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**Technical Support Document (TSD)**

**LOUISIANA  
Area Designations For the  
2010 SO<sub>2</sub> Primary National Ambient Air Quality Standard**

**Summary**

Pursuant to section 107(d) of the Clean Air Act (CAA), EPA must initially designate areas as either “nonattainment,” “attainment” or “unclassifiable” for the 2010 1-hour sulfur dioxide (SO<sub>2</sub>) primary national ambient air quality standard (NAAQS). The CAA defines a nonattainment area as one that does not meet the NAAQS or that contributes to poor air quality in a nearby area that does not meet the NAAQS. Table 1 below identifies the county (parish) in Louisiana that EPA is initially designating “nonattainment” based on monitored violations. The EPA is not yet prepared to designate other areas in Louisiana.

**Table 1. Nonattainment Area Designations for Louisiana**

Area	Louisiana’s Recommended Designation of Area/County (Parish)	EPA’s Designation of Area/County (Parish)
St. Bernard Parish, LA	Nonattainment	Nonattainment

**Background**

On June 2, 2010, EPA revised the primary SO<sub>2</sub> NAAQS (75 FR 35520, June 22, 2010) by establishing a new 1-hour standard at a level of 75 parts per billion (ppb) which is met at an ambient air quality monitoring site when the 3-year average of the annual 99<sup>th</sup> percentile of 1-hour daily maximum concentrations is less than or equal to 75 ppb, as determined in accordance with Appendix T of 40 CFR part 50. 40 CFR 50.17(a)-(b). The EPA has determined that this is the level necessary to provide protection of public health with an adequate margin of safety, especially for children, the elderly and those with asthma. These groups are particularly susceptible to the health effects associated with breathing SO<sub>2</sub>. The Agency is revoking the two prior primary standards of 140 ppb evaluated over 24-hours, and 30 ppb evaluated over an entire year because the standards will not add additional public health protection given a 1-hour standard at 75 ppb. Accordingly, EPA is not designating areas in this process on the basis of either of these two prior primary standards. Similarly, the secondary standard for SO<sub>2</sub> has not been revised, so EPA is not designating areas in this process on the basis of the secondary standard.

## EPA's SO<sub>2</sub> Designation Approach

Section 107(d) of the CAA provides that not later than 1 year after promulgation of a new or revised NAAQS, state Governors may submit their recommendations for designations and boundaries to EPA. For the 2010 SO<sub>2</sub> NAAQS, this deadline was in June 2011. Section 107(d) also requires EPA to provide a notification to states of no less than 120 days prior to promulgating an initial area designation that is a modification of a state's recommendation. EPA has reviewed the state's recommendations and has notified the State Commissioner through a letter signed by the Regional Administrator of any intended modifications. If a state or tribe did not submit designation recommendations, EPA is promulgating the designations that it deems appropriate. If a state or tribe disagreed with EPA's intended area designations, it had an opportunity to demonstrate why any proposed modification is inappropriate.

Designations guidance was issued by EPA through a March 24, 2011, memorandum from Stephen D. Page, Director, U.S. EPA, Office of Air Quality Planning and Standards, to Air Division Directors, U.S. EPA Regions I-X. This memorandum identifies factors EPA has evaluated in determining boundaries for areas designated nonattainment. These 5 factors include: 1) air quality data; 2) emissions and emissions-related data (location of sources and potential contribution to ambient SO<sub>2</sub> concentrations); 3) meteorology (weather/transport patterns); 4) geography/topography (mountain ranges or other air basin boundaries); and 5) jurisdictional boundaries (e.g., counties, air districts, pre-existing nonattainment areas, reservations, metropolitan planning organization), among any other information deemed to be relevant to establishing appropriate area designations and boundaries for the 1-hour SO<sub>2</sub> NAAQS.

The March 24, 2011, designations guidance memo recommended that area boundaries be defaulted to the county boundary unless additional information justifies a larger or smaller boundary than that of the county. EPA believes it is appropriate to evaluate each potential area on a case-by-case basis, and to recognize that area-specific analyses conducted by states, tribes and/or EPA may support a different boundary than that of a default county boundary.

In this TSD, EPA discusses its review and technical analysis of the recommendations submitted by the State of Louisiana for designations of the 1-hour SO<sub>2</sub> standard and any modifications from these recommendations.

### *Definition of important terms used in this document:*

1) **Designated "nonattainment" area** – an area which EPA has determined, based on a state recommendation and/or on the technical analysis included in this document, has violated the 2010 SO<sub>2</sub> NAAQS, based on the most recent three years of air quality monitoring data, or contributes to a violation in a nearby area.

2) **Recommended nonattainment area** – an area that a state or tribe has recommended to EPA to be designated as nonattainment.

3) **Violating monitor** – an ambient air monitor meeting all methods, quality assurance and citing criteria and requirements whose valid design value exceeds 75 ppb, as described in Appendix T of 40 CFR part 50.

4) **2010 SO<sub>2</sub> NAAQS** - 75 ppb, national ambient air quality standard for SO<sub>2</sub> promulgated in 2010. Based on the 3-year average of the 99<sup>th</sup> percentile of the annual distribution of daily maximum 1-hour average concentrations.

5) **Design Value** – a statistic that describes the air quality status of a given area relative to the level of the NAAQS.

