



ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

October 23, 2017

Trey Glenn
Regional Administrator
USEPA Region 4
Atlanta Federal Center
61 Forsyth Street, SW
Atlanta, GA 30303-8960

Subject: Additional Information Related to Round 3 Designations for the 2010 1-Hour Sulfur Dioxide Boundary Recommendation (EPA Docket No. EPA-HQ-OAR-2017-0003)

Dear Mr. Glenn:

Pursuant to section 107(d) of the Clean Air Act and on behalf of Governor Roy Cooper, I am submitting to the U.S. Environmental Protection Agency (EPA), the State of North Carolina's supplemental information concerning the boundaries within Person County that attain or do not attain the June 2, 2010, 1-hour National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO₂). This submission is in response to EPA's August 22, 2017 "120-day letter" notifying the Governor of your preliminary intentions regarding designations. The following information supplements our original January 13, 2017 boundary recommendation, addresses EPA comments, and provides new data necessary for consideration in the designation of townships within Person County.

In the "120-day letter", EPA stated its intent to classify three Person County townships (Holloway, Roxboro, Woodsdale) around the Duke-Mayo facility and CPI-Roxboro facility as "unclassifiable". North Carolina recommended an "attainment" designation for these three townships. EPA stated that the state's air quality characterization did not show that Duke-Mayo does not contribute to ambient air quality in a nearby area and that the recent increase in CPI-Roxboro's SO₂ emissions must be accounted for in the modeling demonstration.

Attached is an updated demonstration that shows that neither Duke-Mayo nor CPI-Roxboro significantly increase ambient 1-hour SO₂ concentrations in any nearby area to affect the NAAQS. Based on this additional analysis, I continue to recommend an "attainment" designation for Holloway, Roxboro and Woodsdale townships in Person County. The information provided herein fully supports EPA's Round 3 designation action which must be completed by December 31, 2017 for all areas except those associated with sources for which the state has elected to install a new SO₂ monitoring network.

North Carolina is committed to protecting the health of our citizens, our environment, and our economy. Improving and maintaining air quality is critical to the health of our citizens, our future growth, prosperity and quality of life. We look forward to working with EPA in the promulgation of final Round 3 designations before December 31, 2017.

Sincerely,



Michael S. Regan, Secretary
NC Department of Environmental Quality

MSR/maa

Attachment

cc: The Honorable Roy Cooper
Ms. Sheila C. Holman, NCDEQ
Mr. Michael Abraczinskas, NCDAQ
Mr. Minor Barnette, Forsyth County Office of Environmental Assistance and Protection
Ms. Leslie Rhodes, Mecklenburg County Air Quality
Mr. David Brigman, Western Regional Air Quality Agency

**North Carolina Division of Air Quality's Submission of Additional Information
on EPA's Proposed Round 3 Area Designations for the 2010 1-Hour SO₂
Primary National Ambient Air Quality Standard for North Carolina**

On August 22, 2017, the U.S. Environmental Protection Agency's (U.S. EPA) sent the "120-day letter" to North Carolina Governor Roy A. Cooper and the North Carolina Department of Environmental Quality (DEQ) and its Division of Air Quality (DAQ). The letter informed Governor Cooper of the U.S. EPA's intended designations for certain areas in North Carolina for the 2010 Primary National Ambient Air Quality Standard (NAAQS) for sulfur dioxide (SO₂). Pursuant to section 107(d) of the Clean Air Act (CAA), the U.S. EPA must designate areas as either "nonattainment," "attainment," or "unclassifiable" for the 2010 1-hour SO₂ primary NAAQS. There are two criteria used in the designations: the area around a source must (1) meet the 2010 SO₂ NAAQS, and (2) the source must not contribute to ambient air quality in a nearby area that does not meet the NAAQS.

This additional information is to supplement modeling submitted by DAQ for a portion of Person County that includes the Duke-Mayo electric generating facility. In the modeling submitted for Duke-Mayo, receptors were not included over the area of Person County where another Duke Energy facility (Duke-Roxboro) is located because Duke-Roxboro has sited an U.S. EPA approved monitor to collect data for the 2017-2019 monitoring period to satisfy the Data Requirements Rule (DRR). DAQ had recommended that all areas in Person County outside of Cunningham Township where the Duke-Roxboro facility is located be classified as attainment.

