DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
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denr.sd.gov

April 8, 2016

Shaun McGrath
Regional Administrator
U.S. Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, CO 80202-1129

Dear Mr. McGrath:

On February 16, 2016, EPA submitted a letter to South Dakota stating that as a result of its settlement agreement with the Sierra Club, EPA is proposing an unclassifiable designation for the 2010 1-hour sulfur dioxide national ambient air quality standard in Grant County which is contrary to South Dakota's recommended designation of attainment. EPA's recommendation is based on what EPA terms a lack of technical information (i.e., 3 years of ambient air quality monitoring or air dispersion modeling). EPA specified that South Dakota should submit by April 19, 2016, any additional information that South Dakota wanted EPA to consider prior to EPA making a final designation.

EPA has delegated nearly all the federal environmental regulatory programs to South Dakota's Department of Environment and Natural Resources (DENR). To help fund the administration of those programs, EPA has awarded South Dakota a Performance Partnership Grant. Unfortunately, this grant has declined over the years. As EPA expands its regulations and expects the states do more with less funding, South Dakota must prioritize and efficiently use its resources.

DENR prioritizes its monitoring network by locating monitors in rural and urban areas throughout the state which represents the highest and lowest concentrations in South Dakota. Currently, DENR operates sulfur dioxide monitors at four locations in South Dakota (i.e. Rapid City, Sioux Falls, Union County, and Badlands). All four of these monitors prove South Dakota is attaining the 1-hour sulfur dioxide standard of 75 parts per billion in urban and rural areas of the state. This monitoring data has been provided to EPA in DENR's previous submittals. In addition, South Dakota submitted 12 consecutive months of historical monitoring data conducted near the Big Stone power plant which indicated the area is attaining the 1-hour sulfur dioxide standard. Modeling conducted at the time indicated the monitor was located in an area where high concentrations would likely be found. The highest recorded hourly reading was 28 parts per billion. This 1-year of historical monitoring data is not significantly different than the current monitoring data collected at the four locations in South Dakota. DENR does not believe it is a

stretch to use a comparative analysis along with an understanding of South Dakota's control strategies and actual emissions to conclude that Grant County is in attainment with the 1-hour sulfur dioxide standard.

This conclusion is strengthened by the Big Stone power plant's recent reductions in sulfur dioxide emissions. At the time historical monitoring recorded its highest hourly reading of 28 part per billion, the Big Stone power plant was emitting approximately 12,000 tons of sulfur dioxide per year. Today, the Big Stone power plant is operating using newly installed emission controls to the tune of $384 million required by the Regional Haze Program. These controls were operational in December 2015 and designed to limit sulfur dioxide emissions to less than 2,212 tons per year, which is an awesome 82 percent reduction. EPA would be justified in concluding that at today's sulfur dioxide emission rates the same monitoring site would not experience sulfur dioxide concentrations greater than 28 parts per billion.

According to the U.S. Supreme Court, the presumption of the innocence of a criminal defendant is best described as an assumption of innocence that is indulged in the absence of contrary evidence (*Taylor v. Kentucky*, 436 U.S. 478, 98 S. Ct. 1930, 56 L. Ed. 2d 468 [1978]). The U.S. Supreme Court confirmed what most citizens of the United States understood; in the United States you are presumed innocent until proven guilty. In proposing EPA's sulfur dioxide designation for South Dakota, in essence, EPA has taken the path that South Dakota must prove beyond a reasonable doubt its innocence.

Under Section 107(d) of the Clean Air Act, an unclassifiable designation means an area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for that pollutant. If EPA considered this definition under the lens of innocent until proven guilty, the available information would need to indicate the area could be considered both in attainment and nonattainment. But this is not the case. All of the information South Dakota submitted to EPA indicates Grant County is in attainment. South Dakota does not have and is not aware of any reliable documentation that would indicate Grant County would not be in attainment. Even though EPA indicates the data South Dakota submitted is not sufficient to make a determination, EPA did not provide any data suggesting Grant County may be nonattainment.

The Big Stone power plant is located in Grant County, which is in a rural area. Grant County has a population of about 7,300 citizens and covers an area of about 688 square miles, which equates to a population density of approximately 10.5 persons per square mile. There is no large sulfur dioxide emission source in the near vicinity of the Big Stone power plant and in fact, actual sulfur dioxide emissions from the Big Stone power plant will likely be less that EPA's data requirements rule's threshold of 2,000 tons per year. With all of this available information, EPA still proposed to list Grant County as unclassifiable. Amazing! What happened to good science? It is no wonder why South Dakota and other states continue to challenge EPA on its recent decisions and other new requirements.

