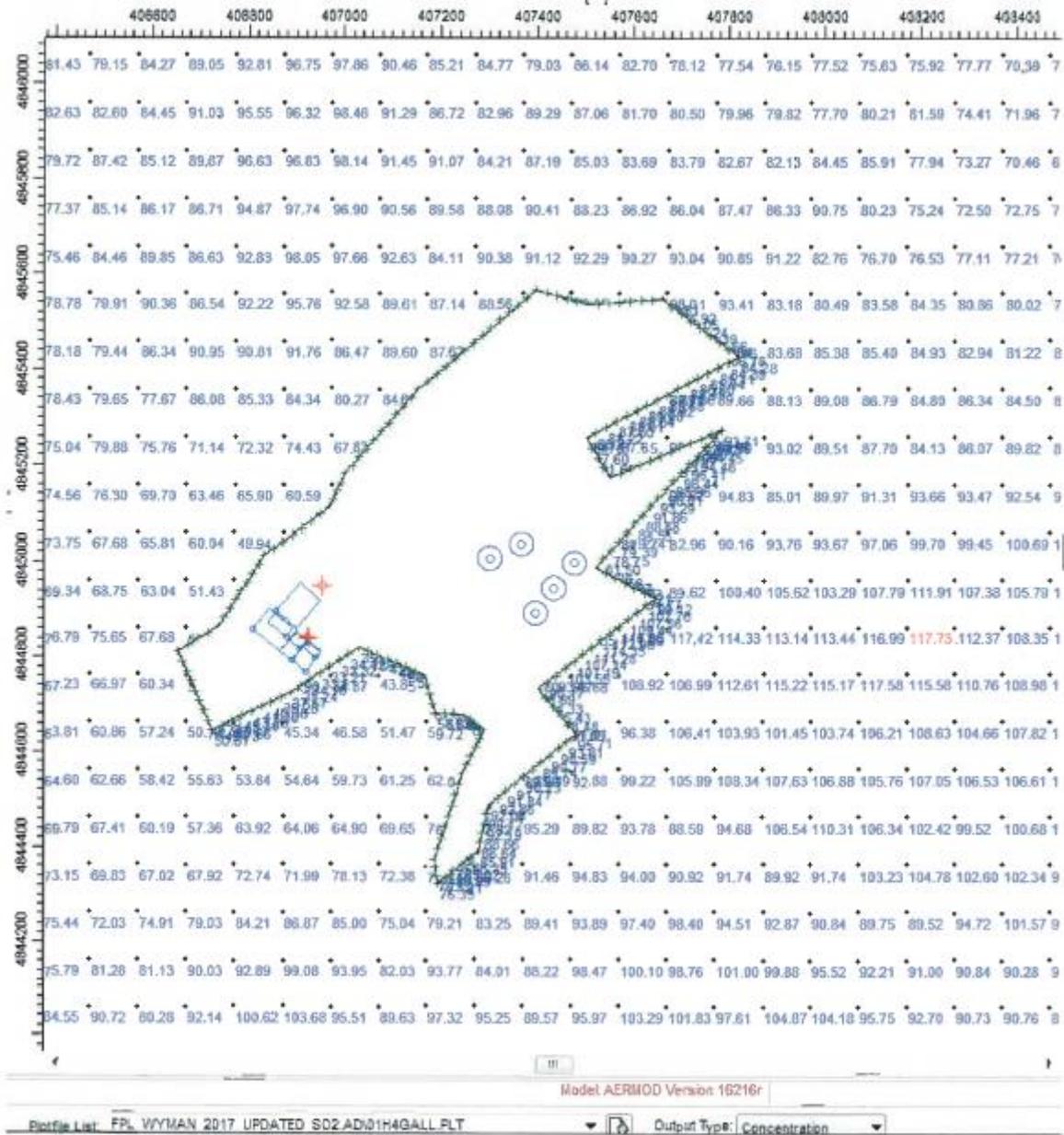
Table 5. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO_2 Concentration Averaged Over Three Years for the Area of Analysis for the Cumberland County Area

Averaging Period	Data Period	Receptor Location [UTM zone 19]		99th percentile daily maximum 1-hour SO_2 Concentration ($\mu g/m^3$)	
		UTM N (m)	UTM E (m)	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2013-2015	4,844,859	408,171	117.7	196.4*

*Equivalent to the 2010 SO_2 NAAQS of 75 ppb using a 2.619 $\mu g/m^3$ conversion factor

The state's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is approximately 117.7 µg/m^3, equivalent to 45.0 ppb. Results using erroneous inputs in the original January 2017 submittal were 108.4 µg/m^3, or 41.4 ppb, slightly lower than the June 2017 results relying on the corrected inputs and updated model, and occurred at a different location. (The state's original resulting value of 108.4 µg/m^3 is 12.0 ppb, or 31.4 µg/m^3, lower than the value provided by the state in its report due to the state's unintentionally double-counting of background levels.) This modeled concentration included the background concentration of SO_2, and is based on actual emissions from Units 1 through 4 and PTE emissions from Unit 5 of the facility. Figure 7 below was included as part of the state's June 2017 analysis, and indicates that the predicted value occurred about 1.2 km from the source, which is on the southeastern portion of Cousins Island. The state's near-source receptor grid with modeled values is also shown in Figure 7.

Figure 7. Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentrations Averaged Over Three Years for the Area of Analysis for the Cumberland County Area

Note: Figure reproduced from the state's June 2017 submission.

The modeling submitted by the state does not indicate that the 1-hour SO₂ NAAQS is violated at the receptor with the highest modeled concentration.

3.3.2.10. The EPA's Assessment of the Modeling Information Provided by the State

The modeling submitted by the state does not contain any significant departures from the Modeling TAD. As explained in the preceding sections, the EPA concurs with the state's

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selection of modeling components, including: rural operating mode; modeling domain and receptor placement; source characterization, including building and stack parameters; emissions parameters and rates; meteorological data and surface parameters; terrain elevations; and background concentrations. In summation, the EPA finds that modeling submitted by the state to be appropriate for use in the designations process for the 2010 1-hour SO_2 NAAQS.

3.4.   Emissions and Emissions-Related Data, Meteorology, Geography, and Topography for the Cumberland County, Maine Area

These factors have been incorporated into the air quality modeling efforts and results discussed above. The EPA is giving consideration to these factors by considering the air quality concentrations predicted by the modeling and whether these factors were properly incorporated, and by considering the air quality concentrations predicted by the modeling.

3.5.   Jurisdictional Boundaries in the Cumberland County Area

Existing jurisdictional boundaries are considered for the purpose of informing the EPA's designation action for Cumberland County. Our goal is to base designations on clearly defined legal boundaries, and to have these boundaries align with existing administrative boundaries when reasonable.

In 2011, the state recommended an unclassifiable designation for the entire state of Maine, including Cumberland County. This recommendation was based on the information available at the time, which did not include designations modeling data or source-oriented monitoring data.

