

# Appendix A

Potential Boundary Options Considered

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# **Sulfur Dioxide Standard and Nonattainment Designation Process**

**April 12, 2011**



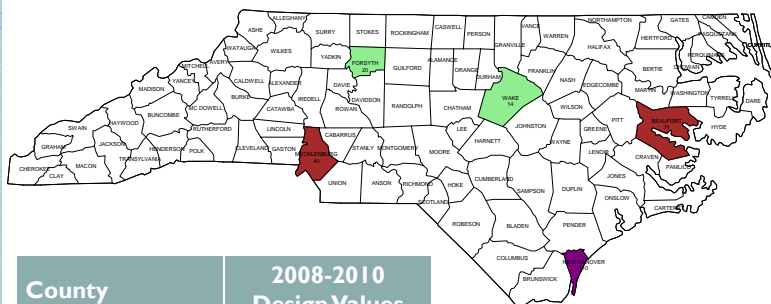
## **What is Sulfur Dioxide (SO<sub>2</sub>)**

- **SO<sub>2</sub> is a criteria pollutant specified in the Clean Air Act**
- **It is a pungent gas that is unhealthy to breathe**
  - **High levels of SO<sub>2</sub> can cause or worsen respiratory ailments & aggravate existing heart disease**
  - **Children, the elderly & other sensitive groups are most affected by exposures to high levels of SO<sub>2</sub>**
- **Damages vegetation & materials such as buildings**
- **Contributes to the formation of particle pollution and acid rain**

## 2010 Sulfur Dioxide Standard

- **New scientific studies provide stronger evidence for link between short-term high level SO<sub>2</sub> exposures, ranging from 5 minutes to 24 hours, and adverse respiratory outcomes**
- **On June 2, 2010, EPA promulgated the primary NAAQS for SO<sub>2</sub>**
  - **New 1-hour SO<sub>2</sub> standard of 75 ppb**
  - **Will revoke existing SO<sub>2</sub> standards after designations for 1-hour standard:**
    - Annual – 30 ppb
    - 24-hour – 140 ppb

## Current SO<sub>2</sub> Design Values



County	2008-2010 Design Values
New Hanover	110 ppb
Mecklenburg	40 ppb
Forsyth	20 ppb
Beaufort	31 ppb
Wake	14 ppb

**Standard = 75 ppb**

## Designation Process

- **Clean Air Act requires States to submit nonattainment boundary recommendations within 1 year after the standard is set**
- **EPA responds back to state with their recommendations**
  - **At least 120 days before designations**
- **State can provide additional data to support their recommendations if different from EPA**
- **EPA makes final designations**
  - **EPA does not have to follow state recommendations**

## What does SO<sub>2</sub> Nonattainment mean?

- **EPA label saying air quality does not meet a standard**
- **Once Designated:**
  - **Requires State to demonstrate how nonattainment areas will meet the standard**
  - **Requires new source review on new major industrial sources and major modifications on existing sources**
  - **Requires general conformity**
  - **Transportation conformity not required for SO<sub>2</sub>**