In the "120-day letter" U.S. EPA said they intend to classify the townships around Duke-Mayo as unclassifiable because they maintain that DAQ has not shown that Duke-Mayo does not contribute to ambient air quality in a nearby area that does not meet the NAAQS. Additionally, they noted that the SO₂ emissions from CPI-Roxboro, modeled as a nearby source, had exceeded 2,000 tons per year after the period during which facilities were identified for analysis for the DRR. The three Person County townships impacted are Holloway, Roxboro, and Woodsdale. After discussions with the regional office, we have prepared updated modeling over Cunningham Township, that shows that neither Duke-Mayo, nor CPI-Roxboro, contribute significantly to ambient air quality in a nearby area that does not meet the NAAQS.

There are two parts to the additional information provided to support DAQ's recommendation of an attainment designation for these townships: 1) the initial modeling that was submitted including more detailed figures and 2) modeling completed using the same inputs as the initial analysis except for receptor locations and the use of the permit limit emissions for CPI-Roxboro in addition to modeling using actual hourly rates.

Initial Duke-Mayo Modeling Analysis

Figure 1 shows the locations of Duke-Mayo, Duke-Roxboro, and CPI-Roxboro along with the receptor placement in the initial modeling for Duke-Mayo. Figure 2 shows the location of the Duke-Mayo facility and its receptors in relation to the counties and townships. Figure 3 shows the results of the initial modeling from all sources. Figure 4 shows the results of the initial modeling from Duke-Mayo only. Figures 5 and 6 are new figures from the same modeling analysis showing the results over a larger area and with more detail for all sources (Figure 5) and for Duke-Mayo only (Figure 6).

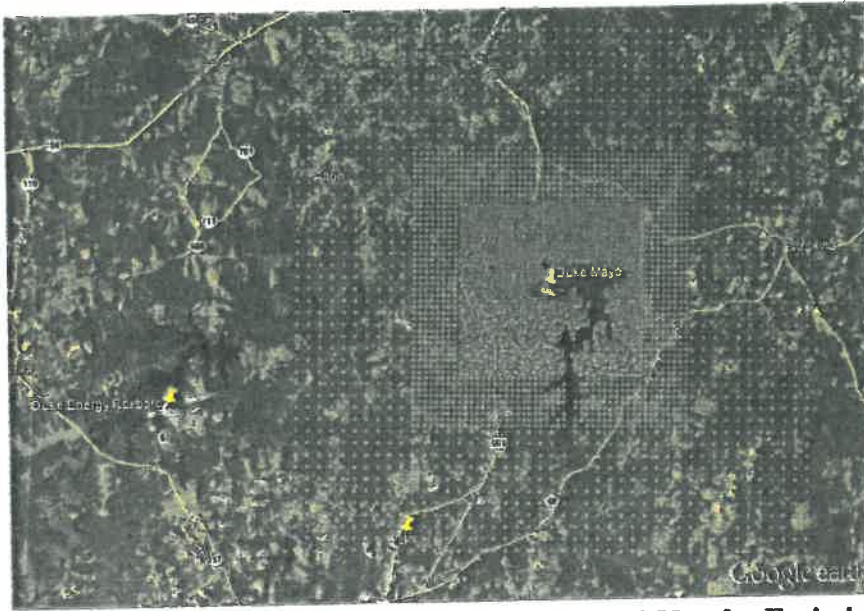


Figure 1. Satellite View of Receptor Layout and Nearby Emissions Sources in the Initial Duke-Mayo Modeling Analysis