3.6.   The EPA's Assessment of the Available Information for the Cumberland County Area

The EPA is basing our intended designation for Cumberland County, Maine, primarily on the updated modeling assessment provided by the state. As explained in section 3.3.2.10, the modeling submitted by the state does not contain any significant departures from the Modeling TAD, and the EPA concludes that the modeling submitted by the state is sufficient for the purpose of identifying potential violations of the NAAQS in this area. The EPA concurs with the state's selection of modeling components, including: rural operating mode; modeling domain and receptor placement; source characterization, including building and stack parameters; emissions parameters and rates; meteorological data and surface parameters; terrain elevations; and background concentrations. Ambient air monitoring data collected at the Portland Deering Oaks site in the Cumberland County area indicate levels below the 2010 SO_2 NAAQS. The EPA does not have information indicating that the monitor is located in an area of maximum concentration relative to Wyman. Therefore, the EPA agrees that the monitoring data from the Deering Oaks site is appropriate for characterizing background concentration, but not for supporting a decision on designations without the support air quality characterization described in previous portions of this section.

The boundaries for the intended designation for the Cumberland County area are the jurisdictional boundaries of Cumberland County. There are no modeling results available for adjacent areas. Based on version 1 of the 2014 National Emissions Inventory (NEI), there are no SO_2 sources within 40 km outside the boundaries of Cumberland County with annual emissions greater than 100 tons. The EPA has no information indicating the presence of a violation near the border of Cumberland County.

There are no areas within or near Cumberland County that are intended to remain undesignated after Round 3 designations are completed, and that would therefore be designated in a later action.

For these reasons, the EPA also finds that this area does not contribute to nonattainment in a nearby area.
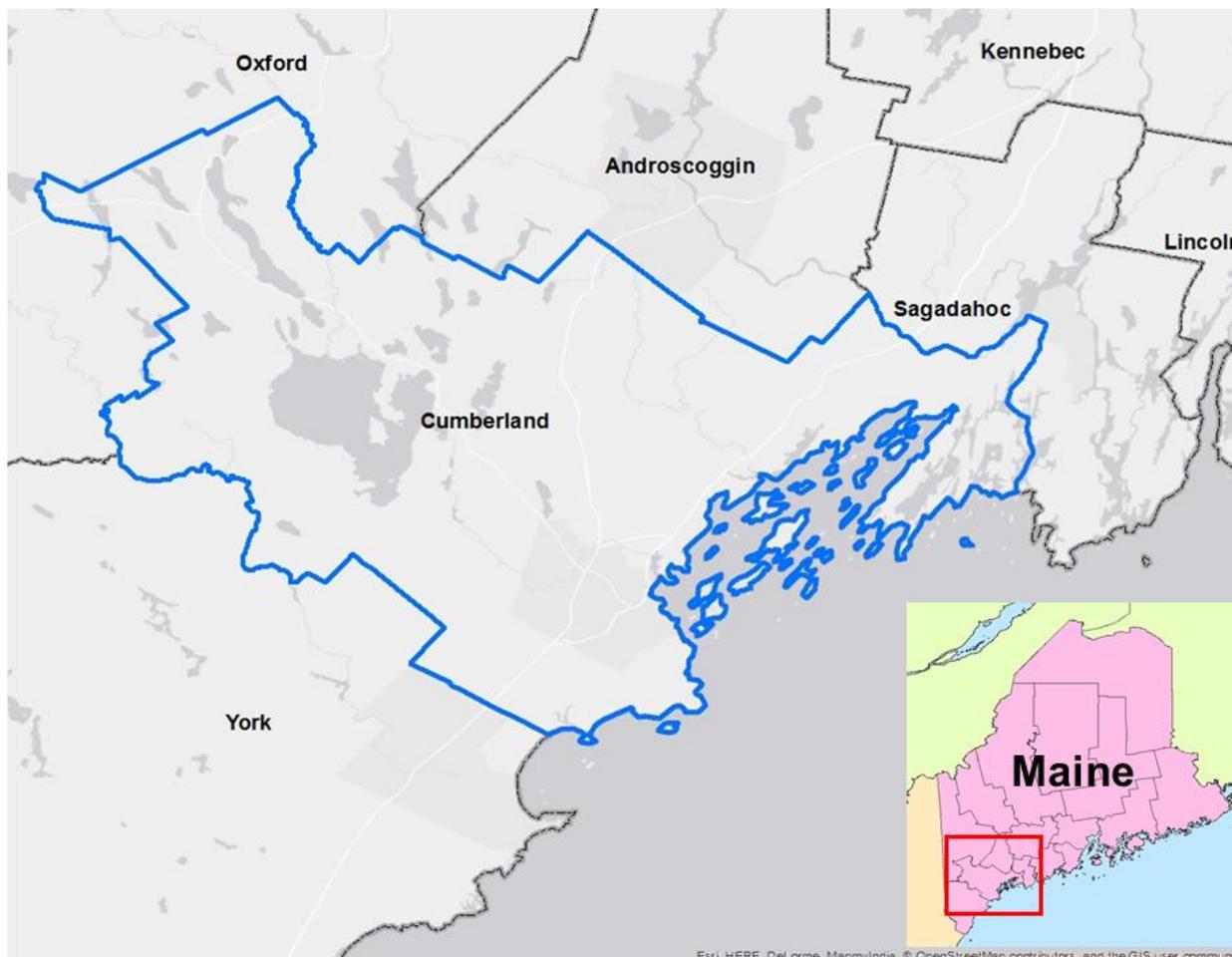
The EPA believes that our intended unclassifiable/attainment area, bounded by the jurisdictional boundaries of Cumberland County, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area.

3.7.   Summary of Our Intended Designation for the Cumberland County Area

After careful evaluation of the State's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate Cumberland County, Maine, as unclassifiable/attainment for the 2010 SO_2 NAAQS because, based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined the area (i) meets the 2010 SO_2 NAAQS, and (ii) does not contribute to ambient air quality in a nearby area that does not meet the NAAQS. Specifically, the boundaries are comprised of the jurisdictional boundaries of Cumberland County. This area will be designated along with York County and the Rest of Maine, described in Sections 4 and 5 of this preliminary TSD, as a single area for the entire state of Maine.

Figure 8 shows the boundaries of this intended designated area.

Figure 8. Boundary of the Intended Cumberland County Unclassifiable/Attainment Area

The source of this map image is Esri, used by EPA with Esri's permission.

At this time, our intended designations for the State only apply to this area and the other areas presented in this technical support document.

4. Technical Analysis for the York County Area

4.1. Introduction

The EPA must designate the York County, Maine, area by December 31, 2017, because the area has not been previously designated and Maine has not installed and begun timely operation of a new, approved SO_2 monitoring network to characterize air quality in the vicinity of any source in Cumberland County.

4.2. Air Quality Monitoring Data for the York County Area

This factor considers the SO_2 air quality monitoring data in the area of York County. The state did not include any monitoring information for York County in its 2011 recommendation, nor

did it provide any monitoring information for the York County area in its 2017 DRR modeling submittal.

