Fields of Opportunities

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR
KIM REYNOLDS, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
ROGER L. LANDE, DIRECTOR

March 29, 2011

Mr. Joshua A. Tapp
Branch Chief
Air Planning and Development Branch
U.S. EPA Region VII
901 North 5th Street
Kansas City, KS 66101

Dear Mr. Tapp:

In your letter dated November 10, 2010, you requested updated recommendations and supporting technical documentation for the second round of designations for the 2008 lead National Ambient Air Quality Standards (NAAQS). In September 2009 the State recommended all areas in Iowa be designated attainment/unclassifiable relative to the 2008 NAAQS for lead. Data from an ambient air lead monitor located in Council Bluffs has since measured lead concentrations which do not meet the lead NAAQS.

The attached technical support document provides justification for a 3.4 square mile area of Council Bluffs that may be impacted by EPA's final nonattainment designation decision. The State of Iowa appreciates EPA's consideration of this information in the designations process. If you have any questions on the enclosed recommendation and supporting information, please contact Jim McGraw at 515-242-5167, or by email at jim.mcgraw@dnr.iowa.gov.

Sincerely,

Catharine Fitzsimmons

Catharine Fitzsimmons
Chief, Air Quality Bureau

Enclosure

cc: Stephanie Doolan, EPA R7, without enclosure

7900 Hickman Road, Suite 1 / Windsor Heights, Iowa 50324
515-242-5100 FAX 515-242-5094 http://www.iowacleanair.com/

Lead Nonattainment Boundary Recommendations
Council Bluffs, IA

Technical Support Document

Iowa Department of Natural Resources
Environmental Services Division
Air Quality Bureau
7900 Hickman Rd Suite 1
Windsor Heights, IA 50324

March 2011

Executive Summary

The National Ambient Air Quality Standards (NAAQS) for lead (Pb) were made more protective of public heath by the U.S. Environmental Protection Agency (EPA) on October 15, 2008. Lead is an air pollutant which is linked to adverse health effects upon IQ, behavior, and learning, particularly among children. The previous lead health standard was established in 1978 at a level of 1.5 ug/m3. The revised level of the standard was set to 0.15 ug/m3.

The EPA generally has two years following adoption of a new or revised NAAQS to designate whether areas are meeting (in attainment with) or failing to meet (in nonattainment with) the standards. The EPA administrator may take an additional year to issue designations if sufficient data is not available to make a determination. In accordance with the federal Clean Air Act timelines, in a letter dated September 10, 2009, the Governor recommended to EPA that all areas in the state be classified as attainment/unclassifiable relative to the revised lead standard. At that time no lead monitors were in operation in the state.

The Clean Air Act allows EPA to take an additional year prior to issuing designations if sufficient information is not available within the normal two-year process. EPA is exercising this option and is extending the designations process by one year to consider data from newly sited source-oriented lead monitors. In the final lead NAAQS rule (73 FR 66964, November 12, 2008) the EPA included provisions requiring an expansion of the lead monitoring network. A phased approach for monitor deployment was provided. In the first phase, states were required to identify sources of lead emissions to be monitored, and to begin measuring ambient lead concentrations by January 1, 2010. The second phase of the monitoring requirements focused on monitoring in large urban areas, to begin by January 1, 2011. To comply with the federal requirements for source-oriented lead monitoring, a lead monitor was sited in Council Bluffs near Griffin Pipe Products Company, and began operation on November 3, 2009.

From April through November 2010, six violations of the lead NAAQS were measured at the Griffin Pipe monitor, with a maximum three-month rolling average of 0.26 ug/m3. A single violation of the 0.15 ug/m3 health standard is all that is required to make a determination that an area no longer meets the lead NAAQS. The Griffin Pipe monitor has measured ambient lead concentrations which do not meet the lead NAAQS. EPA will consider this information as they complete the designations process. Final designations are expected to be issued by EPA by October 15, 2011.

In a letter dated November 10, 2010, the State was given the opportunity by EPA to submit updated designation recommendations. EPA requested any modifications be provided for their consideration by December 15, 2010, although they intend to accept information after this date.

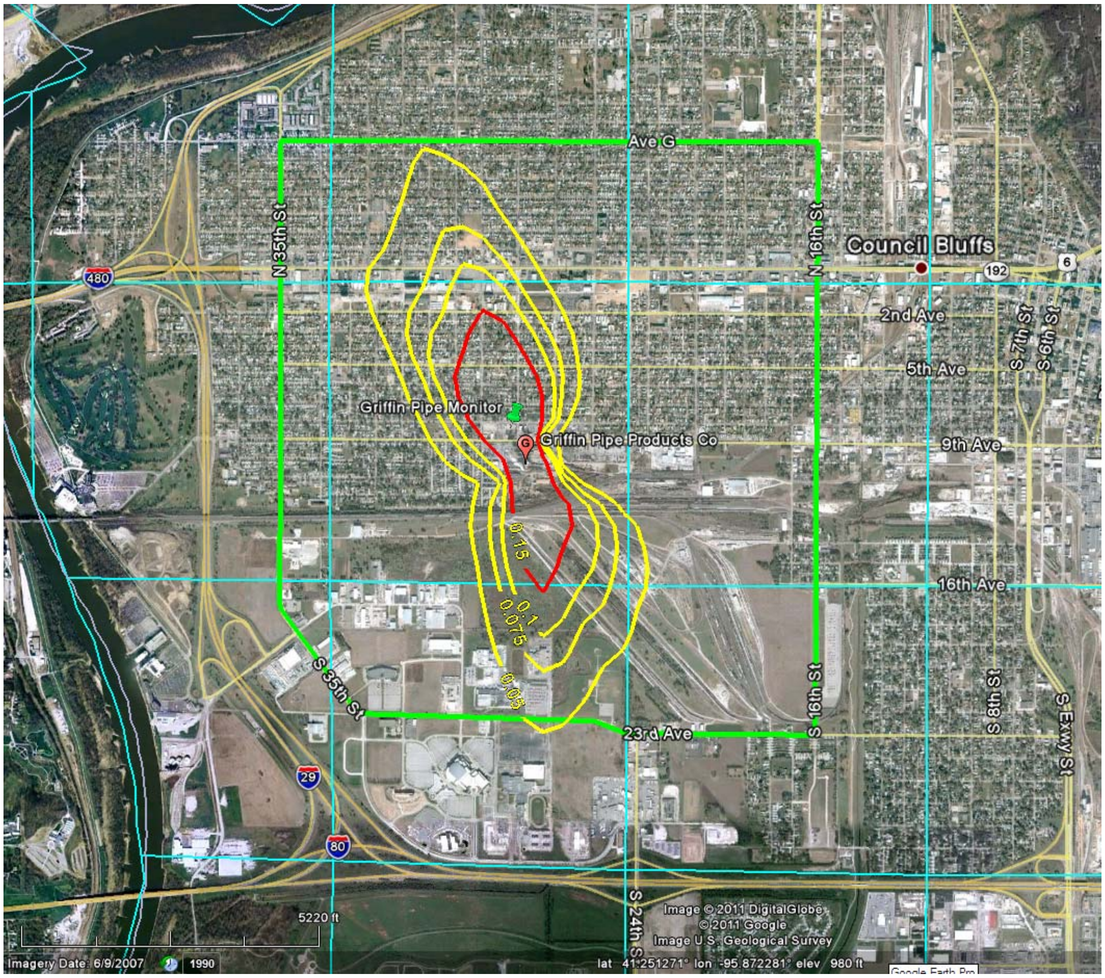
A state may recommend specific geographical boundaries for areas that are no longer meeting the lead NAAQS. For areas not meeting the lead NAAQS, EPA uses a presumptive nonattainment boundary that is the county boundary. A modified designation is being recommended to EPA that includes a nonattainment boundary which is significantly smaller than the default county perimeter. The specific recommendation was developed based upon the results of data analysis and modeling conducted in accordance with EPA's eight-factor analysis, final rules, and guidance documents, and consideration of public comments.

The modified boundary is illustrated below, contains all sources contributing to the lead NAAQS violations, and is defined by the following roadways.

- Northern Boundary: Avenue G
- Southern Boundary: 23rd Ave
- Eastern Border: N 16th St / S 16th St
- Western Border: N 35th St / S 35th St

A public meeting was held in Council Bluffs, IA, on February 16, 2011, to obtain public review and comment on the proposed boundaries. Comments received included a statement to expand the nonattainment area boundary. Several comments suggested narrowing the extent of the boundary. General comments on the narrowing of the boundary included comments to reduce the eastern and western extent of the boundary, as well as a reduction in the area covered in the southwestern portion of the boundary. On March 7, 2011, IDNR received a comment containing specific refinements relating to the southwest portion of the recommended nonattainment boundary.

Modifying the southwestern boundary to incorporate the comments provided March 7, 2011, would require the projection of roadway paths beyond their current extents. Narrowing the boundaries of the nonattainment area would make them more difficult to identify, visualize, and describe. Supporting evidence was not provided to substantiate the suggestions. No changes in the boundaries were made from the proposal presented at the public meeting.



Recommended nonattainment boundary in Council Bluffs. The boundary is outlined in green. Section lines are indicated in light blue, as are the state boundaries. The extent of the predicted NAAQS violations from modeling is shown in red, and associated lower concentration contours (down to 0.05 ug/m3) are plotted in yellow.