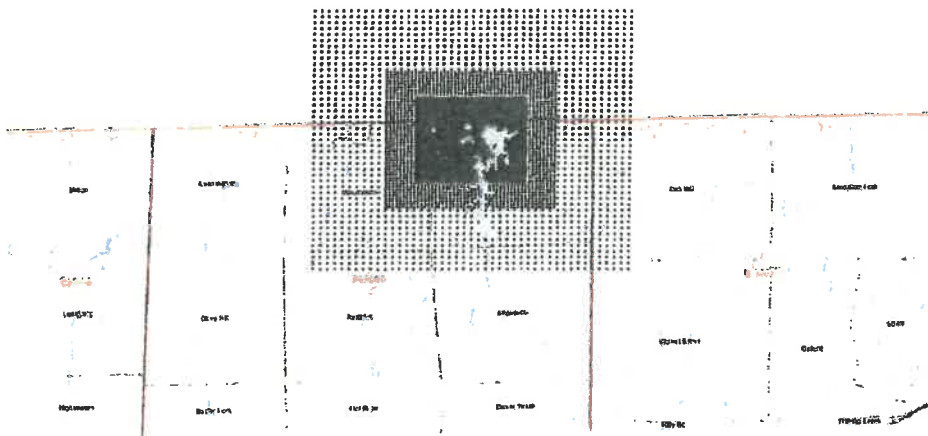


Figure 2. Map of Receptor Layout with Counties and Townships in the Initial Duke-Mayo Modeling Analysis

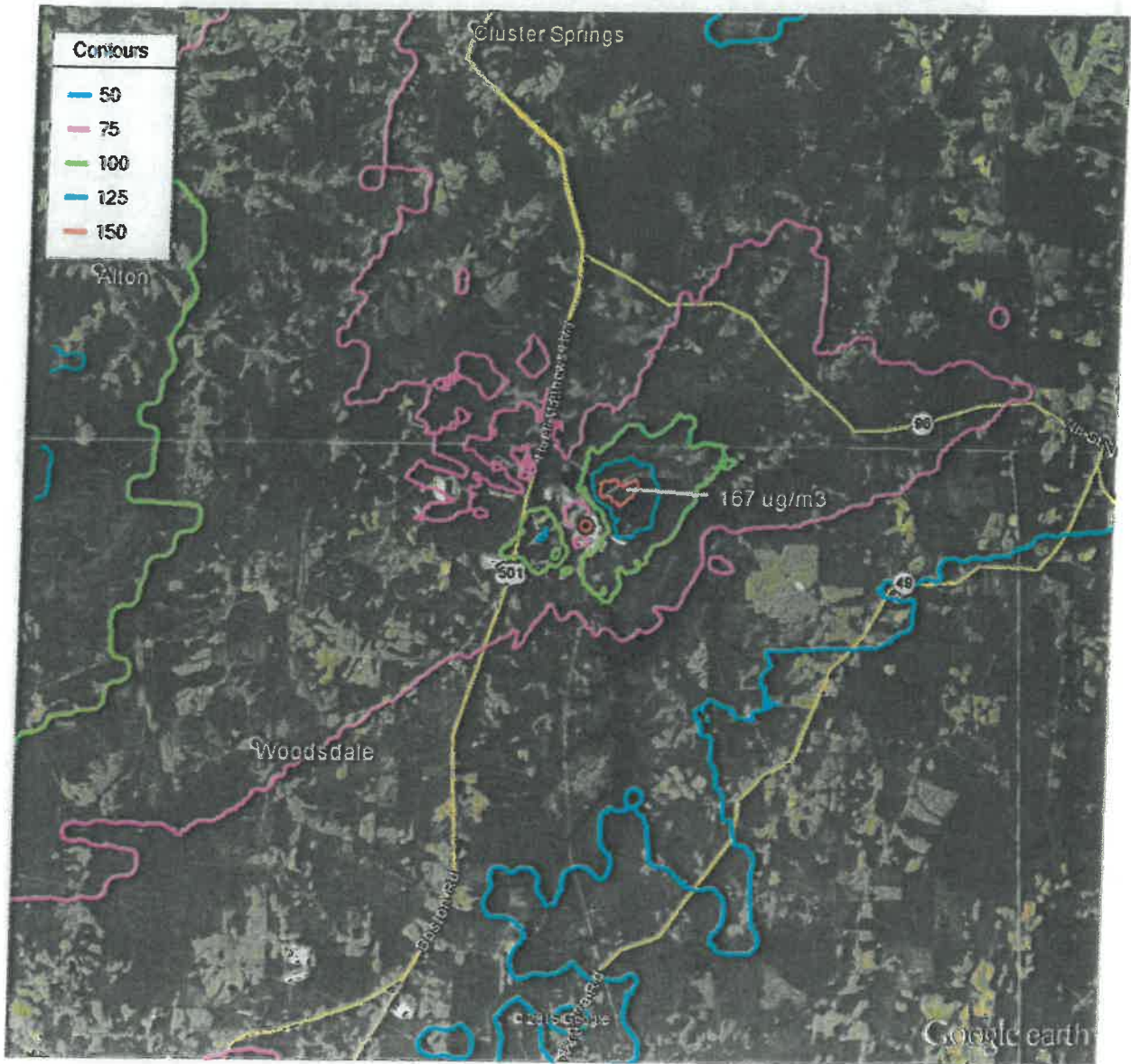


Figure 3. Annual 4th High SO₂ Concentration - Duke-Mayo and Nearby Sources – From the Initial Duke-Mayo Modeling Analysis