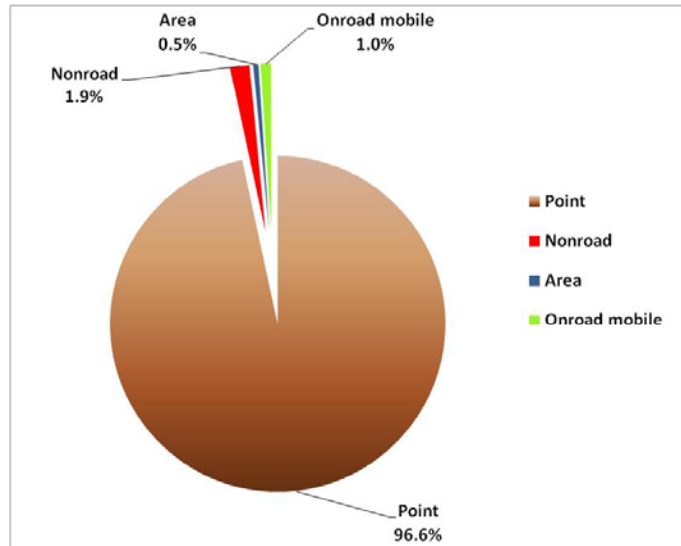
## **EPA Guidance Summary**

- **A nonattainment area should contain the area violating the standard, as well as any adjacent areas (counties or portion thereof) that contain emissions sources contributing to the violation.**
- **Base recommendation on the evaluation of 5 factors**
  - **Air quality data**
  - **Emissions-related data**
  - **Meteorology**
  - **Geography/Topography**
  - **Jurisdictional Boundaries**

## **North Carolina's Process For Recommending Nonattainment Boundaries**

- **Review EPA's guidance document**
- **Evaluate which monitors are violating**
- **Analyze cause/effect relationships and develop sensible boundary options**
- **Conduct public meetings**
- **Coordinate with other agencies impacted by nonattainment designations (NCDOC, and Local Governments)**

## Sources of SO<sub>2</sub> Emissions (New Hanover, Brunswick, Pender Counties)



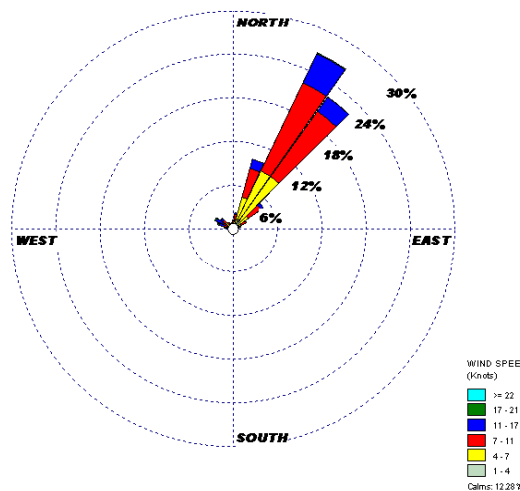
## Top 10 SO<sub>2</sub> Point Sources in New Hanover, Brunswick & Pender

Source	Emissions (tons/year)	County
Progress Energy – Sutton	17,947	New Hanover
Invista S.A.R.L.	2,222	New Hanover
DAK Americas	2,167	Brunswick
CPI USA – Southport	1,734	Brunswick
Southern States Chemical	872	New Hanover
Elementis Chromium	318	New Hanover
New Hanover County WASTEC	23	New Hanover
Hess Corporation	12	New Hanover
Fortron Industries	8	New Hanover
Barnhill Contracting	7	New Hanover

## Pollution Rose Plots

- Looked at the 5-minute-average  $\text{SO}_2$  observations from 1/1/2008 through 12/31/2010
- 5-minute wind observations from **Wilmington airport** were gathered for 1/1/2008-12/31/2010 and matched against the corresponding  $\text{SO}_2$  data
- Plotted wind observations when  $\text{SO}_2$  concentrations were  $> 75$  ppb