Based on conversations with EPA, if Grant County is designated unclassifiable DENR has three options to comply with the requirements and deadlines in EPA's Sulfur Dioxide Data Requirements Rule. The first two options require DENR to either model or agree to monitor for three years to demonstrate Grant County's attainment status. The third option requires the Big

Stone power plant to accept federally enforceable permit conditions that maintain actual sulfur dioxide emissions below the 2,000 tons per year threshold (i.e., reduce its annual emissions by another 213 tons per year). In this third option, modeling and monitoring is not required.

Otter Tail Power Company, one of the co-owners and the operator of the Big Stone power plant, modeled to determine Grant County's attainment status. Through the Regional Haze Program, the Big Stone power plant is limited to 505 pounds per hour averaged over a 30 day period. Since the emission rates will vary and to account for the possibility that an emission rate greater than 505 pounds per hour could occur, Otter Tail Power Company used an emission rate of 801.6 pounds per hour based on a ratio assumption of 0.63. This ratio was derived from EPA's April 23, 2014, "Guidance for 1-Hour SO2 Nonattainment Area SIP Submission". DENR also received concurrence on this emission rate from Carl Daly (see enclosed email) with your air quality program staff. The model, including background levels, indicates the highest concentration would be 22 parts per billion (e.g. 57.9 micrograms per cubic meter), which is 29% of the 1-hour sulfur dioxide standard and lower than the 12-months of historical monitoring data provided to EPA. A copy of the report and modeling files are enclosed. In addition, the new modeling also confirms that South Dakota's monitor operated in 2001/2002 near the Big Stone power plant was located in the high concentration area (see the enclosed overlaid concentration map).

DENR respectfully requests EPA reconsider its proposed unclassifiable designation decision based on the additional information provided herein and designates Grant County in attainment of the 1-hour sulfur dioxide standard. I look forward to your timely concurrence. If you have questions, please contact Brian Gustafson, P.E., who is the Engineering Manager III of DENR's Air Quality Program, at 605-773-3151.

Sincerely,

Steven M. Pirner, P.E.
Secretary

Enclosures

cc: Governor Dennis Daugaard, South Dakota
Attorney General Marty Jackley, South Dakota
Senator John Thune, South Dakota
Senator Mike Rounds, South Dakota
Representative Kristi Noem, South Dakota
Brad Tollerson, Vice President Planning and Strategy, Otter Tail Power Company

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March 17, 2016

OTTER TAIL POWER COMPANY

Mr. Kyrik Rombough
Natural Resources Engineering Director
Air Quality Program
South Dakota Department of Environment
and Natural Resources
523 East Capitol, Joe Foss Building
Pierre, South Dakota 57501-3182

Dear Mr. Rombough:

SUBJECT: Sulfur Dioxide Air Dispersion Modeling of Big Stone Plant

As you are aware, Big Stone Plant was impacted by a March 2, 2015 decision by the U.S. District Court for the Northern District of California concerning the implementation of 2010 1-hour Sulfur Dioxide (SO_2) National Ambient Air Quality Standards (NAAQS). On February 16, 2016 EPA notified the State of South Dakota that the EPA intends to designate Grant County, SD as unclassifiable "based on a lack of technical information, including data from ambient air quality monitors or air dispersion modeling sufficient to indicate whether or not the area around Big Stone Power Plant is attaining the 2010 SO_2 NAAQS". Therefore, the purpose of this submittal is to provide information to the South Dakota Department of Environment and Natural Resources regarding the results of a dispersion modeling characterization of SO_2 concentrations in the vicinity of Big Stone Plant.

The modeling was conducted by Burns & McDonnell in accordance with EPA modeling guidelines, including an adjustment factor that was applied to Big Stone Plant's federally enforceable 30-day rolling average SO_2 emission limitation, as specifically directed by EPA. Burns & McDonnell used the most current version of AERMOD. As shown in Table 2-5 of the report, the AERMOD analysis shows compliance with the 1-hour SO_2 NAAQS by a wide margin, and thus supports the designation of Grant County as being in attainment.

If you have any questions about this information, please contact me at mthoma@otpco.com or at (218) 739-8526.

