ATTACHMENT K

1-HOUR SULFUR DIOXIDE ATTAINMENT DEMONSTRATION
AND
TECHNICAL SUPPORT DOCUMENT
FOR
CENTRAL, WEST CENTRAL, AND SOUTHWEST INDIANA
NONATTAINMENT AREAS

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1-Hour Sulfur Dioxide Attainment Demonstration And Technical Support Document

For Central, West Central, and Southwest Indiana Nonattainment Areas

Daviess (Veale Township), Marion (Wayne, Center, and Perry Townships), Morgan (Clay and Washington Townships), Pike (Washington Township) and Vigo (Fayette and Harrison Townships) Counties, Indiana

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ACRONYMS/ABBREVIATION LIST

AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
BPIP	Building Profile Input Program
CAA	Clean Air Act
CAIR	Clean Air Interstate Rule
CO	Carbon Monoxide
CFR	Code of Federal Regulations
D.C.	District of Columbia
EGUs	Electric Generating Units
FR	Federal Register
GEP	Good Engineering Practice
IAC	Indiana Administrative Code
IDEM	Indiana Department of Environmental Management
MATS	Mercury and Air Toxics Standards
HAPs	Hazardous Air Pollutants
HCl	Hydrochloric Acid
HF	Hydrofluoric Acid
Hg	Mercury
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MWe	Megawatts
MWh	Megawatt hour
NAAQS	National Ambient Air Quality Standards
NAD	North American Datum
NED	National Elevation Dataset
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NO_x	Nitrogen Oxides
NSR	New Source Review
NWS	National Weather Service
OAQ	Office of Air Quality
$PM_{2.5}$	fine Particulate Matter
ppb	parts per billion
PSD	Prevention of Significant Deterioration
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SSI	Sewage Sludge Incineration
TSM	Total Selected Metals
tpy	tons per year
UTM	Universal Transverse Mercator
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
$\mu g/m^3$	micrograms per cubic meter

1.0 OVERVIEW

1.1 INTRODUCTION

Sulfur dioxide (SO_2) is one of six "criteria" pollutants scientists have identified as being particularly harmful to humans and the environment. The Clean Air Act (CAA) requires the United States Environmental Protection Agency (U.S. EPA) to set primary air quality standards at a level judged to be "requisite to protect the public health with an adequate margin of safety," and establish secondary standards requisite to protect public welfare from "any known or anticipated effects associated with the pollutant in the ambient air," including effects on crops, vegetation, wildlife, buildings and national monuments, and visibility.

Sulfur dioxide is part of a group of highly reactive gases known as "oxides of sulfur" and is primarily derived from fossil fuel combustion at power plants and other industrial facilities. Other sources of SO_2 include industrial processes like extracting metal from ore and the burning of high sulfur fuels by locomotives, large ships, and non-road equipment. State and Federal programs such as the Acid Rain Program and vehicle engine and fuel standards (*Tier 2 Tailpipe and Fuel Standards and Diesel Fuel Sulfur Standards*) have resulted in a substantial reduction of SO_2 emissions over the past 30 years.

1.2 NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

The CAA requires U.S. EPA to review National Ambient Air Quality Standards once every five years to determine whether revisions to the standard are appropriate. On June 2, 2010, U.S. EPA promulgated a new primary NAAQS for sulfur dioxide, replacing the two primary standards of 140 parts per billion (ppb) evaluated over 24-hours and 30 ppb evaluated over an entire year with the 1-hour standard of 75 ppb. The primary SO_2 NAAQS is met when the 3-year average of the annual 99th percentile of the daily maximum 1-hour average concentration at any ambient air quality monitor in an area does not exceed 75 ppb. This three-year average is termed the "design value" for the monitor. The design value for a nonattainment area is the highest monitored concentrations at any monitor in the area.

U.S. EPA designated nonattainment areas under the 1-hour SO_2 standard on July 25, 2013. Parts of Daviess, Marion, Morgan, Pike, and Vigo Counties in Indiana were designated nonattainment under subpart 1 of Section 107 of the CAA. Designations were made based on monitored air quality data measured during 2009, 2010, and 2011. Table 1.1 shows the 2009-2011 SO_2 air quality monitoring data for the nonattainment areas.

Table 1.1
Indiana 2009-2011 Air Quality Data used for Nonattainment Area Designations

County	Site ID	Site Name	99th Percentile Values (ppb)			Three Year Design Value (ppb)
			2009	2010	2011	
Marion	18-097-0057	Indianapolis - Harding Street	75	103.4	63	**80**
	18-097-0073	Indianapolis - East 16th Street	61	47.7	59.5	56
	18-097-0078	Indianapolis - Washington Park		20	59.7	40*
Morgan	18-109-1001	Eagle Valley - High Street	98	105	96	**100**
Daviess	18-027-0002	AES/IPL Petersburg-West off of SR 57	138	115	100	**118**
Pike	18-125-0005	Petersburg - Arda Lane	194	211	119	**175**
Vigo	18-167-1014	Terre Haute - Fort Harrison Road	142	169	139	**150**
	18-167-0018	Terre Haute - Lafayette Avenue	115	61.4	95.2	91

* Monitor began operation in 2010
Monitor in Bold has the highest 2009-2011 design value in the respective county.

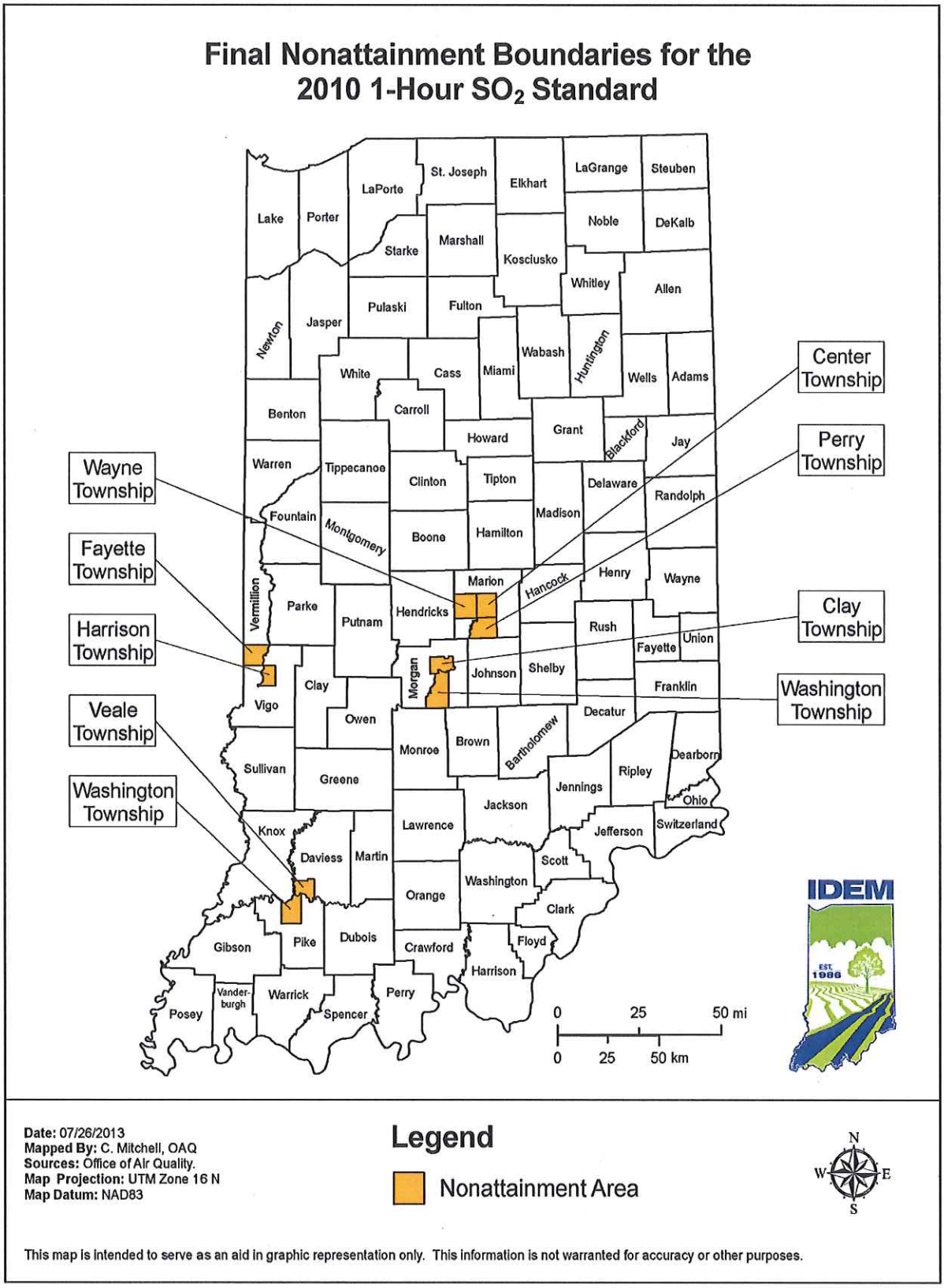
These designations became effective on October 4, 2013. In Indiana, there are nine townships in five counties included in the four designated nonattainment areas (See Figure 1.1). The CAA requires areas designated nonattainment for the SO_2 NAAQS to develop State Implementation Plans (SIP) to expeditiously attain and maintain the standard. Section 172 of the CAA stipulates the requirements nonattainment areas must meet, including the development of a plan to reduce SO_2 emissions. The plan must include an attainment demonstration that shows the area will meet the ambient air quality standard within five years of designation, or by October 2018.

This document demonstrates that, with the combination of current clean air measures and the implementation of new local, state, and federally-required control measures, air quality in the nonattainment areas will meet the SO_2 standard by the attainment date. This document contains the 1-hour SO_2 NAAQS attainment demonstration for the four nonattainment areas. The structure and content of this document addresses each of the elements required by the CAA and U.S. EPA guidance.

1.3 GEOGRAPHICAL DESCRIPTION

U.S. EPA designated four nonattainment areas comprised of nine townships in five counties in the State of Indiana for the 1-hour SO_2 NAAQS. The boundaries established for each nonattainment area includes the township(s) with sources emitting greater than 10 tons per year of SO_2 located within 50 kilometers of a monitored violation. As shown in Figure 1.1, the four nonattainment areas are: Veale Township in Daviess County and Washington Township in Pike County; Wayne, Center, and Perry Townships in Marion County; Clay and Washington Townships in Morgan County; and Fayette and Harrison Townships in Vigo County. These counties are located in the central, west central and southwest geographic regions of the state.

Figure 1.1
U.S. EPA 2013 Sulfur Dioxide Nonattainment Area Designations



2.0 CLEAN AIR ACT REQUIREMENTS

Section 172(c) of the CAA specifies the various planning requirements that apply to SO_2 nonattainment areas. The CAA specifies the following requirements:

1. Reasonably Available Control Measures (RACM)/Reasonably Available Control Technology (RACT),
2. Reasonable Further Progress (RFP),
3. Emission inventories,
4. Identification and quantification of emissions,
5. Permit program for new and modified sources,
6. Other measures,
7. Compliance with section 110(a)(2),
8. Equivalent techniques, and
9. Contingency measures.

These components are due April 6, 2015. The following section provides an overview of Indiana's progress in meeting the CAA requirements mentioned above.

2.1 REASONABLY AVAILABLE CONTROL TECHNOLOGY /REASONABLY AVAILABLE CONTROL MEASURES (SECTION 172(c)(1))

Section 172(c)(1) of the CAA requires states with nonattainment areas to submit a SIP that contains an attainment demonstration showing how affected areas will attain the standard by the applicable statutory attainment date. Plan provisions shall provide for the implementation of all reasonably available control measures as expeditiously as practicable, including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology.

For most criteria pollutants, RACT is control technology that is reasonably available considering technological and economic feasibility. However, the definition of RACT for SO_2 is, simply, "that control technology which is necessary to achieve the NAAQS (40 CFR 51.100(o))". These requirements will be met by submitting a demonstration that shows attainment as expeditiously as practical with the implementation of any emission controls and limitations to be in place and effective by the compliance date of January 1, 2017.

2.2 REASONABLE FURTHER PROGRESS (SECTION 172(c)(2))

Section 172(c)(2) of the CAA requires attainment demonstrations for areas designated nonattainment for criteria pollutants to include a demonstration of reasonable further progress. RFP is defined in this section as "such annual incremental reductions in emissions of the relevant air pollution as required by Part D, or may reasonably be required by U.S. EPA for the purpose of ensuring attainment of the applicable NAAQS by the applicable attainment date".

This definition is most appropriate for pollutants emitted by numerous and diverse sources, where the relationship between any individual source and the overall air quality is not explicitly quantified, and where the emission reductions necessary to attain the NAAQS are inventory-wide. The definition is generally less pertinent to pollutants such as SO_2 which usually have a limited number of sources, where relationship between individual sources and air quality is relatively well-defined, and where emission control measures result in swift and dramatic improvement in air quality. That is, for SO_2, there is usually a single step between pre-control nonattainment and post-control attainment.

Contributing sources in nonattainment areas will be required to implement emission control measures that will ensure attainment of the SO_2 NAAQS by the applicable attainment date. Emission limitations for individual units will be established in the attainment demonstration and made permanent and enforceable in rule 326 IAC 7, Sulfur Dioxide Rules, attached in Appendix F.