## Wilmington Airport Wind Data When $\text{SO}_2$ Observations $> 75$ ppb 1/1/2008-12/31/2010



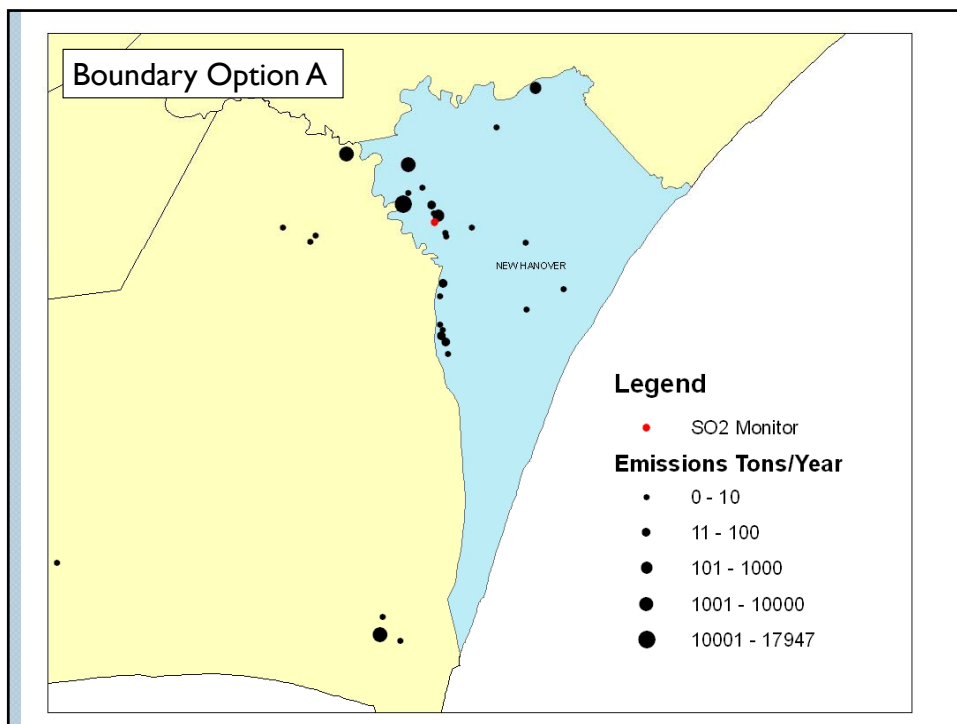


## Nonattainment Boundary Options

- **NCDAQ has developed 7 different nonattainment boundary options**
  - **Option A – All of New Hanover County**
  - **Option B – All of New Hanover County & Part of Brunswick County**
  - **Option C – Northwest Township in Brunswick & Cape Fear Township in New Hanover**
  - **Option D – Cape Fear Township in New Hanover**
  - **Option E – River Boundary in New Hanover County & DAK America Property Boundary in Brunswick County**
  - **Option F – Polygon shape containing parts of Brunswick & New Hanover Counties**
  - **Option G – River Boundary in New Hanover County**

## Boundary Option A New Hanover County

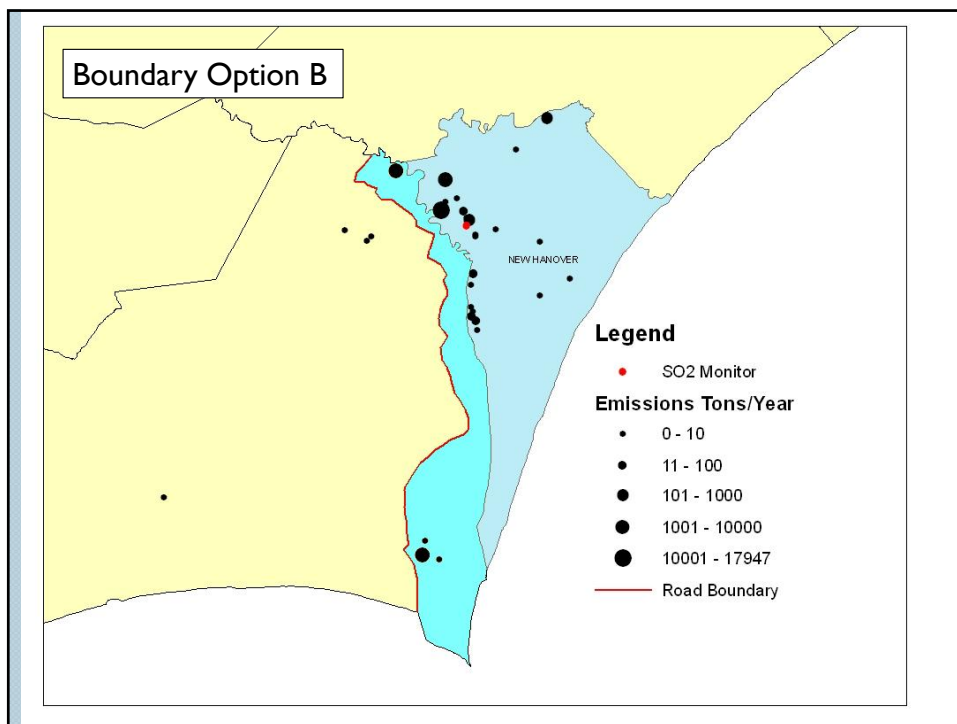
- **Contains ~85% of the SO<sub>2</sub> emissions in Wilmington Metropolitan Statistical Area (Brunswick, New Hanover, Pender Counties)**
- **Represents the EPA recommended starting point for determining SO<sub>2</sub> nonattainment areas**