The EPA has reviewed relevant available monitoring data in the Air Quality System (AQS), and identified one SO_2 monitor in York County and one monitor proximate to York County.

- Air Quality System (AQS) monitor 23-031-0009. A special monitoring study was conducted from October 24, 2014 to April 1, 2016 during which ambient SO_2 concentrations were collected at Sawgrass Lane in Eliot, Maine, located approximately 2.0 km to the northeast of Schiller Station. The monitor was placed to coincide with expected highest impacts from Schiller Station based on previous modeling. The Sawgrass Lane monitor was not in operation for long enough to develop a design value. During the Sawgrass Lane monitoring study, the highest observed level was 37.7 ppb, and no exceedances of the level of the standard were observed. Neither Maine nor New Hampshire relied on data from the Sawgrass Lane monitor to support or corroborate air dispersion modeling results.
- AQS monitor 33-015-0014. This monitor is located on Peirce Island in Portsmouth, New Hampshire, in Rockingham County, and is about 3.9 km to the southeast of Schiller Station. Peirce Island is on the Piscataqua River which delineates the border between Maine (York County) and New Hampshire. Data collected at this monitor indicates that SO_2 levels have declined from 60 parts per billion (ppb; design value for 2004-2006) to 29 ppb (design value for 2013-2015). New Hampshire intended all available data collected at this monitor to support and corroborate air dispersion modeling results. The EPA does not have information to support that this monitor is located in a location of maximum concentration for the area.

For reference, see the annual posted air quality Design Values for SO_2 posted at our Air Quality Design Values website, https://www.epa.gov/air-trends/air-quality-design-values.

4.3. Air Quality Modeling Analysis for the York County Area

4.3.1. Introduction

This section presents all the available air quality modeling information for York County. York County, Maine, is adjacent to Rockingham County, New Hampshire, which contains Schiller Station and Newington Station.

In its 2011 submission, Maine recommended the entire state be designated as unclassifiable based in part on a lack of modeling data to characterize areas around the State. As required by the DRR, New Hampshire has characterized SO_2 air quality via modeling around Schiller and Newington. A description of New Hampshire's modeling for Schiller and Newington, as well as EPA's assessment of New Hampshire's modeling, is provided in the New Hampshire Chapter to the TSD.

Maine has not submitted an assessment or characterization for this area. The EPA intends to designate this area based on the modeling provided by New Hampshire. New Hampshire's

assessment and characterization was performed using air dispersion modeling software, i.e., AERMOD, analyzing currently allowable emissions for Newington and Schiller. As discussed in the TSD Chapter for New Hampshire, the EPA finds these limits provide for attainment of the SO_2 NAAQS in the New Hampshire Seacoast area. Further, the EPA concludes that these limits would also provide for attainment in the York County, Maine, area. After careful review of New Hampshire's assessment, supporting documentation, and all available data, the EPA intends to designate the York County, Maine, area as unclassifiable/attainment as part of the designation for the entire state of Maine described in Section 5 of this TSD chapter.
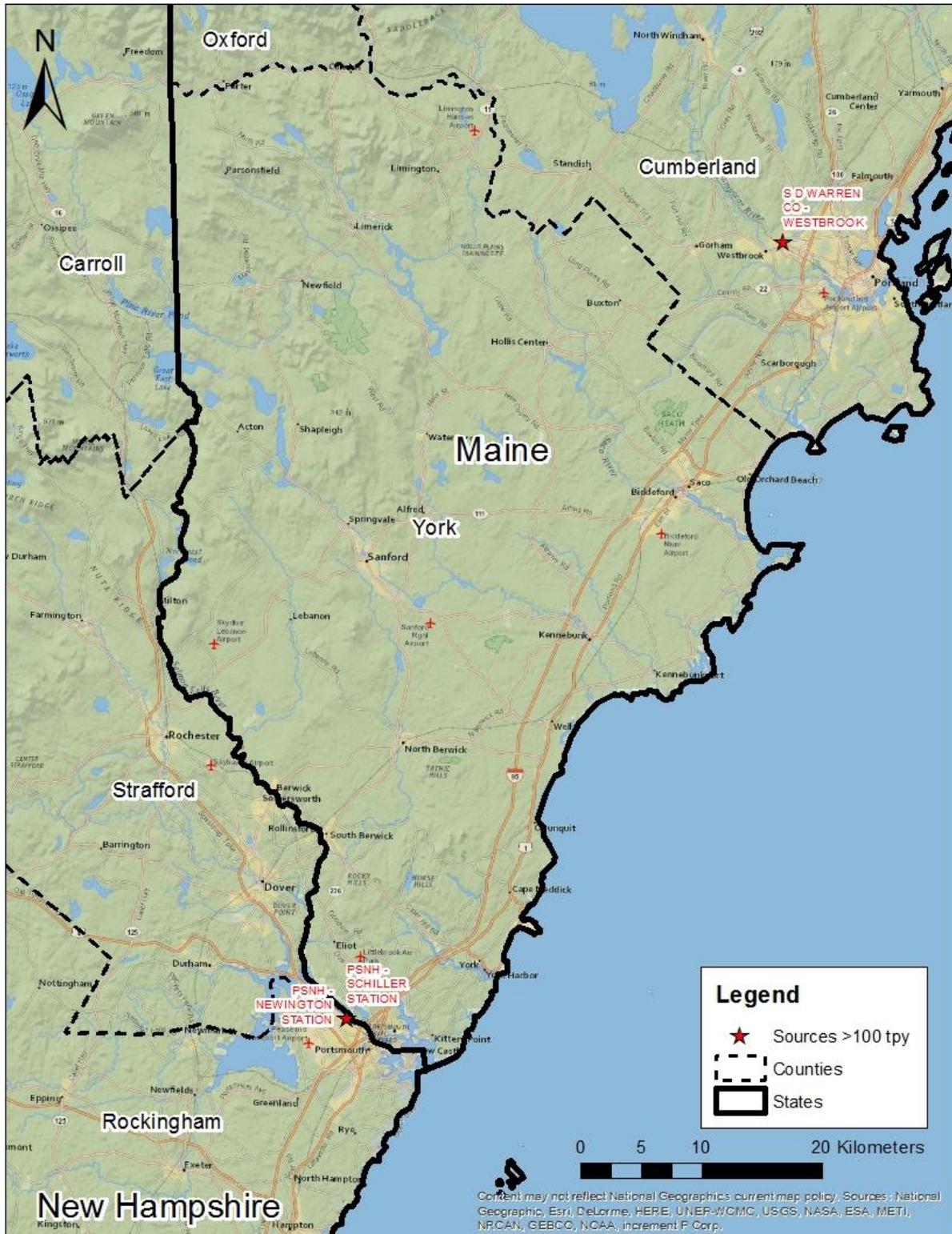
The area that New Hampshire has assessed via air quality modeling covers the majority of York County, Maine, and is centered between Schiller (Portsmouth, New Hampshire) and Newington (Newington, New Hampshire) at the New Hampshire-Maine border. A full description of the New Hampshire modeling is presented in the New Hampshire Chapter of the TSD.