### **State's Recommendation Letter**

In May 2011, Secretary Peggy Hatch, Secretary of the Louisiana Department of Environmental Quality (LDEQ), recommended that 20 parishes be designated as “unclassifiable” for the 2010 SO<sub>2</sub> NAAQS based on the absence of both monitored air quality data and of a modeling demonstration showing attainment of the standard.<sup>1</sup> Secretary Hatch also recommended that 42 parishes be designated as “attainment” for the 2010 SO<sub>2</sub> NAAQS. For 4 of these parishes, the attainment recommendation is based on monitored air quality data from regulatory and non-regulatory monitors with the absence of a modeling demonstration showing attainment of the standard. For 38 parishes, the attainment recommendation is based on 2009 SO<sub>2</sub> emissions from sources in the respective parishes. According to the 2009 Louisiana emissions inventory, these 38 parishes each have total emissions less than 75 SO<sub>2</sub> tons per year (tpy). Secretary Hatch's May 2011 letter also recommended that St. Bernard Parish and West Baton Rouge Parish be designated as “nonattainment” for the 2010 SO<sub>2</sub> NAAQS based on monitored violations.

Secretary Hatch's May 2011 recommendations were based on 2008-2010 monitored air quality data. This is in accordance with the March 24, 2011, designations guidance memo from Stephen D. Page in which we stated our expectation that states and tribes would review available SO<sub>2</sub> monitoring data from 2008-2010 in providing their recommendations to EPA. We also stated in the March 24, 2011, memo that we intended to consider 2011 SO<sub>2</sub> monitoring data in formulating any intended modifications to the states' and tribes' recommendations if such data were to become available prior to EPA issuing the 120 day letters. Since 2011 data are currently available, in the analysis presented in this TSD, EPA is considering 2009-2011 monitored air quality data for all areas in Louisiana, with the exception of West Baton Rouge Parish. Since 2012 data for the monitor in West Baton Rouge Parish was early certified by Louisiana, EPA is considering 2010-2012 monitored air quality data for this particular monitor. The 2010-2012 data for West Baton Rouge meets the 2010 SO<sub>2</sub> NAAQS.

Consequently, this final initial designation does not address West Baton Rouge Parish, which will be further addressed in a subsequent round of designations.

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<sup>1</sup> May 26, 2011, letter from Peggy M. Hatch, Secretary, Louisiana Department of Environmental Quality, to Al Armendariz, Regional Administrator, EPA Region 6.

## Nonattainment Designations

### Technical Analysis for St. Bernard Parish

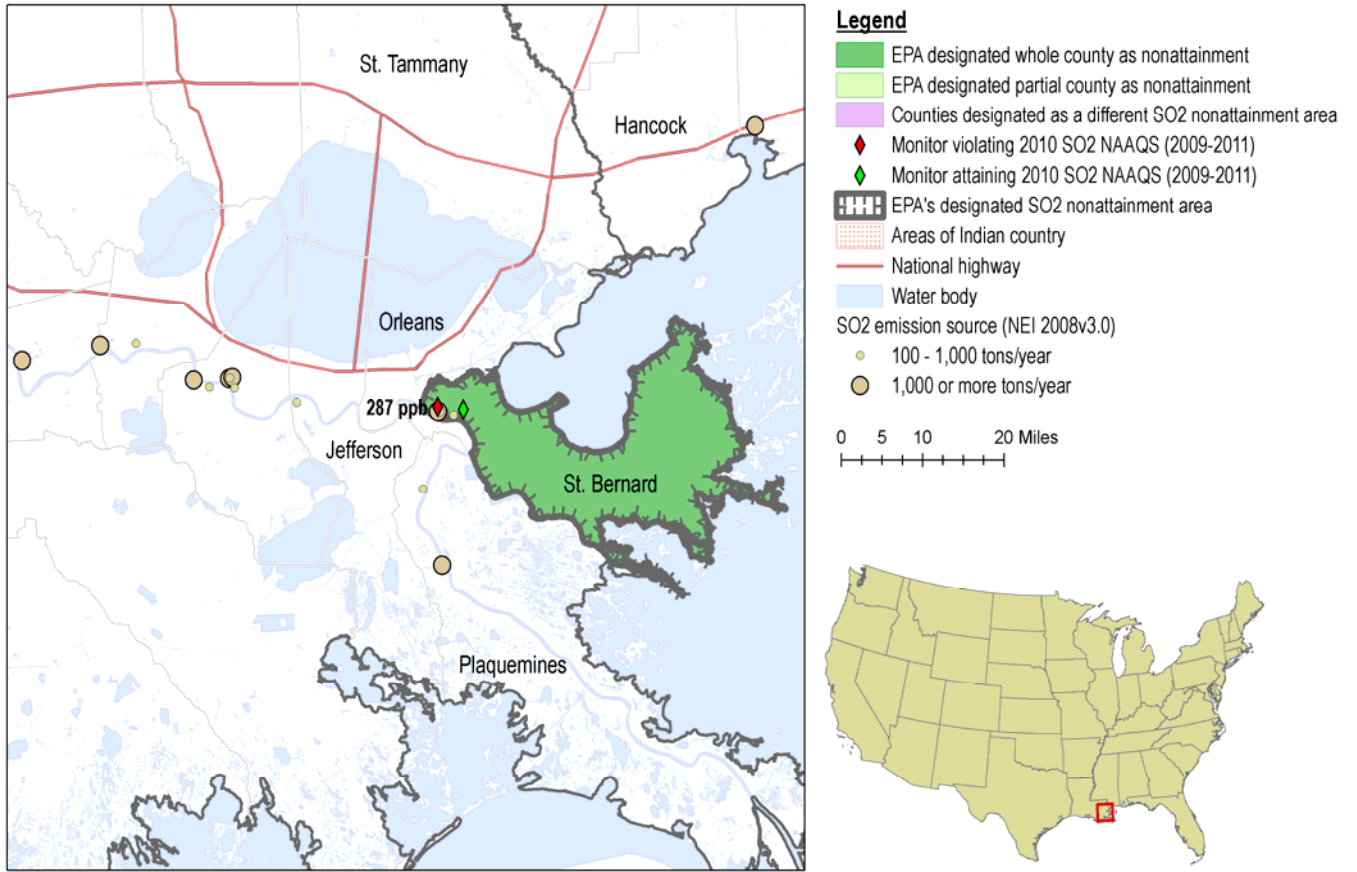
#### Introduction

This technical analysis identifies St. Bernard Parish as having a monitor that violates the 2010 SO<sub>2</sub> NAAQS, and evaluates nearby parishes for contributions to SO<sub>2</sub> concentrations in the area. EPA has evaluated St. Bernard Parish and nearby parishes based on the weight of evidence of the factors recommended in the March 24, 2011, designations guidance memo.