2.3 EMISSION INVENTORIES (SECTION 172(c)(3))

Section 172(c)(3) of the CAA requires the development of a comprehensive, accurate, and current inventory of actual emissions from all sources of SO_2 in the nonattainment areas, including periodic revisions as the Administrator may determine necessary to assure the requirements for this part are met. U.S. EPA guidance requires the submittal of a comprehensive SIP quality emission inventory of SO_2 representative of the base year (2011), and a projection of the emission inventory to the attainment year (2018).

IDEM has submitted a statewide emission inventory for stationary point sources to U.S. EPA. The final 2011 inventory used in the attainment demonstration is attached in Appendix A. The 2011 emission inventory is used as the base year for the purpose of this submittal and will be subject to public comment along with the full attainment demonstration.

2.4 IDENTIFICATION AND QUANTIFICATION OF EMISSIONS (SECTION 172(c)(4))

Section 172(c)(4) requires the SIP to identify and quantify the emissions of SO_2 that sources will be allowed from the construction and operation of major new and modified sources in accordance with section 173(a)(1)(B), and will not interfere with attainment of the SO_2 NAAQS by the attainment date. This requirement is outlined in rule 326 IAC 2-3.

2.5 PERMIT PROGRAM FOR NEW AND MODIFIED MAJOR SOURCES (SECTION 172(c)(5))

Section 172(c)(5) requires the State to implement a permit program consistent with the requirements of Section 173. Indiana has a long standing and fully-implemented New Source Review (NSR) permitting program outlined in rule 326 IAC 2-3. Indiana's NSR program was approved by U.S. EPA, on 10/07/94 (94 FR 24838), as part of the SIP. Any source or emission unit not listed in the 2011 emission inventory, or for the closing of which credit was taken in

demonstrating attainment, will not be allowed to construct, reopen, modify, or reconstruct without meeting all applicable permit rule requirements. This would include conducting an air quality analysis to evaluate whether the new source will threaten the SO_2 NAAQS.

2.6 OTHER MEASURES (SECTION 172(c)(6))

Section 172(c)(6) requires plan provisions to include enforceable emission limitations, and such other control measures, means, or techniques, as well as schedules and timetables for compliance, as may be necessary or appropriate to provide for attainment by the applicable attainment date. Control measures to be phased-in or implemented at contributing sources over the next several years will bring the nonattainment areas into attainment of the SO_2 NAAQS and provide for an ample margin of safety. These control measures along with existing local, state, and national control measures will ensure that attainment in each county will be maintained with an increasing margin of safety over time. These measures are discussed in greater detail in the Control Strategy Section (Section 4.0).

2.7 COMPLIANCE WITH SECTION 110(A)(2) (SECTION 172(c)(7))

Section 172(c)(7) requires nonattainment SIPs to meet the applicable provisions of Section 110(a)(2). IDEM has reviewed the requirements of Section 110(a)(2) and has concluded that this attainment demonstration, along with rule 326 IAC 7, addresses the relevant requirements associated with rule development, state implementation plan submissions, and implementation and enforcement of required control measures.

2.8 EQUIVALENT TECHNIQUES SECTION 172(c)(8)

Section 172(c)(8) of the CAA allows the use, upon approval by U.S. EPA, of equivalent modeling, emission inventory, and planning techniques. However, IDEM has followed U.S. EPA guidance on procedures for modeling, preparing emission inventories, and plan submittal, therefore IDEM is not requesting approval for equivalent techniques.

2.9 CONTINGENCY MEASURES SECTION 172(c)(9)

Section 172(c)(9) of the CAA requires States with SO_2 nonattainment areas to include contingency measures as part of their attainment demonstration. Contingency measures are specific measures to be undertaken in the event the area fails to attain the standard by the applicable attainment date. Potential contingency measures are discussed in greater detail in Section 6.0.

3.0 ATTAINMENT DEMONSTRATION

As part of the attainment demonstration, IDEM evaluated the air quality information available for each of the four nonattainment areas to identify potential trends. The trends analyses evaluated 14 years of monitored data from the SO_2 ambient air monitoring sites used for nonattainment area designations and SO_2 emissions reported by point sources found to be contributing significantly to the monitored violation(s) in each designated nonattainment area. In addition, an analysis of the emission inventories for 2000 through 2012 was conducted to show SO_2 emission contributions by category for each county with designated nonattainment areas. Both analyses are based on air quality information back to the year 2000 in order to provide a more complete picture of the progress made over the years in improving air quality related to SO_2 emissions. The results of these analyses are discussed below.

3.1 AIR QUALITY TRENDS ANALYSIS

IDEM conducted an air quality trends analysis using the monitored data from SO_2 ambient air monitoring sites in the nonattainment areas. As shown in Tables 3.1 and 3.2 and Graphs 3.1 and 3.2, 99th percentile values and design values for 2000 through 2013 show no consistent pattern, as values increase and decrease over the 14 year period in all of the nonattainment areas. However, 2011-2013 design values show three of the six violating monitors in the nonattainment areas are close to the 1-hour SO_2 standard with values 3, 6, and 7 ppb over the 75 ppb NAAQS threshold. Design values for the other three monitors are 34, 48, and 68 ppb over the standard.

A number of state and federal control measures that directly or indirectly require SO_2 emission reductions from power plants and other large SO_2 emitting sources (such as various types of boilers and incinerators) have been finalized since the nonattainment area designations were made in 2013. Compliance with these regulations over the course of the next few years is projected to substantially improve air quality and lower the three-year design value at monitors in the nonattainment areas to values below the 1-hour SO_2 standard by the 2018 attainment date.

Table 3.1
SO_2 Monitored 99th Percentile Values in Nonattainment Areas

County	Site ID	99th Percentile Values (ppb)													
		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Marion	180970057	89	98	111	122	116	103	127	122	79	75	103	63	91	78
Morgan	181091001	Monitor began operation in 2004				130	141	108	140	91	98	105	96	82	64
Daviess	180270002	120	119	119	107	131	91	135	112	122	138	115	100	78	150
Pike	181250005	107	155	130	183	151	119	161	172	205	194	211	119	140	169
Vigo	181671014	143	204	129	143	134	138	104	133	137	142	169	139	128	103
	181670018	99	104	69	83	130	100	99	90	120	115	61	95	73	79

Graph 3.1
SO_2 Monitored 99th Percentile Values in Nonattainment Areas

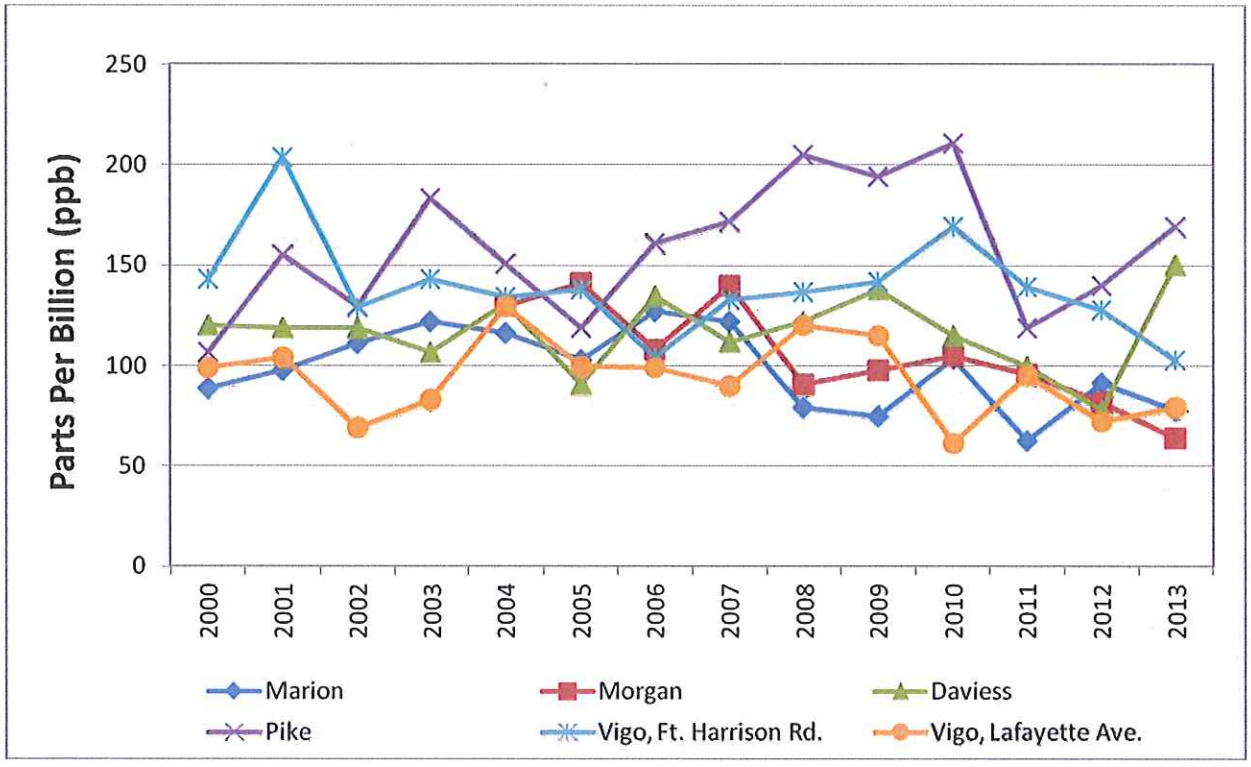
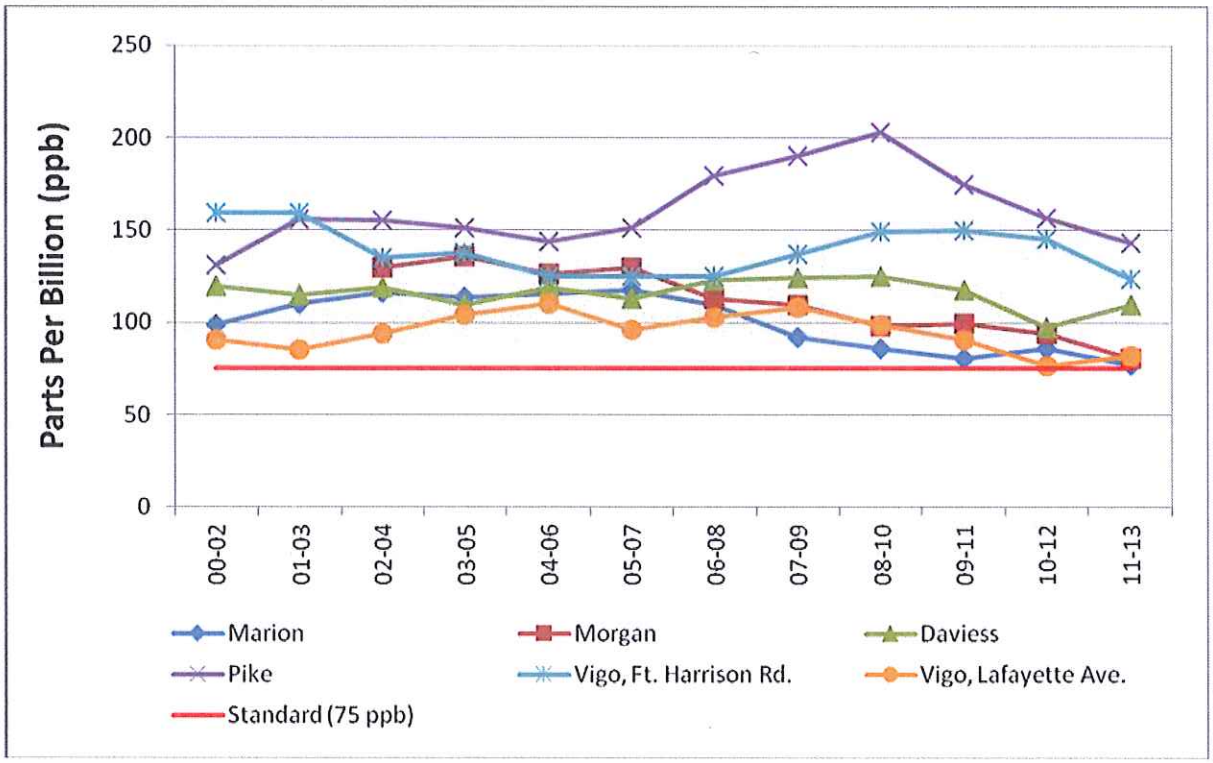


Table 3.2
SO_2 Design Values for Ambient Air Monitors in Nonattainment Areas

	Site ID	Three Year Design Value (ppb)											
		00-02	01-03	02-04	03-05	04-06	05-07	06-08	07-09	08-10	09-11	10-12	11-13
Marion	180970057	99	110	116	114	115	117	109	92	86	80	86	78
Morgan	181091001	Monitor began operation in 2004		130	136	126	130	113	110	98	100	94	81
Daviess	180270002	119	115	119	110	119	113	123	124	125	118	98	109
Pike	181250005	131	156	155	151	144	151	179	190	203	175	157	143
Vigo	181671014	159	159	135	138	125	125	125	137	149	150	145	123
	181670018	91	85	94	104	110	96	103	108	99	91	76	82

Note: Purple font indicates values based on only one year of data and green font indicates values based on only two years of data.