As seen in Figure 9 below, the Schiller and Newington facilities are located adjacent to York County, Maine, in Portsmouth, New Hampshire, and Newington, New Hampshire, respectively. Also included in Figure 9 are other nearby emitters of SO_2.[7]

Maine's 2011 recommendation was for the entire state to be designated as unclassifiable. The EPA's intended designation boundary for the York County, Maine, area is not shown in Figure 9, but is shown in Figure 13 in the section below that summarizes our intended designation.

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[7] SO_2 emitters of 100 tpy or more (based on information in the EPA's 2014 version 1 National Emissions Inventory) are shown in Figure 9.

Figure 9. Map of the York County, Maine, Area

The source of this map image is Esri, used by EPA with Esri's permission.

The discussion and analysis that follows below will reference the Modeling TAD and the factors for evaluation contained in the EPA's July 22, 2016, guidance and March 20, 2015, guidance, as appropriate.
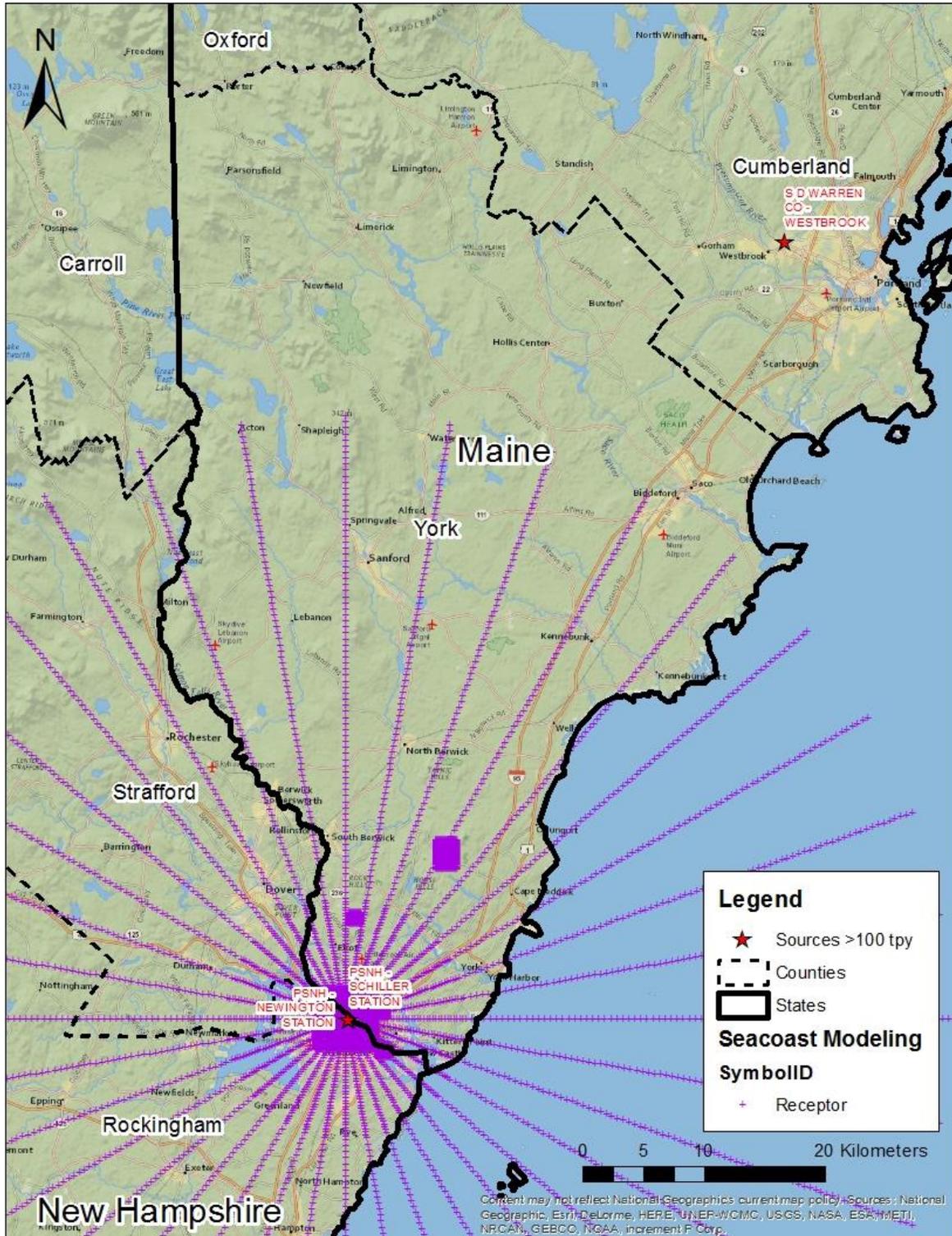
4.3.2. *Modeling Analysis Provided by the State*

Maine did not provide any dispersion modeling for this area.

4.3.3. *Modeling Analysis Provided by New Hampshire*

A full description and EPA's assessment of New Hampshire's modeling analysis is presented in the TSD Chapter for New Hampshire. The section below presents a summary of the model inputs and results. The EPA has concluded that the New Hampshire modeling analysis is a relevant characterization of air quality for York County, Maine, due to the geographic extent of the modeling domain, the spatial resolution of the receptor grid within York County, Maine, and the inclusion of the principal sources expected to contribute to SO_2 air quality in the area. Figure 10 displays the New Hampshire modeling domain and receptor grid relative to York County, Maine.

Figure 10. Area of Analysis for the New Hampshire Seacoast Area Relative to the York County, Maine Area

The source of this map image is Esri, used by EPA with Esri's permission.

The AERMOD modeling input parameters for the New Hampshire Seacoast area of analysis are summarized below in Table 6. A full description and the EPA's assessment of the modeling submitted by New Hampshire for the New Hampshire Seacoast area, which is adjacent to York County, Maine, is available in the TSD Chapter for New Hampshire. This modeling analysis informs the EPA's intended decision for designating the York County, Maine, area.