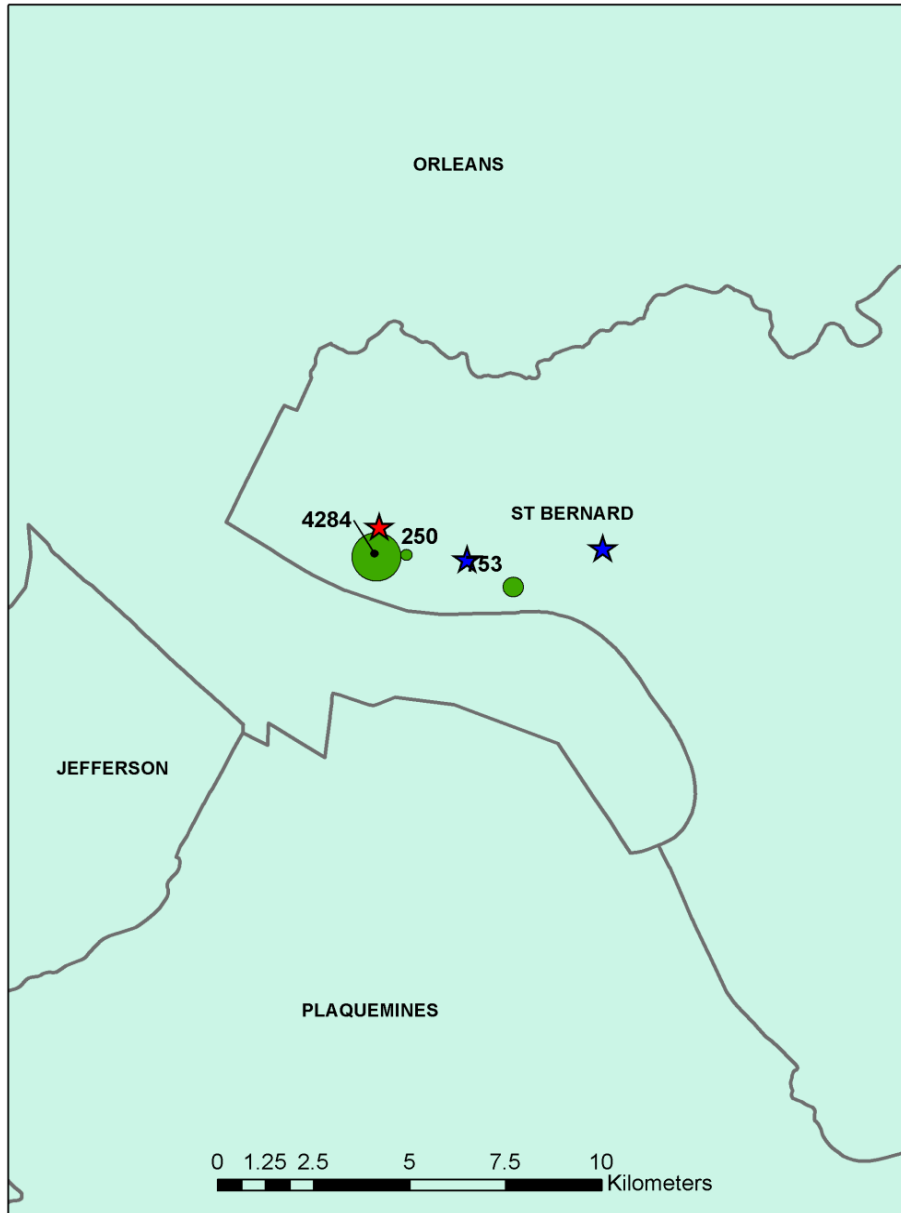
Figures 1 and 2 are maps of St. Bernard Parish, showing the location and design values of air quality monitors in the area, the parishes surrounding the violating air quality monitor, and the location of SO<sub>2</sub> point sources with 2008 emissions greater than 100 SO<sub>2</sub> tpy based on the 2008 National Emissions Inventory (NEI). As shown in the legend for Figure 1, the diamonds represent regulatory SO<sub>2</sub> monitors (red=violating, green=attaining) and the circles represent SO<sub>2</sub> emissions sources. In Figure 2, the stars represent regulatory SO<sub>2</sub> monitors (red=violating, blue=attaining); the green circles represent SO<sub>2</sub> emissions sources, with the size of the circle proportional to the source's 2008 NEI SO<sub>2</sub> emissions (numbers shown are 2008 NEI SO<sub>2</sub> emissions in tpy). As shown in the figures, only one of the three regulatory monitors in St. Bernard Parish has a 2009-2011 design value above the 2010 1-hour SO<sub>2</sub> NAAQS. The violating monitor, shown as a red diamond in Figure 1 and a red star in Figure 2, is the Chalmette-Vista monitor (EPA Site ID 22-087-0007), with a 2009-2011 design value of 287 ppb. The other two regulatory monitors in St. Bernard Parish have design values under the 2010 1-hour SO<sub>2</sub> NAAQS. These monitors, shown as blue stars in Figure 2, are the Chalmette-High School monitor (EPA Site ID 22-087-0009), with a 2009-2011 design value of 64 ppb (incomplete data), and the Meraux monitor (EPA Site ID 22-087-0004), with a 2009-2011 design value of 26 ppb. Note that Figure 1 depicts only the Meraux monitor as having a design value under the standard (i.e., shown as a green diamond), as three full years of data are not available from the Chalmette-High School monitor.