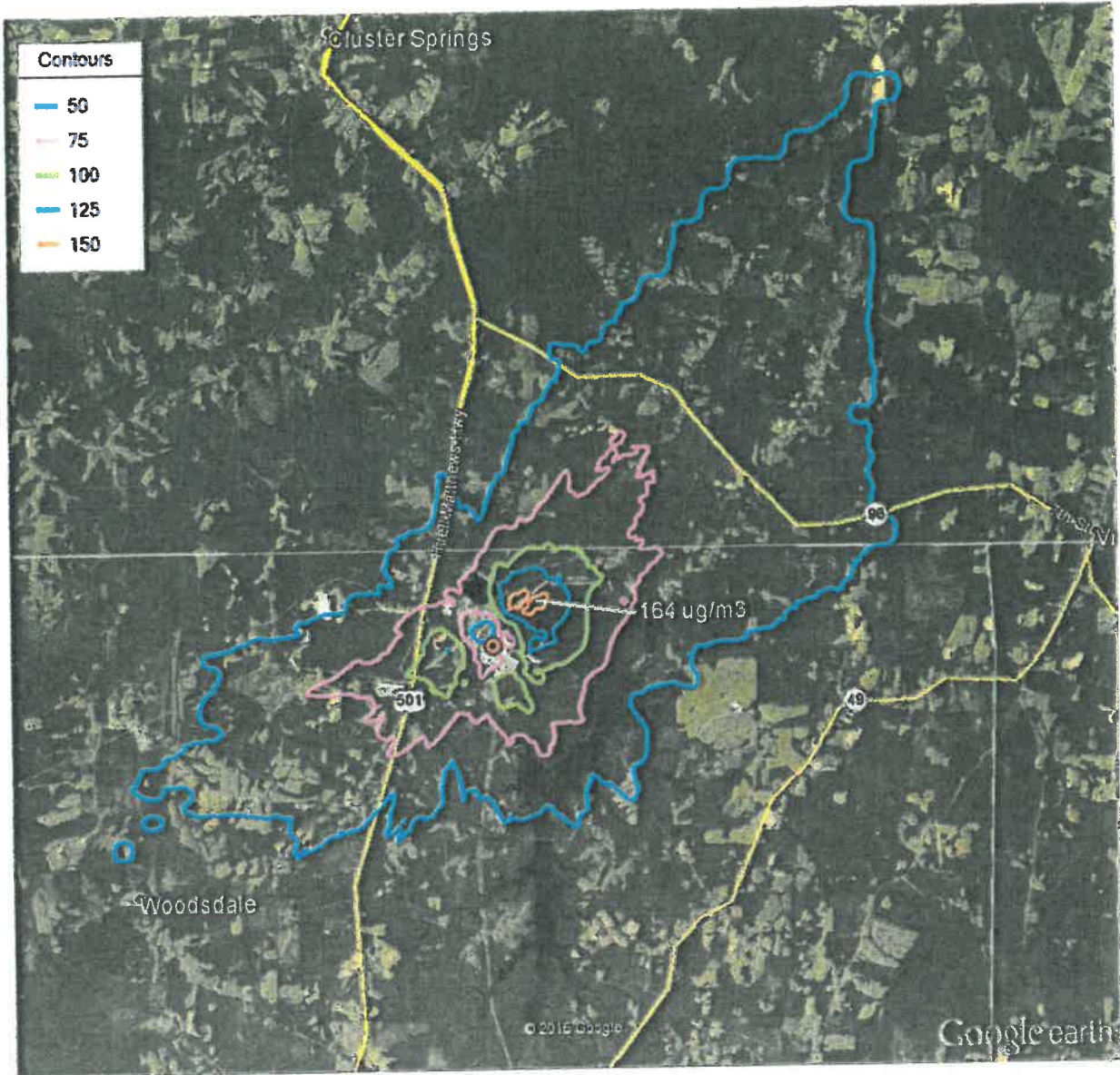


Figure 4. Annual 4th High SO₂ Concentration – Duke-Mayo Only - From the Initial Duke-Mayo Modeling Analysis