Table 6. Summary of AERMOD Modeling Input Parameters for the Area of Analysis for the New Hampshire Seacoast Area

Input Parameter	Value
AERMOD Version	16216r
Dispersion Characteristics	Rural
Modeled Sources	8
Modeled Stacks	34
Modeled Structures	53
Modeled Fencelines	2
Total receptors	10,457
Emissions Type	Hybrid (some actuals and some PTE)
Emissions Years	2011-2014
Meteorology Years	2010-2014
NWS Station for Surface Meteorology	Portsmouth International Airport (PSM)
NWS Station Upper Air Meteorology	Gray, Maine
NWS Station for Calculating Surface Characteristics	Portsmouth International Airport (PSM)
Methodology for Calculating Background SO_2 Concentration	Tier 2 approach utilizing 96 seasonal-hourly pairs derived from observations at Peirce Island (AQS# 33-015-0014) and Londonderry (AQS# 33-015-0018)
Calculated Background SO_2 Concentration	Range: 4.45 to 11.68 ppb

The results presented below in Table 7 show the magnitude and geographic location of the highest predicted modeled concentration based on the input parameters.
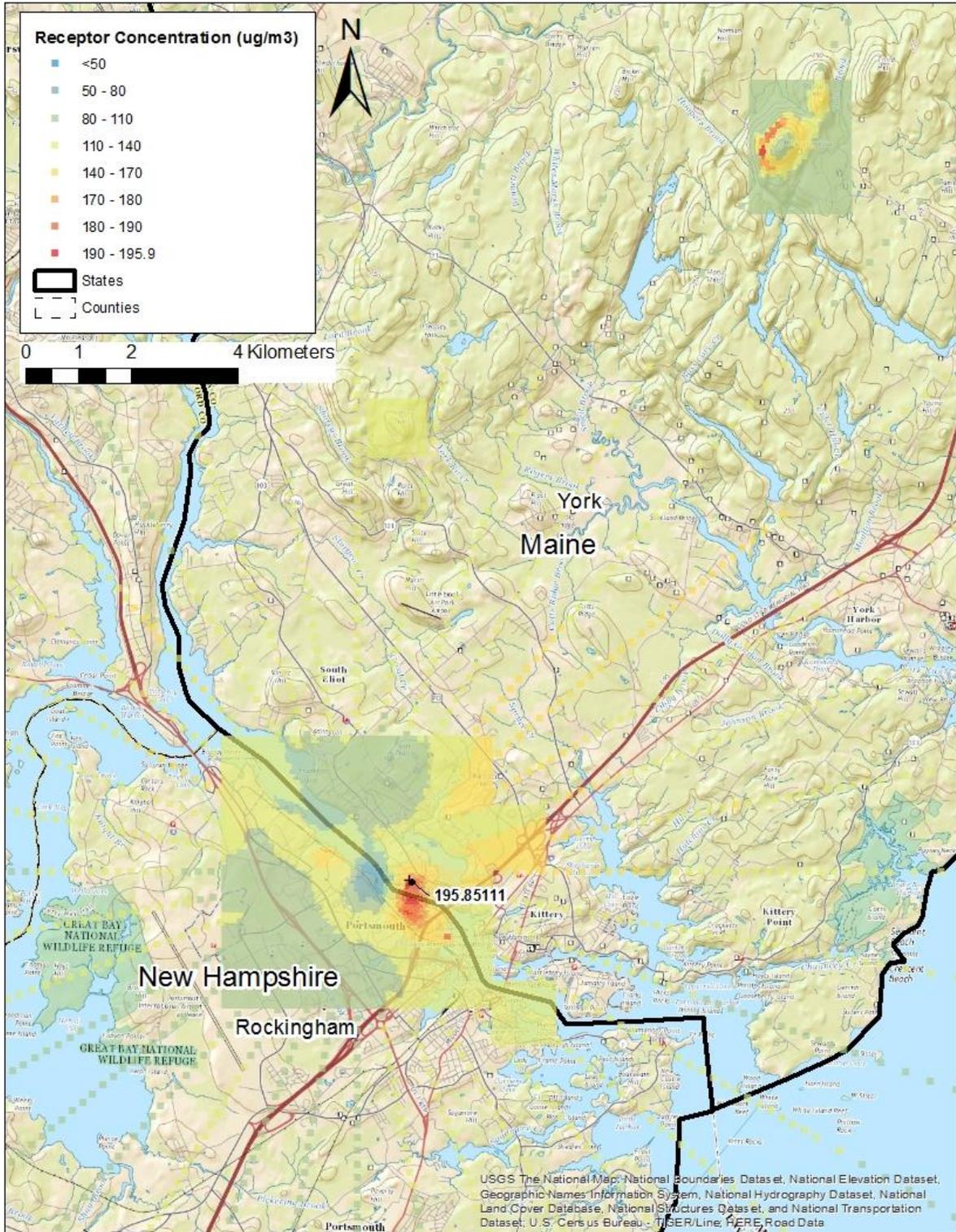
Table 7. Maximum Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentration Averaged Over Five Years for the Area of Analysis for the New Hampshire Seacoast Area

| Averaging Period | Data Period | Receptor Location [UTM zone 19] | | 99th percentile daily maximum 1-hour SO$_2$ Concentration (μg/m^3) | |
		UTM/X (meters)	UTM/Y (meters)	Modeled concentration (including background)	NAAQS Level
99th Percentile 1-Hour Average	2010-2014	355555.8	4773180	195.9	196.4*

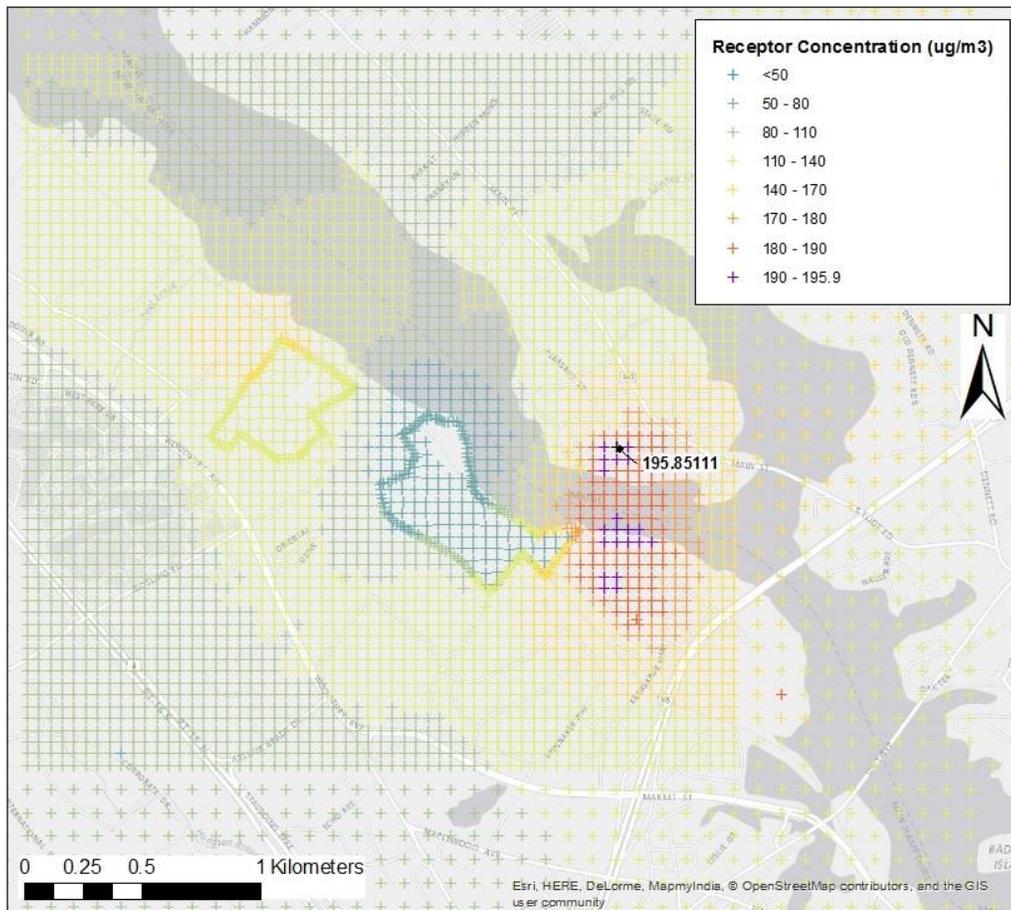*Equivalent to the 2010 SO$_2$ NAAQS of 75 ppb using a 2.619 μg/m^3 conversion factor