Figure 1. St. Bernard Parish 1-hr SO<sub>2</sub> NAAQS Nonattainment Area

### St. Bernard Parish, LA



**Figure 2. St. Bernard Parish 1-hr SO<sub>2</sub> NAAQS Nonattainment Area (close-up)**



Based on EPA's technical analysis described below, EPA is initially designating St. Bernard Parish as nonattainment for the 2010 SO<sub>2</sub> NAAQS, based upon currently available information. EPA is not yet prepared to designate other areas of Louisiana. Areas and sources that we are not yet prepared to conclude are contributing to the monitored violation or other possible violations are not included in this initial nonattainment area, and will be addressed in a subsequent round of designations.

## Detailed Assessment

### *Air Quality Data*

This factor considers the SO<sub>2</sub> air quality monitoring data, including the design values (in ppb) calculated for all air quality monitors in St. Bernard Parish, based on data for the 2009-2011 period.

Secretary Hatch's nonattainment recommendation for St. Bernard Parish was based on 2008-2010 data<sup>2</sup> from Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitors located in the state, in accordance with 40 CFR Part 53. As discussed elsewhere in this TSD, EPA is considering 2009-2011 air monitoring data for St. Bernard Parish in the technical analysis presented in this TSD. The 2009-2011 SO<sub>2</sub> NAAQS design values for the monitors in St. Bernard Parish are shown in Table 2.

**Table 2. Air Quality Data for Nonattainment Designations in Louisiana**

Parish	State Recommended Nonattainment?	Monitor Name*	Monitor Air Quality System ID	Monitor Location	SO <sub>2</sub> Design Value, 2008-2010 (ppb)	SO <sub>2</sub> Design Value, 2009-2011 (ppb)
St. Bernard Parish, LA	Yes	Meraux	22-087-0004	4101 Mistrot Drive	32	26
		<b>Chalmette-Vista</b>	<b>22-087-0007</b>	<b>24 E. Chalmette Circle</b>	<b>297</b>	<b>287</b>
		Chalmette-High School	22-087-0009	1100 E. Judge Perez Drive	60	64**

\* The monitor in bold has the highest 2009-2011 design value in the parish.

\*\* Design Value based on incomplete data.

St. Bernard Parish shows a violation of the 2010 SO<sub>2</sub> NAAQS. Therefore, some area in the parish and possibly additional areas in surrounding parishes must be designated nonattainment. The absence of a violating monitor alone is not a sufficient reason to eliminate nearby parishes as candidates for nonattainment status. Each area has been evaluated based on the weight of evidence of the five factors and other relevant information.

As shown in Table 2, the Chalmette-Vista monitor (Air Quality System ID 22-087-0007) in St. Bernard Parish has a 2009-2011 design value of 287 ppb, which exceeds the NAAQS and is therefore violating the standard. The Chalmette-High School monitor (Air Quality System ID 22-087-0009) and the Meraux monitor (Air Quality System ID 22-087-0004), which are also located in St. Bernard Parish, have 2009-2011 design values of 64 ppb (incomplete data) and 26 ppb, respectively. The violating Chalmette-Vista monitor is approximately 5.1 km away from the Chalmette-High School monitor, and 2.2 km away from the Meraux monitor. This suggests that the emissions source or sources causing or contributing to the recorded violation of the Chalmette-Vista monitor are in closer proximity to the Chalmette-Vista monitor than to the two

<sup>2</sup> May 31, 2011, letter from Peggy M. Hatch, Secretary, Louisiana Department of Environmental Quality, to Al Armendariz, Regional Administrator, EPA Region 6.

other monitors in St. Bernard Parish, and/or that the Chalmette-Vista monitor is located directly downwind from the emissions source(s) causing the violation. There are no other regulatory SO<sub>2</sub> monitors within 100 km of the violating Chalmette-Vista monitor. The regulatory SO<sub>2</sub> monitor located nearest to the St. Bernard Parish monitors is located in East Baton Rouge Parish (approximately 130 km away from the Chalmette-Vista monitor). Air quality data from a monitor located in a nearby parish could potentially be used to indicate whether sources in that parish are contributing to the monitored violation at the Chalmette-Vista monitor. In this case, however, regulatory SO<sub>2</sub> monitors in neighboring parishes are located too far away from the St. Bernard Parish violating monitor (Chalmette-Vista) for their design values to indicate whether or not emissions sources from these parishes may be contributing to the St. Bernard Parish violating monitor.

***Emissions and Emissions-Related Data***

Evidence of SO<sub>2</sub> emissions sources in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. In considering this factor, EPA evaluated county level emission data for SO<sub>2</sub> and any growth in SO<sub>2</sub> emitting activities since the date represented by those emissions data.

Emissions

EPA recognizes that there may be new information on any changes in emissions that may have occurred after 2008, and would consider more recent years if available. Louisiana did not provide updated emissions information, therefore EPA relied on the 2008 NEI emissions data (NEI08V3) to identify sources that could potentially be contributing to a violation.

Table 3 shows total emissions of SO<sub>2</sub> according to the 2008 NEI (in tpy) in St. Bernard Parish and potentially contributing surrounding parishes, as well as emissions from sources emitting greater than 100 tpy of SO<sub>2</sub> in these parishes.