Sincerely,

Mark Thoma
Manager, Environmental Services

Enclosure

BURNS McDONNELL

Big Stone Plant SO_2 NAAQS Modeling

Otter Tail Power Company

Project No. 85139

March 2016

Big Stone Plant SO_2 NAAQS Modeling

prepared for

Otter Tail Power Company

Big Stone City, South Dakota

Project No. 85139

March 2016

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
°F	degrees Fahrenheit
$\mu g/m^3$	micrograms per meter cubed
AERMOD	AMS/EPA Regulatory Model
BART	Best Available Retrofit Technology
CFB	circulating fluid bed
CFR	Code of Federal Regulations
EPA	U.S. Environmental Protection Agency
fps	feet per second
ft	feet
GEP	Good Engineering Practice
lb/hr	pound per hour
lb/MMBtu	pounds per million British thermal units
m	meters
MMBtu	million British thermal units
NAAQS	National Ambient Air Quality Standards
NAD 83	North American Datum of 1983
NED	National Elevation Dataset
NOAA	National Oceanic Atmospheric Administration
ppb	parts per billion
SD DENR	South Dakota Department of Environment and Natural Resources
SIP	State Implementation Plan

Abbreviation	Term/Phrase/Name
SO_2	sulfur dioxide
tpy	tons per year
USGS	U.S. Geological Survey
UTM	Universal Transverse Mercator

1.0 INTRODUCTION

In response to the U.S. Environmental Protection Agency's (EPA's) March 20, 2015, and February 16, 2016, letters to the South Dakota Department of Environment and Natural Resources (SD DENR), Otter Tail Power Company (Otter Tail) retained Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) to conduct air dispersion modeling of the Big Stone Plant for the 1-hour sulfur dioxide (SO_2) National Ambient Air Quality Standard (NAAQS).

On March 2, 2015, the U.S. District Court for the Northern District of California accepted as an enforceable order an agreement between the EPA, Sierra Club, and Natural Resources Defense Council to resolve litigation concerning the deadline for completing the SO_2 1-hour NAAQS designations. The court's order directs the EPA to complete designations in three additional rounds: the first round by July 2, 2016; the second round by December 31, 2017; and the final round by December 31, 2020. The EPA will complete these designations by designating areas as either nonattainment, unclassifiable/attainment, or unclassifiable. As described in EPA's February 16, 2016, letter and accompanying Technical Support Document, without this modeling evaluation, EPA is proposing to designate the area around Big Stone Plant as unclassifiable based on a lack of technical information.

The Big Stone Plant was identified by EPA as meeting the criteria in the March 2, 2015, court order based on 2012 emissions, specifically by emitting more than 2,600 tons per year (tpy) of SO_2 and having an SO_2 emission rate greater than 0.45 pound per million British thermal units (lb/MMBtu). However, 2012 emissions are not representative of current and future emissions. On December 29, 2015, Big Stone Plant began commercial operation of a new dry circulating fluid bed (CFB) scrubber to comply with the Best Available Retrofit Technology (BART) requirements of South Dakota's Regional Haze State Implementation Plan (SIP). This SIP was approved by EPA on April 26, 2012.

Big Stone Plant is now subject to a federally enforceable SO_2 emission limitation of 505 pounds per hour (lbs/hr) over a 30-day rolling average, which includes periods of startup, shutdown, and malfunction. In a March 8, 2016, email to Brian Gustafson (SD DENR) from Carl Daly (EPA), EPA confirmed that Big Stone should use the adjustment factor of 0.63 for the Big Stone power plant to appropriately account for the longer term (30-day rolling average) SO_2 emission limit at the plant in order to model for the 1-hour SO_2 standard. This adjustment factor is consistent with EPA's April 23, 2014, SO_2 nonattainment area guidance. Therefore, the 801.6 lbs/hr emissions rate (derived by applying the 0.63 factor to the Big Stone 30-day rolling SO_2 limit of 505 lbs/hour) is appropriate in a 1-hour modeling analysis of SO_2 emissions at the Big Stone Plant.

Included in this document is a description of the model, input parameters, and results for the SO_2 modeling of the Big Stone Plant. This modeling was conducted in accordance with the EPA and SD DENR modeling guidelines. Additionally, the March 20, 2015, memo from EPA entitled "Updated Guidance for Area Designations for the 2010 Primary Sulfur Dioxide National Ambient Air Quality Standard" was followed.

Based on modeling results, the 1-hour SO_2 concentrations plus the background are substantially less than the NAAQS, and therefore the area surrounding Big Stone Plant should be considered in attainment.

2.0 MODELING METHODOLOGY

Burns & McDonnell used the most current version of the AMS/EPA Regulatory Model (AERMOD) for the air quality analysis (Version 15181) as well as the most current version of AERSCREEN (Version 15181), the regulatory screening model for AERMOD.

2.1 AERMOD

The AERMOD model is an EPA-approved, steady-state Gaussian plume model capable of modeling multiple sources in simple and complex terrain using detailed meteorological data.

The following default model options were used:

- Gradual Plume Rise
- Stack-tip Downwash
- Buoyancy-induced Dispersion
- Calms and Missing Data Processing Routine
- Calculate Wind Profiles
- Calculate Vertical Potential Temperature Gradient
- Rural Dispersion

Details of the modeling algorithms contained in the AERMOD may be found in the User's Guide for AERMOD. The regulatory default option was selected for this analysis.