Graph 3.2
SO_2 Design Values for Ambient Air Monitors in Nonattainment Areas



3.2 EMISSION TRENDS ANALYSIS

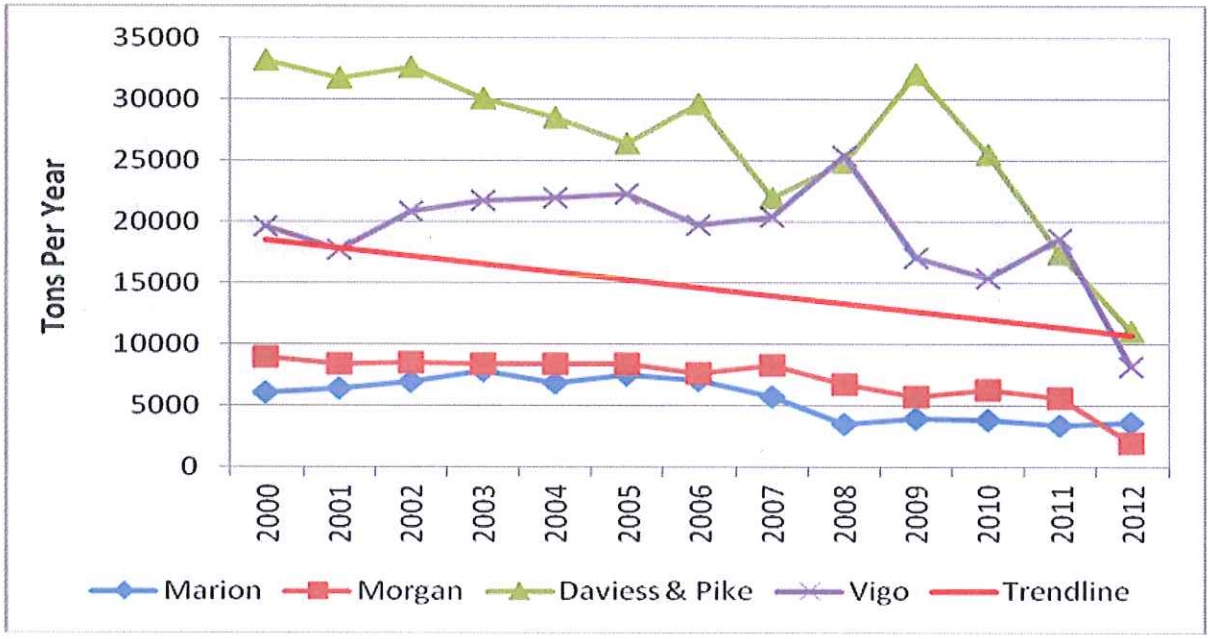
An emission trends analysis was conducted using the current inventory of actual emissions reported from sources of SO_2 in each nonattainment area, as well as sources located outside a nonattainment area that contributed to its "nonattainment" area designation. As shown in Table 3.3, power plants with fossil fuel-fired Electric Generating Units (EGUs) (highlighted in yellow) are the largest emitters of SO_2. Actual (reported) emissions for 2000 to 2012 from contributing sources in the nonattainment areas show that SO_2 emissions from the power plants are substantially higher than emissions from other contributing sources in the nonattainment areas and each nonattainment area contains at least one power plant. Although there are a few spikes in SO_2 emissions reported over the 13 year period shown in Graph 3.3, the reported emissions illustrate a downward trend. In fact, SO_2 emissions have decreased in all of the nonattainment areas by at least 39%, and as much as 78%, based on averaged emissions from contributing sources in each of the nonattainment areas in 2013 compared to 2000.

Table 3.3
Actual (Reported) SO_2 Emissions from Contributing Sources in Nonattainment Areas

County	Contributing Sources		Actual (Reported) Emissions, Tons Per Year												
	Plant ID#	Facility Name	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Marion 18097	00034	Citizens Perry K Plant	1722	1940	3124	2684	2711	3196	3077	3863	4493	4052	4824	4349	3852
	00311	Rolls-Royce Corporation, Plant 5 & 8	57	80	59	107	151	211	223	250	142	137	65	58	39
	00033	IPL Harding St. Station	40317	43068	45732	51714	44782	49351	46346	36201	19578	23599	21669	18994	21542
	00079	Quemetco, Inc.	194	177	147		105			74			124		
	00032	Indianapolis Belmont Waste Water Treatment Plant	4	4	4	3	14	13	14	27	16	28	21	25	
	00315	Vertellus Agriculture & Nutrition Specialties LLC	35	27	16	46	36	38	26	30			37	33	27
Morgan 18109	00004	IPL Eagle Valley	17663	16432	16415	16416	16414	16427	14841	16101	13102	11091	12266	10875	3436
	00007	Hydraulic Press Brick Company	192	429	561	465	502	428	542	515		342	350		
*Daviess 18027/ Pike 18125	00001	Hoosier Energy - Ratts	23052	21424	18054	17603	18252	15124	21638	21286	27335	23948	21308	9496	6682
	00002	IPL - Peterburg	43264	42056	47179	42553	38761	37686	37686	22567	22494	40139	29846	25232	15463
Vigo 18167	00147	Wabash River Combined Cycle Plant									414	479		434	
	00091	sgSolutions LLC	142	69	231	172	14	21	62	75	41			50	
	00021	Duke Energy - Wabash River	58486	52778	61931	64608	65371	66578	58794	60860	75822	50671	45683	55343	24025

Note 1: Reported emissions from emission statement submitted by sources in accordance with 326 IAC-2-6.
Note 2: A blank space indicates no emissions information reported by the source for that year.
*No contributing facilities located within county's nonattainment area boundary.

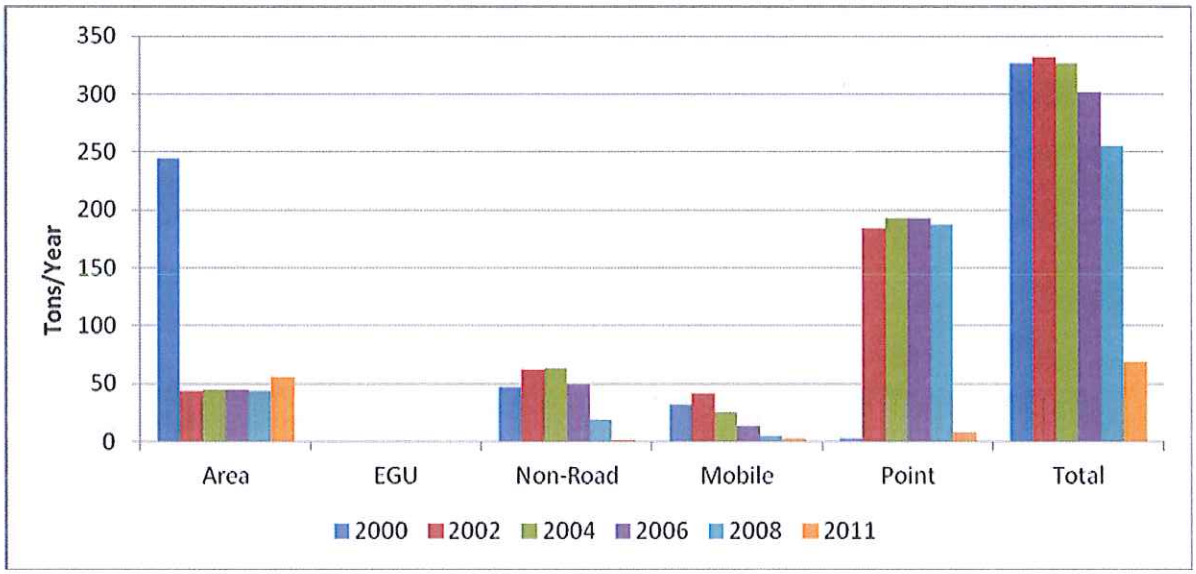
Graph 3.3
Actual (Reported) SO_2 Emissions from Contributing Sources in Nonattainment Areas



In addition, Graphs 3.5, 3.6, 3.7, and 3.8 shows that SO_2 emissions from EGUs represent 70% to 100% of the total SO_2 emissions in every county with a nonattainment area, except Daviess County, as shown in Graph 3.4. The graph for Daviess County does not depict the same conclusion as the graphs for the other counties because the EGUs that significantly contributed to SO_2 monitored violations in Daviess County are physically located in Pike County. However, EGUs are clearly the primary source of SO_2 emissions in each of the nonattainment areas.

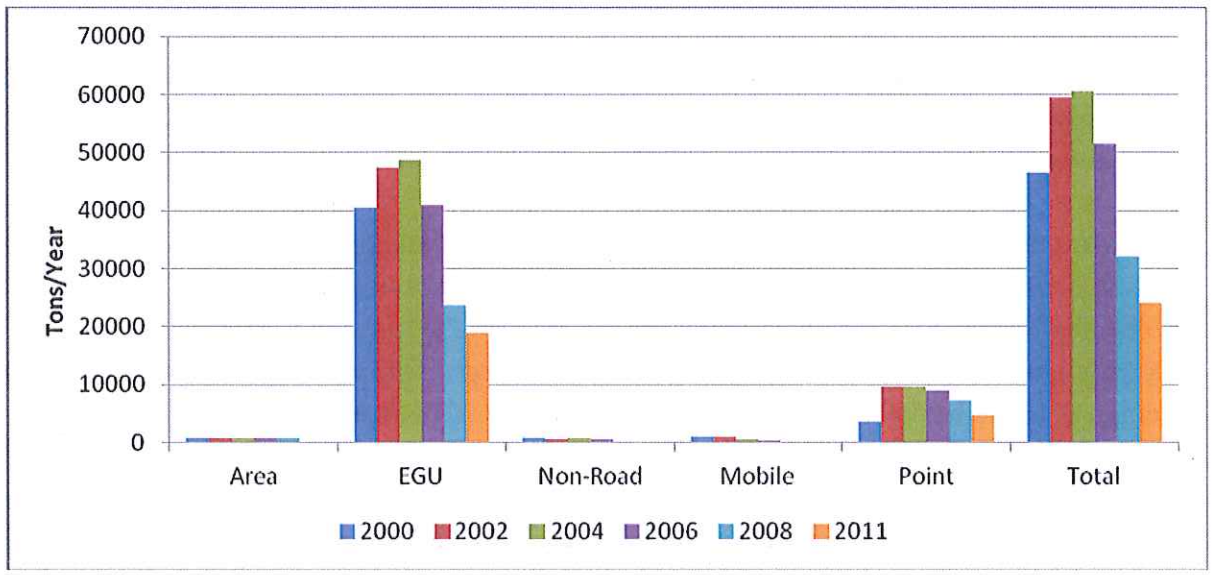
The emission inventory for the base year (2011) and a projection of the emission reductions for the attainment year (2018), shown in Appendix A, demonstrates that state and federal regulations to be implemented over the next few years are projected to lower SO_2 emissions in the nonattainment areas by more than 400,000 tons per year. This will improve air quality across the region to levels below the 1-hour SO_2 standard by the 2018 attainment date. Emission inventories data for the base year used in Appendix A along with 2000-2011 emission inventories data for each of the counties with a designated nonattainment area is provided in Appendix H. The projected emission reductions shown in Appendix A are based on a unit by unit comparison of current and future SO_2 emission limits for affected units in the nonattainment areas. Detailed unit specific information is provided in Appendix I.

Graph 3.4
2000-2011 SO_2 Emission Trends by Category and Year for Daviess County, Indiana



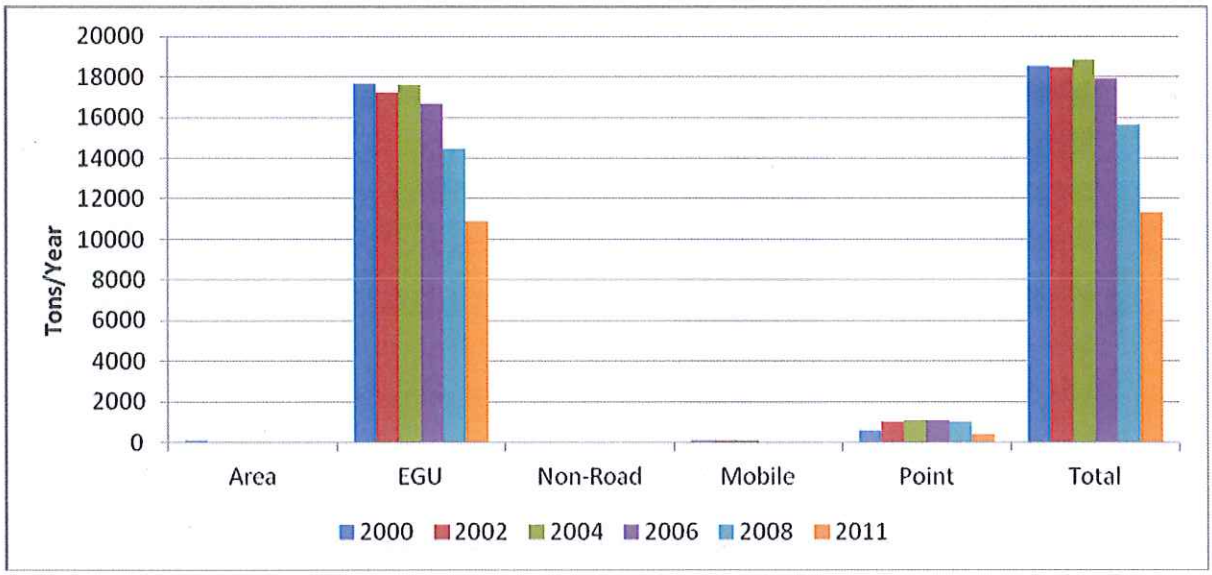
Note: emissions information obtained from the U.S. Environmental Protection Agency's National Emissions Inventory Database.