**Table 3. 2008 NEI SO<sub>2</sub> Emissions (NEI08V3) in St. Bernard Parish and Surrounding Parishes**

Parish	Facility Located in State Recommended Nonattainment Area?	Facility Name, Address, Coordinates, and EIS (or State Facility ID)	Facility Emissions (tpy)	Approximate Facility Distance from St. Bernard Parish Violating Monitor (km)	Total Parish SO <sub>2</sub> Emissions (tpy)
St. Bernard Parish, LA	Yes	Rain CII Carbon LLC- Chalmette Coke Plant  700 Coke Plant Rd.  (29.9375, -89.97694)  EIS ID 5608111	4284 tpy	0.8	6267



		<p>Chalmette Refining LLC- Chalmette Refinery</p> <p>500 W St Bernard Hwy (29.9379, -89.9699)</p> <p>EIS ID 8020411</p>	250 tpy	1.0	
		<p>Murphy Oil USA Inc.- Meraux Refinery</p> <p>2500 E St Bernard Hwy (29.93022, -89.94492)</p> <p>EIS ID 7355411</p>	753 tpy	3.4	
St. Charles Parish, LA	No	<p>Valero Refining Co. - New Orleans LLC- St. Charles Refinery</p> <p>14902 River Rd</p> <p>EIS ID 7449311</p>	238 tpy	40.4	7824
		<p>Rain CII Carbon LLC- Norco Coke Plant</p> <p>801 Prospect Ave (30.00194, -90.39694)</p> <p>EIS ID 8020911</p>	2350 tpy	41.0	
		<p>Shell Chemical LP- Norco Chemical Plant- East Site</p> <p>15536 River Rd (30.00111, -90.40694)</p> <p>EIS ID 8239511</p>	1020 tpy	42.0	
		<p>Motiva Enterprises LLC- Norco Refinery</p> <p>15536 River Rd (29.99537, -90.41017)</p> <p>EIS ID 8020811</p>	769 tpy	42.2	
		<p>Union Carbide Corp.- St. Charles Operations</p> <p>355 Hwy 3142 Gate 28 (29.98229, -90.45562)</p> <p>EIS ID 7202911</p>	416 tpy	46.4	

		Entergy Louisiana LLC- Waterford 1&2 Generating Plant 17705 River Rd (29.9994, -90.4758) EIS ID 5609311	1803 tpy	48.5	
Orleans Parish, LA	No	N/A	None > 100 tpy	N/A	1900
Plaquemines Parish, LA	No	Chevron Oronite Co. LLC- Oak Point Plant 10285 Hwy 23 S (29.81028, -90.01139) EIS ID 8018711	262 tpy	15.3	9316
		Conoco Phillips Co.- Alliance Refinery 15551 Hwy 23 (29.684887, -89.97613) EIS ID 7203711	2785 tpy	29.0	
Jefferson Parish, LA	No	Cornerstone Chemical Co. 10800 River Rd (29.95788, -90.26568) EIS ID 7228511	863 tpy	27.9	3068
St. Tammany Parish, LA	No	N/A	None > 100 tpy	N/A	154

See also Figures 1 and 2 above for facility location in relation to air quality monitors. As shown in Figure 1, the emissions sources closest to the violating monitor are located in St. Bernard Parish. This suggests that sources in St. Bernard Parish are causing or contributing to the monitored violation of the 2010 SO<sub>2</sub> NAAQS. Table 3 shows there are three sources within 30 km from the St. Bernard Parish violating monitor, located in neighboring parishes, and with 2008 NEI SO<sub>2</sub> emissions greater than 100 tpy (each). One of these sources (863 SO<sub>2</sub> tpy, 2008 NEI) is in Jefferson Parish, and is located approximately 27.9 km from the St. Bernard violating monitor. The remaining two sources (262 SO<sub>2</sub> tpy and 2785 SO<sub>2</sub> tpy, 2008 NEI) are in Plaquemines Parish, and are located approximately 15.3 km and 29 km away from the St. Bernard violating monitor, respectively. However, these sources each have 2008 NEI SO<sub>2</sub> emissions that are lower than that of the largest point source in St. Bernard Parish, and they are all located further away from the violating monitor than are St. Bernard Parish's own sources. Based on this information, we are not yet prepared to conclude that the emissions from these sources in Jefferson Parish and Plaquemines Parish contribute to the monitored violation in St. Bernard Parish. All the sources in St. Charles Parish are located at least 40 km from the St. Bernard Parish violating monitor, and each have SO<sub>2</sub> emissions that are lower than that of the largest point source in St. Bernard Parish.

Two other nearby parishes, Orleans and St. Tammany Parishes, do not have any sources with emissions greater than 100 tpy. Based on this information, we are not prepared to conclude that sources in St. Charles, Orleans, and St. Tammany Parishes contribute to the violating monitor's design values. All of these sources and areas will be further addressed in a subsequent round of designations.

### Emissions Controls

The emissions data used by EPA in this technical analysis and provided in Table 3 represents emissions levels taking into account any control strategies implemented on stationary sources in St. Bernard and surrounding parishes up to and including 2008.

### *Meteorology (weather/transport patterns)*

Evidence of source-receptor relationships between specific emissions sources and high SO<sub>2</sub> values at violating monitors is another important factor in determining the appropriate contributing areas and the appropriate extent of the nonattainment area boundary. For this factor, EPA considered 30 years of National Weather Service data on average frequency of wind direction by season. The National Weather Service data for St. Bernard Parish is shown in Table 4. EPA also considered recent hourly meteorological data to determine which wind vectors were associated with monitored 1-hour SO<sub>2</sub> NAAQS violations. The meteorological data used in this analysis were based on 2009-2011 data co-located with the St. Bernard Parish violating site. This data is presented in Table 5. This meteorological data may provide evidence of the potential for SO<sub>2</sub> emissions sources located upwind of a violating monitor to contribute to ambient SO<sub>2</sub> levels at the violation location.