2.1.1 Good Engineering Practice Stack Height

Sources are subject to Good Engineering Practice (GEP) stack height requirements outlined in 40 Code of Federal Regulations (CFR) Part 51, Sections 51.100 and 51.118. As defined by the regulations, GEP height is calculated as the greater of 65 meters (measured from the ground level elevation at the base of the stack) or the height resulting from the following formula:

$$GEP = H + 1.5L$$

Where,

H = the building height; and

L = the lesser of the building height or the greatest crosswind distance of the building - also known as maximum projected width.

To meet stack height requirements, the point sources were evaluated in terms of their proximity to nearby structures. The purpose of this evaluation is to determine if the discharge from each stack will become caught in the turbulent wake of a building or other structure, resulting in downwash of the plume. Downwash of the plume can result in elevated ground-level concentrations. In EPA's 1985 *Guideline for Determination of Good Engineering Practice Stack Height*, the EPA provides guidance for determining whether building downwash will occur. The downwash analysis for this study was performed consistent with the methods prescribed in the EPA guidance document. The point sources were evaluated in terms of their proximity to nearby structures.

Calculations for determining the direction-specific downwash parameters were performed using the most current version of the EPA's Building Profile Input Program – Plume Rise Model Enhancements, otherwise referred to as the BPIP-PRIME downwash algorithm (Version 04274). The BPIP-PRIME algorithm provides direction-specific building dimensions to evaluate downwash conditions. The Big Stone Plant is located in a rural area, and the only buildings that could potentially affect emissions from the Big Stone Plant are the onsite structures; however, buildings from a nearby ethanol plant were also evaluated. The BPIP-PRIME output is included with modeling files.

2.1.2 Emission Source Parameters

Modeling runs were conducted to confirm that operation of the Big Stone Plant will not exceed the required 1-hour SO_2 NAAQS modeling threshold. There are only two SO_2 sources at the facility that are not intermittent sources: the Big Stone Plant coal-fired boiler and the auxiliary boiler. The parameters and operating conditions in Table 2-1 were modeled for each source. Since the new dry CFB scrubber has only recently begun commercial operation, the temperatures and exit velocity are based on manufacturer predictions; however, preliminary stack measurements are consistent with the predictions.

The following source groups were modeled:

MAX= 1MAX and AUXBOIL
FULL= 1FULL and AUXBOIL

Table 2-1: Source Parameters

Model Source ID[a]	1MAX	1FULL	AUXBOIL
Source description	Coal-fired boiler, worst case - SO_2 limit at minimum load	Coal-fired boiler – SO_2 limit at full load	Auxiliary boiler, SO_2 based on ultra-low sulfur diesel
Easting (X) (m)	695,126		695,196.1
Northing (Y) (m)	5,019,800		5,019,781
Base elevation (m)	342.6		342.6
Stack height (ft)	498		252
Stack diameter (ft)	24.17		6.5
Temperature (°F)	174	179	606
Exit velocity (fps)	32.74	72.14	21.12
SO_2 (lb/hr)	801.6		0.32

(a) m = meters, ft = feet, °F = degrees Fahrenheit, fps = feet per second, SO_2 = sulfur dioxide, lb/hr = pound per hour

In addition, in accordance with EPA's March 2011 memo,[1] Otter Tail proposes only to model continuous operation for the 1-hour standard. The emergency diesel generator is limited to emergency operation including testing and maintenance and will not be included in the 1-hour modeling analysis, as it is an intermittent source. The emergency diesel generator operation will not contribute significantly to the annual distribution of the daily maximum 1-hour concentrations.

2.1.3 Receptor Grid

The overall purpose of the modeling analysis is to confirm that operation of the facility will not result in concentrations above the NAAQS. The modeling runs were conducted using the AERMOD model in simple and complex terrain mode within a 25- by 25-kilometer Cartesian grid. The grid incorporates the receptors specified in Table 2-2.

Table 2-2: Receptor Spacing

Distance from Fence Line (kilometers)	Receptor Spacing (meters)
0 - 0.2	50
0.2 - 1	100
1 - 5	250
5 - 25	500

[1] http://www.epa.gov/sites/production/files/2015-07/documents/appwno2_2.pdf

Receptors were also placed along the fence line boundary at a spacing of 50 meters.

The appropriate U.S. Geological Survey (USGS) National Elevation Dataset (NED) was used to obtain the necessary receptor elevations. North American Datum of 1983 (NAD 83) was used to develop the Universal Transverse Mercator (UTM) coordinates for the Big Stone Plant.

