

**Responses to Significant Comments on the Designation  
Recommendations for the 2010 Sulfur Dioxide Primary National  
Ambient Air Quality Standard (NAAQS)**

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U.S. Environmental Protection Agency

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## I. Introduction

This document, together with the preamble to the final designations action, and the Technical Support Documents (TSDs) for the designations, presents the responses of the U.S. Environmental Protection Agency (EPA) to the significant comments we received on our responses to certain state designation recommendations for the 2010 Sulfur Dioxide (SO<sub>2</sub>) Primary National Ambient Air Quality Standard (NAAQS). The public comment period for the EPA's intended designations ended on March 31, 2016. The responses presented in this document are intended to either augment the responses to comments that appear in the preamble to the final action and the TSDs or to address comments not discussed in those documents. In this document "APC" refers to anonymous public comments.

## II. Background

On June 2, 2010, the EPA established a new primary 1-hour SO<sub>2</sub> standard at a level of 75 parts per billion (ppb) to protect against health effects associated with SO<sub>2</sub> exposure, including a range of serious respiratory illnesses. The EPA retained the secondary 3-hour SO<sub>2</sub> standard on March 20, 2012, to protect against welfare effects, including impacts on sensitive vegetation and forested ecosystems.

The process for designating areas following promulgation of a new or revised NAAQS is contained in the Clean Air Act (CAA) section 107(d) (42 U.S.C. 7407). After promulgation of a new or revised NAAQS, each governor or tribal leader has an opportunity to recommend air quality designations, including the appropriate boundaries for nonattainment areas, to the EPA. The EPA considers these recommendations as part of its duty to promulgate the formal area designations and boundaries for the new or revised NAAQS. By no later than 120 days prior to promulgating designations, the EPA is required to notify states and tribes, as appropriate, of any intended modifications to an area designation or boundary recommendation that the EPA deems necessary.

The EPA completed an initial round of SO<sub>2</sub> designations for certain areas of the country on July 25, 2013, designating 29 areas in 16 states as nonattainment. Pursuant to a March 2, 2015, court-ordered schedule, the EPA must complete SO<sub>2</sub> designations for the remaining areas of the country by three specific deadlines: July 2, 2016, December 31, 2017, and December 31, 2020. This current second round of designations addresses two groups of areas: (1) Areas that have newly monitored violations of the 2010 SO<sub>2</sub> NAAQS, and (2) areas that contain any stationary sources that had not been announced as of March 2, 2015, for retirement and that according to the EPA's Air Markets Database emitted in 2012 either (i) more than 16,000 tons of SO<sub>2</sub>, or (ii) more than 2,600 tons of SO<sub>2</sub> with an annual average emission rate of at least 0.45 pounds of SO<sub>2</sub>/mmBTU.

The EPA has determined that the areas meeting these criteria are associated with 64 stationary sources and the island of Hawaii. On or about February 16, 2016, the EPA notified affected states of its intended designation of certain specific areas as either nonattainment, unclassifiable/attainment, or unclassifiable for the 2010 SO<sub>2</sub> NAAQS. On March 1, 2016 (81 FR 10564), the EPA published a notice of availability to solicit input from interested parties other than states on the EPA's recent responses to the state designation recommendations for the 2010 SO<sub>2</sub> NAAQS.

### III. General Comments

#### A. Modeling

##### 1. AERMOD LOWWIND3 Option

**Comment:** Some commenters (0296-FirstEnergy, 0299-OH Utilities Group, 0309-DTE Energy, 0310- NAAQS Implementation Coalition, 0314-OH Valley Electric, 0329-UARG) suggested the EPA should allow states to use the LOWWIND3 option in conjunction with ADJ\_ U\* to provide better performance of the model under low wind speed conditions. Two commenters (0309-DTE Energy, 0329-UARG) stated that the EPA's refusal to accept modeling demonstrations that utilize these more sophisticated options may lead to areas being designated nonattainment for this NAAQS where actual air quality meets this NAAQS due to the default model's over-prediction tendency.

***EPA's Response:***

The EPA proposed revisions to the *Guideline on Air Quality Models* on July 29, 2015, which include proposed updates to the AERMOD modeling system, the air quality dispersion model recommended for use in the SO<sub>2</sub> NAAQS designation process. Specifically, EPA proposed incorporating two Beta options:

- An option in AERMET to adjust the surface friction velocity ( $u^*$ ) to address issues with AERMOD over prediction under stable, low wind speed conditions.
- A low wind option, LOWWIND3, to address issues with model over predictions under low wind conditions. This option increases the minimum value of the lateral turbulence intensity ( $\sigma_v$ ) from 0.2 to 0.3 and adjusts the dispersion coefficient to account for the effects of horizontal plume meander on the plume centerline concentrations. It also eliminates upwind dispersion, which is incongruous with a straight-line, steady-state plume dispersion model such as AERMOD.

These “Beta options” are currently being considered as part of an ongoing rulemaking process and have not been formally adopted into the regulatory version of AERMOD, and pending completion of that rulemaking EPA considers the use of AERMOD run with non-regulatory options as an alternative model. The necessity for this EPA approval of any regulatory application of an alternative model is described in Section 3 of the SO<sub>2</sub> Modeling TAD (first draft available May 2013). Furthermore, the use of AERMOD Beta options was discussed at the 11<sup>th</sup> Modeling Conference in August 2015 and subsequently clarified in a December 10, 2015, memorandum.<sup>1</sup> The Beta options are also discussed in Section 2 of the latest version of the Modeling TAD (February 2016). In order to obtain EPA approval to run AERMOD using the Beta options, the alternative model demonstrations must first be submitted to the EPA Region for approval and concurred with by the Model Clearinghouse. At this time, EPA will only consider

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<sup>1</sup> See [https://www3.epa.gov/ttn/scram/guidance/clarification/AERMOD\\_Beta\\_Options\\_Memo-20151210.pdf](https://www3.epa.gov/ttn/scram/guidance/clarification/AERMOD_Beta_Options_Memo-20151210.pdf)

the modeling analyses that used the current regulatory defaults within AERMOD to predict SO<sub>2</sub> design values for the designations due July 2, 2016, unless an entity seeking to use a Beta option has gained formal approval to use an alternative model consistent with this longstanding process. Where such a request has not been submitted and approved for a specific case, EPA cannot rely upon modeling results that use these Beta options in making its final designation.

**Comment:** Two commenters (0314-OH Valley Electric, 0327-AEP) recognized that the LOWWIND3 Option is not fully approved as a default option in AERMOD, and an alternative model demonstration is required. The commenters stated that Ohio EPA did perform the necessary study and submitted it as part of their demonstration package. Commenters stated that while the EPA does not discuss the appropriateness of Ohio EPA's alternative model demonstration, it cites a guidance memo to apparently disregard Ohio EPA's demonstration. The memo requires a specific process to use an alternative model, but the memo did not exist at the time the proposed designation modeling was filed. Commenters stated that a guidance memorandum cannot be used to establish legally binding requirements, and retroactive application of any rule is also inappropriate. One commenter (0327-AEP) stated that the EPA should approve the use of the LOWWIND3 Beta Option after considering the study submitted by Ohio EPA on its merits, using the requirements that applied to such demonstrations at the time of the submission.

One commenter (0329-UARG) recognized that in a memorandum from December, the EPA announced that use of proposed "future regulatory options" for AERMOD for SO<sub>2</sub> designations "require[s] formal approval as an alternative model and [is] subject to the requirements of Appendix W, Section 3.2.2." The commenter stated that this memorandum is merely guidance, it is not binding, and it was not issued until after the September 18, 2015, date by which the EPA requested states to provide their updated designations to the Agency. Commenter stated it would be arbitrary and unreasonable for the EPA to expect states' recommendations to have complied with this later guidance.

***EPA's Response:***

EPA clearly described the necessity for approval of any regulatory application of an alternative model in Section 3 of the SO<sub>2</sub> modeling TAD (first draft available in May 2013). Furthermore, the use of AERMOD Beta options was discussed at the 11<sup>th</sup> Modeling Conference in August 2015 and subsequently clarified in a December 10, 2015, memorandum. The Beta options are also discussed in Section 2 of the latest version of the modeling TAD (February 2016). In order to obtain EPA approval to run AERMOD using the Beta options, the alternative model demonstrations must first be submitted to the EPA Region for approval and concurred with by the Model Clearinghouse. At this time, EPA will only consider modeling analyses that used the current regulatory defaults within AERMOD to predict SO<sub>2</sub> design values for the designations due July 2, 2016, unless an entity seeking to use a Beta option has gained formal approval to use an alternative model consistent with this longstanding process. Where such a request has not

been submitted and approved for a specific case, EPA cannot rely upon modeling results that use these Beta options in making its final designation. The EPA recognizes that the TAD is not a legally binding, final agency action, and that the other guidance memoranda are similarly non-binding. However, the EPA disagrees that requiring Model Clearinghouse approval in order to use the non-regulatory Beta options in these designations constitutes an impermissible retroactive application of a rule or converts the TAD and the guidance into binding final requirements. That is because these designations themselves are final actions, and the EPA has explained a reasonable basis for not relying upon modeling using the Beta options unless certain processes are followed to ensure that their use is appropriate in a given case. However, these designations do not take final action on the pending rulemaking to revise Appendix W itself, nor do they pre-judge the outcome of that pending rulemaking in any way.

**Comment:** Some commenters (0314-OH Valley Electric, 0327-AEP, 0329-UARG) supported the EPA's positions that the alternative model formulation is superior to the approved version of the model, and that there is no information available demonstrating that AERMOD with LOWWIND3 provides improved statistical performance on tall stack sources. The commenters stated that the Version 15181 Addendum to the AERMOD User's Guide, Appendix F contains an analysis using the EPA's standard Lovett evaluation database, which is a tall stack case. The commenters stated that this case demonstrates that the LOWWIND3 Beta Option coupled with the Beta U\* Option in AERMET shows a statistically better performance than both the base AERMOD Model and the other LOWWIND Beta Options present in AERMOD. Such a finding contradicts the EPA's statement in the TSD. One commenter (0329-UARG) stated that this level of demonstration should suffice to support the use of those techniques in modeling.

***EPA's Response:***

The commenter is referring to technical information provided by EPA as part of its proposed regulatory revisions to the *Guideline on Air Quality Models* (July 2015). Such information was provided to the public in considering the merits of incorporating the LOWWIND3 and adjusted u\* Beta options in the regulatory version of AERMOD. At this time, the EPA is still considering the merits of these options as part of that separate rulemaking process, and these final designations are not taking final action on that pending rulemaking or pre-judging it in any way. Therefore, pending completion of that rulemaking, for these designations we have explained that it is necessary to gain approval of any regulatory application of an alternative model (i.e. AERMOD with use of LOWWIND3 and/or adjusted u\* Beta options) as noted in Section 3 of the SO<sub>2</sub> Modeling TAD (first draft available in May 2013). This will ensure that the use of a Beta option in any specific area designation is appropriate, based on its own facts. The use of AERMOD Beta options was discussed at the 11<sup>th</sup> Modeling Conference in August 2015 and subsequently clarified in a December 10, 2015 memorandum. The Beta options are also discussed in Section 2 of the latest version of the SO<sub>2</sub> Modeling TAD (February 2016). While a state or other entity conducting modeling may have run AERMOD using the Beta options, for these designations EPA will only consider modeling analyses that used the current regulatory

defaults within AERMOD to predict SO<sub>2</sub> design values, unless an entity seeking to use a Beta option has gained formal approval to use an alternative model.

**Comment:** Two commenters (0296-FirstEnergy, 0299-OH Utilities Group) stated that Ohio EPA met the recommendation of Appendix W, Section 3.2.2. The commenters stated there is peer-reviewed work published with respect to LOWWIND3 in Paine et.al. (2015).

Another two commenters (0310-NAAQS Implementation Coalition, 0329-UARG) requested that the EPA reopen comment on the Appendix W Proposal for the limited purpose of allowing the public to respond on the record to critical evaluations of LOWWIND3 not available prior to the close of the comment period. One commenter ((0310-NAAQS Implementation Coalition) stated that, in their review of the Appendix W Proposal's official docket, there is just one comment containing specific concerns with the performance of LOWWIND3, while a substantial majority of the comments were generally supportive. The commenter ((0310-NAAQS Implementation Coalition) also stated that the EPA's rationale for not including LOWWIND3 is unclear. According to the commenter, the EPA proposed to include LOWWIND3 in the Appendix W Proposal because it "improve[s] model performance," but then the EPA refused to use LOWWIND3 for SO<sub>2</sub> designations on grounds that it has not been demonstrated to "statistically improve [model] performance."

***EPA's Response:***

EPA does not consider the request to reopen the public comment period for its proposed revisions to the *Guideline on Air Quality Models* (July 2015) to be within the scope of these final designations. Pending completion of that rulemaking, we have explained that for these designations it is necessary to gain approval of any regulatory application of an alternative model (i.e. AERMOD with use of LOWWIND3 and/or adjusted u\* Beta options) as noted in Section 3 of the SO<sub>2</sub> modeling TAD (first draft available in May 2013). The use of AERMOD beta options was discussed at the 11<sup>th</sup> Modeling Conference in August 2015 and subsequently clarified in a December 10, 2015, memorandum. They are also discussed in Section 2 of the latest version of the SO<sub>2</sub> Modeling TAD (February 2016). The information brought forward by the commenter would need to be formally considered on a case-by-case basis as part of that process. While a state may have run AERMOD using the Beta options, EPA will only consider modeling analyses that used the current regulatory defaults within AERMOD to predict SO<sub>2</sub> design values for the designations due July 2, 2016, unless an entity seeking to use a Beta option has gained formal approval to use an alternative model.

**Comment:** One commenter (0329-UARG) explained (pdf pages 5-6 of their comment letter) that AECOM's recent analyses provide added justification for accepting modeling with the LOWWIND3 option as the basis for an attainment designation. The commenter noted that the EPA explains its reluctance to accept use of the low wind speed options with AERMOD on the basis that it is still reviewing "a number of public comments specific to the LOWWIND3 beta options." According to the commenter however, only one comment by Sierra Club provided a substantive critique of low wind speed options with AERMOD. The commenter attached a report, prepared by Christopher Warren and others at AECOM Environment, which refutes the

concerns expressed in Sierra Club's comments and provides further evidence that the LOWWIND3 option improves AERMOD's performance.

***EPA's Response:***

Pending completion of the separate rulemaking referenced by commenter, the EPA has explained that for these designations it is necessary to gain approval of any regulatory application of an alternative model (i.e. AERMOD with use of LOWWIND3 and/or adjusted u\* Beta options) as noted in Section 3 of the SO<sub>2</sub> modeling TAD (first draft available in May 2013). The use of AERMOD beta options was discussed at the 11<sup>th</sup> Modeling Conference in August 2015 and subsequently clarified in a December 10, 2015, memorandum. They are also discussed in Section 2 of the latest version of the SO<sub>2</sub> Modeling TAD (February 2016). The information brought forward by the commenter would need to be formally considered on a case-by-case basis as part of that process. While a state may have run AERMOD using the Beta options, EPA will only consider modeling analyses that used the current regulatory defaults within AERMOD to predict SO<sub>2</sub> design values for the designations due July 2, 2016, unless an entity seeking to use a Beta option has gained formal approval to use an alternative model.

***Comment:*** One commenter (0329-UARG) stated there are no legal barriers to EPA's reliance on the ADJ\_U\* and LOWWIND3 options. Commenter stated that section 3.2.2 of the current regulatory Guideline gives responsibility for approving an alternative model solely to the Regional Office. Commenter also stated that the Guideline does not apply to modeling for initial designations because it applies only to State Implementation Plan revisions for existing sources and to new source reviews. Commenter stated that the Modeling Technical Assistance Document (TAD) specifies that it does not impose binding and enforceable requirements or obligations and is not final agency action.

***EPA's Response:***

The Beta options are currently being considered as part of an ongoing separate rulemaking process and have not been formally adopted into the regulatory version of AERMOD, and pending completion of that rulemaking EPA considers the use of AERMOD run with non-regulatory options as an alternative model. EPA has discussed the process to gain approval of alternative models in previous responses to comments in this section. The necessity for this EPA approval of any regulatory application of an alternative model is described in Section 3 of the SO<sub>2</sub> Modeling TAD (first draft available May 2013) and the Beta options are discussed in the latest version of the TAD (February 2016). Furthermore, the use of AERMOD Beta options was discussed at the 11<sup>th</sup> Modeling Conference in August 2015 and subsequently clarified in a December 10, 2015, memorandum. In order to obtain EPA approval to run AERMOD using the Beta options, the alternative model demonstrations must first be submitted to the EPA Region for approval and concurred with by the Model Clearinghouse. At this time, EPA will only consider the modeling analyses that used the current regulatory defaults within AERMOD to predict SO<sub>2</sub> design values for the designations due July 2, 2016, unless an entity seeking to use a Beta option has gained formal approval to use an alternative model consistent with this longstanding process. Where such a request has not been submitted and approved for a specific case, EPA cannot rely upon modeling results that use these Beta options in making its final designation. The SO<sub>2</sub>

Modeling TAD is EPA guidance regarding compliance with the relevant statutory and regulatory requirements, and the TAD recommends that the designations modeling should rely upon the principles and techniques in the *Guideline*, Appendix W.

**Comment:** One commenter (0332-Sierra Club) stated that ADJ\_U\* and LOWWIND3 have been shown to decrease model performance and accuracy and should not be relied on by EPA. Commenter provided an attachment to their comments (Exhibit 6) which describes the flaws commenter sees in these options. Commenter stated that use of these options would cripple the efficacy of AERMOD, and lead to significant under-prediction of air pollution impacts. Commenter stated that, to the extent that states or industry submit modeling analyses that incorporate use of these options, EPA should reject them as being inconsistent with regulatory guidance and for the identified issue of inaccuracies flowing from their use. Commenter stated that, in instances where states or industry submit modeling incorporating these options and accompany it with information purporting to justify use of the non-regulatory default configuration of AERMOD, EPA should look very closely at the submissions, the submissions should only be considered as a sensitivity analysis, and the submissions should be accompanied by modeling performed according to EPA's guidance using the regulatory default configuration of AERMOD.

***EPA's Response:***

EPA clearly described the necessity for approval of any regulatory application of an alternative model in Section 3 of the SO<sub>2</sub> modeling TAD (first draft available in May 2013). Furthermore, the use of AERMOD beta options was discussed at the 11<sup>th</sup> Modeling Conference in August 2015 and subsequently clarified in a December 10, 2015, memorandum and also discussed in Section 2 of the latest version of the modeling TAD (February 2016). In order to obtain EPA approval to run AERMOD using the Beta options, the alternative model demonstrations must first be submitted to the EPA Region for approval and concurred with by the Model Clearinghouse. At this time, EPA will only consider modeling analyses that used the current regulatory defaults within AERMOD to predict SO<sub>2</sub> design values for the designations due July 2, 2016, unless an entity seeking to use a Beta option has gained formal approval to use an alternative model consistent with this longstanding process. In either granting or not granting such approval, the EPA is not taking final action with respect to the pending separate Appendix W rulemaking, or pre-judging its future outcome in any way.

2. Modeling to determine attainment status

**Comment:** One commenter (0332-Sierra Club) stated that dispersion modeling is a rigorously verified method for evaluating impacts on the SO<sub>2</sub> NAAQS, and has a lengthy and court-validated history as an appropriate tool for use in designations. Commenter provided a detailed discussion (pdf pages 6-9 of commenter's letter) to support their position that aerial dispersion modeling is the appropriate approach to ascertaining attainment status under the SO<sub>2</sub> NAAQS. Commenter provided several references to support their position, including: the final SO<sub>2</sub> NAAQS Rule, *Implementation of the 1-Hour SO<sub>2</sub> NAAQS Draft White Paper for Discussion*, EPA's 1994 SO<sub>2</sub> Guideline Document, Respondent's Opposition to Motion of the State of North Dakota for a Stay of EPA's 1-Hour Sulfur Dioxide Ambient Standard Rule (attached to

commenter's letter as Exhibit 1), and Sheldon Meyers Memorandum re Section 107 Designation Policy Summary (April 21, 1983) (attached to commenter's letter as Exhibit 2). Commenter also cited several court cases and statements from EPA staff (attached to commenter's letter as Exhibits 3 and 4) to further support their position. Commenter stated that EPA's practice that all nitrogen dioxide, fine particulate matter and SO<sub>2</sub> PSD increment compliance verification analyses are performed with air dispersion modeling demonstrates that modeling is a technically superior approach for ascertaining impacts on NAAQS.

One commenter (0332-Sierra Club) stated that AERMOD accurately models medium-to-large SO<sub>2</sub> sources—even with conditions of low wind speed, the use of off-site meteorological data, and variable weather conditions. Commenter stated that AERMOD has been tested and performs very well during conditions of low wind speeds (see Exhibit 5 attached to commenter's letter). Commenter stated that EPA's use of air dispersion modeling and AERMOD in particular was upheld in the context of a recent CAA section 126 petition for resolution of cross-state impacts.

One commenter (0332-Sierra Club) stated that, by modeling a source to ascertain its impact on the NAAQS, regulators are simultaneously determining how much emissions need to be reduced to avoid causing NAAQS exceedances. Commenter stated that using modeling for and from designations purposes in nonattainment SIP preparation thus can help states and EPA avoid the chronic problem of late NAAQS implementation. Commenter stated it can also be a powerful tool in enabling EPA to prepare federal implementation plans for states that have failed to prepare their SIPs. Commenter stated the EPA should make clear to the states that they can and must submit nonattainment SIPs by the required deadline, and that if not, EPA will use the modeling before it to generate and promulgate federal implementation plans, and will do so far sooner than the expiration of the two-year deadline the Clean Air Act affords EPA.

***EPA's Response:*** EPA appreciates the commenters' support of the use of dispersion modeling for SO<sub>2</sub> NAAQS designations. In this action the EPA is not addressing the submission of nonattainment SIPs or federal implementation plans; comments related to these separate issues are out of scope of the current final action.

### 3. AERMOD FLAGPOLE option

***Comment:*** One commenter (0332-Sierra Club) stated that flagpole receptors are part of the regulatory default AERMOD configuration and their use can only make modeling results more relevant. Commenter stated that, since people breathe through their noses and mouths, not through their shoes and socks, modeling impacts at face-height instead of at foot-height is better practice. Commenter stated this is in part why air monitoring sensors are likewise not placed directly on the ground. Commenter stated that criticisms of Sierra Club modeling on the basis of the use of the FLAGPOLE option should be disregarded.

***EPA's Response:***

EPA disagrees with the statement that the flagpole receptors are part of the regulatory default AERMOD configuration. While not a Beta option, the flagpole receptors must be specified and therefore are not part of the default options. EPA has stated in Section 4.2 of the SO<sub>2</sub> NAAQS

Designations Modeling Technical Assistance Document (TAD) that the use of flagpole receptors is not necessary. The TAD also states that Appendix W does not specify receptors be placed at levels other than ground level for comparison to the NAAQS. The use of flagpole receptors in specific cases of modeling is addressed in the Technical Support Documents (TSDs) for those areas, and/or in responses to comments on the EPA's intended designations for those areas.

## B. Designation Categories

**Comment:** Two commenters (0301-IN Municipal Power, 0302-Duke Energy) supported an "attainment" rather than "attainment/unclassifiable" designation and stated that section 107 of the Clean Air Act does not appear to provide for the "attainment/unclassifiable" designation category. Also see section IX.A. Gibson County.

One commenter (0329-UARG) stated the CAA does not provide for an unclassifiable/attainment designation and it does not authorize EPA to add to additional designations to those specified in the Act. Commenter stated that, where EPA finds that an area attains the NAAQS, the Agency has no basis for designating it anything other than attainment. Commenter stated that making an attainment designation is important because it conveys to those in the area or who may be considering moving to the area that air quality there meets health-based standards. Commenter stated that a designation of unclassifiable/attainment does not convey that same message and should not be used.

**EPA's Response:** In the March 20, 2015, guidance memo (Steve Page, Director EPA-OAQPS to Regional Air Directors, Updated Guidance for Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard) and the August 21, 2015, Data Requirements Rule final rule Federal Register notice the EPA stated that, while states have and may continue to submit designations recommendations identifying areas as "attainment," the EPA expects to continue its traditional approach, where appropriate, of using a designation category of "unclassifiable/attainment" for areas that the EPA determines meet the 2010 SO<sub>2</sub> NAAQS. In this action, the EPA is using the designation category of "unclassifiable/attainment" for areas that are meeting the 2010 SO<sub>2</sub> NAAQS, and is using the category "unclassifiable" for areas where the EPA cannot determine based on available information whether the area is meeting or not meeting the NAAQS or where the EPA cannot determine whether the area contributes to a violation in a nearby area. The EPA is not establishing an additional designations category with this long-standing approach. The EPA also disagrees that the use of the continued unclassifiable/attainment designation conveys the negative message claimed by the commenter, as the designation is premised on an EPA finding that the area is meeting the NAAQS. In any event, the EPA notes that there is no difference in terms of resulting regulatory burden between and unclassifiable, unclassifiable/attainment, or attainment designation, so the use of the unclassifiable/attainment term imposes no injury on any party.

**Comment:** One commenter (0319-Entergy Arkansas) supported the EPA's position that in all legal and practical circumstances the designation of "unclassifiable/attainment" is the same as a designation of "attainment" under the Clean Air Act, and, therefore, it triggers no additional mandates or other data requirements. Commenter stated this follows from EPA's repeated

statements documenting its traditional use of “unclassifiable/attainment” for those areas that the Agency determines meet the NAAQS (e.g., 80 FR 51052, 51084).

***EPA's Response:*** The EPA appreciates the commenters support of our interpretation of the legal and practical consequences associated with a designation of “unclassifiable/attainment.” For areas that the EPA is designating unclassifiable/attainment in this final action, this determination is based on the finding that the area is meeting the 2010 SO<sub>2</sub> NAAQS.

### C. Monitoring

***Comment:*** One commenter (0328-Luminant) stated the EPA’s proposal is unlawful and should not be finalized, in part, because EPA has consistently supported monitoring over modeling for NAAQS designation purposes and its new approach here is inconsistent with the statute, regulations, and EPA’s prior practice. Commenter stated the EPA should utilize monitoring data, not modeling data if it is going to overturn the State of Texas’ recommended designations in favor of its own designations. Commenter supported the TCEQ’s (0294-TCEQ) position that monitoring data is necessary to accurately characterize actual air quality for attainment and nonattainment designations. Commenter stated the EPA has been clear that monitoring data is preferred for NAAQS designations, and EPA’s offer for states to use modeling for the SO<sub>2</sub> NAAQS was simply intended to provide states with another option. Commenter stated that modeling was intended to provide an opportunity for states to avoid the cost and resources associated with siting, installing, and maintaining monitors where the state preferred to rely on modeling. Commenter stated the EPA’s new approach here to *require* modeling and rely solely on that data for designations is inconsistent with the statute and EPA’s prior practice.

One commenter (TX Response) stated, when modeling and monitoring data conflict, courts have acknowledged that actual air monitoring data is superior to modeling data so long as the monitor is sufficient to accurately represent the area in question. *E.g., Republic Steel Corp. v. Castle*, 621F.3d797, 805 (6th Cir.1980); *PPG Industries, Inc. v. Castle*, 630 F.3d 462, 467-68 (6th Cir. 1980).

One commenter (TX Response) stated that a designation of nonattainment has serious consequences to industry, the economy of an area, its citizens, and the state. Commenter stated that nonattainment designations should only be made based on data from 40 CFR Part 58 compliant (regulatory) monitoring showing a violation of the standard. Commenter stated that using modeling to determine a nonattainment designation could result in major capital expenditures for industry to address an issue that may not be an actual problem. Commenter stated that air modeling analyses are a useful tool in determining the impact of a new or modified facility for permitting purposes but not for predicting future design values to demonstrate attainment of NAAQS. Commenter stated that, because of the magnitude of the potential impact areas may face due to a nonattainment designation, such a determination should be based only on real world, monitored data, and not predicted values subject to the limitations and flaws of a model.

**EPA's Response:** The EPA is not at this time taking final action to designate the areas in Texas that had been proposed as nonattainment designations, and will address comments regarding those areas at a later date. However, as a general matter, the EPA maintains our previous position for the reasons delineated in the preamble to the final rule of the 2010 SO<sub>2</sub> NAAQS rulemaking, the February 2013 Strategy Paper, and in the proposed and final SO<sub>2</sub> Data Requirements Rule for why both air quality modeling and ambient monitoring are appropriate tools for characterizing ambient air quality for purposes of informing decisions to implement the SO<sub>2</sub> NAAQS, including designation determinations. The EPA's reliance on modeling to assess SO<sub>2</sub> air quality status, even in the face of conflicting monitoring, has been judicially affirmed. See, e.g., *Montana Sulphur & Chemical Company v. EPA*, 666 F.3d 1174, 1185 (9<sup>th</sup> Cir. 2012). Moreover, it has long been the EPA's practice to rely upon appropriate modeling when issuing designations under SO<sub>2</sub> NAAQS. See, e.g., 43 FR 8962 (March 3, 1978), 43 FR 40416 (September 11, 1978), 43 FR 40502 (September 12, 1978). EPA has also explained the importance of using modeling information for source-oriented pollutants such as SO<sub>2</sub> in cases where existing monitors do not adequately characterize peak ambient concentrations, See, e.g., Memorandum from Sheldon Myers, Director, EPA Office of Air Quality Planning and Standards, to Regional Office Air Division Directors, "Section 107 Designation Policy Summary," April 21, 1983. All designation determinations made by the EPA in this final action are based on the EPA's complete and thorough review and analysis of all available information, as described in each area's final technical support document in this docket.

**Comment:** One commenter (0329-UARG) suggested that an area conducting monitoring consistent with EPA Guidance should be designated unclassifiable and allowed to complete three years of monitoring as long as monitored air quality remains below the NAAQS. Commenter stated that awaiting monitoring results would also be appropriate if modeling studies have produced differing predictions regarding NAAQS compliance. Commenter stated that providing the opportunity for such monitoring could allow an area in which monitoring demonstrates that the 1-hour SO<sub>2</sub> standard is attained to avoid costly implementation measures.

**EPA's Response:** As stated further above, the EPA maintains the position that both air quality modeling and ambient monitoring are appropriate tools for characterizing ambient air quality for purposes of informing decisions to implement the SO<sub>2</sub> NAAQS, including designation determinations. In response to the commenter's suggestion that designations should await future completion of three years of monitoring, the EPA notes that in the case of the designations subject to the court's order to designate certain areas by July 2, 2016, the agency does not have the discretion to await the results of future monitoring.

**Comment:** One commenter (0328-Luminant) explained (pdf pages 36-42) why they believe AERMOD is not a reliable approach for NAAQS designations, and cannot substitute for the preferred option of monitoring.

**EPA's Response:** As stated further above, the EPA is not at this time taking final action to designate the areas in Texas addressed by the commenter, and will respond to comments on those areas at a later time. However, as a general matter, the EPA maintains the position that both air quality modeling and ambient monitoring are appropriate tools for characterizing

ambient air quality for purposes of informing decisions to implement the SO<sub>2</sub> NAAQS, including designation determinations.

#### D. Consent Decree

**Comment:** One commenter (0328-Luminant) stated that the Consent Decree must be read consistently with the May 13, 2014 Data Requirements Rule (DRR). Commenter stated the EPA cannot now contravene its own regulations and deprive states of the opportunity to utilize monitoring data collected under (or alongside) the rule to inform designations by interpreting the Consent Decree in a manner that forecloses monitoring. Commenter stated that, if EPA interprets the Consent Decree to impermissibly require the use of modeling where sufficient monitoring data is not available, even though monitoring data will be available in the future, its interpretation would effectively abrogate the CAA's unclassifiable designation and EPA's prior statements regarding the importance of the use of monitoring data.

One commenter (0328-Luminant) stated that, if read to effectively force a certain designation through the application of over-predictive modeling alone, the Consent Decree would not only contravene the CAA, it would also modify the DRR in a manner that deprives the regulated community of its ability to meaningfully comment, which is an improper rulemaking and impermissible under the Administrative Procedure Act. Commenter stated that the proposed DRR, for instance, did not say the rule's procedures allowing states until 2020 to issue recommendations for areas relying on monitoring did not apply to areas with "large" (as defined specifically for this purpose for the first time in the Consent Decree) stationary sources.

One commenter (0328-Luminant) stated the Consent Decree imposes impermissible legal obligations on states that did not consent to the decree.

**EPA's Response:** The commenter's objections to the consent decree, as well as the commenter's views regarding the Data Requirements Rule, are beyond the scope of this final rule issuing designations. Moreover, as explained above, the EPA is not at this time taking final action to designate the areas on which the commenter submitted comments, and will respond to those comments at a later time. However, the EPA notes that our authority for this final action is CAA Section 107(d), which required the EPA to promulgate designations for the 2010 SO<sub>2</sub> NAAQS no later than three years after the date of promulgation of this NAAQS, as the EPA exercised the available one year extension available under the Act. As stated further above, the EPA maintains our previous position that both air quality modeling and ambient monitoring are appropriate tools for characterizing ambient air quality for purposes of informing decisions to implement the SO<sub>2</sub> NAAQS, including designation determinations. Furthermore, the Consent Decree referenced by commenter sets dates the EPA must act by, not dates that the EPA must wait until to act. Additionally, the SO<sub>2</sub> Data Requirements Rule does not restrict the EPA's CAA Section 107(d) authority, but rather will provide future air quality data developed by air agencies that may be used by the EPA in future actions to evaluate areas' air quality under the 2010 SO<sub>2</sub> NAAQS, including area designations and redesignations, as appropriate. Nothing in either the consent

decree or the Data Requirements Rule has determined the substantive outcome of any of the final designations being issued in this final rule.

**Comment:** One commenter (0332-Sierra Club) stated that, in completing area designations, it is critical that EPA consider all SO<sub>2</sub>-emitting sources in the areas under consideration for the 2016 designations round, and not merely the sources who meet the triggering criteria of the Consent Decree. Commenter stated that, because the Consent Decree speaks in terms of *areas* to be evaluated, not *sources*, it would be contrary to the Consent Decree if EPA were to finalize designations based solely on sources fitting the Consent Decree criteria. Commenter stated that the Modeling TAD provides that “all sources expected to cause a significant concentration gradient in the vicinity of the source of interest should be explicitly modeled”. Commenter stated that, in performing its own air quality modeling, the Sierra Club and others have used the 50 km modeling domain of AERMOD as a tool in determining what sources to include in area modeling evaluations and the EPA should do the same.

**EPA’s Response:** As explained in each area’s Technical Support Document, in this final designations rulemaking the EPA appropriately evaluated all SO<sub>2</sub>-emitting sources that were expected to have impacts on the subject area, and the agency refers to those TSDs and/or specific responses to comments for those areas for further explanation of the scope of each area’s analysis.

#### E. Consider all information in the record

**Comment:** One commenter (0332-Sierra Club) supported the EPA’s use of a mixture of state, industry, and public health and environmental submissions of data, including modeling data. Commenter stated the EPA has properly elected to consider all information before it in keeping with foundational principles of administrative law. Commenter expressed concern that, if EPA were to ignore materials it receives from environmental and public health organizations or from concerned citizens while it was simultaneously accepting and considering materials submitted by states, this would arbitrarily skew EPA’s analysis—particularly if state comments are responsive to or critique comments submitted by the public.

**EPA’s Response:** As described further in the final technical support documents, EPA reviewed and analyzed all available information in determining designations in this final action.

#### F. Support Other’s Comments

American Electric Power (0327) endorsed the comments of the Utility Air Regulatory Group (0329) and the Ohio Utility Group (0299), incorporating those comments by reference.

Georgia Power (0291) supported comments submitted by the Utility Air Regulatory Group (0329).

Wabash Power (0303) supported Duke Energy’s (0302) comments for Gibson County in Indiana and supported the comments submitted by the Utility Air Regulatory Group (0329).

Ohio Valley Electric (0314) endorsed and incorporated by reference the comments submitted by American Electric Power (AEP), the Utility Air Regulatory Group (0329) and the Ohio Utility Group (0299).

## G. Other Comments

**Comment:** Some commenters generally supported action for clean air with the following statements: I support clean air (0214-APC); we want clean air and a serious effort to halt climate change (0216-APC); clean, clear, healthy air is needed and has been needed for a long time (0217-APC); it would be a gross miscreance to allow our health to be compromised by classifying the air quality standards "attainment" (0265-APC); pollution matters (0276-APC); rights to clean air should trump these companies rights (0215-APC); As someone with asthma, I need the air to be as clean as possible (0237-APC).

**EPA's Response:** The EPA notes that the EPA established the 75 parts per billion (ppb) primary 1-hour SO<sub>2</sub> standard at issue in this action's designations to protect against health effects associated with SO<sub>2</sub> exposure, including a range of serious respiratory illnesses. As described further in the final technical support documents, EPA reviewed and analyzed all available information in determining appropriate designations in this final action.

**Comment:** One commenter (0329-UARG) noted that inaccurate "nonattainment" designations lead to unnecessary planning and emission control expenses. Indeed, even an area receiving an unwarranted "unclassifiable" designation may find itself stigmatized when seeking economic growth. The commenter urged EPA to give significant weight to states' designations for areas within their borders and to exercise restraint in modifying those designation recommendations.

**EPA's Response:** As described further in the final technical support documents, EPA reviewed and analyzed all available information in determining designations in this final action.

**Comment:** One commenter (0293-APC) requested the reduction of CO in Anne Arundel Co, MD.

**EPA's Response:** The EPA thanks the commenter for this submission but notes this comment is out of scope of the current final action regarding sulfur dioxide.

**Comment:** One commenter (0245-APC) supported a designation of nonattainment, but did not identify the area.

**EPA's Response:** The EPA thanks the commenter for their submission, but was unable to ascertain on the information provided which area commenter was referring to. Regardless, as described further in the final technical support documents, EPA reviewed and analyzed all available information in determining designations in this final action.

**Comment:** One commenter (0311-APC) stated Ameren should be held to the law and do the right thing for future generations.

***EPA's Response:*** As described further in the final technical support document for the area at issue in this comment, EPA reviewed and analyzed all available air quality characterization information in determining the appropriate designation in this final action.

***Comment:*** One commenter (0207-APC) suggested the EPA should go after companies who dump illegally around Curtis Bay rather than a high profile power station that keeps utilities affordable.

***EPA's Response:*** The EPA thanks the commenter for this submission but notes this comment is out of scope of the current final action regarding the EPA's mandatory duty to designate areas under the 2010 SO<sub>2</sub> NAAQS.

## IV. Arkansas

### A. Independence County

***Comment:*** One commenter (0319-Entergy Arkansas) expressed its support of the State's recommendation to designate Independence County, Arkansas, as unclassifiable/attainment. Commenter asserted that the State's recommendation was based on modeling showing that the Independence plant neither causes nor contributes to any model predicted exceedance of the SO<sub>2</sub> standard in the area. In addition, commenter stated that the Arkansas Department of Environmental Quality is preparing modeling and other support information that will address the Agency's concern that previous modeling did not establish a comprehensive emissions profile for the area's air quality. Commenter urged the EPA to carefully consider all technical support documents and adopt the State's recommendation.

***EPA's Response:***

According to the information received by EPA from the State, the submittal of additional modeling and other support information has been delayed. Since no other additional information has been made available, there is currently no information available to justify a change in EPA's proposed designation of unclassifiable.

As further detailed in the Arkansas technical support document for this area, when evaluating the initial modeling that came in from the state, the State did not include all emissions from contributing sources; specifically the State did not include the emissions from Future Fuels. The Sierra Club's submitted modeling for Independence, however, showed inconsistencies with the Modeling TAD. The State did provide updated modeling, including Future Fuels emissions, in response to Sierra Club's modeling, but without further refinements to the modeling of Future Fuels to address the inconsistencies with the Modeling TAD. Because of the identified inconsistencies with the Modeling TAD in each of the State's and Sierra Club's modeling submittals, EPA does not have sufficient information to support a designation of nonattainment

or unclassifiable/attainment. Therefore, the EPA's designation for the area within Independence County is unclassifiable. EPA notes that in future SO<sub>2</sub> designations, ADEQ will be required to address the Future Fuels facility, which will include analysis of any contributing impacts from the Independence Electric Station, and notes that Future Fuels is a listed source under the Data Requirements Rule.

## B. Jefferson County

**Comment:** One commenter (0319-Entergy Arkansas) supported the EPA's proposal to adopt the State's recommendation and to designate Jefferson County, Arkansas, as unclassifiable/attainment. Commenter stated that the EPA's position is based on a close examination of the State's recommendation and the State's supporting information and is consistent with the State's AERMOD modeling and analysis, which follows the EPA's guidance.

**EPA's Response:** EPA appreciates the supportive comments, but notes that the EPA's designation for this area was based on review and analysis of all available information.

## V. Colorado

### A. Colorado Springs

**Comment:** Some commenters (0209-APC, 0228-APC, 0244-Masias, 0249-APC, 0262-APC, 0263-Colorado groups and citizens, 0270-APC, 0281-APC, 0287-Ostrom, 0298-Weise, 0307-EDF, 0321-AEC, 0332-AA-Sierra Club) requested that the EPA change its designation of El Paso County, Colorado from unclassifiable to nonattainment. Commenters stated that credible data on this matter have been provided by multiple air quality professionals showing violations of air quality caused by the Martin Drake Plant. Some commenters (0307-EDF, 0321-AEC, 0332-AA-Sierra Club) provided detailed technical comments in their letters and attachments to support their positions.

One commenter (0307-EDF) stated that the modeling report by Dr. Andrew Gray attached to their comment letter demonstrates that, using the actual hourly emission rates from the period 2011 to 2013 shows that the design value is almost ten times the allowable health-based NAAQS, even when one assumes a background concentration of zero. Commenter stated that two independent modeling studies (Klafka and Barrett) demonstrate exceedances of the NAAQS from the Martin Drake power Plant.

One commenter (0332-AA-Sierra Club) provided two modeling studies by Wingra Engineering (Klafka) and stated that both reports showed violations of the standard. Two commenters (0307-EDF, 0332-AA-Sierra Club) stated that critiques raised by EPA in its proposed designation (model assumptions such as downwash, urban versus rural dispersion coefficients, stack heights

and use a newer version of AERMOD/AERMET etc.) simply do not affect the conclusion that the area should be designated nonattainment and do not support a conclusion that the area should be found to be “unclassifiable.” Commenter’s (0307-EDF) letter includes a detailed discussion of why the commenter believes other factors identified by EPA for rejecting the Klafka model are not a basis for the “unclassifiable” designation.

One commenter (0307-EDF) stated that modeling future allowable rates is not representative of the current attainment status and would understate the impacts of the current uncontrolled SO<sub>2</sub> emissions. Two commenters (0307-EDF, 0332-AA-Sierra Club) stated that the nonattainment results occur even when one assumes that the operator has installed and is operating pollution controls that are not yet fully operating (and won’t be required until December 31, 2017).

***EPA's Response:*** The EPA has determined that the meteorological data from the Colorado Springs Airport are not representative of meteorological conditions at the Martin Drake Power Plant. Considering the unique topography influencing the area around the Martin Drake Power Plant, the EPA finds that a modeling demonstration for this area could not adequately inform a designation decision absent representative meteorological data. Therefore, modeling which relies on meteorological data from the Colorado Springs Airport is not sufficient to enable the EPA to determine whether the area impacted by emissions from the Martin Drake Power Plant is meeting the 2010 SO<sub>2</sub> NAAQS. As further detailed in the final Colorado Technical Support Document in this docket and elsewhere in this response to comment (RTC) document Section V.A., the two areas have different terrain patterns generating different wind patterns, wind drainage patterns, and upslope and downslope wind conditions. These characteristics will significantly impact the transport and dispersion conditions of the Martin Drake Power Plant plumes due to the differences in meteorological conditions between the Colorado Springs Airport and the Martin Drake Power Plant.

In addition to the meteorological data not being representative, the Barrett and Klafka AERMOD simulations did not align with EPA’s recommended configuration options. The non-default options utilized in these simulations included:

- Population estimate is too high and not representative (668,000 vs 416,000)
- Receptors are included within secured facility boundaries, while receptors should only be placed in areas where the public has access.

Further, the actual emissions were based on years 2011 to 2013 and not based on the most recent three years of SO<sub>2</sub> emissions data from the facility. The total SO<sub>2</sub> emissions at the facility from 2013 to 2015 were 79.77 percent of the total emissions from 2011 to 2013, meaning updated emissions would most likely decrease impacts. Some of the modeling analyses used future allowable emission rates which considered the SO<sub>2</sub> controls currently being installed at the Martin Drake Power Plant. With regard to these analyses, EPA emphasizes that the use of allowable emissions that are not federally enforceable is inconsistent with the Modeling TAD and modeling analyses that include such allowable emissions cannot be relied upon in determining whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS. The EPA also notes that the State recently received a permit modification application from Colorado Springs Utilities which requires the shutdown of unit 5 by the end of 2016.

Certain configuration options and input assumptions selected by the commenter, particularly the use of actual emissions from 2011 to 2013 instead of more recent years and the inclusion of receptors on the facility's secured property, most likely contribute to modeled design values of SO<sub>2</sub> concentrations that are significantly too high.

The EPA disagrees that refinements with the meteorological data and model configuration options do not affect our conclusion regarding the designation for this area. EPA has been provided numerous model simulations and analyses that utilized various emissions data (actual and allowable emissions, and even expected future allowable emissions), meteorological data sets (airport, highway, and on-site data sets), and configuration options (rural, urban, building downwash). Most of the analyses presented the model results in the form of the design value to illustrate the model's sensitivity to various configuration options. In merely reviewing the modeled design values of SO<sub>2</sub> concentrations from the various AERMOD simulations provided to EPA, the modeled results are indeed very sensitive to the meteorological and emissions data sets and model configuration options. The EPA's analysis, provided in the final technical support document for this area and elsewhere in this RTC document Section V.A., illustrates the model's sensitivity to various input data and selected model configurations to support that model refinements are necessary to ensure accurate predictions of the modeled design values of SO<sub>2</sub> concentrations.

Furthermore, some of the model simulations and associated analyses provided to EPA predict modeled design values of SO<sub>2</sub> concentrations below the SO<sub>2</sub> NAAQS. Therefore, it is imperative that the input data and AERMOD configuration are representative and align with EPA air quality modeling guidance to support the decision regarding whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS and the designation of the area impacted by emissions from the Martin Drake Power Plant.

**Comment:** One commenter (0332-AA-Sierra Club) Sierra Club states that nothing in the record suggests that any modeling has ever been conducted that shows the air in Colorado Springs meets the SO<sub>2</sub> NAAQS.

**EPA's Response:** EPA agrees that air quality modeling conducted to date has not shown that the air in Colorado Springs meets the 2010 SO<sub>2</sub> NAAQS as the EPA finds that any modeling demonstration for this area could not adequately inform a designation decision absent representative meteorological data. This is one reason that, based on available information, the EPA is unable to determine whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS. However, EPA has had significant concerns with the input assumptions and configurations options used in the completed air quality modeling that commenters assert are sufficient information to demonstrate that the area is not meeting the NAAQS. In particular, the completed air quality modeling has not used representative meteorological data (which are not available), appropriate emissions, or configuration options that align with EPA air quality modeling guidance. Given these issues, the predicted SO<sub>2</sub> concentrations are most likely too high and not representative for this area. As a result, the model results available to date are not sufficient to enable EPA to determine whether the area impacted by emissions from the Martin Drake Power Plant is meeting the NAAQS.

**Comment:** Two commenters (0307-EDF, 0332-AA-Sierra Club) stated that, based on the extensive available evidence, it would be arbitrary and capricious to designate the Colorado Springs area as anything other than nonattainment for the one hour SO<sub>2</sub> NAAQS. Another commenter (0270-APC) expressed concern that, given the available data, an unclassifiable designation would be tantamount to negligence and will potentially mire Colorado Springs Utilities, CDPHE, and EPA in further legal battles with various individuals and environmental groups.

**EPA's Response:** The EPA disagrees that our designation decision is arbitrary, capricious, or negligent. The EPA has fully considered all of the technical information received regarding our intended designation, and has determined that the Colorado Springs area cannot be classified on the basis of available information as meeting or not meeting the 2010 SO<sub>2</sub> NAAQS, and that therefore the EPA determines that the area must be designated unclassifiable. For full discussion of the EPA's review and analysis of all available information, see the final Colorado technical support document section regarding the Colorado Springs area and also see the EPA's responses elsewhere in this RTC document Section V.A.

**Comment:** Some commenters (0244-Masias, 0287-Ostrom, 0298-Weise) stated that it is unacceptable for EPA and CDPHE to reject the Sierra Club's modeling and ignore the evidence in the record when making a designation. Commenters stated the EPA must consider the evidence before it and provide substantial contrary evidence supporting its own positions. One commenter (0298-Weise) provided a list of eight findings and questions in support of a nonattainment designation and also three attached letters. One commenter (0219-APC) stated there is no reasonable scientific justification to avoid the conclusion that the air quality is out of compliance with our Clean Air standards and describing this region as "non-classifiable" is scientifically dishonest.

One commenter (0307-EDF) urged the EPA to either rely upon the existing modeling to designate the Colorado Springs area as nonattainment for the SO<sub>2</sub> NAAQS or to make the appropriate adjustments to the model and use those model outputs to classify the area as nonattainment. One commenter (0332-AA-Sierra Club) stated that neither the plant-owner, nor the state, nor EPA have provided any modeling whatsoever showing that the air in Colorado Springs meets the NAAQS for SO<sub>2</sub>. Commenter (0332-AA-Sierra Club) stated that, when CDPHE re-ran Sierra Club's modeling to account for its own criticisms, the adjusted results still showed exceedances of the SO<sub>2</sub> NAAQS.

One commenter (0287-Ostrom) stated that CDPHE and CSU have never placed any physical monitors in the foothills on the west side of Colorado Springs, where multiple models show there are the greatest exceedances of SO<sub>2</sub>. One commenter (0332-AA-Sierra Club) stated that the limited data available from the Highway 24 monitor was outside of the plume of high SO<sub>2</sub> concentrations predicted by the model and, thus, consistent with Sierra Club's modeling.

**EPA's Response:** The EPA has considered all of the information before it, and provided significant review of that information and its impact on our final designation decision. This

review, as well as our justification for final designation, can be found in our final technical support document for this designation and also can be found in the EPA's responses elsewhere in this RTC document Section V.A.. The EPA disagrees that our final designation decision is "scientifically dishonest." It is the agency's honest scientific opinion that absent representative meteorological data, the existing modeling is not sufficient to form the basis for a determination that the area is either meeting or not meeting the NAAQS.

The EPA does not agree with many of the modeling configuration options chosen by Sierra Club in their modeling analysis, as discussed in our February 16, 2016, Draft Technical Support Document. The attaining design value from the Highway 24 monitor is not sufficient to compensate for these flaws in the modeling, nor is the lack of historic monitoring in the foothills west of Colorado Springs. The EPA also notes that in the modeling analyses submitted by Air Expertise Colorado (AEC), every violating plume includes the attaining monitor.

According to Clean Air Act section 107(d)(1), it is the responsibility of the states to provide designation recommendations to the EPA following the promulgation of a new NAAQS. The EPA also requested that third parties submit relevant information to assist in this round of designations for the 2010 SO<sub>2</sub> NAAQS, and appreciates the commenters having done so. In this instance, both the State and EPA have determined that representative meteorological data with which the Martin Drake Power Plant could adequately be modeled does not exist. Therefore, EPA could not have conducted sufficient modeling to correct the fundamental problem in these modeling runs to determine whether the area meets or does not meet the 2010 SO<sub>2</sub> NAAQS, namely, the absence of necessary representative meteorological data.

In regards to Colorado's modeling, the State neither submitted the associated input files nor considered the results of the analysis to be reliable due to the lack of representative meteorological data. Without representative meteorological data or the associated input files, the EPA cannot determine whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS based on Colorado's modeling.

**Comment:** Some commenters (0262-APC, 0270-APC, 0332-AA-Sierra Club) did not agree that a designation decision should be delayed for two years due to availability of meteorological data. One commenter (0262-APC) stated that historical data show a strong correlation between the two sites and that the minor variation of airport versus Drake wind data, in the models, would tend to model lower concentrations, and yet the models show clear violations. The commenter (0262-APC) added that, while data from a tower constructed in October 2015 will be valuable to assess future NAAQS compliance, the best available, and representative data between 2010 and 2015 is the airport data. Another commenter (0270-APC) stated that granting the facility permission to harm our citizens for a minimum of two more years in the face of evidence that requires action would be a dereliction of duty.