**Table 4. National Weather Service 30-Year Average Frequency (%) of Wind Direction by Season for St. Bernard Parish**

<b>Wind Direction</b>	<b>Season<sup>1</sup></b>			
	<b>Winter</b>	<b>Spring</b>	<b>Summer</b>	<b>Autumn</b>
<b>North-northeast</b>	21.1	13.7	12.3	23.3
<b>East-northeast</b>	15.0	9.5	11.1	21.7
<b>East-southeast</b>	11.7	13.9	10.5	15.3
<b>South-southeast</b>	11.7	19.2	11.0	10.7
<b>South-southwest</b>	11.5	18.5	19.1	7.6
<b>West-southwest</b>	7.0	8.0	14.2	4.4
<b>West-northwest</b>	8.1	7.9	13.3	6.4
<b>North-northwest</b>	14.0	9.4	8.4	10.6

<sup>1</sup> For purposes of this table, winter is defined as the months of December, January, and February; spring is March, April, and May; summer is June, July, and August; and autumn is September, October, and November.

The 30-year average frequency of wind direction data for St. Bernard Parish shows that in general, the prevailing surface winds blow into St. Bernard Parish primarily from the north-northeast, east-northeast, south-southwest, south-southeast, and east-southeast. As shown in Table 5, monitored 1-hour SO<sub>2</sub> NAAQS exceedance events during 2009-2011 occurred throughout all seasons, but primarily took place in the spring and summer months in 2009 and 2010 and in the spring months in 2011. Table 4 shows that in winter, the wind has historically blown into St. Bernard Parish to a greater extent from the north-northeast (21.1% of time). In spring, the wind has historically blown into St. Bernard Parish to a greater extent from the south-southeast (19.2%) and south-southwest (18.5%). In summer, the wind has historically blown into St. Bernard Parish to a greater extent from the south-southwest (19.1%). The data suggest that on months with the highest observed SO<sub>2</sub> levels in 2009-2011 (i.e., winter, spring, and summer), the prevailing surface winds were to a greater extent from directions that correspond to the location of sources in St. Bernard Parish (see Figures 1 and 2) and not to those of sources in surrounding parishes.

As stated above, EPA also analyzed wind direction as measured by the Chalmette-Vista monitor specifically during days with monitored 1-hr SO<sub>2</sub> NAAQS hourly exceedances (i.e., violation days) in 2009-2011 (see Table 5). Although some violation days had multiple hourly SO<sub>2</sub> exceedances, only the maximum 1-hour SO<sub>2</sub> concentration and the corresponding wind direction during that hour are shown for each violation day.

**Table 5. Wind Direction during 1-hour SO<sub>2</sub> NAAQS Exceedances at Chalmette-Vista Monitor in St. Bernard Parish- AQS Site ID 22-087-0007**

<b>2009 1-hour SO<sub>2</sub> NAAQS Hourly Exceedances</b>				
<b>Date<sup>1</sup></b>	<b>Time<sup>2</sup></b>	<b>1-hr SO<sub>2</sub> Concentration (ppb)</b>	<b>Wind Direction<sup>3</sup> (Compass °)</b>	<b>Wind Direction<sup>3</sup> (Compass Point)</b>
1/2/2009	06:00	109	191	South
1/3/2009	12:00	159	186	South
1/5/2009	18:00	200	188	South
1/6/2009	07:00	96	192	South-southwest
1/18/2009	02:00	87	194	South-southwest
1/21/2009	22:00	120	189	South
1/22/2009	19:00	95	175	South
1/23/2009	00:00	88	176	South
2/2/2009	07:00	120	238	West-southwest
2/10/2009	05:00	89	190	South
2/11/2009	05:00	316	177	South
2/13/2009	14:00	101	192	South-southwest
2/17/2009	23:00	81	185	South
2/20/2009	20:00	111	189	South
2/21/2009	20:00	126	185	South
2/27/2009	03:00	194	177	South

3/8/2009	10:00	85	194	South-southwest
3/10/2009	14:00	108	181	South
3/11/2009	20:00	147	187	South
3/14/2009	07:00	206	179	South
3/25/2009	23:00	245	183	South
3/26/2009	00:00	285	182	South
3/27/2009	23:00	152	193	South-southwest
3/31/2009	09:00	83	195	South-southwest
4/5/2009	04:00	166	182	South
4/9/2009	06:00	311	181	South
4/10/2009	03:00	314	184	South
4/12/2009	21:00	279	181	South
4/19/2009	10:00	192	184	South
4/23/2009	12:00	148	185	South
4/24/2009	14:00	114	176	South
5/1/2009	19:00	249	185	South
5/2/2009	23:00	298	186	South
5/3/2009	21:00	239	182	South
5/4/2009	00:00	291	181	South
5/5/2009	23:00	104	184	South
5/6/2009	21:00	350	186	South
5/7/2009	15:00	83	198	South-southwest
5/8/2009	23:00	373	183	South
5/9/2009	20:00	281	184	South
5/10/2009	17:00	275	182	South
5/11/2009	18:00	88	178	South
5/12/2009	17:00	214	181	South
5/14/2009	10:00	83	171	South
5/24/2009	20:00	272	182	South
5/25/2009	00:00	147	203	South-southwest
5/26/2009	06:00	107	201	South-southwest
6/1/2009	20:00	232	194	South-southwest
6/7/2009	20:00	187	189	South
6/8/2009	02:00	99	190	South
6/9/2009	16:00	85	194	South-southwest
6/10/2009	16:00	225	179	South
6/19/2009	20:00	150	187	South
6/24/2009	16:00	86	319	Northwest
6/26/2009	18:00	188	189	South
6/27/2009	20:00	130	196	South-southwest
7/1/2009	21:00	79	191	South
7/3/2009	16:00	168	179	South
7/5/2009	16:00	115	195	South-southwest
7/6/2009	19:00	238	188	South
7/10/2009	17:00	123	185	South
7/16/2009	15:00	81	180	South
7/20/2009	18:00	78	184	South
7/21/2009	17:00	94	187	South
7/22/2009	02:00	110	187	South
7/25/2009	15:00	131	181	South
7/27/2009	10:00	95	184	South
7/28/2009	06:00	314	186	South