AERMOD has a terrain preprocessor (AERMAP) which uses gridded terrain data for the modeling domain to calculate not only a XYZ coordinate, but also a representative terrain-influenced height associated with each receptor location selected. This terrain-influenced height is called the height scale and is separate for each individual receptor. AERMAP (Version 11103) utilizes the electronic NED data to populate the model with receptor elevations.

2.1.4 Meteorological Data

AERMOD requires a preprocessor called AERMET (Version 14134) to process meteorological data for 5 years from offsite locations to estimate the boundary layer parameters for the dispersion calculations.

Raw meteorological data was attained from the National Oceanic Atmospheric Administration (NOAA)[2] [3] for years 2010-2014. Surface air meteorological data from Ortonville, MN (station # 04982) and upper air data from Aberdeen, MN (station #14929) were used in the analysis. The following parameters were used to process the raw data using AERMET and AERSURFACE:

- Time adjust: zone 6
- Primary site ID: 04982
- Coordinates: 45.300°N 96.417°W
- Surface station elevation (profile base elevation): 335 meters
- Upper air site ID: 14929
- Primary wind sectors: 12
- Primary surface characteristics frequency: monthly
- Season definition: default (winter = December-February; spring = March-May; summer = June-August; autumn = September-November)
- Winter season snow cover: yes, continuous snow cover for one or more months
- Airport: no
- Arid region: no

[2] ftp1.ncdc.noaa.gov
[3] esrl.noaa.gov/raobs/

- Surface moisture: average

2.1.5 Land Modeling Parameters

Based on the Auer scheme, the existing land use for a 3-kilometer area surrounding the Big Stone Plant is more than 50 percent rural. Also, the population density is fewer than 750 people per square kilometer for the same area. Because this area is considered rural, the rural dispersion coefficients option in the AERMOD model was selected.

2.1.6 Background Air Quality

The NAAQS are set up to protect the air quality for all sensitive populations, and attainment is determined by the comparison to the NAAQS thresholds. As such, there are existing concentrations of each criteria pollutant that are present in ambient air, and these must be included in an analysis to account for items such as mobile source emissions that are not accounted for in the model. Monitored ambient emission levels were added to the modeled ground level impacts to account for these sources.

The SO_2 background is presented in Table 2-3. The highest 3-year average value from nearby monitors was used: 28.95 micrograms per meter cubed ($\mu g/m^3$). This is conservative compared to the standard, which is 99th percentile.

Table 2-3: SO_2 1-hour Background

Monitor	Year	SO_2 1-hour Background	
		Parts per Billion (ppb)	Micrograms per Meter Cubed ($\mu g/m^3$)
Fargo Northwest AQS Site ID: 38-017-1004	2012	5.3	13.99
	2013	6.3	16.63
	2014	2.9	7.66
	3-year average	**4.8**	**12.76**
South of Badlands National Park Headquarters AQS Site ID: 46-071-0001	2012	3.9	10.30
	2013	24.7	65.21
	2014	4.3	11.35
	3-year average	**11.0**	**28.95**
South Dakota School for the Deaf AQS Site ID: 46-099-0008	2012	6.3	16.63
	2013	4.3	11.35
	2014	20.4	53.86
	3-year average	**10.3**	**27.28**

2.1.7 NAAQS

The model results plus the background are compared to the SO_2 NAAQS, which is shown in Table 2-4.

Table 2-4: SO_2 NAAQS

Pollutant	Averaging Period	NAAQS	Modeled High
Sulfur dioxide (SO_2)	1-hour	196.5 micrograms per meter cubed ($\mu g/m^3$)	99th percentile (4th-highest max daily 1-hour)

2.1.8 AERMOD Results

The results of the 1-hour SO_2 modeling are shown in Table 2-5. The impact of the Big Stone Plant plus the background is less than one-third the NAAQS, with the peak impacts occurring approximately 0.5 mile north and 2.3 miles northwest from Big Stone Plant fence line for the MAX and FULL runs, respectively. Therefore, the area should be considered in attainment with the 1-hour NAAQS. Concentration isopleths are plotted in Figures 2-1 and 2-2.