Two commenters (0307-EDF, 0332-AA-Sierra Club) stated that the proposed classification appears to rest upon the erroneous conclusion that there is no existing meteorological data that is "representative of meteorological conditions at the Martin Drake Power Plant" that can be used for AERMOD modeling. The commenters stated that (1) the available meteorological data represent a reasonable data set for modeling with AERMOD, and (2) the modeled design values

are not particularly sensitive to the meteorological data used with respect to the attainment analysis. Commenters' letters include a detailed discussion of why the meteorological data used to model the SO<sub>2</sub> design values is appropriate.

One commenter (0332-AA-Sierra Club) stated that finalizing an "unclassifiable" designation means that, even if CDPHE were to generate on-site meteorological data, it is unclear on what timeline—if ever—EPA would redesignate the Colorado Springs area. Commenter stated there is no reason for such an open-ended delay in addressing the air pollution problems threatening the residents of Colorado Springs: all the information before the Agency clearly necessitates a nonattainment designation.

Another commenter (0286-CS Utilities) provided a five factor analysis to support an unclassifiable recommendation, including a meteorological analysis to support the conclusion that modeling efforts to date utilizing the airport data should not be considered in the designation determination.

***EPA's Response:*** The EPA does not consider the time needed to be taken to collect onsite meteorological data to be unacceptable in the case of the Martin Drake Power Plant, as the area currently lacks representative meteorological data. EPA further notes that we could revisit this unclassifiable designation after receiving any additional air quality characterization required for Martin Drake under the Data Requirements Rule (80 FR 51052, August 21, 2015). The availability of on-site meteorological data currently being collected could inform future decisions addressing the air quality status of the area. As stated in the DRR, "If the EPA has previously determined through a designation action that sufficient information has not yet been identified to support an attainment or nonattainment designation (*i.e.*, the area was initially designated as unclassifiable), then the additional information required by this rule will be used to inform possible future actions by the EPA or the state (*e.g.*, to determine whether the area is attaining or not attaining the standard, and change designation status)." (80 FR 51084).

As discussed in the final Colorado technical support document and elsewhere in this RTC document Section V.A., the EPA disagrees that the Highway 24 data and Colorado Springs Airport data are similar. Based on the wind rose plots provided to EPA, the wind conditions are significantly different between the two data sets. In particular, the prominent wind directions of the Highway 24 data is northwest and southeast, while the Colorado Springs Airport data is generally north and south-southeast. Further, the Highway 24 data contain wind speeds that are generally lower than those at the Colorado Springs Airport. This information supports EPA's decision that representative meteorological data is needed, such as measurement of meteorological conditions at the Martin Drake Power Plant, given the significant differences among these two data sets alone.

The EPA disagrees that the modeling efforts to date utilizing the airport data should not be considered in the designation determination, but does find that the lack of available representative meteorological data for these modeling analyses prevents EPA from relying on the conclusions of these analyses for the purpose of determining whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS.

**Comment:** Commenters (0307-EDF, 0332-AA-Sierra Club) assert that the lower wind speeds at the Martin Drake Power Plant compared to those at the Colorado Springs Airport would actually lead to higher modeled concentrations if the facility was modeled using on-site meteorological data.

**EPA's Response:** EPA agrees that slower wind speeds measured by the Highway 24 monitor, relative to the Colorado Springs Airport, could potentially generate peak modeled SO<sub>2</sub> concentration impacts from the Martin Drake Power Plant that would be higher than the results from AERMOD simulations using the Colorado Springs Airport data. However, EPA cannot confirm this possibility because no modeling has been conducted with the Highway 24 meteorological data which lacks many of the input parameters necessary for use with AERMOD.

**Comment:** One commenter (0321-AEC) provided AERMOD analysis and stated that it shows that the 1-hour SO<sub>2</sub> impacts at the Martin Drake are essentially equivalent for the case of using meteorological data from the nearby National Weather Service station, to the results for the case of using onsite meteorological data collected by Colorado Springs Utilities at the Martin Drake site. Commenter stated that the airport meteorological data are fully representative of conditions at the Martin Drake plant. The commenter provided information and access to the EPA for all of the modeling files.

**EPA's Response:** EPA disagrees that the predicted 1-hour SO<sub>2</sub> impacts at the Martin Drake Power Plant from an AERMOD simulation that uses the Colorado Springs Utilities SODAR data and an AERMOD simulation that uses the Colorado Springs Airport NWS data are similar. Based on EPA's review of the model results, the AERMOD simulation that uses the SODAR data produces a dominant plume originating from the Martin Drake Power Plant to about 2 km northeast of the Plant, whereas the AERMOD simulation that uses the NWS data produces a plume that generally disperses equally/radially from the Plant to about 2 km in all directions. This information supports EPA's decision that representative meteorological data is needed, such as measurement of meteorological conditions at the Martin Drake Power Plant, given the significant differences among these two data sets alone. EPA also notes that the comparative simulations produced by AEC using the Airport and SODAR data have additional flaws (as discussed in the final Colorado technical support document section for this designation and elsewhere in this RTC document Section V.A.) which make them insufficient for the purposes of informing a determination regarding whether the area is meeting the NAAQS.

**Comment:** Commenter (0307-EDF) stated that the Colorado Springs surface hourly and one-minute data, combined with the upper air data (morning soundings) from the Denver Airport, represent a reasonable data set for modeling with AERMOD.

**EPA's Response:** EPA does not agree that the Colorado Springs airport meteorological data represents a reasonable data set for modeling with AERMOD. AERMOD's meteorological preprocessor program, AERMET, is used to organize and process meteorological data and estimate the necessary boundary layer parameters for dispersion calculations in AERMOD. AERMET processes the meteorological data to generate AERMOD-ready input files for each hour of the simulated time period. The key input variables for AERMET include surface characteristics, wind speed, wind direction, cloud cover, and temperature to adequately represent

the meteorology affecting plume transport and dispersion. Therefore, it is important that the data used as inputs to AERMET possess an adequate degree of representativeness to ensure that the wind, temperature and turbulence profiles derived by AERMOD are both laterally and vertically representative of the source area. Furthermore, similar emphasis should be given to assessing the representativeness of the surface characteristics, particularly for areas where surface conditions vary significantly (i.e., complex terrain), to ensure adequate characterization of the transport and dispersion between the source(s) of concern and area(s) where maximum design concentrations are anticipated to occur. Given this information, AERMET has the ability to capture various drainage flows and variable meteorological conditions by hourly time periods, providing that these conditions are represented within the meteorological data. This means that as long as representative meteorological data are used in AERMOD, AERMOD will have the capacity to account for any unique drainage flows and meteorological conditions that exist in the analysis domain.

EPA was provided meteorological data from a sound detection and ranging (SODAR) tower located on-site at the Martin Drake Power Plant (hereafter referred to as “on-site meteorological data”). This on-site meteorological data were collected between October 18, 2015, and December 31, 2015. In EPA’s analysis of the on-site meteorological data and corresponding National Weather Service meteorological data from the Colorado Springs Airport (hereafter referred to as “NWS meteorological data”), EPA identified significant differences among the two data sets. In particular, wind rose plots show that the dominant wind direction of the on-site meteorological data during this timeframe is from the north-west, and consistently lower wind speeds, while the dominant wind directions of the NWS meteorological data are from the north and south, with wind speeds consistently higher. Note that the on-site meteorological data was only collected for a short time period, where the differences in meteorological conditions among the on-site and NWS meteorological data sets are likely to be even more evident during other times of the year. This is because the increased heating during the summer months is likely to generate more variable meteorological conditions, including more diverse wind patterns.

Further, aerial images of the terrain and surface characteristics where the on-site and NWS meteorological data were collected are significantly different. The on-site tower (i.e, Martin Drake Power Plant) is surrounded by urban development in the immediate vicinity and a steep elevation increase from the mountains within five kilometers to the west of the plant, while the NWS station (i.e., Colorado Springs Airport) does not have urban development in the immediate vicinity (i.e., closest development about 3 kilometers) and higher terrain (though to a much lesser extent than the elevation gain west of Martin Drake)<sup>2</sup> begins about 8 kilometers to the north. Additional information regarding the representativeness of the NWS meteorological data or the Colorado Springs Airport data is also provided in EPA’s draft and final technical support documents.

Given the significance differences between on-site and NWS meteorological data sets due to the unique topographical features near Martin Drake Power Plant and AERMOD’s sensitivity to these differences (i.e., wind speed and direction and surface characteristics), representative meteorological data is imperative in order for AERMOD to accurately predict SO<sub>2</sub>

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<sup>2</sup> The highest elevation increase near the airport is of roughly 600 feet, which is at a peak about 10 kilometers to the northeast.

concentrations in this area. In the absence of that representative meteorological data, EPA is unable based on the provided modeling or available information to determine whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS.

**Comment:** One commenter (0307-EDF) states that Colorado was incorrect regarding its assertions about upper air meteorological data. The commenter went into detail regarding the influence of upper air data when using AERMOD, arguing that it is less influential than the State has asserted.

**EPA's Response:** EPA disagrees that vertical measurements are not important and disagrees that AERMOD can make accurate predictions without upper air measurements. It also appears that the commenters are confusing or intermixing the purposes of upper air data and vertical profiles for transport. A full morning upper air sounding is a required input for AERMET in order to calculate the convective mixing height throughout the day. Without this information, AERMOD cannot estimate the convective parameters that impact the transport and dispersion of a plume. Vertical measurements of meteorological conditions or wind profiles for the plume transport (i.e., multi-level tower) are also important for constructing realistic vertical profiles of wind direction, wind speed, temperature, vertical potential temperature gradient, and vertical and lateral turbulence. These measurements are most important in applications involving complex terrain (like the Martin Drake Power Plant) to accurately capture the relationship between the plume and receptor heights. While upper air and vertical profiles of meteorological data are sparse and may not be as imperative as meteorological conditions at the surface, these data are important for modeling the plume transport accurately, particularly in complex terrain. Given that unique terrain features are in close proximity to the Martin Drake Power Plant, representative upper air measurements and vertical measurement are needed to accurately predict the transport and dispersion of the emissions from this facility, and to enable EPA to determine based on a modeling analysis whether the area is meeting the NAAQS. Therefore, if it is feasible to set up a multi-level meteorological tower at or near the site, this option would be preferable over meteorological data collected from distant locations, especially in areas with complex terrain.

**Comment:** One commenter (0307 – EDF) stated that the modeled design values for the Martin Drake facility are not particularly sensitive to the meteorological data used with respect to the attainment analysis.

**EPA's Response:** EPA does not agree that the modeled design values for the Martin Drake facility are not sensitive to the meteorological data used by the commenter with respect to the attainment analysis. The analysis provided to EPA to support this comment was based on running AERMOD with eight different meteorological data sets and calculating the modeled design value SO<sub>2</sub> concentrations. The meteorological data sets included:

1. Albuquerque, NM;
2. Bakersfield, CA;
3. Columbus, OH;
4. Jefferson County, MO;
5. Rochester, MN;
6. Rome, GA;
7. Colorado Springs Airport, CO; and

#### 8. Colorado Springs Highway 24 Monitor, CO.

The results of the simulations completed by the commenter predicted modeled design values of SO<sub>2</sub> concentrations between about 190 µg/m<sup>3</sup> and 402 µg/m<sup>3</sup>. While all but one site (Bakersfield, CA) predicted SO<sub>2</sub> concentrations above the NAAQS, the analysis has many deficiencies that prohibit the interpretation of the results in an appropriate and accurate manner, and used assumptions that are not representative for this area or do not align with EPA air quality modeling guidance. In merely reviewing the modeled design values of SO<sub>2</sub> concentrations from the various AERMOD simulations provided by the commenter (Gray, page 7/table7), unlike the conclusion provided in this comment, the modeled results are indeed significantly sensitive to the meteorological data sets given that the modeled design values of SO<sub>2</sub> concentrations range from 190 µg/m<sup>3</sup> and 402 µg/m<sup>3</sup>. This suggests that the modeled design values of SO<sub>2</sub> concentrations could change by a factor of two depending on the meteorological data set. Additionally, based on EPA's analysis of the AERMOD output from the simulations provided by commenter, EPA found that the location of the modeled design values of SO<sub>2</sub> concentrations changed significantly depending on the meteorological data set used in AERMOD.

In regards to the AERMOD configuration used for these simulations, the analysis provided by the commenter does not use configuration options that align with EPA air quality modeling guidance. Based on EPA's analysis of the AERMOD output from the simulations provided by commenter, EPA found that most of the modeled design values of SO<sub>2</sub> concentrations could potentially be found on the secured facility's property, inside the fence, to which the public does not have access. If the analysis was consistent with EPA's air quality modeling guidance, the receptors associated with the modeled design values of SO<sub>2</sub> concentrations from the commenter's analysis would have been excluded, resulting in modeled design values of SO<sub>2</sub> concentrations that would most likely be significantly lower. Furthermore, the simulations assumed values for the population density that are too high. These simulations assumed an unsupported population density of 668,000, which based on United States Census Bureau reports should be around 416,000 people. Some of the simulations also used older versions of AERMET (12345, 13350, 14134) that do not include bug fixes and enhancements that improve the performance of AERMET (e.g., mixing heights, minimum wind thresholds, cloud cover values, bulk Richardson scheme). Using the configuration options and input assumptions selected by the commenter, particularly including receptors on the facility's secured property, are most likely contributing to modeled design values of SO<sub>2</sub> concentrations that are too high.

In other words, the modeled design values of SO<sub>2</sub> concentrations could potentially be significantly lower, if more appropriate configuration options and representative input assumptions were utilized in these AERMOD simulations, aside from the central issues resulting from the use of unrepresentative meteorological data sets.

The EPA was provided the meteorological data sets from the eight sites used in this analysis. In EPA's analysis of meteorological data sets, EPA identified significant differences among the eight data sets. In particular, wind rose plots show that the dominant wind directions and range of wind speeds of the data sets vary greatly among the selected meteorological data sets. EPA was also provided meteorological data from the SODAR tower located on-site at the Martin Drake plant. In EPA's analysis, none of the data sets used by the commenter are similar to or representative of the on-site meteorological data. Further, aerial images of the terrain and surface

characteristics where the meteorological data sets were collected are significantly different from each other and, more importantly, from the location of the Martin Drake Power Plant in Colorado Springs, Colorado.

Given that AERMOD's meteorological preprocessor program, AERMET, requires the input of surface characteristics, wind speed, wind direction, cloud cover, and temperature to estimate the necessary parameters for the dispersion calculations in AERMOD, it is of paramount importance that the data used as input to AERMET are representative to adequately represent the meteorology affecting plume transport and dispersion. Given this information, AERMET has the ability to capture various drainage flows and variable meteorological conditions by hourly time periods, providing that these conditions are represented within the meteorological data. This means that as long as representative meteorological data are used in AERMOD, AERMOD will have the capacity to account for any unique drainage flows and meteorological conditions that exist in the analysis domain.

As a result, representative meteorological and emissions data, along with AERMOD configurations that align with EPA guidance, are needed to accurately predict the modeled design values of SO<sub>2</sub> concentrations for this area. Based on the information provided, the predicted SO<sub>2</sub> concentrations for the Martin Drake facility are sensitive to these parameters, generating modeled design values for the facility that could potentially be below the NAAQS if other, more representative input data and configuration assumptions were utilized in the analyses. Without representative meteorological data, the EPA determines that the area is unable to be classified based on the provided modeling or available information whether it meets or does not meet the 2010 SO<sub>2</sub> NAAQS.

**Comment:** One commenter (0307 – EDF) stated that AERMOD can accurately predict peak concentrations as long as the general dispersive nature of the atmosphere is reasonably well represented by the meteorological data used by the model. The commenter further states that the wind data used in AERMOD does not need characterize the upslope and drainage flows associated with the nearby terrain features, so long as the wind data adequately represent the distribution of dispersive conditions of the atmosphere and for the model to be able to accurately predict the peak distribution of ambient concentrations.

**EPA's Response:** EPA agrees that AERMOD has the ability to provide reliable statistical distributions of the daily peak hourly average SO<sub>2</sub> concentration. However, EPA does not agree that it is not necessary for the meteorological data used in AERMOD to characterize the drainage flows and other meteorological conditions in order to accurately predict peak distributions of SO<sub>2</sub> concentrations. The reliability of AERMOD's predictions are strongly dependent on the representativeness of the input assumptions, surface characteristics, and primary atmospheric input variables, including wind speed and direction, temperature, and cloud cover. These input variables provide the information for AERMOD to characterize the drainage flows and meteorological conditions associated with terrain features in order to predict the transport and distributions of SO<sub>2</sub> concentrations. Therefore, as long as representative input information, such as meteorological data, are used in AERMOD, AERMOD will have the capacity to account for any unique drainage flows and meteorological conditions that exist in the analysis domain. Further, the accuracy of the peak SO<sub>2</sub> concentrations not only depends on the magnitude of the

predicted concentrations but also the location of the peak concentrations or the dispersion of the plume that forms the peak concentrations. The relationship between the dispersion of the plume and the calculation of the SO<sub>2</sub> design values is strongly dependent on representative input information, where differences in the transport and dispersion of the pollutant will impact the estimation of the peak concentrations because the distribution of the concentrations will change based on the input information used to estimate the dispersion of the pollutants.

As discussed further above, based on EPA's review of the AERMOD modeling analyses provided by the commenters, it is evident that AERMOD is sensitive to the use of various input variables. The modeling analyses provided by the commenter used various meteorological and emissions data and different configuration options. The results from these AERMOD simulations illustrate that the predicted peak hourly average SO<sub>2</sub> concentration changes significantly in magnitude and location. Therefore, it is imperative to ensure that input information used in AERMOD is representative in order to estimate accurate modeled design values of SO<sub>2</sub> concentrations for this area.

**Comment:** One commenter (0307-EDF) asserted that AERMOD is capable of reliably predicting peak concentrations using airport data much further than the distance from the Martin Drake Power Plant to the airport NWS station (11 km).

**EPA's Response:** EPA agrees that it is acceptable in some cases to use meteorological data collected at an airport NWS station that may be located a significant distance from the modeled source. However, where the meteorological data collected at the airports were utilized in regulatory application of AERMOD, the data have been representative of the meteorological conditions at the location of the modeled source. As EPA explained in the February 16, 2016, draft technical support document, the meteorological data collected at the Colorado Springs airport, instead, is not representative of the meteorological conditions and surface characteristics at the location of the Martin Drake Power Plant, and the most recent meteorological data from the SODAR tower located on-site at the Martin Drake plant have significant differences in wind speed and direction compared to the data from the Colorado Springs Airport data. Therefore, EPA does not consider this case to be one in which it is accurate to accept the airport data collected at some distances from the modeled source as providing representative information of the meteorological conditions at the modeled source.

**Comment:** One commenter (EDF-0307) asserted that EPA's emphasis on representative meteorological data is unnecessary because AERMOD does not pick up on meteorological subtleties, specifically stating that the AERMOD model does not simulate air pollutant transport around complex terrain features.

**EPA's Response:** EPA does not agree that AERMOD cannot simulate the transport of air pollutants in complex terrain. EPA air quality guidance recommends AERMOD as the preferred near-field model, even in complex terrain. AERMOD's meteorological preprocessor program, AERMET, is used to organize and process meteorological data and estimate the necessary boundary layer parameters for dispersion calculations in AERMOD. The key input variables for AERMET include surface characteristics, wind speed, wind direction, cloud cover, and temperature to adequately represent the meteorology affecting plume transport and dispersion.

Therefore, it is of paramount importance that the data used as inputs to AERMET possess an adequate degree of representativeness to ensure that the wind, temperature and turbulence profiles derived by AERMOD are both laterally and vertically representative of the source area. Furthermore, similar emphasis should be given to assessing the representativeness of the surface characteristics, particularly for areas where surface conditions vary significantly (i.e., complex terrain), to ensure adequate characterization of the transport and dispersion between the source(s) of concern and area(s) where maximum design concentrations are anticipated to occur. Given this information, AERMET has the ability to capture various drainage flows and variable meteorological conditions providing that these conditions are represented within the meteorological data. This means that as long as representative meteorological data are used in AERMOD, AERMOD will have the capacity to account for any unique drainage flows and meteorological conditions that exist in the analysis domain.

**Comment:** One commenter (0307-EDF) stated that wind speed and direction are specifically inconsequential to AERMOD results.

**EPA's Response:** EPA does not agree that wind direction is not important to plume dispersion and concentrations predicted by AERMOD. In particular, wind direction is important in AERMOD for estimating the impacts that building downwash and complex terrain have on the dispersion and transport of the plume. Without representative wind direction data, the dispersion of the plume will be impacted, subsequently making it difficult for AERMOD to predict accurate concentrations for this area. According to studies referenced in EPA's Appendix W Guidelines,<sup>3</sup> uncertainty of 5 to 10 degrees in the measured wind direction, which transports the plume, can result in concentration errors of 20 to 70 percent for a particular time and location, depending on stability and station location.

**Comment:** Some commenters (0249-APC, 0263-Colorado groups and citizens, 0298-Weise) stated that the pollutants from the Martin Drake plant have a disproportionate effect on these low-income and minority communities, those who are most vulnerable and least able to advocate for the health of their community. Some commenters (0227-Permut) expressed concern about air quality in the area. One commenter (0249-APC) stated that a designation of nonattainment is the only way to allow for swift and necessary action to stop harmful emissions, and provide sufficient oversight to protect public health to ensure the air we breathe is safe.

**EPA's Response:** EPA agrees that SO<sub>2</sub> pollution can be very harmful to public health, which is why EPA established the 2010 SO<sub>2</sub> NAAQS for the pollutant. As we explained in the preamble to the final SO<sub>2</sub> NAAQS, the prevalence and severity of asthma is higher among certain ethnic or racial groups and in minority and inner-city communities, which indicates that exposure to ambient SO<sub>2</sub> could have a significant impact on the public health of these groups and communities. 75 FR at 35527. We also agree that it is necessary to designate areas nonattainment when the available information demonstrates that an area is not meeting the NAAQS and therefore indicates that such a designation is appropriate so that harmful pollution problems must be addressed through a required state implementation plan leading to expeditious

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<sup>3</sup> 40 CFR Part 51: Revision to the Guideline on Air Quality Models: Adoption of the Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule, November 9, 2005.

future NAAQS attainment. However, as EPA has determined that based on currently available information the area cannot be classified as meeting or not meeting the NAAQS, it is not appropriate for the EPA to designate it as nonattainment.

**Comment:** One commenter (0226-APC) stated this is not a health issue, but an attempt to close a power plant that operates very efficiently and releases a steam cloud. Commenter cautioned to not be influenced by this radical group of individuals.

**EPA's Response:** The EPA does not agree that designation under the 2010 SO<sub>2</sub> NAAQS is not an issue of health, as the primary NAAQS are set with the purpose of protecting public health with an adequate margin of safety, and the EPA has made the designation determinations in this action based upon its own review and technical analysis of all available information.

**Comment:** One commenter (0254-Goins) opposed a designation to nonattainment until more monitoring is conducted at ground level. The commenter stated that, given that past monitoring showed the area was not close to exceeding the standard and with no change to coal fired sources, it does not make sense that the area would all of a sudden be exceeding the standard.

**EPA's Response:** The EPA agrees that there is not sufficient technical information to determine whether the area around the Martin Drake Power Plant is meeting or is not meeting the 2010 SO<sub>2</sub> NAAQS. However, the EPA disagrees that ambient air monitoring is the only way the area can be characterized in the future to inform any potential redesignation of the area for this NAAQS.

**Comment:** One commenter (0286-CS Utilities) recommended the unclassifiable area be limited to the City of Colorado Springs west of Academy Blvd. Commenter provided a five factor analysis to support its recommendation. Commenter stated that air quality monitoring throughout El Paso County at numerous monitoring stations from 1988 through the present has consistently shown attainment of the 2010 sulfur dioxide NAAQS. Commenter suggested that it is necessary to update the emissions and emission controls factor analysis to include the announced decommissioning of Drake Unit 5.

One commenter (0321-AEC) stated that analyses completed by AEC support a designation of nonattainment for the 1-hour SO<sub>2</sub> NAAQS for an approximately five square-kilometer area around the Martin Drake plant in Colorado Springs, Colorado. The commenter provided information and access to the EPA for all of the modeling files.

One commenter (CO Response) recommended an unclassifiable designation for the area surrounding Drake Power Plant and attached a TSD (CO Response Attachment 1) that provides detailed information for the specific boundary recommendation. The commenter stated the TSD analyzes each of the five factors set forth in EPA's March 20, 2015 memorandum. The commenter stated that the TSD shows that their designation boundary recommendations are accurate and supportable for EPA approval and stated that the boundaries are based on guidelines

in EPA's Modeling TAD and an EPA memo issued March 1, 2011 as well as other factors. The commenter recommended a boundary around a portion of the city of Colorado Springs, including enclosed unincorporated county areas, bounded to the north by East Woodmen Road, North Academy Boulevard, and city limits, to the east by North/South Powers Boulevard, and to the south and west by city limits, with the addition of the census designated place termed "Stratmoor" bounded by South Academy Boulevard. As described in detail in the TSD, commenter stated this recommendation is based on the following information:

- Preliminary monitoring and emissions-related data shows that this boundary incorporates the primary source (Martin Drake Power Plant). Emissions from the only other notable SO<sub>2</sub> source in the vicinity are in a separate airshed;
- Meteorological and topographical information indicate that potential impacts would be contained within this boundary;
- The mountains that generally begin just to the west of the cities of Colorado Springs and Manitou Springs constitute a geographical boundary limit;
- Basing the area boundary on the guideline 10 km radius for a modeling domain is not appropriate because of the complex terrain and urban demographics;
- Affected populations, including sensitive subpopulations, within the city of Colorado Springs, including those living in unincorporated enclosed county areas, and the city of Manitou Springs are located within this boundary. EPA has previously approved area boundaries for other Round 2 SO<sub>2</sub> designation boundaries that align with roadways, rather than the outermost jurisdictional boundaries of a unit of local government.

***EPA's Response:*** The EPA considers the updated boundary recommendations submitted by Colorado to be appropriate for the final designation of this unclassifiable area. See the final Colorado technical support document for this designation for the complete rationale.

## B. Morgan County

***Comment:*** One commenter (CO Response) recommended an unclassifiable designation for the area surrounding Pawnee Power Plant and attached a TSD (CO Response Attachment 1) that provides detailed information for the specific boundary recommendation. The commenter stated the TSD analyzes each of the five factors set forth in EPA's March 20, 2015 memorandum. The commenter stated that the TSD shows that their designation boundary recommendations are accurate and supportable for EPA approval and stated that the boundaries are based on guidelines in EPA's Modeling TAD and an EPA memo issued March 1, 2011 as well as other factors. As described in more detail in the TSD, commenter recommended a radius of 10 kilometers around the Pawnee Power Plant as the boundary for the unclassifiable designation based on the following information:

- EPA's Modeling TAD and March 1, 2011 Memo distance guidelines indicate that a 10 km radius normally establishes an appropriate modeling domain. SO<sub>2</sub> modeling for the area around the Pawnee Power Plant will not be completed before the court ordered deadline for making Round 2 designations. No SO<sub>2</sub> ambient monitoring data is available

for this area. Without completed modeling results or ambient monitoring data, it is appropriate to base the SO<sub>2</sub> area boundary on the 10 km radius outlined in EPA's March 1, 2011 Memo;

- SO<sub>2</sub> emissions from the Pawnee Power Plant have been significantly reduced since the installation of the semi-dry lime scrubber in 2014. Emissions from Cargill Meat Solutions are captured by the 10 km radius. The Western Sugar Cooperative facility is located further than 10 km from the Pawnee Power Plant, and has significantly lower emissions than the power plant;
- There are no significant meteorological, geographical or topographical features that make the 10 km radius an inappropriate area designation boundary;
- The nearby town of Brush and the affected areas of the city of Fort Morgan closest to the Pawnee Power Plant are included in this proposed radius.

**EPA's Response:** The EPA's review of Colorado's updated designation recommendation can be found in the final Colorado technical support document for this designation.

## VI. Georgia

### A. Juliette

**Comment:** One commenter (0291-GA Power) generally supported the EPA's response and technical analysis, with the following exceptions: (1) the deferral of designations for Bibb County, and (2) the use of a background concentration that may already include impacts from Plant Scherer.

**EPA's Response:** The EPA acknowledges the Commenter's support of the EPA's considerations for the Robert W. Scherer Power Plant in the Juliette, Georgia, Area. Regarding the two exceptions asserted by the Commenter, please refer to the separate responses below.

**Comment:** One commenter (0291-GA Power) stated the EPA should not defer designation of Bibb County for the following reasons: (1) the state's modeling and analyses already show attainment; (2) the state has a population-based air quality monitor in the county that has been consistently monitoring attainment; and (3) there are no individual or collection of sources in Bibb County or neighboring counties that will be required to conduct source-specific modeling or monitoring under the consent decree or the Data Requirements Rule (DRR) for purposes of the remaining area designations in 2017 or 2020. Additional details on these points is provided in the Commenter's letter.

**The EPA's Response:** On March 2, 2015, the U.S. District Court for the Northern District of California issued a court order requiring the EPA to complete designations for the 2010 1-hour SO<sub>2</sub> NAAQS by three future deadlines. Phase 1 requires the EPA to designate areas by July 2, 2016 (16 months from the court's order) for 1) areas that have newly monitored violations of the 2010 SO<sub>2</sub> NAAQS, and (2) areas that contain any stationary sources that had not been announced as of March 2, 2015, for retirement and that, according to the EPA's Air Markets Database,

emitted in 2012 either: (i) more than 16,000 tons of SO<sub>2</sub>, or (ii) more than 2,600 tons of SO<sub>2</sub> with an annual average emission rate of at least 0.45 pounds of SO<sub>2</sub> per one million British thermal units (lbs SO<sub>2</sub>/mmBTU). Phase 2 requires the EPA, by December 31, 2017, to finalize designations for remaining undesignated areas in which, by January 1, 2017, states have not installed and begun operating new SO<sub>2</sub> monitoring networks meeting EPA's specifications. Finally, Phase 3 requires the EPA, by December 31, 2020, to designate all remaining undesignated areas. The EPA notes that the court-ordered designations schedule for Phase 2 and 3 will be informed and benefited by any additional information that is timely obtained pursuant to the DRR.

Bibb County does not contain a source that meets the criteria, as specified in the consent decree, for the designations due by July 2, 2016. Furthermore, the Commenter did not provide any comment to the contrary. As the EPA noted in the final Georgia TSD, the Agency intends to designate Bibb County and all other remaining undesignated areas of Georgia not addressed in this action by either December 31, 2017, or December 31, 2020, consistent with the deadlines of the March 2, 2015, final court ordered consent decree. The EPA believes that in this case it is reasonable to limit the scope of our final designations in the current round to those areas that met the criteria for being required to be designated now. This will provide a more complete opportunity for states and the EPA to fully implement its carefully developed strategy for implementation of the 2010 SO<sub>2</sub> NAAQS.

**Comment:** One Commenter (0291-GA Power) asserted that the TSD for the Juliette, Georgia, Area provides an overly conservative analysis regarding background concentrations. Specifically, the commenter suggests that the background concentration from the Bibb County monitor (AQS Site ID: 130210012) may already include impacts from Plant Scherer suggesting double counting the source's impacts. The Commenter goes on to suggest that further analysis should have been performed to determine if Plant Scherer was impacting the monitor. Lastly, the Commenter asserts that their analysis indicates that Plant Scherer impacts the monitor in a 45° sector downwind of the source and therefore monitored values measured while winds were blowing in this sector results in a background concentration of 11 ppb and therefore EPA should revise the TSD to incorporate an adjusted background concentration of 11 parts per billion (ppb), rather than 15 ppb.

**The EPA's Response:** The EPA disagrees with the Commenter's assertion that the background concentration represents an overly conservative analysis. As discussed in the EPA's final Georgia TSD, the Agency finds that the Bibb County monitor provides the most representative background concentration for the modeling due to its proximity to the area of analysis. The EPA has reviewed the additional information provided by the Commenter and has concluded that the Commenter's analysis of the Bibb County monitor data does show the potential for impacts from Plant Scherer's emissions to be included in the monitored background value (i.e., potential for double counting). The Commenter presented information to show that the 99<sup>th</sup> percentile monitored values at the Bibb County monitor in 2012 and 2013 occurred during hours when the winds were blowing from the direction of Plant Scherer. Therefore, use of the design value from the Bibb County monitor likely adds some level of conservatism to the modeled estimate of ambient impacts in the area around Plant Scherer. However, this only serves to reinforce the EPA's decision to designate the area around Plant Scherer as unclassifiable/attainment.

## VIII. Illinois

### A. Alton Township

**Comment:** One commenter (0315-Alton Steel) requested that the EPA reject the State's recommendation and include the Alton Township Area in the larger unclassifiable area so that the region's overall attainment status can be comprehensively addressed using more reliable data at a later stage of this designation process. Commenter did not agree that Alton Steel, which was identified as a 38-40 tpy SO<sub>2</sub> source, alone caused the Alton Township Area to be classified as nonattainment, while Wood River -- a 6,700 – 7,600 tpy SO<sub>2</sub> source less than 2,500 meters away -- was deemed "unclassifiable" and presumed not to be contributing to Alton Township's nonattainment. Commenter stated that the only reason the Alton Township Area was included in EPA's initial round of SO<sub>2</sub> designations was its proximity to the Wood River Power Station.

Commenter (0315-Alton Steel) stated that, while Illinois EPA's recommended designation of the Alton Township Area is based on the State's use of AERMOD, the State's modeling is unsuitable for several reasons, including: it is a deterministic model, there are little to no actual emissions data, it has an inability to properly account for heated releases, it was run on incorrect and incomplete data, and it is known to over-predict emissions in low-wind and downwash areas. Commenter stated that Illinois EPA could have validated the model by including modeled results at the location of two nearby SO<sub>2</sub> monitors, which have not recorded an SO<sub>2</sub> exceedance. In the commenter's letter additional details are provided on these points.

The commenter asserts that "the model utilized incomplete and, in many cases, incorrect data," and expresses particular concern about the emissions data that Illinois used. The commenter states that "emissions [for the ladle metallurgy facility (LMF)] were based on the industry emission factor that was higher than Alton Steel's stack testing results throughout the majority of the stack test." The commenter asserts that a number of the features of AERMOD make it unsuitable for determining the attainment status of the area near Alton Steel. The commenter asserts that "AERMOD is a deterministic model for [addressing] a snapshot in time," whereas the standard "is a probabilistic standard . . . [the results of which] require significant refinement to realistically address the frequency of the peak short-term impacts that are the output of the model." The commenter asserts that "the downwash formulation in AERMOD have known formulation deficiencies which may cause unrealistically high concentration predictions," The commenter asserts that the plume, emanating from a ladle metallurgy facility, has significant buoyancy that Illinois' modeling does not properly address.

The commenter asserts that AERMOD is "known to over-predict emissions in low-wind areas," but EPA "failed to properly account for the relative absence of wind around the [critical] receptors." The commenter also stated that "multiple conditions present [at the 14 receptors with 'potential' exceedances] reflect factors well known . . . as leading to AERMOD's significant

overestimation,” and that the result of Illinois’ failure “to properly account for those factors” was the exclusion of a much larger source from the nonattainment area and the identification of a “hot spot’ requiring only a very small nonattainment designation. Commenter (0315-Alton Steel) stated that, given the flaws in Illinois EPA’s modeling effort, if EPA were to adopt Illinois EPA’s recommendations for the Alton Township Area, that decision would be arbitrary, capricious and an abuse of its discretion under the Clean Air Act. Commenter stated that the modeling effort conducted thus far is sufficient only to support a decision to place a monitor in the area of the allegedly violating receptors.

***EPA’s Response:***

Under a court order, EPA is obligated to designate the area around the Wood River power plant by July 2, 2016, and EPA to designate the remainder of the country (excepting areas newly monitoring according to specified criteria) by December 31, 2017. Illinois has provided pertinent information and recommendations regarding an area near the Wood River power plant that includes all of Wood River Township, a portion of Chouteau Township, and a portion of Alton Township that includes Alton Steel. Alton Township is nearby the Wood River power plant. Specifically, it is directly adjacent to the Wood River Township and the Wood River power plant. Upon consideration of the State’s recommendations, based on its own modeling which followed EPA’s modeling TAD, EPA finds that there is persuasive evidence regarding the air quality in this portion of Alton Township which warrants a finding that the area is not meeting the NAAQS and a nonattainment designation, and EPA is making this designation under the EPA’s Clean Air Act section 107 authority.

As mandated under Clean Air Act section 107, EPA has evaluated both the area that is violating the air quality standard and any nearby sources that may be contributing to that violation. Through this evaluation, EPA reviewed modeled violations in the immediate vicinity of Alton Steel. EPA further analyzed whether the Wood River power plant should be considered to contribute to these violations; EPA’s proposed designation reflected the EPA’s finding that “the critical day impacts of the [Wood River] power plant at the location of modeled violations at the fenceline of Alton Steel are likely to be minimal.” As stated in the technical support document for the proposed designation, exceedances of the standard at the locations of modeled violations primarily occur with southwest winds, when emissions from the Wood River power plant are being transported well to the east of the area of violations. Despite the disparity in tons per year of emissions noted by the commenter, the commenter provides no evidence that emissions from the power plant are having more than a de minimis impact on concentrations near Alton Steel at times when concentrations above the standard are occurring. While the commenter implies that the modest emissions from Alton Steel cannot alone be the cause of violations, particularly with a much larger source a few kilometers away, EPA finds that, based on our technical knowledge of the nature of SO<sub>2</sub> emissions and our analysis of Illinois’ modeling results, as further detailed in the Illinois final TSD, available information provides convincing evidence to support our conclusion that in fact the Wood River power plant (with most of its impact occurring elsewhere on occasions of violations near Alton Steel) does not contribute to the modeled violations near

Alton Steel and that Alton Steel (with relatively short stacks and significant building downwash) does contribute to those violations.

While the commenter objects to Illinois' emission factor, the commenter does not provide quantitative evidence with which to judge how accurate Illinois' emission factor was in representing average emissions from the LMF, including the portions of the stack test when results apparently exceeded the industry emission factor. For example, batch processes in which emissions are elevated only a minority of the time would by definition have lower emissions "throughout the majority of the stack test," but the comment sidesteps the question of whether the emission factor is accurate considering the entirety of the stack test. The commenter does not explain how use of an average emission rate (uniformly distributing Alton Steel's annual emissions) can result in overestimating Alton Steel's actual emissions, nor does the commenter explain why a mix of understating and overstating hourly emission rates wouldn't be just as likely to understate as to overstate the impacts of this facility. Given that the commenter has not provided quantitative evidence as to the degree to which Illinois has allegedly overstated emissions (and presumably at other times understated emissions), and given the substantial margin by which estimated concentrations exceed the standard, EPA finds that the available evidence is adequate to conclude that the area is violating the standard.

Contrary to the commenter's objections based on the design of AERMOD, AERMOD is in fact designed to use a representative set of meteorological data (in this case for the 3 years of 2012 to 2014), to estimate the ensemble of concentrations over that time, and from that ensemble to judge the expected 99<sup>th</sup> percentile of daily maximum concentrations at each modeled location. The commenter has not identified any further refinements that would be needed to estimate design concentrations for the area, nor has the commenter identified any reason that this approach inherent in using AERMOD has any tendency to over- or underestimate the design value that can be expected.

The commenter provides no evidence or justification for its assertion regarding deficiencies in the treatment of downwash in AERMOD. EPA continues to maintain the position that the downwash formulation in AERMOD provides the best available means of estimating the increase in concentrations associated with the downwash phenomenon.

To evaluate comments regarding buoyancy at Alton Steel, EPA must consider the configuration at the facility. At this facility, the vents are positioned adjacent to a building that is roughly three times the height of the vents, and the discharge is in a downward direction. Therefore, the dominant dispersion phenomenon is the downwash/dilution of the plume caused by the building structure, and the buoyancy of the plume would likely be inadequate to escape the building wake influences.

The standard approach for modeling a horizontal (or downward) discharge of emissions is detailed in the AERMOD Implementation Guide (2009) document. This document discusses both horizontal discharge and rain-capped stacks for situations with and without building downwash. The approach for a horizontal release or a capped stack in a situation with building downwash utilizes a minimal exit velocity to account for the zero momentum rise the

release. The actual stack diameter and exit gas temperature are used in the modeling. The consequence of this is that plume rise is limited both in terms of momentum and buoyancy. Illinois' modeling approach used this approach.

EPA has also developed a beta option for capped stacks and horizontal releases, i.e. the POINTCAP and POINTHOR options that further consider buoyancy. However, Illinois did not request use of these options, and neither Illinois nor the commenter provided the necessary justification for their use. Furthermore, given the immediate proximity of the release to a substantially taller building, the dominant influence on concentrations will likely be the building wake effects, and it appears unlikely that the buoyancy of the plume would influence concentrations sufficiently to indicate attainment. The commenter provided no evidence that Illinois' approach significantly overestimated impacts. Therefore, EPA finds that Illinois' modeling approach provides reasonable estimates of concentrations in the area.

Regarding comments relating to low wind situations, the commenter did not document or support any rationale that the treatment of low wind conditions is causing an overestimation of concentrations near Alton Steel. Similarly, regarding factors allegedly causing AERMOD to overestimate concentrations, which are purported to result in exclusion of the Wood River power plant from the recommended nonattainment area, the commenter does not identify and provides no explanation of the allegedly problematic factors, and so the commenter provides no information for EPA to consider within any portion of the analysis supporting designating the area near Alton Steel as nonattainment.

While Illinois did not obtain or use hourly emission data for this facility, Illinois has used the best available emissions data. The commenter has provided no reason to believe that more detailed emission data would yield a different result as to whether this area is violating the standard, particularly given the margin by which the area is estimated to be violating the standard, and so EPA views our analysis of this comment and the Illinois modeling as providing a reasonable basis for EPA to conclude that the area is violating the NAAQS and that a nonattainment designation is warranted.

**Comment:** Commenter (0315-Alton Steel) disagreed with the selected receptor locations because they do not represent locations that could have an actual SO<sub>2</sub> monitor located at them. Commenter stated that many, if not all of these receptors are located where it would not be possible to locate a SO<sub>2</sub> monitor given the presence of a railroad track and a railroad right-of way.

**EPA's Response:**

The TAD provides the option not to place receptors at locations where monitoring is not feasible, but states nevertheless retain the option to consider concentrations estimated at such ambient air locations. In any case, a careful review of the location of the violating receptors does not show these receptors to be located on railroad tracks, and instead shows that the receptors are located at ambient air locations where monitoring is feasible and therefore should be included when

modeling to adequately characterize air quality. Furthermore, the fact that 14 separate receptors show modeled violations suggests that even if the commenter had identified receptors of concern and had proposed alternate nearby locations as replacement receptors, these replacement receptors would likely have shown violations as well. Illustrative of this point is the fact that two of Illinois' receptors, located 13 meters apart on opposite sides of the railroad tracks, are estimated to have nearly identical concentrations, both approximately twice the standard. A public road with numerous businesses on the near side is about 100 meters from the railroad track, and the commenter has provided no evidence to dispute the conclusion that many of these locations, which clearly represent appropriate locations to monitor, are within an area that EPA's analysis has determined is violating the standard.

**Comment:** Commenter (0315-Alton Steel) objects that Illinois did not use monitoring data from two monitors in Madison County to assess model performance, which the commenter presumes would have demonstrated the over-conservatism of the model. The commenter recommends that EPA defer designating the area and provide for the attainment status to be "comprehensively addressed using more reliable data at a later stage of this designation process."

***EPA's Response:***

The monitors that the commenter seeks to be used for model performance evaluation purposes are approximately 5 and 10 kilometers from the Alton Steel facility, respectively. Given the short range of the influence of downwash on ambient concentrations, especially given the short stacks present at the Alton Steel facility which limits dispersion, these monitors are far too distant to provide any indication of the validity of model performance near Alton Steel. These monitors are both in the area that EPA proposed to designate as unclassifiable/attainment, and data from these monitors tend to corroborate the modeling evidence that Wood River Township and relevant portions of Chouteau Township are attaining the standard, but data from these monitors do not indicate whether or not violations are occurring near Alton Steel. Illinois has recommended that this area be designated nonattainment, EPA's analysis of the evidence supports the conclusion that the area is in fact violating the standard, and EPA finds that deferring action on the designation of the area near Alton Steel is not warranted.

**B. Marion**

**Comment:** Two commenters (IL Response, 0318-Paine) requested that the EPA revise the proposed designation of Williamson County, IL from nonattainment to attainment.

One commenter (0318-Paine) attached a recent modeling report to address the EPA's response to the Illinois EPA designation recommendations: *Characterization of 1-Hour SO<sub>2</sub> Concentrations for the Marion Power Plant* by AECOM, March 2016. Commenter stated the updated AERMOD analyses (1) were conducted for the latest 3 years (the 2013-2015 period), a period which was associated with a reduction in SO<sub>2</sub> emissions relative to previous years due to improved emission controls associated with MATS and CSAPR; (2) were conducted using the current regulatory

defaults in one set of runs, as well as another set of runs with refinements, such as EPA-proposed low wind options; and (3) show attainment in all of the modeling approaches, including the default options with no refinements. The AECOM report stated that three modeling scenarios were conducted with the current EPA default options, AERMOIST source characterization, and ADJ\_U\*/LOWWIND3 beta options and the results of these three modeling scenarios all support an attainment designation. The AERCOM report stated that, with refined modeling approaches, the 2013-2015 3-year average design concentration is likely to be about 80% of the SO<sub>2</sub> NAAQS and, in the future, with continued implementation of the CSAPR and MATS controls, the design concentration is expected to be lower.

One commenter (IL Response) stated the Illinois EPA has reviewed and considered the modeling submitted by AECOM on behalf of Southern Illinois Power Cooperative (SIPCO), supports the methodology and inputs, and agrees with the results that demonstrate Williamson County should be designated in attainment of the SO<sub>2</sub> NAAQS. The commenter noted that the Illinois EPA comments on the SIPCO modeling relate to the AECOM modeling using default options. Commenter stated the receptor network used by AECOM followed guidance provided in the Modeling TAD. Commenter stated the meteorological data used in AECOM's modeling uses the same information the Illinois EPA had used, except for the very minor issue involving AECOM's generation of monthly surface characteristics values for the month of February 2015. Commenter stated this minor difference would have no effect on the modeled determination that the area should be designated attainment. Commenter stated that EPA Region 5 has informed Illinois EPA that it has reviewed the hourly emissions data and determined that they translate to the annual emission totals reported to CAMD, with emissions that seem sufficiently regular to be considered adequately representative.

***EPA's Response:***

A full review of the modeling submitted by this commenter is provided in the final Illinois technical support document for the final Illinois designations. The commenter has not adequately justified use of alternate modeling approaches, and the modeling has omitted significant receptor areas that appear to be violating the standard.

## IX. Indiana

### General

***Comment:*** Regarding designations in the Counties of Gibson, Posey and Jefferson, one commenter (0271-Blair) requested the EPA thoroughly review the modeling inputs, parameters and source code used by the state and noted that in all the cases they looked at, there was almost zero margin of error, even after IDEM suggested new emissions limits for the power plants involved. Commenter stated that, since the NAAQS require a reasonable margin of safety, it seems to follow that new emissions limits suggested by the state should not be so close to violation of the NAAQS for SO<sub>2</sub>.

***EPA's Response:***

EPA has thoroughly reviewed Indiana's modeling inputs for all of the relevant parameters and found the modeling to be fully appropriate for the purposes for which EPA is using this modeling. (Indiana used AERMOD, a model which EPA developed, so no further review of the source code is needed.) More complete discussion of EPA's technical evaluation of Indiana's modeling for these areas is found in the Indiana technical support documents for this action, particularly in the draft technical support document for the intended Indiana designations, although EPA reaffirms this review in its final technical support document for the final Indiana designations. EPA has established an air quality standard that, in accordance with CAA section 109, protects public health with an adequate margin of safety, but EPA's assessments of whether emission limits yield attainment of that standard are not contingent on the limits providing an additional margin of safety beyond that inherent in the standard.

**A. Gibson County**

***Comment:*** Some commenters (0301-IN Municipal Power, 0302-Duke Energy, 0303-Wabash Power) supported the EPA's assessment that that the Gibson area is in attainment and that the Coal Road (CR) and Mount Carmel (MC) monitors are reliable indicators of whether the area is meeting the standard. One commenter (0302-Duke Energy) supported EPA's assessment that the CR and MC monitors are reliable indicators of whether the area is meeting the 1 hour SO<sub>2</sub> NAAQS. Commenter (0302-Duke Energy) provided the following additional information in support of an attainment designation.

1. IDEM modeling and wind flow patterns in Gibson area suggest that the CR and MC monitors are reasonably well located to monitor maximum concentrations in the area.
2. The MC and CR monitors have historically shown higher concentrations.
3. The CR and MC monitoring data indicates that the design values are trending downward.
4. IDEM modeling indicates that AERMOD tends to over predict and does a poor job predicting concentrations in space and time when compared to the actual monitored data.

***EPA's Response:***

EPA agrees that the Coal Road and Mt. Carmel sites are appropriately located to monitor maximum concentrations in the area, and that these monitors have historically shown higher concentrations than other monitors previously and/or currently in the area. The data do not indicate a clear trend in ambient concentrations, but the data do indicate that concentrations are remaining below the standard. For example, compared to 2012 to 2014 design values at the Coal

Road and Mt. Carmel sites of 72 and 66 ppb, respectively, the 2013 to 2015 design values at these sites are 67 and 50 ppb, respectively.

EPA does not agree that AERMOD over predicts or otherwise “does a poor job of predicting concentrations.” Further response regarding IDEM’s model evaluation study in this area is provided below.

**Comment:** Also see commenters’ (0301-IN Municipal Power, 0302-Duke Energy) comments in sections III.B regarding designation categories.

**Comment:** Commenter (0301-IN Municipal Power) supported Duke Energy's comment (0302-Duke Energy) that the Indiana Department of Environmental Management's AERMOD evaluation study at Gibson, dated May 15, 2015, indicates that AERMOD tends to over-predict at the level of the standard when compared to actual monitored data. In addition, commenter stated that AERMOD does a poor job predicting concentrations in space and time when compared to the actual monitored data and the results of this evaluation call into question the representativeness of the AERMOD data.

***EPA’s Response:***

The IDEM May 15, 2015, model evaluation cited by the commenter is a seriously flawed analysis. Most notably, comparisons in this report involve comparisons of modeled levels expressed in  $\mu\text{g}/\text{m}^3$  against monitored values in ppb, which would treat perfect agreement between model and monitored results as if the model were over predicting by a factor of over 2.6. A more appropriate assessment of this model-monitor comparison, as discussed, for example, in an article in the Journal of the Air and Waste Management Association by Kali Frost of the Indiana Department of Environmental Management, published April 9, 2014, shows that AERMOD results match monitoring data relatively closely. Thus, while EPA agrees that the monitoring network in this area is adequate, based upon the complete analysis detailed in the final technical support document for Indiana, for EPA to determine that the monitoring data is a more reliable basis for judging whether the area meets the NAAQS and to support the appropriate designation of this area, EPA does not agree that the cited model comparison indicates poor model performance by AERMOD as a general matter.

**Comment:** Some commenters (0231-Hirschland, 0234-APC, 0235-Jay, 0236-APC) expressed concern regarding the adverse health effects of coal extraction and burning and stated that Gibson County should be designated as nonattainment. The commenters stated that modeling by the State of Indiana demonstrates that the Gibson coal-burning plant causes violations of the health-based 2010 SO<sub>2</sub> standard.