## **Boundary Option B**

### **Part of Brunswick County and all of New Hanover County**

- **Contains 99.9% of the SO<sub>2</sub> emissions  
in Wilmington MSA**

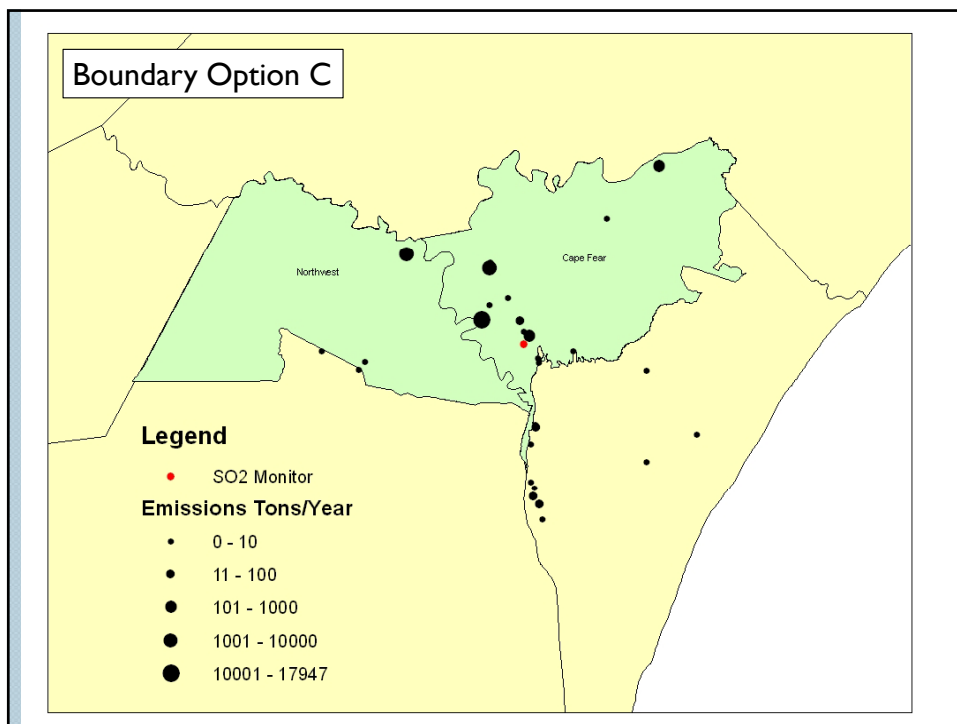


### **Boundary Option C**

#### **Northwest Township in Brunswick**

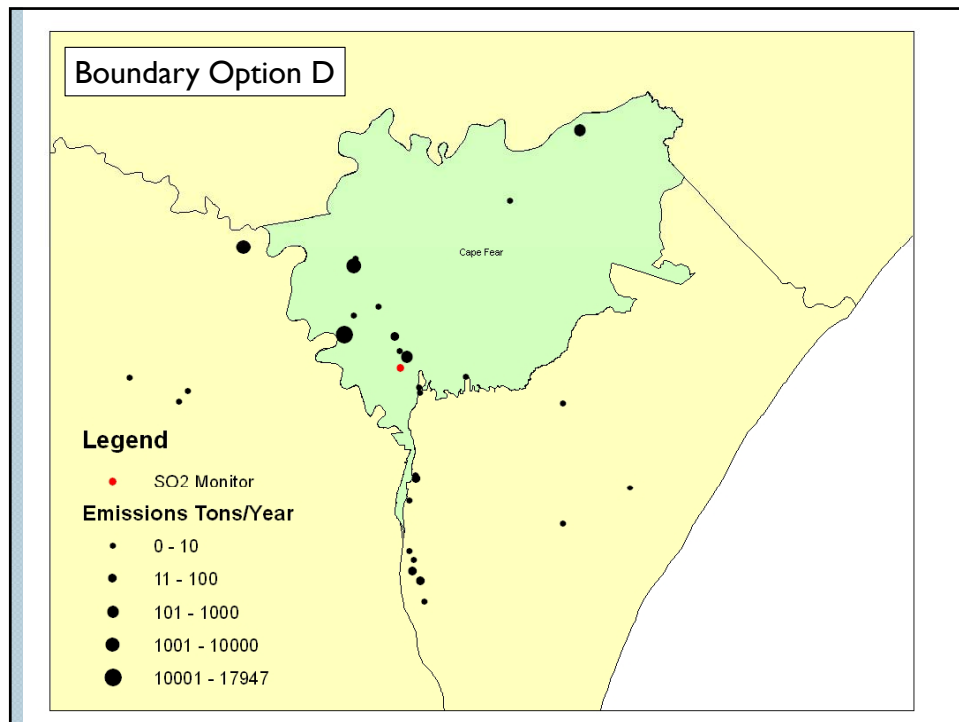