Table 2-5: AERMOD 1-hour SO_2 Modeling Results

Source Group	Big Stone Plant Model Results[a]	Background	Model Plus Background	NAAQS	% of NAAQS
	micrograms per meter cubed ($\mu g/m^3$)				
MAX	28.93	28.95	57.88	196.5	29%
FULL	18.09	28.95	47.04	196.5	24%

(a) 3-year average of the 99th percentile of the daily maximum 1-hour average

Figure 2-1: SO_2 1-Hour NAAQS (MAX Run)

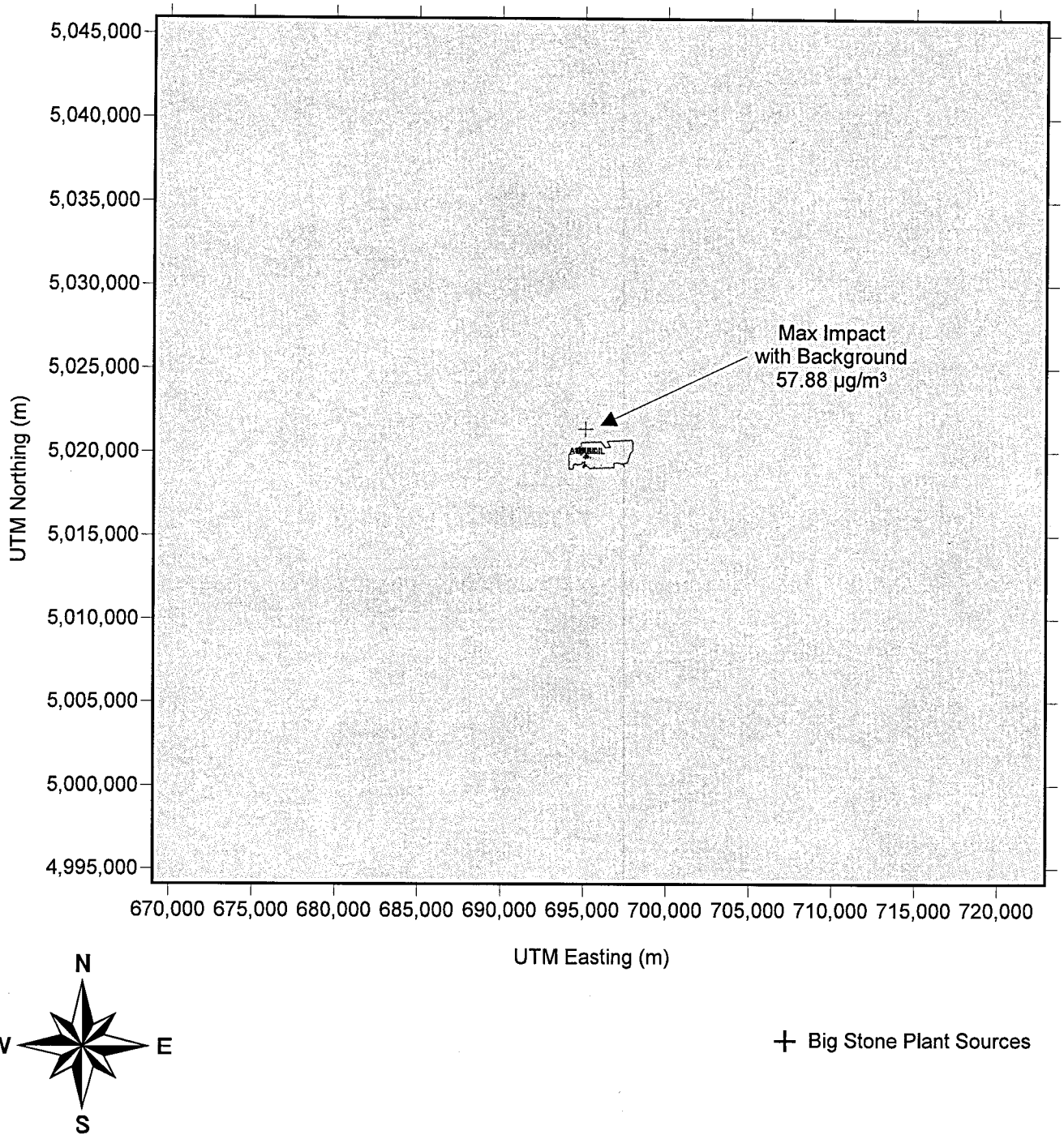

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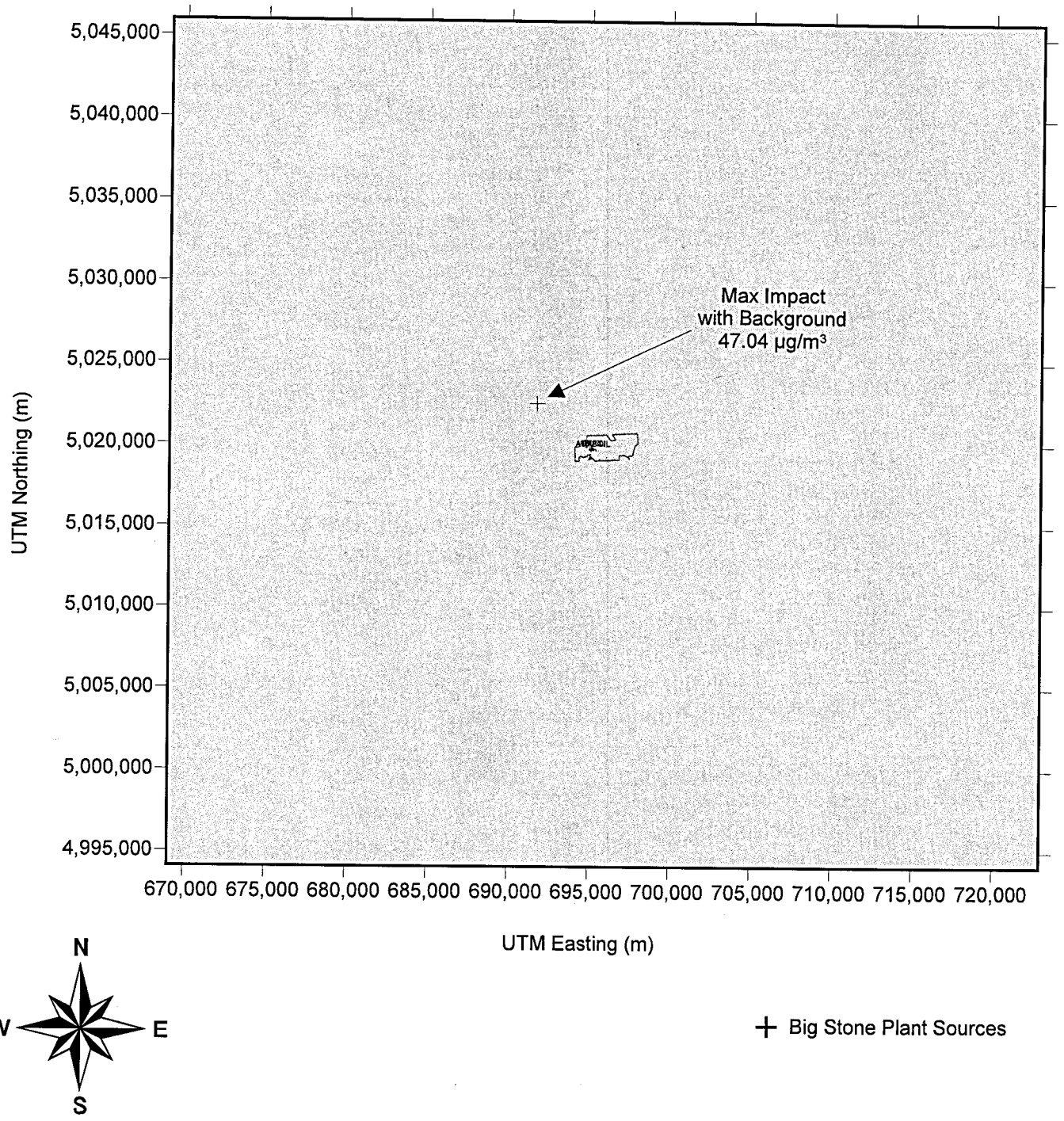
Figure 2-2: SO_2 1-Hour NAAQS (FULL Run)



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Rombough, Kyrik

From: Daly, Carl <Daly.Carl@epa.gov>
Sent: Tuesday, March 08, 2016 1:44 PM
To: Gustafson, Brian
Cc: Morales, Monica; Clark, Adam; Rombough, Kyrik
Subject: 1-Hour SO2 Emission Rate for Big Stone

Brian

In response to Kyrik's email to Adam Clark, we can confirm that EPA considers the adjustment factor of 0.63 for the Big Stone power plant to appropriately account for the longer term (30-day rolling average) SO2 emission limit at the plant in order to model for the 1-hour SO2 standard. This adjustment factor is consistent with EPA's April 23, 2014 SO2 nonattainment area guidance.

This means that the 801.6 lbs/hr emissions rate (derived by applying the 0.63 factor to the Big Stone 30-day rolling SO2 limit of 505 lbs/hour) would be appropriate in a 1-hour modeling analysis of SO2 emissions at the Big Stone power plant. However, until South Dakota submits the results of air quality modeling and we review the modeling, we can't say what EPA's final 1-hour SO2 designation decision for the area around Big Stone would be.