Graph 3.5
2000-2011 SO_2 Emission Trends by Category and Year for Marion County, Indiana



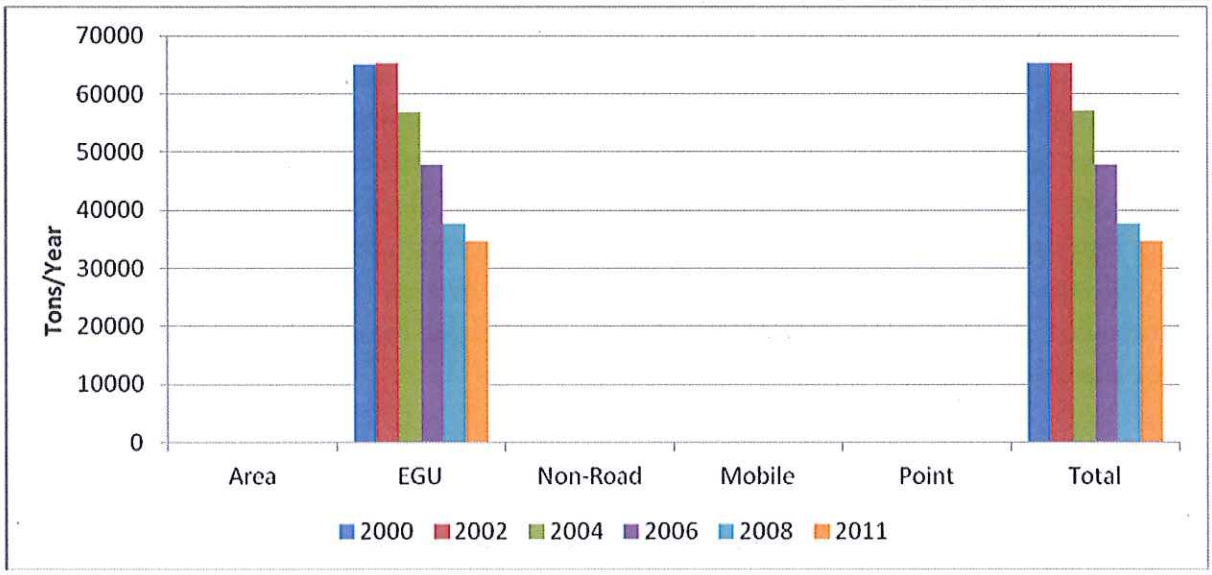
Note: emissions information obtained from the U.S. Environmental Protection Agency's National Emissions Inventory Database.

Graph 3.6
2000-2011 SO_2 Emission Trends by Category and Year for Morgan County, Indiana



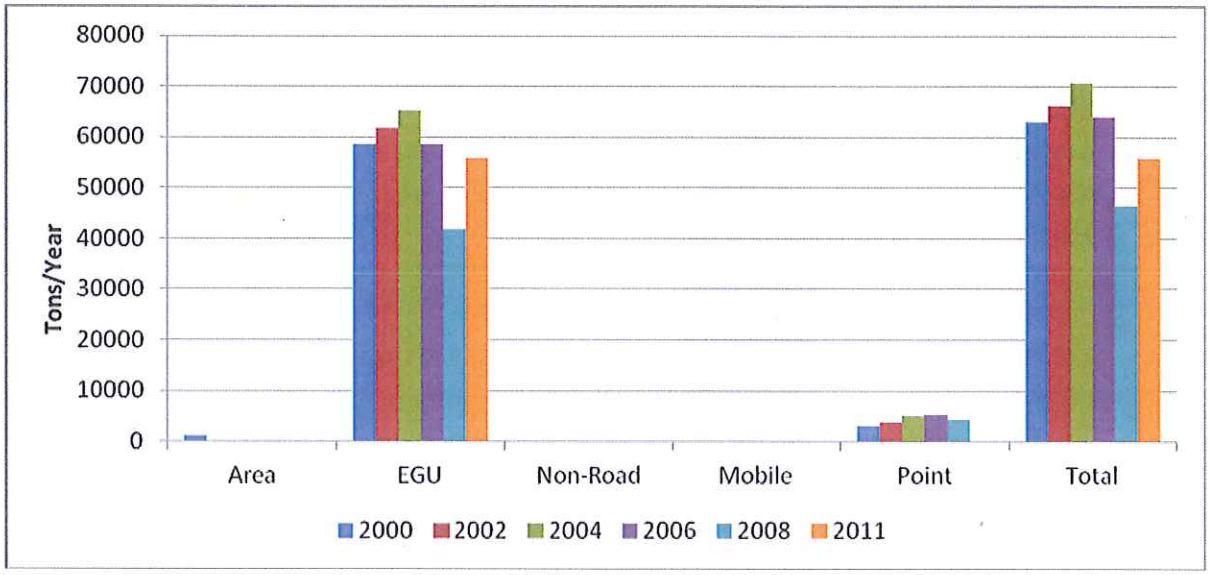
Note: emissions information obtained from the U.S. Environmental Protection Agency's National Emissions Inventory Database.

Graph 3.7
2000-2011 SO_2 Emission Trends by Category and Year for Pike County, Indiana



Note: emissions information obtained from the U.S. Environmental Protection Agency's National Emissions Inventory Database.

Graph 3.8
2000-2011 SO_2 Emission Trends by Category and Year for Vigo County, Indiana



Note: emissions information obtained from the U.S. Environmental Protection Agency's National Emissions Inventory Database.

4.0 CONTROL STRATEGY

A series of existing and forthcoming state and federal control measures to be phased in or implemented over the course of the next few years will result in substantial reductions in future SO_2 emissions. These regulations focus on reducing SO_2 emissions from fossil fuel-fired EGUs and other large sources, such as various types of boilers and incinerators, which are the largest emitters of sulfur dioxide. The control strategies that companies with affected sources use to comply with these federal programs may provide for sufficient SO_2 emission reductions to meet the unit-specific emission limitations established in the attainment demonstration modeling. Additional control measures may not be necessary to meet the new 1-hour SO_2 standard. Control measures included in the air quality analysis were modeled for the attainment year of 2018 and are discussed in detail below.

4.1 CROSS STATE AIR POLLUTION RULE

On July 6, 2011, the U.S. EPA finalized the Cross State Air Pollution Rule (CSAPR). This rule was developed in accordance with the U.S. Court of Appeals for the DC Circuit's July 11, 2008 opinion regarding CAIR, which led to the rule being remanded and vacated on December 23, 2008. As established under CAIR, CSAPR will require 28 states in the East, Midwest, and South to reduce emissions of sulfur dioxide and nitrogen oxide.

CSAPR was scheduled to replace CAIR starting January 1, 2012. However, the rule was challenged by several states, local governments, industry groups and labor groups. On December 30, 2011, the U.S. Court of Appeals for the DC Circuit ordered a stay of CASPR and ordered that CAIR be implemented until judicial review of CSAPR was completed. The same

court ultimately vacated CSAPR on August 21, 2012, and ordered that CAIR be continued to be implemented until the rule was rewritten.

The United States government petitioned the U.S. Supreme Court asking the Court to review the D.C. Circuit Court's decision on CSAPR. On April 29, 2014, the Supreme Court upheld U.S. EPA's authority to regulate cross-state air pollution by reversing the DC Circuit Court's ruling vacating CSAPR. A motion to lift the stay of CSAPR was filed with the U.S. Court of Appeals for the D.C. Circuit, which ordered that U.S. EPA's motion be granted on October 23, 2014. CSAPR took effect January 1, 2015 for SO_2 and annual NO_X, and May 1, 2015 for ozone season NO_X.

4.2 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FROM COAL AND OIL-FIRED ELECTRIC UTILITY STEAM GENERATING UNITS AND STANDARDS OF PERFORMANCE FOR FOSSIL-FUEL-FIRED ELECTRIC UTILITY, INDUSTRIAL-COMMERCIAL-INSTITUTIONAL, AND SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS

On December 16, 2011, the U.S. EPA signed a rule to reduce emissions of toxic air pollutants from power plants. The National Emission Standards for Hazardous Air Pollutants (NESHAP) from Coal- and Oil-Fired Electric Utility Steam Generating Units, also referred to as the Mercury and Air Toxics Standards (MATS) rule for power plants, will reduce toxic air pollutants from new and existing electric utility steam generating units larger than 25 MWe that burn coal or oil for the purpose of generating electricity for sale and distribution through the national electric grid to the public.

The MATS rule establishes numeric emission limits for mercury (Hg), PM, and hydrochloric acid (HCl) emissions from coal-fired EGUs and PM, HCl and hydrofluoric acid (HF) emissions from oil-fired EGUs. This includes numeric emission limits for SO_2 (as an alternative to HCl), individual non-mercury metal air toxics and total non-mercury metal air toxics (as alternatives to PM), and work practice standards, instead of numeric limits, to limit organic air toxics. All power plants will have to limit their toxic emissions, ultimately preventing 90% of the Hg in coal burned at power plants from being emitted into the air. Reducing toxic power plant emissions will significantly cut SO_2 emissions and fine particle pollution, as well.

The New Source Performance Standards for fossil-fuel-fired EGUs, also signed under the MATS rule, revises the standards new coal- and oil-fired power plants must meet for PM, SO_2, and NO_x. Existing sources generally will have up to 4 years to comply with MATS, if needed. This includes the 3 years provided to new and existing sources by the CAA and an additional year state permitting authorities can grant under the CAA to existing sources as needed for technology installation.

4.3 NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR MAJOR SOURCES: INDUSTRIAL, COMMERCIAL, AND INSTITUTIONAL BOILERS AND PROCESS HEATERS

On March 21, 2011, the U.S. EPA published the National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters. On that same day, the U.S. EPA also published a notice announcing its intent to reconsider certain provisions of the final rule. The final adjusted standards were published January 31, 2013. The Boiler MACT rule, as this rule is commonly referred to, requires facilities classified as major sources of Hazardous Air Pollutants (HAPs) with affected boilers or process heaters to reduce toxic air emissions from these combustion sources. Section 112(d) of the CAA requires the U.S. EPA to regulate HAPs from major stationary sources based on the performance of Maximum Achievable Control Technology (MACT). The rule establishes MACT standards for new and existing industrial, commercial, and institutional boilers and process heaters.

Recognizing the diversity of this source category and the multiple sectors of the economy this rule effects, the U.S. EPA established subcategories for boilers and process heaters based on the design of the combustion equipment. Numeric emission limits were established for 16 of the 19 subcategories created under this rule for five pollutants, carbon monoxide (CO), HCl, Hg, and total selected metals (TSM) or filterable PM. The other three subcategories are subject to work practice standards in lieu of emission limits for all pollutants.

The Boiler MACT rule is part of the control strategy for compliance with the SO_2 NAAQS because reducing toxic air emissions from these combustion sources will also contribute significantly to SO_2 emission reductions and assist the nonattainment areas in attaining the standard. The compliance dates for the rule are January 31, 2016, for existing sources, and January 31, 2013, or upon startup, whichever is later, for new sources. If needed, existing sources may request an additional year for technology installation.

4.4 NEW SOURCE PERFORMANCE STANDARDS FOR NEW STATIONARY SOURCES AND EMISSION GUIDELINES FOR EXISTING SOURCES: SEWAGE SLUDGE INCINERATOR UNITS

On February 21, 2011, the U.S. EPA finalized new source performance standards and emission guidelines for new and existing Sewage Sludge Incineration (SSI) units. The final rules cover two SSI subcategories based on the type of incinerator: multiple hearth and fluidized bed. Units incinerating sewage sludge at other types of facilities (e.g., commercial, industrial, and institutional) will be covered under different air pollution incineration standards.

These rules establish emission limits for nine pollutants emitted from the regulated SSI units: Hg, lead, cadmium, HCl, PM, CO, dioxins/furans, NO_x, and SO_2. SO_2 emissions from SSI units subject to these rules are emitted in the form of acid gases. U.S. EPA expects these rules will reduce nationwide emissions of acid gases (i.e., SO_2 and HCl) from these units by 450 tons per

year. In addition, affected units under these rules will be required to meet SO_2 emission limitations that in some cases are more stringent than those established to attain the SO_2 NAAQS.

The compliance dates for these rules are as expeditiously as practicable after State plan approval, but no later than 3 years after State plan approval or by February 21, 2015 under the Indiana rule, 326 IAC 11-10, whichever is earlier, for existing sources. New sources have up to 60 days after the SSI unit reaches the feed rate at which it will operate, or up to 180 days after initial startup, whichever is earlier.

5.0 TECHNICAL ELEMENTS OF DEMONSTRATION

This section presents details of the technical work performed to analyze air quality data to demonstrate attainment of the 1-hour SO_2 standard. A detailed discussion of the model selection, methodologies, meteorology, and model inputs, analysis, and results are discussed in detail in the following pages. Attainment demonstration modeling exercises for current and proposed emission limitations described in the facility discussions below can be found in Appendix C to this document.