Table of Contents

Introduction

The National Ambient Air Quality Standards (NAAQS) for lead (Pb) were made more protective of public heath by the U.S. Environmental Protection Agency (EPA) on October 15, 2008 (73 FR 66964, November 12, 2008)[1]. Lead is an air pollutant which is linked to adverse health effects upon IQ, behavior, and learning, particularly among children. EPA revised both the primary and secondary national ambient air quality standards for lead. Primary NAAQS are established to protect public health with an adequate margin of safety. The secondary NAAQS are established to protect public welfare, such as the protection of ecosystems, wildlife, soils, and vegetation.

The EPA revised the primary standard by lowering the level by a factor of 10, from 1.5 ug/m3 to 0.15 $\mu g/m^3$. The previous lead standard was established in 1978. The averaging methods used to determine whether an area meets the standard were also revised. The form of the standard was revised "to a rolling 3-month period with a maximum (not-to-be-exceeded) form, evaluated over a 3-year period" (73 FR 66964). The EPA retained lead in total suspended particulate matter (TSP) as the indicator for lead. The secondary standard was revised to be identical in all respects to the primary standard.

The standard was revised based on over 6000 health studies published since 1990 examining lead exposure and its health impacts. According to EPA's fact sheet on the revised lead NAAQS, the evidence shows that lead can have adverse health effects at concentrations much lower than previously thought; and "Exposures to low levels of lead early in life have been linked to effects on IQ, learning, memory, and behavior. There is no known safe level of lead in the body."

Following a revision to a NAAQS, Section 107(d) of the Clean Air Act requires areas be designated. Designations are done separately for each NAAQS. Areas can be designated as either attainment, nonattainment, or unclassifiable. An area that meets a NAAQS is classified as an attainment area. An area that does not meet the standard, or an area that contributes to a nearby area not meeting the standard, is classified as a nonattainment area. If sufficient data is not available to make a determination, the area is designated as unclassifiable. Designations are normally made by EPA within two years of a NAAQS revision, although EPA may take an additional year if sufficient information is not available.

States are required to submit designation recommendations to EPA within one year of a NAAQS revision. In a letter dated September 10, 2009, the Governor submitted to EPA a recommendation that all areas in the state be classified as being attainment/unclassifiable relative to the lead standard. At that time, no lead monitors were in operation in the state.

EPA has the final authority in determining whether areas are designated as attainment, nonattainment or unclassifiable. EPA considers both the state recommendations and their own data prior to issuing

---

[1] The final lead NAAQS rule was promulgated (signed by the EPA administrator and disseminated) on 10/15/2008. It was published in the Federal Register on November 12, 2008, at 73 FR 66964.

designations. If the designations process is extended by one year, EPA may seek additional or updated recommendations from the state where new information is available.

When EPA revised the lead NAAQS they also revised requirements for lead monitoring, including provisions requiring an expansion of the lead monitoring network. A phased approach for monitor deployment was provided. In the first phase, air quality agencies were required to deploy, by January 1, 2010, lead monitors in areas known or suspected of violating the NAAQS. An emissions based threshold was established as a component to assist in determining monitor deployment. Sources with lead emissions of 1 ton per year[2] were to have a monitor sited nearby. This requirement could be waived if it could be demonstrated (through modeling) that ambient air impacts from the source would not exceed 50% of the NAAQS. The second phase of the monitoring requirements focused on monitoring in large urban areas, to begin by January 1, 2011.

As a result of EPA's rules to expand the lead monitoring network, EPA is exercising their option to extend the lead designations process by one year to consider data from newly sited source-oriented lead monitors. EPA stated their intent to pursue the designations process in two rounds in the lead NAAQS rule (73 FR 66964, November 12, 2008). In the first round, designations were issued within the normal two-year process, by October 15, 2010, where sufficient information was available. In areas where existing lead data showed a violation of the NAAQS, EPA issued nonattainment designations (75 FR 71033, November 22, 2010). EPA has not acted on Iowa's designations recommendations submitted on September 10, 2009. EPA will issue designations for areas in Iowa at the conclusion of the second round of designations, by October 15, 2011.

In accordance with the federal requirements for establishing source oriented lead monitors, a lead monitor was sited near Griffin Pipe Products Company, and began operation on November 3, 2009. An extensive emissions inventory review, including efforts to improve the lead emissions inventory through incorporation of stack test data, was conducted to help identify sources requiring lead monitoring. In early 2009, an evaluation of Griffin Pipe's lead emissions yielded emissions greater than 1 ton/yr. In April 2009, IDNR initiated modeling to determine if the facility's operations demonstrated compliance with the revised lead NAAQS, and also to determine where a lead monitor, if needed, should be sited. These analyses indicated that facility operations were causing predicted violations of the revised lead NAAQS. In late 2009, IDNR installed a source-oriented lead monitor just to the north of the facility in a residential area. This monitor is within the city of Council Bluffs, which is the county seat of Pottawattamie County. No other source-oriented monitors were required in Iowa, based upon emissions data and dispersion modeling results.

---

[2] An administrative petition was filed with EPA seeking a review of the 1.0 ton per year threshold. EPA granted the petition and proposed to revise the threshold to 0.5 tons per year. On December 27, 2010, EPA finalized revisions to the monitoring requirements, lowering the source emissions threshold from 1.0 to 0.5 tons per year. Should additional sources require monitoring as a result of the lower threshold, the monitors must be operational by December 27, 2011. No additional source oriented lead monitors are anticipated in Iowa as a result of this change.

The lead monitor adjacent to Griffin Pipe has recorded six three-month rolling averages that violate the lead NAAQS. In a letter from EPA dated November 10, 2010, the Governor was given the opportunity to submit a request to modify the State's initial designation recommendations and to recommend specific geographical boundaries for areas that do not meet the lead NAAQS. EPA requested any modifications be provided for their consideration by December 15, 2010, but they intend to accept information after that date. The purpose of this document is to provide EPA with a recommended geographic lead nonattainment boundary, and the appropriate technical justification for that boundary.

Nonattainment Boundary Development

For monitors that do not meet the lead NAAQS, the lead NAAQS preamble (73 FR 66964, November 12, 2008) discusses a presumptive boundary for nonattainment areas. This presumptive boundary is defined as the perimeter of the county containing the violating monitor. However, defining a presumptive nonattainment boundary does not constitute a binding or rigid determination. Deviations may be appropriate or necessary, for example, to ensure the nonattainment area includes not just the sources that are causing the NAAQS violation, but also nearby sources that may contribute to the NAAQS violations.

Lead is a pollutant that is associated with direct emissions from sources, and does not readily participate in chemical reactions occurring in the atmosphere. With the elimination of leaded gasoline, lead emissions have been reduced dramatically, and the largest sources of lead are typically associated with emissions from stationary sources. With these facts in mind, EPA recognizes there could be cases where the appropriate boundary is smaller than the presumptive county boundary.

In the preamble to the lead NAAQS EPA identified eight subjects, or factors, for states to consider as they develop recommendations for nonattainment boundaries. No additions or changes were made to the factors in subsequent guidance provided by EPA on August 21, 2009 ("Area Designations for the 2008 Revised Lead National Ambient Air Quality Standards", William T. Harnett, EPA). Should a state choose to deviate from the presumptive boundary, EPA consistently recommends that states conduct an eight-factor analysis. These eight factors which may influence the development of a nonattainment boundary are listed below:

- Emissions data*****
- Air quality data*****
- Meteorology
- Jurisdictional boundaries
- Level of control of emissions sources
- Population density and degree of urbanization
- Geography/topography
- Expected growth (including extent, pattern and rate of growth)

*In areas potentially included versus excluded

As stated in the final lead NAAQS rule: "At the revised standard level, EPA expects stationary sources to be the primary contributor to violations of the NAAQS" (73 FR 67032). The final rule also discusses situations for which a single source is causing a NAAQS violation, and that a state may well be able to define a nonattainment boundary that is smaller than the presumptive boundary, provided that the area-specific analysis supports such a determination (73 FR 67033). An area specific analysis may be supported by results from an air quality simulation by dispersion modeling (73 FR 67034). An area larger than the presumptive county nonattainment boundary may also be recommended should additional sources or influencing factors outside the county be causing or contributing to the NAAQS violation. As the secondary standard was revised to be identical in all respects to the primary lead standard, it is expected that all areas will have the same designation and boundary for each standard.

Technical Evaluation

The state has developed a nonattainment boundary recommendation which includes the area that is violating the standard plus any areas that may contribute to the violations. The recommendation was developed following EPA guidance. Only one source of lead is identified as causing the lead NAAQS violations; no contributing sources were identified. The boundary recommendations are supported by an evaluation of eight factors and dispersion modeling results. The details of the eight-factor analysis and dispersion modeling results used to develop the recommended nonattainment boundary are discussed below.

Air Quality

In most instances determining if an area is either meeting or violating a NAAQS requires the calculation of a metric referred to as a design value. For many NAAQS pollutants, three years of data are required before a design value can be determined. The lead NAAQS design value is based upon a three-year period, but since it utilizes a three-month rolling average, 38 months of data (the most recent three-year period plus two previous months) are required.

A characteristic of the lead NAAQS is that a design value is not necessary to determine if an area has violated the standard. The averaging time and form of the lead standard is based upon a three month-rolling average, which is not to exceed 0.15 ug/m3. A single three month-rolling average over the 0.15 ug/m3 level constitutes a violation of the standard. In other words, if one three-month rolling average exceeds 0.15 ug/m3, that area can be designated nonattainment. Determining that an area has attained the lead standard requires a lead design value that meets the NAAQS, which requires three years (plus 2 months) of supporting data.