#### **Cape Fear Township in New Hanover**

- **Contains ~93% of the SO<sub>2</sub> emissions in Wilmington MSA**



## Boundary Option D Cape Fear Township in New Hanover County

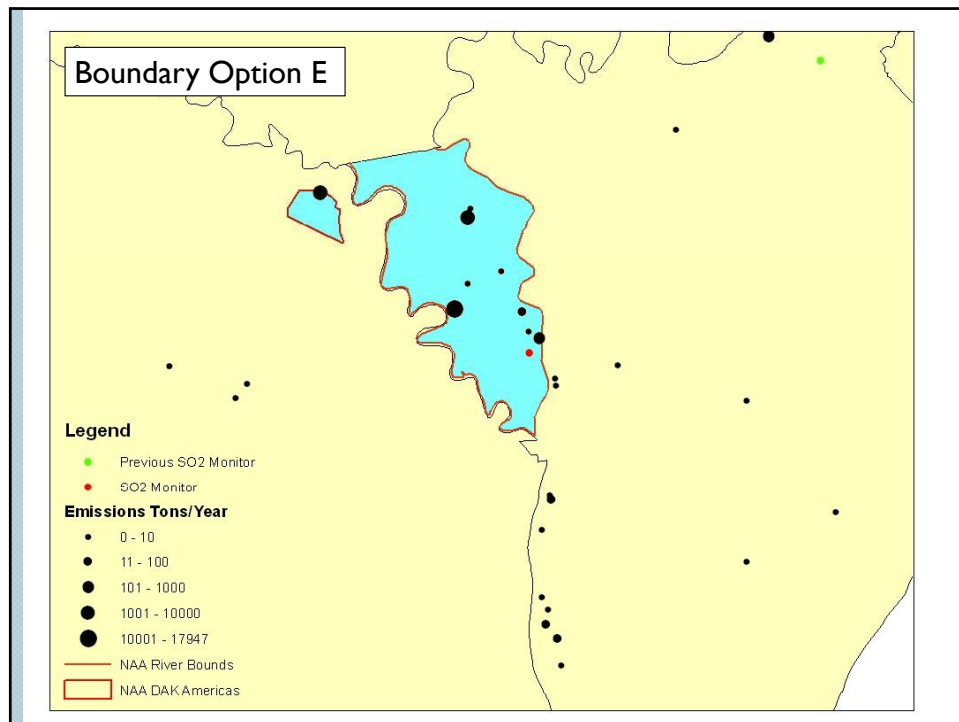
- **Contains ~84% of the SO<sub>2</sub> emissions in Wilmington MSA**
- **Contains ~99% of the SO<sub>2</sub> emissions in New Hanover County**