7/30/2009	07:00	217	178	South
7/31/2009	17:00	86	194	South-southwest
8/1/2009	15:00	84	223	Southwest
8/6/2009	02:00	123	197	South-southwest
8/30/2009	18:00	187	190	South
9/14/2009	08:00	139	190	South
9/15/2009	02:00	124	184	South
9/16/2009	19:00	104	191	South
9/18/2009	12:00	97	189	South
9/20/2009	18:00	114	187	South
10/1/2009	08:00	177	191	South
10/4/2009	14:00	155	179	South
10/6/2009	07:00	178	185	South
10/13/2009	23:00	116	205	South-southwest
10/14/2009	05:00	83	198	South-southwest
10/22/2009	22:00	93	194	South-southwest
10/30/2009	16:00	161	187	South
11/14/2009	22:00	119	193	South-southwest
11/15/2009	22:00	90	189	South
11/16/2009	16:00	122	182	South
11/29/2009	11:00	118	177	South
11/30/2009	06:00	260	180	South
12/8/2009	14:00	238	178	South
12/14/2009	03:00	135	176	South
<b>2010 1- hour SO<sub>2</sub> NAAQS Hourly Exceedances</b>				
<b>Date<sup>1</sup></b>	<b>Time<sup>2</sup></b>	<b>1-hr SO<sub>2</sub></b>	<b>Wind Direction<sup>3</sup></b>	<b>Wind Direction<sup>3</sup></b>
1/20/2010	17:00	158	178	South
1/24/2010	04:00	181	178	South
2/14/2010	18:00	217	181	South
2/25/2010	20:00	125	192	South-southwest
2/28/2010	23:00	112	191	South-southwest
3/10/2010	15:00	147	178	South
3/23/2010	21:00	107	181	South
3/31/2010	22:00	117	186	South
4/1/2010	18:00	90	181	South
4/3/2010	06:00	103	185	South
4/6/2010	16:00	119	180	South
4/7/2010	19:00	246	186	South
4/8/2010	12:00	80	184	South
5/20/2010	16:00	151	185	South
5/21/2010	19:00	137	191	South
5/22/2010	20:00	160	186	South
5/23/2010	00:00	100	194	South-southwest
5/29/2010	16:00	131	195	South-southwest
5/30/2010	17:00	135	184	South
5/31/2010	14:00	213	175	South
6/1/2010	16:00	98	197	South-southwest
6/2/2010	15:00	143	185	South
6/3/2010	15:00	105	203	South-southwest
6/4/2010	18:00	230	189	South
6/5/2010	18:00	254	193	South-southwest

6/6/2010	15:00	112	190	South
6/10/2010	18:00	111	194	South-southwest
6/11/2010	08:00	110	182	South
6/12/2010	20:00	135	190	South
6/26/2010	00:00	115	195	South-southwest
7/5/2010	08:00	153	191	South
7/9/2010	14:00	83	198	South-southwest
7/17/2010	18:00	77	191	South-southwest
7/25/2010	20:00	230	181	South
7/26/2010	18:00	127	183	South
7/27/2010	15:00	143	197	South-southwest
8/2/2010	19:00	106	184	South
8/17/2010	23:00	230	182	South
8/18/2010	00:00	176	188	South
8/19/2010	10:00	83	176	South
10/24/2010	19:00	153	175	South
10/25/2010	21:00	244	180	South
10/26/2010	20:00	242	180	South
10/27/2010	13:00	163	177	South
10/31/2010	22:00	125	183	South
11/1/2010	01:00	83	185	South
11/8/2010	21:00	95	198	South-southwest
11/22/2010	13:00	106	171	South
11/23/2010	07:00	242	182	South
11/24/2010	12:00	136	180	South
11/25/2010	15:00	208	180	South
11/29/2010	23:00	378	180	South
11/30/2010	03:00	149	185	South
12/11/2010	12:00	248	181	South
12/15/2010	23:00	266	181	South
12/16/2010	01:00	243	177	South
12/21/2010	09:00	235	192	South-southwest
12/30/2010	14:00	247	178	South

### 2011 1- hour SO<sub>2</sub> NAAQS Hourly Exceedances

Date <sup>1</sup>	Time <sup>2</sup>	1-hr SO <sub>2</sub> Concentration (ppb)	Wind Direction <sup>3</sup> (Compass °)	Wind Direction <sup>3</sup> (Compass Point)
1/1/2011	04:00	180	176	South
1/5/2011	04:00	245	176	South
1/15/2011	21:00	186	195	South-southwest
1/16/2011	00:00	78	202	South-southwest
1/29/2011	23:00	127	178	South
1/30/2011	03:00	89	173	South
2/1/2011	12:00	214	179	South
2/15/2011	18:00	135	181	South
2/20/2011	03:00	230	174	South
2/21/2011	01:00	96	178	South
2/24/2011	18:00	238	178	South
2/27/2011	09:00	145	177	South
3/12/2011	18:00	213	175	South