There is one lead monitor operating in Iowa that has measured a rolling three-month average lead concentration that violates the lead NAAQS. This lead monitor is located at approximately 8^{th} Avenue and S 27^{th} St in Council Bluffs, Iowa. The monitor is located approximately 200 meters from lead emitting sources at Griffin Pipe Products Company in Pottawattamie County (see Figure 1). This monitor is also referred to as the Griffin Pipe monitor, and is located near a residential area inside of the Council Bluffs city limits. Council Bluffs is located in Western Iowa within Pottawattamie County (see Figure 2).

Figure 1. The approximate location of the Griffin Pipe monitor, near 8th Avenue and S 27th St in Council Bluffs, Iowa; roughly 200 meters north/northwest of lead sources at Griffin Pipe Products Company. (Imagery from Microsoft's Bing Maps.)

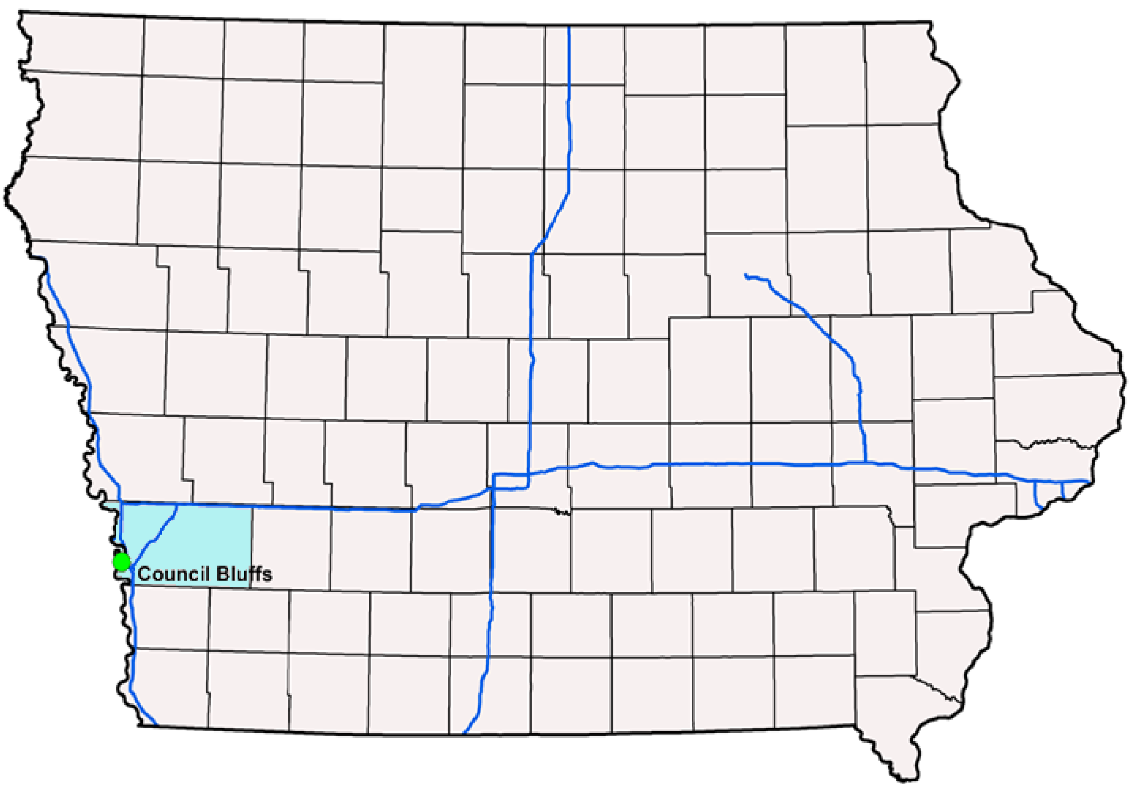


Figure 2. Map of Iowa highlighting Pottawattamie County (light blue) and the approximate location of the lead monitor in Council Bluffs.

The Griffin Pipe monitor began collecting data on November 3, 2009. Three years of data has not yet been collected and a true design value is not currently available. As discussed above the lack of a design value does not prevent a determination that a violation of the lead NAAQS has occurred.

Three consecutive months of data are required before a comparison against the NAAQS can be made. Only one three-month rolling average above the 0.15 ug/m3 standard is needed to violate the lead NAAQS. Based upon the data available at this time (November 2009 – December 2010), the Griffin Pipe monitor has recorded six (6) three-month rolling averages violating the lead NAAQS. The highest of these 3-month rolling averages occurred over the period June – August 2010, at 0.26 ug/m3 (see Table 1).

Table 1. Three-month rolling averages of lead concentrations at the Griffin Pipe monitor.

Time Period	3-Month Rolling Average	NAAQS Violation
Nov '09 - Jan '10	0.10	
Dec '09 - Feb '10	0.03	
Jan-Mar (2010)	0.07	
Feb-Apr (2010)	0.12	
Mar-May (2010)	0.14	
Apr-Jun (2010)	**0.17**	X
May-Jul (2010)	**0.20**	X
Jun-Aug (2010)	**0.26**	**Maximum**
Jul-Sep (2010)	**0.24**	X
Aug-Oct (2010)	**0.25**	X
Sep-Nov (2010)	**0.18**	X
Oct-Dec (2010)	0.14	

Emissions

According to data compiled by the IDNR and reported in the 2008 National Emissions Inventory (NEI), there are two major (Title V) point sources in Pottawattamie County that emit significant quantities of lead, Griffin Pipe Products Company (Griffin Pipe) and the Mid American Energy Company - Walter Scott Jr. Energy Center (see Table 2). Griffin Pipe manufactures ductile iron pressure pipe for potable water transmission and wastewater collection. Lead emissions associated with their operation occur as a result of melting metal, a hot iron desulfurization process and a magnesium inoculation process. The melting process uses a cupola furnace which is charged with coke, scrap iron, scrap steel, and fluxes as raw materials. Lead content present in the scrap metals is released as the materials are heated and melted. Lead emissions from the cupola furnace are the primary source of lead emissions at the facility. Lead emissions are also produced from a hot iron desulfurization process and a magnesium inoculation process. Total facility wide lead emissions were calculated to be 0.59 tons per year for calendar year 2008. This value was based upon stack test data collected on March 2, 2010, from the cupola, and stack test data collected in March 2009 from the hot iron desulfurization & magnesium inoculation processes, and emissions inventory calculations based upon throughput data reported by the facility for 2008.

The 2008 Griffin Pipe facility total lead emission rate of 0.59 tpy is below the 1 ton per year threshold value originally[3] established in the lead NAAQS rule (73 FR 66964, November 12, 2008). In this rule, source-oriented lead monitors were required to be operational by January 1, 2010. Siting of source oriented monitors required use of data developed prior to the 2008 NEI. The DNR estimated lead emissions from the Griffin Pipe facility using 2007 activity data in combination with data from a March 4, 2009 stack test. The estimated lead emissions for calendar year 2007 was 3.91 tons per year. The emission rate for the cupola did not meet its permitted emissions rate, based on the March 4, 2009 stack test data. If the cupola had emitted lead at its permitted rate, the facility would still have exceeded the one ton per year monitoring threshold.

MidAmerican's Walter Scott Jr. Energy Center (WSEC) is an electricity generation facility, more commonly known as a power plant. WSEC is located approximately 8.9 km to the south-southeast of Griffin Pipe (see Figure 3). There are four coal-fired electric generating units (EGUs) at WSEC. Coal naturally contains small quantities of minerals and metals such a lead. When burned, lead compounds which are not captured by control equipment are released into the atmosphere. Total lead emissions for calendar year 2008 were calculated from the four coal-fired units to be 0.58 tons per year.

[3] As mentioned in a previous footnote, EPA lowered the 1 tpy threshold value to 0.5 tpy in a rulemaking published in the Federal Register on December 27, 2010 (75 FR 81126).

Table 2. Lead emissions in Pottawattamie County from point sources. Data submitted by IDNR in the 2008 NEI.