### Boundary Option E

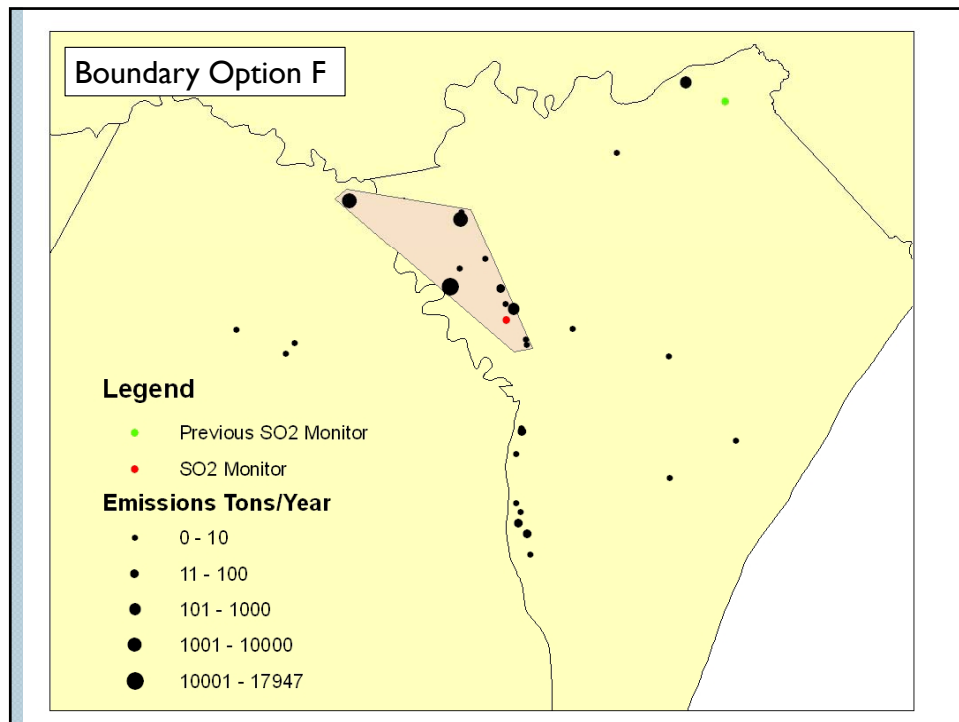
**River Boundary in New Hanover and  
DAK America Property Boundary in  
Brunswick**

- **Contains ~92% of the SO<sub>2</sub> emissions in  
Wilmington MSA**
- **2005 Temporary SO<sub>2</sub> monitor at Castle  
Hayne site had no exceedances of 1-hr  
SO<sub>2</sub> standard**



**Boundary Option F**  
**Polygon Shape Identified by**  
**Latitudes / Longitudes**  
**Contains Part of Brunswick &**  
**New Hanover Counties**