5.1 DISPERSION MODELING ANALYSIS

For SO_2 attainment demonstrations, monitoring data alone is not adequate to demonstrate attainment of the NAAQS. A small number of ambient SO_2 monitors are not always representative of the air quality for an entire area. Modeling estimates of maximum ambient concentration are based on a fairly infrequent combination of meteorological and source operating conditions. To capture such results with a monitor requires a prohibitively large and expensive network. Therefore, atmospheric dispersion modeling can be used to comprehensively evaluate a source's impacts and determine the areas of expected high concentrations.

5.2 MODEL SELECTION

As documented in Appendix A of the, "Guidance for 1-Hour Sulfur Dioxide (SO_2) Nonattainment Area State Implementation Plan (SIP) Submissions" dated April 23, 2014, the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) is the preferred regulatory air quality model for the 1-hour SO_2 attainment demonstration modeling. The latest AERMOD version 14134 was used for this attainment demonstration modeling. The appropriate form of the SO_2 standard was modeled which is the 4th high (99th percentile), also known as the modeled design value, of the 1-hour maximum daily SO_2 concentration averaged across five years. This modeled result combined with the background concentration must meet the 1-hour SO_2 NAAQS of 75 ppb. The actual attainment demonstration modeling results were compared to a 1-hour SO_2 NAAQS of 196.2 $\mu g/m^3$ as stated in the November 7, 2011 Federal Register.

As part of the input data required by AERMOD, the mapping of terrain elevations were assigned with the terrain preprocessor mapping program for AERMOD known as AERMAP. AERMAP determines the elevation heights of all buildings, sources, and receptors included in the air quality modeling. The AERMAP program version 11103 was used to assign all elevations of sources, buildings, and receptors prior to running AERMOD. Additionally, the terrain elevation data were obtained from the National Elevation Dataset (NED) based on the Universal Transverse Mercator (UTM) coordinates for the North American Datum (NAD) 1983. These NED elevation files were downloaded from the United States Geological Survey (USGS) web site as recommended by the U.S. Environmental Protection Agency (EPA) modeling guidance.

The regulatory default was selected for all air quality modeling runs. The appropriate rural or urban land classifications were selected with only the Marion County SO_2 modeling being classified as urban. The remaining 1-hour SO_2 nonattainment areas in Daviess, Morgan, Pike, and Vigo counties were modeled as rural classification. The downwash algorithm was invoked in all air quality modeling where stacks did not meet the good engineering practice (GEP).

5.3 RECEPTOR GRID AND MODELING DOMAIN

The receptor grids and modeling domain followed the recommended approach from Appendix W, Guideline on Air Quality Models, with some additional built-in conservatism. Receptor spacing for each modeled facility fence line was every 50 meters with 100 meter spacing of receptors out to a distance of 500 meters beyond each facility. In addition, the distances in between the modeled facilities contained receptors which were spaced at 100 meter intervals. The 100 meter spacing receptor grid was a very extensive grid and contained in excess of several thousand receptors for each of the nonattainment areas which were modeled. The next grid extended out to a distance of 2500 meters or two and a half kilometers with a receptor spacing of 250 meters. The 500 meter spacing receptor grid extended out to a distance of 5000 meters or five kilometers with 1000 meter spacing of receptors out to a distance of ten kilometers. The outer receptor grid extended out to a distance of 50 kilometers with the receptor spacing of 2000 meters.

The five receptor grids with the above receptor spacing and the facility fence line receptors brought the total modeled receptors for Marion County attainment demonstration to 17,925 receptors. Three additional receptors were placed at SO_2 monitor locations with two receptors at each of the Marion County SO_2 monitor locations and an additional receptor at the Morgan County SO_2 monitor location. The Morgan County SO_2 attainment demonstration had a total of 10,445 receptors modeled with one receptor located at the Morgan County SO_2 monitor. The Vigo County SO_2 attainment demonstration had a total of 7,111 receptors modeled including two receptors located at each of the Vigo County SO_2 monitors. The total number of receptors for the Daviess and Pike County attainment demonstration was 5,354 including two receptors located at the Daviess and Pike Counties SO_2 monitors.

5.4 SO_2 MODELED SOURCES

A total of 16 facilities were modeled in the four nonattainment areas which are located in five counties. A facility specific write-up for Marion and Morgan County is included with this document which includes a discussion of the required emission reductions to meet an attainment demonstration for each of the modeled facilities. Generally, a source was included in the attainment demonstration modeling if the source was physically located in the nonattainment area, was a source listed in the original SO_2 SIP, as was the case of the Marion, Morgan and Vigo County facilities, and had actual annual SO_2 emissions of greater than ten tons per year.

Two facilities in Marion County, Allison Transmission (formerly Detroit Diesel Allison Plant 3) and Eskenazi Health (formerly Wishard Hospital) were not explicitly modeled even though they are located in the Marion County nonattainment area and were included in the original Marion County SO_2 SIP. Both facilities have reported annual SO_2 emissions of ten tons per year or less. Additionally Allison Transmission has converted their three remaining operating boilers out of five in the original SO_2 SIP to operate on natural gas only. The remaining emissions at Allison Transmission consist of engine test cells and engine test stands which operate on a random operating schedule.

5.5 DOWNWASH AND GEP STACK HEIGHT

The Building Profile Input Program (BPIP) was used to calculate the wind direction specific building dimensions for input to AERMOD. The output from BPIP is read by AERMOD to calculate the aerodynamic downwash for all modeled stacks. All buildings which may affect the aerodynamic downwash in the wake of each modeled stack were included in the program. The length, width, height and location of each building and the height and location of each stack are included as inputs to the program. Since no stacks have a physical stack height above 65 meters or approximately 213 feet, thereby not exceeding the GEP stack height formula; all stacks were modeled at their actual stack height. The actual GEP stack height formula is, for stacks in existence prior to January 12, 1979, $H_{GEP} = 2.5H$ and after January 12, 1979, $H_{GEP} = H + 1.5L$, where H is the height of the nearby structure and L is the lesser of the height or projected width of nearby structures within the 5L formula.

5.6 METEOROLOGICAL DATA AND MODELED YEARS

The Indianapolis National Weather Service (NWS) surface data and the Lincoln, Illinois upper air data were processed with the latest version 14134 of the AERMOD meteorological data processor program AERMET. Similarly, the Evansville NWS surface data and the Lincoln, Illinois upper air data were processed with the 14134 version of AERMET. The Indianapolis surface and the Lincoln, Illinois upper air preprocessed meteorology were used for the Marion, Morgan, and Vigo County attainment demonstration modeling, and the Evansville surface and Lincoln, Illinois upper air preprocessed meteorology were used for the Daviess and Pike County

attainment demonstration modeling. The five modeled years were 2008 through 2012 for both the Indianapolis and Evansville preprocessed meteorological data.

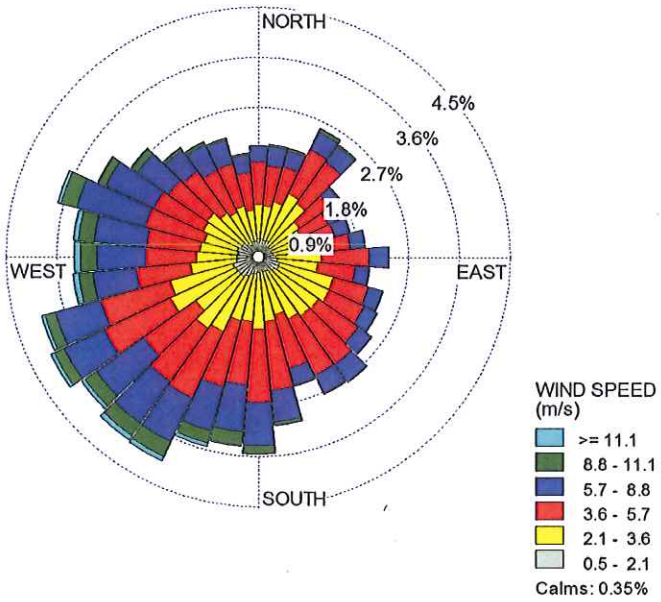
Since the NWS meteorological data can contain a number of calm wind speeds greater than ten percent of the 8760 annual observation hours, the 1-minute wind speed and wind direction Automated Surface Observing System (ASOS) data from the Indianapolis and Evansville NWS stations were processed with the U.S. EPA 1-minute data processor program AERMINUTE. The latest AERMINUTE version 11325 was used to process the 1-minute wind speed and wind direction ASOS data. The recommended default of 0.5 meters per second (m/s) for the calm wind speed threshold was used when processing the 1-minute wind speed and wind direction ASOS data from Indianapolis and Evansville. Additionally, a default wind speed threshold of 0.5 m/s was used when processing the standard ASOS NWS wind speed and wind direction data.

The U.S EPA program AERSURFACE was used to determine the surface characteristics; albedo, Bowen ratio, and surface roughness for each of the two NWS meteorological tower locations in Indianapolis and Evansville. Surface characteristics were determined at each NWS location for 12 wind direction sectors with a recommended default radius of one kilometer.

The albedo and the Bowen ratio surface characteristics were adjusted during the three winter months of December, January, and February in accordance with the EPA Region V document, "Regional Meteorological Data Processing Protocol," dated May 6, 2011. Additionally, a dry or wet Bowen ratio value was used during months when soil moisture conditions were abnormally dry or wet; otherwise the Bowen ratio value for average soil moisture conditions was used. The surface roughness value for snow cover was used if more than half of the month had days with at least one inch of snow on the ground. Otherwise, the no snow cover surface roughness value was used. In the case of the Evansville NWS meteorology, all the winter months during the five year modeled period of 2008 through 2012 had much less than half of the days in each winter month with no snow cover on the ground. As a result, the no snow cover value for surface roughness was used for the Evansville meteorology during all winter months for the five modeled years 2008 through 2012. Indianapolis NWS had a total of four winter months in which at least half of the days in the month had at least one inch of snow cover on the ground. Three of the four months had a total of 20 days or more with at least one inch on snow on the ground. As a result, the surface roughness snow cover value was not adjusted for the number of days in each month using the no snow cover surface roughness value. Therefore, the surface roughness snow cover value without adjustment was used for these four winter months.

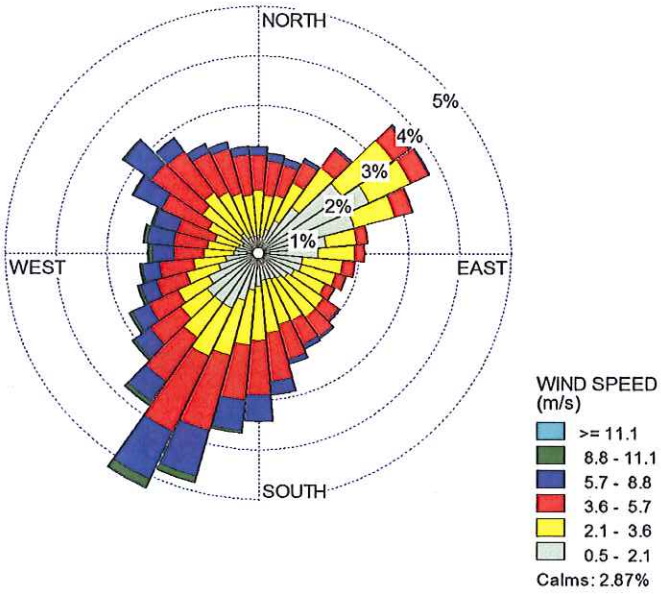
The Indianapolis and Evansville NWS wind rose plots are shown in Figures 5.1 and 5.2 below. The wind roses show the frequency of the wind direction every ten degrees for each of the wind speed ranges for the entire five year modeled period 2008 through 2012. The wind directions are the directions the wind is blowing from in compass degrees and the wind speeds are in meters per second.

Figure 5.1
2008-2012 Indianapolis NWS Wind Rose



As can be seen, the prevailing winds at the Indianapolis NWS station are from the southwest while the prevailing winds at the Evansville NWS station are from the south-southwest for 2008 through 2012.

Figure 5.2
2008-2012 Evansville NWS Wind Rose



5.7 SO_2 BACKGROUND CONCENTRATIONS

Appropriate nonattainment county SO_2 background concentrations were developed in accordance with the recommended U.S. EPA guidance for establishment of such background concentrations. U.S. EPA's "Guideline for 1-Hour SO_2 Nonattainment Area SIP Submissions, April 2014, Section 8" recommended avoiding double counting modeled and monitored contributions in the background concentration. The procedures used to develop the SO_2 background concentrations for each of the five nonattainment counties are included as Appendix B. Table 5.1 lists the 1-hour SO_2 background concentrations for 2011 through 2013 for the five counties which have nonattainment areas. The appropriate 1-hour SO_2 background concentrations were added to the 4th high 1-hour maximum daily SO_2 modeled concentration averaged across five years.

Table 5.1
1-Hour SO_2 County Background Concentrations for 2011-2013

1-Hour Design Value (99th %)	County				
	Daviess	Marion	Morgan	Pike	Vigo
1-Hour (ppb)	8.6	8.6	9.4	9.9	8.8
1-Hour ($\mu g/m^3$)	22.5	22.5	24.6	25.9	23.0

5.8 ATTAINMENT DEMONSTRATION MODELING RESULTS

Table 5.2 shows the 4th high 1-hour maximum daily SO_2 concentrations averaged across five years for the five nonattainment counties. The modeled concentrations are the highest 4th high 1-hour maximum daily SO_2 concentration averaged across five years for the entire county and include the impacts from all of the modeled sources in each county. The AERMOD modeling results shown in Table 5.2 demonstrate the nonattainment areas located in the five counties of Davies, Marion, Morgan, Pike and Vigo will meet the 1-hour SO_2 NAAQS 75 ppb or 196.2 $\mu g/m^3$.