Facility ID	Facility Name	Lead Emissions (tons per year)
78-01-012	Griffin Pipe Products Company	0.59
78-01-026	MidAmerican Energy Co. - Walter Scott Jr. Energy Center	0.58

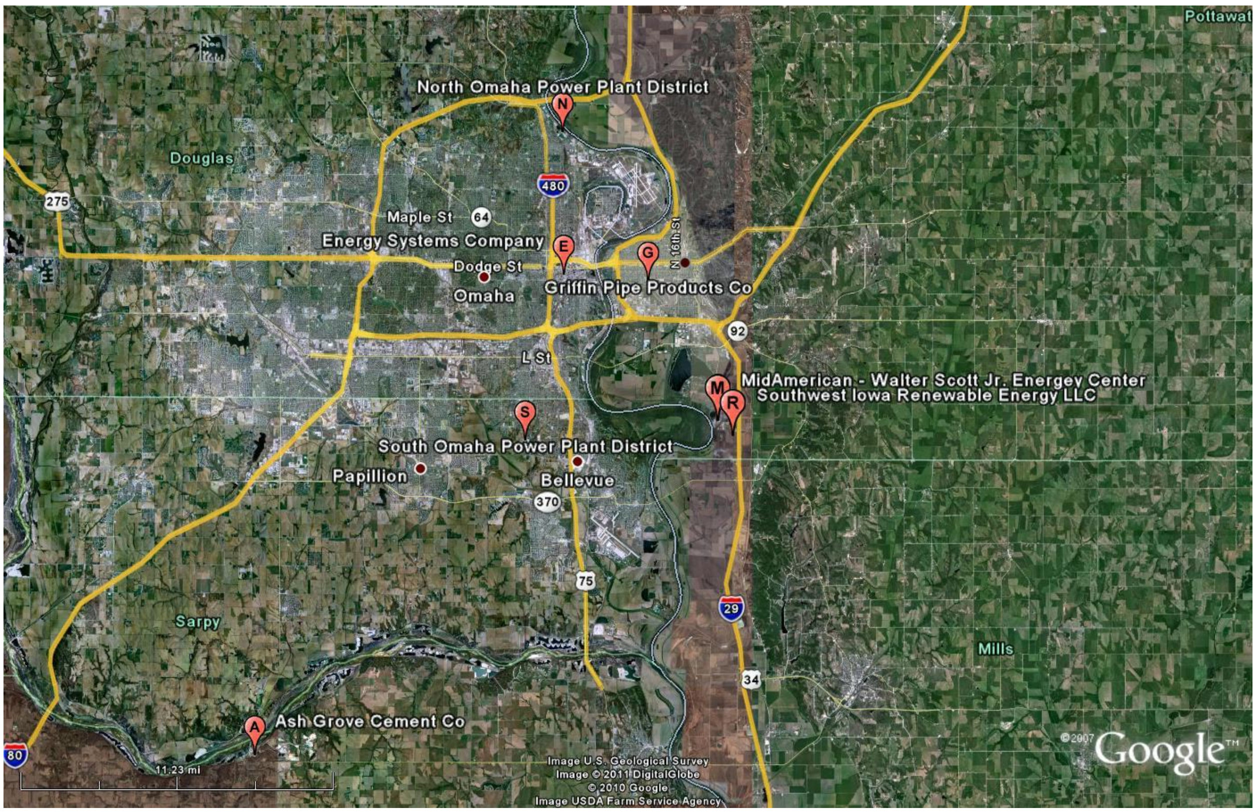


Figure 3. Locations of point source lead emissions included in the PSD modeling.

A Prevention of Significant Deterioration (PSD) modeling analyses (discussed later) included one additional potential lead source in Iowa, Southwest Iowa Renewable Energy (SIRE), LLC. There is no significant impact level for lead in PSD analyses and thus no consistently acceptable method for screening sources to exclude from the modeling analyses. Sources with low potential emissions rates may be included in lead PSD modeling analyses to be conservative. Two natural gas fired boilers at the SIRE ethanol production facility were included in the PSD modeling analysis. Potential emissions rates from each boiler were established at 0.0001 (lb lead)/hr. Total potential lead emissions from these units, assuming continuous operation, yields a potential annual emissions rate of .000876 tons/yr. The location of this facility is approximately 10 km south-southeast of Griffin Pipe, as represented in Figure 3. This facility was recently constructed and is not present in the 2008 NEI. The facility reported no actual lead emissions in 2009. This number is realistic given the extremely low potential emission rate.

The IDNR collects and calculates emissions from minor point sources in the state using a three-year cycle. In the first year, emissions in the eastern third of the state are addressed. In the following two years, emissions in the central and western thirds of the state are prepared, respectively. The most recently available and quality assured minor source inventory data available for the western portion of the state is from 2005. According to these data no minor sources in Pottawattamie county emitted any lead or lead compounds in quantities greater than 0.01 tons per year.

There is a minor source recycling plant, Alter Metal Recycling, which is located adjacent to Griffin Pipe. An investigation of inventory reports for this operation indicates there have been no sources of lead emissions at this facility.

Potential sources of lead emissions in Nebraska were identified as part of the PSD modeling analysis. The Nebraska facilities included in the modeling analysis, and their approximate distance and location relative to Griffin Pipe are (see Figure 3 for additional location information):

- North Omaha Power Plant District (3 boiler stacks) ~ 10.0 km northwest
- South Omaha Power Plant District (7 gas turbines) ~ 11.5 km southwest
- Energy Systems Company (1 boiler stack) ~ 4.9 km west
- Ash Grove Cement Company (2 kilns) ~ 35.5 km southwest

The facility total lead emissions rates reported in the 2005 NEI data (2008 NEI data is not yet available from EPA for out of state sources) are provided in Table 3.

Table 3. Lead compound emissions rates for industrial facilities located in Nebraska and included in the Griffin Pipe PSD modeling project. Facilities were included in the PSD analysis based upon potential emissions; actual (2005 NEI) emission rates are provided here.

Facility	**Lead (Compound) Emissions (tpy) (2005 NEI)**
Ash Grove Cement	0.00655
North OPPD	0.00470885195280717
Energy Systems Company	0
South OPPD	0

For completeness purposes additional review of the 2005 NEI lead point source emissions data for Douglas and Sarpy Counties (the two counties in Nebraska which are adjacent to Council Bluffs) was conducted. The 2005 NEI data indicates that the Paxton-Mitchell Company, a hot-iron foundry, emitted 0.1325 tpy of lead compounds in 2005. Subsequent investigation of this emission rate reveals that it is no longer accurate or representative. The emission rate was calculated using default lead emissions factors which do not reflect that the scrap material being utilized by Paxton-Mitchell is free of lead. Based upon conversations with air agencies located in Nebraska, lead is not emitted by the facility and future inventories will reflect these conditions.

The IDNR has not identified any fugitive sources of lead in or around Pottawattamie County that would influence the nonattainment boundary. The predominant fugitive lead emissions, should there be any, would be associated with resuspension of previous deposited lead, most likely from emissions from the Griffin Pipe facility, and will be contained within a potential nonattainment boundary.

Lead emissions from Eppley Airfield have not been identified as causing or contributing to violations of the lead NAAQS around Griffin Pipe. Supporting evidence is provided in the Meteorology chapter. The significant lead sources are located in Council Bluffs. Analysis of the location and magnitude of lead emissions in the Omaha/Council Bluffs area does not support expansion of the lead nonattainment boundary beyond locations in Council Bluffs. Modeling data, discussed later, strongly supports this conclusion.

Meteorology

An analysis of meteorological variables that influence the transport of lead to the monitor violating the lead NAAQS was conducted. The main variable of focus for this analysis is wind direction. Lead particles are emitted directly from sources and not secondarily formed in the atmosphere and thus concentrations do not exhibit a dependence on other variables such as temperature and humidity. Wind data used for this analysis were collected by meteorological observation equipment located at a nearby airport. The purpose of this analysis is to determine contributing emissions in any particular direction relative to the violating monitor. Wind rose plots were produced to characterize the local area wind flow that influenced the transport of lead to the monitor.

Wind roses are a graphical representation of prevailing wind directions. They show the relative frequency of each observed wind direction for a given analysis period. They are essentially histograms of wind speed and direction, with the length of the bars indicating the magnitude of relative frequency for each of 36 wind direction bins. Instead of a traditional bar graph, wind roses wrap the bars around a central point such that the orientation of the bar represents that particular wind direction.

The nearest Automated Surface Observing System (ASOS) meteorological station is located approximately 3 miles to the north-northwest of the Griffin Pipe monitor at the Eppley Airfield Airport (KOMA) in Omaha, NE. Figure 4 shows the location of Eppley Airfield in Omaha and the Griffin Pipe monitor in Council Bluffs. Wind speed and direction measurements at the KOMA ASOS station are considered to be representative of the wind flow over the Griffin Pipe monitor location based on the proximity of the KOMA ASOS station to the Griffin Pipe monitor location and the topographical similarities between the two locations.