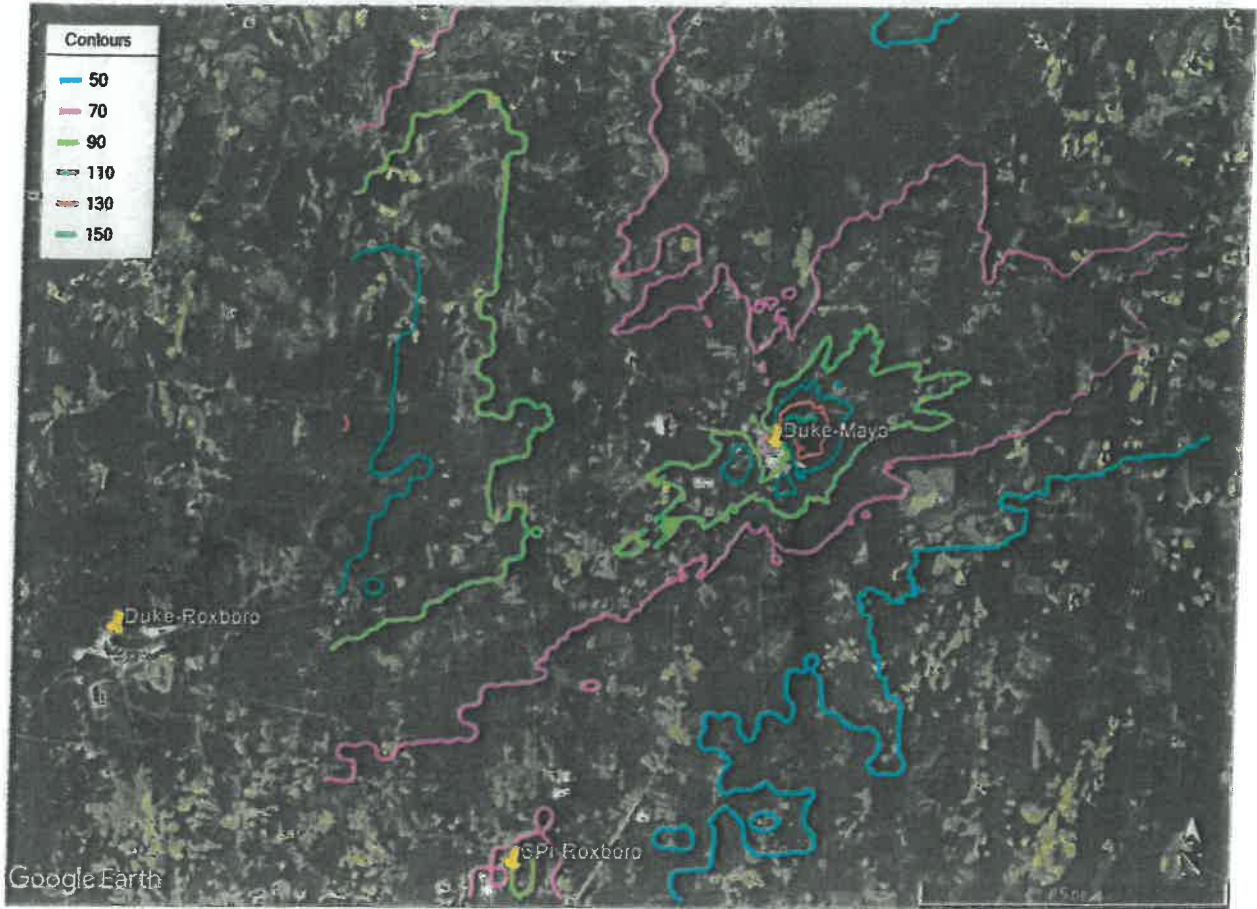


Figure 5. Annual 4th High SO₂ Concentration - Duke-Mayo and Nearby Sources – New Figure Presenting Same Data from the Initial Duke-Mayo Modeling Analysis