New Hampshire's modeling indicates that the highest predicted 99th percentile daily maximum 1-hour concentration within the chosen modeling domain is 195.9 μg/m^3, equivalent to 74.8 ppb. This modeled concentration included the background concentration of SO$_2$, and is based on a mixture of actual and PTE emissions from the facilities. Figure 11 below was developed by the EPA based on model files provided by New Hampshire, and indicates that the predicted value occurred in a populated area of South Eliot, Maine, just across the Piscataqua River from Schiller. The highest receptor is among a cluster of similarly high receptors just to the east of Schiller and spanning areas of Portsmouth, New Hampshire, and Eliot, Maine. A cluster of high receptors is also noticeable in Figure 11 at Mount Agamenticus (in York County, Maine) approximately 16 km to the northeast of Schiller and Newington, though the highest receptor is not located in that area. Figure 12, similarly developed by the EPA using the same data, shows this area of receptors. New Hampshire's receptor grid is also shown in Figure 12.

Figure 11. Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentrations Averaged Over Five Years for the Area of Analysis for the New Hampshire Seacoast Area

The source of this map image is Esri, used by EPA with Esri's permission.

Figure 12. Closer View of the Predicted 99th Percentile Daily Maximum 1-Hour SO₂ Concentrations Averaged Over Five Years for the Area of Analysis for the New Hampshire Seacoast Area

The source of this map image is Esri, used by EPA with Esri's permission.

The modeling submitted by the state does not indicate that the 1-hour SO₂ NAAQS is violated at the receptor with the highest modeled concentration.

4.3.4.   *The EPA's Assessment of the Modeling Information Provided by New Hampshire*

The TSD Chapter for New Hampshire provides a full description and assessment of New Hampshire's modeling of the New Hampshire Seacoast area, which the EPA intends to use as a basis for designation of the York County, Maine, area. New Hampshire's modeling includes the principal sources expected to contribute to SO₂ air quality in York County, Maine, specifically Schiller and Newington. New Hampshire's modeling also includes additional sources in the modeling domain. There are no other notable emission sources in York County, Maine. Furthermore, the New Hampshire Seacoast area receptor grid covers the majority of York County, Maine, with sufficient spatial resolution to allow the EPA to draw conclusions about the attainment status of this area.

In summary, the EPA concurs with New Hampshire's selection of modeling components, including rural operating mode; modeling domain and receptor placement; source characterization, including building and stack parameters; emission rates; meteorological data and surface parameters; terrain elevations; and background concentrations.

In summation, the EPA finds that modeling submitted by New Hampshire to be appropriate for use in the designations process for the 2010 1-hour SO_2 NAAQS.

4.4. Jurisdictional Boundaries in the York County Area

Existing jurisdictional boundaries are considered for the purpose of informing the EPA's designation action for York County. Our goal is to base designations on clearly defined legal boundaries, and to have these boundaries align with existing administrative boundaries when reasonable.

In 2011, the state recommended an unclassifiable designation for the entire state of Maine, including York County. This recommendation was based on the information available at the time, which did not include designations modeling data or source-oriented monitoring data.

4.5. Other Information Relevant to the Designations for the York County Area

The EPA also received modeling for this area from Sierra Club on July 24, 2014. This modeling included scenarios with either historic hourly emissions (through March 2013) or previously allowable emission rates of 2.4 lb/MMBtu for Schiller Units 4 and 6. Neither scenario in the Sierra Club modeling reflects current conditions. First, the historic actual emissions do not reflect operation of the dry sorbent injection systems installed in 2016 for Units 4 and 6 for the control of SO_2 and other pollutants. Second, New Hampshire's June 15, 2017 revised Title V operating permit (TV-0053) for Schiller includes updated federally enforceable limits of 0.83 lb/MMBtu for Units 4 and 6 on a boiler operating day basis, as required by NH Rule 616 (see the TSD Chapter for New Hampshire), as well as recently revised allowable emissions rates at nearby Newington Station. The updated limits for Schiller Units 4 and 6 are 65% lower than the previously allowable emission rates used in the Sierra Club modeling. The modeling submitted by New Hampshire on February 27, 2017, includes emissions from Schiller Units 4 and 6 that are comparably stringent to the emission limits revised on June 15, 2017, and does not indicate that the 1-hour SO_2 NAAQS is violated at the receptor with the highest modeled concentration or for any location in York County, Maine. Therefore, because neither the actual nor allowable emission rates included in the Sierra Club modeling reflect current conditions for Schiller, and because New Hampshire's February 27, 2017 modeling assessment is appropriate for use in the current designations process (see the TSD Chapter for New Hampshire), the EPA will not rely on the Sierra Club modeling for the current designations process.

4.6.   The EPA's Assessment of the Available Information for the York County Area

The EPA is basing our intended designation for the York County area primarily on the modeling assessment provided by New Hampshire. Ambient air monitoring data collected at the temporary Sawgrass Lane monitor, which was located in an area of expected maximum concentration, indicate levels below the level of the NAAQS, though data were not collected for a sufficient period of time to provide a valid design value.

Based on this assessment, the EPA concludes that New Hampshire's analysis has the capability to demonstrate that no violations of the NAAQS will occur based on allowable limits for DRR sources near the area. As explained in the preceding sections and in the New Hampshire Chapter of the TSD, the EPA concurs with the state's selection of modeling components, including: rural operating mode; modeling domain and receptor placement; source characterization, including stack parameters; emissions parameters and rates; meteorological data and surface parameters; terrain elevations; and background concentrations. Therefore, the EPA believes that the modeling submitted by New Hampshire is sufficient to base designations determinations on for the York County, Maine, area. York County is not nearby to any area where designations are deferred, nor is there any data to suggest that sources within York County contribute to any nearby nonattainment area, mainly the Central New Hampshire Nonattainment Area; the largest SO_2 source in York County emitted 9.8 tons in 2014 and is 57 km from the Central New Hampshire nonattainment area.