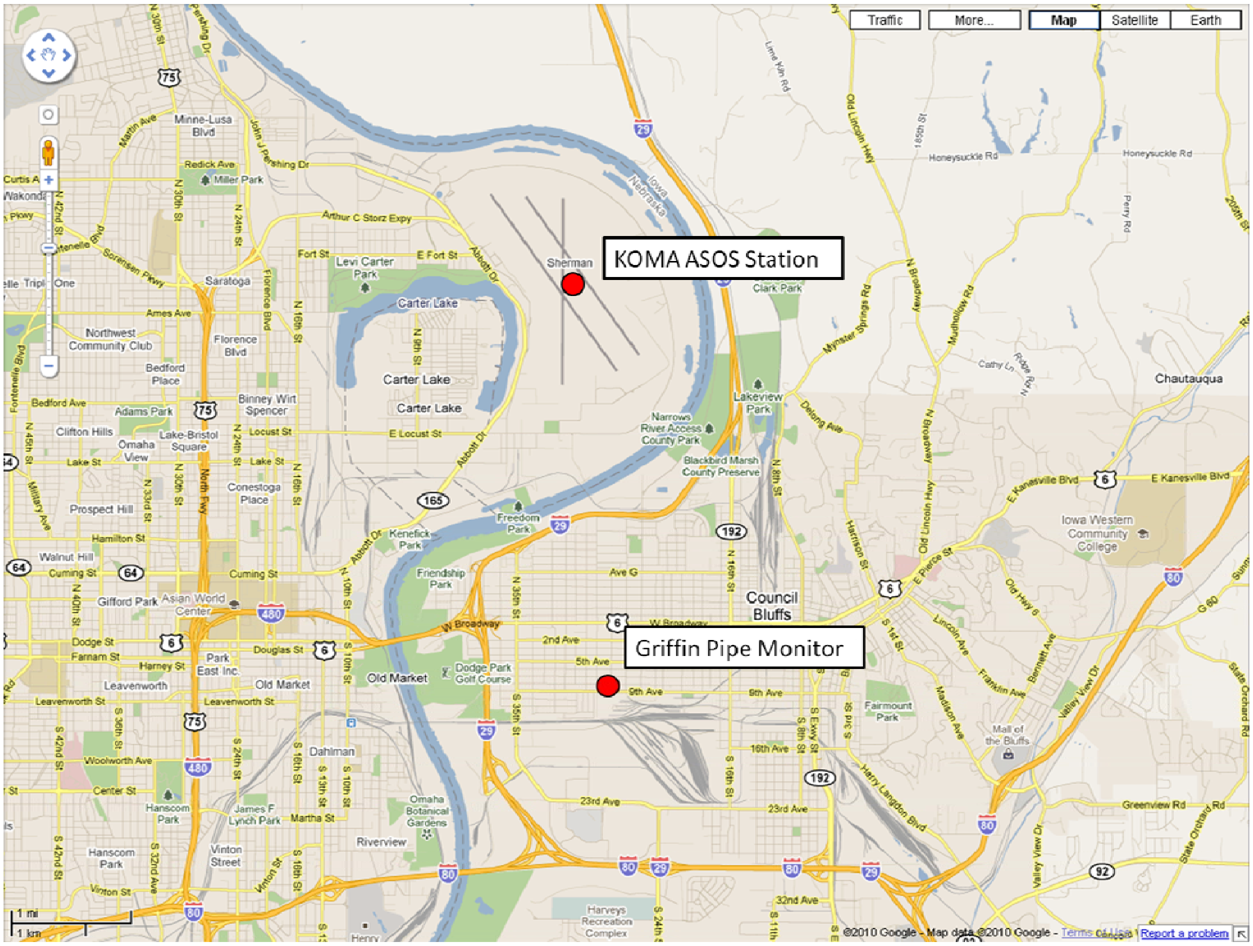


Figure 4. Map of Council Bluffs area showing the locations of Eppley Airfield and the Griffin Pipe monitor.

Wind rose plots were generated using WRPLOT VIEW, developed by Lakes Environmental (http://www.lakes-environmental.com). Figure 5 shows the wind rose for hourly measurements on days that align with the 1-in-3 day sampling interval of the monitor from November 3, 2009 to October 28, 2010[4]. Each petal represents a measured wind direction (from where the wind is blowing), which were archived in 10 degree intervals ranging from 10 to 360. The azimuth of each petal indicates the measured wind direction, and the length from the center of the plot measures the relative frequency each wind direction was observed. For a particular wind direction the length of the colored segments indicates the relative frequency of six wind speed bins, shown in the lower right corner. The plot shows winds on sampling days are predominately from two directions, north-northwest and south-southeast. The most frequently sampled wind speed bin was 7 to 11 knots.

[4] The wind-rose analysis was conducted when November 2009 – October 2010 data was available and represents a one year (12 month) period. Subsequent analysis of the November and December 2010 data does not alter the conclusions. Additionally, including these data would artificially weight the meteorological analysis towards the late fall and early winter events.

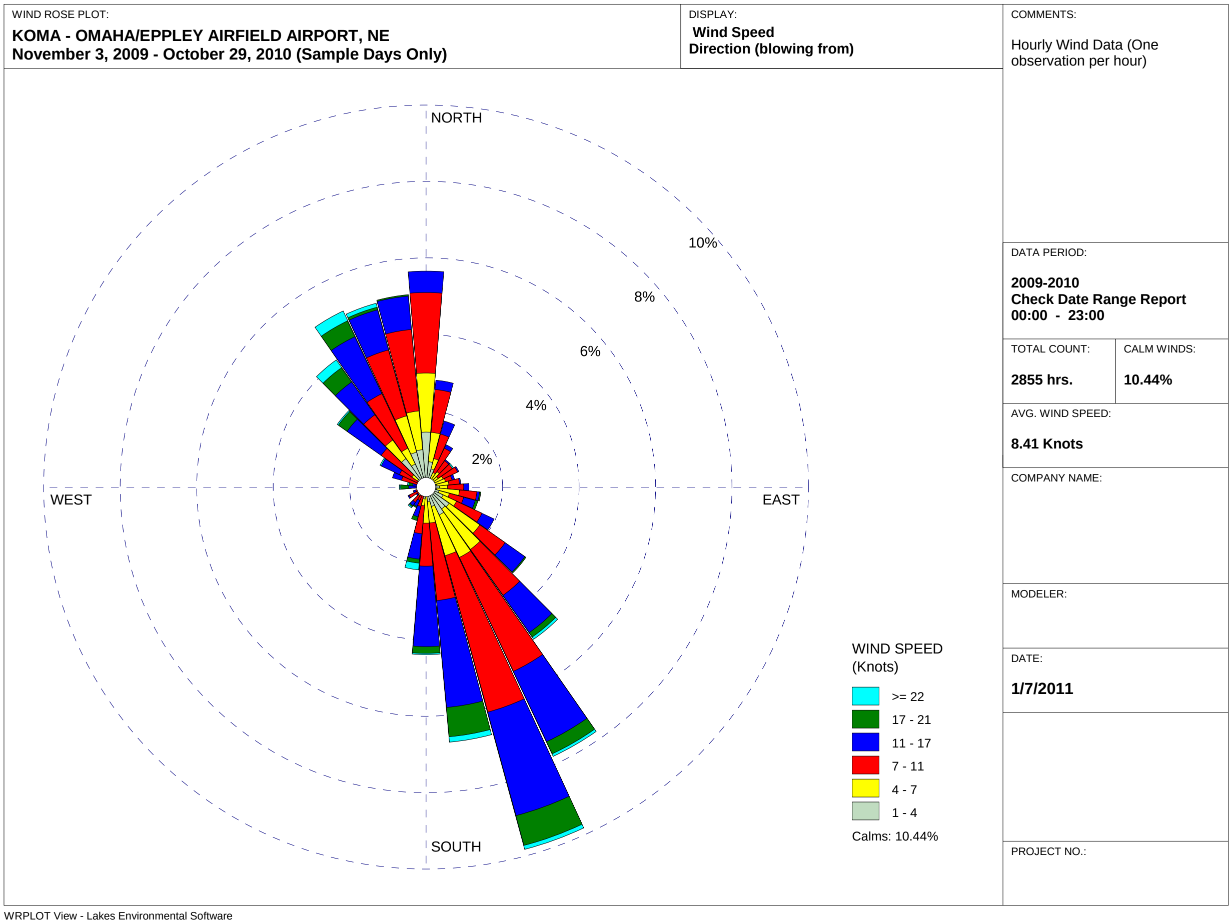


Figure 5. Wind rose for Eppley Airfield for sampling days between November 3, 2009 and October 28, 2010.

Figure 6 shows a wind rose plot for hourly wind data measured on days the monitor measured values higher than 0.154 µg/m^3. Nearly 85% of measured wind directions (excluding calm conditions) during days in which ambient lead concentrations are greater than 0.154 ug/m3 occur in a 70 degree swath, from 125 to 195 degrees. Over half of the measured wind directions are within an even narrower 30 degree swath from 145 to 175 degrees. The 15% of the measured wind directions occurring outside the 125-195 degree arc are the result of wind shifts on days which contain wind directions from the south-southeast. The direction of the cupola stack at the Griffin Pipe facility is oriented approximately 155 degrees relative to the monitor.