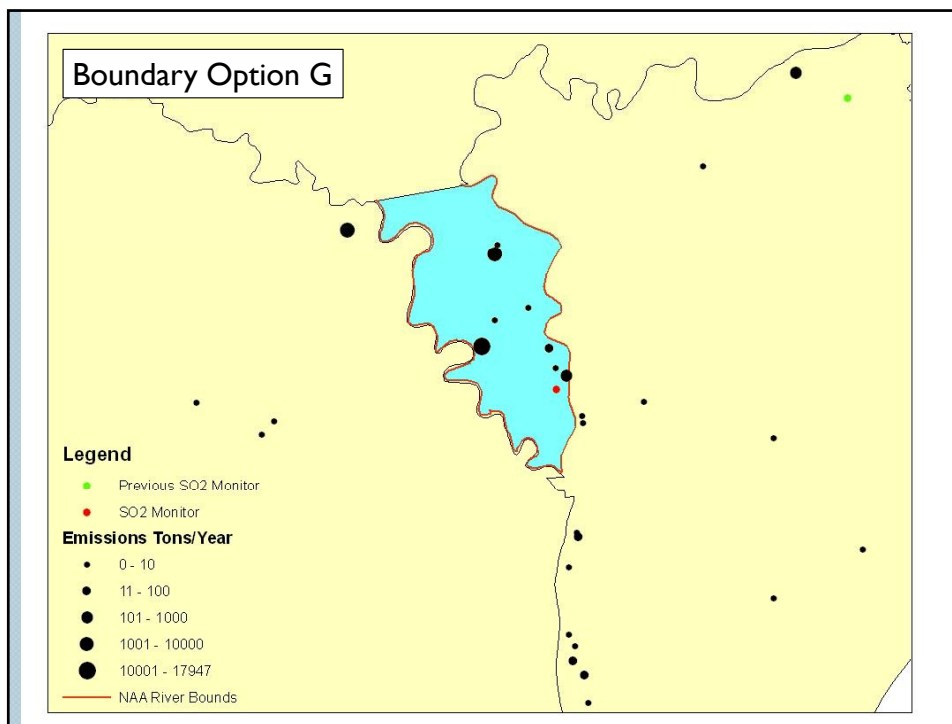
- **Contains ~92% of the SO<sub>2</sub> emissions in Wilmington MSA**



## Boundary Option G

### Boundary Between Northeast Cape Fear River and the Cape Fear River in New Hanover County

- Contains ~83% of the SO<sub>2</sub> emissions in **Wilmington Metropolitan Statistical Area (Brunswick, New Hanover, Pender Counties)**
- Contains ~98% of the SO<sub>2</sub> emissions in **New Hanover County**
- **2005 Temporary SO<sub>2</sub> monitor at Castle Hayne site had no exceedances of 1-hr SO<sub>2</sub> standard**



## SO<sub>2</sub> Milestones

Deadline	Milestone
June 2010	EPA sets new primary SO2 standard
June 2011	State boundary recommendations to EPA
February 2012	EPA feedback on State recommendations
April 2012	State deadline to respond to EPA feedback
June 2012	EPA makes final designations
January 2013	New SO2 monitoring operational
June 2013	State Plan for Attainment areas due
February 2014	State Plan for Nonattainment areas due
August 2017	All areas attain the standard



## Comments on Potential Boundary Options

- **Request comments by April 30<sup>th</sup>**
- **Send via email to:**
  - **DAQ.publiccomments@ncdenr.gov**
- **Send via FAX to:**
  - **(919) 715-7476**
- **Send via mail to:**

**Laura Boothe**  
**Division of Air Quality**  
**Mail Service Center 1641**  
**Raleigh, NC 27699-1641**

## QUESTIONS?

**Laura Boothe**  
**Attainment Planning Branch Supervisor**  
◦ **Laura.Boothe@ncdenr.gov**  
**(919) 733-1488**

**Brad Newland**  
**Wilmington Regional Office Supervisor**  
**Brad.Newland@ncdenr.gov**  
**(910)796-7239**

**Copies of these slides can be found at**  
<http://daq.state.nc.us/planning/so2/>