The EPA believes that our intended unclassifiable/attainment area, bounded by the jurisdictional boundaries of York County, Maine, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area. This area will be designated along with Cumberland County and the Rest of Maine, described in Sections 3 and 5, as a single area for the entire state of Maine.
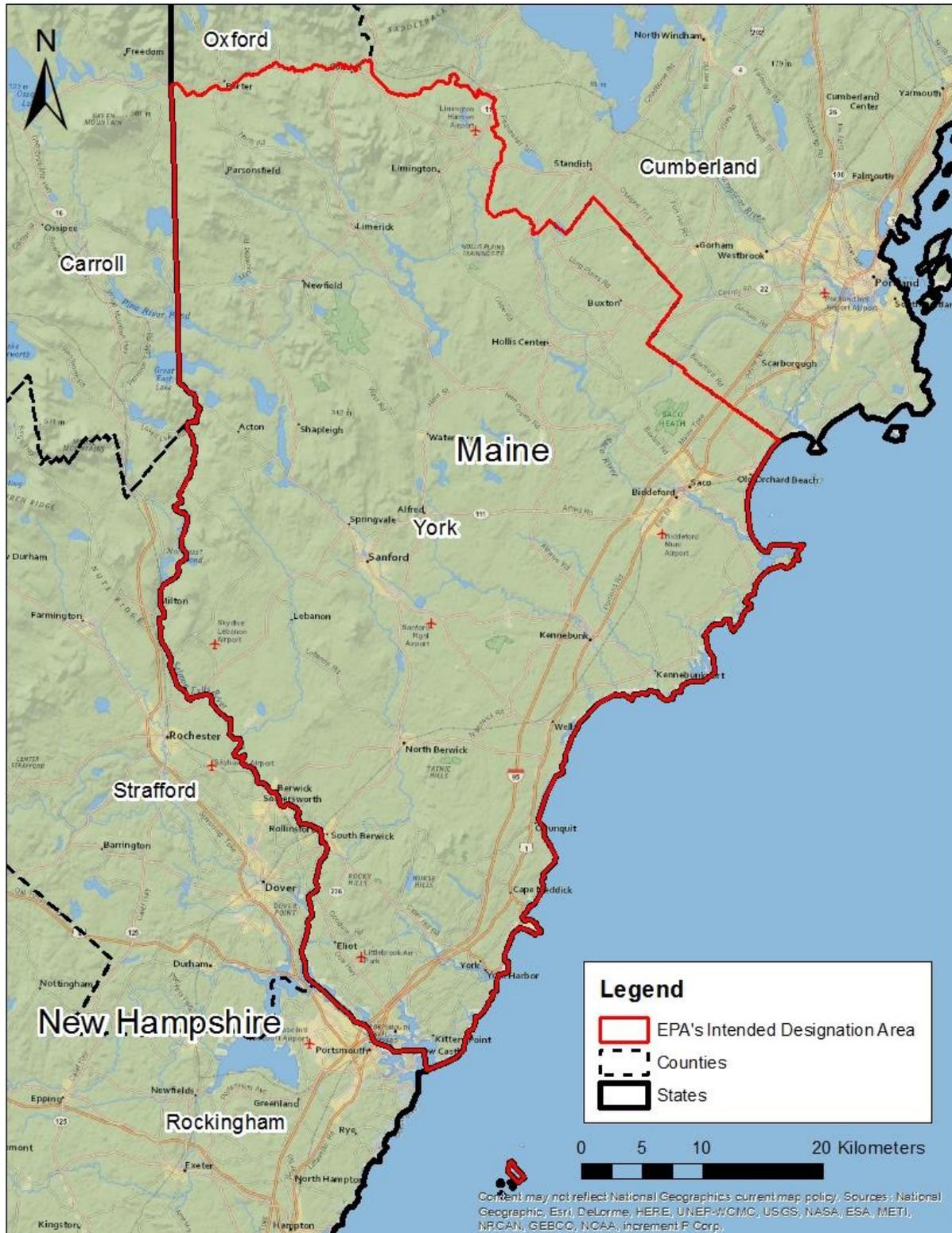
There are no areas within or near York County that are intended to remain undesignated after Round 3 designations are completed, and that would therefore be designated in a later action.

4.7.   Summary of Our Intended Designation for the York County Area

After careful evaluation of the State's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate York County, Maine, as unclassifiable/attainment for the 2010 SO_2 NAAQS with the Rest of Maine as described in Section 5. because, based on available information including (but not limited to) appropriate modeling analyses and/or monitoring data, the EPA has determined the area (i) meets the 2010 SO_2 NAAQS, and (ii) does not contribute to ambient air quality in a nearby area that does not meet the NAAQS.

Figure 13 shows the boundaries of this intended designated area, within the State of Maine.

Figure 13. Boundary of the Intended York County Unclassifiable/Attainment Area

The source of this map image is Esri, used by EPA with Esri's permission.

At this time, our intended designations for the State only apply to this area and the other areas presented in this technical support document.