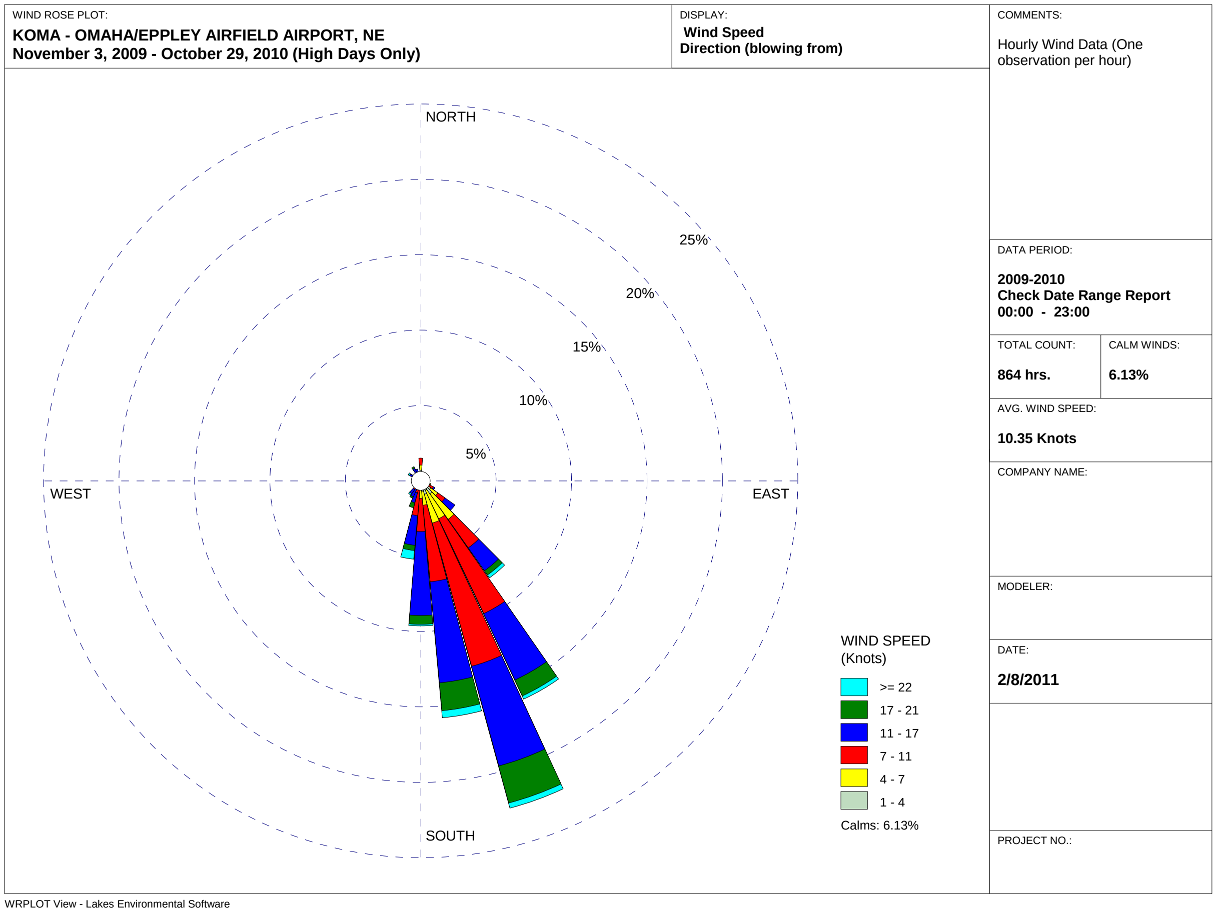


Figure 6. Wind rose for Eppley Airfield for days between November 3, 2009 and October 28, 2010 when the 24-hour average lead concentration at the Griffin Pipe monitor exceeded 0.154 μg/m^3.

Figure 7 shows the ratio of wind measurements collected on high[5] days to those collected on all sample days. Commonly observed wind directions, such as those from the southeast to south, are frequently measured on high days. Winds from the north to northwest, which also occur frequently, are rarely measured on high days. Wind shifts occurring on days which contain south-southeasterly winds account for those rare conditions in which winds are not south-southeast on high days. The rare wind directions are not the result of high days having occurred without south-southeast wind directions. These results support the conclusion that lead emissions at Eppley Airfield are not contributing to lead NAAQS violations.

[5] For purposes of this analysis, a high day is classified as one in which the 24-hour averaged concentration is greater than 0.154 ug/m3.

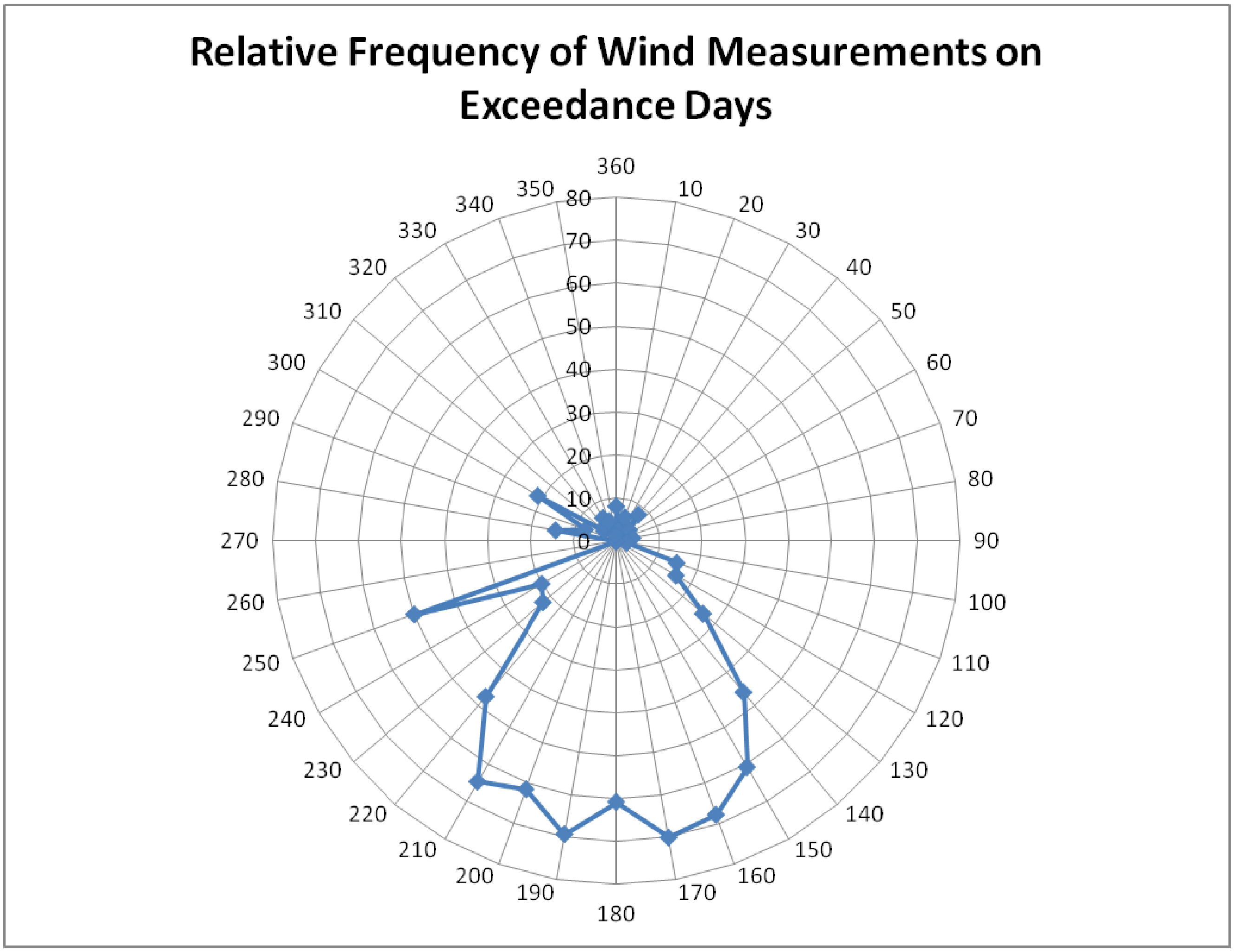


Figure 7. Fraction of measured wind directions which are observed on days in which the measured lead concentration at the monitor exceeds 0.154 µg/m^3.

Wind direction appears to have a strong influence on lead concentrations at the violating monitor. On days when the 24-hour average lead concentration exceeds 0.154 µg/m^3, winds are very frequently out of the south-southeast. This coincides with the direction of the Griffin Pipe facility from the monitor. Other meteorological variables may influence transport, such as wind speed and static stability, however these appear to have minimal effect given the close proximity of the monitor to the Griffin Pipe facility.

Emissions Controls

Griffin Pipe

Recent Prevention of Significant Deterioration (PSD) permitting activities at Griffin Pipe have resulted in facility modifications, control technology installations, and lead emissions reductions that are anticipated to result in attainment of the lead NAAQS. In order to obtain a PSD permit the facility must complete an ambient air impact analysis. This analysis requires a modeling demonstration showing that the source (Griffin Pipe) will not cause or contribute to any violation of the lead NAAQS. The facility must also install air quality control equipment and/or use processes which meet Best Available Control Technology (BACT) criteria. BACT is an emission limit based on the maximum degree of reduction achievable through emissions reductions or process modifications. BACT is determined on a case-by-case basis taking into account energy, environmental, and economic impacts. BACT can be add-on control equipment or it can be modification to the production processes/methods.

On May 24, 2010 the Department received a complete PSD application from Griffin Pipe regarding proposed amendments to the Council Bluffs plant. The PSD project was required to resolve a significant[6] increase in lead emissions occurring at the facility. The project involved the replacement of the existing wet scrubber system with a baghouse. The cupola furnace at Griffin Pipe, the primary lead source, was historically controlled with a wet scrubber. In addition to the cupola baghouse, a second baghouse will be added for control of the magnesium inoculation process and the desulfurization process. Finally, two new silos will be added for chemical storage. One silo will store a chemical that will be injected into the gas stream after the cupola and before the baghouse for SO2 control. The other silo will store a chemical that will be added to the gas stream in order to help with the treatment of heavy metals in the baghouse.

The final PSD permit was issued on December 7, 2010. BACT limits were established for lead sources at Griffin Pipe (the cupola and the desulfurization of hot iron & magnesium inoculation processes). The cupola furnace generates the majority of the lead emissions at the facility. To comply with the BACT limits the cupola wet-scrubber will be replaced with a baghouse. At this type of facility a baghouse is considered the best available add-on control method for limiting lead emissions, and no additional control technologies were required for review in the BACT analysis. BACT limits also require installation of a second baghouse for the hot iron desulfurization & magnesium inoculation processes. The facility must also utilize a scrap management plan to limit the amount of lead content in processed scrap metal. The addition of the baghouses requires changes to the arrangement and heights of stacks at Griffin Pipe.

---

[6] The current PSD regulations define a significant lead emissions increase as equal to or greater than 0.6 tons per year of lead. The dispersion modeling, discussed later, is rooted in the PSD project involving a significant increase in lead emissions at Griffin Pipe.