Table 5.2
1-Hour SO_2 Nonattainment Area Attainment Demonstrations

County	Daviess	Marion	Morgan	Pike	Vigo
Modeled Concentration ($\mu g/m^3$)	170.0	168.6	11.3	169.1	167.0
Background Concentration ($\mu g/m^3$)	22.5	22.5	24.6	25.9	23.0
Total Concentration ($\mu g/m^3$)	**192.4**	**191.1**	**35.9**	**194.8**	**189.9**
1-Hour SO_2 NAAQS ($\mu g/m^3$) *	**196.2**	**196.2**	**196.2**	**196.2**	**196.2**
Models Below Standard?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

*1-Hour SO_2 NAAQS of 75 ppb equates to 196.2 $\mu g/m^3$ for modeling purposes

The modeled SO_2 attainment strategy limits for each facility which resulted in the concentrations in Table 5.2 are discussed on the following pages of this document. Emission limits are expressed as pounds of SO_2 per million British Thermal Units (lbs/MMBtu) or pounds of SO_2 per hour (lbs/hr).

5.8.1 1-Hour SO_2 Attainment Demonstration for Nonattainment Area in Daviess County and Pike County

Two facilities were included in the 1-hour SO_2 attainment demonstration for the nonattainment area in Daviess County. The same two facilities were included in the 1-hour SO_2 attainment demonstration for the nonattainment area in Pike County. They are the Hoosier Energy Frank E. Ratts Generating Station and the Indianapolis Power and Light Company Petersburg Generating Station. Both facilities are located in Pike County. However, they are both considered contributing sources to the nonattainment area in Daviess County, as well, because they are located in close proximity to the monitored violation in Veale Township, Daviess County. Therefore, the 1-hour SO_2 attainment strategies and emission rate limits for each of these facilities are included for both the Daviess and Pike County nonattainment area.

Hoosier Energy - Frank E. Ratts Generating Station

Hoosier Energy - Ratts, located on North Blackburn Road in Petersburg, Indiana, operates two coal-fired boilers, identified as Boilers 1 and 2, and a distillate #2 oil-fired auxiliary boiler, identified as No. 2 Aux. Boiler. There are no SO_2 controls associated with these emission units. The allowable SO_2 emission limit of 6 lbs/MMBtu for Boilers 1 and 2 with the auxiliary boiler burning low sulfur fuel oil at 0.05 lbs/MMBtu does not model attainment. However, Hoosier Energy entered into a consent decree agreement with the U.S. EPA in 2010 that called for increasingly stringent emission rate limits per unit and system-wide caps for SO_2 emissions from its generating facilities in the coming years. The consent decree agreement allows for the option to retire or repower one or both main boilers at Ratts by no later than January 1, 2017, however an approved one year extension to the MATS rule allows Boilers 1 and 2 to operate until April 16, 2016.

Indianapolis Power and Light Company - Petersburg Generating Station

IPL - Petersburg currently operates four coal-fired boilers, identified as Units 1, 2, 3, and 4 and three diesel fuel-fired emergency generators, identified as PB2, PB3 and PB4 at its facility on North State Road 57 in Petersburg, Indiana. Each boiler utilizes a flue-gas desulfurization scrubber for SO_2 control and is equipped with SO_2 Continuous Emission Monitors (CEM). Units 1 and 2 utilize bypass stacks that emit uncontrolled SO_2 emissions during periods of startup and shutdown. The three emergency generators are limited to 500 hours per year burning distillate fuel oil at 0.3 lbs of SO2/MMBtu. Units 1 and 2 (including bypass stacks) have SO_2 emission limits of 6.0 lbs/MMBtu when combusting coal and 0.5 lbs/MMBtu when burning fuel oil. Units 3 and 4 are subject to the SO_2 emission limits of 1.2 lbs/MMBtu when combusting coal and 0.8 lbs/MMBtu when burning fuel oil. These SO_2 emission limits will not model attainment.

IPL plans to upgrade existing control equipment and install new control systems as part of its control strategy for compliance with the new MATS rule. The company's MATS compliance plan includes upgrading the bypass scrubber systems on Units 1 and 2 to minimize bypass time, and installing Dry Sorbent Injection (DSI) systems on each of the four boilers for SO_2 emission control. As a result of the expected increase in control efficiencies for Units 1 and 2 and reduction in SO_2 emissions due to new add-on pollution control equipment on all four units, IPL submitted the following SO_2 emission limits for Petersburg's SO_2 attainment demonstration strategy: 0.15 lbs/MMBtu for Units 1 and 2, 0.37 lbs/MMBtu for Unit 3, and 0.35 lbs/MMBtu for Unit 4. These SO_2 emission limits model attainment for the 1-hour SO_2 standard.

Tables 5.3 and 5.4 summarize the 1-hour SO_2 attainment demonstrations for Daviess County and Pike County facilities with the modeled impact for both facilities when added to the 1-hour SO_2 background concentrations and show both counties meet the 1-hour SO_2 NAAQS of 196.2 $\mu g/m^3$. In addition, IPL submitted an evaluation for 30-day rolling average limits for Units 1-4. The protocol narrative for the evaluation is attached in Appendix D and the data set and pertinent calculations can be found at the following link:

http://www.in.gov/idem/airquality/files/attainment_so2_multi_2015_ipl_data.pdf

The 30-day rolling average evaluation yielded the following limits for Units 1-4: 0.12 lbs/MMBtu for Units 1 and 2, 0.29 lbs/MMBtu for Unit 3, and 0.28 lbs/MMBtu for Unit 4.

Table 5.3
1-Hour SO_2 Attainment Demonstration Results for Nonattainment Areas in Daviess County

Modeled Source	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	1-Hour SO_2 NAAQS	Models Below the Standard?
Hoosier Energy - Ratts	8.28	22.5	**30.78**	**196.2**	**Yes**
IPL - Petersburg	165.15	22.5	**187.65**	**196.2**	**Yes**

Table 5.4
1-Hour SO_2 Attainment Demonstration Results for Nonattainment Area in Pike County

Modeled Source	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	1-Hour SO_2 NAAQS	Models Below the Standard?
Hoosier Energy - Ratts	11.31	25.9	**37.21**	**196.2**	**Yes**
IPL - Petersburg	163.78	25.9	**189.68**	**196.2**	**Yes**

Table 5.5
1-Hour SO_2 Emission Rate Limits for
Nonattainment Area in Daviess County and Pike County

Modeled Source	Emission Unit	lbsSO_2/ MMBtu	lbs/hr	30-Day Rolling Average	
				lbsSO_2/ MMBtu	lbs/hr
Hoosier Energy - Ratts	Boiler 1	0.05	58		
	Boiler 2	0.05	58		
	Auxiliary Boiler	0.05	1		
IPL - Petersburg	Unit 1	0.15	330	0.12	263.0
	Unit 2	0.15	621.6	0.12	495.4
	Unit 3	0.37	2049.8	0.29	1,633.7
	Unit 4	0.35	1942.5	0.28	1,548.2
	PB2		500 Hour Operating Limit		
	PB3		500 Hour Operating Limit		
	PB4		500 Hour Operating Limit		

5.8.2 1-Hour SO_2 Attainment Demonstration for the Nonattainment Area in Marion County

A total of six facilities were included in the Marion County 1-hour SO_2 attainment demonstration: Belmont Advanced Wastewater Treatment Plant (formerly Indianapolis Sludge Incinerator), Citizens Thermal (formerly Indianapolis Power & Light Company (IPL) Perry K), IPL - Harding Street Generating Station, Quemetco, Rolls Royce Corporation (formerly Allison Gas Turbine Plant 5 and Plant 8), and Vertellus Agriculture and Nutrition Specialties (formerly Reilly Industries and Reilly Tar and Chemical). All six of these facilities are located in the Marion County 1-hour SO_2 nonattainment area and are part of the current Marion County SO_2 SIP. Modeling results for all six facilities show Marion County will attain the 1-hour SO_2 NAAQS by January 1, 2017. The 1-hour SO_2 attainment strategies and SO_2 emissions limits for each facility are discussed in more detail in the following pages.

Belmont Advanced Wastewater Treatment Plant

The Belmont Wastewater Treatment Plant originally operated a total of eight incinerators at their Belmont Avenue facility. However, four of the eight incinerators are no longer operating and have been physically removed from the plant location. The remaining four incinerators will continue to operate. The sewage sludge incinerator Maximum Achievable Control Technology (MACT) rule will require the SO_2 emissions for each incinerator to be limited to 26 parts per million by Dry Volume (ppm/DV). The 26 ppm/DV limit will equate to a modeled SO_2

emission limit for each of the four incinerators of 2.25 to 2.45 pounds per hour (lbs/hr). However, the actual modeled limit is 12.5 lbs/hr which is higher than the total for all four incinerators emission limits combined. The overall 12.5 lbs/hr SO_2 emission limit is considered conservative and is the attainment demonstration control strategy for Belmont Wastewater Treatment Plant.

Citizens Thermal, C.C. Perry K Steam Plant

Citizens Thermal currently operates eight boilers at their South Street facility in downtown Indianapolis. Boilers 12, 15, and 16 have been converted to operate on natural gas only with a SO_2 emission limitation of 0.0006 pounds per million British thermal units (lbs/MMBtu) for each of the three boilers. Boilers 11, 13, and 14 are permitted to operate at 0.2 lbs of SO_2/MMBtu, and the remaining two boilers, boiler 17 and 18, are permitted to operate at 0.3 lbs of SO_2/MMBtu when combusting fuel oil or distillate oil. These SO_2 emission limits model attainment and are the attainment strategy for Citizens Thermal - Perry K.

Indianapolis Power and Light Company - Harding Street Generating Station

The Indianapolis Power & Light Company (IPL) located on South Harding Street has historically operated five units, oil-fired boilers 9 and 10 also referred to as units 3 and 4, coal-fired boilers 50 and 60 also referred to as units 5 and 6, coal-fired boiler 70, also referred to as unit 7, five combustion gas turbines GT1, GT2, GT4, GT5, and GT 6 and an emergency generator. Combustion gas turbine GT3 no longer operates and was not included in the attainment demonstration modeling. Units 3 and 4 have also ceased operation. Unit 7 has a separate bypass stack which currently emits the uncontrolled SO_2 emissions during periods of startup and shutdown of unit 7.

The attainment demonstration modeling for IPL - Harding Street consists of boilers 9 and 10 not operating, boilers 50, 60, and 70 converted to natural gas only at 0.0006 lbs of SO_2/MMBtu. Gas turbine units, GT1, GT2, GT4 and GT5 will operate on low sulfur diesel at 0.10 percent (%) sulfur or 0.10 lbs of SO_2/MMBtu. Gas turbine GT6 is a natural gas-fired only unit. The emergency generator is limited to 500 hours per year burning distillate fuel oil at 0.5 lbs of SO_2/MMBtu. This annual operating limitation for the emergency generator is already in the current IPL Harding Street air permit.

Quemetco, Inc.

The SO_2 emission sources at Quemetco consist of a reverberatory furnace, an electric arc slag reduction furnace, nine refining kettles, one casting machine, and one rotary dryer. The original design of the plant had the SO_2 emissions for the processes listed above being vented out the main stack, S-100, with an emission limitation of 366 lbs of SO_2/hr, and through the scrubber stack S-111 with controlled SO_2 emissions of 50 lbs of SO_2/hr. With the construction of the Wet Electrostatic Precipitator (WESP) stack, 100% of the main stack SO_2 emissions are now routed to the WESP stack with no SO_2 emissions emitted through the main stack. The scrubber stack, S-111, SO_2 emissions are also routed to the WESP stack. As a result, the total modeled SO_2 emissions through the WESP stack were reduced to 52 lbs/hr. The SO_2 emission limit of 52

lbs/hr, reduced by approximately 87.5 percent from the original SIP emission limits, meets the 1-hour SO_2 NAAQS in the attainment demonstration.

Rolls Royce Corporation

Rolls Royce Corporation currently operates four combustion boilers, two Babcock & Wilcox (B&W) boilers, 25 turbine engines, 49 engine test stand cells, three natural gas fired shack heaters, and up to ten emergency rental generators at their Tibbs Avenue Plant 5 and Plant 8 facilities on the southwest side of Indianapolis. The six boilers can currently operate on fuel oil at 2.1 lbs of SO_2/MMBtu, but may operate on natural gas at any time. The turbine engines and engine test stand cells primarily operate on jet fuel at 0.1% sulfur or 0.1 lbs of SO_2/MMBtu. There are three operating scenarios for the six boilers with the worst case operating scenario occurring when three of the four combustion turbines and one B&W boiler are operating at the same time. A worst case operating scenario was provided by Rolls Royce for the engine test stand cells. The scenario included 29 engine test stand cells with 21 operating at one time and all but two engine test stand cells operating on jet fuel at 0.1 lbs of SO_2/MMBtu. The remaining two engine test stand cells operate on natural gas for the worst case operating scenario. The engine test stand cells and turbine engines operate on a limited basis at 2000 hours per year or less. Gas turbines 0070-68a and 0070-68b may operate at 4000 hours per year, but these turbine engine units fire natural gas only. The majority of these 29 engine test stand cells operate less than 1000 hours per year according to Rolls Royce. The worst case operating scenario modeled attainment with the engine test stand cell N6 and the 12 D2 0070-67 turbine engines operating as intermittent emissions and limited to 1000 and 1500 annual operating hours respectively. An additional 20 engine test stand cells are not operating during this worst case operating scenario provided by Rolls Royce and were not modeled as part of this original attainment demonstration.