***EPA’s Response:***

This rulemaking evaluates whether the ambient air quality in the area rises to levels that result in adverse health effects of exposure to SO<sub>2</sub>, or more precisely whether this and other areas have concentrations of SO<sub>2</sub> above the standard (i.e., the level established as providing an adequate margin of safety to protect public health). The existence of coal extraction and burning does not

mean that the area is encountering excessive concentrations of SO<sub>2</sub>, and is not indicative of whether the area is violating the standard and should be designated as nonattainment for the SO<sub>2</sub> standard. While modeling by Indiana provides evidence that the area might be violating the SO<sub>2</sub> standard, EPA must also weigh the evidence in the form of monitoring indicating that the area is attaining the standard, as well as all other available information. Weighing all of the evidence, in this case EPA has concluded that the area is attaining the standard, based on the uniquely large set of current and historical monitoring information supporting that conclusion.

***Comment:*** One commenter (0332-AE-Sierra Club) urged the EPA to issue a final nonattainment designation for Gibson County. Commenter stated that, although the EPA proposed an unclassifiable/attainment designation based on results from air monitors near the Gibson plant, these monitors are not located to capture peak impacts and, thus, the EPA should rely on the overwhelming air modeling information to finalize a nonattainment designation.

Commenter stated that both the Sierra Club (Exhibit 2 of 0332-AE-Sierra Club comment letter) and Indiana Department of Environmental Management (IDEM) submitted air dispersion modeling in September 2015 that showed violations of the SO<sub>2</sub> NAAQS. Commenter stated that the Sierra Club modeling comports with EPA's Appendix W modeling guidelines, and that they submitted a March 2016 supplemental modeling analysis (Exhibit 3) that responds to certain concerns raised by IDEM (Exhibit 1) and confirms that the Gibson plant has caused and will continue to cause significant violations of the SO<sub>2</sub> NAAQS.

Commenter stated that they did not agree with EPA that there is conflicting evidence on the attainment status in Gibson County. Commenter stated the EPA should consider that, while the Coal Road (CR) monitor has registered design values in recent years that are just below the 75 ppb NAAQS, the modeling evidence—Sierra Club's two sets of analyses and IDEM's analysis—show very high exceedances of the SO<sub>2</sub> NAAQS. Commenter stated that the EPA's failure to weight this evidence at all makes its proposed designation arbitrary and unreasonable. In addition, commenter stated that the modeling and monitoring evidence are not in conflict because the CR monitor is not located to capture peak impacts from the plant, which are modeled to occur closer to the plant. Commenter stated that, because the CR monitor has registered high SO<sub>2</sub> values in recent years and this monitor is not located to capture peak impacts from Gibson, this evidence actually shows that the Gibson plant has likely been violating the SO<sub>2</sub> NAAQS in recent years, which is consistent with the modeling evidence provided by Sierra Club and IDEM.

***EPA's Response:***

EPA continues to find that the monitors are sufficiently representative to provide a reliable basis for determining whether the area is meeting the 2010 SO<sub>2</sub> NAAQS. The commenter states that the monitors are not located to measure peak impacts, but the commenter does not provide persuasive evidence that concentrations would be higher at other locations. The commenter cites as evidence EPA's observation that "[modeling results suggest that] 'a maximum concentration is estimated to occur approximately 2 kilometers from the plant,' while [the Coal Road] monitor is 3 kilometers away." However, the commenter does not demonstrate that monitoring at

locations 2 kilometers from the plant would necessarily show concentrations higher than those at 3 kilometers away, or in particular that the concentrations that would be monitored 2 kilometers away from the plant would show violations.

EPA finds that the monitors in this area are sufficiently representative of maximum concentrations, based on EPA's complete analysis detailed in the final technical response document for Indiana, which includes evidence from historical monitoring. Therefore, EPA maintains that the monitors are indicative of whether SO<sub>2</sub> concentrations in the area are exceeding the standard.

The final technical support document for the final Indiana designations describes a full review of the modeling provided by the commenter. The modeling provided by the commenter is consistent with the recommendations of Appendix W, but the same is true of the modeling by Indiana. Since the results differ in some respects, the evaluation of these two sets of modeling evidence must consider which analysis is more likely to provide a more accurate representation of Gibson's impacts, especially with respect to the spatial variations of these impacts and the likely areas where violations have the greatest potential to be occurring. As discussed in more detail in the final Indiana technical support document for the final designation, consideration of modeling evidence, historical monitoring evidence, and other evidence leads to the conclusion that the monitors are sufficiently representative to measure maximum concentrations in the area. The monitors and available modeling provide conflicting evidence as to whether the areas a few kilometers north and north northeast of Gibson are violating the standard, but EPA finds that the monitoring evidence provides a reliable indication of whether the areas of maximum concentration are meeting the standard. Weighing the monitoring evidence that these areas (and thus Gibson County as a whole) are meeting the standard, notwithstanding modeling evidence that these areas are violating the standard, EPA concludes that these areas, and Gibson County as a whole, are meeting the standard.

## B. Posey County

***Comment:*** One commenter (0271-Blair) stated that, in the case of AB Brown in Posey County, others have modeled current emissions and determined that emissions limits substantially lower than those proposed by Vectren/IDEM should be achieved in order to comply with the NAAQS.

One commenter (0282-Bryant) expressed concern over the amount of respiratory and cardiovascular disease in Posey County and objected to the proposed attainment designation. Commenter stated this area has historically exceeded SO<sub>2</sub> emission standards and that one cannot assume IDEM's modeling is accurate since IDEM failed to disclose any information about their modeling effort.

***EPA's Response:***

The commenter does not identify the “others” that determined that lower limits should be achieved to meet the NAAQS, and the commenter provides no specific evidence as to the adequacy of applicable limits for providing for attainment. If the commenter is implicitly referring to modeling provided by Sierra Club, a response is provided below, stating that no violations were identified in the area of A.B. Brown, and the area where violations were identified (in and near Warrick County, Indiana) will be addressed in future rulemaking. Comments regarding the amount of respiratory and cardiovascular disease in Posey County and regarding compliance with emission limits do not inform the judgment as to whether SO<sub>2</sub> concentrations are exceeding the 2010 SO<sub>2</sub> NAAQS. The docket for the proposed designation included information from Indiana summarizing its modeling, so that the commenter had a reasonable opportunity to identify specific concerns regarding Indiana’s modeling.

***Comment:*** One commenter (0332-AE-Sierra Club) urged the EPA to issue a final nonattainment designation for the A.B. Brown plant. Commenter stated that IDEM initially concluded that A.B. Brown contributed to exceedances of the NAAQS, but then remodeled the source using lower emissions based on proposed, allowable emissions. Commenter stated that the EPA cannot designate areas as attainment on the basis of modeling that uses allowable emissions from a proposed SIP revision.

Commenter stated that IDEM’s modeling is not reliable and cannot support attainment designations as explained in their comments to the State (Exhibit 4). Commenter stated that IDEM’s modeling failed to account for major background sources within the modeling domain. Commenter stated that IDEM’s use of an across-the-board distance threshold for excluding major background sources is particularly troubling given that IDEM’s results, 196.08 µg/m<sup>3</sup>, are so close to the NAAQS limit of 196.2 µg/m<sup>3</sup>. Commenter stated that Wingra Engineering conducted modeling (Exhibit 5) using the proposed emission limits IDEM used in its modeling, but adding the concentrations from major background sources. Commenter stated the results indicate that areas east of A.B. Brown exceed the 1-hour SO<sub>2</sub> NAAQS. Commenter stated that the EPA should designate the portions of the counties identified in Appendix E Exhibit 5 as exceeding the NAAQS as nonattainment areas.

***EPA's Response:***

On May 6, 2016, at 81 FR 27330 (effective June 6, 2016), EPA published action approving Commissioner’s Orders for A.B. Brown and for Clifty Creek, thereby making these Orders federally enforceable. As a result, EPA policy provides that the emission levels mandated by these orders are an appropriate basis on which to determine the attainment status of the respective areas. Indeed, the comment objecting to use of limits in a proposed SIP revision may be viewed as supporting EPA’s proposed action (proposing nonattainment designations in the absence of fully approved emission limits) and not commenting on EPA’s contingent proposal (anticipating promulgating unclassifiable/attainment designations if the Commissioner’s Orders were to become SIP approved).

EPA finds Indiana's modeling to be adequately reliable in support of unclassifiable/attainment designations for the pertinent areas. The sources that the commenter believes should have been included in the analysis for A.B. Brown are at considerable distance from the facility. Indeed, the commenter acknowledges the distances, identifying the Warrick power plant and the ALCOA industrial operations as being 35 km away, the Culley power plant also being 35 km away, and the Gibson plant being 50 km away. EPA agrees with Indiana's implicit conclusion that these facilities are sufficiently distant from the A.B. Brown facility that the spatial gradients in SO<sub>2</sub> impacts are likely to be minimal, and Indiana's background concentration estimates may be considered to include the impacts of these facilities. The commenter provides no evidence that including these facilities in the modeling analysis and reducing the background concentration values to remove the impact of these facilities would increase rather than decrease net concentration estimates. Although Indiana's modeling indicates that air quality near A.B. Brown is close to the standard (albeit less close to a more carefully calculated equivalent to 75 ppb, namely 196.4 µg/m<sup>3</sup>, than to the 196.2 µg/m<sup>3</sup> figure cited by the commenter), the commenter has not provided persuasive evidence that the area is above rather than just below the standard.

The commenter states that "areas east of A.B. Brown exceed the 1-hour SO<sub>2</sub> NAAQS." However, the areas estimated to exceed the NAAQS are in fact two counties east of A.B. Brown (generally in Warrick County), well removed from the area being addressed in this action, in an area that is not required to be designated in this round of designations. EPA will designate the Warrick County area in a subsequent round of designations, at a time when EPA may have additional information pursuant to the DRR.

## X. Iowa

### A. Des Moines County

**Comment:** Two commenters (IA Response, 0233-Alliant) recommended an attainment designation for both Des Moines County and Wapello County. Commenters asserted that the State submitted additional modeling information to the EPA on December 23, 2015 which demonstrates that both Des Moines County and Wapello County still show modeled attainment.

One commenter (IA Response) stated that the updated modeling emission rates were defined using either existing federally enforceable maximum allowable emissions rates or three years of recent historical actual emissions data. Commenter stated those modeling results captured the areas of maximum impact and showed attainment with the 1-hr SO<sub>2</sub> NAAQS in both Wapello and Des Moines Counties. Commenter stated the use of proposed maximum allowable emission rates was eliminated. Commenter provided the following information regarding the areas of maximum impact:

- The Burlington Generating Station is situated in the Mississippi River valley. The area around the generating station consists of the flood plain and surrounding bluffs. The change in elevation between the flood plain and the highest points along the bluffs is on the order of 150-200 feet, which could have an impact on predicted concentrations. The nearest area of elevated terrain is the bluff along the western edge of the flood plain, which is located only approximately 1 km north-northwest of the facility. This area of elevated terrain is included in the current modeling domain provided to EPA. The next nearest area of elevated terrain is the bluff along the eastern edge of the flood plain in Illinois. This area is approximately 8 km away. Based on proximity, meteorological conditions in the area, and dispersion characteristics, the maximum concentration from the facility almost certainly occurs in the closer area of elevated terrain. For this reason the current modeling domain is sufficient to determine the magnitude of maximum concentration from this facility.
- The Ottumwa Generating Station is situated along the edge of the Des Moines River valley. The area around the generating station consists of the narrow Des Moines River valley and multiple small valley tributaries, along with the areas of higher elevation above these valleys. The elevations in the area range from approximately 640 feet above sea level in the valley to 890 feet above sea level, with the main boiler stack base elevation at approximately 680 feet above sea level. The current modeling domain provided to EPA encompasses the entire range of elevated terrain in this area. As such, there is no need to expand the receptor grid in order to encompass additional terrain features. Since the modeled concentrations are decreasing at the edge of the existing receptor grid, the current modeling domain is sufficient to determine the magnitude of maximum concentration from this facility.

***EPA's Response:***

The EPA acknowledges that we received information from IDNR regarding our intended designation for this area prior to the February 16, 2016, notification to the state. However, due to the timing of this information relative to the scheduled timeline for announcing our intended designation, the EPA was not able to fully evaluate the information at that time. The final Iowa technical support document for this area and our final designation incorporates our analyses and conclusions regarding that information.

**B. Wapello County**

***Comment:*** Two commenters (IA Response, 0233-Alliant) recommended an attainment designation for both Des Moines County and Wapello County. See discussion immediately above in section X.A. Des Moines County.

***EPA's Response:***

The EPA acknowledges that we received information from IDNR regarding our intended designation for this area prior to the February 16, 2016, notification to the state. However, due to the timing of this information relative to the scheduled timeline for announcing our intended designation, the EPA was not able to fully evaluate the information at that time. The final Iowa technical support document for this area and our final designation incorporates our analyses and conclusions regarding that information.

### C. Woodbury County

**Comment:** One commenter (IA Response) recommended the EPA designate Woodbury County attainment. Commenter stated that, although the original modeling results submitted to EPA captured the areas of maximum impact around the George Neal facilities, the DNR has extended the modeling receptor grid to address EPA's concerns and used finer receptor grids embedded within areas of elevated SO<sub>2</sub> concentrations. Commenter stated that the modeled concentrations are now clearly decreasing at the edges of the grid and the maximum total concentration demonstrates attainment with the 1-hr SO<sub>2</sub> NAAQS. Commenter stated that, while these modeling results conservatively assume that George Neal North Units 1 and 2 will combust natural gas, these units will permanently shut down on or before April 16, 2016. Commenter stated that the process to revoke their air construction permits, which will make their shutdown federally enforceable, cannot be completed until after a 60-day public comment period and the DNR expects to complete the permit revocation process near EPA's July 2, 2016, designations deadline. Commenter noted that emissions from Cargill Inc. – Sioux City are less than 1 ton per year and will not affect the attainment status of the area. Commenter stated that, if the EPA instead designates Woodbury County as unclassifiable because the permanent closures of George Neal North Units 1 and 2 are not yet federally enforceable, the DNR anticipates that the State of Iowa will submit an attainment redesignation request after their closure is made federally enforceable through the revocation of their air construction permits.

#### ***EPA's Response:***

In order for operational limitations, including shutdowns, to be considered in this designation process, the operational limitations must be federally enforceable and take effect in time for the state to conduct and for EPA to review modeling based on the effective allowable emissions limits. Since the shutdowns of George Neal Units 1 and 2 were not federally enforceable prior to July 2, 2016, the allowable emissions limits reflecting the shutdowns could not be relied upon in modeling analyses, in lieu of actual emissions that reflected the recent historical operation of those units, for the final designation determination. EPA acknowledges that IDNR plans to submit a redesignation request for this area once the limits reflecting the shutdown are effective and anticipates that a proposed unclassifiable/attainment redesignation may be appropriate once the shutdowns are federally enforceable if the area is shown to be meeting the 2010 SO<sub>2</sub> NAAQS based on such allowable emissions and other statutory criteria for obtaining a redesignation are met.

## XI. Kansas

### A. Wyandotte County

**Comment:** One commenter (0313-KC Utilities) stated that EPA should revise its proposed designation from “unclassifiable” to “unclassifiable/attainment” based on new modeling analyses conducted in response to the EPA’s concerns identified in the Draft TSD. A copy of the revised Trinity modeling, entitled “Air Dispersion Modeling Report for 1-Hour SO<sub>2</sub> NAAQS Designation” (March 2016), is attached with these comments. Commenter stated the revised modeling shows SO<sub>2</sub> concentrations at all receptors within the new 100 km x 100 km grid are in attainment with the 2010 SO<sub>2</sub> NAAQS and thus reaffirms the Kansas Department of Health and Environment’s (KDHE) earlier modeling results that Nearman Station is not causing or contributing to a violation of the NAAQS in either Wyandotte County, Kansas or in Missouri.

#### ***EPA’s Response:***

While the revised modeling corrected issues related to modeling receptor domain and the inclusion of all nearby sources of SO<sub>2</sub>, the revised modeling continued to use emission limits that will not be federally enforceable by July 2, 2016. Therefore, EPA can neither rely on the updated information referred to by the commenter to support a finding that the area is now meeting the 2010 SO<sub>2</sub> NAAQS based on currently effective limits, nor support a designation of unclassifiable/attainment for the Nearman Station area.

## XII. Kentucky

### A. Ohio County

**Comment:** On April 18, 2016, the Commonwealth of Kentucky provided the EPA additional information to consider in response to the agency’s February 16, 2016, intended designation for the Ohio County, KY, area. Kentucky subsequently submitted a proposed Title V permit renewal on April 26, 2016, which included a new federally enforceable allowable permit limit for the Big Rivers Electric Corporation D.B. Wilson Station source in support of the Commonwealth’s September 16, 2015, recommendation for Pulaski County to be designated attainment for the 2010 1-hour SO<sub>2</sub> NAAQS. This permit submission initiated EPA’s 45-day review period and on May 20, 2016, the agency provided comments to the Commonwealth on the proposed Title V permit revision. As a follow up to the EPA’s May 20, 2016, letter, Kentucky submitted responses to the EPA’s comments on June 20, 2016, and finalized the Title V permit with modifications.

**EPA's Response:** Kentucky's most recent information was provided too late for the EPA to be able to review it in the same depth as the April 18 information. Nevertheless, the EPA analyzed the new information to the extent time allowed before completing the final designation. Based on the EPA's review of the additional information provided on June 20, 2016, the EPA's position is that Kentucky has not sufficiently addressed the outstanding technical concerns, as outlined in the TSD for the EPA's February 16, 2016, intended designation for the Ohio County, KY, area, nor did the responses or modifications sufficiently address the EPA's concerns, as outlined in the EPA's May 20, 2016, letter related to the Title V permit. The EPA is still unable on the basis of available information to determine whether the area is meeting or not meeting the 2010 1-hour SO<sub>2</sub> NAAQS, and therefore is designating the area as unclassifiable for the 2010 1-hour SO<sub>2</sub> NAAQS. Furthermore, the EPA notes that the Agency carefully considered the additional information provided by Kentucky of April 18, 2016, in support of their recommendation of attainment for Ohio County, and determined that the agency's previous concerns were not fully addressed. Please refer to the final Kentucky TSD for more information and rationale.

## B. Pulaski County

**Comment:** On April 18, 2016, the Commonwealth of Kentucky provided the EPA additional information to consider in response to the agency's February 16, 2016 2010 SO<sub>2</sub> NAAQS intended designation for the Pulaski County, KY area. This information was supported by a proposed Title V permit renewal submitted to the EPA on April 14, 2016, which included a new federally enforceable allowable permit limit for East Kentucky Power Cooperative John Sherman Cooper Power Station source in support of the Commonwealth's September 16, 2015 recommendation for Pulaski County to be designated attainment for the 2010 1-hour SO<sub>2</sub> NAAQS. This permit submission initiated EPA's 45-day review period and on May 20, 2016, the agency provided comments to the Commonwealth on the proposed Title V permit revision. As a follow up to the EPA's May 20, 2016, Kentucky submitted responses to the EPA's comments on June 20, 2016, and finalized the title v permit with modifications.

**EPA's Response:** Kentucky's most recent information was provided too late for the EPA to be able to review it in the same depth as the April 18 information. Nevertheless, the EPA analyzed the new information to the extent time allowed before completing the final designation. Based on the EPA's review of the additional information provided on June 20, 2016, the EPA's position is that Kentucky has not sufficiently addressed the outstanding technical concerns as outlined the TSD for the EPA's February 16, 2016, intended designation for the area, nor did the responses or modifications sufficiently address the EPA's concerns as outlined in EPA's May 20, 2016, letter related to the Title V permit. The EPA is still unable to determine on the basis of available information whether the area is meeting or not meeting the 2010 1-hour SO<sub>2</sub> NAAQS, and therefore is designating the area as unclassifiable for the 2010 1-hour SO<sub>2</sub> NAAQS. Further,

the EPA notes that the Agency carefully considered the additional information provided by Kentucky on April 18, 2016, in support of their recommendation of attainment for Pulaski County, and determined the agency's previous concerns were not fully addressed. Please refer to the final Kentucky TSD for more information and rationale.

### XIII. Louisiana

#### A. DeSoto Parish

**Comment:** One commenter (0327-AEP) recommended that, based on new more accurate information, the EPA should revise the proposed nonattainment designation to attainment. Commenter stated that the Sierra Club modeling used by the EPA did not use hourly exit gas temperatures and velocities in their analysis that reflect the actual operating conditions at the Dolet Hills Power Station and did not include emissions from the International Paper Mansfield Plant. Commenter stated that when the hourly inputs for the Dolet Hills Power Station are corrected to reflect actual operating conditions and the emissions from the Mansfield Plant are added, the modeled results demonstrate attainment. A Technical Note and supporting modeling files covering this work are attached with these comments.

**EPA's Response:**

EPA has reviewed the supplemental air modeling and finds that it complies with the modeling TAD and incorporates CEMS data for emissions rate, stack temperature, and stack velocity, and simulates building downwash. A refined background was also estimated which varied by season and hour of day. A subset of the simulations included the emissions from the International Paper Mansfield Plant. The results of the model indicate that the highest design value for DeSoto Parish with Dolet Hills alone is 170.5 ug/m<sup>3</sup> and in combination with Mansfield Mill is 171 ug/m<sup>3</sup>. Both of these values are less than the 1-hour SO<sub>2</sub> standard of 196.2 ug/m<sup>3</sup> indicating modeled attainment. As further detailed in the final Louisiana technical support document, based on this analysis of the modeling EPA revises the proposed nonattainment status for DeSoto Parish to unclassifiable/attainment for the 1-hour SO<sub>2</sub> standard.

**Comment:** Two commenters (0331-Cleco and LDEQ) stated the EPA should accept the Louisiana Department of Environmental Quality's (LDEQ) recommendation to designate DeSoto Parish as attainment for the 1-hour SO<sub>2</sub> NAAQS. Commenter stated that, based on air quality modeling conducted by American Electric Power and monitoring data derived from a properly-sited air monitor located in DeSoto Parish, there is substantial evidence to accept LDEQ's attainment recommendation for this area. Commenter stated that, if EPA does not accept LDEQ's recommendation, a designation of "unclassifiable/attainment" is more appropriate for DeSoto Parish than the designation recently proposed by EPA.

**EPA Response:**

EPA has reviewed the AEP air modeling and finds that it complies with the modeling TAD and incorporates CEM data for emissions rate, stack temperature and stack velocity and simulates building downwash. A refined background was also estimated which varied by season and hour of day. A subset of the simulations included the emissions from the International Paper Mansfield Plant. The results of the model indicate that the highest design value for DeSoto Parish with Dolet Hills alone is 170.5 ug/m<sup>3</sup> and in combination with Mansfield Mill is 171 ug/m<sup>3</sup>. Both of these values are less than the 1-hour SO<sub>2</sub> standard of 196 ug/m<sup>3</sup> indicating modeled attainment. As further detailed in the final Louisiana technical support document, based on this analysis of the modeling EPA revises the proposed nonattainment status for DeSoto Parish to unclassifiable/attainment for the 1-hour SO<sub>2</sub> standard.

A demonstration of attainment using monitoring data requires well-sited monitor(s) with three most recent years of SO<sub>2</sub> data. The newly sited SO<sub>2</sub> monitor in DeSoto Parish appears to be located according to EPA guidance, as contained in the Monitoring TAD, but has acquired less than one-year of data. The EPA notes that though no exceedances of the standard have been recorded to date, because of the short period of record the data do not demonstrate attainment of the standard. Additionally, based on past modeling information and current information shared for monitoring siting, there was a second area to the west of the facility that we would also recommend for monitoring. Therefore, even if the one monitor had three years of data we would likely not be able to determine attainment status based on monitoring data since a monitor was not installed to the west of the facility in the other hot spot identified. Other monitors in the state are located too far away to record peak concentrations from Dolet Hills. Because of these considerations, if only the monitor data existed, DeSoto Parish would be likely be designated as unclassifiable due to the lack of relevant data. Regardless, the second monitor issue is not controlling here because the updated modeling provides sufficient basis for the EPA's designation determination.

**Comment:** One commenter (0331-Cleco) provided a detailed discussion of issues in their comment letter and also attached modeling and monitoring analyses. Commenter requested that the EPA provide a detailed, written response to each of the following comments.

1. Supplemental air modeling conducted by AEP demonstrates that SO<sub>2</sub> emissions from the Dolet Hills Power Station and the paper mill are below the 1-hour SO<sub>2</sub> NAAQS. This modeling is more accurate than prior modeling analyses conducted by the Sierra Club and the LDEQ/industry responds to specific issues raised by EPA in its technical analysis. This modeling includes actual stack temperature and stack velocity and building downwash and is more representative of actuals than the Sierra Club's modeling that used constant stack temperature and velocity and no downwash.
2. Emissions from International Paper's Mansfield Mill do not contribute to concentration gradients around the Dolet Hills Power Station or to the south of this facility as asserted in EPA's I20-day letter. Because such emissions have now been adequately considered in AEP's modeling analysis, an attainment designation is appropriate.

3. A more representative background concentration should be used for the DeSoto Parish area modeling analyses than what was used by the Sierra Club or LDEQ.
4. EPA accepted similar air modeling in Arkansas that used better site data and more closely adhered to EPA's technical assistance document. For consistency, EPA should also accept the attached modeling report that demonstrates attainment with the SO<sub>2</sub> NAAQS.
5. EPA should consider the existing ambient air monitoring data that exists for the DeSoto Parish area that was located using EPA-accepted protocol. This monitoring data confirms that the 1-hour SO<sub>2</sub> NAAQS has been satisfied for a representative period. At a minimum, the monitoring data demonstrates that not enough data exists to classify the area as nonattainment.
6. Based on the available information, EPA should allow more time to evaluate the monitoring data before designating any part of DeSoto Parish as nonattainment. Sufficient data does not exist to make a conclusion that the DeSoto Parish area is not meeting the 1-hour SO<sub>2</sub> NAAQS.

***EPA's Response:***

***The EPA responds to each of the above numbered comments as follows:***

1. EPA has reviewed the air modeling of the Sierra Club and AEP and finds that they comply with the modeling TAD. However, the AEP modeling incorporates CEMS data for emissions rate, stack temperature, and stack velocity, and simulates building downwash. A refined background was also used in the AEP modeling, which varied by season and hour of day. The results of the AEP modeling indicate that the highest design value for DeSoto Parish with Dolet Hills alone declined from 218.7 ug/m<sup>3</sup> (Sierra Club) to 170.5 ug/m<sup>3</sup>(AEP) with the refined modeling inputs.

Also, AEP explicitly modeled the Mansfield Mill as a contributing source and found a small increase of the design value to 171 ug/m<sup>3</sup>. Since no exceedances were predicted it was not necessary to evaluate the Mansfield Mill contribution beyond looking at contribution to the maximum. Both of these values are less than the 1-hour SO<sub>2</sub> standard of 196.2 ug/m<sup>3</sup> which indicates modeled attainment.

2. Both International Paper (IP) and AEP modeled the combination of Dolet Hills and Mansfield Mill using slightly different inputs. For IP's modeling: 0.2 ug/m<sup>3</sup>, and for AEP modeling: 0.5 ug/m<sup>3</sup>, to the domain maximums in the refined modeling provided. Since no exceedances were predicted it was not necessary to evaluate the Mansfield Mill contribution beyond looking at contribution to the maximum.

IP modeling was initially conducted prior to AEP/Dolet Hills refined modeling runs. The IP modeling used CEMS data for emission rate and velocity but used a fixed, nominal temperature for the Dolet Hills source; while AEP used CEMS data for emission rate, velocity, and temperature. With the lower, fixed temperature used in the IP modeling, Dolet Hills was still modeled to contribute to concentrations higher

than the standard, 207.6 ug/m<sup>3</sup> with a small contribution, about 0.2 ug/m<sup>3</sup> from Mansfield Mill. The AEP modeling using full CEMS data found the modeled impact to be 171.0 ug/m<sup>3</sup>, below the standard. Since the AEP modeling used the most realistic stack parameters, the EPA finds that the AEP model results are the most representative of what a monitor would have recorded.

Mansfield Mill's emissions rates were modeled conservatively using an analysis of the CEMS SO<sub>2</sub> emission rate (lb/MBTU) to estimate the mean SO<sub>2</sub> emission rate over the three-year period for the two largest sources, Boiler 1 and Boiler 2. The modeled emissions from the boilers were held constant and set as the product of the maximum unit heat rate and the mean SO<sub>2</sub> emission rate. All other sources were modeled at allowable emissions. AECOM modeled the maximum design value for Mansfield Mill at 137.6 ug/m<sup>3</sup>.

3. Per the modeling TAD, EPA recommends either tier 1 or tier 2 background determinations for modeled SO<sub>2</sub> attainment designations. The more conservative tier 1 background determination uses an average of 3-years of the annual monitor design value during conditions when the modeled sources are not contributing. The Tier 2 background determination breaks the monitor concentration into seasonal and hourly bins and computes a design value corresponding to the 99th percentile concentration for each bin. EPA's view is that the tier 2 background method yields background estimates which are more realistic, but its use is optional. We are relying on modeling that also incorporated the Tier 2 approach in support of this designation.
4. For each designation area EPA reviews all available sources of data, and analyzes whether the information meet the recommendations of the Modeling and Monitoring TADs. In this case, we have reviewed the submitted modeling report and are utilizing this information in our final designation as the modeling is more representative of actual conditions than previous modeling.
5. The EPA maintains our position, most recently recounted in the Data Requirements Rule, that, in order to demonstrate attainment with the 1-hour SO<sub>2</sub> standard, the most recent three years of monitor data must show that the design value does not exceed the standard over that period. The newly installed monitor in Desoto Parish appears to have been located following the Monitoring TAD guidelines and is considered to be properly located in one of the hotspot areas around the facility. Based on past modeling information for monitor siting pursuant to EPA's Monitoring TAD and current information shared for monitoring siting, there was a second area to the west of the facility that we would also recommend for monitoring, so we do not agree that one monitor would be enough monitors in this case. However, the period of record (less than one year) for the one monitor is not sufficient to demonstrate compliance even if only one monitor was needed to characterize air quality for designations. The fact that that the 1-hour standard has not been exceeded in that period is consistent with a demonstration of attainment but is not sufficient to base such a designation on. Even if the one monitor had three years of data we would likely not be able to determine attainment status based on monitoring data since a monitor was not

installed to the west of the facility in the other hot spot identified. The second monitor issue is not controlling in this case because of the updated modeling, which provides sufficient information to make the designation.

6. The EPA maintains our previous position, for the reasons delineated in the preamble to the final rule of the 2010 SO<sub>2</sub> NAAQS rulemaking, the February 2013 Strategy Paper, and in the proposed and final SO<sub>2</sub> Data Requirements Rule, that both air quality modeling and ambient monitoring are appropriate tools for characterizing ambient air quality for purposes of informing decisions to implement the SO<sub>2</sub> NAAQS, including designation determinations. The EPA considered all available information in making this action's final designations. Because of the lack of a suitably located SO<sub>2</sub> monitoring sites with only one of the two monitors that we would recommend and less than 3 years of data, the EPA finds that the monitoring data cannot be used to designate the area. However, suitable modeling data are available and have been used as a basis for designating attainment for DeSoto Parish, as further discussed in the final Louisiana technical support document.

**Comment:** One commenter (0332-Appendix F-Sierra Club) supported EPA's proposal to designate the area surrounding the Dolet Hills Power Station in DeSoto Parish, Louisiana as nonattainment for purposes of compliance with the 2010 1-hour SO<sub>2</sub> NAAQS. Commenter stated that two separate rounds of modeling by Sierra Club (September and December 2015) that adhered to EPA's guidance have now reached the same results: Dolet Hills causes the areas surrounding each facility to be in nonattainment. Commenter stated that EPA's suggested adjustments and refinements to this modeling would likely only increase Dolet Hills' modeled impacts. These modeling issues are described in detail in the commenter's letter and include: International Paper Mansfield Mill and background concentrations, downwash, stack temperature and velocity, flagpole height receptors, and LOWWIND3 in the previous LDEQ modeling.

The revised Sierra Club modeling (12/15/2015) updated to the most current version of AERMOD but kept in place protocol options that were held by the Sierra Club to most likely tend to decrease the maximum modeled concentrations for the Dolet Hills Power Plant and that EPA's suggested refinements would likely increase the modeled impacts:

- Use of temperature and velocity for 100% load from the most recent permit application instead of actual temperature and velocity values
- Lack of building or structure downwash
- Lack of including other large SO<sub>2</sub> sources in DeSoto Parish. There is one other large source, Mansfield Mill, located 14 miles north of Dolet Hills, but Sierra Club's contractor investigated and estimate only a 0.03 µg/m<sup>3</sup> increase near the Dolet Hills facility when the mill was included.

One commenter (0332-AF-Sierra Club) stated that LDEQ's modeling that included the LOWWIND3 option was not in accordance with EPA's Modeling TAD or Appendix W. Commenter stated that information submitted by the owner of Dolet Hills did not follow the monitoring TAD or modeling TAD. Commenter stated that EPA and LDEQ recognized that Sierra Club's modeling inputs and assumptions were generally acceptable and followed EPA's

guidance. Commenter concluded that the only “reliable” and “acceptable” evidence in the record makes clear that the area around Dolet Hills should be designated as being in nonattainment with the 2010 1-hour SO<sub>2</sub> NAAQS.

***EPA’s Response:***

EPA agrees, as discussed in the Desoto Parish portion of the draft Louisiana TSD, that LDEQ's initial modeling was problematic in following the Modeling TAD. The Sierra Club performed air modeling (initially in September 2015 and updated in December 2015), asserting that the area around Dolet Hills experiences impacts in exceedance of the NAAQS. The state reviewed this modeling, and subsequently performed its own revised modeling using the input parameters provided by Sierra Club. These assessments and characterization were performed using air dispersion modeling software, i.e., AERMOD, analyzing actual emissions. However, the state factored and used the currently non-default beta option low wind speed modification (LOWWIND3). This revised modeling using LOWWIND3 predicted peak concentrations slightly below the NAAQS. As a result, the state changed its unclassifiable recommendation to attainment. The EPA notes that the use of beta options, such as ADJ\_U\* and LOWWIND3, in AERMOD for any regulatory applications should follow the recommendations of Appendix W, Section 3.2.2. This is further explained in the EPA’s December 10, 2015, Memorandum titled, “Clarification on the Approval Process for Regulatory Application of the AERMOD Modeling System Beta Options.” Among other conditions, the use of beta options should include consultation with the appropriate EPA Regional Offices. Upon concurrence by the EPA’s Modeling Clearinghouse, EPA Regional Offices may approve the use of these beta options for regulatory applications as an alternative model on a case-by-case basis. However, LDEQ performed air dispersion modeling intended to characterize air quality as a result of SO<sub>2</sub> emissions from Dolet Hills without prior consultation with or approval from an EPA Regional Office, and therefore has not been consistent with Appendix W, Section 3.2.2. As a result, the EPA finds that the air quality modeling results obtained from the use of these beta options cannot be used as a reliable indicator of attainment status in the area around Dolet Hills until appropriate alternative model approval is granted, or these beta options are promulgated as regulatory options in AERMOD through EPA rulemaking.

The recently submitted AEP modeling used the majority of the Sierra Club inputs but used the CEMS actual temperature and velocity, added building downwash, and included Mansfield Mill as a contributing source. Also, a seasonal hourly background was used which was derived by AECOM. These refinements reduced the modeled concentrations to below the 1-hour SO<sub>2</sub> standard. The EPA’s Modeling TAD notes that for the purposes 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. To be as realistic as possible, 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’s view is that detailed throughput, operating schedules, and emissions information from the impacted source(s) should be used. The EPA’s position is that CEMS data, such as that used by AEP, provide acceptable historical emissions information when it is available.

Sierra Club continues to support their use of flagpole receptor height (1.5 meters), but we note that EPA guidance does not require or specifically recommend using flagpole receptor height. Regardless, the change in impacts here are extremely small and not consequential. Analysis provided by Sierra Club and industry both indicate a small change in the area around the plant and the value (less than 1  $\mu\text{g}/\text{m}^3$  to the maximum modeled value around Dolet Hills) regarding receptor height, and it does not alter the attainment projection of the modeling based on industry modeling.

As detailed above, subsequent to the submission of the Sierra Club modeling a more refined model analysis was conducted by AEP. As detailed in the final Louisiana technical support document, this modeling has been reviewed by EPA and found to adhere to the Modeling TAD and to employ more realistic data than were available to the Sierra Club for their modeling. EPA finds that the AEP refined modeling is a better indicator of what an ambient monitor would read because of the more realistic inputs of stack temperature and velocity, the incorporation of building downwash, and the use of seasonal hour background concentrations.

**Comment:** Two commenters (0317-International Paper, 0325-LA Pulp and Paper) stated that the Mansfield Mill and the surrounding area should be excluded from the nonattainment area proposed by the EPA for DeSoto Parish.

One commenter (0317-International Paper) stated that the modeling report conducted by AECOM and attached to their comment letter verifies that emissions from the Mansfield Mill do not contribute, or only minimally contribute (less than one percent), to any modeled exceedances of the  $\text{SO}_2$  NAAQS for this area. The commenter stated that the highest offsite impacts attributed to the Mansfield Mill are well below the standard and those impacts are in relatively close proximity to the mill, but are not close to the Dolet Hills Power Station. Commenter stated that the AECOM modeling used AERMOD (Version 15181) and was performed in accordance with EPA's draft air modeling guidance document, *SO<sub>2</sub> NAAQS Designations Modeling Technical Assistance Document*, dated February 2016.

One commenter (0325-LA Pulp and Paper) stated that, because the modeling analyses submitted by the Sierra Club and the LDEQ did not include  $\text{SO}_2$  emissions from the paper mill, the EPA has no scientific or technical basis to conclude that the paper mill contributes to concentration gradients near those caused by the coal-fired utility. Commenter stated the EPA's decision should not be based on conjecture or speculation and encouraged the EPA to base its final decision strictly on information that is known to it and has been included in the administrative record. The commenter stated that, based on current information, it is arbitrary and capricious for EPA to include International Paper's Mansfield Mill in the proposed nonattainment area for DeSoto Parish.

**EPA's Response:**

While the EPA previously expected that Mansfield Mill could significantly impact locations when available information indicated that Dolet Hills was modeled to contribute to 1-hour  $\text{SO}_2$  nonattainment, the modeling results submitted by AEP and IP, show, however, that refined modeling with both sources does not result in any modeled nonattainment instances, and are a better indicator of what an ambient monitor would read because of the more realistic inputs of

stack temperature and velocity, the incorporation of building downwash, and the use of seasonal hour background concentrations. In light of this additional information, the EPA finds that Mansfield Mill does not contribute to any non-attainment values.

**Comment:** One commenter (0325-LA Pulp and Paper) encouraged the EPA to consider supplemental modeling that International Paper and the LDEQ have submitted in their comments related to the SO<sub>2</sub> NAAQS designation for DeSoto Parish. Commenter stated that, if the modeling demonstrates that SO<sub>2</sub> emissions from the paper mill have a *de minimis* impact to any modeled exceedances of the SO<sub>2</sub> NAAQS for this area, EPA should exclude the paper mill from the final nonattainment area. Commenter stated there is no legal basis to include a stationary source in a nonattainment area simply because it emits above a certain threshold.

One commenter (0317-International Paper) stated that, not only should the Mansfield Mill not be included in the nonattainment designation area in DeSoto Parish, the modeling supports the area around Mansfield Mill as being in attainment with the 1-hour SO<sub>2</sub> NAAQS. Commenter also provided modeling results indicating the other areas around Dolet Hills and the rest of the domain were attainment levels and impacts from the Mansfield Mill were included demonstrating that the Mill does not contribute to nonattainment. Commenter stated that they are aware of modeling conducted on behalf of the Dolet Hills Power Station that indicates attainment for all of DeSoto Parish.

Another commenter (0325-LA Pulp and Paper) stated that, if other modeling supports a designation of attainment for the entire parish, then the EPA should accept LDEQ's initial recommendation of attainment for this area by July 2, 2016.

***EPA's Response:***

The basis for including a stationary source in a non-attainment area is that it contributes to concentrations above the standard or that contributes to gradients in concentration near such events. The potential contributing source's emissions are used as part of a determination in addition to direction from the main source and its proximity. EPA used all available information in its proposed non-attainment designations. Prior to receiving the AERMOD results for the combined impact of Mansfield Mill and Dolet Hills, the EPA expected that Mansfield Mill could significantly impact locations when available information indicated that Dolet Hills was modeled to contribute to 1-hour SO<sub>2</sub> nonattainment. However, the modeling results submitted by AEP and IP show that there are no modeled nonattainment instances in DeSoto Parish, therefore the Mansfield facility does not contribute to nonattainment given the final designation of DeSoto Parish as unclassifiable/attainment.

As stated in other responses above and in more detail in the final Louisiana technical support document, the EPA finds that the modeling provided by AEP provides the most realistic projection of ambient concentrations of all of the analyses that were provided and is consistent with EPA's Technical Assistance Document. Based on the EPA's analysis of that modeling, the EPA is finalizing a designation of unclassifiable/attainment for DeSoto Parish.

**B. Calcasieu Parish**

**Comment:** One commenter (0323-Beall) stated that Calcasieu Parish should be designated as "attainment," or at a minimum, "unclassifiable/attainment." The commenter stated that the air modeling conducted by Providence Engineering and Environmental Group LLC demonstrates that this area is meeting the 1-hour SO<sub>2</sub> NAAQS. Commenter stated this conclusion is supported by ambient monitoring data from three air monitoring stations located throughout the parish and near the modeled industrial sources. Commenter stated that the EPA failed to consider other valid SO<sub>2</sub> ambient air monitors located in Calcasieu Parish in its *Technical Analysis for Calcasieu*. Commenter concluded that the EPA should consider all three monitors in Calcasieu Parrish (Westlake, LAIA North, and LAIA South) when evaluating a final SO<sub>2</sub> designation for this parish. Commenter provided a detailed discussion of the ambient data and requested that the EPA provide a detailed, written response.

One commenter (0320-Entergy LA-TX) supported the recommendation by LDEQ to designate Calcasieu Parish, Louisiana, as in attainment for the 2010 SO<sub>2</sub> NAAQS, and urged the EPA to adopt the same. Commenter stated that, in consideration of the entirety of the monitoring data in close proximity to the industrial sources in question and the non contradicted air quality modeling analysis submitted by LDEQ, EPA should affirm LDEQ's attainment recommendation for Calcasieu Parish, Louisiana.

One Commenter (LDEQ) stated that the current Westlake monitor is 32 ppb and that they disagree with EPA's proposal to designate the areas unclassifiable. Commenter stated that the modeling showed maximum value of 170 ug/m<sup>3</sup>, AERMOD over predicts concentrations when used to determine a one-hour standard and provides conservative results, and emissions in the area of analysis have been reduced by some 20% from 2012 to 2014. Commenter concludes that all these factors are indicative that the areas is in attainment and EPA should conclude the area is in attainment.

***EPA's Response:***

The EPA disagrees with the comment that the three air monitoring stations support an attainment designation. EPA stated in its proposed action that the lack of air monitoring showing nonattainment is not sufficient information to determine an area is meeting the standard because a monitor may not be located in the area of greatest impact and is not sufficient to rule out that a violation of the 2010 SO<sub>2</sub> NAAQS may occur in the immediate vicinity of the facility or other facilities in the Parish. The EPA provided analysis of the closest monitor to the Nelson & NISCO facilities on page 21-22 of the draft TSD, the Westlake monitor (AQS ID 220-19-0008). As discussed below, this monitor, as well as the others not listed, were not representative of the maximum emission impacts (maximum ambient concentrations), making any further analysis for the other monitors is unnecessary.

EPA's Monitoring TAD provides recommendations on performing modeling to locate the areas of maximum impacts and frequency of impacts around a facility for selecting a location for monitoring the maximum impacts from a source. No modeling analysis following EPA's TAD, other modeling analysis, or other technical analysis other than proximity to a source were provided to substantiate that any of the three monitors are located to pick up the maximum

impacts from the sources. EPA's Monitoring TAD relies on both proximity and wind data (speed and direction) to identify appropriate monitor locations and recommends modeling as the most sophisticated tool typically used to site monitors because it takes into account many atmospheric conditions (upper and lower atmosphere wind speed and direction; location, emission rates, and dispersion of pollutants from background sources; etc.) to estimate the areas where maximum impacts would most likely occur. The only justification provided by the commenters was general proximity without consideration of meteorology and other factors. As discussed in the draft TSD, the maximum impact from the Nelson & NISCO facilities would likely be closer to the facilities and would be in a different direction than the direction of the Westlake monitor. Based on past modeling in the area (including the Sasol PSD permit modeling that was very close to the Westlake monitor), the maximum impacts from the Nelson & NISCO facilities were to the Northwest of the facility and to the Southwest of the facility and the Westlake monitor is actually to the Southeast of the Nelson & NISCO facilities. Therefore, the EPA finds that available information indicates that the Westlake monitor is not in the area where maximum impacts from the Nelson & NISCO facilities would be expected. Additionally, the LAIA North monitor is located just west of Nelson and South-Southwest of NISCO and the monitor is not situated to be downwind of both facilities at any given time, so it would not be representative of the maximum impact (See Figure 3 of LDEQ's September 18, 2015 recommendation). The LAIA South monitor is located where winds from a North-Northeast direction could transport both facilities impacts to the monitor, but the monitor is over 8 km away, so it is not situated to monitor the maximum impacts from these two facilities. We evaluated LDEQ's recommendation and map in preparing our proposal and concluded that no monitors in the area were located to monitor maximum ambient concentrations, including the Westlake monitor (Proposed Designation draft TSD for Louisiana). Moreover, there is no substantial information to indicate that any of the three monitors are located in the area of maximum impacts from sources and the information available indicates that none of these monitors are situated to monitor the maximum impacts from these two facilities, nor from all the facilities in Calcasieu Parrish.

The EPA also noted in our TSD several discrepancies in the modeling provided that make it unreliable for making a decision of attainment or nonattainment. Some of these issues are also discussed below in response to other comments, and in the draft and final TSDs. The EPA finds that based on our analysis of available information, it is unclear whether the area would model attainment or non-attainment if the discrepancies remedied.

With regard to concerns about model over-prediction, AERMOD underwent a very detailed performance analysis using many field study datasets to assess the model's capabilities and determine the model was adequate for estimating ambient concentrations from emission sources before it was promulgated in 2005 as EPA's preferred model for estimating ambient concentrations for near field impacts. As discussed in a previous response above, performance analyses show that AERMOD results match monitoring data relatively closely. We disagree with the commenter that AERMOD results in overly conservative estimates for the situations modeled in the Calcasieu area.

The emission decreases that the commenter raises could have been fully taken into account in modeling actual emissions for each of the facilities in the domain, but the modeling provided did not include short-term actual emissions or stack parameters. The EPA cannot predict how modeling both the best estimates of actual emissions and actual stack parameters (exit velocity, temperature, etc.) would change the modeled concentrations. Building downwash, appropriate meteorology, and other modeling considerations would also have to be appropriately included/addressed in order to assess if maximum modeled concentrations were above or below the standard. Decreases in emissions could potentially also be paired with decrease in stack velocities or temperatures, that also would have to be factored into the dispersion and estimated concentrations.

The modeling used an estimate of background concentrations that was likely too low. Background was estimated by using data from the Westlake monitor but excluding data collected when winds were from a 90 degree arc said to be influenced by non-background sources (i.e. sources explicitly modeled). As discussed in our TSD and elsewhere in this RTC, the 90 degree arc likely excludes too much data, resulting in background levels that are too low.

Given the above deficiencies in the modeling, the EPA finds that the modeling is not reliable for making a decision regarding attainment or nonattainment of the 2010 SO<sub>2</sub> NAAQS. Further, existing air monitoring data is not representative of the areas of expected maximum impacts. As a result, EPA does not agree that sufficient information exists to support a designation of unclassifiable/attainment.

**Comment:** One commenter (0320-Entergy LA-TX) stated that the impact of the alleged technical errors or discrepancies in the September 2015 air quality modeling analysis concerning the area of analysis, meteorology and surface characteristics and background concentrations are trivial and do not justify modification of LDEQ's attainment recommendation, particularly considering that no alternate analysis is available in the public record of EPA's proposed designation. Commenter stated that many of the alleged technical errors regarding meteorology and surface data are not prohibited by EPA's Modeling TAD and have been accepted by LDEQ and EPA in previous New Source Review modeling analyses.

One commenter (0323-Beall) provided a detailed discussion of the modeling analysis, including area of analysis, meteorology and surface characteristics, background concentration, standard conditions, and emissions and requested that the EPA provide a detailed, written response to the following:

- The air modeling analysis conducted on behalf of the Calcasieu SO<sub>2</sub> Stakeholders Group demonstrates that Calcasieu Parish should be designated as "attainment" for the 1-hour SO<sub>2</sub> NAAQS. At a minimum, the data supports a designation of "unclassifiable/attainment" for this area.
- The conversion from modeled concentrations to Standard Temperature and Pressure (STP) has not been required in some modeling analyses in the state of Louisiana and accepted by EPA and LDEQ in the past.
- CEMS data for Nelson and NISCO facilities were not used and would be used if given more time.

- EPA failed to consider other valid SO<sub>2</sub> ambient air monitors located in Calcasieu Parish in its *Technical Analysis for Calcasieu*. Full consideration of this data supports a final designation of "attainment" for this area. At a minimum, the data supports a designation of "unclassifiable/attainment" for Calcasieu Parish.
- EPA should allow more time to evaluate the available modeling and monitoring data *after* a final designation is made for this area by July 2, 2016. It is wholly inequitable to require Calcasieu Parish to meet either January 2017 EPA deadline (which also mandates a state deadline of July 1, 2016) if EPA makes a final designation of "unclassifiable" for this area.

***EPA's Response:***

The EPA disagrees with the comment that the technical errors and discrepancies cited by the EPA are "alleged" or "trivial." As discussed in this response, other responses within this RTC, and our TSDs, the EPA has many concerns with the reported modeling results. Also, public health protection in areas where there may be a violation of the standard are serious matters and not considered trivial. These concerns can make significant differences in the modeling. Without corrected modeling it is difficult to predict exactly how model results would change, but in the EPA's experience we could easily see differences of 10 to 30% for many of these errors /discrepancies, which could result in very different modeled results.

The EPA disagrees with the comment that Calcasieu Parish should be designated as "attainment." When evaluating the modeling submitted by the industry, the EPA determined that the industry modeling approach is not consistent with the SO<sub>2</sub> Modeling TAD.

As further detailed in the TSDs, the use of Baton Rouge surface data instead of Lake Charles data in the industry modeling does not follow the guidance in the TAD regarding the proximity and representativeness of the site to the area under consideration, nor does it follow LDEQ's own guidance for modeling in Southwestern Louisiana. The TAD, Guideline on Air Quality Models (40 CFR Part 51 App. W), and EPA guidance do not specifically prohibit the use of meteorological data from another area, but there are several things that have to be addressed in order to do so, and in this case none of these issues were adequately addressed. First, no information was provided as to why the Lake Charles (Calcasieu Parrish) area meteorological data was not acceptable and was not utilized. Secondly, no information was provided to support a conclusion that the Baton Rouge NWS data is representative of the Calcasieu Parrish area. The data has to be representative of the meteorology that transports pollutants in the area being analyzed, use local data if available (in this case there is a local station), and if no local data is available then the data must nevertheless still be representative (40 CFR Part 51 App. W). Adequate reasoning was not provided for why NWS surface station information in Calcasieu Parrish was not used in the modeling and little evidence was provided to support using the alternate location, on the other side of the state, for surface data. Given the differences in surface, locations/distances, and orientation to water bodies (both the Gulf of Mexico and Lake Ponchartrain) between the two stations, the EPA does not find a basis for the position that the alternate station would be representative. While the comment generally states that the meteorological data is similar, this assertion is not substantiated by the commenter and no reason was provided for not using the local Calcasieu NWS data. Also, the meteorological data was from 2009-2013 rather than the latest three years recommended in the modeling TAD. Without

modeling that uses representative meteorological data and data from the appropriate time period, the modeling provided by the industry and state is of limited value and is not sufficient for EPA to appropriately assess the local attainment status of the area.