These modifications in combination will reduce ambient lead air impacts by reducing emissions and building downwash effects.

Activities at the facility allowed for a short timeframe between permit issuance and implementation. The addition of the two baghouses, stack relocations, and other associated facility modifications have been completed and the two new baghouses started operation in early January 2011. The modeling demonstration, discussed in detail later in this document, shows modeled attainment of the NAAQS under the newly implemented requirements of the PSD permit. Compliance with the PSD permit is expected to prevent further violations of the lead NAAQS around Griffin Pipe.

Other Sources

The modeling analysis discussed below supports the conclusion that no other lead sources are causing or contributing to the NAAQS violations measured at the Griffin Pipe monitor. The maximum impact in the receptor grid by a non-Griffin Pipe source was 0.0006 ug/m3, or 1/250th the level of the NAAQS. This numerically insignificant contribution was attributable to Mid American Energy Company's Walter Scott Jr. Energy Center (WSEC) facility, which is located ~8.9 km south/southeast of Griffin Pipe. There are four coal-fired electrical generating units at WSEC. Units 1 and 2 are the smallest units, receive less the 10% of the heat-input combined, and are controlled by electrostatic precipitators. Units 3 and 4 are both controlled by baghouses, and baghouses generally represent the best particulate control technology device available for a coal-fired EGU.

Summary

The implementation of the requirements of the PSD permit are predicted to result in attainment of the 2008 lead NAAQS. The stack parameter modifications have been completed and operation of the baghouses began in early January 2011. The presumptive county boundary is not a suitable perimeter to define the nonattainment area. A focused nonattainment area around the facility is appropriate.

Air Dispersion Modeling

Introduction

Dispersion modeling is not one of the eight-factors, but is recognized by EPA in the preamble to the lead NAAQS rule (see 73 FR 67034, November 12, 2008) as an analysis method which could provide data supporting a nonattainment boundary that deviates from the presumptive county boundary. Computer generated predictions of air quality, created by dispersion modeling, have been used as an effective tool for estimating ambient air quality near sources emitting air pollution, and are used as an important predictive tool for preventing violations of the NAAQS. Dispersion modeling conducted as part of the ambient air quality impact analysis associated with the Prevention of Significant Deterioration (PSD) permitting activities at Griffin Pipe are particularly helpful in this instance. Results from the modeling analysis support a nonattainment boundary smaller than the presumptive county boundary. The nonattainment area boundaries were developed considering the footprint where the predicted lead impacts violated the lead NAAQS.

A thorough modeling analysis of lead sources in the Omaha/Council Bluffs area was conducted to determine the likely areas of elevated lead concentrations. Dispersion modeling incorporates many of the 8-factors (including meteorology, topography, emissions, emissions controls, and air quality) in a single scientific framework which encompasses the interdependency of the factors and their roles in influencing ambient impacts. The modeling analysis is therefore appropriately given due consideration in development of the recommended boundaries. Results from the analysis strongly support a nonattainment boundary smaller than the presumptive county border. The modeling analysis shows that lead concentrations in the area are the result of emissions from the Griffin Pipe facility, and other sources are not contributing. Modeling supports the conclusion that the appropriate nonattainment boundary is confined to an area around the Griffin Pipe facility.

The IDNR conducted air dispersion modeling originating from a PSD project involving a significant lead emissions increase at Griffin Pipe Products Company. As part of the implementation process to fulfill lead monitor siting requirements associated with the 2008 revised lead NAAQS, the IDNR required some facilities to conduct stack tests in order to gather better data to calculate lead emissions. Griffin Pipe was one of the facilities required to conduct stack tests. The first set of testing was done in March of 2009 and the cupola tested at 1.33 lb/hr. Griffin Pipe's allowable rate, established as part of a synthetic minor permit, was 0.78 lb/hr. Griffin Pipe tested again in May of 2009 and tested at 1.06 lb/hr. Griffin Pipe tested again in August of 2009 under four (4) different operating scenarios. All four (4) scenarios tested over the PSD synthetic minor limit of 0.78 lb/hr as they ranged from 0.82 lb/hr to 1.41 lb/hr. The Department issued a Notice of Violation (NOV) in response to each of these failed stack tests.

It was not until March of 2010 that Griffin Pipe conducted a stack test that demonstrated compliance with the PSD synthetic minor emission limit of 0.78 lb/hr. However, by that time Griffin Pipe had enough production during the 2009 year that the PSD significant increase threshold of 0.6 tons/yr was exceeded, and a PSD analysis was required.

The PSD air dispersion modeling analysis incorporated facilities in the Omaha/Council Bluffs region identified as potential sources of lead emissions. The modeling determined cumulative lead impacts on ambient air from Griffin Pipe and other potential sources of lead emissions in the region. The analysis showed that the predicted ambient concentrations of lead are due to emissions from the Griffin Pipe facility. Emissions from other facilities did not contribute significantly. Lead from the cupola and the desulfurization processes are the significant contributors to violations of the ambient air standard. These processes account for essentially 100% of the lead emissions from the Griffin Pipe.

Model Setup

For the purpose of assessing the probable cause of the ambient air quality violations and the extent of predicted lead NAAQS violations, and for determining the efficacy of emissions reduction solutions, air dispersion modeling analyses were conducted. Two modeling scenarios were created: a model reflecting the state of Griffin Pipe's operations during 2010 when monitored NAAQS violations were detected (Scenario A) and a model reflecting the facility's lead impacts from the redesign of the cupola and desulfurization processes, including the addition of baghouses and stack relocations, that were part of the PSD project[7] (Scenario B). Previous DNR reviews conducted specifically for the PSD permitting process have indicated these changes will lead to attainment of the lead NAAQS in the Council Bluffs area. Each modeling configuration (Scenarios A and B) is based upon the methods and procedures used for PSD permitting at Griffin Pipe. The differences between Scenario A and B are limited to changes in Griffin Pipe's operations before and after the PSD permitting activities.

Scenario A (Absent baghouse controls): This configuration reflects the state of Griffin Pipe's operations during 2010. Actual emission rates were used for the cupola (EP2) and desulfurization sources (EPFG2A and EPFG2B) at Griffin Pipe. The lead emission estimate for the cupola is based on stack testing conducted on March 2, 2010. The lead emissions from the desulfurization process are based on stack test results conducted on March 3, 2009, and engineering estimate.

Scenario B (Baghouse controls): This configuration represents Griffin Pipe's operations after changes are made to comply with the PSD permits. For the PSD permitting, the company proposed to redesign the cupola (re-designated as EP2A) and desulfurization processes (re-designated as EP3), relocate the stacks, and add two baghouses. In Scenario B, the lead emission rate from the cupola (EP2A) is based on the Best Available Control Technology (BACT) limit as specified in air construction permit 10-A-270-P. The lead emission rate for the desulfurization process and magnesium inoculation (EP3) is based on the potential lead emission limit as specified in air construction permit 10-A-271-P. The DNR has confirmed that these changes would mitigate the predicted violations of the lead NAAQS.

For both Scenarios A and B, the lead emissions from the cupola and desulfurization stacks account for virtually 100% of the Griffin Pipe's lead emissions inventory. Both scenarios also incorporate other lead sources identified within the region, consistent with the PSD cumulative ambient air quality impact

[7] PSD Project Number 10-030.

assessment requirements. Lead emission rates from other sources were modeled using their potential to emit, and thus their emissions rates remained constant between Scenarios A and B. These sources and their locations relative to Griffin Pipe are provided in the Emissions chapter above, and repeated here for convenience (a spatial plot can also be found above, see Figure 3):

In Iowa:

- Mid-American Energy (Walter Scott) (4 boiler stacks) ~8.9 km south-southeast
- Southwest Iowa Renewable Energy (2 boiler stacks) ~10 km south-southeast

In Nebraska:

- North Omaha Power Plant District (3 boiler stacks) ~10.0 km northwest
- South Omaha Power Plant District (7 gas turbines) ~11.5 km southwest
- Energy Systems Company (1 boiler stack) ~4.9 km west
- Ash Grove Cement Company (2 kilns) ~35.5 km southwest

There is a recycling plant, Alter Metal Recycling, which is located adjacent to Griffin Pipe. An investigation of inventory reports for this operation indicates there have been no sources of lead emissions at this facility.

Both models use a discrete receptor array. The design incorporates the standard receptor separations as a function of distance from the facility boundary. Receptor spacing varies from 50 meters near the boundary to 500 meters at distances greater than 3 km.

The modeling was completed using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD, dated 09292). For the Scenario A and Scenario B models, the principal lead emission sources at Griffin Pipe were evaluated using the emission rates and stack parameters listed in Table 4. For both models, the Table 4 sources represent essentially 100% of the lead emissions from Griffin Pipe. As described above, the lead sources at Griffin Pipe for Scenario A use actual emission rates and the sources at Griffin Pipe for Scenario B use potential emission rates. Table 5 lists the remaining lead emission sources from Griffin Pipe and other nearby facilities used in both model scenarios. For both scenarios, all of these remaining sources are modeled with potential emission rates.