After discussions with U.S. EPA Region V and Rolls Royce, the final attainment demonstration for Rolls Royce limited two combustion boilers and two B&W boilers to operate on ultra-low sulfur diesel fuel at 0.0015 lbs of SO_2/MMBtu but with no restriction on how many boilers can operate at one time and with the option to burn landfill gas at 0.01 lbs of SO_2/MMBtu for two of the combustion boilers 0070-64 and 0070-65. Twenty-one turbine engines and all engine test stand cells at plant 5 will operate on a cleaner jet fuel at 0.05 lbs of SO_2/MMBtu with no annual operating hour limitation for the engine test stand cell 0070-N6 and the 21 turbine engines which are identified as units D-2 0070-67, D-3 0070-68 (c, d, and e), and D-4 0070-69. Two of the eight turbine engines for unit 0070-68 will operate on natural gas only at 0.0006 lbs of SO_2/MMBtu, and the two remaining turbine engines unit 0070-66 will maintain a 0.1 lbs of SO_2/MMBtu jet fuel limit. Since the emergency rental generators, up to a total of ten, will operate on ultra-low sulfur diesel fuel at 0.0015 lbs of SO_2/MMBtu, no annual operating hour limitation is required for the emergency rental generators. Modeling assumed all ten emergency rental generators can operate simultaneously for 8760 hours per year. As part of the final attainment demonstration for Rolls Royce, ten of the engine test stand cells at Plant 5 and four engine test stand cells at Plant 8 will no longer operate. These 14 engine test cell stands were removed from the air quality modeling bringing the total number of modeled engine test stand cells to 35 at both plants. The originally proposed intermittent emissions limitation for the

engine test stand cell unit N6 and the twelve D-2 0070-67 gas turbine engines will no longer be a requirement for the Rolls Royce attainment demonstration with the conversion to a cleaner jet fuel at 0.05 lbs of SO_2/MMBtu for the Plant 5 engine test stand cells and the 21 turbine engines.

Vertellus Agriculture and Nutrition Specialties, LLC

Vertullus currently operates six boilers, six heaters, and seven furnaces at their facility on Tibbs Avenue on the southwest side of Indianapolis. The attainment demonstration consisted of boilers, heaters, and furnaces operating on various fuels including natural gas, landfill gas, or process gas. Boilers R70K, R30K, and R28K operate on process gas at 0.2 lbs of SO_2/MMBtu to 0.27 lbs of SO_2/MMBtu with boilers CB20 and 50K operating on landfill gas at 0.09 lbs of SO_2/MMBtu. Boiler CB70K operates on natural gas only at 0.0006 lbs of SO_2/MMBtu. Six furnaces can operate at 0.05 lbs of SO_2/MMBtu with furnace HW-925-001 at 1.25 lbs of SO_2/MMBtu. The heaters 722804, BS2740Q, BT2728S can operate at 0.05 lbs of SO_2/MMBtu with the remaining three heaters on natural gas only at 0.0006 lbs of SO_2/MMBtu. The SO_2 emission limits listed above will model attainment for Vertellus and meet the 1-hour SO_2 NAAQS.

Table 5.6 summarizes the 1-hour SO_2 attainment demonstration for the Marion County facilities. The modeled design value for each facility when added to the 1-hour SO_2 Marion County background concentration of 22.5 $\mu g/m^3$ meets the 1-hour SO_2 NAAQS of 196.2 $\mu g/m^3$. The Rolls Royce operating scenario modeled in Table 5.6 is with all engine test stand cells at Plant 5 and the 21 turbine engines operating on clean jet fuel at 0.05 lbs of SO_2/MMBtu.

Table 5.6
1-Hour SO_2 Attainment Demonstration Results for Nonattainment Area in Marion County

Modeled Source	Belmont WWTP	Citizens Thermal	IPL - Harding	Quemetco	Rolls Royce	Vertellus
Modeled Concentration ($\mu g/m^3$)	162.0	66.5	165.1	165.6	163.1	138.0
Background Concentration ($\mu g/m^3$)	22.5	22.5	22.5	22.5	22.5	22.5
Total Concentration ($\mu g/m^3$)	**184.5**	**89.0**	**187.6**	**188.1**	**185.6**	**160.5**
1-Hour SO_2 NAAQS	**196.2**	**196.2**	**196.2**	**196.2**	**196.2**	**196.2**
Models Below the Standard?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Table 5.7
1-Hour SO_2 Emission Rate Limits for Nonattainment Area in Marion County

Modeled Source	Emission Unit	lbs/MMBtu	lbs/hr
Belmont Advanced Wastewater Treatment Plant	Incinerator 1	Comply with SO_2 limit in 40 CFR 60 Subpart MMMM	
	Incinerator 2		
	Incinerator 3		
	Incinerator 4		
Citizens Thermal	Boiler 11	0.2	73.6
	Boiler 12	Burn Natural Gas	
	Boiler 13	0.2	80.6
	Boiler 14	0.2	80.6
	Boiler 15	Burn Natural Gas	
	Boiler 16	Burn Natural Gas	
	Boiler 17	0.3	72.6
	Boiler 18	0.3	72.6
IPL - Harding	Boiler 9	Do Not Operate	
	Boiler 10	Do Not Operate	
	Boiler 50	Burn Natural Gas	
	Boiler 60	Burn Natural Gas	
	Boiler 70	Burn Natural Gas	
	Gas Turbine 1	0.1	29.9
	Gas Turbine 2	0.1	29.9
	Gas Turbine 4	0.1	87.5
	Gas Turbine 5	0.1	86.7
	Gas Turbine 6	Burn Natural Gas	
	Emergency Generator		500 Hour Operating Limit
Quemetco	WESP Stack		52.0

Table 5.7 (continued)
1-Hour SO_2 Emission Rate Limits for Nonattainment Area in Marion County

Modeled Source	Emission Unit	lbs/MMBtu	lbs/hr
Rolls Royce	Boiler 0070-58	0.0015	0.07
	Boiler 0070-59	0.0015	0.07
	Boiler 0070-62	0.0015	0.37
	Boiler 0070-63	0.0015	0.37
	Boiler 0070-64	Burn Natural Gas or Landfill Gas	
	Boiler 0070-65	Burn Natural Gas or Landfill Gas	
	2 Gas Turbine Engines 0070-66	0.1	
	12 Gas Turbine Engines 0070-67	0.05	
	2 Gas Turbine Engines 0070-68a and 0070-68b	Burn Natural Gas	
	3 Gas Turbine Engines 0070-68c, 0070-68d, and 0070-68e	0.05	
	3 Gas Turbine Engines 0070-69	0.05	
	Three Shack Heaters 0070-70	Burn Natural Gas	
	Generating Turbine 0070-80	Burn Natural Gas or Landfill Gas	
	Rental Generators	0.0015	
	Engine Test Cells (Plant 5)	0.05	
	Engine Tests Cell (Plant 8)	0.1	
	Engine Test Cell N20	18 foot vertical stack	
	Engine Test Cell N21	20 foot vertical stack	
	Engine Test Cell N23	30 foot vertical stack	
	Engine Test Cell N24	20 foot vertical stack	

Table 5.7 (continued)
1-Hour SO_2 Emission Rate Limits for Nonattainment Area in Marion County

Modeled Source	Emission Unit	lbs/MMBtu	lbs/hr
Vertellus	70K Boiler 70-2722W	0.20	18.4
	30K Boiler 30-2726S	0.25	9.8
	28K Boiler 28-186N	0.27	9.9
	Boiler CB-70K	Burn Natural Gas	
	BM Furnace BM2724W	0.05	1.1
	Box Furnace BX2707V	0.05	0.8
	DAB Furnace 732714	0.05	2.8
	Born Heater 722804	0.05	0.34
	Born Heater Furnace BXS2706Q	0.05	0.3
	EP Furnace EP2729Q	0.05	0.15
	CB20 CB600-300 Boiler	0.09	2.3
	50K CN5-400 Boiler	0.09	5.5
	BD Furnace BD2714V	0.05	0.75
	Heater BS2740Q	0.05	0.3
	Heater BT2728S	0.05	0.3
	Furnace HW-925-001	1.25	12.25
	CS Kettle Born Heater	Burn Natural Gas	
	CS Still Born Heater	Burn Natural Gas	
	Born Hot Oil Furnace (Process Heater) Unit 2607T	Burn Natural Gas	

5.8.3 1-Hour SO_2 Attainment Demonstration for Nonattainment Area in Morgan County

Indianapolis Power and Light Company Eagle Valley Generating Station

IPL Eagle Valley was the facility modeled for the Morgan County 1-hour SO_2 attainment demonstration. IPL Eagle Valley is located in the Morgan County nonattainment area and is in the current Morgan County SO_2 SIP. IPL Eagle Valley has historically operated six boilers, units 1-6 and a distillate oil fired generator at its generating facility located on Blue Bluff Road in Martinsville, Indiana. The current permitted SO_2 emission limits for the IPL Eagle Valley plant will not model attainment. However, IPL Eagle Valley was issued a Prevention of Significant Deterioration (PSD) permit in October of 2013 to construct and operate two natural gas fired combined cycle combustion turbines, an auxiliary boiler, a dew point heater, an emergency generator and an emergency fire pump. IPL Eagle Valley plans to continue operation of the existing six boilers at its Martinsville plant until it is required to comply with MATS. An approved one year extension to the MATS rule allows Boilers 3-6 to operate until April 16, 2016. Then, in 2017, IPL plans to begin operation of the facilities permitted in 2013. The newly permitted PSD units will model attainment and meet the 1-hour SO_2 NAAQS.

An additional attainment demonstration was modeled which consisted of SO_2 emissions limitations for boilers 1, 2 and 6 and boilers 3, 4 and 5 not operating. A SO_2 emission limit of 0.275 lbs/MMBtu for boilers 1 and 2 at a 524 MMBtu/hr maximum heat capacity for each boiler and boiler 6 at 0.20 lbs/MMBtu with a maximum heat capacity of 1017 MMBtu/hr will still model attainment. These SO_2 emission limits for boilers 1, 2 and 6 at IPL Eagle Valley will not be included in the Morgan County SO_2 SIP. This attainment demonstration was modeled to determine the SO_2 emission limits required for attainment if the existing units continued to operate at IPL Eagle Valley. However, the existing six boilers will be offline by the compliance date of January 1, 2017. The new IPL Eagle Valley two natural gas-fired combined cycle combustion turbines and the auxiliary boiler will begin operating in 2017. The attainment demonstration results in Table 5.8 show Morgan County will meet the 1-hour SO_2 NAAQS with the PSD permit limits for IPL Eagle Valley, shown in Table 5.9 by January 1, 2017.

Hydraulic Press Brick Company

Hydraulic Press Brick currently operates three coal fired kilns identified as Kilns 3, 4 and 5 at its brick-making facility located on North Tidewater Road in Mooresville, Indiana. In addition to the SO_2 emissions from fuel combustion in the kilns, shale, the raw material used to produce bricks, contains sulfur compounds that also contribute to SO_2 emissions from the brickmaking-process. The company has committed to discontinue operation of Kiln #3 and to install and operate dry sorbent injection for SO_2 emission controls on Kilns #4 and #5. This control technology achieves a 50% SO_2 reduction on average which has been determined to be adequate by IDEM and the U.S. EPA in addressing Hydraulic Press Brick's SO_2 emission contributions in the nonattainment area. Therefore, Kilns 4 and 5 will be limited to a minimum control efficiency of 50% or 2.5 lbs of SO_2/MMBtu, whichever is less stringent, with a maximum limit of 6 lbs of SO_2/MMBtu. The company has also committed to testing the sulfur content of the shale, which is mined onsite, to ensure the use of lower sulfur content shale. This control strategy will reduce

sulfur dioxide emissions from the facility and provide a reasonable level of reduction to address its potential impact on SO_2 concentrations in Morgan County.

Table 5.8
1-Hour SO_2 Attainment Demonstration Results for Nonattainment Area in Morgan County

Modeled Source	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	1-Hour SO_2 NAAQS	Models Below the Standard?
IPL - Eagle Valley	11.3	24.6	**35.9**	**196.2**	**Yes**

Table 5.9
1-Hour SO_2 Emission Rate Limits for Nonattainment Area in Morgan County

Modeled Source	Emission Unit	lbs/MMBtu	lbs/hr
IPL - Eagle Valley	Combustion Turbine 1	Burn Natural Gas	
	Combustion Turbine 2		
	Aux. Boiler		
	Dew Point Heater		

5.8.4 1-Hour SO_2 Attainment Demonstration for Nonattainment Area in Vigo County

Contributing sources included in the attainment demonstration for the Vigo County nonattainment area were Duke Energy Indiana Wabash River Generating Station, Wabash River Combined Cycle Plant, and sgSolutions, LLC. There were also four small sources with zero reported SO_2 emissions included in the attainment demonstration modeling analysis. They were Sony Digital Audio Disc (DADC), Taghleef Industries, Inc., Terre Haute Regional Hospital, and Terre Haute Union Hospital. These facilities were included in the modeling analysis for Vigo County because they are already listed in the Indiana SIP.