As we noted in our proposed designation TSD, the industry group's report included an error in the conversion of the AERMOD modeled 99th percentile impact from  $\mu\text{g}/\text{m}^3$  to ppb, converting 168.6  $\mu\text{g}/\text{m}^3$  to 59.77 ppb. However, based on standard conditions of 25C, 1 atm, and a molecular weight of 64 for SO<sub>2</sub>, 168.6  $\mu\text{g}/\text{m}^3$  equals 64.46 ppb. The AERMOD results provided are for STP conditions but in the modeling analysis provided the conversion was done at non-STP conditions. AERMOD uses a 0.3823 multiplier to convert  $\mu\text{g}/\text{m}^3$  to ppb. When this correction is applied, the industry group's modeling indicates that the predicted 99th percentile 1-hour average concentration within the chosen modeling domain is 206.61  $\mu\text{g}/\text{m}^3$ , or 78.78 ppb. This modeled concentration is based on actual annual emissions from the facilities. Furthermore, based on our correction to the industry group's calculated background concentration that involved an interpolation between two data points, the predicted 99th percentile 1-hour average is 207.6  $\mu\text{g}/\text{m}^3$ , or 79.31ppb. To be clear, the EPA's view is that this background value is still likely underestimated because of the use of 90 degree arcs to exclude data from the background value calculation.

Hourly CEMS data available for Nelson Electric Generating Plant and the Nelson Industrial Steam Company (NISCO) were available but not utilized in the modeling, which is inconsistent with the TAD. Additionally, the industry's modeling did not include any varying emission rates for any of the facilities and the same rate was modeled for all years, which is also inconsistent with the TAD.

In regards to the background value used in the analysis (discussed in more detail in another response within this RTC), given the close proximity of the sources (primarily Entergy and Sasol) to the Westlake monitor, we have concerns that more data was excluded than should have been by using the 90 degree arc. The likely result of correcting this issue would be higher background value, as more data would most likely result in a higher value and could not result in a lower value, which, when added to modeling results, would yield higher values than the current analysis presents. Thus, the EPA's view is that the modeling results are biased low.

The modeling only takes into account 2013 actual annual emissions based on LDEQ inventory data—the hourly CEMS data for Nelson Electric Generating Plant and the Nelson Industrial Steam Company for the 2012-2014 period was not utilized in the modeling—and held constant, rather than utilizing hourly-variable stack temperature and exit velocity. As discussed above, the background monitor value used may not reflect actual conditions in the area that experiences the predicted maximum impacts of SO<sub>2</sub>.

Lastly, it is also unclear what building information was available for downwash and what facilities/sources downwash was considered within the modeling. Downwash can have significant impacts on modeled values.

In our TSD for the proposal, we raised concerns that we could not evaluate the adequacy of the area of analysis. Commenter asserted that the area of analysis was sufficient without additional information. EPA still finds that it is not possible to ascertain whether the area of analysis used in the modeling is adequate. The modeling provided was broken into over 40 model runs and no maps of the receptor grids were provided to review how the receptors grids were broken up and whether the receptor grid was adequate for the analysis area. We have consistently and historically strongly discourage the breaking of modeling into more than 2 or 3 receptor grids, as it makes the modeling extremely difficult to review, especially in the time frame that reviews have to be completed. Of particular concern is whether adequate receptors were included in areas around other relevant sources. Lastly, as discussed above, the background monitor value used may not reflect actual conditions in the area that experiences the predicted maximum impacts of SO<sub>2</sub>.

As discussed above, we also do not have information on any potential impacts on the western part of Calcasieu Parish from two large Orange County, Texas, sources near the western border, the lack of which also provides uncertainty in designating Calcasieu Parish. For these reasons and based on available information, EPA does not have sufficient information to determine whether the area is attaining or not attaining the standard. Therefore, the EPA's final designation for the area within Calcasieu Parish is unclassifiable.

The EPA disagrees with the comment that we did not consider other valid monitors in the parish. As discussed in more detail in another response to comment in this document, EPA stated in its proposed action and still maintains that the lack of air monitoring showing a nonattainment problem is not sufficient information to determine an area is meeting the standard because a monitors may not be located in the area of greatest impact.

The EPA disagrees with the comment that more time should be allowed to evaluate the available modeling and monitoring data *after* a final designation is made for this area by July 2, 2016. The EPA has fully reviewed and analyzed the currently available information referred to by commenter and has determined that this information does not provide an adequate basis for the EPA to determine whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS. Regarding the comment on Data Requirements Rule deadlines, while out of scope of this final action, as discussed within that rulemaking, the EPA's view is that the schedule and deadlines are reasonable. The EPA stated specifically in that rulemaking that, while the schedule for meeting the requirements of this rule is expeditious, the schedule can be achieved with the appropriate planning, coordination, and program implementation by affected air agencies. The EPA strongly encouraged air agencies to start their investigation of that issue as soon as practicable, as any further delay in air quality characterization around sources subject to the DRR would delay implementation of the standard and public health protection in areas where there may be a violation of the standard.

***Comment:***

One commenter (0320-Entergy LA-TX) stated that both the non-contradicting 2015 air quality modeling analysis and EPA's Louisiana TSD reflect that the most recent design value based on data collected between 2012 and 2014 for the Westlake monitor was 35 ppb. Commenter stated

that the EPA concludes that the Westlake monitor's design value demonstrates that the two Nelson facilities likely are not the primary contributors to EPA's predicted maximum concentrations of SO<sub>2</sub>. Commenter stated that, given these findings, EPA should conclude that SO<sub>2</sub> emissions reductions at the Nelson facilities are not warranted or necessary to achieve a designation of attainment for Calcasieu Parish for the 2010 SO<sub>2</sub> NAAQS.

One commenter (0320-Entergy LA-TX) stated that EPA's own Louisiana TSD includes an apparent contradiction with respect to the Westlake monitor by encouraging the use of the monitored data in establishing background concentrations based on the monitor's "close proximity" to Entergy's Nelson facilities, while simultaneously asserting that the monitor is "not representative of the maximum from Nelson facilities and other cumulative sources."

***EPA's Response:***

The EPA disagrees with the comment that we did not consider other valid monitors in the parish. As discussed in more detail in another response in this document, the EPA provided analysis of the closest monitor to the Nelson & NISCO facilities on page 21-22 of the draft TSD, the Westlake monitor (AQS ID 220-19-0008), but this monitor, as well as the others not listed, were not representative of the maximum impacts.

The EPA disagrees with the commenter's reasoning that emission reductions are not potentially needed to achieve attainment. While the ambient air quality data collected at the Westlake monitor (AQS ID 220-19-0008) may not adequately characterize the impacts from the Nelson & NISCO facilities, the most recent design value, based on data collected between 2012 and 2014, at the Westlake monitor was 35 ppb. This monitor is located approximately 2.5 km south of the Nelson & NISCO facilities, and 10 km north of the area where the greatest impacts of SO<sub>2</sub> are expected based on our grouping analysis. While this monitor is not a good monitor for the maximum impacts of Nelson & NISCO and other sources, it is close enough to the Nelson & NISCO facilities that they could have impacts often enough to affect the Westlake monitor's design value. This analysis does not alter our previous analysis discussed above in this RTC that the Westlake monitoring data is not informative as to whether these two facilities are causing any NAAQS exceedance or violation. The Nelson & NISCO facilities are several kilometers from other high modeled values near the standard (considering discrepancies and errors). Therefore the EPA's analysis is that the Nelson & NISCO facilities are not the primary contributors to the predicted maximum concentrations of SO<sub>2</sub> near Rain, Citgo, and Alcoa but the Nelson & NISCO facilities could still have some impact on these higher impact areas, and the EPA notes that these potential impacts will likely need to continue to be considered in future assessment of the areas.

The EPA disagrees with the comment that there is a contradiction in the discussion regarding the Westlake monitor. None of the monitors represent the maximum impacts from the Nelson & NISCO facilities. The Westlake monitor is located such that it is more likely to pick up the maximum impacts from the Sasol facility, not the Nelson & NISCO facilities. The draft TSD highlighted the Westlake monitor to show that even the closest monitor was not very representative of the maximum impacts.

The EPA did not choose or recommend the use of the Westlake monitor as background specifically. The modeling provided used a technique in utilizing the Westlake monitoring data,

using only the data when the wind directions were from directions not potentially impacted from an industrial facility, to create an artificial background value. As discussed above, the analysis used a 90 degree arc around the facility that, due to proximity of local sources to the monitor, resulted in dropping more data than EPA finds would be appropriate. A different background monitor than the Westlake monitor could potentially be used, or refinements would be needed to include additional data if the Westlake monitor is used to estimate background concentrations, which would likely increase the estimated background values. The commenter erroneously asserts that EPA encourages the use of the Westlake monitor due to its close proximity to the Nelson & NISCO facilities. EPA's concern was due to the close proximity of the monitor to the Nelson & NISCO facilities that the 90 degree arc (+/- 45 degrees centered on the wind direction from the Nelson & NISCO facilities to the Westlake monitor) excludes some wind directions to the Westlake monitor that would not include impact at the monitor from the Nelson & NISCO facilities, thus excluding monitoring data from the background concentration calculation and resulting in a biased low value within the modeled value for estimating ambient concentrations.

**Comment:** Two commenters (0320-Entergy LA-TX , 0323-Beall) stated that, if EPA makes a final designation for Calcasieu Parish of unclassifiable, the EPA should allow more time to evaluate the available modeling and monitoring data after a final designation is made for this area by July 2, 2016. Commenter (0323-Beall) stated it is inequitable to require Calcasieu Parish to meet either the January 2017 EPA deadline (which also mandates a state deadline of July 1, 2016) if EPA makes a final designation of "unclassifiable" for this area.

Commenter (0320-Entergy LA-TX) asserted that it is inequitable to require the State and affected sources to comply with the July 1, 2016 deadline for air quality characterization under the Data Requirements Rule where EPA will not finalize the area designation which triggers applicability of the DRR until July 2, 2016. Commenter stated that, for such areas, EPA should not arbitrarily impose an unrealistic deadline for completing the additional evaluation at the expense of the public and affected sources.

***EPA's Response:***

The EPA disagrees with the comment that more time should be allowed to evaluate the available modeling and monitoring data *after* a final designation is made for this area by July 2, 2016. The EPA has fully reviewed and analyzed the currently available information referred to by commenter and has determined that this information does not provide an adequate basis for the EPA to determine whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS. Regarding the comment on Data Requirements Rule deadlines, while out of scope of this final action, as discussed within that rulemaking, the EPA's view is that the schedule and deadlines are reasonable. The EPA stated specifically in that rulemaking that, while the schedule for meeting the requirements of this rule is expeditious, the schedule can be achieved with the appropriate planning, coordination, and program implementation by affected air agencies. The EPA strongly encouraged air agencies to start their investigation of that issue as soon as practicable, as any further delay in air quality characterization around sources subject to the DRR would delay implementation of the standard and public health protection in areas where there may be a violation of the standard. Moreover, the fact that EPA is issuing an unclassifiable designation for this area does not affect the applicability of the DRR in this case – the area was already subject to it as an undesignated area, and simply remains so following designation as

unclassifiable. Only a designation of nonattainment would have changed the applicability of the DRR.

## XIV. Maryland

### A. Anne Arundel County and Baltimore County

**Comment:** Some commenters (0208-APC, 0210-APC, 0211-Didonato, 0218-APC, 0247-Garofolo, 0259-Allen, 0264-Smith, 0267-APC, 0273-APC, 0277-APC, 0279-Meadows, 0290-Fernandez, 0292-Zetter, 0295-ACP) expressed concern about air quality in this area. Many of these commenters suggested that the coal-fired power plants in the area (Wagner and Brandon Shores) should reduce their sulfur dioxide emissions. One commenter (0247-Garofolo) urged the State of MD and Raven power to provide readily accessible information about the hourly rates and appropriate and timely notifications to local communities when the regulated rates are exceeded.

**EPA's Response:** EPA acknowledges the commenters' concerns. With this designation, EPA is taking action to address air quality in the area surrounding the Wagner power plant. EPA's designations and implementation processes for the 2010 1-hour SO<sub>2</sub> NAAQS will address through the planning process of Part D of Title I of the CAA ambient air quality issues resulting from sulfur dioxide emissions in the nonattainment area. It is beyond the scope of this action for EPA to comment on MD's or Raven Power's ability to provide the local communities with accessibility to sulfur dioxide emissions data.

**Comment:** Some commenters (0212-APC, 0225-APC, 0229-APC, 0230-APC, 0232-Leopold, 0247-Garofolo, 0278-APC, 0332-AB-Sierra Club, Sierra Club 5-10-16) supported the EPA designation of "nonattainment" for the area. Commenter (0230-APC) provided five attachments regarding air quality in this area. One commenter (Sierra Club 5-10-16) stated that Maryland should establish modeling-informed short-term emission limits for Wagner, Crane and Brandon Shores sufficient to ensure that the areas around these plants attains EPA's health-protective SO<sub>2</sub> NAAQS and, in the interim, EPA should finalize its proposed nonattainment designation.

One commenter (0332-AB-Sierra Club) stated that, while both the Sierra Club and the State of Maryland submitted air dispersion modeling analyses, the EPA found the Sierra Club modeling of violations persuasive and stated that it closely follows the EPA modeling guidance. Commenter stated that the EPA found Maryland's modeling analysis problematic and not in accordance with EPA's modeling guidance. Commenter stated that, both for the reasons identified in the EPA TSD and as discussed in commenter's letter regarding use of synthetic emission rates and the LOWWIND3 option, Maryland's modeling does not support an attainment designation. Commenter stated that, absent an enforceable 1-hour limit on Wagner Unit 2's SO<sub>2</sub> emissions, there is no basis for Maryland's modeling analysis revising downward the unit's historical emissions.

Commenter (0332-AB-Sierra Club) objected to the modeling provided by AECOM to Maryland because the EPA has not formally approved the use of the ADJ\_U\* and LOWWIND3 options as the regulatory default under Appendix W and because AECOM failed to support the preferability of these options for modeling the Baltimore-area coal plants, especially for determining whether the area is attaining the 1-hour SO<sub>2</sub> NAAQS. Commenter provided discussion of this issue in their letter and attachments, including attached comments of Camille Sears (Exhibit 4). Also see discussion of these options in section III.A.1 of this document.

Commenter (0332-AB-Sierra Club) stated that, while the Sierra Club believes that their 2015 modeling fully supports a nonattainment designation, they attached a supplemental modeling report (Appendix B Exhibit 3) demonstrating that the results of the 2015 modeling report are robust to the modeling years selected, the use of emission data from EPA's Emissions Modeling Clearinghouse and to the inclusion of variable hourly exit velocities. Commenter stated that, consistent with these conclusions and with the supplemental information described in their letter and attachments, they urged the EPA to finalize its proposed nonattainment designation for the areas around the Wagner coal-fired power plant.

**EPA's Response:** EPA appreciates the support for the proposed nonattainment area. EPA discusses in detail the modeling analyses submitted by both Sierra Club and the State of Maryland in order to inform EPA's proposed designation in the Maryland technical support document (TSD) for the intended designation. The modeling analyses submitted by Sierra Club and Maryland during the public and state comment periods are discussed in detail in the TSD for the final designation.

**Comment:** Two commenters (MD Response, Attachment 1, 0308-Raven Power) stated that a nonattainment designation is not supported by the data available.

One commenter (MD Response) stated that refined modeling of the 1-hour SO<sub>2</sub> emissions in the area of Wagner shows that the area is in attainment of the standard. Commenter's letter referred to detailed comments their TSD (MD Response, Attachment 1, 13 pages and Appendices A-E). Commenter included five additional attachments: AECOM modeling report April 2016 for Wagner and Brandon (Attachment 2); AECOM modeling report January 2016 for Wagner and Brandon Shores (Attachment 3); MDE April 14, 2016 letter to EPA Region 3 (Attachment 4); MDE April 19, 2016 technical report for Wagner and Brandon Shores (Attachment 5); and MDE letter to EPA Region 3 November 20, 2015 (Attachment 6).

Commenter (MD Response, Attachment 1) provided the following summary to show that an attainment designation is supported by the available data and analysis. Additional details are provided in their comments (MD Response, Attachment 1, pdf pages 4-7).

1. Modeling results for a 12-month period of post-MATS actual emissions for the Wagner facility show the area to be in attainment of the 1-hour SO<sub>2</sub> standard.
2. As found in the three-year study that MDE provided to EPA in January 2016, and as substantiated through additional modeling evidence produced since and described in this document, the Wagner area is currently attaining the 1-hour SO<sub>2</sub> NAAQS. This modeling

takes into account emissions reductions achieved through compliance with EPA's MATS Rule and the application of some permissible AERMOD modeling options, as listed below. See commenter's Attachment 4 which describes commenter's position that the ADJ\_U\* option is justified for use in the 1-hour SO<sub>2</sub> characterization air quality modeling for the Wagner power plant.

- a. (i) ADJUST U star (ADJ\_U\*)
  - b. (ii) LOWWIND3
  - c. (iii) Sector-specific 1-hour SO<sub>2</sub> background concentrations
  - d. (iv) Variable actual emission rates, exit temperatures, and exit velocities
3. The MATS Rule emission limits will be incorporated into the facilities' Title V Operating Permits making them federally enforceable and therefore appropriate for use in this modeling demonstration.

Commenter (0308-Raven Power) stated the EPA has not adequately justified its dismissal of the modeling demonstration provided by the Maryland Department of Environment (MDE) initially. Commenter stated that the MDE modeling results demonstrated that the area around Wagner is in attainment with the SO<sub>2</sub> standard when emission reductions achieved through compliance with EPA's MATS Rule are accounted for, and when some permissible AERMOD modeling options including beta U\*, LOWWIND3, and sector-specific background levels are applied.

One commenter (Sierra Club 5-10-16) stated that nothing in Maryland's April 14 and 19 submissions alters the facts that (1) Maryland has identified no federally enforceable short-term SO<sub>2</sub> limits for the Wagner plant, thereby delegitimizing any modeling that fails to reflect the Wagner plant's actual historical emissions and (2) when Wagner's actual emissions are modeled, both MDE's and Sierra Club's modeling show nonattainment. Commenter stated that, in Wagner Units 2 and 3, Raven is authorized to blend and burn a range of coals, which could result in significant fluctuation in the plant's future emissions rate, including emissions at rates that exceed those modeled by AECOM and MDE. Commenter stated that, because the State of Maryland has not adopted any federally enforceable emission limitations that would eliminate these violations, the EPA should finalize its proposed nonattainment designation.

**EPA's Response:** EPA disagrees with the commenters MD and Raven Power and finds that a nonattainment designation for the area surrounding the Wagner power plant is indeed supported by the available data. EPA's detailed analyses and explanations concerning the points listed above can be found in both EPA's TSDs for the intended and final designations for the State of Maryland.

EPA agrees with commenter Sierra Club concerning no federally enforceable SO<sub>2</sub> limits being identified in Maryland's submissions. A detailed analysis of Maryland's April 14 and 19 submissions can be found in EPA's final designations Maryland TSD.

**Comment:** Commenters (MD Response, Attachment 1, 0308-Raven Power) stated that, while the EPA primarily relied on Sierra Club's modeling for its preliminary recommendation of nonattainment, there are many deficiencies in the Sierra Club modeling, including issues with

background concentrations, meteorological data processing, receptor locations and the use of constant stack exit temperatures. Additional details are provided in their comments (MD Response, Attachment 1, pdf pages 7-9; 0308-Raven Power, pdf pages 5-7). Commenter (MD Response, Attachment 1) stated these errors in the Sierra Club modeling make it unsuitable for use in the designation process.

One commenter (Sierra Club 5-10-16) stated that Maryland's criticisms of certain factors in the Sierra Club modeling have not been shown to have any meaningful impact on the modeled results. Commenter stated that the EPA TSD indicated that these factors should not significantly change the final model concentrations. Commenter stated that Maryland's critiques are poorly taken given that it is Maryland's preferred modeling analysis, not Sierra Club's, which is fundamentally inconsistent with EPA's modeling guidance. Commenter stated that, when MDE modeled actual emissions for Wagner, its modeled results did not differ appreciably from those in the Sierra Club modeling.

***EPA's Response:*** EPA disagrees with the commenters MD and Raven Power. EPA's detailed analysis of the Sierra Club's modeling can be found in EPA's draft TSD for the State of Maryland. EPA, however, received new modeling from both Maryland and Sierra Club during the state and public comment periods, and after evaluating these newer modeling analyses, EPA is finalizing a designation of nonattainment for an area surrounding the Wagner power plant based largely on one of Maryland's modeling analyses (i.e. the BETA Adjust U\* modeling run found in Appendix of D of Maryland's April 19, 2016, submission). As such, EPA agrees with commenter Sierra Club in that ultimately Maryland's Appendix D run, which EPA determined to be most representative of actual air quality in the area surrounding Wagner, still showed SO<sub>2</sub> NAAQS violations in the area surrounding Wagner. A detailed analysis of the new modeling analyses submitted to EPA during the comment periods can be found in EPA's final TSD for the State of Maryland.

***Comment:*** Two commenters (MD Response, Attachment 1, 0308-Raven Power) disagreed with the EPA's proposed designation and stated that variations in modeling results support an unclassifiable/attainment designation. Commenter (0308-Raven Power) stated that the EPA has designated areas in other states as unclassifiable/attainment when conflicting information was presented or if modeling submitted from different parties showed results just under or over the NAAQS. Commenter (MD Response, Attachment 1) stated that an unclassifiable designation would allow for additional time to address the modeling uncertainties, better capture the benefits of the MATS reductions and potentially conduct additional monitoring. Additional details are provided in their comments (MD Response, Attachment 1, pdf pages 9-10; 0308-Raven Power, pdf page 7).

One commenter (Sierra Club 5-10-16) stated that, although Maryland contends that there is conflicting modeling and this warrants an "unclassifiable" designation, there is actually broad agreement between MDE's modeling and the Sierra Club modeling. Commenter stated that there is no significant difference in the modeling results as both show that the plant, as currently permitted and based on its actual emissions, is causing nonattainment.

***EPA's Response:*** EPA disagrees with the first commenter. As discussed in both the draft and final Maryland TSDs, EPA does not agree that the available information supports an attainment designation or an unclassifiable designation given the modeling results available to and considered by the EPA. As the EPA has consistently maintained, including in EPA's SO<sub>2</sub> Data Requirements Rule (DRR) (80 FR 51054, August 21, 2015), any emission reductions a source relies upon must be achieved through federally enforceable mechanisms in place prior to final designations. For instance, such a federally enforceable mechanism could include a SO<sub>2</sub> emission rate approved into a title V permit or into the state's state implementation plan (SIP) prior to final designations. Relying on a limit established to comply with MATS that has not been reflected in a federally enforceable permit or SIP is not sufficient for demonstrating that an area is complying with the 2010 SO<sub>2</sub> NAAQS. In addition, in both the proposed and final Maryland TSDs, EPA discusses that EPA's guidance provides that modeling for the SO<sub>2</sub> NAAQS should be done using federally enforceable limits. As discussed in the TSDs, the modeling referred to by the commenter did not rely on any such federally enforceable limits which would show attainment of the NAAQS or undermine the Sierra Club modeling which supports a nonattainment designation. Finally, EPA discusses the use of AERMOD modeling options including beta adjust U\* in the final Maryland TSD. As discussed in more detail in that TSD, the EPA evaluated Maryland's modeling with acceptable AERMOD alternatives and finds that the modeling still supports a designation of nonattainment for the area around the Wagner power plant.

***Comment:*** One commenter (0289-Transpoint Atlantic) stated that a nonattainment designation in Anne Arundel County is not technically supported and will cause grave economic consequences to the growth of the region and their planned port-to-rail-to-road facility at the former Bethlehem Steel Plant in Sparrows Point. The commenter disagreed in particular that the boundary of the nonattainment area should extend 35.5 km from Wagner, which would have the effect of including Transpoint Atlantic's property in Baltimore County. The commenter stated that (1) no monitor in Maryland has shown a violation of the one hour SO<sub>2</sub> NAAQS, (2) peak daily one hour values in the summer of 2013 were generally well below the applicable standard, (3) Wagner unit 2 began in April 2015 to use low sulfur coal at that facility, and (4) unit 3 will be adding an injection system that can also help reduce SO<sub>2</sub> emissions.

Two commenters (MD Response, Attachment 1, 0308-Raven Power) stated that the extent of the nonattainment area proposed by EPA is unjustified because, for the distant receptor locations, it is impossible for the plume to travel that distance within the model's 1-hour averaging time. A more detailed explanation of these views is provided in the commenters' letters (MD Response, Attachment 1, pdf pages 11-13; 0308-Raven Power, pdf page 8).

***EPA's Response:*** EPA acknowledges Transport Atlantic's concerns, however, EPA disagrees that a nonattainment designation is not technically supported. As discussed in the draft TSD, although no monitor in Maryland has shown a violation of the SO<sub>2</sub> NAAQS, there are no ambient SO<sub>2</sub> air quality monitors located in Anne Arundel County, the county within which Wagner Generating Station is located, so reliance on air quality data alone is not sufficient in this case to evaluate the area's status in attaining the SO<sub>2</sub> NAAQS. The commenter's point

concerning peak daily 1-hour values in the summer of 2013 as being generally below the standard is likewise discussed in the draft TSD (p. 9) in which the EPA provided its response to the 2013 data. EPA disagrees that this data is a reliable indication of the actual air quality in the area surrounding Wagner for the reasons discussed in the TSD. With regards to the commenter's third and fourth points concerning Wagner's use of low sulfur coal in unit 2 and proposed dry sorbent injection (DSI) installation in unit 3, as discussed earlier in this document, any emission reductions must be achieved through federally enforceable mechanisms in place prior to final designations to be considered relevant for that designation. Wagner's use of low sulfur coal has not been incorporated into a federally enforceable mechanism, nor has a DSI system been installed yet. EPA cannot base a final designation decision on emission reductions systems that are not federally enforceable, or in the case of the DSI system, that are proposed for the future and do not yet exist.

EPA acknowledges Raven Power's comment concerning the extent of the nonattainment area boundary. EPA has evaluated additional information received during the public and state comment periods and as further detailed in the final Maryland TSD, EPA is modifying the nonattainment area boundary to exclude the far north/northwest portions of Baltimore County.

## XV. Michigan

### A. St. Clair

**Comment:** One commenter (0309-DTE Energy) agreed with the designation recommendation that only a portion of St. Clair County should be considered nonattainment. Commenter supported the EPA's change to clarify the southeastern and northeastern corners of the nonattainment area. The commenter disagreed with the use of the Pontiac meteorological station instead of the closer St. Clair Airport based on proximity to Lake St. Clair.

**EPA's Response:** The EPA appreciates the support on the recommendation. As discussed further in the final Michigan TSD, for the recommendation of meteorological stations, the EPA maintains that meteorological data were selected from the Pontiac Station because the Pontiac Station had a more complete data set than the St. Clair Airport. Specifically, the Pontiac Station had one minute Automated Surface Observing System (ASOS) data available, and the St. Clair Airport did not. Therefore, the Pontiac Station offered a more appropriate data set within the guidelines of Appendix W and the Modeling TAD.

**Comment:** One commenter (0332-AG-Sierra Club) supported the EPA's intended designation of the area around DTE's Belle River and St. Clair Power Plants, including portions of St. Clair

County, as a nonattainment area for the 2010 1-hour SO<sub>2</sub> NAAQS. Commenter stated these are two of the largest SO<sub>2</sub> emitters in the nation, have no SO<sub>2</sub> controls, and such a designation is compelled by the modeling performed by MDEQ and Sierra Club. Commenter stated that MDEQ and Sierra Club's modeling evaluations adhere to EPA's Modeling TAD and Appendix W and both predict levels that far exceed the SO<sub>2</sub> NAAQS. Commenter stated that the EPA's proposed nonattainment area boundaries are equally supported by all of the modeling in the record.

**EPA's Response:** The EPA appreciates the support.

## B. Bay County

**Comment:** One commenter (MI Response) requested that Bay County be designated as unclassified/attainment for the SO<sub>2</sub> 1-hour NAAQS, rather than unclassified, because the Consumers Energy's Weadock facility in Bay County permanently discontinued operations. Commenter stated that, in a February 16, 2016, letter from Acting Regional Administrator Robert Kaplan to Governor Rick Snyder, the EPA stated that Bay County could be designated unclassified/attainment if the Weadock facility were shut down by April 15, 2016. Commenter stated that, based on federal consent orders for the facility, that the requirement has now been satisfied.

**EPA's Response:** As further discussed in the final Michigan TSD, at the time of proposal the EPA stated in the draft TSD that the modeling in the Michigan Department of Environmental Quality's (MDEQ) September 18, 2015, submittal, was an appropriate characterization of the air quality in the area other than the assumption that Weadock had no emissions. Now that Weadock is shut down, assuming zero tons per year of allowable SO<sub>2</sub> emissions is appropriate and EPA agrees that Michigan's modeling supports the EPA's conclusion that the area is meeting the NAAQS and the EPA's unclassifiable/attainment designation for the Bay County Area.

## E. Monroe County

**Comment:** One commenter (MI Response) stated that Consumers Energy's Whiting facility in Monroe County permanently discontinued operations. Therefore, the commenter requested that the county be designated as unclassified/attainment for the SO<sub>2</sub> 1-hour NAAQS rather than unclassified. One commenter (MI Response) requested that Monroe County be designated as unclassified/attainment for the SO<sub>2</sub> 1-hour NAAQS, rather than unclassified, because the Consumers Energy's Whiting facility in Monroe County permanently discontinued operations. Commenter stated that, in a February 16, 2016, letter from Acting Regional Administrator Robert Kaplan to Governor Rick Snyder, the EPA stated that Monroe County could be

designated unclassified/attainment if the Whiting facility were shut down by April 15, 2016. Commenter stated that, based on federal consent orders for the facility, that the requirement has now been satisfied.

***EPA's Response:*** As further discussed in the final Michigan TSD, at the time of proposal the EPA stated in the draft TSD that the modeling in the MDEQ's September 18, 2015, submittal the modeling was an appropriate characterization of the air quality in the area other than the assumption that Whiting had no emissions. Now that Whiting is shut down, assuming zero tons per year of allowable SO<sub>2</sub> emissions is appropriate and EPA agrees that Michigan's modeling supports the EPA's conclusion that the area is meeting the NAAQS and the EPA's unclassifiable/attainment designation for the Monroe County Area.

***Comment:*** One commenter (0309-DTE Energy) objected to the EPA's proposed unclassifiable designation for Monroe County based on that the retirement date (April 15, 2016) for the J. R. Whiting Power Plant had not passed. Commenter stated that adequate documentation has been provided to the EPA to designate Monroe County as attainment and there is no useful purpose for the interim "unclassifiable" label. Commenter stated the modeling demonstration, even with conservative assumptions, clearly shows that this NAAQS is attained and there are three years of monitoring data with a design concentration well below the NAAQS at a location as close as possible to the modeled peak impact receptor for Monroe Power Plant. The commenter also objected to the use meteorological data from Toledo Express Airport because it is 50 kilometers away from the Monroe Power Plant and Lake Erie has a profound effect on wind speed and direction when light gradient winds are present in Monroe County.

***EPA's Response:*** As discussed elsewhere in this section and the final Michigan TSD, the EPA agrees that since Whiting is now shut down, assuming zero tons per year of allowable SO<sub>2</sub> emissions is appropriate and Michigan's modeling supports a conclusion that the area is meeting the NAAQS and an unclassifiable/attainment designation for the Monroe County Area. EPA maintains that meteorological data were selected from the Toledo Express Airport because the Toledo Airport had a more complete data set than the Monroe Custer Airport. Specifically, the Toledo Express Airport, also near Lake Erie, had one minute Automated Surface Observing System (ASOS) data available, and the Monroe Custer Airport did not. Therefore, Toledo Express Airport offered a more appropriate data set within the guidelines of Appendix W and the Modeling TAD.

***Comment:*** One commenter (0332-AG-Sierra Club) stated that the EPA should designate Monroe County as in nonattainment with the 1-hour SO<sub>2</sub> NAAQS. Commenter stated that modeling provided by MDEQ is not in accordance with EPA's Modeling TAD or Appendix W, and does

not support an unclassifiable designation. Commenter stated that the Sierra Club modeling demonstrates violations and is consistent with EPA's Modeling TAD as it modeled actual emissions from all the sources in Monroe County that are likely to cause or contribute to an exceedance of the NAAQS in 2012 to 2014. Commenter stated that MDEQ's modeling uses an emission rate for the J.R. Whiting facility that reflects neither actual historical SO<sub>2</sub> emissions nor CAA enforceable emissions. Commenter stated that, absent an enforceable 1-hour limit, there is no basis for revising downward J.R. Whiting's historical emissions to zero.

**EPA's Response:** The EPA disagrees that the modeling for the Monroe County area is not in accordance with Appendix W and the Modeling TAD. The Modeling TAD allows for the modeling of allowable emissions or actual emissions to represent the current air quality. Allowable emissions can be more reflective of the current air quality, rather than historical actual emissions, especially when recent controls have been installed, which has occurred at the Monroe facility. Assuming no emissions from a permanently shut down facility is also appropriate to reflect current air quality conditions. Since the Whiting facility shut down, assuming zero tons per year of allowable SO<sub>2</sub> emissions is appropriate and the EPA finds that Michigan's modeling is sufficient and in the basis of our determination that the area is meeting the 2010 SO<sub>2</sub> NAAQS and the EPA's unclassifiable/attainment designation for the Monroe County Area.

## XVII. Missouri

### A. Franklin County

**Comment:** One commenter (0326-Ameren) stated that EPA's Proposed Designation is contrary to law, the available credible evidence, and EPA's own guidance and practice with respect to the 2010 SO<sub>2</sub> NAAQS and, therefore, is arbitrary and capricious. Commenter stated that:

1. EPA may not base an area designation on unreliable or non-representative data that does not clearly demonstrate nonattainment.
2. EPA's proposed designation is premature and arbitrary and capricious because it effectively prohibits consideration of monitoring data in contravention of EPA's own regulation.
3. EPA's approach in designating Franklin County as nonattainment is inconsistent with similarly-situated areas that EPA designated as unclassifiable and, therefore, is arbitrary and capricious.
4. An unclassifiable designation is required where reliable conflicting information exists.
5. It is arbitrary and capricious for EPA to disregard a state unclassifiable designation based upon third-Party Data.

**EPA's Response:** In order, 1) EPA agrees with the commenter that designations should be made based on representative data, including for both unclassifiable/attainment and nonattainment. 2) As we stated in our March 20, 2015, guidance memo, we recognized that the timeline for designations by the court-ordered deadline of July 2, 2016, does not provide for establishment and use of data from new ambient monitors. We further stated that we anticipated that in many areas the most reliable information for information the July 2, 2016, designation would be based on modeling. As we discuss in the response to comments for the final Data Requirements Rule, EPA has historically used modeling for designation purposes under the SO<sub>2</sub> NAAQS and it is the EPA's position that it is appropriate to do so. See section (III)(A)(2) of this document for further information on utilizing modeling for the purposes of designations. 3) EPA disagrees with the commenter that the Labadie area is similarly-situated with other areas in the data available and circumstances surrounding the proposed designation – see the EPA's response to Ameren response request #2. 4) Based on all the available and reliable data, including new information received following the notification of our intended nonattainment designation, EPA is making a final designation of unclassifiable. 5) EPA did not disregard the state's designation recommendation. Both EPA's intended and final designation were based on all available and reliable information, including the state's submittal and recommendations to EPA and 3<sup>rd</sup> party information, including information submitted by Ameren.

**Comment:** One commenter (0326-Ameren) requested that EPA respond to the following issues:

1. EPA's basis for failing to account for Ameren's actual monitoring data, where EPA relied upon available monitoring data in Colorado Springs, for example, in proposing an unclassifiable designation.
2. EPA's basis for failing to treat Ameren's actual monitoring data as a "reliable indicator" that Franklin County is attaining the NAAQS, where the monitors are located in areas of maximum concentration and where EPA relied upon similar monitoring data in Gibson County and Gallia County, for example, as an support for an attainment/unclassifiable and unclassifiable designation, respectively.
3. EPA's basis for failing to evaluate the accuracy of modeling in light of Ameren and MDNR quality-assured monitoring results and issuing a request to MDNR to perform additional modeling with revised assumptions.
4. EPA's basis for ignoring Ameren's alternative modeling as an indication that MDNR and Sierra Club's modeling over-predict s SO<sub>2</sub> concentration levels and, therefore, is unreliable.
5. EPA's basis for crediting Sierra Club modeling uses standard cubic feet per minute (SCFM) rather than actual cubic feet per minute (ACFM) and the reliability of such analysis given this fundamental error.

6. EPA's basis for ignoring monitoring data on grounds that it was not quality assured where there is clear evidence that such quality assurance has occurred and verification of such data was made available to EPA.
7. EPA's substantiation for how historic hourly monitoring data can support a present-day nonattainment designation.
8. EPA's justification for modeling separate emissions from the combined Unit 3 and Unit 4 stack.
9. EPA's justification for relying on background concentrations from East St. Louis rather than Nilwood, where the latter is more representative of onsite conditions.
10. The status of Ameren/MDNR's outstanding site-specific request for use of beta options for modeling.
11. EPA's basis for rejecting the use of ADJ\_U\* beta option where it has previously been approved by EPA for use.
12. EPA's justification for ignoring/not addressing modeling over-prediction caused by the known penetrated plume issue.

***EPA's Response:***

The EPA will respond to each of the commenter's numbered comments in turn within this response, below. The EPA notes that on March 31, 2016, Mr. Steven C. Whitworth provided comments on EPA's proposed nonattainment designation for the area around Labadie Energy Center in Franklin County, Missouri. The comments were extensive and as noted above included 18 additional exhibits, including dispersion modeling provided directly to EPA Region 7 on both March 18<sup>th</sup>, 2016, and March 29<sup>th</sup>, 2016. In sum, Ameren contended in this submittal that new monitoring data supports attainment, revised modeling submitted by Ameren supports attainment, use of ADJ\_U\* and LOWWIND3 in modeling is more representative than default model options and supports attainment, and dispersion modeling EPA relied upon from MDNR over predicts actual conditions and is in error.

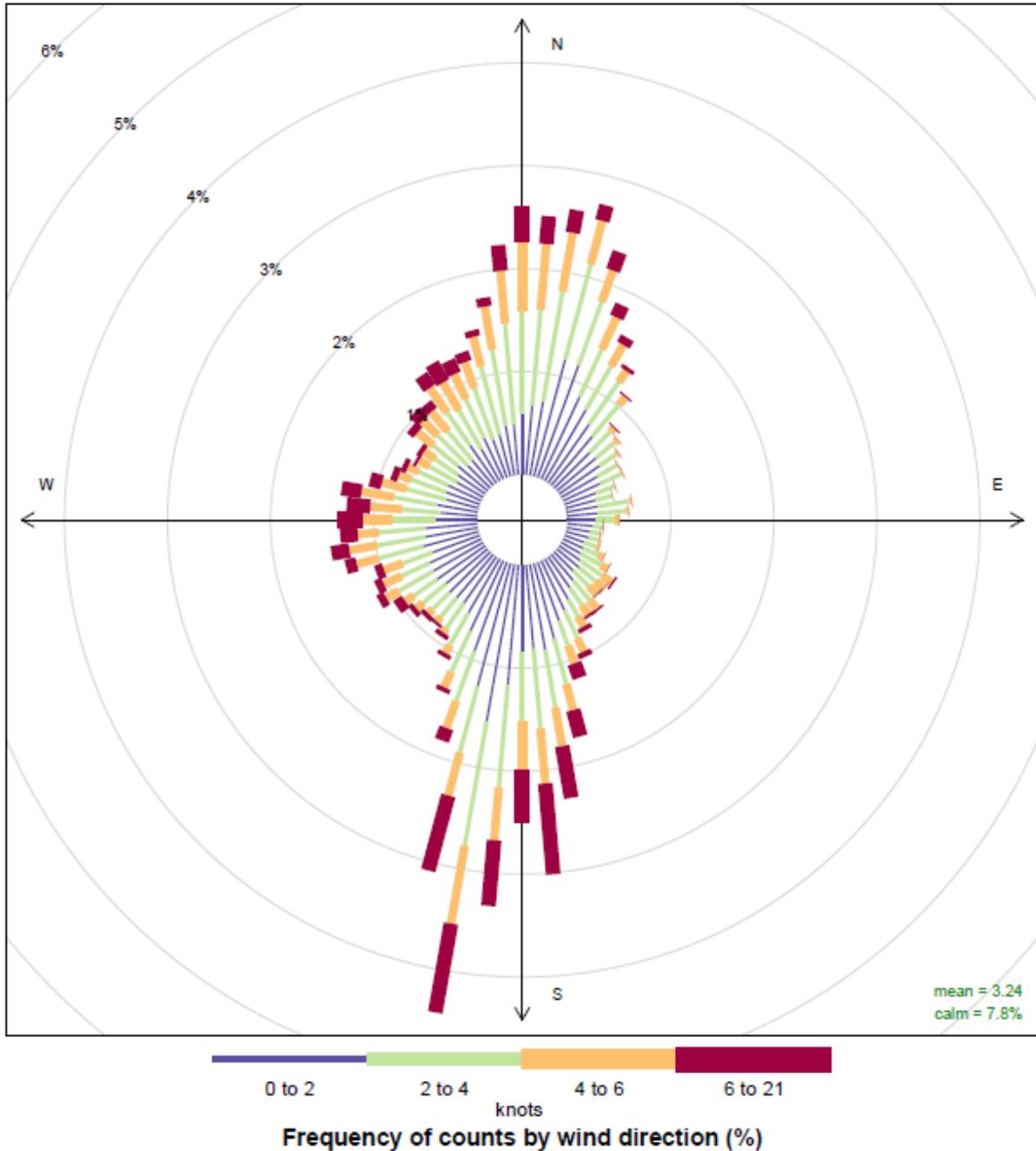
As detailed below, EPA does not agree that an attainment designation is appropriate for numerous reasons and is specifically responding to the 12 issues requested in the comment. Note that EPA has combined responses to some of the comments when there was overlap between such comments.

***EPA's Response to Ameren #1 and #2 - Claims that current monitoring data around Labadie shows attainment.***

EPA finds that the record reviewed and analyzed for this designations action does not support a claim that the current two monitors around Labadie are placed in areas representative of maximum concentrations when considering terrain and available meteorological data. This EPA

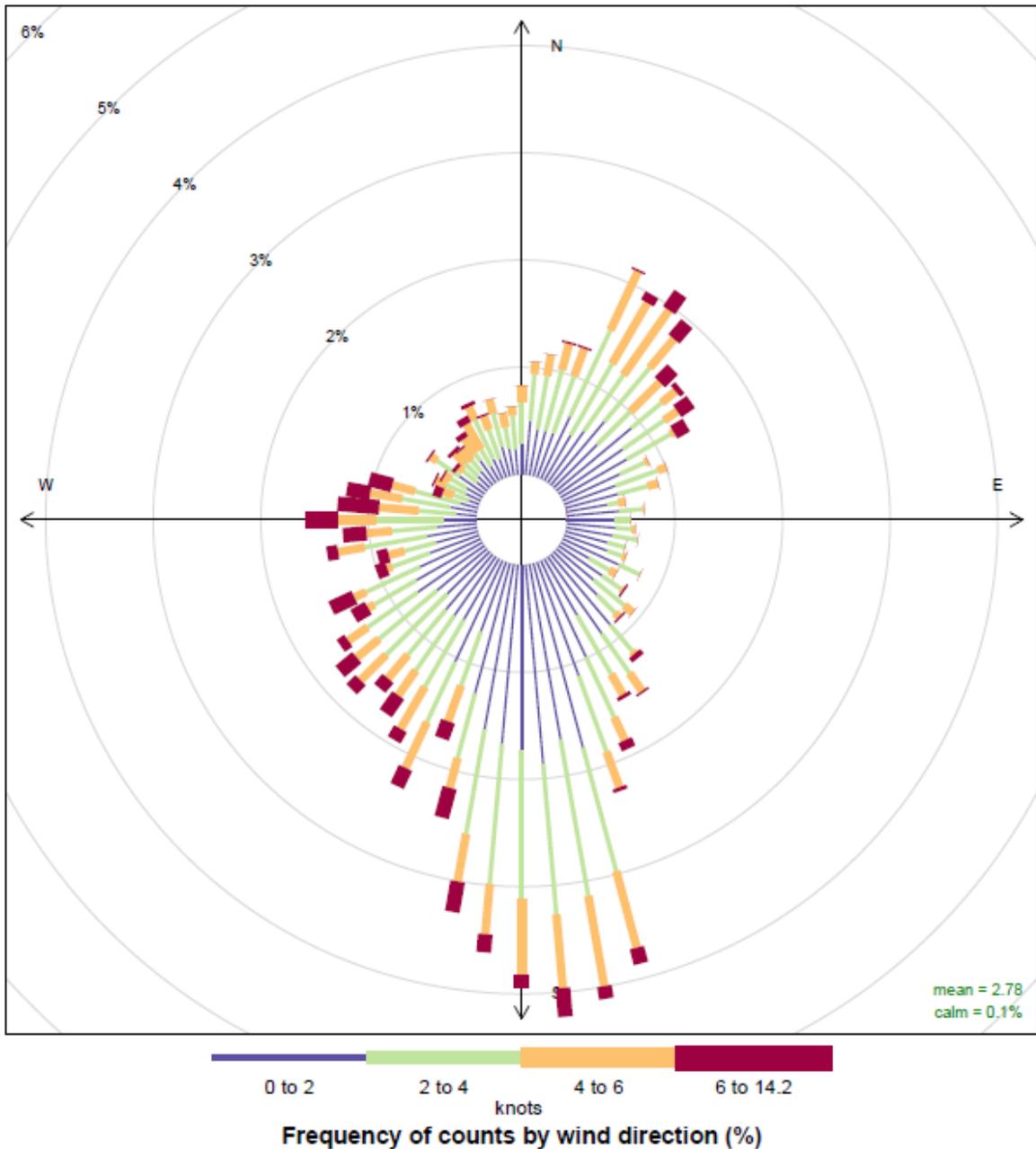
conclusion is based on an analysis of all available data, including historic and new meteorological and monitoring data. For example, using the historic 1995-1998 Augusta Quarry meteorology data, the three year windrose shows that the predominant surface winds around Labadie are north and south while the current SO<sub>2</sub> monitors are located to the east and west of Labadie stacks. While surface winds are not always representative of upper air flow patterns, these surface winds are clearly indicative of the directions emissions will travel once those emissions are mixed to the lower levels of the atmosphere.

1995-1998 Windrose Augusta Quarry 7m



This historic windrose data is also complemented by the new Valley meteorology site that shows a very similar pattern as the historic Augusta Quarry meteorology data. The EPA notes that the Valley site only includes data from April 2015 through December 31, 2015, so it is likely missing some of the northern components seen in the historic dataset, given that some of the winter months are missing when northern winds are more prevalent. Note that no other Valley data beyond December 31, 2015, was available to EPA at the time of preparation of this response to comments document.

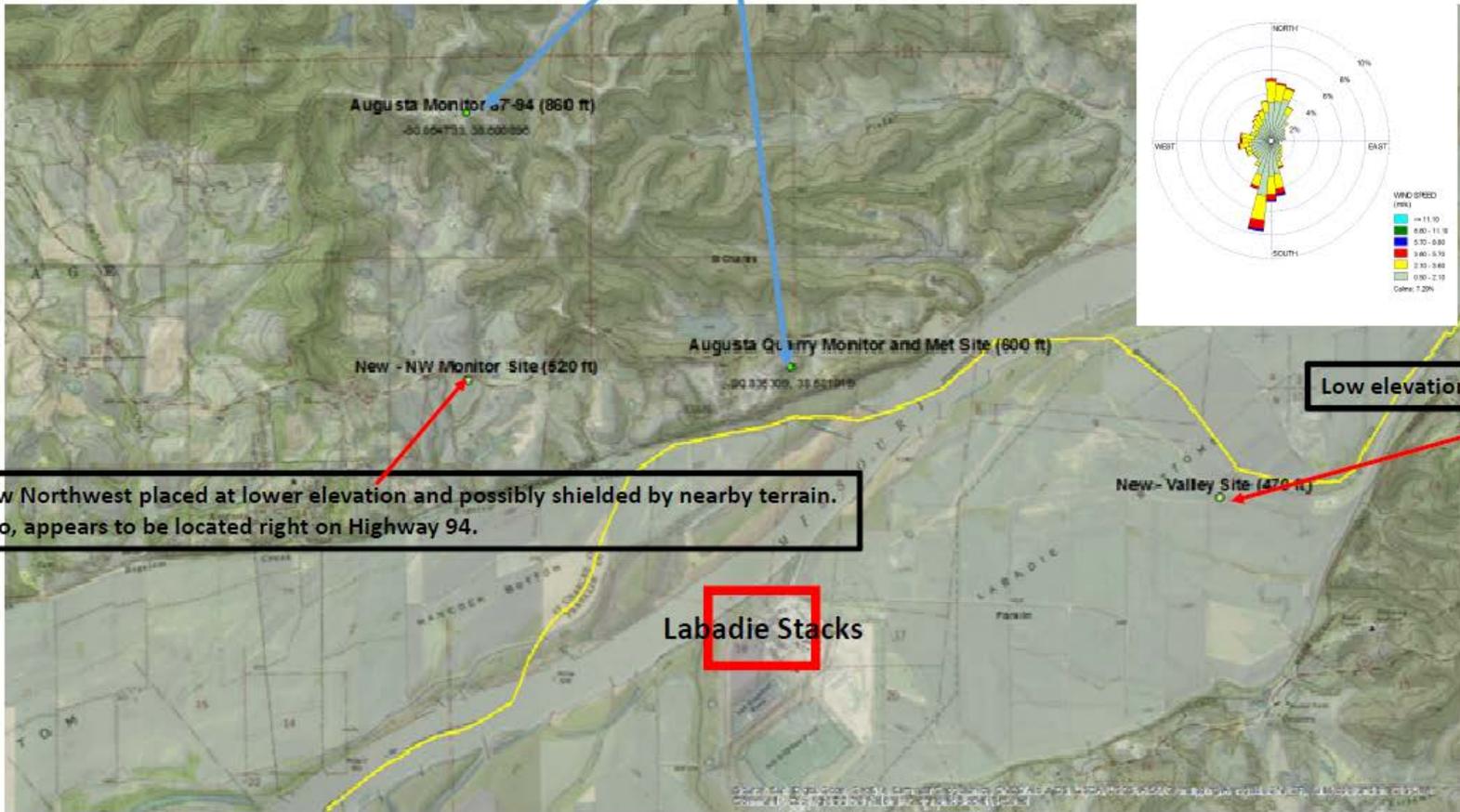
Windrose Valley 10m



The EPA's position is that neither of the current monitoring site locations are placed in areas representative of maximum concentrations based on an examination of both the current or historic wind rose information, as the wind frequency is predominantly north and south, not east and west as the current monitors are oriented.

An analysis of the historic monitor locations also shows they were located at higher elevations with better exposure to direct stack emissions, as opposed to the new monitors located at lower elevations. The figure below shows the current monitors are located at elevations of ~520 ft (NW monitor) and ~470 ft (Valley monitor), while the historic monitors are at elevations of ~600 ft (Augusta Quarry monitor) and ~860 ft (Augusta monitor). Because emissions are released at 700 ft above their base elevation, monitors placed at high elevations in the direction of higher wind frequencies are more likely to record higher concentrations, or peak concentrations. The current monitors are not in the predominant wind directions, nor are they located at elevated terrain surrounding Labadie, like the historic monitors were. In addition, in the EPA's analysis, it appears that the NW monitor may actually be somewhat shielded by other terrain features located between the Labadie stacks and this monitor location. When examining the maximum hourly readings for the two new monitors we note that there is a substantial difference in the maximum values between the two monitors, and this terrain shielding may be partially responsible for these differences in maximum values.