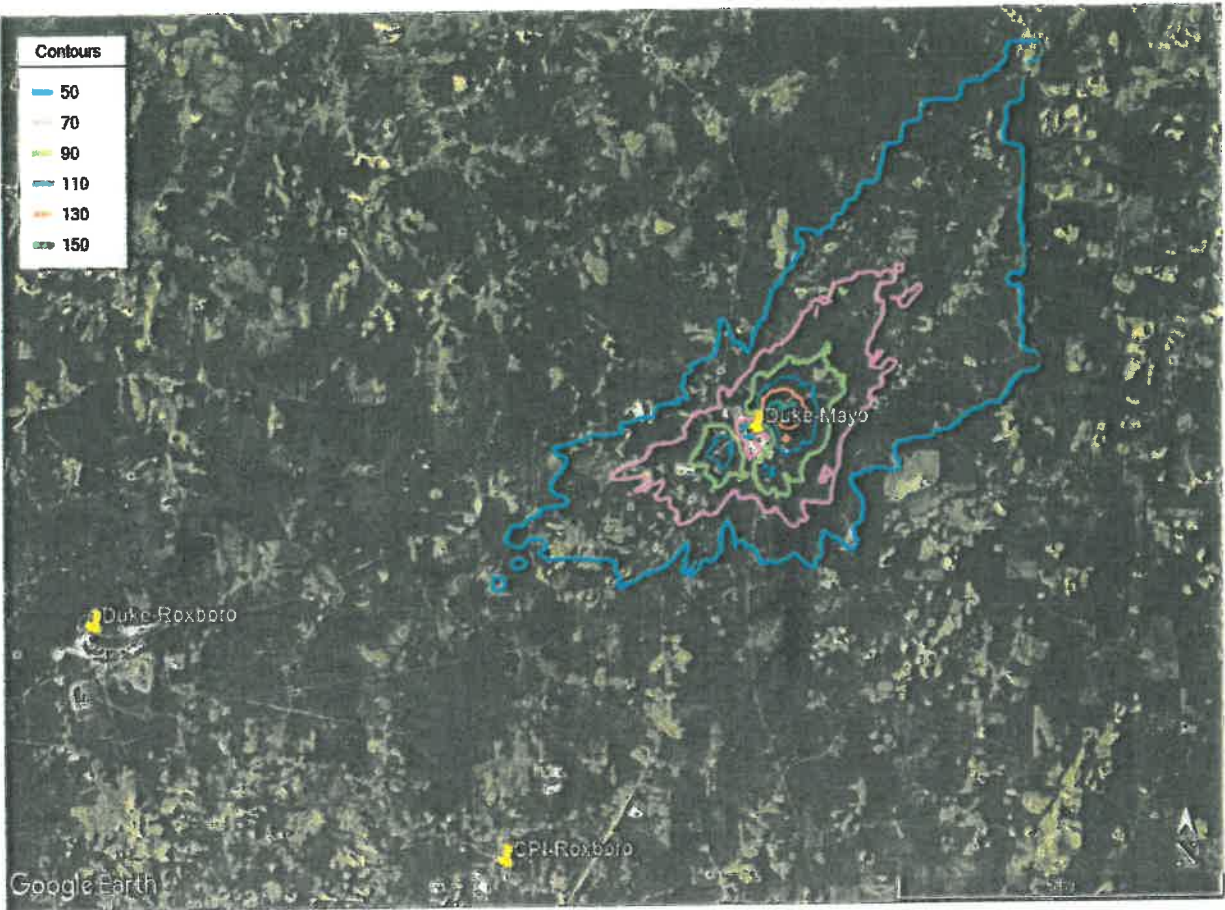


Figure 6. Annual 4th High SO₂ Concentration – Duke-Mayo Only – New Figure Presenting Same Data from the Initial Duke-Mayo Modeling Analysis

Updated Duke-Mayo Modeling Analysis with Receptor Grid Over Cunningham Township

In response to EPA’s intention to classify the townships around Duke-Mayo as unclassifiable, we completed modeling using the same inputs as before except for receptor locations. As shown in Figure 7, in the updated modeling, receptors were spaced at 100 meter intervals Cunningham Township. As before, receptors were removed over waterbodies since these are areas where monitors could not be placed. Additionally, since the purpose here was to determine if Duke-Mayo and CPI-Roxboro contribute to ambient air quality in a nearby area that does not meet the NAAQS, receptors were removed within the fenceline of Duke-Roxboro.