Thanks

Carl Daly, Director
Air Program
303-312-6416


PLOT FILE OF 4TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR
Max: 18.1 [ug/m^3] at (691750.00, 5022500.00)
18.1
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.6
Clinton
Big Stone Lake
Goose Island
SO2 Monitor
Manhattan Island
Pancake Island
Frying Pan Island
Kite Island
Mud Island
Skeleton Island
18.1
Otter Tail Power Company
Ortonville
Big Stone City
© 2016 Google
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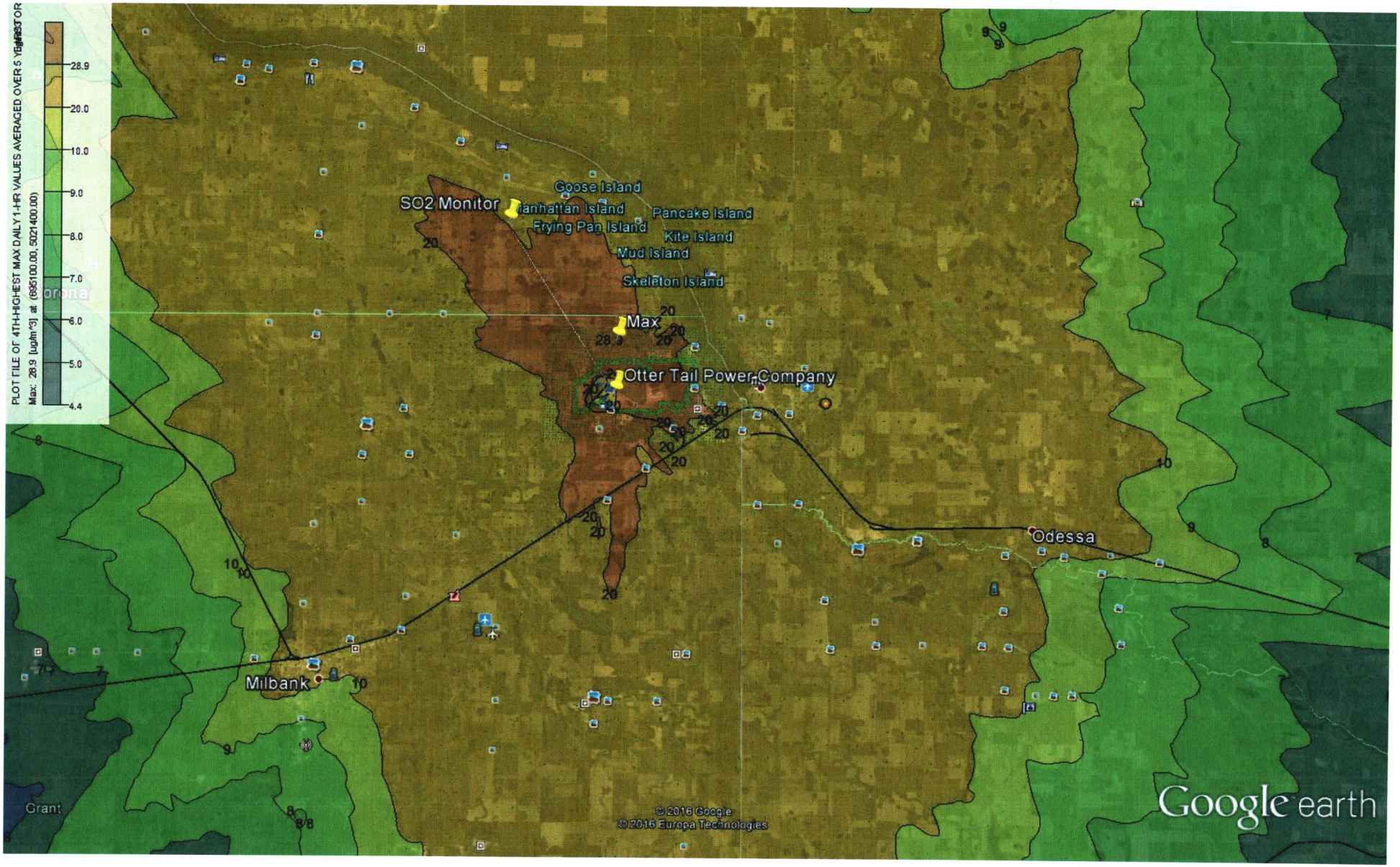
Google earth
Imagery Date: 8/2/2015 45°19'08.54" N 96°29'42.62" W elev 1115 ft eye alt 11.43 mi


PLOT FILE OF 4TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR
Max: 28.9 [ug/m^3] at (686100.00, 5021400.00)
28.9
20.0
10.0
9.0
8.0
7.0
6.0
5.0
4.4
SO2 Monitor
Goose Island
Manhattan Island
Pancake Island
Frying Pan Island
Kite Island
Mud Island
Skeleton Island
Max
Otter Tail Power Company
Odessa
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km
10
20