Old locations at more "elevated" sites which would be more conducive to direct impact during southerly winds

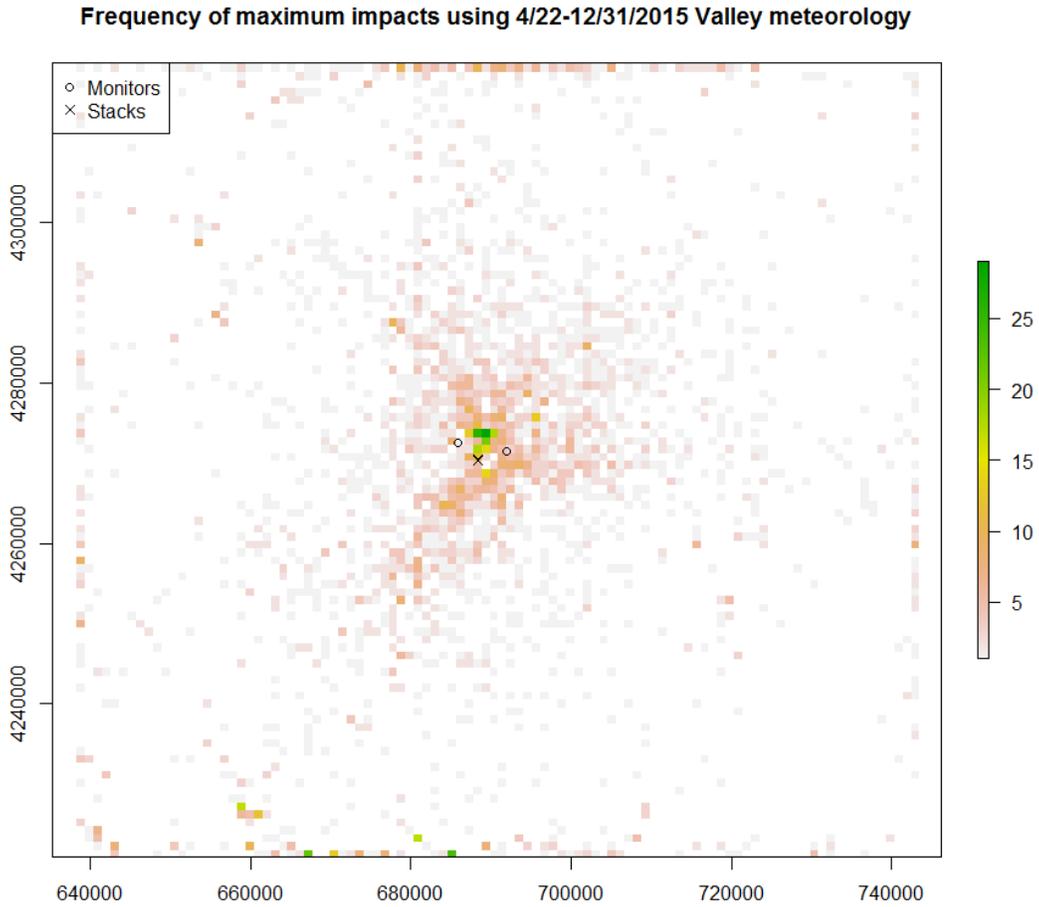


New Northwest placed at lower elevation and possibly shielded by nearby terrain. Also, appears to be located right on Highway 94.

Low elevation in the river bottom

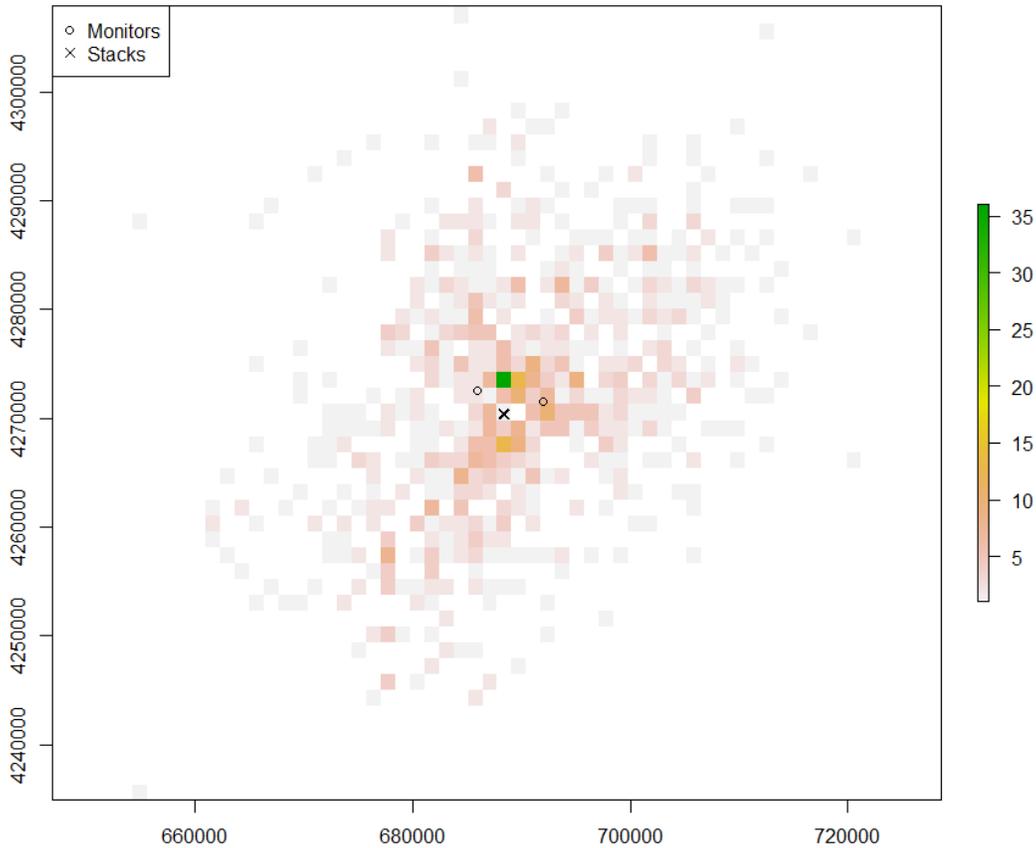
Ameren claims these new monitors are sited using EPA methodology and approval. MDNR is classifying the new Labadie monitors as Special Purpose Monitors (SPM) (<http://dnr.mo.gov/env/apcp/docs/2015-monitoring-network-plan.pdf>), and EPA has not yet concurred that the monitors are in locations expected to measure maximum concentrations, as EPA would need to for, for example, a Data Requirements Rule source. While EPA has indicated for MDNR's 2015 monitoring network plan that the monitors meet siting criteria for purposes of being away from obstructions, etc., EPA has not made any determinations of whether the monitors are in expected peak concentration locations as outlined by the 1-hr SO<sub>2</sub> designations Monitoring Technical Assistance Document. Given our analysis of both the windrose and terrain information, along with factoring in historic monitoring locations, it appears that the current monitors are not likely sited in an area to measure the maximum concentrations.

EPA analyzed the modeling and data that Ameren submitted using the onsite meteorology. The plot below is a frequency plot of AERMOD modeled hourly impacts, where a count of maximum hourly impacts is made based on the onsite modeling data Ameren has provided. These counts represent the receptor with the maximum modeled reading during any given hour throughout the entire modeling domain being used by Ameren. The frequency of maximum hourly impacts occurs to the north of the Labadie stacks, not the northwest or east at the Valley monitor location. In the figure, the 'x' represents the location of Labadie and the 'o' are the locations of the two current monitors.



The plot below is very similar to the one above except a  $> 30 \text{ ug/m}^3$  modeled cutoff was used to eliminate the low concentration hours where no receptors are indicating high impacts. Similar to the plot above, the frequency of maximum hourly impacts occurs to the north of the Labadie stacks, not to the northwest or east at the Valley monitor location.

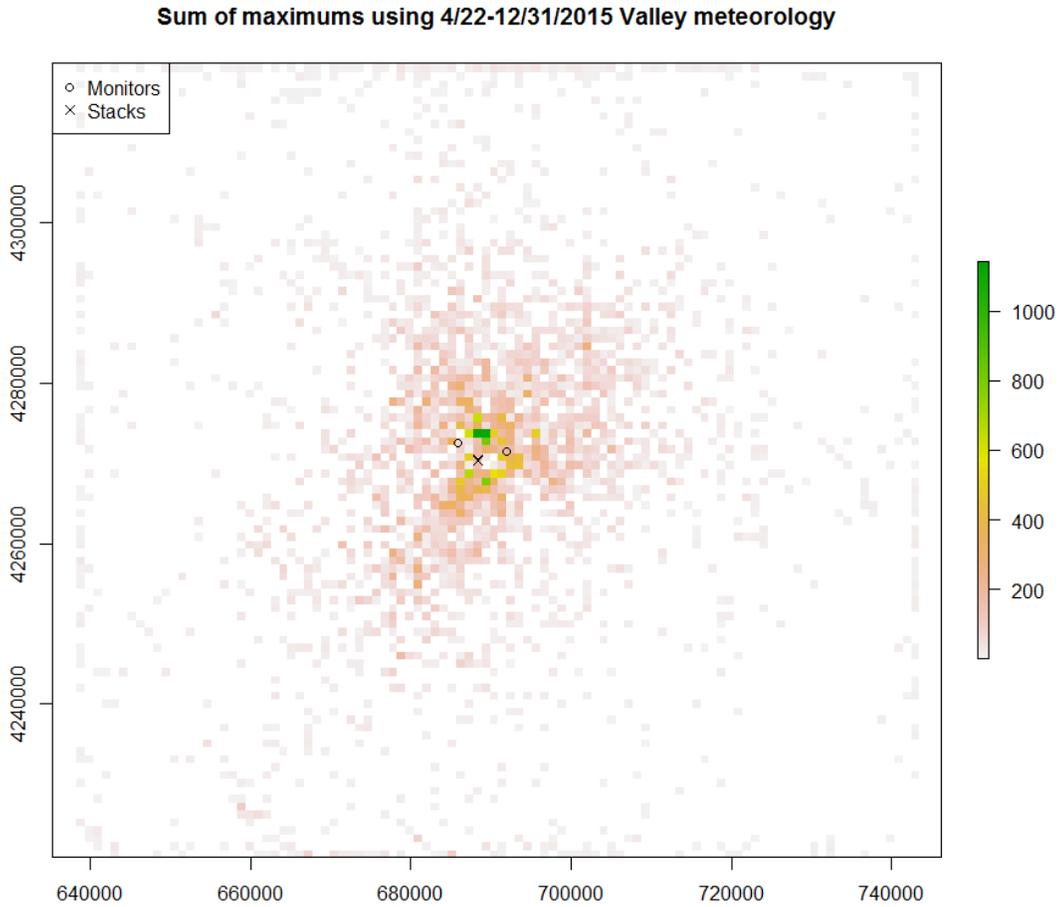
Frequency of maximum impacts using 4/22-12/31/2015 Valley meteorology (>30 ug/m3)



The final plot is a similar concept as above except, rather than just counting the frequency of maximum impacts, EPA is summing the maximum modeled impacts on an hourly basis. Again, this plot is based on the modeling using Ameren's onsite modeling inputs provided to EPA for the period 4/22/2015 to 12/31/2015. Summing the maximum hourly impacts gives additional weight to the magnitude of the modeling impacts along with the frequency and locations. The result is again similar to the two plots above, except that it appears to indicate that elevated impacts are occurring to the south of the Labadie stacks as well.

Again, it is important to note that this modeling is for just a portion of calendar year 2015 and does not include the entire winter period where northerly winds would likely be more prevalent. In addition, this modeling also uses actual hourly emissions and stack parameters. Thus, the impacts are specific to actual plant conditions occurring during this period and not necessarily indicative of future conditions. EPA notes there were several units that did not operate for a portion of this period. These plots all demonstrate the current monitors did not likely record the maximum impacts from Labadie during this 8 month period. The EPA's view is that this

information is likely very representative of actual impacts since the modeling analysis used site specific conditions provided by Ameren, and the modeling is performing very well at the current monitoring locations (see model performance discussion in Beta option response).



Concerning Ameren’s contention that EPA is classifying other areas such as Martin Drake area in Colorado Springs, Colorado as unclassifiable based on monitoring alone, EPA analyzes each area independently and includes all relevant and available data to form the basis of a designation decision. Ameren is incorrect in its assessment that EPA somehow relied on the monitoring near Martin Drake to support a final designation of unclassifiable for the area surrounding Martin Drake. See Final Technical Support Document for Colorado. In the Labadie case, there are not 3 years of monitoring data and the monitors are likely not located in areas representative of peak concentrations. In the Gibson, Indiana case cited by Ameren, there was a long record (many years) of monitoring data available at numerous locations that EPA found representative of maximum area of impact, which is not the case for the *monitors currently around Labadie*. See Final Technical Support Document for Indiana. For the reasons above, these areas are quite different and are not comparable to Labadie.

***EPA Response to Ameren #3 and #4. Alternative modeling provided by Ameren shows NAAQS attainment.***

Ameren provided alternative modeling to MDNR during the state's public process but all four runs were unsupported with the information available at that time. Two runs relied upon unapproved beta options and the other two runs relied upon inputs that EPA could not verify at that time (mainly combined stack information). In addition, all four runs utilized a background value from Nilwood, IL, with minimal supporting information at that time other than to state that the Nilwood, IL, monitor is in a rural area, similar to Labadie.

Ameren asserts EPA provided no rational basis in the TSD for disregarding Ameren's alternative modeling data. EPA disagrees, as EPA did provide the rationale within the TSD for not accepting Ameren's modeling, specifically the beta option modeling showing attainment, which Ameren did not and still does not have approval to use in a regulatory modeling analysis. As described in the TSD, there were numerous modeling runs provided, and all the modeling runs using regulatory defaults indicated nonattainment, including Ameren's own regulatory default modeling runs using two different meteorology datasets. All the modeling analyses EPA relied upon for its intended designation used approved default options, followed the modeling TAD and indicated the area did not attain the NAAQS.

Ameren also outlines in their comments that a designation decision be based on data that is:

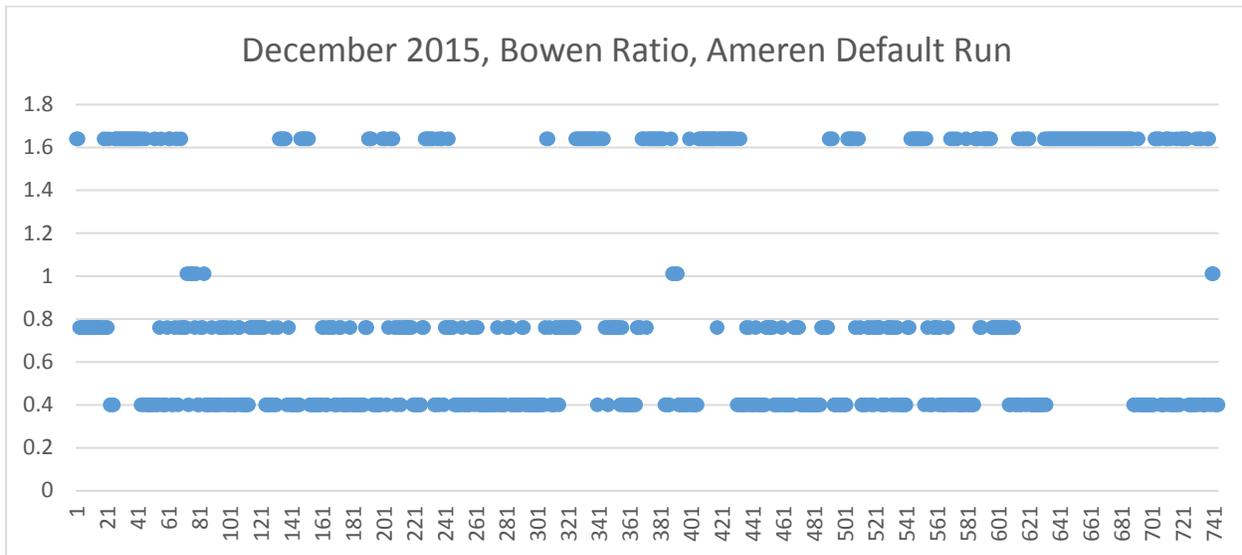
- (1) reliable – meaning the data must not be based on incorrect or questionable inputs or assumptions;
- (2) supportable – meaning that alternate available modeling or monitoring data does not support a different designation;
- (3) representative – meaning that the data, whether it consists of modeling or monitoring data, accurately reflects conditions that are, or have in the past, occurred in the designation area; and
- (4) inclusive – meaning that the data takes into account all available information (provided it is reliable and representative).

Ameren further claims the modeling and data we relied upon to form our proposed designation met none of the conditions above (1-4). EPA disagrees with this argument by Ameren. EPA reviewed and relied upon the all relevant and available information at the time of the initial recommendation and has continued to do so for the final unclassifiable designation. The EPA's position is that the TSD adequately describes the record and approach EPA used and the reasons why some data was not initially considered or weighted above other data.

To date EPA has received a total of 48 model runs for Labadie, 22 from Ameren, 23 from the Sierra Club, and 3 from MDNR. EPA reviewed all of the modeling runs provided along with all of the information submitted to inform the agency, including comments and exhibits from Ameren.

Ameren submitted numerous modeling analyses on 3/29/2016 and 5/2/2016 using 2013-2015 emissions but, as detailed here and in the TSDs, the EPA finds that they were all impacted by errors. The most substantial error was the incorrect calculation of the modeling input for the

Bowen ratio, which is done through the AERMOD preprocessor AERSURFACE. Ameren attempted to process the surface data and calculate the Bowen Ratio on a monthly basis. The monthly approach Ameren attempted to implement is more representative of actual conditions than just assuming average moisture conditions on a yearly basis. However, there was a processing error in the implementation where the Bowen ratio lookup for a period of wet, dry, or average conditions was done incorrectly. This error caused the incorrect monthly Bowen ratios to be used for many hours in each month. This error can be graphically visualized by plotting the Bowen ratio for any given month in the AERMET surface file. An example is given below for the month of December 2015 from the Ameren 5/2/2016 modeling submittal.



The Bowen ratio should be a fixed value for this month (and other months) at a value equal to the moisture conditions that existed during this month (wet, dry, avg). As can be seen in the chart above, the Bowen ratios are not fixed for December 2015 and do not appear to be fixed in any other month in the Ameren meteorological surface datasets. Further, the processing approach Ameren used for the monthly moisture is likely not appropriate since there were periods where continuous monthly snow cover was assumed, which is not supported by the snow cover record Ameren provided. Ameren’s modeling also contained other errors such as incorrectly calculating the exit velocity when merging the stacks which impacted all 8 of the Ameren modeling submittals on 3/29/2016. This error was corrected for the modeling runs Ameren submitted on 5/2/2016.

Ameren commented that EPA must rely upon “reliable, supportable, representative, and inclusive” data. The 12 modeling runs provided by Ameren to support an attainment designation using the 2013-2015 emissions data do not meet EPA’s criteria for representative modeling to form our decision. Therefore, EPA cannot rely on these 12 modeling runs submitted by Ameren to designate the area as attainment, as suggested by Ameren.

Note the MDNR modeling runs are discussed in further detail elsewhere in the TSD but EPA generally agrees with Ameren’s comments that all the MDNR runs using fixed temperature and exit velocities are not as representative as using variable stack conditions.

***EPA Response to Ameren #5. Sierra Club modeling ACFM versus SCFM.***

The basis of our proposed nonattainment designation was not Sierra Club modeling as Ameren indicates. The basis for our proposed nonattainment designation was the modeling conducted by MDNR using default modeling options and 2012 – 2014 emissions data. The use of SCFM as a modeling input to determine exit velocity is not prohibited in EPA guidance, nor is it a fundamental error. We do agree with Ameren that ACFM, if calculated appropriately, is more representative in dispersion modeling to characterize actual impacts.

***EPA Response to Ameren #6. EPA ignores monitoring data and claims it is not quality assured in TSD.***

The basis for our statement in the initial TSD that the monitoring data Ameren has recently collected was not quality assured were statements made in MDNR's 2010 1-Hour Sulfur Dioxide Standard Area Boundary Recommendations, Adoption September 24, 2015 (see page 30). It is EPA's understanding that the 2015 data for the monitors surrounding Labadie have now been quality assured.

EPA acknowledges Ameren's and MDNR's efforts to install and operate monitoring around Labadie, including meteorology monitoring, and acknowledges that Ameren and MDNR have made these datasets available to EPA in a timely manner as the data becomes available and is quality assured. However, since the current monitoring dataset doesn't include the 3 years needed to calculate a design value to compare to the NAAQS and the fact that, as detailed above, the EPA's analysis of available information indicates that the new monitors are not located in an area where the expected maximum concentration occurs, the EPA cannot rely on the monitoring data generated by the new monitors in informing our final designation (see response to #1 and #2). The fact that EPA cannot rely on this data to inform our final designation does not mean that EPA is ignoring or not analyzing the data. We have performed extensive analysis of the monitoring data that we have been provided and will continue to do so for any monitoring data we receive in the future.

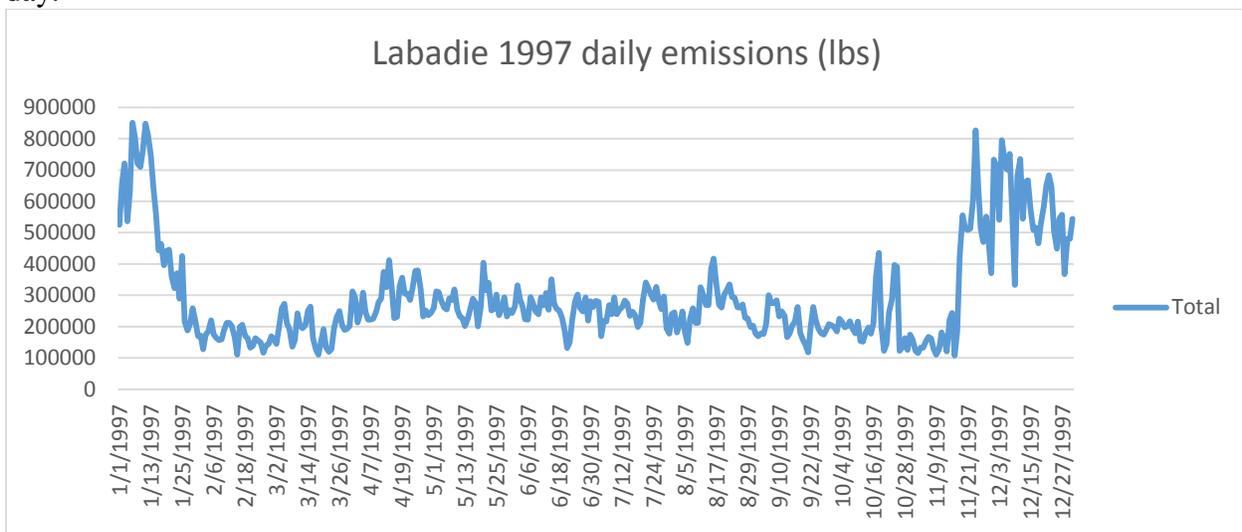
***EPA Response to Ameren #7. EPA analysis of historic monitoring and how it supports nonattainment.***

To be clear, EPA did not state in the TSD that the historic monitoring alone supports nonattainment. The EPA analyzed the historic monitoring data to determine the conditions that led to higher monitor concentrations in 1997, which was the last available full year of data collected at the historic SO<sub>2</sub> monitors around Labadie. EPA analyzed the historic monitored concentrations, available meteorology, and hourly emissions from Labadie. Based on this analysis, and as stated in the TSD, the EPA's position is that conditions still exist at Labadie today that could lead to exceedances of the NAAQS. Please note an exceedance of the 75 ppb NAAQS is not a violation, as violations are determined from the 99th percentile readings averaged over 3 years, or via representative modeling. Additional discussion of EPA's analysis is presented below. Ameren's contention EPA "cherry picked" a single data point is also not accurate. EPA included the 4th high day as one example to demonstrate our contention that the

conditions that led to higher monitored concentrations still exist today and could cause hourly monitored readings above 75 ppb, as these conditions have led to NAAQS exceedances in the past based on the available data record.

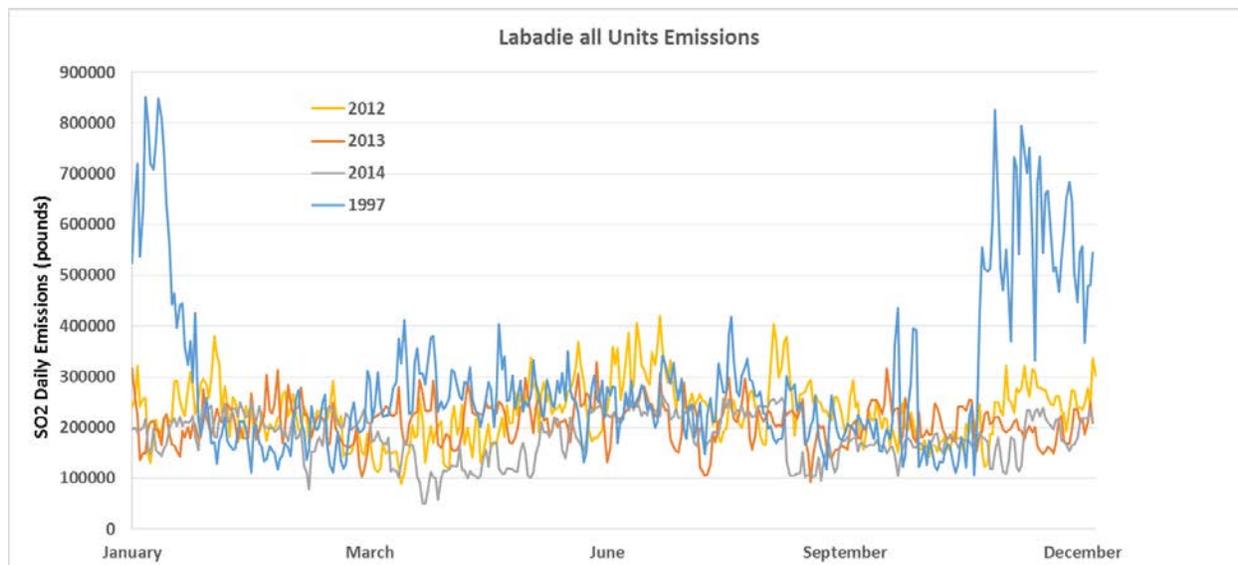
Ameren indicates they believe that there were periods in the historic monitoring data set that indicate attainment. Ameren also points out that significant reductions in annual SO<sub>2</sub> emissions have occurred at Labadie in recent years. EPA concurs that annual SO<sub>2</sub> emissions have been trending downward over the past several years. The emission reduction first appears to occur in 1997, around the time Ameren switched to burning a lower sulfur content coal. However, since the form of the SO<sub>2</sub> standard is hourly, EPA analyzed the hourly emission rates that caused historic high monitored values at the Augusta Quarry monitor to better understand conditions, both meteorological conditions and corresponding hourly emissions, which could have led to exceedances of the new hourly NAAQS in the past. EPA's analysis focused on the year 1997, where the Augusta Quarry monitor had a 4th high daily value of 80 ppb, with a maximum recorded value of 284 ppb. The year 1997 was chosen because the annual emissions in 1997 appear to best reflect current annual emissions, in that the annual emissions were the lowest of the years in which the historic monitoring was conducted, and it was the last historic monitoring year where a full year of monitoring data was available.

EPA has gathered the CEM data publically available from the Clean Air Markets website (<http://www2.epa.gov/airmarkets>) and evaluated the overall emission rates from the four Labadie units on a daily basis for calendar year 1997. SO<sub>2</sub> emissions ranged from 107,058 lbs per day to 850,911 lbs per day, with an average of 295,485 lbs/day or approximately 148 tons/day from the four units combined. Figure 9 below shows the range of daily emissions in 1997 in pounds per day.



**Figure 9. Daily emissions from the 4 Labadie Energy Center Units in 1997**

Figure 10 shows a comparison of the daily emissions from Labadie in 1997 to a more current 2012-2014 timeframe.



**Figure 10. Daily summary of emissions from Labadie for 1997 and 2012-2014.**

For the months of February – October, daily emissions in 1997 appear similar in magnitude to the daily emissions occurring from 2012 -2014. Emission were higher in January, November, and December of 1997 when compared to the same months from 2012 – 2014, with daily SO<sub>2</sub> emissions ranging between 400,000 to 850,000 lbs. Labadie did not emit more than 410,000 lbs of SO<sub>2</sub> on any day in 2012 – 2014.

In 1997, there were four days in which one or more hours exceeded the 75 ppb standard: 10/18, 01/14, 12/07, 03/16. Exceedances on 01/14 and 12/07 occurred on days with large daily emission outputs. The highest 1997 exceedance on 10/18 occurred with a daily emissions of ~400,000 lbs. For comparison, the recent year 2012 does have days with daily emissions at ~400,000 lbs. The 3/16 monitored exceedance occurred on days where the SO<sub>2</sub> emissions are in a similar range or below what are seen in the 2012 -2014 timeframe. Further analysis of the four individual days are provided in the following section.

For the following analysis, EPA gathered data from public sources. EPA gathered CEM data for the Labadie units through EPA Clean Air Markets (<http://www2.epa.gov/airmarkets>). EPA gathered monitoring data and meteorology data from the EPA AQS system (<http://www3.epa.gov/airdata>). Further, EPA relied on meteorology data from the NWS for Jefferson City Airport. In the windrose analysis, for each day EPA has included a windrose from both the Jefferson City NWS site, which is the surface location used in the MDNR modeling, and also onsite meteorological data collected at the Augusta Quarry site and reported to the EPA AQS system.

#### ***10/18/1997 – 284 ppb maximum 1-hr concentration***

Labadie only operated Units 2 and 4 on 10/18. The majority of the SO<sub>2</sub> emissions were from Unit 2 on this day. Emissions averaged 18,166 lbs/hr during this day. The Augusta Quarry site monitored 5 consecutive hours of high SO<sub>2</sub> on this day starting at noon and ending at 4pm. On that day, winds were light from the ESE. The Augusta Quarry site measured a 1 hour peak of 284

ppb which is approximately 3.79 times 75 ppb. This indicates that, under these meteorological conditions occurring on this day, an hourly emission rate from Labadie units of  $18,166/3.79 = 4,797$  lbs/hr would have resulted in a 75 ppb monitored value at the Augusta Quarry site.

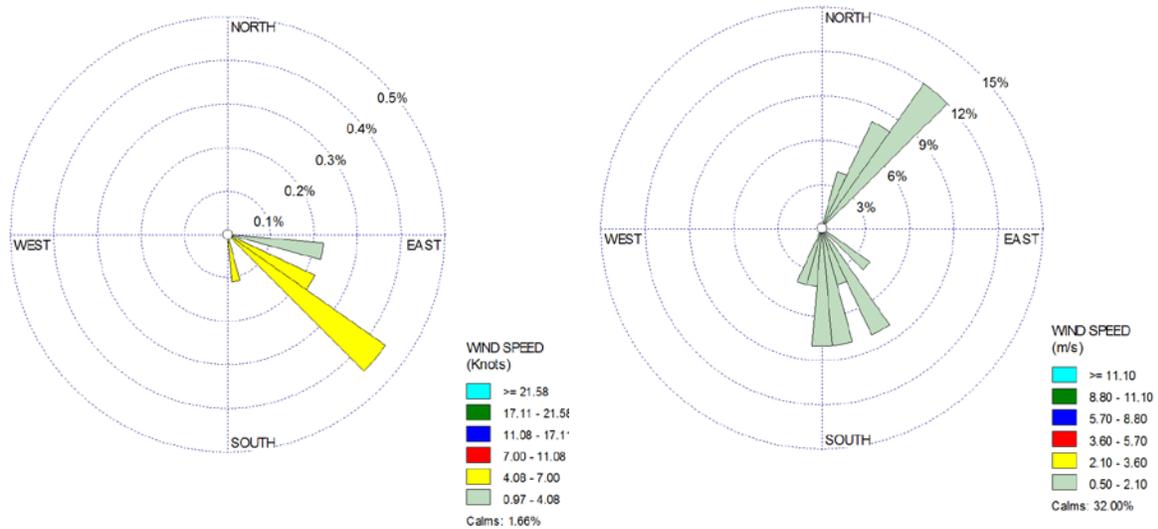
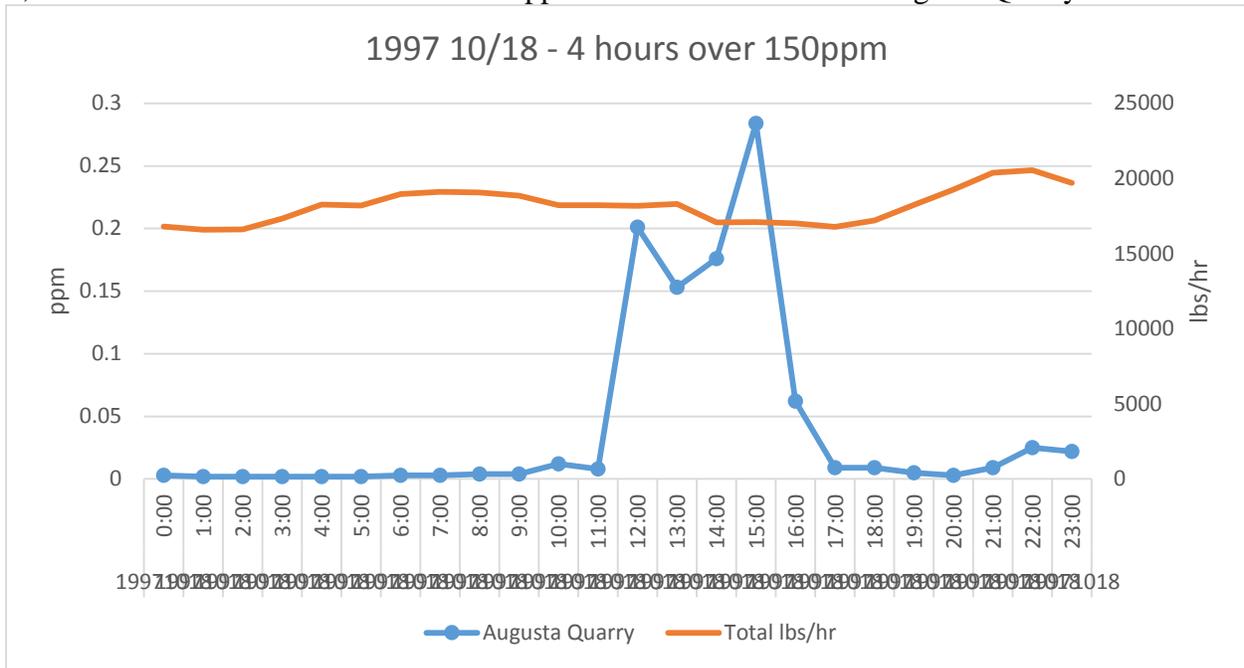
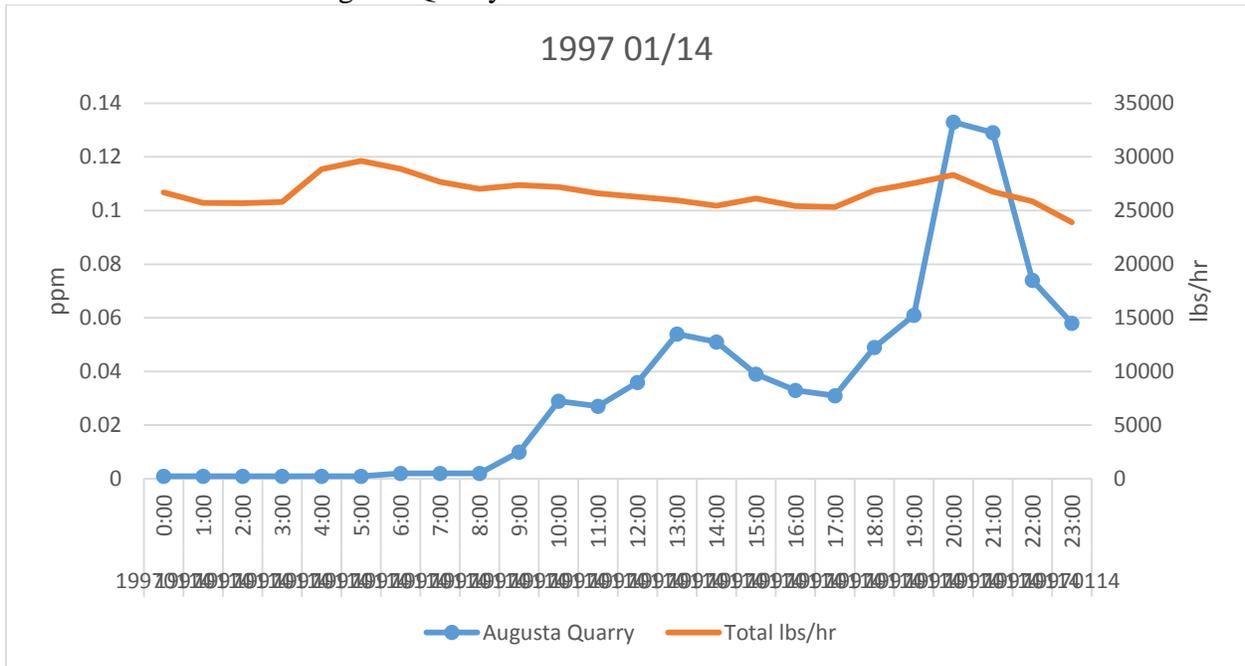


Figure 11 Hourly emissions, monitor concentration and windrose on 10/18/1997

**01/14/1997 – 133 ppb maximum 1-hr concentration**

Labadie operated all 4 units on this day with the majority of emissions coming from units 3 and 4. Overall emissions averaged 26,697 lbs/hr throughout this day. The hourly emission rates were fairly constant. High SO<sub>2</sub> concentrations were measured during evening hours, i.e., 8-9pm, but elevated levels were measured starting at around 10 am on this day. Winds were from the ESE during most hours during this day according to the NWS dataset while the onsite data shows fairly calm winds from varying directions, but from the south during the hours with peak concentrations. The 1 hour peak on this day was 133 ppb, which is approximately 1.77 times 75 ppb. This indicates that, under these meteorological conditions on this day, an hourly emission rate from Labadie units of  $26,697/1.77 = 15,055$  lbs/hr would have resulted in a 75 ppb monitored value at the Augusta Quarry site.



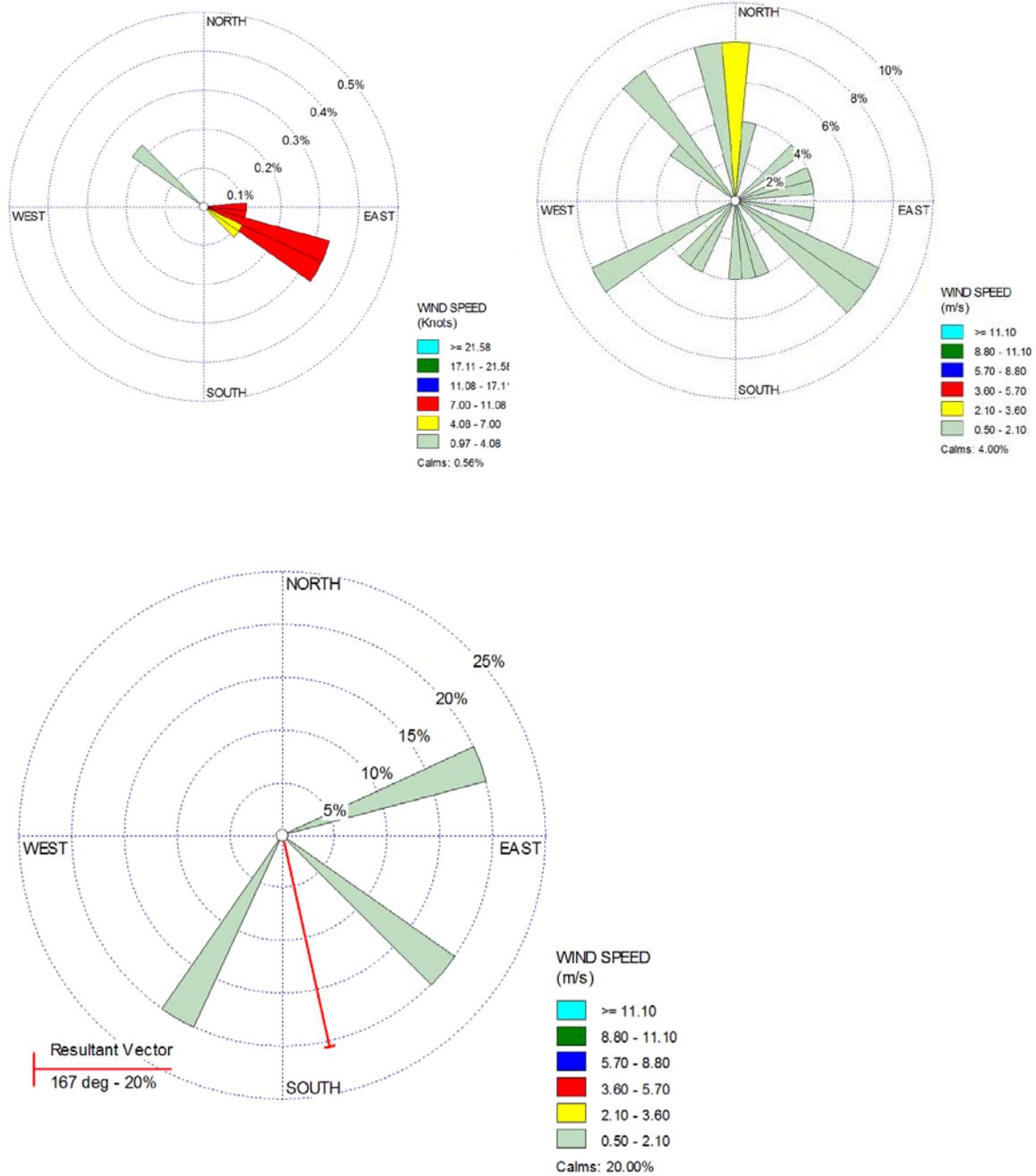


Figure 12. Hourly emissions, monitor concentration and windrose on 1/14/1997.

**12/07/1997 – 88 ppb 1-hr maximum concentration**

Labadie operated all 4 units on this day with the majority of emissions coming from units 1 and 2. Overall emissions averaged 31,295 lbs/hr throughout this day and hourly emission rates

increased into the evening hours. High readings were measured during morning hours, peaking at 11am, but elevated levels were measured starting at around 10am on this day. Winds were predominantly from the NW and from the ESE during this day according to the NWS site. The onsite meteorological data shows more variability with light winds throughout the day. The 1 hour peak on this day was 88 ppb, which is approximately 1.17 times 75 ppb. This indicates that, under these meteorological conditions on this day, an hourly emission rate from Labadie units of  $31295/1.17 = 26,671$  lbs/hr would have resulted in a 75 ppb monitored value at the Augusta Quarry site.

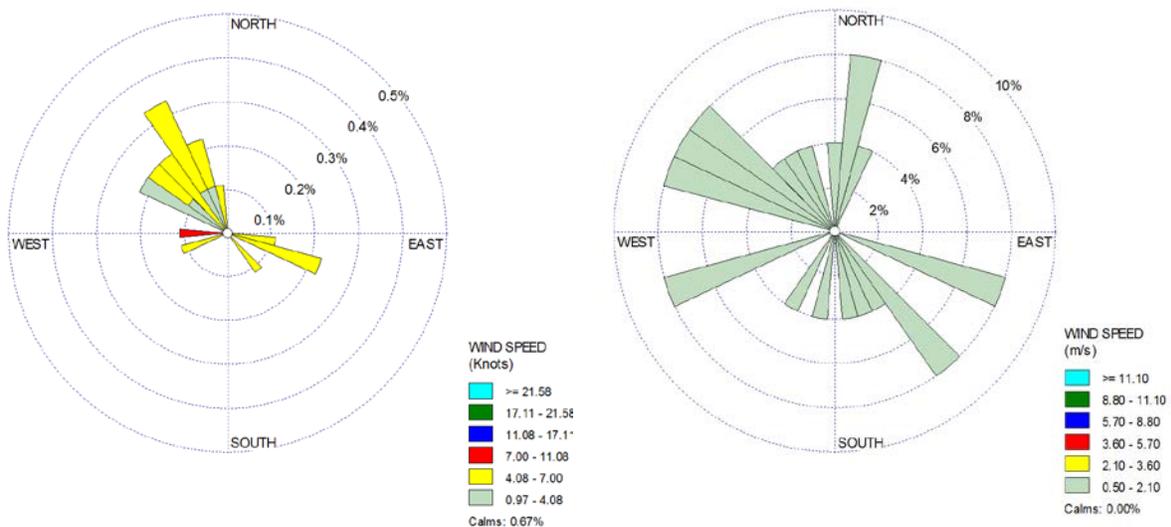
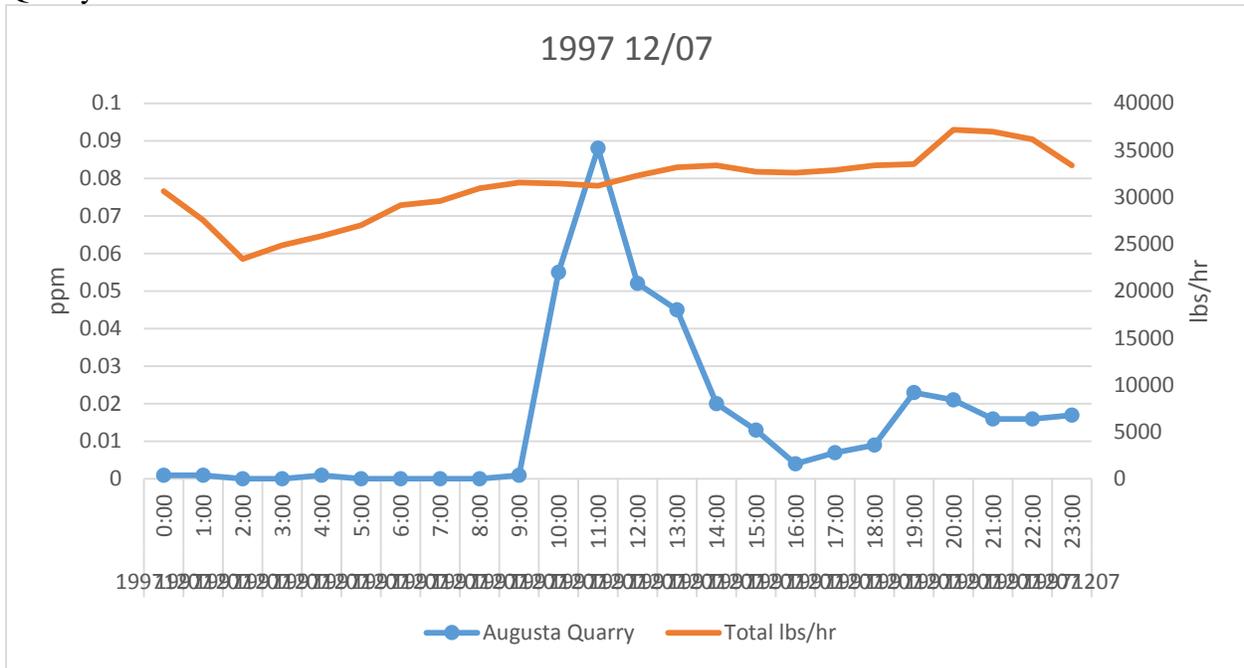
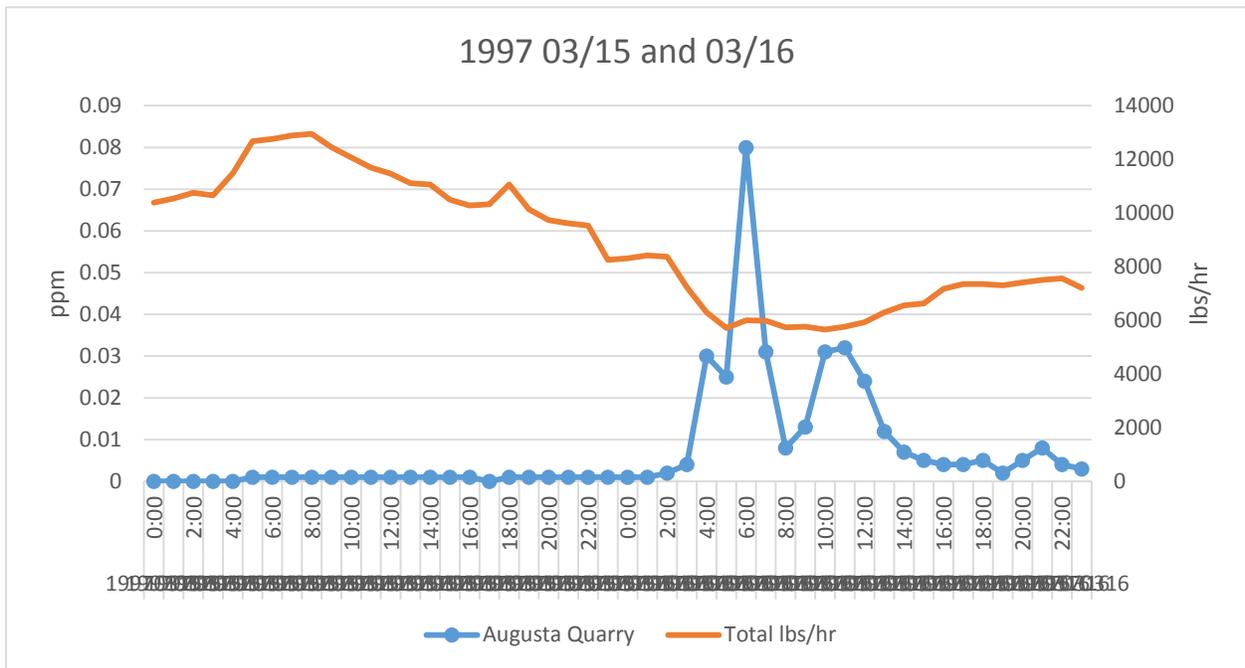


Figure 13. Hourly emissions, monitor concentration and windrose on 12/7/1997

**03/16/1997 – 80 ppb 1-hr maximum concentration**

Labadie operated all 4 units on this day, with the 4th unit operating only in the early morning hours. The majority of the emissions came from units 1 and 2 on this day. Overall emissions averaged 6,813 lbs/hr throughout this day, which was fairly low for days in 1997. High readings were measured during morning hours, i.e., 6 am, but elevated levels were measured starting at around 4 am on this day. Winds were from the SSE during this day at both the NWS and onsite meteorological stations. Because the peak monitored value occurred in the earlier morning hours, EPA also looked at emissions from the prior day on 3/15/1997, where the average emission rate was a bit higher, averaging 11,016 lbs/hr. However, 10 hours preceding the monitored exceedance the average hourly rate is 8,149 lbs/hr. The highest measured 1-hour SO<sub>2</sub> concentration on this day was 80 ppb, which is approximately 1.07 times 75 ppb. This indicates that, under these meteorological conditions on this day, an hourly emission rate from Labadie units of  $6,813/1.07 = 6,387$  lbs/hr would have resulted in a 75 ppb monitored value at the Augusta Quarry site.



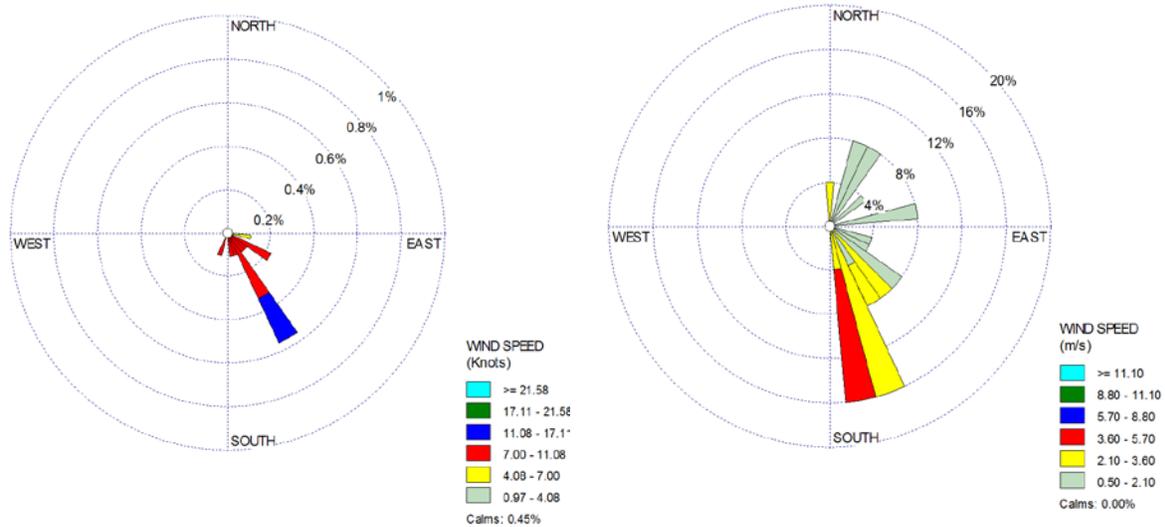


Figure 14. Hourly emissions, monitor concentration and windrose on 3/16/1997

From this analysis, EPA has observed that the Augusta Quarry monitor in 1997 likely is recording values from the plume from a nearby source, as for all individual days analyzed, the monitor records very low hourly concentration values and then records a spike in concentrations for a few hours and returns to a low value again. Given the proximity of Labadie, and the wind direction during monitored spikes, it is likely that Labadie Energy Center emissions are the cause of elevated monitored values in 1997.