The AERMOD option MAXDCONT was used to assess the impact of Duke-Mayo and CPI Roxboro on modeled estimates over Cunningham Township. MAXDCONT outputs source group contributions to high ranked values, paired in time and space. In this analysis, the overall fourth highest air concentration estimate is partitioned into the contributions from each source – Duke-Mayo, Duke-Roxboro, and CPI-Roxboro.



Figure 7. Satellite View of the Updated Receptor Layout

Table 1 presents the maximum and average contribution of Duke-Mayo to the total air concentration over all MAXDCONT values and over values that are at or above 90 percent of the NAAQS or $175 \mu\text{g}/\text{m}^3$ (66.8 ppb). Table 2 presents the same results for CPI-Roxboro. These tables show that while the impact of Duke-Mayo can be significant over Cunningham Township, the largest impact is less than half of the NAAQS. Also, when the total modeled value approaches the NAAQS, the impacts of Duke-Mayo and CPI-Roxboro are very low.

Table 1. Contribution of Duke-Mayo to Total Air Concentrations in Updated Modeling

Sub-set of Receptors	Range of Values	Maximum Contribution		Average Contribution	
		$\mu\text{g}/\text{m}^3$	PPB	$\mu\text{g}/\text{m}^3$	PPB
All Values	All	78	30	5.6	2.1
90% of NAAQS	$\geq 175 \mu\text{g}/\text{m}^3$	1.3	0.50	0.14	0.05

Table 2. Contribution of CPI-Roxboro to Total Air Concentrations in Updated Modeling Using Actual Emissions

Sub-set of Receptors	Range of Values	Maximum Contribution		Average Contribution	
		$\mu\text{g}/\text{m}^3$	PPB	$\mu\text{g}/\text{m}^3$	PPB
All Values	All	11	4.2	0.92	0.35
90% of NAAQS	$\geq 175 \mu\text{g}/\text{m}^3$	0.21	0.08	0.03	0.01

An additional analysis was completed to show that even if CPI-Roxboro were to run continuously at the permitted SO₂ emissions limit of 3,931 tons per year (897.6 pounds per hour), they would not contribute to ambient air quality in a nearby area that does not meet the NAAQS. These results are shown in Table 3.

Table 3. Contribution of CPI-Roxboro to Total Air Concentrations in Updated Modeling Using Permit Limit Emissions

Sub-set of Receptors	Range of Values	Maximum Contribution		Average Contribution	
		µg/m ³	PPB	µg/m ³	PPB
All Values	All	56	21	2.1	0.80
90% of NAAQS	≥175 µg/m ³	0.50	0.19	0.11	0.04

Conclusion

The U.S. EPA agreed that the initial modeling analysis showed that the area around Duke-Mayo did meet the 2010 1-hr SO₂ NAAQS; however, they contended that DAQ had not shown that Duke-Mayo, and nearby facility CPI-Roxboro, do not contribute to ambient air quality in a nearby area that does not meet the NAAQS. Thus, they intend to designate four townships (Cunningham, Holloway, Roxboro, and Woodsdale) as unclassifiable. Cunningham Township is where the Duke-Roxboro facility is located and where a monitor is operating for the 2017-2019 period as part of the deferral of classification under the DRR. To date this monitor shows attainment with the standard. Therefore, as demonstrated in the initial modeling, Duke-Mayo does not contribute to ambient air quality in a nearby area that does not meet the NAAQS.

Furthermore, as shown in Figures 3 and 5, the initial modeling shows that when all sources are included, there is an increase in air concentrations as one nears Duke-Roxboro. Figures 3 and 6, show that when Duke-Mayo alone is modeled, the concentrations are below 50 µg/m³, far below the NAAQS of 196 µg/m³, and just more than twice the background level of 21 µg/m³. The initial analysis and the figures also show that there are no significant sources in Holloway and Roxboro Townships, and that the air concentration in these townships were well below the NAAQS. Thus, an attainment designation is supported.

Finally, the additional modeling, the results of which are presented in Tables 1 to 3, shows that when receptors are located over Cunningham Township where Duke-Mayo and CPI-Roxboro could possibly *contribute to ambient air quality in a nearby area that does not meet the NAAQS*, their contribution is two orders of magnitude less than the NAAQS. Therefore, except for Cunningham Township where designation is deferred, an attainment designation for all Person County townships is supported.