3/14/2011	13:00	162	180	South
3/16/2011	23:00	92	186	South
3/17/2011	00:00	83	189	South
3/18/2011	07:00	143	176	South
3/19/2011	19:00	117	192	South-southwest
4/2/2011	21:00	185	184	South
4/3/2011	16:00	178	187	South
4/4/2011	01:00	243	178	South
4/7/2011	15:00	153	188	South
4/8/2011	18:00	180	179	South
4/9/2011	02:00	127	176	South
4/10/2011	02:00	168	188	South
4/11/2011	03:00	190	179	South
4/15/2011	07:00	237	184	South
4/18/2011	17:00	300	182	South
4/19/2011	05:00	159	177	South
4/20/2011	02:00	128	178	South
4/23/2011	12:00	121	188	South
4/25/2011	23:00	204	180	South
4/26/2011	00:00	202	178	South
4/27/2011	07:00	255	186	South
5/6/2011	19:00	170	188	South
5/9/2011	18:00	218	178	South
5/10/2011	16:00	137	179	South
5/11/2011	17:00	133	179	South
5/13/2011	04:00	126	171	South
5/21/2011	17:00	149	180	South
5/22/2011	17:00	224	178	South
5/23/2011	12:00	153	181	South
5/24/2011	16:00	198	179	South
5/25/2011	15:00	173	184	South
5/26/2011	02:00	129	199	South-southwest
5/28/2011	01:00	76	192	South-southwest
6/14/2011	17:00	85	137	Southeast
6/19/2011	20:00	111	144	Southeast
6/20/2011	16:00	86	170	South
6/21/2011	03:00	131	190	South
6/22/2011	16:00	198	182	South
6/24/2011	16:00	165	168	South-southeast
6/26/2011	20:00	228	142	Southeast
6/27/2011	19:00	165	135	Southeast
7/3/2011	17:00	91	359	North
8/6/2011	19:00	358	186	South
8/20/2011	11:00	90	191	South
8/23/2011	16:00	86	215	Southwest
9/4/2011	09:00	223	171	South
9/5/2011	02:00	296	169	South
9/13/2011	17:00	196	202	South-southwest
9/19/2011	11:00	115	357	North
9/25/2011	23:00	177	183	South
9/26/2011	02:00	226	189	South



10/23/2011	21:00	189	197	South-southwest
10/27/2011	23:00	82	188	South
11/9/2011	08:00	139	187	South
11/11/2011	20:00	80	186	South
11/13/2011	13:00	127	180	South
11/14/2011	15:00	218	181	South
11/15/2011	23:00	350	182	South
11/16/2011	04:00	375	184	South
11/26/2011	23:00	299	189	South
12/5/2011	11:00	256	180	South
12/16/2011	04:00	122	193	South-southwest
12/20/2011	12:00	159	194	South-southwest

<sup>1</sup> In some cases, there was more than one hourly exceedance on a given day. However, only the maximum 1-hour SO<sub>2</sub> concentration and corresponding wind direction during that hour are shown for each violation day.

<sup>2</sup> Based on Local Standard Time.

<sup>3</sup> Wind Direction corresponds to the specific time interval during which the 1-hour SO<sub>2</sub> NAAQS hourly exceedance took place.

As shown in Table 5, there were a total of 92 violation days in 2009, 58 violation days in 2010, and 76 violation days in 2011 at the Chalmette-Vista monitor in St. Bernard Parish. The data shows that from 2009-2011, the prevailing surface winds were predominantly from the south during 1-hour SO<sub>2</sub> NAAQS hourly exceedances. The data shows that prevailing surface winds were also often from the south-southwest during 1-hour SO<sub>2</sub> NAAQS hourly exceedances (although to a much lesser extent than from the south). The direction from which wind blew into St. Bernard Parish during 1-hour SO<sub>2</sub> NAAQS hourly exceedances corresponds to the location of the Rain CII Carbon coke plant (depicted in Figures 1 and 2 as a green circle labeled “4284”) and the ExxonMobil Refinery Complex (depicted in Figures 1 and 2 as a green circle labeled “250”), both located in St. Bernard Parish. Taken together, the wind data in Tables 4 and 5 suggest that the Chalmette-Vista monitor in St. Bernard Parish is located downwind from the Rain CII Carbon coke plant and the ExxonMobil Refinery in St. Bernard Parish, and that these sources are causing the violation of the 1-hour SO<sub>2</sub> NAAQS at the Chalmette-Vista monitor.

### ***Geography/topography (mountain ranges or other air basin boundaries)***

St. Bernard Parish does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in determining the nonattainment boundary for St. Bernard Parish.

### ***Jurisdictional boundaries***

As discussed above, our evaluation of the factors indicate that St. Bernard Parish’s own sources are causing the violation of the Chalmette-Vista monitor. The State recommended St. Bernard Parish to be the area designated nonattainment. Since there are no other data available to support a nonattainment boundary smaller than the St. Bernard Parish boundary, the only jurisdictional boundary we considered in our evaluation is the parish boundary.

### ***Other Relevant Information***

EPA did not receive additional information from the state relevant to establishing the initial nonattainment area boundary for St. Bernard Parish.

### **EPA's Area Designations Conclusion for Louisiana**

After considering the factors described above and considering and responding to comments submitted by the state and the public (see our Response to Comments Document), EPA is initially designating St. Bernard Parish as nonattainment (see Table 1).

An air quality monitor in St. Bernard Parish shows a violation of the 2010 SO<sub>2</sub> NAAQS based on 2009-2011 air quality data. The nonattainment area boundary that EPA describes above is based on the following five factors: air quality data, emissions-related data, meteorology, geography/topography, and jurisdictional boundaries. Based on the consideration of all the relevant and available information, as described above, EPA believes that the boundary described herein encompasses the appropriate initial area that does not meet the 2010 SO<sub>2</sub> NAAQS, based on monitoring, and the sources that contribute to the monitored violation.

Based on the consideration of all the relevant and available information, as described above, EPA is initially designating St. Bernard Parish as nonattainment for the 2010 SO<sub>2</sub> NAAQS. EPA is not yet prepared to conclude that the emissions from sources located outside the initial nonattainment boundary contribute to the monitored violation or to other possible violations. In a subsequent round of designations, we will further address these areas and sources and make final initial designation decisions for areas in Louisiana not included in the nonattainment area designation addressed in this TSD.