An analysis of emissions during the four historic days in 1997 where measured concentrations were above the 2010 1-hour primary NAAQS of 75 ppb indicates that both high and low hourly emission rates can cause elevated hourly measured concentrations. This analysis indicates meteorology has a large impact on the concentrations recorded by the monitor and appears to be just as important as the hourly emission rates in the probability of high monitored values in this case. In fact, high hourly emissions don't necessarily lead to high monitored concentrations at any given hour, which is expected given the height of the Labadie stacks. It is also clear that on all four exceedance days where there were elevated hourly impacts, winds were from a direction that would indicate the Labadie emissions were being measured at the Augusta Quarry monitor. It is also evident that even at modest hourly emission rates, at least modest under current operations at Labadie, exceedances of the NAAQS can occur. For example, on 3/16/1997, the average hourly rate from all four units was 6,813 lbs/hr, which equates to less than 30,000 tons/yr if this emission rate is assumed for all hours during a year. This actual emission rate caused a monitored hourly exceedance of 80 ppb in 1997. As seen in Figure 15, 81% of the days from the 2012 – 2014 period have average daily hourly rates from all Labadie units greater than the 6,813 lbs/hr, so the probability is high that there are many hours where emission rates are high enough that exceedances could still occur around the Augusta Quarry site. In fact, we see evidence that an hourly emission rate as low as 4,797 lbs/hr can cause a monitored value above 75 ppb at the Augusta Quarry site. During 2012-2014 there were 24,880 hours with a total

emissions at or greater than this 4,797 lbs, which represents over 94.5% of all hours in 2012-2014.

Given that the local meteorological conditions and terrain are unlikely to have significantly changed since 1997, the SO<sub>2</sub> emissions emitted from Labadie in 2012 -2015 would be capable of contributing to exceedances of the 75 ppb NAAQS in the vicinity of the historic monitors. When you look further at the other days that show historic exceedances and calculate the average hourly rate that would have caused a 75 ppb monitored value, we see two additional days where the average hourly emissions fall within the current actual average hourly emission rates. These days are 10/18/1997 with 4,797 lbs/hr and 1/14/1997 with 15,055 lbs/hr. Based on this analysis, current hourly emission rates being emitted at Labadie are equivalent to the emission rates that were being emitted during days in 1997 where the monitor recorded a value greater than the NAAQS. Therefore, there is a possibility, based on this analysis alone, that values greater than the NAAQS could be recorded today at the Augusta Quarry site if a monitor at that site or similar site was still in operation.

EPA also notes MDNR's latest SO<sub>2</sub> rule, 10 CSR 10-6.261, currently allows Labadie to emit 40,837 lbs/hr using a 24 hour block average which is well above the rates that caused historic monitored exceedances. Nothing in the operational history or enforceable agreement/permit would indicate Labadie emission rates will continue to decrease or even stay at current levels. In fact, Labadie's annual emissions have varied from under 40,000 tons in 1999 and 2000 to over 60,000 tons in 2009 and 2010.

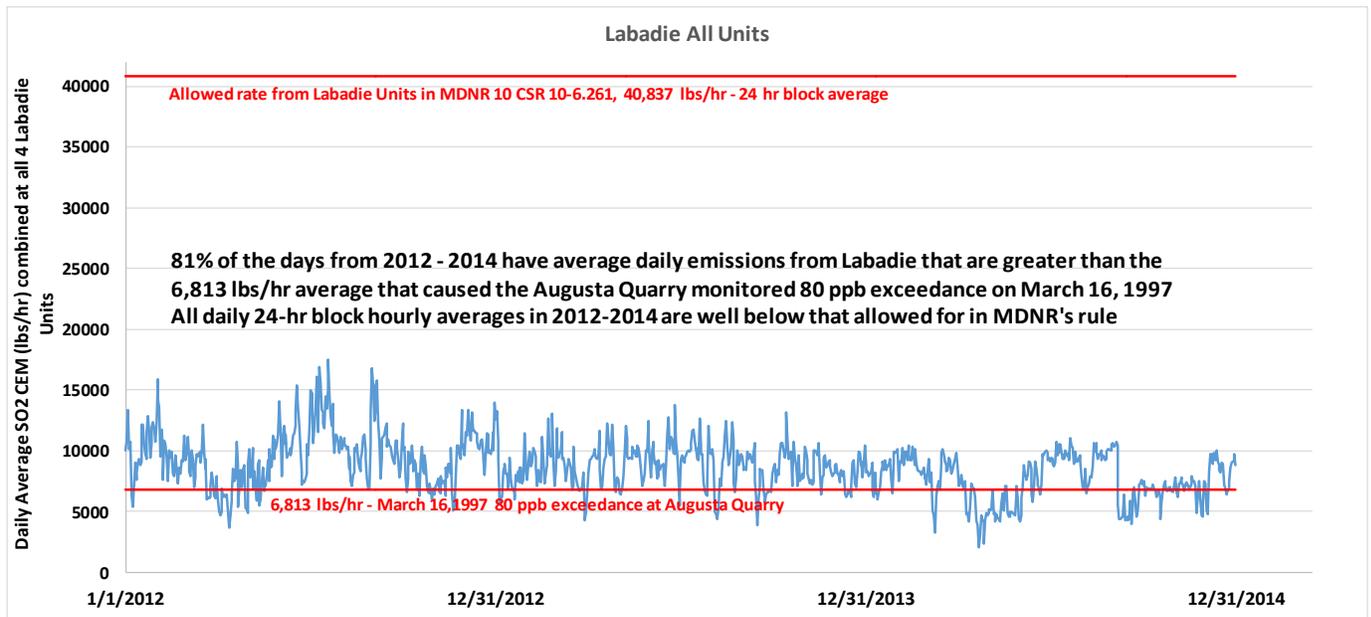


Figure 15. Daily average hourly emissions (lbs/hr) at Labadie.

Although the EPA's view was that the historic monitoring performed at the two Augusta sites near Labadie supported our proposed nonattainment designation for the area near Labadie, it was not the basis of this proposed designation. All evidence indicates the hourly emissions from the

four Labadie units that appear to have caused NAAQS exceedances at the historic Augusta Quarry monitor in the past, exist today based on the most recent CEM data. The historic monitor analysis indicates meteorological conditions are just as significant in impacting the SO<sub>2</sub> concentrations as the hourly emission rates, since moderate hourly emission rates in 1997 resulted in a monitor reading above the NAAQS. The analysis indicates emissions from Labadie are currently at levels that could result in exceedances above the NAAQS at the historic monitor location. This stresses the importance of having a monitor(s) sited in both the correct terrain and wind direction to reflect the predominant wind and dispersion conditions, where exceedances in the area surrounding Labadie might occur. We also note that MDNR's latest SO<sub>2</sub> rule, 10 CSR 10-6.261, currently allows Labadie to emit 40,837 lbs/hr using a 24 hour block average. On all four days in 1997 where the monitored exceedances occurred at the Augusta Quarry the actual 24 hour block average on these days were well below this 40,837 lbs/hr allowed for in 10 CSR 10-6.261.

EPA notes, however, that due to the lack of a monitor currently located at or near the Augusta Quarry site, this historic monitoring does not provide EPA a clear basis to determine whether the area meets or does not meet the 2010 SO<sub>2</sub> NAAQS based on all currently available information.

***EPA Response to Ameren #8. EPA's justification for modeling separate stacks for Units #3 and #4.***

EPA relied upon no modeling performed by the agency itself to form our proposed designation recommendation of nonattainment as Ameren alludes to in this comment. EPA relied upon modeling and other analysis submitted to the agency by the state and other parties, including Ameren. EPA did note in the February 16, 2016, TSD that additional justification for combining stacks in modeling would likely be needed. This additional justification included the calculation methodology and supporting data to do such stack merging calculations, along with the justification of merging the stacks in the model.

At the time EPA analyzed and authored the proposed nonattainment designation recommendation the agency did not have this data (i.e. the calculations or underlying data) to review or the justification for merging available, thus the February 16, 2016, TSD statement that additional justification would be required for merging of stacks. EPA has and will continue to use data that is most representative for decision making including data used to verify merged modeling of Labadie Units 3 and 4.

We do agree with Ameren that Units 3 and 4 are physically in a dual flue stack configuration and, provided that the merging calculations are performed correctly and data is available, that merging the plumes within the modeling for designations purposes is likely reasonable and most representative of Labadie's configuration. Again, as discussed above during EPA's initial authoring of the TSD, EPA did not have the actual calculations supporting the merging. We do believe at this point that Ameren has supplied the justification to merge stacks in the modeling and, provided the merging calculations are performed correctly for emissions, temperature, and exit velocities and these calculations are well documented, agrees that any modeling merging stacks can be considered in forming a designation.

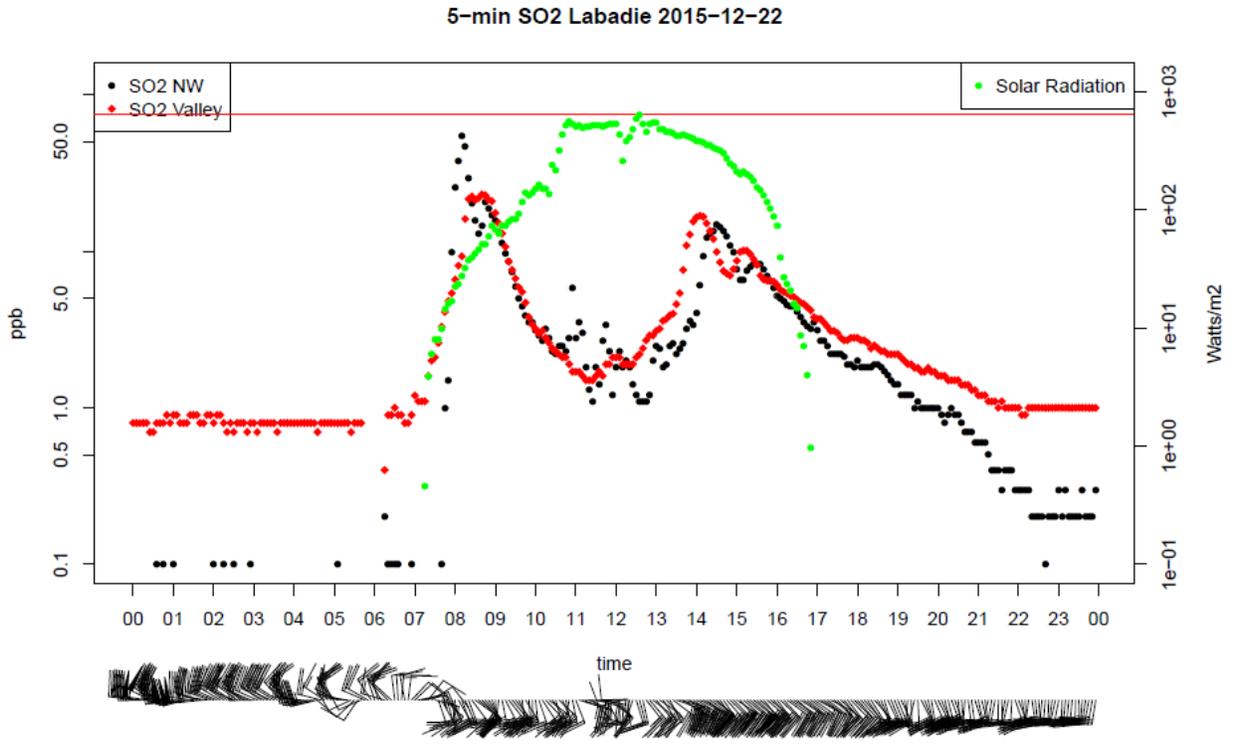
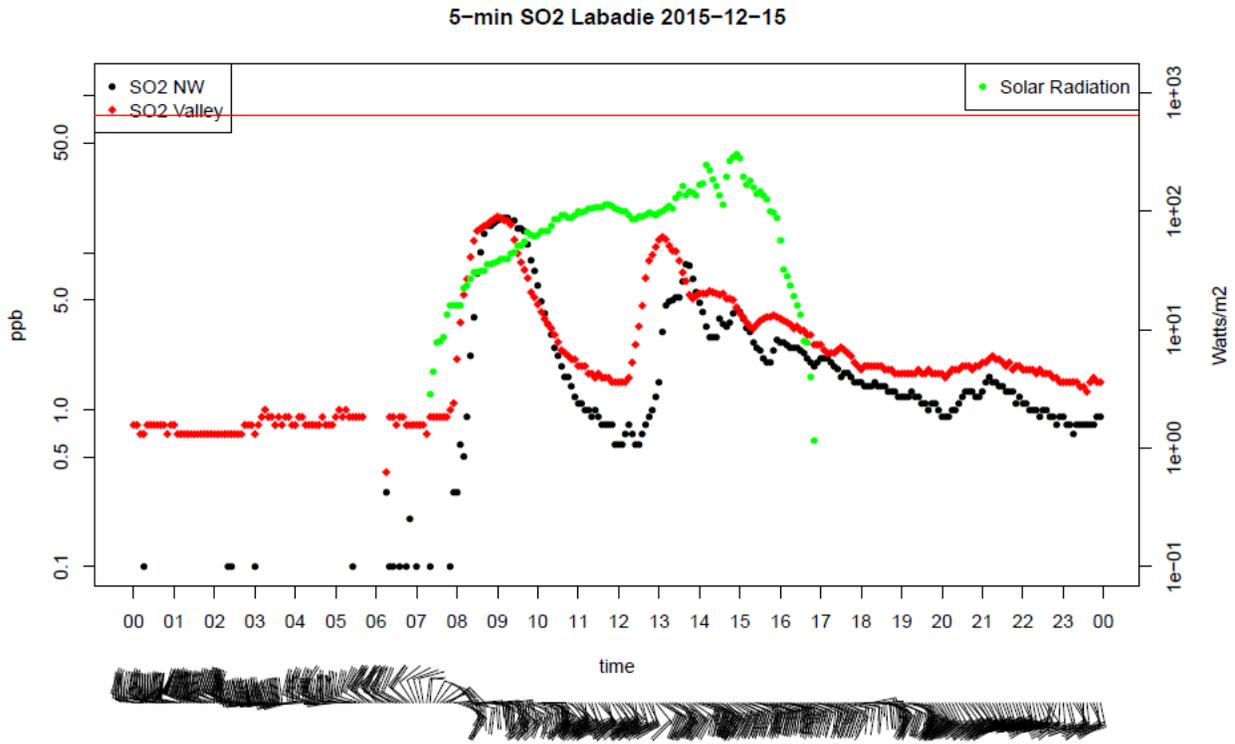
***EPA Response to Ameren #9. EPA's justification of relying on background data from East St. Louis.***

EPA did not select the monitor to use for a background site. MDNR selected this background monitor and EPA worked with and agrees with MDNR's approach to exclude sectors or periods where the monitor was picking up impacts not representative of Labadie. MDNR provided their technical analysis supporting this background value and site and EPA accepted the background value the state used as representative.

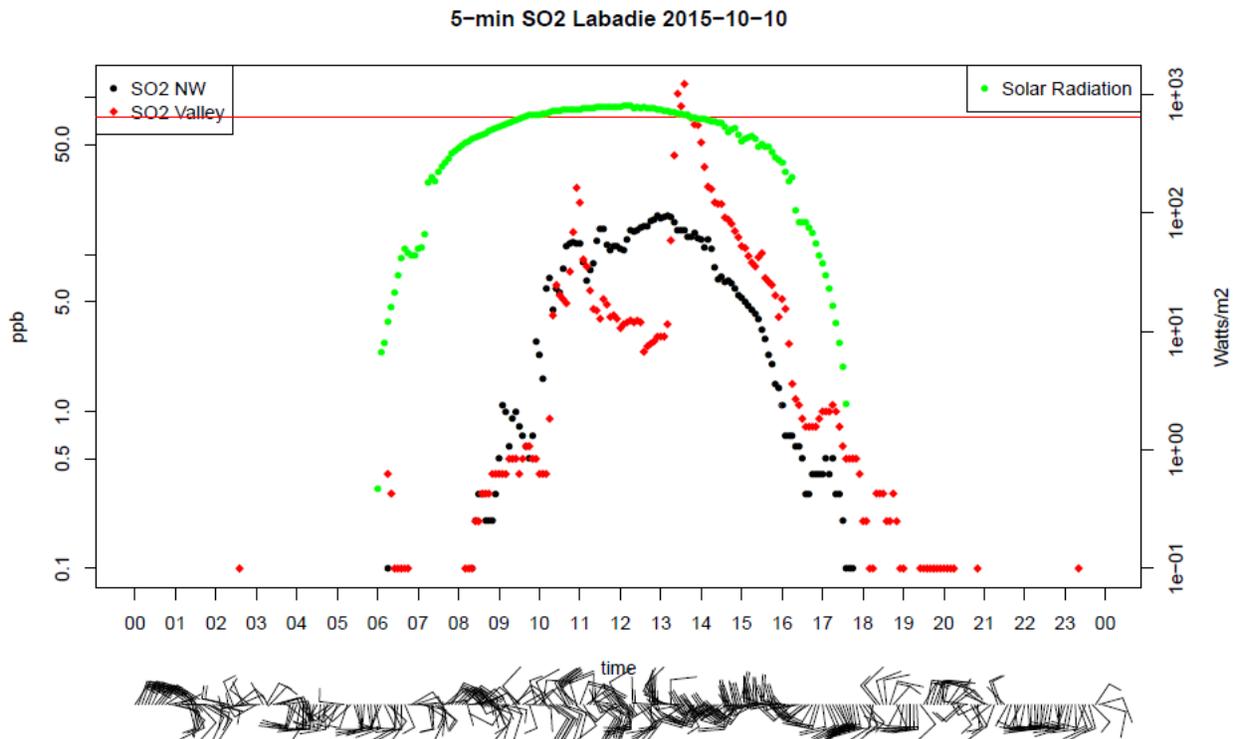
Ameren currently contends that a seasonal, hourly background value from Nilwood, IL, is an appropriate background value, while MDNR in their initial recommendation chose an annual background value from a different monitor. In addition to the Nilwood recommendation, Ameren in a March 2016 submittal to EPA, performed a background analysis using the monitored data from the NW and Valley monitors. In this analysis Ameren excluded certain sectors with wind blowing to the respective monitors and calculated the hourly background at the 99th percentile from the remaining dataset. In reviewing this analysis EPA notes that some of the highest readings in remaining hours not excluded were also the highest recorded at those monitors. In other words the highest hourly readings don't reflect winds from the known Labadie location. The Ameren analysis indicate a fixed background of 4-5 ppb (10.5-13.1 ug/m<sup>3</sup>), higher than many hours in the Nilwood dataset where the average hourly value is 7.7 ug/m<sup>3</sup>. We note the Ameren analysis was missing January, February, March, and much of April when higher readings at Nilwood occur (i.e. winter and spring).

While it is likely that Labadie is the sole cause of the highest monitor readings, this background analysis by Ameren and EPA also indicates that recirculation of the Labadie plume(s) likely leads to the highest impacts, and the winds aren't always in the direction from Labadie during those highest monitor hours. Because of this wind direction issue, EPA chose to focus on an analysis of the 5-minute monitoring and meteorological data collected during the 4/22-12/31, 2015 period. While still not an entire year with all seasons represented, it is still useful data collected concurrently around Labadie.

The plots below depict 5 minute monitored SO<sub>2</sub> concentrations (red and black dots) with green dots representing measured incoming solar radiation and were created by EPA based on Ameren data. The plots below demonstrate that there are periods where a well-mixed plume appear to impact both monitors concurrently. These events of both monitors being impacted at the same time can occur over multiple hours at varying times during a 24-hour period. The plots for 12/15/2015 and 12/22/2015 are provided below. These plots show that the 5-minute data is well correlated between the monitors during the day. The 5-minute recorded wind directions with windbarbs below the plots indicate that these correlated monitored concentrations are not from direct Labadie emissions. They appear to be from a plume recirculation, or possibly another source. The concern in these situations is that when these well mixed concentrations that occur over a large area, at least a 6km wide area, are added to new emissions, this situation can cause greater impacts that occur where there is no monitor recording them, and clearly the background concentrations are large under these recirculation situations, larger than Nilwood, IL, background values Ameren asserts are appropriate.

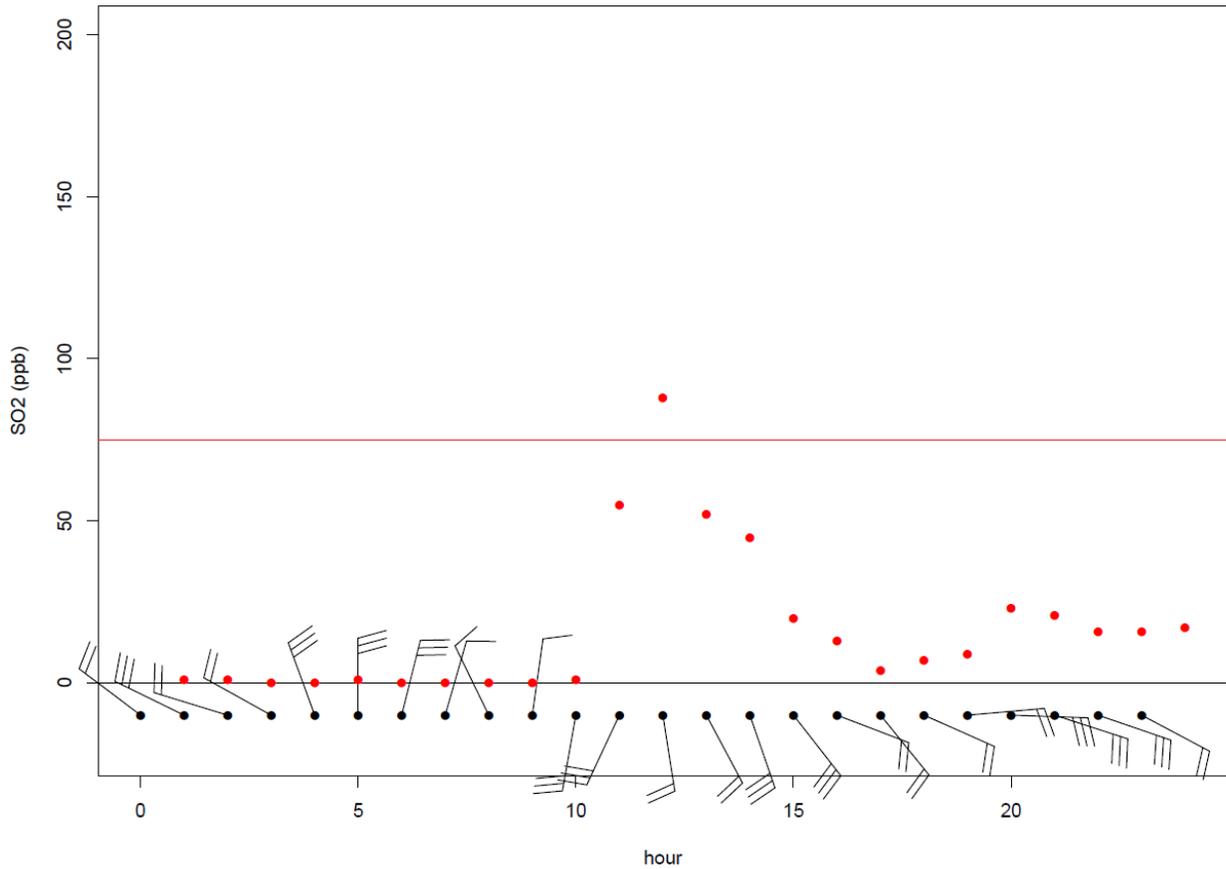


Because these recirculation events or distant source impacts can be multi-hour in duration, and don't reflect direct Labadie emission impacts, AERMOD would not capture these impacts except in a background value. In other words, these likely recirculation events would need to be represented as background within AERMOD, as AERMOD is an hourly steady state model. In fact, during one of the highest hourly recorded events at the Valley location it appears that the background during this period is likely above that assumed from Nilwood or East St. Louis. This is based on the fact that both the NW and Valley sites see elevated concurrent concentrations during hours 13-14, while the Valley site greatly exceeds the NW monitor after the wind shifts blowing the direct plume from Labadie to the Valley site and it appears that both the direct and recirculated plume are impacting the Valley site concurrently, leading to much higher concentrations.



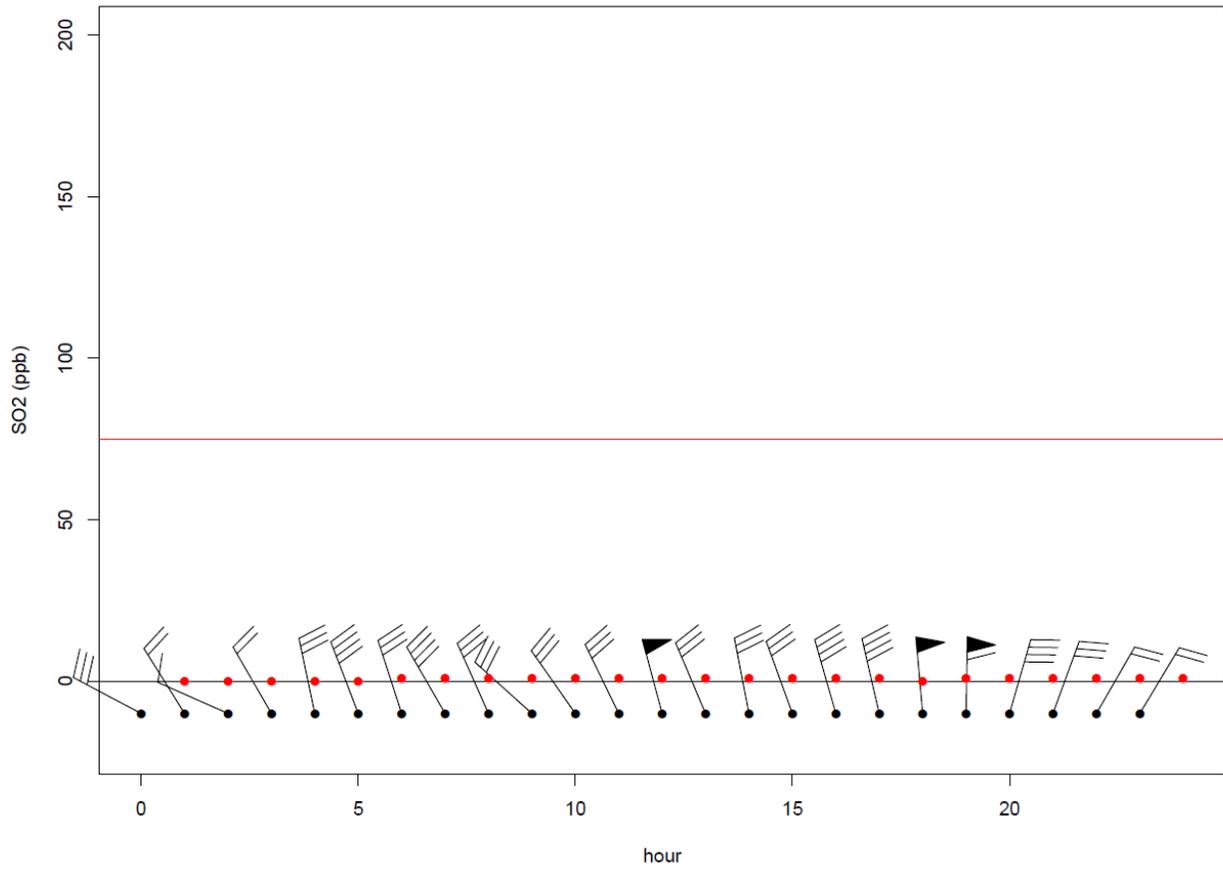
The likely recirculation event described above also appears to be what was happening from an EPA analysis of the historic 1997 data. While the area did not have the 5-minute monitor frequency or a second monitor in 1997, there is the onsite meteorological data where the same wind shifts are observed during some high monitored events. As an example, take the 12/7/1997 period where winds are from the north in the early morning hours and then the winds shift from the south and the monitor experiences the elevated plume from what appear to be both recirculation and likely some direct impacts. Note that this monitor was much better positioned to see direct impacts being at a higher elevation and in better alignment with predominant wind directions.

Labadie Augusta Quarry 19971207

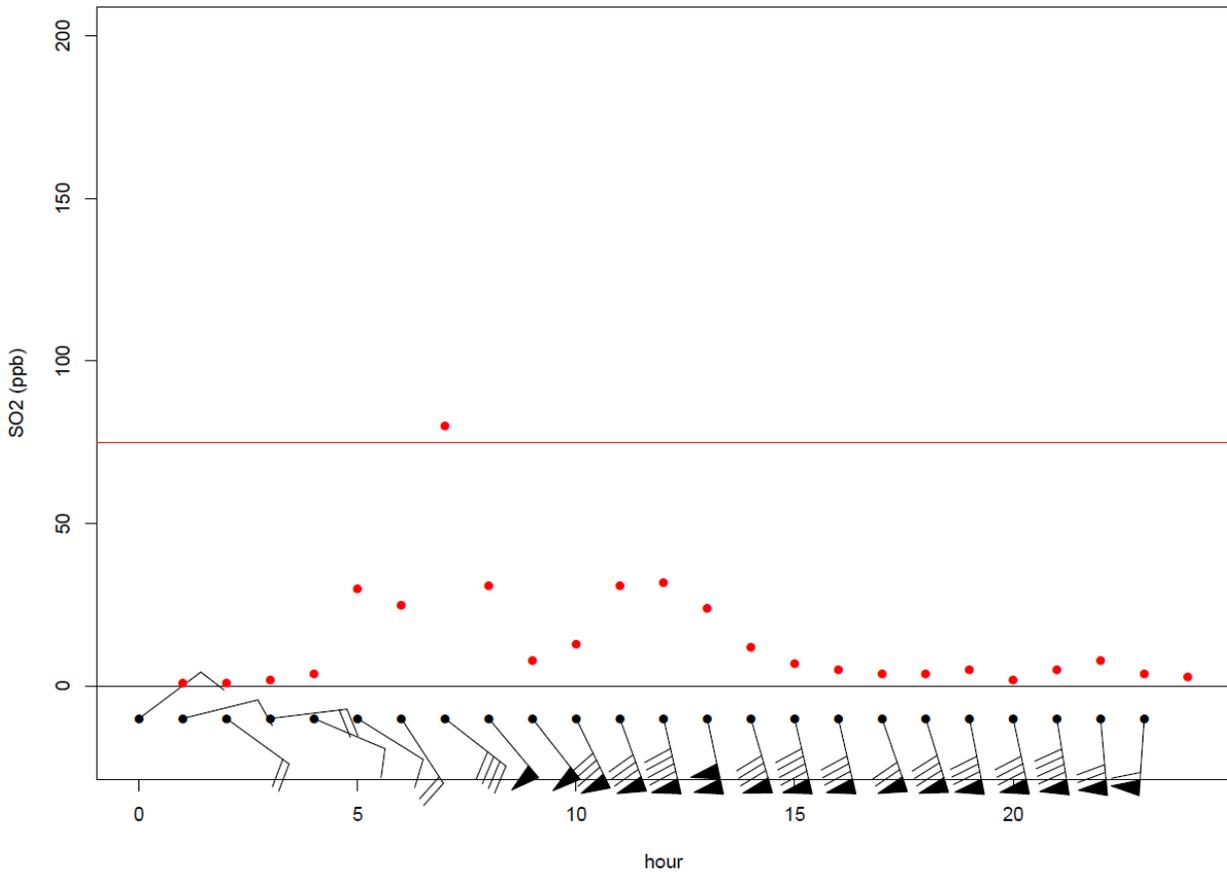


The 3/15-16, 1997 is another example of a likely recirculation event where the plume appears to be advected back into the vicinity of the monitor after being transported to the south for multiple hours before the monitored exceedance on 3/16/1997. This is another example of where a Nilwood background value would potentially be too low and an inaccurate assumption.

Labadie Augusta Quarry 19970315



Labadie Augusta Quarry 19970316



While the analysis of the current onsite monitor dataset does indicate there are periods where a background of 9 ppb is too high, the data also indicate that there are periods where the Nilwood, IL, seasonal by hour backgrounds values are too low. Given the designation decision relies upon peak modeled impacts, and these peak modeling impacts may have plume recirculation that a steady-state model could not predict, EPA believes a fixed background between 4-9 ppb is reasonable. EPA also finds numerous periods where there are clearly no hourly background impacts, however the purpose of the background value is to capture those conditions leading to peak concentrations using a steady state dispersion model. Given this information and further analysis discussed above, EPA finds that the 9 ppb recommendation from MDNR is reasonable, and it is supportable both in the MDNR analysis and further analysis EPA performed here, i.e. there are periods where 9 ppb is seen at both the current monitors concurrently indicating these are indirect or background events not explicitly modeled. EPA does note that a 9 ppb background would likely not be appropriate to use if investigating AERMOD model performance for all hours, especially at lower modeling impacts during all periods, or at monitors not sited in areas of peak expected concentrations. In the beta option analysis the data indicate a value greater than 4ppb is needed to reduce all under predictions at the peak concentrations, and 9ppb at these peak predictions is not unreasonable.

***Response to Ameren #10 and #12. Status of Ameren's beta option request with EPA and over prediction of the model without beta options and the penetrated plume issue.***

As outlined in the February 16, 2016, TSD, approval of a beta option request can be performed under several scenarios including a peer reviewed option, where that option applies to Labadie, or a site specific study where Ameren demonstrates that an alternative model has superior performance based on a comparison to representative site specific data. Ameren is pursuing two beta option approval tracks asserting that both LOWWIND3 and ADJ\_U\* have been peer reviewed and apply in the tall stack Labadie case, and using a separate site specific analysis, with site specific modeling data submitted to EPA Region 7 on 3/17/2016.

While we do agree the ADJ\_U\* has been peer reviewed, the LOWWIND3 option has not met the criteria of scientific peer review consistent with Section 3.2.2.(e)(i) of Appendix W at the time of authoring this document. Ameren in their comments, and more specifically AECOM, point to a peer reviewed article where LOWWIND2 was analyzed with a follow-up submittal analyzing LOWWIND3. The addition of the supplemental study to the peer reviewed article does not make the supplemental peer reviewed, nor does it suggest that the study applies in the case of Labadie.

For the site specific demonstration, Ameren has included the latest modeling they have performed using the April 22nd, 2015 – December 31, 2015 data. In this study they have both the monitoring data at two sites, NW and Valley, along with the CEMS emissions from the Labadie stacks and use a 4 ppb background value. Also available is onsite meteorology at the Valley location.

In the most recent onsite data submittal AECOM is using a performance technique that relies only upon the daily maximum modeled and monitored pairs. EPA does not agree with using only the maximum daily statistic as EPA guidance (Protocol for Determining the Best Performing Model, September 1992) suggests using all hours in the modeling analysis for Q-Q plots and all hours for other statistical metrics such as the Robust Highest Concentration (RHC). EPA finds that the most representative on-site model run is the one using the onsite meteorological data collected at the Valley location.

Figure 9 in the AMEREN Exhibit #2 report, shown below, compares the modeled and monitored values for 3 runs – default runs using both combined and uncombined stacks at units 3 and 4, and a LOWWIND3 run with uncombined stacks. These runs are the most representative of actual conditions around Labadie as they utilize the onsite data being collected at the Valley site. As seen in the figure, using maximum daily values for the partial year of 2015, the two default runs appear to have quite different performance at the Valley site, with the individual stack runs over-predicting while combining the stacks seems to result in under-predictions, especially at the higher concentrations. In focusing on the 99th percentile value in Figure 9, it would appear that the default settings with no merging of stacks performs best, lying directly on the 1-1 line. Note that EPA has produced Q-Q plots displaying the hourly values, rather than just the maximum daily values further below.

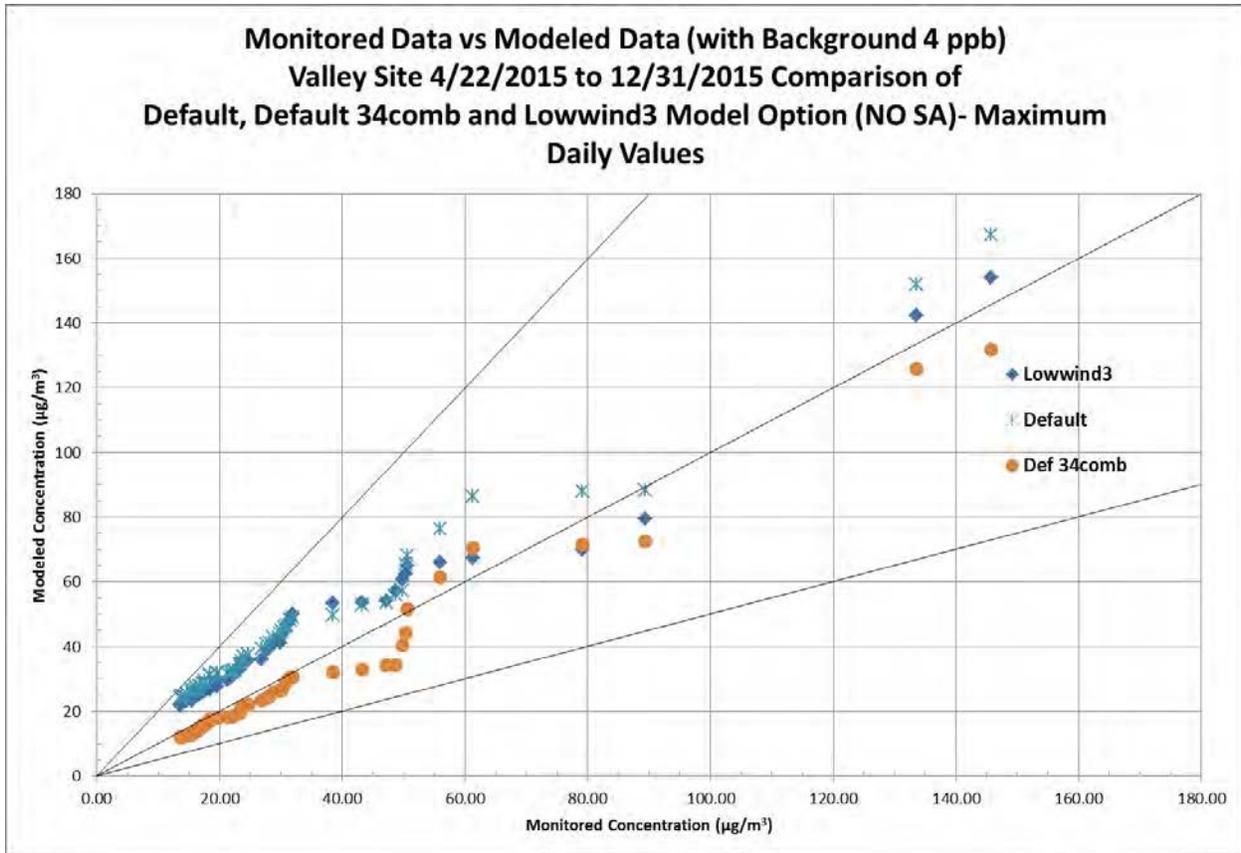
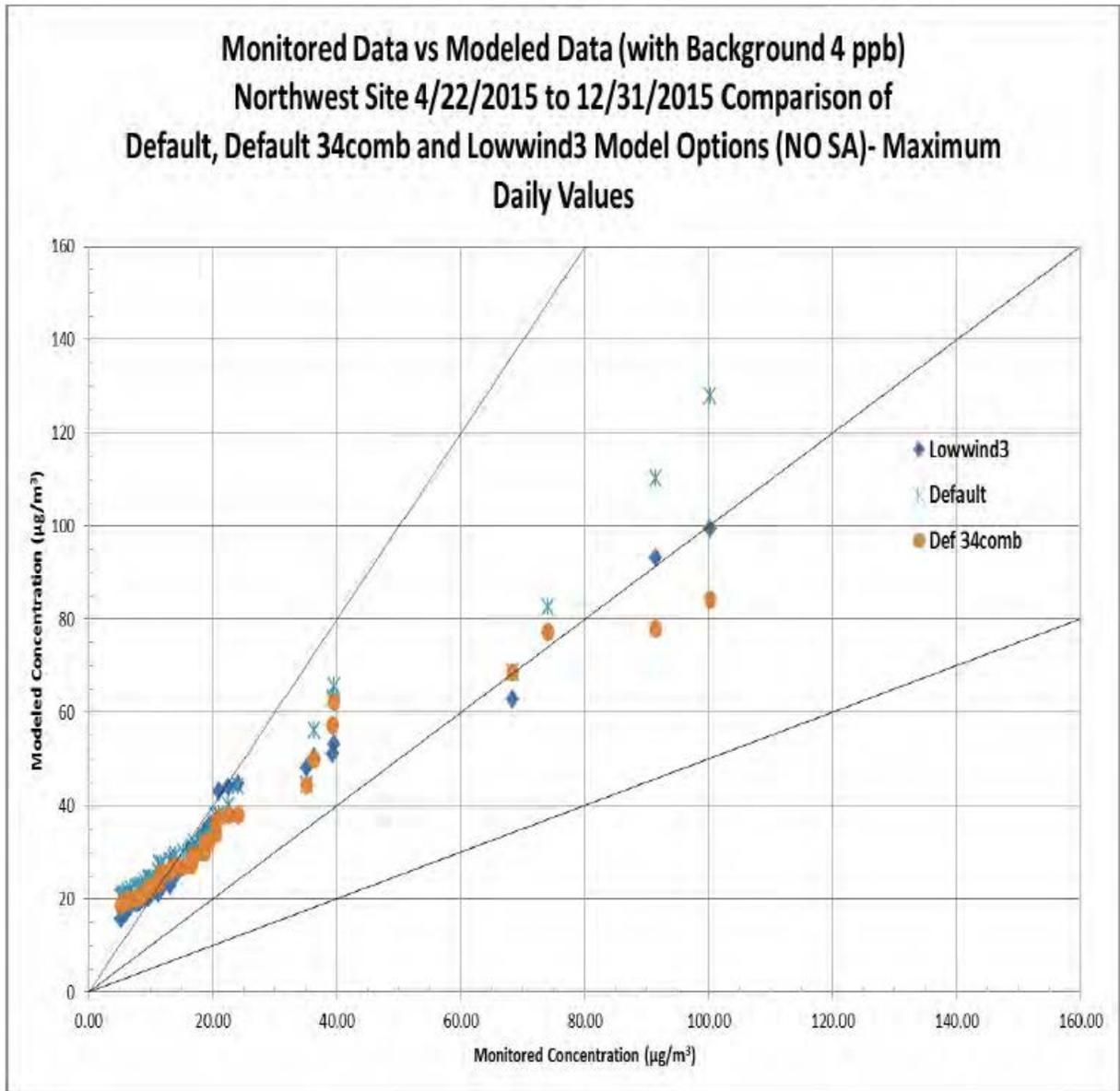


Figure 5, from the same Ameren Exhibit #2, provides the NW monitor performance again with the onsite meteorological data. As seen in Ameren’s Figure 5, combining the plumes seems to result in under-predictions at the NW site using the maximum daily values only at the higher end of the distribution. At the 99th percentile it appears all three models are performing about the same showing slight over-predictions. EPA cautions that this monitor has a fairly low design value and it is likely not representative of the highest impacts around Labadie and therefore likely not the best monitor to review for model performance.

Figure 5

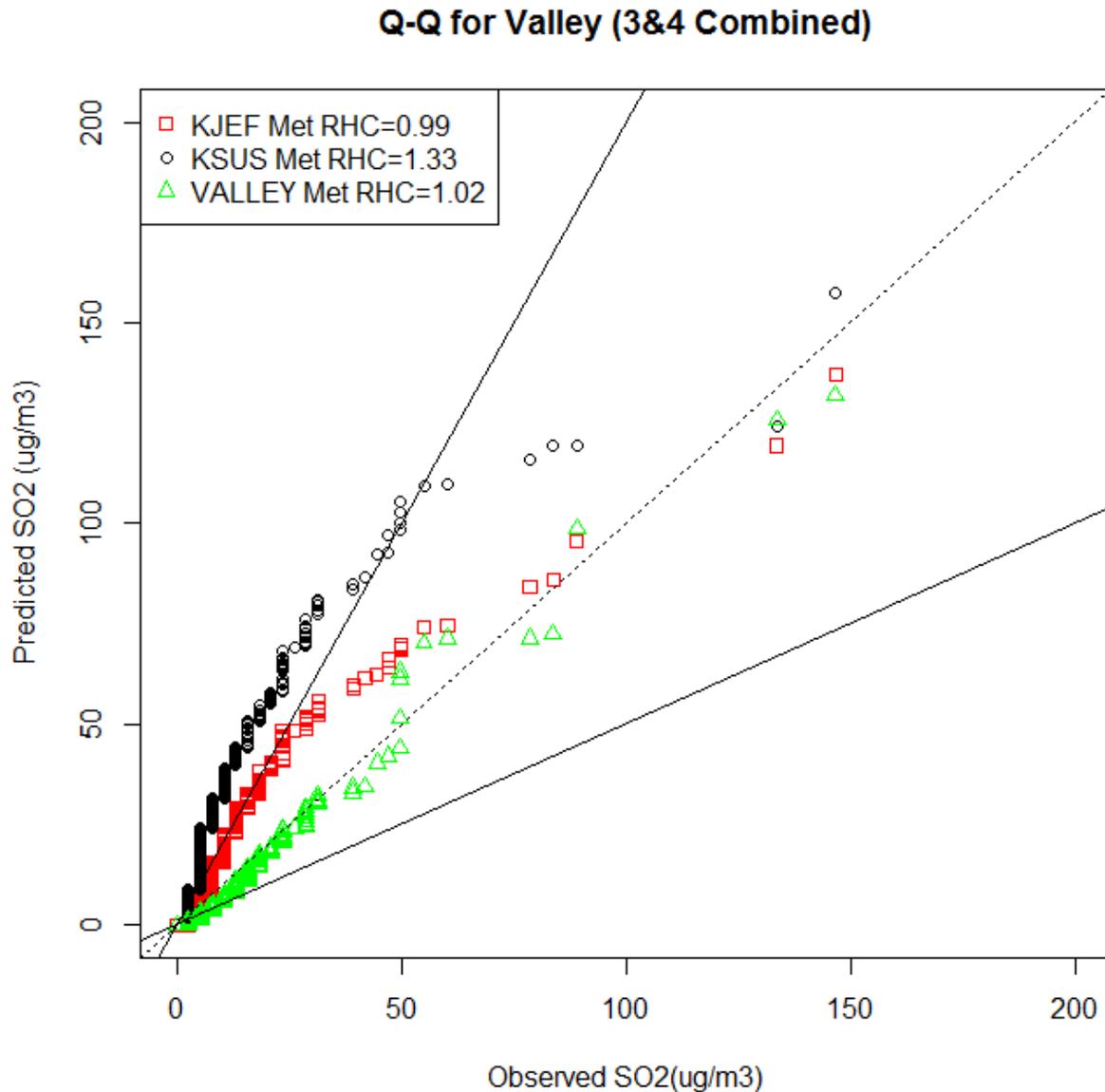


Also note that none of these runs include the combination of LOWWIND3 and combined units 3 and 4 which would likely show values below the “Def 34comb”, a clear under prediction, and Ameren proposes that this is the run (along with Nillwood background) they believe would likely be most representative. EPA does not believe that the site specific data provided support even LOWWIND3 with the stacks separate, and clearly would not support combined stacks and LOWWIND3 using an even lower background.

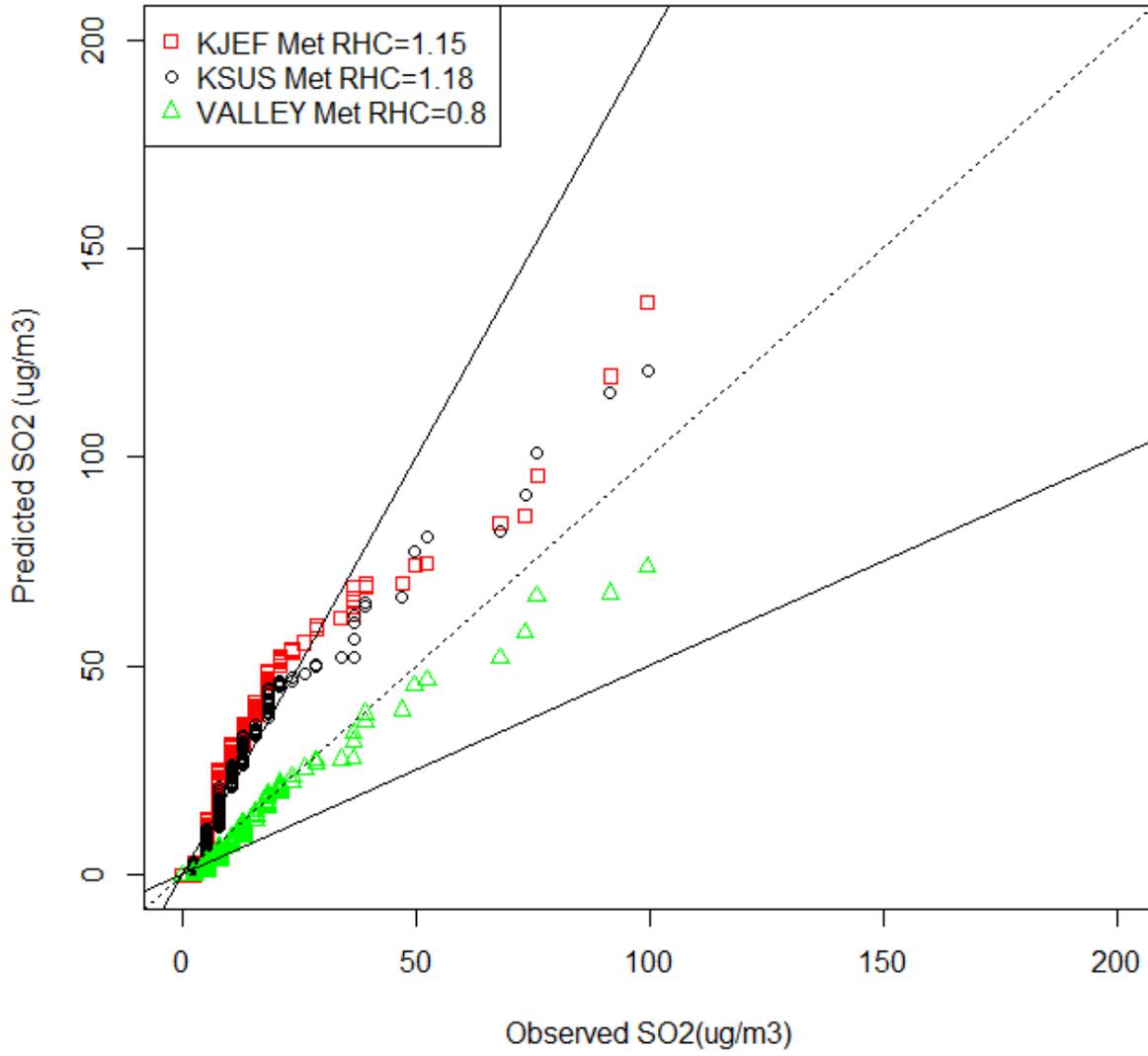
Ameren provided runs using three sets of meteorological data using combined and separate stack configurations for units 3 and 4. Meteorological data at Jefferson City, Spirit of St. Louis, and local data collected at the Valley monitoring sites were provided by Ameren. In the prior

2012-2014 modeling submitted to EPA it was determined by MDNR that the most representative meteorology dataset was from the Jefferson City NWS airport site. Onsite data, if collected properly and in a representative location, should provide better model performance than offsite NWS airport data.