5. Technical Analysis for the Rest of Maine
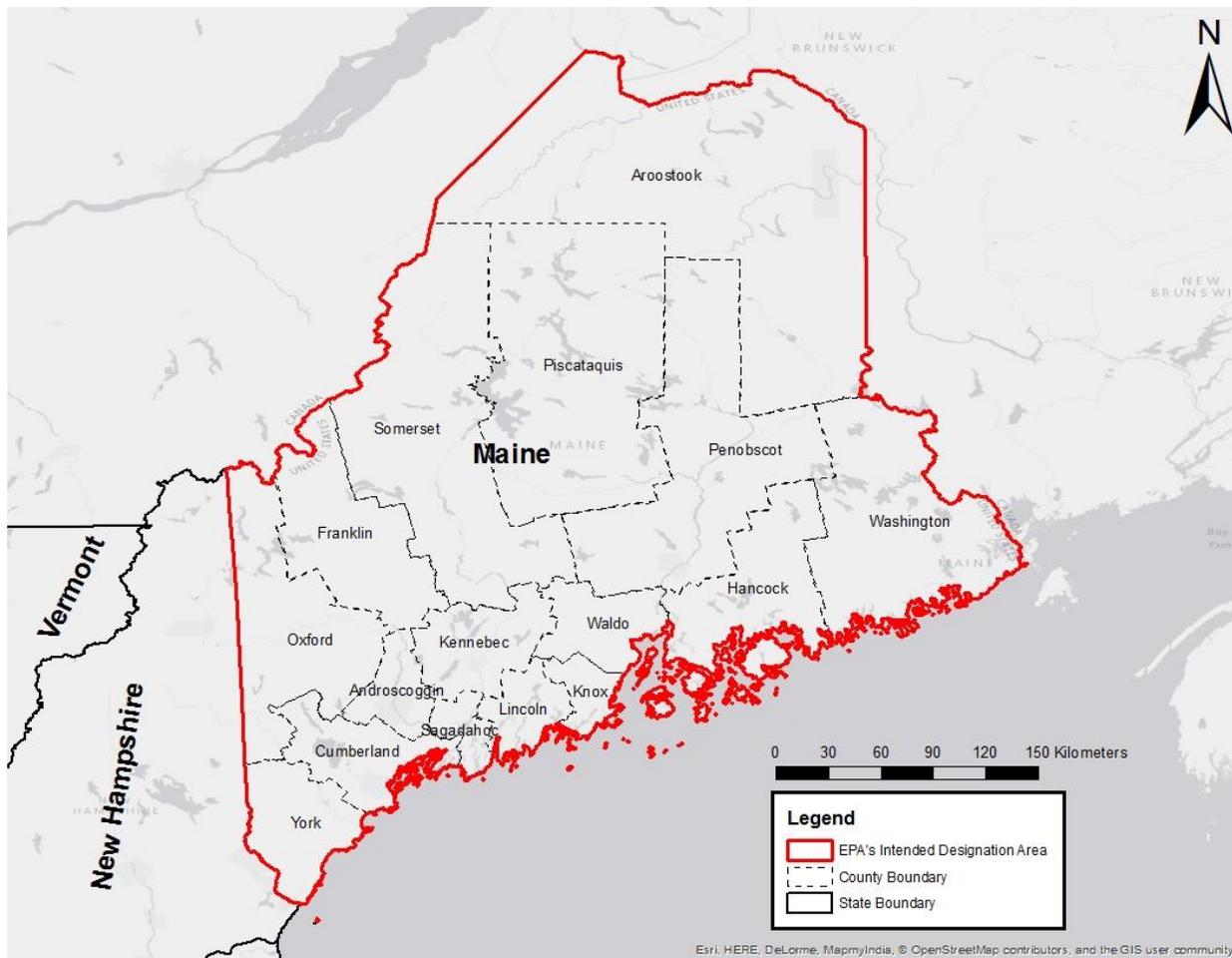
5.1. Introduction

The state has not timely installed and begun operation of a new, approved SO_2 monitoring network meeting EPA specifications referenced in the EPA's SO_2 DRR for any sources of SO_2 emissions in the counties and portions of counties identified in Table 8. Accordingly, the EPA must designate these counties or portions of counties by December 31, 2017. At this time, there are no air quality modeling results available to the EPA for these counties and portions of counties. In addition, there is no air quality monitoring data that indicate any violation of the 1-hour SO_2 NAAQS. The EPA is designating the counties and portions of counties in Table 8 in the state as "unclassifiable/attainment" since these counties were not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS. Also included in this table are Cumberland and York Counties, which EPA intends to include along with the Rest of Maine in a single designated area encompassing the entire state of Maine.

Table 8. Counties that the EPA Intends to Designate Unclassifiable/Attainment

County	Maine's Recommended Area Definition	Maine's Recommended Designation	EPA's Intended Area Definition	EPA's Intended Designation
Androscoggin	Entire state of Maine	Unclassifiable	The entirety of Androscoggin, Aroostook, Cumberland, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Piscataquis, Sagadahoc, Somerset, Waldo, Washington, and York Counties, Maine	Unclassifiable/ Attainment
Aroostook				
Cumberland				
Franklin				
Hancock				
Kennebec				
Knox				
Lincoln				
Oxford				
Penobscot				
Piscataquis				
Sagadahoc				
Somerset				
Waldo				
Washington				
York				

Table 8 also summarizes Maine's recommendations for these counties. Specifically, the state recommended that the entire state of Maine be designated as unclassifiable based in part on a lack of modeling data to characterize areas around the state. After careful review of the state's assessment, supporting documentation, and all available data, the EPA intends to designate the entire state of Maine as unclassifiable/attainment. Figure 14 shows the locations of these areas within Maine.

Figure 14. The EPA's Intended Unclassifiable/Attainment Designation for the Entire State of Maine

The source of this map image is Esri, used by EPA with Esri's permission.

As discussed in the Section 1, there are no counties associated with sources for which Maine has installed and begun timely operation of a new, approved SO_2 monitoring network and which are required to be designated by December 31, 2020, but are not being addressed at this time. Additionally, no areas in Maine were previously designated in Round 1 or Round 2.

5.2. Air Quality Monitoring Data for Aroostook County and Hancock Counties, Maine

AQS monitor 23-003-1100 located at Presque Isle at 8 Northern Road in Aroostook County, Maine, and AQS monitor 23-009-0103 located at Bar Harbor on McFarland Hill at Acadia National Park in Hancock County, Maine, have sufficient valid data for 2013-2015. These data indicate that there were no violations of the 2010 SO_2 NAAQS at the monitoring sites in that period, but the EPA does not have information to support the monitors are located in maximum concentrations for each respective area.

For reference, see the annual posted air quality Design Values for SO_2 posted at our Air Quality Design Values website, https://www.epa.gov/air-trends/air-quality-design-values.

5.3. Jurisdictional Boundaries in the Rest of Maine

Existing jurisdictional boundaries are considered for the purpose of informing the EPA's designation action for the rest of Maine areas. Our goal is to base designations on clearly defined legal boundaries, and to have these boundaries align with existing administrative boundaries when reasonable.

5.4. The EPA's Assessment of the Available Information for the Rest of Maine

These counties were not required to be characterized under 40 CFR 51.1203(c) or (d) and the EPA does not have available information including (but not limited to) appropriate modeling analyses and/or monitoring data that suggests that the area may (i) not be meeting the NAAQS, or (ii) contribute to ambient air quality in a nearby area that does not meet the NAAQS. These counties therefore meet the definition of an "unclassifiable/attainment" area for this action.

Our intended unclassifiable/attainment area, bounded by the jurisdictional boundaries of Androscoggin, Aroostook, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Piscataquis, Sagadahoc, Somerset, Waldo, and Washington Counties, Maine, will have clearly defined legal boundaries, and we intend to find these boundaries to be a suitable basis for defining our intended unclassifiable/attainment area. These counties will be designated along with Cumberland and York Counties, described in Sections 3 and 4, as a single unclassifiable/attainment area for the entire state of Maine.

5.5. Summary of Our Intended Designation for the Rest of Maine

After careful evaluation of the state's recommendation and supporting information, as well as all available relevant information, the EPA intends to designate the rest of Maine as unclassifiable/attainment for the 2010 SO_2 NAAQS. Specifically, the boundaries are comprised of the combined jurisdictional boundaries of Androscoggin, Aroostook, Franklin, Hancock, Kennebec, Knox, Lincoln, Oxford, Penobscot, Piscataquis, Sagadahoc, Somerset, Waldo, and

Washington Counties, Maine. This area will be designated along with Cumberland and York Counties, described in Sections 3 and 4, as a single unclassifiable/attainment area for the entire state of Maine.

At this time, our intended designations for the state only apply to these areas and the areas presented in Sections 3 and 4. Following the completion of these Round 3 designations, there will be no remaining undesignated areas in Maine.

Figure 14 shows the location of this area within Maine.