Duke Energy Indiana - Wabash River Generating Station

Duke Energy - Wabash River located on Bolton Road in West Terre Haute, Indiana, consists of the following SO_2 emission sources: five coal-fired boilers with #2 fuel oil backup, identified as Units 2, 3, 4, 5, and 6, and three diesel generators combusting #2 fuel oil. There are no SO_2 controls on any of these units. The coal-fired boilers have a SO_2 emission limit of 4.04 lbs/MMBtu. The emergency generators are limited to 500 operating hours operating using low sulfur fuel oil. At the allowable hourly emission rates, Duke Energy-Wabash River will not model attainment. However, Duke Energy plans to retire Units 2-5 and convert Unit 6 to natural gas or retire it by mid-2016. Therefore, a SO_2 emission limit of 0.5 lbs/MMBtu, for fuel oil back-up, corresponding to an hourly emission rate of 1,499.5 lbs/hour, was modeled for Unit 6 with the other four units not operating. This control strategy scenario modeled attainment for the 1-hour SO_2 standard.

Wabash River Combined Cycle Plant

The Combined Cycle Plant is located on contiguous property with the Duke Energy-Wabash River Generating Station and sgSolutions, Inc. These three facilities have supporting relationships, which by definition means they are all considered a single source with separate operating permits. The Combined Cycle Plant consists of an integrated gas combined cycle combustion turbine, identified as Unit 1A, permitted to burn synthetic gas or natural gas, with no SO_2 controls. The allowable SO_2 emission limit for the combustion turbine is 0.195 lbs/MMBtu, which corresponds to an hourly emission rate limit of 333.27 lbs/hour. The Combined Cycle Plant modeled attainment at the allowable emission rate for Unit 1A.

sgSolutions, LLC

sgSolutions is also located on contiguous property with the Duke Energy Wabash River Generating Station. This facility is a gasification plant that sends 100% of its total output to the Wabash River Combined Cycle Plant. sgSolutions operates a tail gas incinerator, identified as Unit 1 and a flare, identified as Unit 2. The modeled SO_2 emission rate limits for both units were taken from the facility's operating permit. According to the emissions calculations in Renewal Administrative Permit, T-167-32893-00091, the SO_2 emission rate limit for the process flare was calculated using the emission factor for steady state operation using syngas, 0.3 lbs/MMBtu and the heat input capacity of the raw material combusted for fuel, 2,634.45 MMBtu/hr. sgSolutions will not model attainment at the allowable SO_2 emission limits. However, the process flare's historical data indicates that it operates well below 500 hours annually. The process flare was modeled with a 500 operating hour annual limit, which resulted in a 30-day rolling average SO_2 emission rate limit for the tail gas incinerator of 230.6 lbs/hr that modeled attainment.

Sony Digital Audio Disc (DADC)

The SO_2 emission sources at Sony DADC, located on North Fruitridge Avenue in Terre Haute, Indiana, include: 2 Kewanee Boilers, identified as Units 001 and 002, 2 Burnham Boilers, identified as Units 003 and 004, 2 Superior Boiler Works Boilers, identified as Units 005 and 006, and an unnamed boiler, identified as Unit 018. All seven boilers are natural gas-fired units with #2 fuel oil as backup and none of the seven boilers have SO_2 emission controls. Units 001 and 002 are listed in 326 IAC 7-4-3 with a 0.36 lbs/MMBtu SO_2 emission limitation but none of the other 5 boilers are listed in the current rule and none of them have permitted SO_2 emission limitations. Since the five boilers utilize #2 fuel oil for backup fuel, a 0.5 lbs/MMBtu SO_2 emission limit was modeled for each boiler. The facility did not model attainment using the SO_2 emission limit for #2 fuel oil. A SO_2 emission limit of 0.05 lbs/MMBtu, limiting the backup fuel to low sulfur fuel oil, was modeled for each of the seven boilers. This control strategy scenario modeled attainment for the 1-hour SO_2 standard.

Taghleef Industries

Taghleef Industries is located on US 41 North in Terre Haute, Indiana and operates two Murray Iron Works Boilers, identified as Boilers A and B, a Clayton Standby Boiler, identified as Boiler C, and a Nebraska Boiler, identified as Boiler D. Each of the four boilers is permitted to combust natural gas, #1 fuel oil, and #2 fuel oil but none of the boilers have any SO_2 emission controls. The four boilers are listed in 326 IAC 7-4-3 as each having SO_2 emission limits of 0.51 lbs/MMBtu. Taghleef will not model attainment at these hourly emission rate limits. However, the company plans to remove both Murray Boilers and install a new boiler operating on natural gas only. This boiler is referred to as the Nebraska-D Boiler. The Clayton Standby Boiler and the existing Nebraska Boiler were both modeled with an SO_2 emission limit of 0.0015 lbs/MMBtu, limiting the backup fuel to ultra-low fuel oil and the Nebraska-D Boiler was modeled at 0.0006 lbs SO_2/MMBtu for use with natural gas only. This control strategy scenario modeled attainment for the 1-hour SO_2 standard.

Terre Haute Regional Hospital

Terre Haute Regional Hospital, on South 7th Street in Terre Haute, Indiana, operates two boilers, permitted to burn natural gas, #1 diesel oil, and #2 diesel oil, with no SO_2 emission controls at its facility on South 7th Street in Terre Haute, Indiana. The two boilers at Terre Haute Regional Hospital are listed in 326 IAC 7-4-3 as having SO_2 emission limits of 0.45 lbs/MMBtu, which gives an hourly SO_2 emission rate limit of 5.625 lbs/hour. The facility modeled attainment at its allowable emission rates; therefore the emission rate limits for this facility will not change.

Union Hospital

Terre Haute Union Hospital, on North 7th Street in Terre Haute, Indiana, has two Keller Boilers, permitted to burn natural gas, #1 diesel oil, and #2 diesel oil, with no controls. Both boilers are listed in 326 IAC 7-4-3 as having SO_2 emission limits of 0.36 lbs/MMBtu, which equates to an hourly SO_2 emission rate limit of 14.076 lbs/hour. These emission rate limits modeled attainment for the 1-hour standard. Therefore, no further modeling was required for this facility.

Table 5.10 summarizes the 1-hour SO_2 attainment demonstration for the Vigo County facilities with the modeled impact for each facility added to the 1-hour SO_2 Vigo County background concentration and shows the county meets the 1-hour SO_2 NAAQS of 196.2 $\mu g/m^3$.

Table 5.10
1-Hour SO_2 Attainment Demonstration Results for Nonattainment Area in Vigo County

Modeled Source	Modeled Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Concentration ($\mu g/m^3$)	1-Hour SO_2 NAAQS	Models Below the Standard?
Duke Energy - Wabash River	41.53	23.0	64.53	**196.2**	**Yes**
Combined Cycle Plant	13.56	23.0	36.56	**196.2**	**Yes**
sgSolutions	165.91	23.0	188.91	**196.2**	**Yes**
Sony DADC	147.35	23.0	170.35	**196.2**	**Yes**
Taghleef Industries	11.23	23.0	34.23	**196.2**	**Yes**
Terre Haute Regional Hospital	18.47	23.0	41.47	**196.2**	**Yes**
Terre Haute Union Hospital	4.96	23.0	27.96	**196.2**	**Yes**

Table 5.11
1-Hour SO_2 Emission Rate Limits for
Nonattainment Area in Vigo County

Modeled Source	Emission Unit	lbs/MMBtu	lbs/hr
Duke Energy - Wabash River	Unit 6 boiler	0.5	1,499.5
	Diesel Generator, 7A	0.05	500 Hour Operating Limit
	Diesel Generator, 7B	0.05	500 Hour Operating Limit
	Diesel Generator, 7C	0.05	500 Hour Operating Limit
Combined Cycle Plant	Combustion Turbine	0.195	333.76
sgSolutions	Tail Gas Incinerator		230.6**
	Process Flare*		500 Hour Operating Limit on coal/syngas
Sony DADC	Unit 001 Kewanee Boiler	0.05	
	Unit 002 Kewanee Boiler	0.05	
	Unit 003 Burnham Boiler	0.05	
	Unit 004 Burnham Boiler	0.05	
	Unit 005 Superior Boiler Works Boiler	0.05	
	Unit 006 Superior Boiler Works Boiler	0.05	
	Unit 018 Boiler	0.05	
Taghleef Industries	Clayton Standby Boiler	0.0015	.03
	Nebraska Boiler	0.0015	.05
	Nebraska Boiler-D	Burn Natural Gas	
Terre Haute Regional Hospital	Boiler 1	0.45	
	Boiler 2	0.45	
Terre Haute Union Hospital	Boiler 1	0.36	
	Boiler 2	0.36	

*The lbs/MMBtu and MMBtu/hr value represents the emission factor and heat input of the raw material, not of the flare.
**30-day rolling average limit

6.0 CONTINGENCY MEASURES

The U.S. EPA interprets the contingency measure provisions as primarily directed at general programs which can be undertaken on an area wide basis; however, SO_2 presents special considerations. First, for some of the other criteria pollutants, the analytical tools for quantifying the relationship between reductions in precursor emissions and resulting air quality improvements remain subject to significant uncertainties, in contrast with procedures for pollutants such as SO_2. Second, emission estimates and attainment analyses can be strongly

influenced by overly-optimistic assumptions about control efficiency and rates of compliance for many small sources. In contrast, controls for SO_2 are well understood and are far less prone to uncertainty. Since SO_2 control measures are by definition based upon what is directly and quantifiably necessary to attain the SO_2 NAAQS, it would be unlikely for an area to implement the necessary emission controls, yet fail to attain the NAAQS. Therefore, for SO_2 programs, U.S. EPA interprets "contingency measures" to mean the State agency has a comprehensive program to identify sources of violations of the SO_2 NAAQS and will undertake an aggressive follow-up for compliance and enforcement, including expedited procedures for establishing enforceable consent agreements pending the adoption of revised SIPs.

Indiana will consider necessary contingency measures to be phased-in or implemented from a comprehensive list of measures deemed appropriate and effective at the time the selection is made. Listed below are example measures that may be considered. The selection of measures will be based upon cost-effectiveness, emissions reduction potential, economic and social considerations, or other factors that IDEM deems appropriate. IDEM will solicit input from interested and affected persons in the nonattainment area prior to selecting appropriate contingency measures. All of the listed contingency measures are potentially effective or proven methods of obtaining significant reductions of SO_2 emissions. Because it is not possible at this time to determine what control measure(s) will be appropriate at an unspecified time in the future, the list of contingency measures outlined below is not comprehensive. Indiana anticipates that if contingency measures should ever be necessary, it is unlikely that a significant number (i.e., all those listed below) will be required.

1. Require alternative fuel.
2. Require SO_2 emissions add-on control technologies for existing emission units.
3. Require reduced operating hours.
4. Require SO_2 emission offsets for new and modified major sources.
5. Require SO_2 emission offsets for new and modified minor sources.

No contingency measure shall be implemented without providing the opportunity for full public participation during which the relative costs and benefits of individual measures, at the time they are under consideration, can be fully evaluated.

7.0 PUBLIC PARTICIPATION

In accordance with 40 CFR 51.102, public participation in this request was provided as follows:

Notice of availability of the complete document and a request for the opportunity for a public hearing was made available on IDEM's website on August 5, 2015 at http://www.in.gov/idem/5474.htm. It remained posted on the site until at least September 21, 2015.

IDEM received written comments from the Indianapolis Power and Light Company (IPL) during the public comment period, which concluded on September 21, 2015. IPL's comments consisted

of minor clarifying revisions that were incorporated into the document as requested. There was not a request for a public hearing during the public comment period and the hearing was not required to be held.

A copy of the legal public notice and certification of publication can be found in Appendix J.

8.0 CONCLUSION

Monitored air quality in the nonattainment areas has generally shown a downward trend of sulfur dioxide emissions over time. SO_2 emissions are primarily derived from fossil fuel combustion at power plants and other industrial facilities. A number of pending national, regional, and local control measures that directly or indirectly require SO_2 emission reductions from EGUs and other large sources (such as various types of boilers and incinerators) have been finalized and upheld since designation. Compliance with these regulations is projected to substantially lower SO_2 emissions over the next few years and improve air quality to levels below the 1-hour SO_2 standard.

This demonstration shows that SO_2 emission reductions since designation have had a positive effect on monitored SO_2 levels in Veale Township in Daviess County, Wayne, Center, and Perry Townships in Marion County, Clay, and Washington Townships in Morgan County, Washington Township in Pike County, and Fayette and Harrison Townships in Vigo County. This attainment demonstration shows that once the air dispersion modeling results are considered along with national, regional, and local control measures to be phased-in or implemented at contributing sources over the next several years, air quality in the nonattainment areas will continue to improve. In addition, this attainment demonstration provides comprehensive evidence that the nonattainment areas will achieve attainment of the SO_2 NAAQS by October 2018 with an ample margin of safety.

This plan satisfies Indiana's obligation under Section 172(c) of the CAA to demonstrate how the area will attain the air quality standard for sulfur dioxide by the attainment date, and, as a result, realize cleaner air. The development of this plan will bring the areas into compliance with state and federal sulfur dioxide air quality standards, and provide real progress in the state's journey toward cleaner air.

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