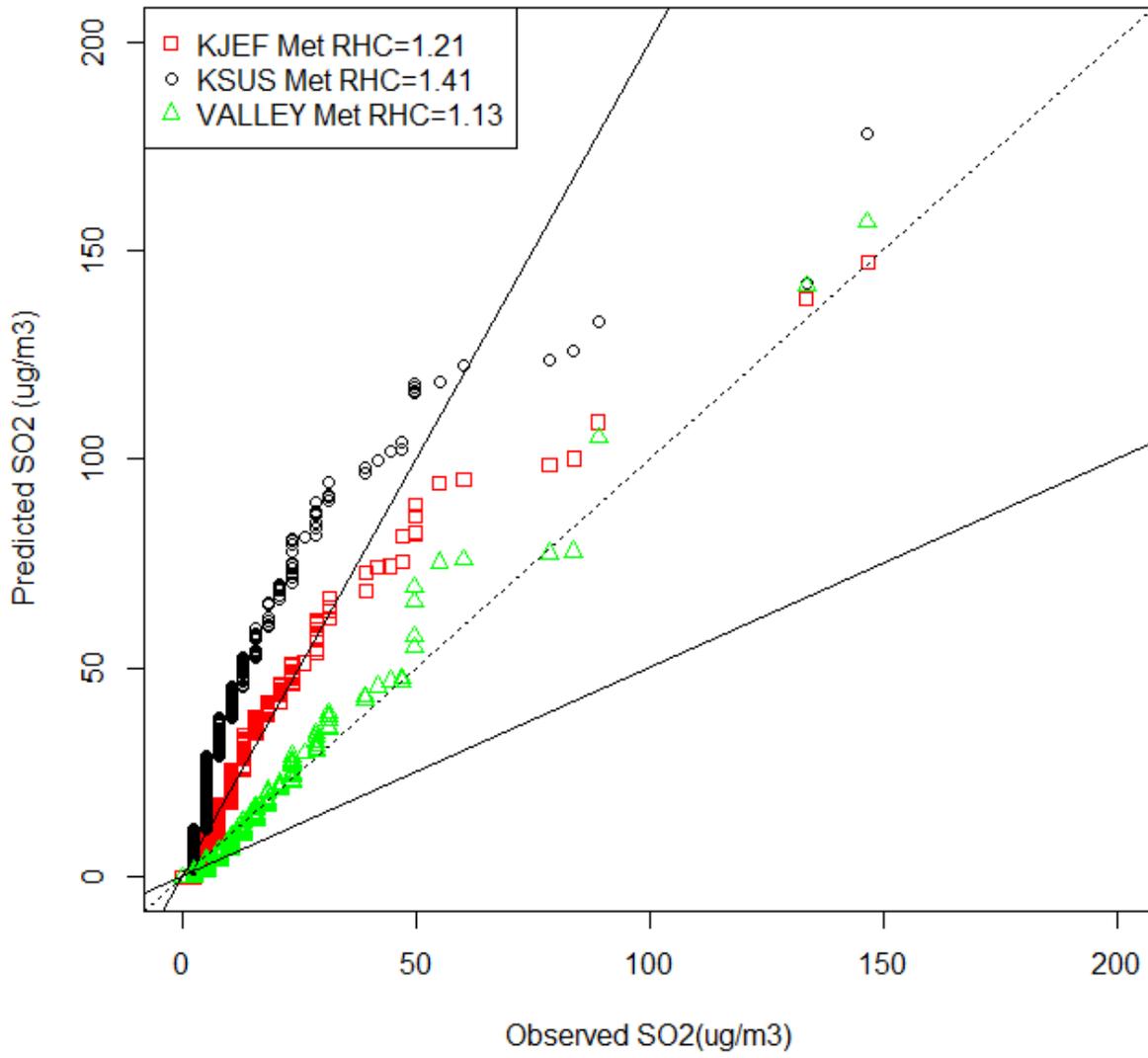
Below is a similar comparison of modeling performance (Q-Q and RHC) using the three meteorological sites Ameren provided with both combined and separate stacks using all hours rather than a maximum daily values. In all cases below, no background value is used and all inputs Ameren provided were utilized by EPA as submitted including Ameren processed meteorology and varying stack parameters including temperatures and exit velocities on an hourly basis.



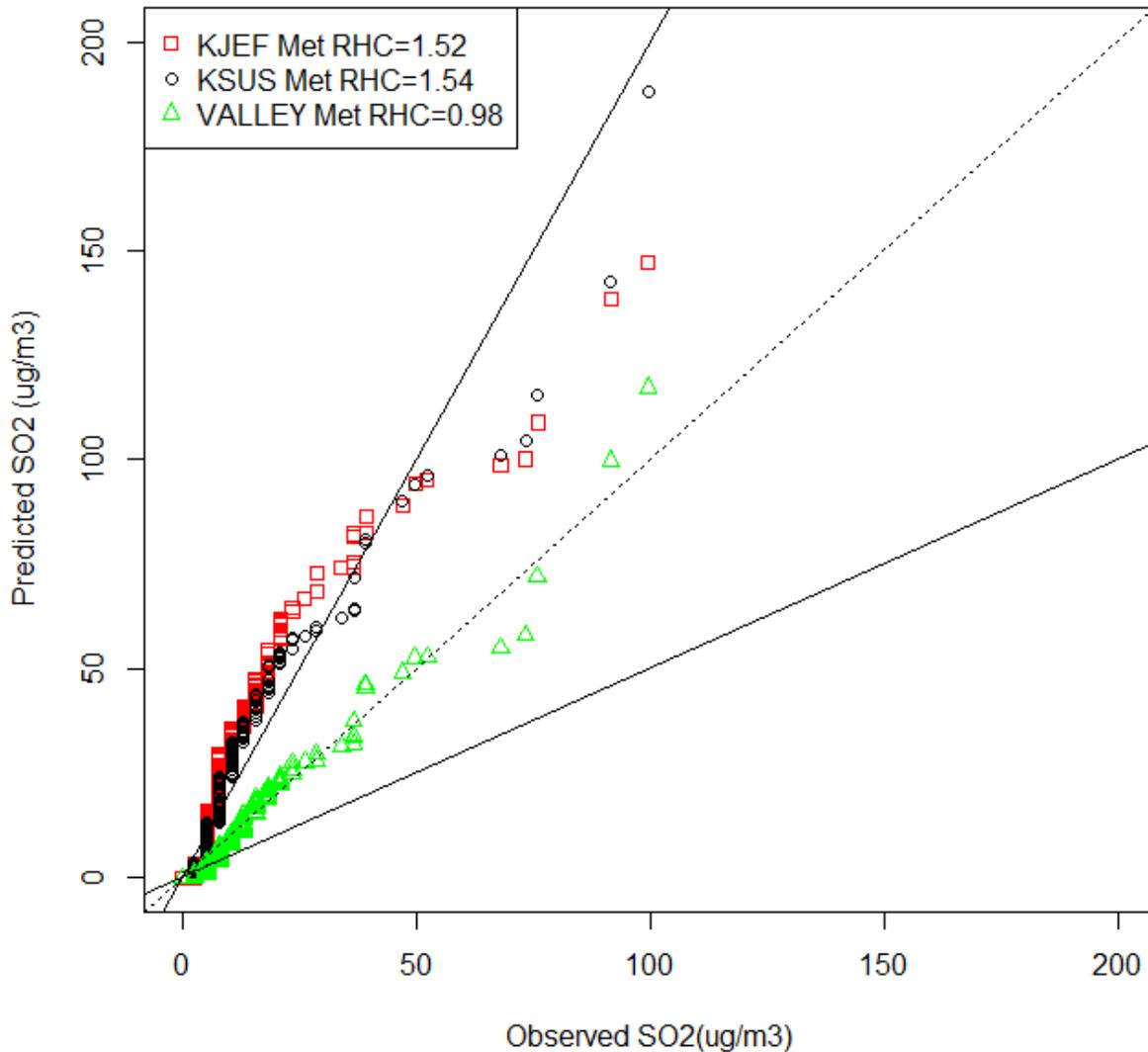
### Q-Q for NW (3&4 Combined)



### Q-Q for Valley (3&4 Separate)



### Q-Q for NW (3&4 Sepatate)



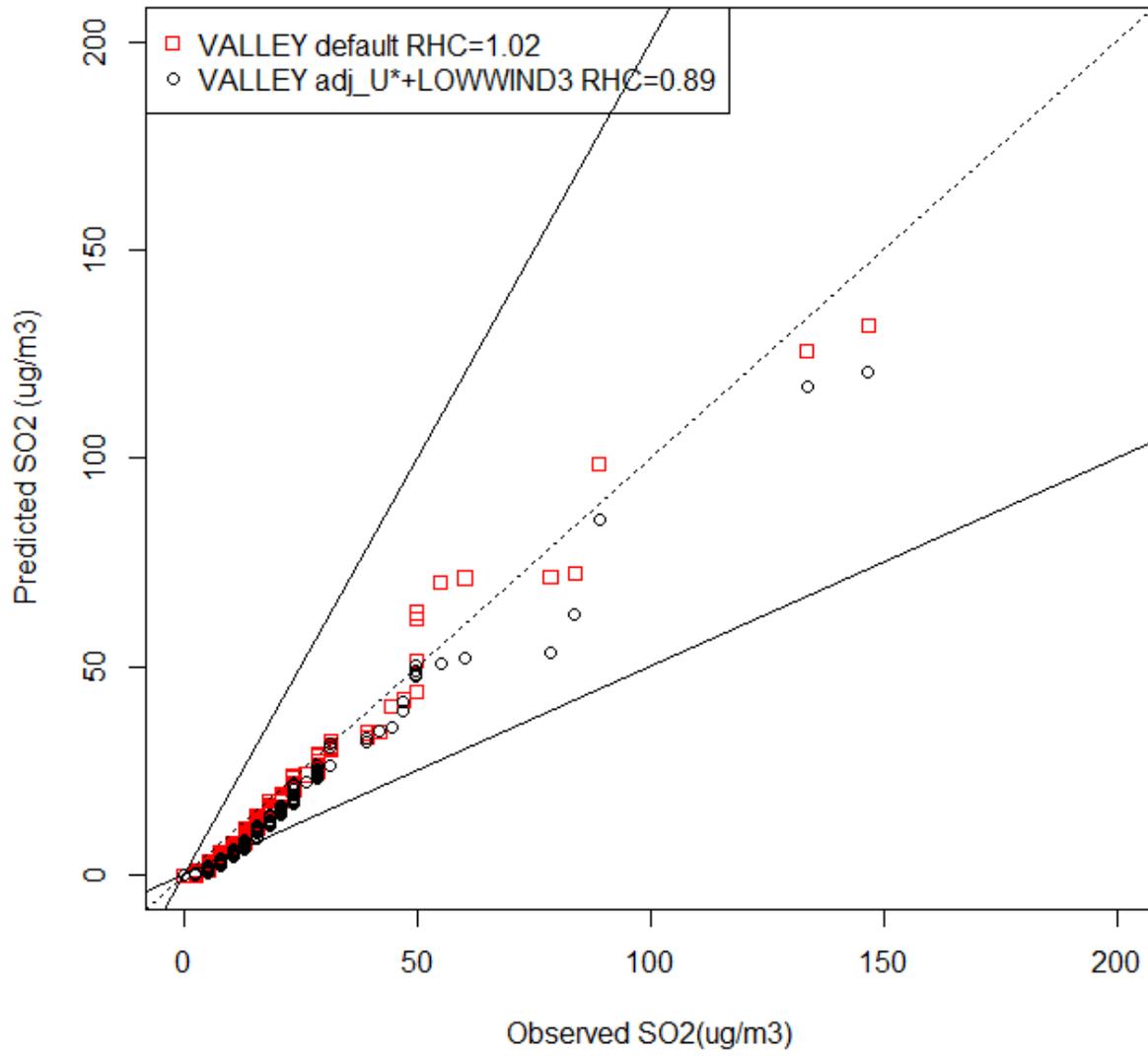
From the Q-Q plots and RHC metrics using default modeling settings, it does appear that combining the stacks provides better modeling performance at the two monitoring sites, Valley and NW. Because the meteorology data is being collected at the Valley site, and the Valley site has a higher design value, EPA weights the performance metrics at this site above the NW site. From the combined Valley figure it is apparent that the onsite data performs much better than either of the offsite NWS datasets at these two specific locations. This performance improvement is expected as the local meteorology should be more representative for an individual location than offsite data especially when comparing to a specific monitor. This does not necessarily indicate the use of NWS data for designations is inappropriate as only two locations are provided here in the performance metrics, and the higher predictions at these locations using NWS data are likely a function of more frequent winds in the direction of the monitor locations which don't

actually occur at Labadie. In other words, the AERMOD model using NWS data likely over predicts at these locations and under predicts in other areas around Labadie since the wind directions are not as accurate as the site specific winds. The overall 4th high domain wide modeled concentration is likely similar in magnitude, just at a different location. Note there is not enough onsite data at this point to do this type of comparison since not all seasons are represented in the onsite data.

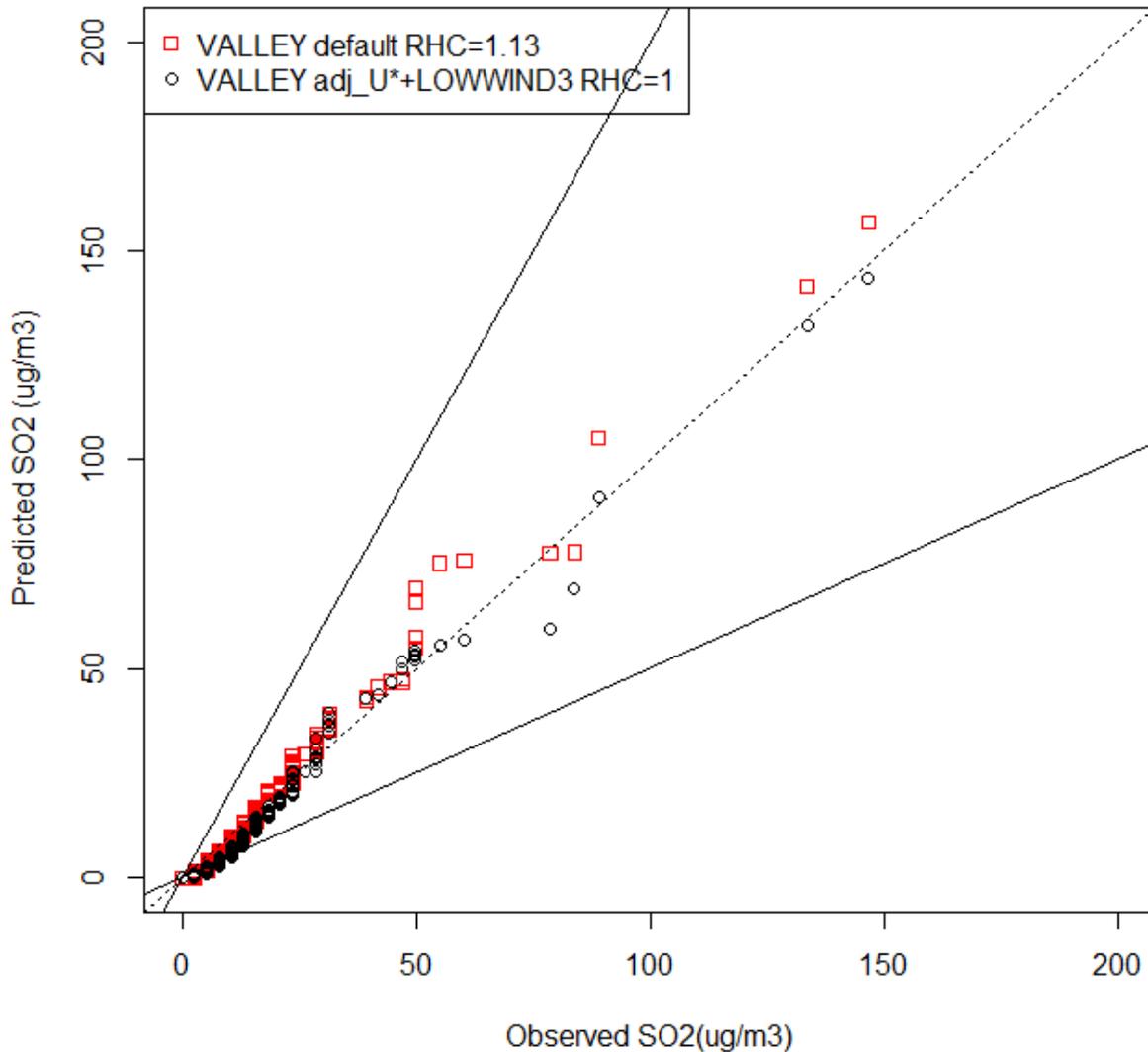
Because site specific meteorology, emissions, and stack parameters are being used, the model performance appears very good with RHC=1.02 at the valley site with combined units 3 and 4 and many points on the 1-1 Q-Q line. At the high end of the modeled distribution there is a slight under prediction of modeled values, but this is likely due to no background values being included in the modeling presented above. We also note that the Jefferson City meteorology data appears to perform better than the Spirit of St. Louis NWS data at these two locations. Better model performance using Jefferson City data is likely a function of the current monitors being sited using Jefferson City NWS data and this alone does not necessarily indicate that Spirit of St. Louis NWS data is less representative than Jefferson City NWS data.

Because this onsite dataset was being provided for a site specific beta request, EPA also investigated the performance metrics using the adj\_U\* and LOWWIND3 at both the NW and Valley sites using the most representative dataset, i.e. the onsite valley meteorology at the valley monitoring site. The comparison of performance using the beta options vs. default options is found below. Based on the analysis above EPA believes using the combined stacks and Valley location is most representative for this analysis, but plots for both combined and separate stacks at the Valley location are included below since Ameren included both.

### Q-Q for Valley (3&4 Combined)

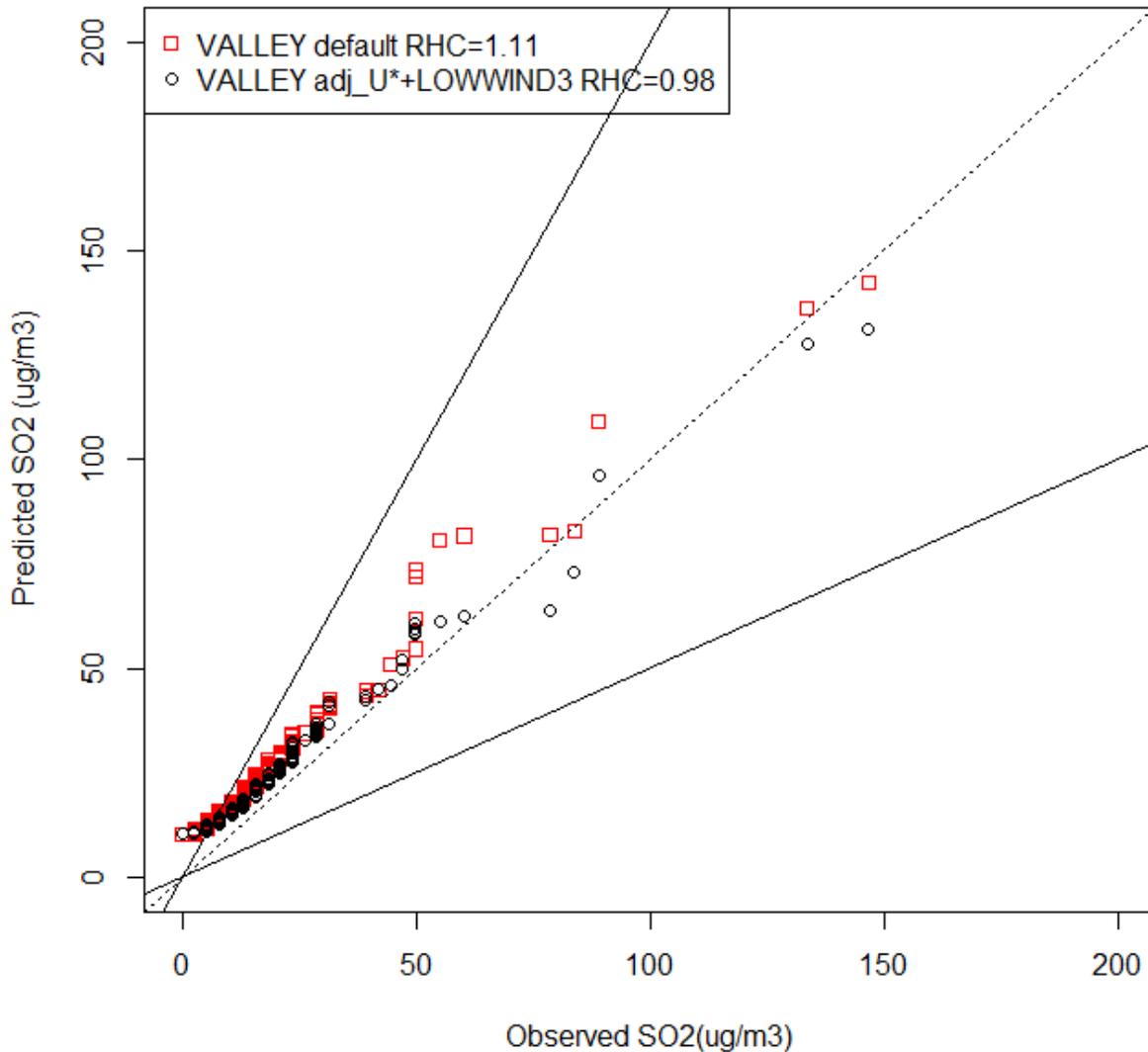


### Q-Q for Valley (3&4 Separate)



As described above, EPA’s view is that the RHC statics and Q-Q plots indicate performance using default AERMOD model settings and onsite data is very good, with almost perfect agreement of modeled to monitored values (units 3 and 4 combined). Introduction of the beta options, specifically LOWWIND3, does not appear to improve performance and appears to introduce an under prediction bias that can be seen in the Q-Q plots. We do not agree that the site specific data provided by Ameren to date support approval of the beta option requests from Ameren, specifically LOWWIND3. Adding a background value to the modeled values eventually results in the RHC statistic (N=26) approaching 1.0 using beta options but the Q-Q plot still indicates under prediction at the peak concentrations, while the performance of the default option remains acceptable as shown in the figure below.

### Q-Q for Valley (3&4 Combined) with 4ppb background



Finally, we note that both of the existing monitors appear to be in a location that is not expected to measure peak concentrations, as discussed in more detail elsewhere. Ideally, a performance evaluation should be performed at a monitor in a location of expected peak concentrations, as performance at a high concentration is important when determining an area designation. The current data available shows the AERMOD model performs well and there is no clear bias towards model over prediction when using default model settings and onsite representative data. EPA finds no evidence in this onsite dataset of either the penetrated plume over prediction issue discussed by Ameren in requested response #12 or clear over predictions requiring adj\_U\*+LOWWIND3 that Ameren claims exist in the AERMOD model using default settings.

**Response to Ameren #11. Use and approval of adj\_U\* only.**

In the requests that EPA has reviewed from Ameren for use of beta options, they all appear to include a combination of both adj\_U\* and LOWWIND3. EPA would consider an adj\_U\* only approval based on the peer review record for adj\_U\*. In response to Ameren requests #10 and #12 above, we do note that it does not appear to EPA there is the need for model adjustments based on site specific data, as performance using default options appear appropriate.

**Comment:** One commenter (Washington University in St. Louis, for the Sierra Club, on 4/19/2016) expressed concern that updated emissions alone are not the reason for Ameren's attainment modeling. Specifically the commenter contends that undisclosed manipulation of surface characteristics were performed leading to attainment modeling. The commenter disagrees with merging of Unit 3&4 stacks at Labadie and points out what appear to be an error in the merging of stacks. The commenter also believes unusual outages that occurred during the modeling period that may not represent future emissions and therefore substitute emissions should be used. Finally the commenter contends there are no guarantees that Ameren will continue to use ultra-low sulfur coal or will continue to be able to purchase it from their current supplier. This same commenter provided additional modeling via email to EPA Region 7 (on 4/29/2016) using augmented or substitute emissions for what the commenter felt were certain unusual outages.

**EPA's Response:** EPA has evaluated the approach Ameren used in processing AERMET in its 2013-2015 modeling datasets. As identified in EPA's response to Ameren's response request #3 and #4 above, EPA did find an error in the processing of surface characteristics that the EPA's finds makes us unable to rely on Ameren's modeling. Concerning merging of Units 3 & 4, EPA has determined merging is allowed and representative, as further described in the final Missouri TSD and this RTC. The commenter is correct that an error in the processing of the 2015 merging of Units 3 and 4 was made, and Ameren corrected that error in a submittal made to the EPA on 5/2/2016. Concerning unusual outages and low sulfur coal availability, designations are made on the basis of what the actual ambient air concentrations would be during the latest 3 year period for which data is available, which is calendar years 2013-2015 in this area's case. EPA does agree that emissions do vary, and that historical information shows emission variation both annually and hourly, but EPA can't predict the future emissions referenced by commenter, thus we are not using, recommending, or relying on modeling with substitute emissions during unusual outages.

**Comment:** One commenter (Ameren) filed a 4/29/2016 response to Sierra Club comments made on 4/19/2016. The commenter states monitoring shows attainment, disagrees with Sierra Club assertions that surface characteristics used in Ameren's modeling are inappropriate, states that snow cover assignments that Ameren used are appropriate and not determinative of attainment, asserts merged stacks are appropriate and allowed by guidance, asserts stack temperatures are correct, corrected an error in the processing of merged unit 3 and 4 exit velocities, asserts extended outages are a normal process for utilities, asserts the facility is in a rural location and therefore a rural background is appropriate, and finally Ameren states that they are contractually

obligated to use ultra-low sulfur coal at Labadie and they should be applauded by both Sierra Club and EPA for the resulting environmental improvements. The commenter provided four additional modeling runs to support their positions.

**EPA's Response:** EPA has provided responses to all the issues raised by the commenter in the Ameren response requests 1-12 above, responses to Sierra Club, and within the final Missouri TSD.

**Comment:** One commenter (0326-Ameren) stated that Ameren's updated modeling data, coupled with nearly a year of Ameren and Missouri Department of Natural Resources quality-assured monitoring data similarly evidencing attainment, provides a great weight of evidence that demands that EPA designate the Labadie area as in attainment of the 2010 SO<sub>2</sub> NAAQS. In addition to commenter's 45 page letter, commenter included eighteen exhibits in the docket.

**EPA's Response:**

Please see EPA's response to Ameren's response requests #1, #2, #3, and #4 above.

**Comment:** Some commenters (0238-Hinson, 0239-Schatz, 0240-Mathews, 0326-Ameren) disagreed that Franklin County be designated nonattainment and recommended a designation of unclassifiable. Commenters stated that air quality data (data attached to their letters) from 2 monitors installed in April 2015 demonstrate attainment and that modeling cannot be considered reliable.

One commenter (0306-MO Industries) stated the EPA's decision to designate the Franklin County Missouri Area as nonattainment is arbitrary, wrong and must be reversed. The commenter stated the EPA's proposed decision fails to consider the monitored data gathered in the last year and fails to consider flaws in the modeling which lead to over-prediction. Commenter stated that two air monitors were installed in April, 2015 at locations around the Labadie Energy Center pursuant to EPA criteria and there has not been a single reading on either monitor in which the 1 hour SO<sub>2</sub> NAAQS was exceeded (monitoring data are attached to commenter's letter). Commenter supported the position that, in light of this monitoring data and uncertainties with the modeling, more information is needed before a correct designation decision can be made. Commenter stated that there is no benefit to recommending an area as nonattainment if the modeling cannot be considered reliable and if full consideration of actual data could very well demonstrate that the area actually attains the standard.

One commenter (0332-AC-Sierra Club) stated that monitoring data collected from two sites around the Labadie Plant since April 2015 do not provide convincing evidence that the area is in attainment. Commenter stated that eight months of monitoring data do not and cannot demonstrate attainment of the NAAQS because three full years of monitoring data are required to calculate a design value for comparison to the NAAQS. Commenter stated that, if monitored concentrations are higher in 2016 and/or 2017 than they were in 2015, the design value for one or both monitors could exceed the NAAQS once the requisite three years of data have been collected. As detailed in commenter's letter (pdf pages 15-18) commenter argued that the

Labadie monitors are not sited in areas of expected peak SO<sub>2</sub> concentrations – based on modeling performed by Ameren itself for monitor siting purposes and also based on the modeling performed more recently by MDNR for area designation purposes.

***EPA's Response:***

For comments concerning monitor siting and use of current monitoring data for the Labadie area, please see EPA's response to Ameren's response requests #1 and #2 above. EPA agrees with the commenter that 8 months of monitoring data does not meet the completeness requirements in 40 CFR Part 50, Appendix T to be comparable to the 1 hour SO<sub>2</sub> NAAQS.

***Comment:*** One commenter (0326-Ameren) stated the EPA should have proposed an unclassifiable designation, consistent with the Missouri Department of Natural Resources September 25, 2015 recommendation. The commenter stated that they provided a detailed discussion in their (45 page) comment letter and included eighteen attachments providing additional documentation to respond to every issue articulated by EPA in its Draft TSD and to show that each of EPA's contentions and bases for its Proposed Designation are in error.

One commenter (0326-Ameren) stated that, if EPA develops a rational basis for why attainment is not warranted, Ameren's updated modeling data is sufficient to warrant an unclassifiable designation. Commenter stated that the new modeling demonstrates attainment even using conservative inputs and demonstrates attainment by a wide margin when using representative inputs. Commenter stated the EPA cannot reasonably find that its Proposed Designation is based upon modeling that "clearly demonstrate[s]" nonattainment.

***EPA's Response:*** Please see EPA's response to Ameren's response requests #3 and #4 above.

***Comment:*** One commenter (MO Response, Attachment 1) stated that, because it cannot be determined with certainty based on available information whether the area is or is not meeting the 1-hour SO<sub>2</sub> standard, the air program recommended an unclassifiable designation for the area near Labadie. Commenter stated that the previously submitted modeling was updated to reflect the most recent emissions and meteorological data, 2013 through 2015 and these model results support an unclassifiable classification. Commenter stated that the air program performed two new modeling scenarios around the Labadie facility: (1) the only change made to the modeling was to include 2015 hourly emissions and meteorological data, which resulted in a decrease in the approximate design value of the area from 90 ppb to 77 ppb and (2) units 3 and 4 were modeled as a merged plume, which resulted in an approximate design value of 67 ppb which is in compliance with the 1-hour standard of 75 ppb. Commenter provided a detailed discussion of the use of a merged plume in their comments. Commenter stated that, although the dataset from Labadie's new SO<sub>2</sub> monitors is not yet complete, it further supports the unclassifiable designation for the area (Attachment 2) and the air program must consider it, consistent with state law.

**EPA's Response:** The EPA fully considered the commenters' recommendation, and reviewed and analyzed the modeling and data referenced by commenter, and has provided response in the final Missouri TSD.

**Comment:** One commenter (0306-MO Industries) stated that the proposed decision violates the intent of the state of Missouri's decision, expressed through a vote of the general assembly and signature by the Governor, to require that any designation within its own borders be based upon the best available scientific information including actual monitored data. Commenter stated that a nonattainment designation will have long-term negative economic consequences and the EPA's reliance on flawed science also has the long-term effect of eroding public confidence in the Agency's credibility.

Another commenter (0326-Ameren) stated that the EPA's proposed designation is premature and arbitrary and capricious because it effectively prohibits consideration of monitoring data in contravention Missouri state law.

**EPA's Response:**

Pursuant to section 107(d) of the Clean Air Act (CAA), EPA must designate areas for the 2010 1-hour sulfur dioxide (SO<sub>2</sub>) primary national ambient air quality standard (NAAQS). EPA is under an enforceable order to complete the area designations according to the court-ordered schedule. By no later than July 2, 2016 (16 months from the court's order), the EPA must designate two groups of areas: (1) areas that have newly monitored violations of the 2010 SO<sub>2</sub> NAAQS and (2) areas that contain any stationary sources that had not been announced as of March 2, 2015, for retirement and that according to the EPA's Air Markets Database emitted in 2012 either (i) more than 16,000 tons of SO<sub>2</sub> or (ii) more than 2,600 tons of SO<sub>2</sub> with an annual average emission rate of at least 0.45 pounds of SO<sub>2</sub> per one million British thermal units (lbs SO<sub>2</sub>/mmBTU). EPA is bound by the CAA and the court order on this matter, and Missouri law is not controlling or relevant in this instance. EPA considered all available, relevant data in making the final designation. For further discussion on utilizing modeling to inform designation decisions, see section (III)(A)(2) of this RTC.

**Comment:** Some commenters (0213-Mass Mailer, 0246-Labadie Environmental Org., 0250-APC, 0251-APC, 0252-APC, 0253-Alt, 0256-APC, 0258-Friedman, 0260-Zerbe, 0261-APC, 0266-APC, 0280-Orr, 0283-Dittrich, 0288-APC, 0304-APC, 0305-APC, 0322-APC, 0332-AC-Sierra Club) supported a nonattainment designation in order to improve air quality in the area. One commenter (0246- Labadie Environmental Org.) supported the EPA's nonattainment designation using the EPA's recommended model and stated there is not adequate monitoring data (3 years) to support a designation based on monitoring.

One comment letter (0213-Mass Mailer) consists of 565 individual comment letters. These comments supported the EPA's proposal to reject the unclassifiable sulfur dioxide designation, supported EPA's proposal to declare the area in nonattainment, and stated Ameren should have to reduce harmful sulfur dioxide emissions in this region to protect public health.

**EPA's Response:** The EPA considered all available, relevant data in making the final designation. After careful review of the information, the EPA is unable to determine whether the area is meeting the NAAQS, and so is designating the area as unclassifiable.

**Comment:** One commenter (0332-AC-Sierra Club) supported the EPA's proposed nonattainment designation and stated that the evidence supporting a nonattainment designation is overwhelming. Commenter stated that modeling performed by MDNR, Sierra Club, and Ameren using AERMOD's regulatory default options shows nonattainment. Commenter stated that neither MDNR's nor Sierra Club's modeling shows attainment when run with Ameren's proposed beta options. Commenter stated that MDNR's and Sierra Club's modeling evaluations are consistent with EPA's Modeling TAD and Appendix W.

One commenter (0332-AC-Sierra Club) provided detailed comments (19 pages) regarding the use of modeling and monitoring data for the Labadie Plant in support of their position that the area be designated nonattainment. Commenter also submitted detailed comments in Exhibit 1 (54 pages) attached to their comment letter. Exhibit 1 is a copy of comments Sierra Club submitted to MDNR on September 3, 2015 regarding designation of the Labadie area. That comment letter argues that (1) modeling performed by MDNR and the Sierra Club make clear that the Labadie plant's SO<sub>2</sub> emissions are causing areas around the plant to exceed the NAAQS; (2) an unclassifiable designation is inappropriate because it relies on far less than three full years of monitoring data (from monitors that are not sited in areas of expected peak concentrations); and (3) modeling by Ameren's consultant deviated in several critical respects from MDNR's approach.

One commenter (0332-AC-Sierra Club) stated the EPA should continue to critically evaluate Ameren's modeling and should not rely on it for purposes of making its final designation decision. As detailed in commenter's letter (pdf pages 6-14) commenter objected to the Ameren modeling because Ameren (1) used ADJ\_U\* and LOWWIND3; (2) merged and modeled as a single release point the emissions from units 3 and 4; (3) used temporally varying background concentrations based on a monitor 130 kilometers from Labadie; and (4) used hourly stack parameters instead of fixed values, with hourly exit velocities based on (calculated) "actual" flows instead of standard flows.

Commenter (0332-AC-Sierra Club) submitted Exhibit 2 which contains supplemental comments submitted by Sierra Club to USEPA Region 7 on September 18, 2016 that address Ameren's modeling using the LOWWIND3 option. Commenter stated that, to their knowledge, Ameren did not submit and the Regional Administrator did not approve an alternate model demonstration showing that AERMOD performs better for Labadie with the LOWWIND3 option. Commenter stated that, absent an analysis of model performance that follows EPA's protocol, use of the beta LOWWIND3 option instead of the regulatory default option cannot be approved by the Regional Administrator, and Ameren's modeling cannot be used as the basis for an SO<sub>2</sub> area designation. Commenter stated that an alternate model demonstration that follows EPA's protocol for evaluating model performance for predicting peak concentration values is not currently possible for Labadie due to a paucity of measured air quality data.

**EPA's Response:** EPA evaluated all information provided by all parties including modeling submitted by Ameren. EPA has further addressed the use of ADJ\_U\* and LOWWIND3, merged stacks for Labadie Units 3 & 4, background concentrations, and actual versus standard flows in response to Ameren comments above. A summary of all modeling runs and the EPA's analysis of their representativeness is found in the final Missouri TSD.

In response to comment related to the use of hourly stack parameters versus fixed stack parameters, hourly stack parameters for modeling purposes should be most representative of actual conditions and resulting ambient concentrations, although EPA's modeling TAD does not require the use of hourly stack parameters. Assuming the hourly varying stack parameter data is available and representative, it is appropriate to use this data in modeling for designation purposes. Fixed parameters for temperature and exit velocity at maximum design values or at similarly high values may not be representative of normal operations or operations at reduced loads. In modeling analyses where emissions are varying hourly, using variable stack parameters for those hours will more likely lead to values that would be observed by a monitor at each receptor location. Please see the final Missouri TSD for further discussion of the EPA's analysis of the hourly stack parameters and fixed stack parameters used in the modeling runs currently available for this area.

**Comment:** Some commenters (0241-Clauson, 0255-ACP, 0268-Brazil, 0283-Dittrich, 0284-APC) expressed concern and requested the EPA to act in the best interest of the health of those living near the Ameren Labadie power plant. Another comment (0272-Nohl) requested that scrubbers be installed on the Labadie power plant to help save the air. One commenter (0257-APC) stated Ameren must clean up their emissions.

**EPA's Response:**

The EPA appreciates the concerns expressed by citizens who live in the vicinities of sources of SO<sub>2</sub> air pollution emissions. The EPA evaluated the impacts of Ameren Labadie emissions as they relate to the 2010 SO<sub>2</sub> National Ambient Air Quality Standards health based air quality standard. EPA followed all relevant EPA rules, regulations, and guidance in this evaluation. After careful review of the available information, the EPA is unable to determine whether the area is meeting the NAAQS, so is designating the area as unclassifiable.

## B. Jackson County

**Comment:** One commenter (MO Response, Attachment 1) provided updates to their technical analysis and reaffirmed their recommendation of attainment for the portion of Jackson County containing the Sibley plant. Commenter stated the previously submitted modeling has been updated to reflect the most recent emissions and meteorological data and still demonstrates compliance with the standard at 189µg/m<sup>3</sup> (or 72.7 ppb). Commenter responded to EPA concerns

regarding three sources in the vicinity of the Sibley plant that could potentially interfere with attainment: the Veolia Energy steam plant (Veolia), the Blue Valley plant, and the Missouri City plant.

Commenter stated that the Veolia plant is being addressed through Missouri's Jackson County nonattainment area (NAA) plan (submitted to EPA on October 9, 2015) and the new limitations (compliance date of January 1, 2017) set through the NAA plan demonstrate compliance with the standard. Commenter stated that, because this compliance date occurs after this round's designation date of July 2, 2016, Veolia was included in Sibley's modeling analysis as an interactive source at their actual emission rates as reported in 2014. Commenter stated that modeling the higher emission rates for Veolia does not cause modeled violations within the attainment area boundary proposed for the Sibley plant. Commenter provided monitoring data (including Attachment 2) and stated that trends at the nearby Troost monitor reflect recent shift from coal to natural gas at the Veolia plant. Commenter stated that this indicates that the Jackson County nonattainment area will demonstrate compliance by the attainment date and the Veolia plant will not interfere with attainment around the Sibley plant.

Commenter stated that the EPA's concern regarding the Blue Valley plant is that the modeled emission rates were not federally enforceable at the time of the State's recommendations, even though Blue Valley had already switched to exclusively burning natural gas. Commenter stated that Blue Valley's Units 1 & 2 are subject to the Industrial Boiler MACT while Unit 3 is subject to the Mercury and Air Toxics Standard, which have compliance dates of January 31, 2016, and April 15, 2015, respectively. Commenter stated that the compliance strategy for these units as documented in their permit renewal is to cease burning coal and burn exclusively natural gas after January 31, 2016 and the federal regulations provide the enforceability to Blue Valley's early switch to exclusively burning natural gas. Commenter stated that, together these points demonstrate that the Blue Valley plant will not interfere with attainment around the Sibley plant.

Commenter stated that the Missouri City plant was not included in Sibley's modeling analysis as an interactive source as they have reportedly shut down. Commenter stated the Missouri City plant ceased burning coal effective January 31, 2016 in order to comply with the Industrial Boiler MACT and, since the plant is not capable of burning natural gas, the cessation of coal burning effectively is the shutdown of the plant. Commenter stated that, since this plant is no longer emitting SO<sub>2</sub>, it will not interfere with attainment around the Sibley plant.

***EPA's Response:***

As further detailed in the final Missouri TSD, since the emission rates for Independence Power and Light Blue Valley Station that were used in the modeling analysis were not federally enforceable by the date of the final designation for the area, we could not rely upon the modeling analysis that was submitted by Missouri to determine whether the area was or was not meeting the 1-hour SO<sub>2</sub> NAAQS.

## C. Scott County

**Comment:** One commenter (MO Response, Attachment 1) stated that, for the area surrounding the Sikeston Power Station (Sikeston), the air program reaffirms the recommendation of an attainment designation for Scott County. Commenter stated that the previously submitted modeling has been updated to reflect the most recent emissions and meteorological data, 2013 through 2015 and the resulting approximate design value for the area still demonstrates compliance with the standard at  $96\mu\text{g}/\text{m}^3$  (or 37 ppb).

**EPA's Response:** As further detailed in the final Missouri TSD, the EPA reviewed Missouri's updated modeling using 2013-2015 emissions and finds that the analysis demonstrates compliance with the 1-hour SO<sub>2</sub> NAAQS.

## XVIII. Nebraska

### A. Lancaster County

**Comment:** One commenter (NE Response) attached supplemental information in support of the initial designation of unclassifiable for the 2010 1-hour SO<sub>2</sub> standard for Nebraska Public Power District (NPPD) Sheldon Station in Lancaster County, NE. Commenter stated the attached documentation was received from NPPD (Attachment 1 cover letter) and reflects actions they have taken to further comply with the 2010 1-hr SO<sub>2</sub> standard for Sheldon Station. Commenter stated these attachments include construction permits for Units #1 and #2 (Attachments 4 and 5) and dispersion modeling data and analysis (Attachments 2 and 3). Commenter stated the modeling analysis used the AERMOD model (Version 15181), actual hourly emissions inputs for the 2012-2014 period, and demonstrated compliance with the SO<sub>2</sub> 1-hour NAAQS by inclusion of stack height increases for the Unit 1 and 2 boiler stacks. Commenter stated that NPPD is in the process of increasing the Unit 1 stack height from 174 feet to 224 feet above local ground level, and the Unit 2 stack from 174 feet to 210 feet above local ground level. Commenter stated that, while the de minimis good engineering practice (GEP) stack height is 65 meters (213 feet), the new (modeled) heights of the stacks are well below the calculated GEP height of 335.6 feet (102.3 meters) for each stack.

One commenter (0269-NE Power) did not agree with the SO<sub>2</sub> emission rates found in the EPA's technical analysis document for Sheldon Station. Commenter stated that, in 2012, Sheldon Station emitted a total of 2,760 tons of SO<sub>2</sub> with a total heat input of 12,058,767 mmBTU, which results in an SO<sub>2</sub> emission rate for the facility of 0.458 lbs SO<sub>2</sub>/mmBTU, not 0.92 lbs SO<sub>2</sub>/mmBTU. Attached to the commenter's letter is additional information to support the basis for the SO<sub>2</sub> background concentration used in the dispersion modeling analysis for Sheldon

Station submitted to the Nebraska Department of Environmental Quality in early September 2015.

***EPA's Response:***

EPA appreciates NPPD's identification of the inaccuracy of the 2012 SO<sub>2</sub> emission rates. EPA reviewed the available information and finds that the emission rates provided by NPPD are appropriate. This value was corrected in the final Nebraska TSD. As explained in the final Nebraska TSD, EPA is designating the area as unclassifiable since available information does not enable EPA to determine whether the area is meeting or not meeting the SO<sub>2</sub> 1-hr NAAQS. The updated modeling that demonstrates compliance with the SO<sub>2</sub> 1-hr NAAQS is not consistent with EPA's recommended practice for using either actual emissions or allowable emissions in the Modeling TAD. While the modeling scenarios provided by the state use actual emissions, they also depend on future, not yet effective changes to Sheldon Station operations (i.e., increased stack heights, ceasing the combustion of coal at future unknown date). Therefore, the EPA finds that the modeling submitted is not a reliable basis to inform a decision that based on allowable emissions levels the area meets the NAAQS and to designate the area as unclassifiable/attainment.

B. Lincoln County

***Comment:*** Commenter (0269-NE Power) did not agree with the SO<sub>2</sub> emission rates found in the EPA's technical analysis document for the Gentleman plant. Commenter stated that, in 2012 Gentleman Station emitted a total of 26,437 tons of SO<sub>2</sub> with a total heat input of 89,473,660 mmBTU, which results in an SO<sub>2</sub> emission rate for the facility of 0.591 lbs SO<sub>2</sub>/mmBTU, not 1.05 lbs SO<sub>2</sub>/mmBTU.

***EPA's Response:***

EPA appreciates NPPD's identification of the inaccuracy of the 2012 SO<sub>2</sub> emission rates. EPA reviewed the available information and finds that the emission rates provided by NPPD are appropriate. This value was corrected in the final Nebraska TSD.

XX. North Carolina

A. Brunswick County

**Comment:** On April 19, 2016, to address the EPA's concerns related to the Northwest Township, as described in the February 16, 2016, correspondence on intended designations for Brunswick County, North Carolina provided documentation of the shutdown of the DAK Americas, LLC source in the Northwest Township of Brunswick County. Also on April 19, 2016, the State provided both additional, updated air dispersion modeling information and a final, issued title V permit, which asserts that compliance with the 1-hour SO<sub>2</sub> standard can be shown through compliance with a maximum hourly SO<sub>2</sub> emission rate of 453.6 pounds per hour for CPI Southport units ES01 and ES02 each. This information was submitted by the State after they were notified by CPI that 2015 actual emissions were higher than those modeled for their initial boundary recommendation. Limits of 453.6 pounds per hour for Units ES01 and ES02 (each) were incorporated into CPI's title V permit, which the State issued on April 18, 2016, and is therefore federally enforceable and effective.

**EPA Response:** The EPA has considered all of the information presented by North Carolina in the April 19, 2016, submission and has addressed that information in the final North Carolina TSD. As explained in the final North Carolina TSD, based on the available information the EPA is not able to determine whether the area is meeting or not meeting the NAAQS, and is designating the area as unclassifiable.

## XXI. North Dakota

### A. Mclean County/Eastern Mercer County

**Comment:** One commenter (ND Response) submitted a March 2016 modeling analysis by AECOM in support of the State's recommendation that the area around the Leland Olds Station, Stanton Station and Coal Creek Station be designated as attainment. Commenter stated that the updated modeling addresses the EPA's concern that the modeling submitted by NDDH in 2015 used a 30-day average allowable SO<sub>2</sub> emission rate rather than a 1-hour emission rate. Commenter stated that an appropriately conservative 1-hour emission rate has now been modeled along with the actual emissions from the other sources being included in the analysis. Commenter stated that, while the revised analysis indicates that a 1-hr emission rate of 1,430.3 lb/hr would be appropriate for a BART limit of 1,162.8 lb/hr on a 30-day rolling average basis, to be conservative, the source was modeled with an emission rate of 3,876 lb/hr which is more than three times the BART limit. Commenter stated the results of this modeling continue to show attainment of the SO<sub>2</sub> NAAQS.

Commenter (ND Response) stated that the AECOM March 2016 modeling was conducted with the EPA default option and beta ADJ\_U\* with LOWWIND3 options and the results with both options tested show compliance with the 1-hour SO<sub>2</sub> NAAQS by a comfortable margin, especially with the EPA-proposed low wind options employed using AERMOD version 15181. Attached to the AECOM March 2016 modeling report are: Appendix A Alternative Model Justification for Low Wind Speed Options (AERMET ADJ\_U\* and AERMOD LOWWIND3,

Version 15181); Appendix B Evaluation of Low Wind Modeling Approaches for Two Tall-Stack Databases Technical Paper; and Appendix C Evaluation of Low Wind Modeling Approaches for Two Tall-Stack Databases with AERMET ADJ\_U\* and AERMOD LOWWIND3 Options.

**EPA's Response:** Responses to these comments, as well as the EPA's review of North Dakota's updated designation recommendation, can be found in the final North Dakota technical support document for this designation.

## XXII. Ohio

### A. Clermont County

**Comment:** Some commenters (OH Response, 0296-FirstEnergy, 0299-OH Utilities Group) supported a designation of attainment for Clermont County. One commenter (0296-FirstEnergy) agreed with Ohio EPA's modeling work and their recommendation that the area surrounding the Zimmer plant (Clermont County) should be classified as attainment.

**EPA's Response:**

EPA appreciates the commenter's support.

### B. Gallia/Meigs County

**Comment:** Some commenters (OH Response, 0296-FirstEnergy, 0299-OH Utilities Group, 0314-OH Valley Electric) requested that U.S. EPA follow Ohio EPA's recommendation of attainment for these counties.

Two commenters (0314-OH Valley Electric, 0327-AEP) stated that, when AEP data is combined with the Ohio EPA modeling data submitted in September 2015, it should allow U.S. EPA to easily determine that the Ohio EPA modeling using AERMOD with the BETA U\* and LOWWIND3 Beta Option with actual hourly emissions from the J. M. Gavin Plant and the Kyger Creek Station for the period 2012 – 2014 is acceptable and demonstrates compliance with the 1-Hour SO<sub>2</sub> Standard. One commenter (0327-AEP) stated this conclusion supports not only the proposed designation of unclassifiable, but would support a designation of attainment.

One commenter (OH Response) contended the September 15, 2015 Ohio EPA modeling using the LOWWIND3 beta option should be the basis for an attainment designation. Commenter stated that they have provided justification for the use of the LOWWIND3 beta option. Commenter stated that, if the EPA continues to contend that a sufficient demonstration has not been provided to justify LOWWIND3 usage, the EPA should rely on the regulatory default

modeling that Ohio EPA provided (OH Response, Attachment 1) in making a designation of attainment.

One commenter (OH Response) stated that Ohio EPA provided revised refined dispersion modeling in this source area, in which AERMOD and AERMET were used in the regulatory default modes (OH Response, Attachment 1). Commenter stated that this dispersion modeling analysis used hourly variable SO<sub>2</sub> emissions, a variable background concentration and corrected 2014 meteorology data. Commenter stated that, for this analysis, the maximum modeled 3-year design value, years 2012-2014, was 74.1 ppb, including background and, thus, no exceedance of the standard was modeled.

***EPA's Response:***

See the EPA's response to other comments in this section below.

***Comment:*** Some commenters (OH Response, 0296-FirstEnergy, 0299-OH Utilities Group, 0314-OH Valley Electric, 0327-AEP) did not agree with the EPA's objection to Ohio EPA's use of the beta option LOWWIND3. Also see section III.A.1 regarding LOWWIND3.

One commenter (OH Response) stated that Ohio EPA provided justification to utilize the LOWWIND3 and ADJ\_U\* options to the EPA on September 16, 2015 and December 17, 2015. Commenter stated that Ohio EPA consulted with the EPA and requested approval of the use of these beta options. Commenter stated that Ohio EPA is providing additional technical support information (OH Response, Attachment 1) to the EPA, including an expanded statistical analysis of model performance in the Gallia County, Ohio area. Commenter stated that, based upon the analysis performed by Ohio EPA in this source area, the only reliable indicator of any designation status for this area is modeling that incorporates the LOWWIND3 beta option. Commenter questioned why the EPA asserts LOWWIND3 is not appropriate in this specific area when Ohio EPA has provided a robust area-specific analysis justifying its use, yet the EPA proposes it as a regulatory default that could thereby be used in any area without the need for any analyses.

One commenter (0296-FirstEnergy) agreed with Ohio EPA's modeling work and their recommendation that the area surrounding the Gavin plant (Gallia County) should be classified as attainment. Commenter stated that Ohio EPA has fulfilled the recommendations set forth in Appendix W that pertain to the use of beta models, and EPA should therefore more carefully consider Ohio EPA's recommendations, and ultimately approve their submissions.

One commenter (0314-OH Valley Electric) stated the U.S. EPA has proposed to discount the Ohio EPA modeling results and designate this area as unclassifiable due to its apparent determination that Ohio EPA's modeling is inadequate due to the use of the LOWWIND3 Beta Option and the numerous inaccuracies identified in various reviews of the independently submitted Sierra Club modeling.

Two commenters (0314-OH Valley Electric, 0327-AEP) provided a Table in their comment letters and stated that the Table provides additional support and justification to the Ohio EPA demonstration. Commenters stated this is a supplement to the Ohio EPA demonstration that further amplifies the conclusion that LOWWIND3 provides superior model performance in the Gallia and Meigs County area when compared to a monitor that was sited at an area that had historically observed elevated SO<sub>2</sub> readings.

One commenter (0332-AD-Sierra Club) stated that, as explained in Sierra Club's national comments, EPA should not approve the use of ADJ\_U\* and LOWWIND3 beta options. See section III.A.1 of this document.

***EPA's Response:***

While EPA has proposed to modify 40 CFR Part 51 Appendix W to provide for more routine use of selected beta options including LOWWIND3 and ADJ\_U\*, unless and until such revisions are made, it is necessary that the use of these options in regulatory actions be justified and approved as alternate modeling techniques pursuant to Appendix W section 3.2.2. A commenter objects to being subject to a specific process for evaluating requests for justifying the use of alternative model options, identified in a memorandum issued after Ohio's submittal of modeling using these beta options. However, with or without this memorandum, during the time before any revisions are made to Appendix W, i.e., before any judgments are made as to the merits of these options as a general matter, it would be inappropriate for the EPA to rely on modeling results based on the use of these beta options without justification that these beta options improve the performance of the model in the particular areas being addressed.

The site from which Ohio obtained the data for its comparison to model estimates is located approximately 13 kilometers from the modeled sources, whereas the maximum modeled concentration was approximately 1.2 kilometers from one of the sources. Therefore, the EPA finds that model performance at the monitoring site in this area is not a reliable indication of how well the model is performing in the area of maximum concentrations or whether the use of beta options improve that performance. Additional statistics from the comparison at the monitoring site do not alter the conclusion that the available information is insufficient to evaluate the merits of the beta options in this area or to justify the use of these beta options.

***Comment:*** One commenter (0332-AD-Sierra Club) urged the EPA to issue a final nonattainment designation for Gallia County, Ohio. Commenter stated that the Sierra Club submitted modeling analyses in September 2015 (Exhibit 1 attached to their comment letter) and March 2016 (Exhibit 3) that show exceedances of the SO<sub>2</sub> NAAQS. Commenter stated that their 2015 modeling analysis complied with all regulatory requirements and did not agree that it is not reliable. As described in detail in their letter, commenter stated that their March 2016 modeling responds to certain concerns raised by Ohio EPA, and confirms that the Gavin and Kyger Creek plants have caused and will continue to cause significant violations of the SO<sub>2</sub> NAAQS. Commenter asserted that the State of Ohio submitted unreliable modeling that used two low-wind-speed beta options that are not approved for regulatory use. Commenter asserted that, if the state had not selected these beta options, its analysis would have very likely predicted

exceedances of the NAAQS. Commenter stated that against the Sierra Club modeling showing nonattainment, there is no reliable evidence showing attainment.

One commenter (0332-AD-Sierra Club) stated that, even if EPA were to consider the beta options for the designation here, Sierra Club's modeling analysis would still support a nonattainment designation for Gallia County. Commenter stated that, even if the peak impacts were reduced by 11 ppb, Sierra Club's modeling would continue to show exceedances of the standard (set at 75 ppb).

One commenter (0332-AD-Sierra Club) agreed with the EPA that the SO<sub>2</sub> monitor in Meigs County does not support an attainment designation. Commenter stated that, at 13 km from the Gavin stack, the Meigs County monitor is far too distant to capture peak SO<sub>2</sub> impacts from Gavin which, according to Sierra Club's modeling, occur within 2-4 km of the Gavin plant and because such impacts sometimes occur to the southeast of the Kyger Creek plant, in the opposite direction from the Meigs County monitor.

One commenter (OH Response) stated that a nonattainment designation would be inappropriate at this time. Commenter stated that there is significant bias and error determined at the representative monitor in the source area. Commenter stated that, if the EPA promulgates a designation other than attainment, the uncertainty of the modeled results demonstrated in this submittal must be taken into account. Commenter stated that the EPA's acknowledgement that there is a performance issue with AERMOD under low-wind conditions must be taken into account. Commenter stated that it would be highly inappropriate for the EPA to promulgate a designation of nonattainment based on a model that is demonstrably over-predictive until such a time that the inadequate performance of the AERMOD model under low wind conditions is corrected, and that such corrections be readily available for use by the States and not subject to overly complicated and burdensome demonstrations. Commenter stated that, if the EPA were to entertain a designation of nonattainment for this area based on this modeling, the State of Ohio must again be given time to review and comment on this modeling and any amended technical support document supporting such a designation, at least 120-days prior to such a designation occurring.

One commenter (OH Response) stated that the first round of modeling submitted by the Sierra Club for this area was flawed, as discussed in Ohio EPA's November 17, 2015 comments. Commenter stated that, while Ohio EPA has not had sufficient time to review the more recent Sierra Club comments and modeling, Ohio EPA is doubtful that Sierra Club's modeling corrected faulty 2014 meteorological data or used accurate 2015 emissions.

***EPA's Response:***

EPA finds that, based on the available information, we are unable to determine whether the area is meeting or not meeting the 2010 SO<sub>2</sub> NAAQS at this time. The technical support document for the intended Ohio designations describes a review of the modeling Ohio provided with its recommendations and the modeling that Sierra Club provided in September 2015, and the technical support document for the final designations describes a review of the supplemental

modeling that Ohio provided in April 2016 and that Sierra Club provided in March 2016. In brief, Ohio's supplemental modeling uses background concentrations that reflect adjustments that are not justified and result in understating background concentrations in the area, and Sierra Club's modeling uses an unnecessarily conservative background concentration and reflects greater emissions than were actually emitted by the pertinent sources. While the area is clearly close to the standard, the available evidence is insufficient for the EPA to determine whether the area is meeting or not meeting the standard.

While the monitoring data indicate that the Meigs County portion of the area is likely attaining the standard, EPA agrees that the monitor is too far from the primary sources to provide conclusive evidence as to whether portions of the area closer to these sources are attaining the standard.

## XXIII. Oklahoma

### A. Muskogee County

**Comment:** One commenter (0312-OK Sierra Club, 0332-AH-Sierra Club) supported the proposed designation of the portions of Muskogee County near the coal fired power plant operated by Oklahoma Gas and Electric (OG&E) as nonattainment. Two commenters (0312-OK Sierra Club, 0330-Swan, 0334-Swan) expressed concern that unhealthy concentrations of SO<sub>2</sub> created by the power plant lead to adverse health impacts in the community.

One commenter (0332-AH-Sierra Club) stated the Muskogee Power Plant is one of the largest SO<sub>2</sub> emitters in Oklahoma, has no SO<sub>2</sub> controls, and such a designation is compelled by the modeling performed by the State. As described in detail in commenter's letter, commenter stated the EPA rightly concluded that monitoring data is not supportive of an attainment designation since the monitor is not located close to the facility and is not located in the area of highest SO<sub>2</sub> concentration. Commenter stated the EPA correctly rejected Oklahoma's weight of the evidence argument that the area should not be designated nonattainment because a monitor in the area has not shown exceedances. Commenter stated that, as a result, the EPA must base the designation on air quality modeling by the State which supports a nonattainment designation.

**EPA's Response:** The EPA is not at this time taking final action on the designation of the Muskogee area, and will respond to all comments regarding this area at a later time.

**Comment:** Two commenters (OK Response, 0316-OK Gas and Electric) stated the EPA should not proceed with the proposed nonattainment designation for the Muskogee area in 2016 because the EPA's consent decree with Sierra Club does not require EPA to address the Muskogee area at this time.

One commenter (0316-OK Gas and Electric) stated that, given that OG&E announced in 2014 that two of the Muskogee units will be converted to burn only natural gas before January 4,

2019, the timing of this announcement meets the consent decree deadline for such announcements. Commenter stated OG&E remains committed to the conversion of these two units, and the conversions will address the modeled nonattainment of the area quicker than a designation would. Commenter stated that a designation would result in a meaningless and administratively burdensome paperwork exercise for both EPA and the State which is unnecessary to protect public health and the environment since a previously approved source-oriented monitor for the Muskogee area is well in attainment.

One commenter (OK Response) requested the EPA reconsider its intended designation of a portion of Muskogee County as being a nonattainment area. Commenter stated that the EPA is not required to designate a portion of Muskogee County at this time, due to Oklahoma Gas and Electric's (OG&E) Muskogee Generating Station having satisfied criteria which exempts it from this round of designations pursuant to the Consent Decree (CD) at issue. As described in detail in their letter, commenter stated that, because OG&E announced for retirement Units 4 and 5 at the Muskogee Generating Station within the meaning and timeframe established by the CD, it is therefore exempt from the CD. Commenter stated that the Muskogee Generating Station should be included in a subsequent designation round under EPA's Data Requirements Rule (DRR) and Muskogee County should be designated at a later date. Commenter noted that the area's major sources of SO<sub>2</sub> are currently in the process of retiring a total of three coal-fired units, which will result in significant reductions of SO<sub>2</sub> in the area.

**EPA's Response:** The EPA is not at this time taking final action on the designation of the Muskogee area, and will respond to all comments regarding this area at a later time.

**Comment:** Commenter (0316-OK Gas and Electric) stated that, if the EPA determines that the Muskogee area should be included in the 2016 round of designations, the EPA should designate the Muskogee area as attainment for the following reasons: (1) an EPA-approved source-oriented monitor shows attainment; (2) real-world monitoring data contradicts the model's conclusions; (3) federally enforceable regional haze emission limits should be considered in the modeling; and (4) the monitor is being moved to correlate with the modeling. Additional details regarding these points are included in the commenter's letter.

**EPA's Response:** The EPA is not at this time taking final action on the designation of the Muskogee area, and will respond to all comments regarding this area at a later time.

## B. Noble County

**Comment:** One commenter (0316-OK Gas and Electric) agreed with the EPA's determination that the area surrounding the Sooner Generating Station in Noble County, Oklahoma should be designated as unclassifiable/attainment. Commenter agreed with EPA that the modeling conducted by DEQ satisfied EPA guidance and showed the area in attainment with the 2010 SO<sub>2</sub> NAAQS.

**EPA's Response:**

The EPA acknowledges the comment and agrees for the reasons detailed in the final Oklahoma technical support document, and is designating that area as unclassifiable/attainment.

## XXIV. South Dakota

### A. Grant County

**Comment:** One commenter (SD Response) requested the EPA reconsider its proposed unclassifiable designation and designate Grant County in attainment of the 1-hour sulfur dioxide standard. Commenter provided additional modeling and monitoring information and stated that all of the information South Dakota submitted to EPA indicates Grant County is in attainment. Commenter stated that South Dakota does not have and is not aware of any reliable documentation that would indicate Grant County would not be in attainment.

Commenter (SD Response) stated that new modeling shows compliance with the 1-hour standard by a wide margin, and thus supports the designation of Grant County as being in attainment. Commenter stated that included in the Burns & McDonnell modeling report (report attached to SD Response letter) is a description of the model, input parameters, and results for the SO<sub>2</sub> modeling of the Big Stone Plant. Commenter stated this modeling was conducted in accordance with the EPA and SD DENR modeling guidelines, including an adjustment factor that was applied to Big Stone Plant's federally enforceable 30-day rolling average SO<sub>2</sub> emission limitation, as specifically directed by EPA. Commenter stated that the new modeling also confirms that South Dakota's monitor operated in 2001/2002 near the Big Stone power plant was located in the high concentration area.

Commenter (SD Response) stated that DENR operates sulfur dioxide monitors at four locations in South Dakota and all four of these monitors prove South Dakota is attaining the 1-hour sulfur dioxide standard. Commenter stated that South Dakota submitted 12 months of historical monitoring data conducted near the Big Stone power plant which indicated the area is attaining the 1-hour sulfur dioxide standard and that modeling conducted at the time indicated the monitor was located in an area where high concentrations would likely be found. Commenter stated that their conclusion is strengthened by the Big Stone power plant's recent reductions in sulfur dioxide emissions. Commenter stated that the Big Stone power plant is operating using emission controls installed in December 2015 which reduced emissions by 82 percent.

**EPA's Response:** The EPA's review of South Dakota's updated designation recommendation can be found in the final South Dakota technical support document for this designation.

## XXV. Tennessee

### A. Sumner County

**Comment:** In the EPA's February 16, 2016, intended designations, we indicated that Tennessee provided additional information dated December 28, 2015, to support the State's recommendation. The Agency did not have sufficient time to complete a full review at that time, but indicated it would be considered prior to final designations. Tennessee subsequently updated the December 28, 2015, information with additional data on March 4, 2016. The purpose of this additional information was to present the dispersion modeling results that were performed in support for assessing compliance with the 1-hour SO<sub>2</sub> NAAQS for designation purposes. The primary objective of the modeling analysis by the State was to demonstrate that SO<sub>2</sub> emissions from the TVA Gallatin Fossil Plant would not cause or contribute to a violation of the 1-hour SO<sub>2</sub> NAAQS.

**EPA Response:** The EPA has considered all of the information presented by Tennessee in the December 28, 2015, and March 4, 2016, submissions and has addressed that information in the final Tennessee TSD.

## XXVI. Texas

### General Comments

**1. Comment:** Commenter (0294-TCEQ) stated that the nonattainment designations that the EPA proposes for portions of Freestone, Anderson, Rusk, Gregg, Panola, and Titus Counties appear to have been based solely on third-party, non-peer reviewed modeling that has errors and clearly overestimates actual SO<sub>2</sub> concentrations as evidenced by the actual monitoring data in the proposed Gregg County nonattainment area.

**EPA's Response:** The EPA is not at this time taking final action to designate these areas, and will address comments regarding them at a later date.

**2. Comment:** Commenter (0294-TCEQ) stated that for Fort Bend, Milam, and Potter Counties, the State's recommended unclassifiable/attainment designations are more appropriate than the EPA's unclassifiable designation because no SO<sub>2</sub> monitoring data exists for Fort Bend and

Milam Counties and the regulatory monitor in Potter County does not have three complete years of data but has been monitoring well below the standard.

**EPA's Response:** EPA received revised modeling information for Fort Bend County and is revising its recommendation that Fort Bend be unclassifiable and is designating the area as unclassifiable/attainment. With regard to Potter County, EPA has stated and maintains that the presence of monitoring data showing attainment is not sufficient to determine an area is attainment because the monitor may not be located at the point of maximum impact. We received no additional information for this county. Therefore, we are finalizing our proposal that the area be unclassifiable. We refer the reader to the proposed and final TSD for our full evaluation. The EPA is not at this time taking final action on the designation of the Milam area, and will respond to all comments regarding this area at a later time.

**3. Comment:** As described in commenter's (0274-Mann) letter, over 1300 Sierra Club members and supporters in Texas submitted personal comments (attached to commenter's letter) to Administrator McCarty in support of EPA's proposed SO<sub>2</sub> nonattainment designations near the three Luminant plants (Big Brown, Monticello, and Martin Lake). Commenters generally stated that the three Luminant power plants in the EPA plan are among the worst polluters in Texas and even in the nation because none of them have modern pollution controls for sulfur dioxide and stated that it is time that these old plants are held to the public health standards that exist to ensure healthy air for all.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

4. **Comment:** One commenter (0328-Luminant) stated the EPA has been clear that monitoring data is preferred for NAAQS designations, and EPA's offer for states to use modeling for the SO<sub>2</sub> NAAQS was simply intended to provide states with another option. EPA's new approach here to require modeling and rely solely on that data for designations is inconsistent with the statute and EPA's prior practice.

**EPA's Response:** The EPA is not at this time taking final action to designate the areas addressed in Luminant's comments, and will respond to comments on those areas at a later date. As a general matter, EPA has not required that modeling be conducted for the sources covered by the consent decree. Rather, the EPA is considering all information made available to the EPA in making designation determinations. Outside parties utilizing the modeling option for locations without adequate monitoring data have provided valuable information to the EPA, and in many cases have assisted EPA in SO<sub>2</sub> designations for the areas at issue in this final action.

5. **Comment:** One commenter (0328-Luminant) stated the EPA should uphold the State of Texas' recommended designations or at most, and as it did for Sandow Power Company, designate the areas around Martin Lake and Big Brown unclassifiable and allow the installation of monitoring equipment to properly evaluate and measure actual air quality for the purposes of designating attainment and nonattainment areas. Commenter stated that, based on conservative

modeling of future operating conditions (0328-Luminant, Attachments 1-4), areas around Martin Lake and Big Brown, which include Rusk, Panola, Freestone and Anderson Counties, should be designated unclassifiable/attainment, and the area around Monticello, which includes Titus County, should be designated attainment or unclassifiable/attainment.

One commenter (TX Response) stated that Luminant recently submitted to the TCEQ (March 2016) AERMOD modeling analyses prepared by AECOM that characterize one-hour SO<sub>2</sub> concentrations in the vicinity of the Monticello Steam Electric Station, Big Brown Steam Electric Station, and Martin Lake Steam Electric Station using 2013- 2015 actual hourly emissions. Commenter stated the company intends to submit the reports (included in TX Response, Attachment 5), *Luminant Modeling Analyses*, and the associated modeling files to the EPA, to support attainment designations for the 2010 SO<sub>2</sub> NAAQS. Commenter stated Attachment 5 includes: A. *Characterization of One-Hour SO<sub>2</sub> Concentrations in the Vicinity of the Monticello Steam Electric Station*; B. *Supplemental Characterization of One-Hour SO<sub>2</sub> Concentrations in the Vicinity of the Monticello Steam Electric Station: Future Case*; C. *Characterization of One Hour SO<sub>2</sub> Concentrations in the Vicinity of the Big Brown Steam Electric Station*; and D. *Characterization of One-Hour SO<sub>2</sub> Concentrations In the Vicinity of the Martin Lake Steam Electric Station*.

One commenter (TX Response) stated the recent Luminant (March 2016) modeling analyses use source characterization techniques (AERLIFT and AERMOIST) as well as the low wind options (ADJ\_u\* and LOWWIND3) to address several technical issues related to AERMOD. Commenter stated the EPA and stakeholders discussed some of these technical issues during the 10th Modeling Conference, 11th Modeling Conference and the Regional, State, and Local Modeling Workshops in 2012, 2013, and 2014. Commenter stated that, while TCEQ did not have time to review the appropriateness of the source characterization techniques, Luminant provided documentation of peer-reviewed and published scientific literature to support the use of each technique and option (included in TX Response, Attachment 5). Commenter stated that the report states that the modeling results do not account for the penetrated plume over-prediction, which could easily result in lower predicted concentrations.

One commenter (TX Response) asserted that air quality monitoring is the only way to accurately characterize air quality. Commenter stated that, while AERMOD is a useful tool in certain situations, it does have known technical issues and the information provided by Luminant should be considered as additional support for the unclassifiable/ attainment designations recommended by Texas for Titus, Freestone, and Rusk Counties.

**EPA's Response:** The EPA is not at this time taking final action on the designation of the areas addressed by the commenters' points raised above, and will respond to all comments regarding them at a later time. Please refer to the earlier discussions in this RTC regarding general comments on the use of modeling in designations actions.

6. **Comment:** EPA rejects Sierra Club's modeling for the Gibson, Indiana area for the lack of "[u]se of hourly stack parameters more accurately characterize plume characteristics, which will provide greater reliability both in the estimated concentration and in the geographical distribution of concentrations." But for the same error in Sierra Club's modeling of the Martin Lake area, for example, EPA simply states that Sierra Club did not use variable stack temperatures and velocities "because they [we]re not publically available.

**EPA's Response:** The EPA is not at this time taking final action on the designation of the Martin Lake area, and will respond to all comments regarding this area at a later time.

7. **Comment:** One commenter (328-Luminant) stated that for Gibson, Indiana there were several ambient monitors located near the source, including monitors near the highest projected concentrations. However, the peak modeled concentration from the State of Indiana's modeling was approximately two times higher than the monitored concentrations from the two monitoring stations near Gibson when excluding background). Based on this an equation was given which among other factors attempted to adjust the Sierra Club modeling design value down by a factor of 2 for Big Brown, Martin Lake and Monticello.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

8. **Comment:** One commenter (0328-Luminant) stated the EPA's proposal is unlawful and should not be finalized, in part, because EPA's proposal relies solely on over-predictive Sierra Club modeling of Luminant's facilities. Commenter stated the flaws in Sierra Club's modeling arise from both the over-predictive aspects of its dispersion model and from errors in assessing source characteristics and, once corrected for those flaws, Sierra Club's modeling would show attainment with the standard and therefore should not be relied upon to overturn Texas's recommended designations. Commenter's letter (pdf pages 27-36) details why they believe the Sierra Club's modeling is biased, flawed, and unreliable for the three Luminant plants. Commenter's letter (pdf pages 43-49) details why they believe the areas around Luminant's plants show attainment when Sierra Club's modeling errors are corrected.

Commenter (0328-Luminant) stated that, while the Sierra Club submitted 27 AERMOD modeling evaluations alleging violations for specific locations, the EPA accepted only ten of these evaluations – including the three Luminant locations model evaluations – and disregarded approximately 63% of the Sierra Club AERMOD evaluations because of the same errors present in Sierra Club's modeling of Luminant's plants. Commenter stated the EPA should likewise disregard Sierra Club's modeling here.

One commenter (0328-Luminant) stated that, in a similar situation, EPA rejected modeling prepared by Sierra Club for the Gibson Station in Indiana. Commenter stated that Luminant has applied a similar analysis to the Sierra Club modeling submitted for its Big Brown, Martin Lake, and Monticello facilities and confirmed that Sierra Club has likely over-predicted the concentrations of SO<sub>2</sub> in the area around those facilities and that the modeling does not "clearly demonstrate" nonattainment.

Commenter (0328-Luminant) stated that the EPA's reliance on the Sierra Club modeling would deny Luminant and the State of Texas the opportunity to gather actual monitoring data to use for determining attainment status and is inconsistent with the CAA, EPA's regulations, and EPA's prior practice. Commenter stated that correcting the problems with that modeling demonstrates that modeling is inexact and cannot be used to demonstrably determine the attainment or nonattainment status of any area with the SO<sub>2</sub> standard, and specifically undermines any reliance on Sierra Club's overstated modeling.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

9. **Comment:** One commenter (0328-Luminant) stated the EPA's proposal is unlawful and should not be finalized, in part, because Luminant is submitting with their comments a modeling analysis for Freestone, Rusk, Titus, Anderson, and Panola Counties that supports an attainment or unclassifiable designation for each of these counties. Commenter stated that, in the face of conflicting analyses, EPA should either retain Texas's recommended designations or utilize the unclassifiable designation, or the unclassifiable/attainment designation, until monitoring data can be obtained.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

10. **Comment:** One commenter (0328-Luminant) stated the EPA's proposal is unlawful and should not be finalized, in part, because EPA has not demonstrated that its proposed changes to Texas's designations are "necessary" as it is required to do under the CAA. Commenter's letter (pdf pages 50-57 and attachments 1, 2 and 4) details why they believe Luminant's forecasted operations confirm that a modification of Texas' designation recommendations for the areas around these plants is not "necessary." Commenter stated that additional modeling, based on reasonable assumptions of future operating conditions, submitted with their comments demonstrates that the affected counties will not exceed the NAAQS in the future. Commenter stated that changes to Texas's proposed designations are not "necessary" when modeling of future operating conditions during the period of evaluation show attainment and, thus, EPA has no authority under the CAA to, and should not, finalize these designations. Commenter stated that a designation of nonattainment as EPA proposes for these areas would not serve the purposes of section 110 or 107 in any event because it would not accelerate attainment of the NAAQS for these areas.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

11. **Comment:** One commenter (0328-Luminant) stated the EPA's proposal is unlawful and should not be finalized, in part, because, in the face of inconsistent modeling results, the record

before EPA does not “clearly demonstrate” nonattainment of the SO<sub>2</sub> standard as is required under the CAA and, thus, the EPA has no authority under the CAA to, and should not, finalize these designations.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

12. **Comment:** One commenter (0328-Luminant) stated that, if EPA will not reinstate Texas' recommendation of attainment for each of these counties, then, in light of the lack of monitored data and conflicting modeling assessments, EPA must designate the areas around these facilities as “unclassifiable.” Commenter stated the CAA provides this classification option, and EPA has confirmed that it should apply this designation wherever available information does not clearly demonstrate that a nonattainment or attainment designation is warranted.

One commenter (0328-Luminant) provided a detailed discussion of the unclassifiable designation, including legislative history, case law, and EPA guidance and concluded that an unclassifiable designation is required where data is insufficient to support a designation of attainment or nonattainment. Commenter stated that, because of all the factors that influence modeling, modeling results in this case cannot “clearly demonstrate” that a nonattainment designation is warranted and should not be relied on for such purposes. Commenter stated the only monitoring data available shows attainment of the standard and Luminant's modeling shows that any monitor sited near one of its locations will also be attaining the standard. Commenter stated that, accordingly, EPA must designate the areas around Luminant's plants as unclassifiable and allow for monitors to be placed into service to acquire three years of data to accurately characterize actual air quality for attainment and nonattainment designations.

One commenter (0328-Luminant) stated that, although the Consent Decree requires EPA to complete designations of certain areas before monitoring data can be collected, it does not compel or authorize EPA to rely on questionable modeling and, therefore, where EPA lacks monitoring data, and modeling data is uncertain, EPA must use the unclassifiable designation. Commenter's letter (pdf pages 57-61) details why they believe that, to avoid a conflict between the Consent Decree, the DRR, and CAA's cooperative federalism system, EPA should designate the areas around Luminant's facilities as unclassifiable/attainment or unclassifiable until additional, reliable information is available to inform some other designation.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

13. **Comment:** One commenter (0332-AI-Sierra Club) supported the EPA's proposal to designate areas surrounding the Big Brown power plant in Freestone County, Texas, the Martin Lake power plant in Rusk County, Texas, and the Monticello power plant in Titus County, Texas as nonattainment areas for purposes of compliance with the 2010 1-hour SO<sub>2</sub> NAAQS. Commenter stated that there are no monitoring stations located close to these three plants, and both the State of Texas and the plants' owner chose not to submit any modeling. Commenter stated the only evidence before EPA is the modeling submitted by the Sierra Club, which

supports EPA's proposed nonattainment designation. Commenter stated that, with the updated modeling and analysis attached to their comments, three separate rounds of modeling (September 2015, December 2015, and March 2016) have now reached the same result: Big Brown, Martin Lake, and Monticello cause the areas surrounding each facility to be in nonattainment of the 1-hour SO<sub>2</sub> NAAQS.

Commenter stated that September 2015 modeling by Wingra Engineering demonstrates the areas surrounding Big Brown, Martin Lake, and Monticello should be designated as nonattainment areas. Commenter stated that, on December 14, 2015, Sierra Club submitted updated modeling analyses for Big Brown and Monticello which demonstrated that even using the most recent emission data and adjusting certain emissions and stack parameter assumptions, as suggested by TCEQ, Big Brown, Monticello, and Martin Lake caused significant exceedances of the 1-hour standard in the surrounding areas.

Commenter stated that, as explained in detail in comments prepared by Dr. H. Andy Gray (Exhibits 1 and 2 to commenter's 0332-AI-Sierra Club letter), making adjustments to Wingra Engineering's 2015 modeling, as suggested in the EPA TSD, would not change the outcome from nonattainment to attainment, given the large margin by which emissions from these plants exceed the NAAQS and the minor differences expected from these adjustments. Commenter stated that, in response to the issues raised in EPA's TSD for Texas, Sierra Club retained Wingra Engineering and Dr. H. Andrew Gray to update the modeling for Big Brown, Martin Lake, and Monticello. Commenter stated the March 31, 2016 modeling confirms that even after making all of the potential adjustments identified by EPA, the SO<sub>2</sub> concentrations in the areas surrounding Big Brown, Martin Lake, and Monticello exceed the 1-hr SO<sub>2</sub> NAAQS. These modeling analyses are in Exhibits 3-5 attached to commenter's (0332-AI-Sierra Club) letter.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

**14. Comment:** One commenter (TX Response) stated that the TCEQ reviewed the December 2015 Sierra Club supplemental modeling and, while the modeling did address some issues, a number of techniques used in the modeling are still not consistent with the EPA's SO<sub>2</sub> Modeling TAD. Commenter stated that the EPA's review of the additional modeling also identified several of the same inconsistencies, such as the exclusion of building downwash and use of flagpole receptors. Commenter stated that, in addition to the inconsistencies, several refinements should be made to the modeling to more accurately represent conditions near the sites. Commenter stated that background concentrations should be refined, varying stack parameters should be used, and the 1992 National Land Cover Dataset used should be updated with recent data. Commenter stated that this is especially relevant for sites with predicted concentrations relatively close to the NAAQS, such as Monticello Steam Electric Station. Commenter stated the combination of these errors could lead to the over-prediction of NAAQS exceedances in Anderson, Gregg, and Panola Counties. Commenter noted that the Sierra Club modeling predicted only a few receptors in Gregg County would marginally exceed the NAAQS. Commenter stated that the EPA's review of the Sierra Club's modeling for Martin Lake indicated the "inclusion of downwash often leads to higher concentrations closer to the source."

Commenter stated that, if more SO<sub>2</sub> emissions reach ground level near the source, this would almost certainly reduce the impact farther away, i.e. in Gregg and Panola Counties.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

#### A. Atascosa County

**Comment:** Two commenters (TX Response, 0294-TCEQ) agreed with the EPA's intended designation for Atascosa County.

**EPA's Response:** The EPA appreciates the support of commenters who agreed with the EPA's proposed designation for San Miguel Electric Lignite Fired Power Plant in Atascosa County.

#### B. Fort Bend County

**Comment:** Two commenters (TX Response, 0275-NRG Energy) requested that EPA designate Fort Bend County as unclassifiable/attainment. One commenter (0275-NRG Energy) attached a modeling report that indicates that the area is attaining the standard.

One commenter (TX Response) stated that NRG Energy provided supplemental modeling for the W.A. Parish Electric Generating Station in January 2016 in response to EPA comments on modeling submitted in September 2015 and November 2015. Commenter stated the TCEQ reviewed the supplemental modeling and determined the modeling and refinements made are consistent with the Modeling TAD and support a designation of unclassifiable/attainment for Fort Bend County. Commenter stated the EPA noted several inaccuracies, use of non-representative data, and non-adherence to the Modeling TAD in the Sierra Club's modeling. Commenter stated the EPA should find the recent NRG Energy modeling sufficient to designate the area around W.A. Parish station as unclassifiable/attainment.

**EPA's Response:** The EPA acknowledges the receipt of the modeling analysis provided by industry for Fort Bend County. As detailed in our final Texas Technical Support Document for this county, based on the review of the most recent modeling analysis for Fort Bend County we are revising the designation of this area to unclassifiable/attainment. Additional details regarding the EPA's review and our findings that the revised modeling analysis addresses our previous concerns and is consistent with the Modeling TAD are provided in the final TSD made available as part of this final designations action.

**Comment:** Also see General comments #2 in this section (Texas).

**EPA's Response:** See our response to General Comment # 2 above.

### C. Freestone-Anderson County

**Comment:** Commenter (0294-TCEQ) stated that Anderson and Panola Counties should be designated as unclassifiable/attainment because their SO<sub>2</sub> emissions contributions to their respective proposed nonattainment areas are negligible, and therefore including portions of these counties is unnecessary to control additional SO<sub>2</sub> sources.

One commenter (TX Response) stated that Freestone-Anderson County should be designated unclassifiable/attainment.

One commenter (TX Response) stated that actual point source emissions inventory data for Anderson, Gregg, and Panola Counties indicate either no SO<sub>2</sub> point source emissions or insignificant SO<sub>2</sub> point source emissions. Commenter provided data analysis of the monitored values and point source emissions data in Attachments 1-3 of their comment letter. Commenter stated that, despite the actual monitored or reported data that indicate these counties' contributions to the proposed nonattainment areas are negligible, the EPA relied on third-party, non-peer reviewed modeling which predicted exceedances of the SO<sub>2</sub> NAAQS in these counties. Commenter stated that, because of the uncertainty present in the third-party modeling, the EPA should not impose unjustifiable regulatory burdens of a nonattainment designation on Anderson, Gregg, and Panola Counties.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

### D. Goliad County

**Comment:** Two commenters (TX Response, 0294-TCEQ) agreed with the EPA's intended designation for Goliad County.

**EPA's Response:** The EPA appreciates the support of commenters who agreed with the EPA's proposed designation for Coletto Creek Power Station in Goliad County.

### E. Gregg County

**Comment:** Two commenters (TX Response, 0294-TCEQ) stated the EPA should revise its proposed designation for Gregg County to attainment to comply with federal regulations at 40 CFR 50.17(b) and to reflect the observed air quality data from the regulatory monitor located in that portion of the county which has shown attainment since 2010.

One commenter (TX Response) stated the EPA has offered no rational explanation for refusing to designate as attainment those areas with ambient, regulatory monitoring data that demonstrate that the area is actually meeting the NAAQS. Commenter stated the EPA's actions on the Texas Annual Monitoring Plan and Annual Data Certification clearly indicate that Texas' ambient air monitoring network is in compliance with the Federal Clean Air Act and EPA requirements, both

in terms of placement and data quality, respectively. Commenter stated, when modeling and monitoring data conflict, courts have acknowledged that actual air monitoring data is superior to modeling data so long as the monitor is sufficient to accurately represent the area in question. *E.g., Republic Steel Corp. v. Castle*, 621F.3d797, 805 (6th Cir.1980); *PPG Industries, Inc. v. Castle*, 630 F.3d 462, 467-68 (6th Cir. 1980). Also see section III.C. Monitoring in this RTC.

Commenter (0285-Stoudt) requested that the EPA designate Gregg County as attainment. The commenter stated the EPA's proposal to designate portions of Gregg County as nonattainment disregards the certified monitoring data that are below the standard and relies instead on air quality modeling data of questionable origin and reliability. Commenter stated that the model's level of over-predicted should not be acceptable as the basis for a decision as significant as an attainment designation, particularly when certified monitoring data is available. The commenter stated that the proposed nonattainment area boundaries went beyond the receptors identified in the model as impacted by the Martin Lake Steam Electric Station., most of these receptors were over Lake Cherokee where potential exposure would be intermittent, and as a result, these boundaries include additional area in Gregg County for which there is no basis for a designation. The commenter stated that it seems questionable for a party who initiated the litigation, the Sierra Club, leading to an agreement concerning the designation process to provide the government with which it reached an agreement the data on which designations would be made.

One commenter (0328-Luminant) stated the EPA's proposal is unlawful and should not be finalized, in part, because the portion of Gregg County designated nonattainment contains a monitor that has collected actual data demonstrating attainment with the standard; thus a nonattainment designation for this area is wholly unsupported. Commenter stated the EPA should designate Gregg County as attainment because the design value for the monitor in the county is well below the SO<sub>2</sub> NAAQS.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time. Please refer to the earlier sections of this RTC for responses to general comments on the use of modeling in designations.

**Comment:** One commenter (TX Response) stated that actual point source emissions inventory data for Anderson, Gregg, and Panola Counties indicate either no SO<sub>2</sub> point source emissions or insignificant SO<sub>2</sub> point source emissions. Commenter provided data analysis of the monitored values and point source emissions data in Attachments 1-3 of their comment letter. Commenter stated that, despite the actual monitored or reported data that indicate these counties' contributions to the proposed nonattainment areas are negligible, the EPA relied on third-party, non-peer reviewed modeling which predicted exceedances of the SO<sub>2</sub> NAAQS in these counties. Commenter stated that, because of the uncertainty present in the third-party modeling, the EPA should not impose unjustifiable regulatory burdens of a nonattainment designation on Anderson, Gregg, and Panola Counties. Also see General comment #14 regarding Sierra Club modeling.

**EPA's Response:** The EPA is not at this time taking final action on the designation of these areas, and will respond to all comments regarding them at a later time.

## F. Lamb County

**Comment:** Two commenters (TX Response, 0294-TCEQ) agreed with the EPA's intended designation for Lamb County.

**EPA's Response:** The EPA appreciates the support of commenters who agreed with the EPA's proposed designation for Tolk Electric Station in Lamb County.

## G. Limestone County

**Comment:** Commenters (TX Response, 0275-NRG Energy, 0294-TCEQ) agreed with the EPA's plan to designate Limestone County as unclassifiable/attainment. Commenter (0275-NRG Energy) attached a modeling analysis based on representative actual emissions.

**EPA's Response:** The EPA acknowledges and appreciates the support of commenters who agreed with the EPA's proposed designation for Limestone Power Station in Limestone County as unclassifiable/attainment. As detailed in our proposed designation action and final Texas TSD, the designation of Limestone County is based on the information and results included in industry's most recent modeling analysis dated November 30, 2015, which was resubmitted to us by the commenter.

## H. McLennan County

**Comment:** Two commenters (TX Response, 0294-TCEQ) stated that the EPA's proposed designation of unclassifiable for McLennan County disregards the monitoring data in those counties. Commenters stated that McLennan County should not be designated at this time because Sandy Creek Power Station's 2012 actual emissions are below the emissions threshold established in the EPA's consent decree.

One commenter (TX Response) stated that the EPA should act to approve Sandy Creek Energy Station's petition for an alternate methodology for reporting 2012 substituted emissions data. Commenter stated this would confirm that Sandy Creek Station is not subject to the emissions threshold established in the EPA's consent decree with the Sierra Club and Natural Resources Defense Council. Commenter stated that Sandy Creek's estimate of 2012 actual emissions, taking into account controls and actual conditions, is 25.6 tons, whereas the substituted emissions data used was 4,954.8 tons.

One commenter (TX Response) stated that, as additional evidence for the recommended attainment designation for McLennan County, the TCEQ provided updated AERMOD modeling for Sandy Creek Energy Station using permitted allowable emission rates (TX Response, Attachment 4). Commenter stated the updated modeling fully addresses all of EPA's written concerns regarding the previous modeling submitted for this source, including updated

meteorology and surface characteristics, expansion of the receptor grid, and use of latest versions of AERMET and AERMOD. Commenter stated this modeling demonstration supports the previous recommendation that McLennan County should be designated attainment.

**EPA's Response:** As documented elsewhere in this Response to Comments document and the final Texas Technical Support Document (TSD), based on additional modeling information submitted by TCEQ for Sandy Creek Energy Center we are designating McLennan County as unclassifiable/attainment. We note, as documented in the TSD that accompanied our proposed designation for McLennan County, the absence of a violating monitor within the county of concern when considering the distance of that monitor from a facility is not a sufficient justification to rule out that an exceedance of the 2010 SO<sub>2</sub> NAAQS may occur in the immediate vicinity of the facility. The Waco Mazanec monitor in McLennan County is located approximately 24.5 km from the Sandy Creek Energy Station. It is EPA's continued position that the monitoring data from the Waco SO<sub>2</sub> monitor is not sufficient to support an unclassifiable/attainment designation.

Regarding the commenter's statement that the Sandy Creek Energy Station should not be included in this round of SO<sub>2</sub> designations, we do not agree. The sources included in the second round of SO<sub>2</sub> designations (i.e., "CD sources") were identified based on the 2012 SO<sub>2</sub> emissions information contained in the EPA's Air Markets Database. While both the facility and TCEQ have provided information indicating the 2012 emissions are based on substituted emissions data and not measured emissions data, the magnitude of emissions contained in the Air Markets Database are above the thresholds contained in the March 2, 2015, consent decree. Therefore, the EPA is designating McLennan County as part of this round of designations. We also address the updated modeling proved by TCEQ for McLennan County in our TSD.

**Comment:** One commenter (0300-Sandy Creek Services) requested that the EPA designate McLennan County as attainment, not "unclassifiable." The commenter stated that proposal is unnecessary, unfounded, misinforms the general public, and burdens the State of Texas with additional demonstration requirements. The commenter stated the EPA has based the proposal on inaccurate emissions data, yet even with emissions modeled under the most conservative assumptions, the modeling supported an "attainment" designation. Commenter stated the EPA's treatment of McLennan County stands in stark contrast to far less conservative analyses of far larger sources. Extensive technical analyses are provided in the commenter's letter and attachments. As part of that analysis, the commenter raised the following key points or concerns:

- McLennan County should not be subject to this round of SO<sub>2</sub> designations. The commenter stated that Sandy Creek Energy Station should not have been included because the 2012 emissions information contained in the Acid Rain Database for the 29 days the SCES operated in 2012 was based on data substitution emissions and does not accurately reflect the actual (or allowable) emissions for that 29 day period, or any other. The commenter referenced a 2013 petition filed by SCES with the EPA's Clean Air Markets Division (CAMD) regarding the erroneous emissions data contained in the database that has not been acted on. The commenter also stated that the EPA has

discretion to determine that SCES should not be included in this round on the basis that the petition had been filed with CAMD. (Pages 2-4 of comments pdf)

- The magnitude of SO<sub>2</sub> emissions from the SCES are much lower than emissions from other plants located in Texas for which EPA has proposed an unclassifiable/attainment designation. Comparison of emissions with other plants coupled with the size of the SCES's property warrant an attainment designation. (Pages 4-5 of comments pdf)
- The modeling analysis previously submitted by industry in support of an attainment designation for McLennan County is much more conservative than the analyses submitted and accepted for any other source. (Pages 5-6 of comments pdf)
- The alleged deficiencies identified by the EPA in their proposed designation are at most trivial, with no possibility of affecting the ultimate conclusion regarding the designation for McLennan County. (Pages 6-13 of comments pdf)

**EPA's Response:** We do not agree with the commenter's opinion that our proposed designation of McLennan County was unnecessary, unfounded, misinformed the general public, and burdened the State of Texas with additional demonstration requirements. As outlined in our proposed designation, we were unable to determine if the area surrounding the SCES was meeting or not meeting the NAAQS. Because we lacked definitive information to support a specific designation, the EPA proposed a designation of unclassifiable. During the 120-day period, TCEQ did submit additional technical information, specifically an air dispersion modeling analysis for the area surrounding SCES. As documented elsewhere in this Response to Comments document and the final Texas Technical Support Document (TSD), based on additional modeling information submitted by TCEQ for SCES we are designating McLennan County as unclassifiable/attainment. While our revised designation is not based on the additional information provided by the commenter, we are providing responses to the specific points raised by the commenter below.

In response to a court order, the EPA is required to complete designations for the 2010 primary 1-hour SO<sub>2</sub> standard by July 2, 2016, for areas containing stationary sources that had not been announced as of March 2, 2015, for retirement and that, according to the EPA's Air Market Database, in 2012 emitted in 2012 either (i) more than 16,000 tons of SO<sub>2</sub>, or (ii) more than 2,600 tons of SO<sub>2</sub> with an annual average emission rate of at least 0.45 lbs SO<sub>2</sub>/mmBTU. As of March 2, 2015, the SCES had not met the specific requirements for being "announced for retirement" and in 2012 the facility emitted 4,955 tons of SO<sub>2</sub>, and had an emission rate of 1.41 lbs SO<sub>2</sub>/MMBtu based on the EPA's Air Markets Database. In our proposal, we acknowledged that SCES had submitted a petition regarding the 2012 emissions contained in the Database and indicated that if that petition was approved and the Air Market's Database is updated to reflect a change in the reported emissions by the deadline for designations, the EPA consent decree obligation to designate this area by July 2, 2016, would not apply. Absent an update to the 2012 emissions data, the SCES does meet the requirements for the consent decree; and therefore, the consent decree applies to the source and the EPA is under obligation to designate this area by July 2, 2016.

As the commenter stated in their letter, predicted impacts are dependent upon source-specific parameters and a straight comparison of annual plant-wide SO<sub>2</sub> emissions between facilities does not provide information that is sufficient to find the area is attaining of the 2010 SO<sub>2</sub> NAAQS.

While the comparison of plant-wide actual emissions may provide some additional information about a given facility, it does not provide information regarding the SO<sub>2</sub> concentration values. As stated in our proposed designation, based on the information available at the time of our proposal we were unable to determine whether the area was meeting or not meeting the NAAQS and an unclassifiable designation was proposed.

The TSD accompanying our proposed designation of McLennan County outlined our evaluation of the modeling submittal for the SCES provided by industry. While we agree that several of the approaches used in this modeling would be considered conservative (i.e., modeling of permitting emission rates, background value combined with modeled concentrations, and inclusion of all receptors within a given grid without consideration of access), the original submittal did not provide information regarding the level or magnitude of conservatism provide by these approaches. Furthermore, we identified several areas where the modeling was inconsistent with the EPA's modeling guidance. Therefore, the modeling submittal did not provide sufficient information to support a specific NAAQS designation resulting in the EPA's proposed designation of McLennan County as unclassifiable.

As stated in the summary of the EPA's evaluation for the proposed unclassifiable designation for McLennan County, we identified several areas where the SCES modeling analysis submitted by industry was not consistent with the TAD. The combined potential impacts from these inconsistencies resulted in the determination that the modeling analysis, as submitted, was not sufficient to support a designation of unclassifiable/attainment. The information included in the initial modeling, nor the recent feedback provided by the commenter, do not provide any demonstration to support the claims that the inconsistencies with the TAD would not have resulted in significant differences in the modeling results. Without additional information to support these claims, it is unclear how the modeled concentrations would change if these inconsistencies were addressed. Therefore, we do not have sufficient information available to base a designation of unclassifiable/attainment using the modeling results provided by industry.

The EPA's discussion regarding the modeled receptor grid did acknowledge that modeled impacts throughout the grid were below the 2010 SO<sub>2</sub> NAAQS. However, as stated in the TSD, revised modeling conducted to address the inconsistencies with the modeling TAD may result in modeled areas of concern within the relatively small receptor grid that may require the inclusion of additional receptors outside the originally modeled 5-km receptor grid to demonstrate that no violations of the 1-hour SO<sub>2</sub> NAAQS are predicted in the area surrounding the SCES.

We do not agree that modeling conducted with an older version of AERMOD is not inconsistent with the modeling TAD. As documented in the model release information, the revised versions of AERMOD, which include various bug fixes and/or enhancements replace the previous version of the model. Therefore a reference to AERMOD within a guidance document is referencing the current release of the model, since previous version(s) have been replaced by the most recent release. Regarding the impact of the model version upon modeled impacts, this finding is one of several regarding the inconsistency of the SCES modeling analysis with EPA modeling guidance – specifically the modeling TAD. The original modeling submittal, nor the recent feedback provided by the commenter, do not quantify the differences in the predicted impacts as a result of the older model version. Even if these differences were quantified via test case information or

other information made available, it would not address the other inconsistencies in the modeling as compared with the modeling TAD. As previously stated in our proposal, based on the inconsistencies in the modeling with current EPA guidance, we do not have sufficient information based on the industry submitted modeling to support a designation of unclassifiable/attainment.

As stated in the TSD accompanying the proposed designation of McLennan County the meteorological data used in the SCES modeling analysis was outdated. Furthermore, the use of this data was inconsistent with the modeling TAD, especially considering that more recent meteorological data is available for the same station. The modeling TAD states the following: “When using allowable emissions, the most recent permitted or PTE rate should be used along with the most recent three years of meteorological data.” The meteorological data included in the industry modeling is not consistent with modeling TAD.

The Modeling TAD provides information regarding the surface characteristics that should be used in the processing of meteorological data. In cases where meteorological data is not site-specific and instead taken from a meteorological station determined to be representative of the facility, the surface characteristics of the meteorological site (and not the facility) should be used in processing in the meteorological data Section 8.3.c of Appendix W and the AERSURFACE User’s Guide (U.S. EPA 2008)]. When choosing the preprocessed meteorological dataset to be used in the SCES modeling, industry calculated the surface characteristics at the facility, which is not consistent with EPA modeling guidance. As stated previously, this is one of the inconsistencies found in the initial SCES modeling that resulted in our determination that the modeling did not adequately indicate that the area surrounding the facility is attaining the 2010 1-hour SO<sub>2</sub> NAAQS.

#### I. Milam County

**Comment:** One commenter (TX Response) stated that Milam County should be designated unclassifiable/attainment.

**EPA Response:** The EPA is not at this time taking final action on the designation of the Milam area, and will respond to all comments regarding this area at a later time.

**Comment:** See General comments #2 in this section (Texas).

**EPA Response:** The EPA is not at this time taking final action on the designation of the Milam area, and will respond to all comments regarding this area at a later time.

#### J. Panola County

**Comment:** Two commenters (TX Response, 0294-TCEQ) stated that Anderson and Panola Counties should be designated as unclassifiable/attainment because their SO<sub>2</sub> emissions contributions to their respective proposed nonattainment areas are negligible, and therefore including portions of these counties is unnecessary to control additional SO<sub>2</sub> sources.

One commenter (TX Response) stated that actual point source emissions inventory data for Anderson, Gregg, and Panola Counties indicate either no SO<sub>2</sub> point source emissions or insignificant SO<sub>2</sub> point source emissions. Commenter provided data analysis of the monitored values and point source emissions data in Attachments 1-3 of their comment letter. Commenter stated that, despite the actual monitored or reported data that indicate these counties' contributions to the proposed nonattainment areas are negligible, the EPA relied on third-party, non-peer reviewed modeling which predicted exceedances of the SO<sub>2</sub> NAAQS in these counties. Commenter stated that, because of the uncertainty present in the third-party modeling, the EPA should not impose unjustifiable regulatory burdens of a nonattainment designation on Anderson, Gregg, and Panola Counties.

**EPA's Response:** The EPA is not at this time taking final action on the designation of this area, and will respond to all comments regarding it at a later time.

#### K. Potter County

**Comment:** One commenter (TX Response) stated that Potter County should be designated unclassifiable/attainment.

**EPA's Response:** Please see the final Texas TSD for detailed reasoning regarding the EPA's final designation of Potter County as unclassifiable.

**Comment:** See General comments #2 in this section (Texas).

**EPA's Response:** See our response to General Comment # 2 above.

#### L. Robertson County

**Comment:** Two commenters (TX Response, 0294-TCEQ) agreed with the EPA's intended designation for Robertson County.

**EPA's Response:** The EPA appreciates the support of commenters who agreed with the EPA's proposed designation for Twin Oaks Power Station in Robertson County.

#### M. Rusk County

**Comment:** One commenter (TX Response) stated that Rusk County should be designated unclassifiable/attainment.

**EPA's Response:** The EPA is not at this time taking final action on the designation of this area, and will respond to all comments regarding it at a later time.

## N. Titus County

**Comment:** One commenter (0328-Luminant) stated that Luminant has provided to TCEQ a modeling report (attachment 3 to their comment letter) which supports a NAAQS attainment demonstration for the plant. Commenter stated this report documents the use of AERMOD modeling to characterize the SO<sub>2</sub> concentrations around the Monticello Steam Electric Station using the 2013-2015 actual hourly emissions. Commenter stated the use of source characterization techniques (AERLIFT and AERMOIST) as well as the low wind options (ADJ\_U\* and LOWWIND3) are supported by EPA's Appendix W proposals as well as peer-reviewed papers available for each option. Commenter stated that the modeling results remain highly conservative because they do not account for the penetrated plume over-prediction, which could easily result in a much lower actual concentration, as was found by EPA for the Gibson Generating Station.

**EPA's Response:** The EPA is not at this time taking final action on the designation of this area, and will respond to all comments regarding it at a later time.

**Comment:** One commenter (TX Response) stated that Titus County should be designated unclassifiable/attainment.

**EPA's Response:** The EPA is not at this time taking final action on the designation of this area, and will respond to all comments regarding it at a later time.