Table 4. Modeled emission rates and stack parameters for Griffin Pipe's principal lead sources. Scenario A (absent baghouse controls) and Scenario B (baghouse controls)

Scenario / Emission Points			**Stack Parameters**				
Scenario	ID	Description	Pb Emission Rates (lb/hr)	Stack height (ft)	Stack gas exit temp (°F)	Stack gas flow rate (acfm)*	Stack tip diameter (ft)
A	EP2	Cupola	0.587	125	156	60,140	7.0
A	EPFG2A	Desulfurization	0.153	40	95	122,350	9.15
A	EPFG2B		0.04	40	95	122,350	9.15
B	EP2A	Cupola	0.28**	100	300	93,935	6.67
B	EP3	Desulfurization	0.30	100	125	85,060	6.17
B	EP7A	Desulfurization (uncaptured)	0.008	80	95	119,550	10.2
B	EP7B	Magnesium inoculation (uncaptured)	0.008	80	95	119,550	10.2

*Discharge type vertical/unrestricted.

** Emission rate based on application of BACT limit and maximum charge rate.

Table 5. Modeled emission rates and stack parameters for other lead sources. Emissions rates for these sources were based upon potential to emit, therefore emissions rates did not change between Scenarios A and B.

Facility / Emission Points			Stack Parameters				
Facility	ID	Description	Pb Emission Rates (lb/hr)	Stack height (ft)	Stack gas exit temp (°F)	Stack gas flow rate (acfm)*	Stack tip diameter (ft)
GP	EP4A	Annealing Furnace	<0.0001	36	500	19000	3.67
GP	EP8	Transporter	<0.0001	43	70	VO	1.5
GP	EP10	Cement Silo	<0.0001	52	70	VO	0.56
GP	EP16	Cement Silo	<0.0001	47	70	VO	1.12
GP	EP27	Annealing Oven	<0.0001	60	1800	7400	3.5
GP	EP27A	Annealing Oven	<0.0001	53	1400	1700	1.83
GP	EP28	Core Oven	<0.0001	38	500	2600	2
GP	EP31	Cement Silo	<0.0001	61	70	VO	0.4
GP	EU11B**	Sand Transfer to Bins	<0.0001	--	--	--	--
GP	EU19A**	Bull Ladle	<0.0001	--	--	--	--
SIRE	SIRES11	Boiler	0.0001	65	320	81370	4.5
SIRE	SIRES12	Boiler	0.0001	65	320	81370	4.5
OPPD	OPPDN	Boiler	0.003	207	300	1189715	14.5
OPPD	OPPDN2	Boiler	0.0014	207	300	525770	9.6
OPPD	OPPDN3	Boiler	0.0022	207	300	748350	11.5
OPPD	OPPDS12	Gas Turbine	0.025	51	1090	501850	14.33
OPPD	OPPDS22	Gas Turbine	0.025	51	1090	501850	14.33
OPPD	OPPDS32	Gas Turbine	0.007	75	1010	2916160	22.25
OPPD	OPPDS412	Gas Turbine	0.002	51	1350	480610	10.75
OPPD	OPPDS422	Gas Turbine	0.002	51	1350	480610	10.75
OPPD	OPPDS512	Gas Turbine	0.002	51	1350	480610	10.75
OPPD	OPPDS522	Gas Turbine	0.002	51	1350	480610	10.75

MAE	MAE1	Boiler	0.016	250	300	186610	12
MAE	MAE2	Boiler	0.023	250	340	282970	12
MAE	MAE3	Boiler	0.18	550	290	2382700	25
MAE	MAE4	Boiler	0.20	550	165	2664800	24.67
ESC	ESC	Boiler	0.0015	71	350	20110	5.5
AGCC	AGK2	Kiln	0.059	272	300	205935	6
AGCC	AGK1	Kiln	0.089	272	300	91530	4

* Discharge type vertical/unrestricted, unless otherwise indicated. VO = vertically obstructed.
** Modeled as volume sources.
Facility Legend:
GP - Griffin Pipe; SIRE - Southwest Iowa Renewable Energy; OPPD(N/S) - Omaha Power Plant District (North/South); MAE - MidAmerican Energy Company (Walter Scott Jr. Energy Center);
ESC - Energy Systems Company; AGCC - Ash Grove Cement Company

Model Results

Scenario A (absent baghouse controls) modeling results predict the lead emissions would cause predicted ambient lead concentrations that are greater than the lead NAAQS. The lead NAAQS requires that ambient concentrations of lead not exceed 0.15 µg/m^3 based on the maximum 3-month rolling average.

Scenario B (baghouse controls) modeling results predict the lead emissions would not cause predicted ambient lead concentrations greater than the lead NAAQS.

The lead modeling results (cumulative impact[8]) for the worst-case three-month rolling average and year are listed in Table 6 and Table 7 for Scenarios A and B, respectively. Maximum predicted concentrations from each modeled facility are listed in Table 8 and Table 9 for Scenarios A and B, respectively.

Table 6. Worse case modeling result (highest modeled impact) for Scenario A (absent baghouse controls), represents cumulative impact from all facilities for the 2000-2004 meteorological dataset.

Rolling 3-month period for which result occurred	Predicted Concentration* (µg/m3)	Background Concentration (µg/m3)	Total Concentration (µg/m3)	NAAQS (µg/m3)
July – September / 2003	0.60	0	0.60	0.15

* The rolling 3-month concentration is the highest predicted value. The location of the highest predicted lead concentration is at UTM coordinates 258176 m (easting) and 4570749 m (northing), NAD83. This is on the south fenceline near stack EP2.

[8] IDNR conducted an analysis of ambient data obtained from the source-oriented lead monitor near Griffin Pipe. Using meteorological data concurrent with monitored concentration data, an effort was made to determine a background lead concentration applicable for that area. The data did not support use of a background lead concentration that differs from the historical value of 0.0 µg/m3.

Table 7. Worse case modeling result (highest modeled impact) for Scenario B (baghouse controls & stack changes), represents cumulative impact of all facilities for the 2000-2004 meteorological dataset.

Rolling 3-month period for which result occurred	Predicted Concentration* (μg/m3)	Background Concentration (μg/m3)	Total Concentration (μg/m3)	NAAQS (μg/m3)
July – September / 2004	0.054	0	0.054	0.15

* The rolling 3-month concentration is the highest predicted value. The location of the highest predicted lead concentration is at UTM coordinates 258026 m (easting) and 4571199 m (northing), NAD83. This is just north of the facility in a residential area.

Table 8. Worse case modeling result (highest modeled impact) for Scenario A (absent baghouse controls) by facility. Maximum impact from each facility for the 2000-2004 meteorological dataset.

Facility	Maximum Impact (μg/m^3)*
Griffin Pipe	0.5981
MidAmerican Energy	0.0006
Energy Systems (NE)	0.0003
Omaha Power Plant District (NE)	0.0001
Ash Grove Cement Company (NE)	<0.0001
Southwest Iowa Renewable Energy	<0.0001

* Modeled results carried to more decimal places to demonstrate relative magnitudes.

Table 9. Worse case modeling result (highest modeled impact) for Scenario B (baghouse controls & stack changes) by facility. Maximum impact from each facility for the 2000-2004 meteorological dataset. Note: emissions rates for all facilities (except Griffin Pipe) were held constant between Scenarios A & B (at potential to emit). Maximum impacts from these other facilities are therefore the same in Scenario A and Scenario B.

Facility	Maximum Impact (μg/m^3)*
Griffin Pipe	0.0540
MidAmerican Energy	0.0006
Energy Systems (NE)	0.0003
Omaha Power Plant District (NE)	0.0001
Ash Grove Cement Company (NE)	<0.0001
Southwest Iowa Renewable Energy	<0.0001

* Modeled results carried to more decimal places to demonstrate relative magnitudes.

Surface mapping software[9] is used to provide visual displays of the results. A visual display of the predicted lead concentration isopleths for Scenarios A and B is provided in Figure 8 and Figure 9, respectively.[10] The isopleths are based on the highest 3-month rolling average concentrations at each of the 3,232 receptors in the models.

In Figure 8 (Scenario A model), the red concentration isopleth line indicates the area within which the lead NAAQS is exceeded under the worst-case conditions. The location of the highest concentration is along the south boundary near the cupola (EP2). Similar concentrations also occur in the residential area just north of the facility. The isopleths indicate the lead concentration distribution is essentially bimodal, reflecting the summer and winter predominant wind directions.

Figure 9 (Scenario B model) indicates that all predicted ambient lead concentrations are well below the lead NAAQS. The much lower concentrations are also bimodally distributed, with the highest concentrations occurring in the residential area just north of the facility.

The significant reduction in predicted worst-case lead concentrations is not due solely to the reduction in lead emissions at Griffin Pipe. The emissions are about 25% lower, however, the highest concentrations are approximately 90% lower. This is because the sources of lead are relocated, the stack heights changed, and the arrangement of buildings, including the baghouse structures, has changed the downwash effects.

Conclusion

Based on the results of this modeling analysis, the DNR concludes that the potential for violation of the lead NAAQS in the Council Bluffs area should be eliminated. The PSD permit was issued December 7, 2010, and incorporates a scrap management plan, stack relocations, the addition and operation of two baghouses, and BACT level lead emissions reductions from the cupola and desulfurization operations. The stack changes have been made, and the baghouses started operation in early January 2011. Compliance with the PSD permit conditions should return the Council Bluffs area to attainment with the lead NAAQS. Additional monitored lead NAAQS violations are not expected.

[9] Surfer Surface Mapping System, Golden Software, Inc. (version 9.11.947, Aug 25, 2010)

[10] Aerial photos were taken from Google Earth Pro.

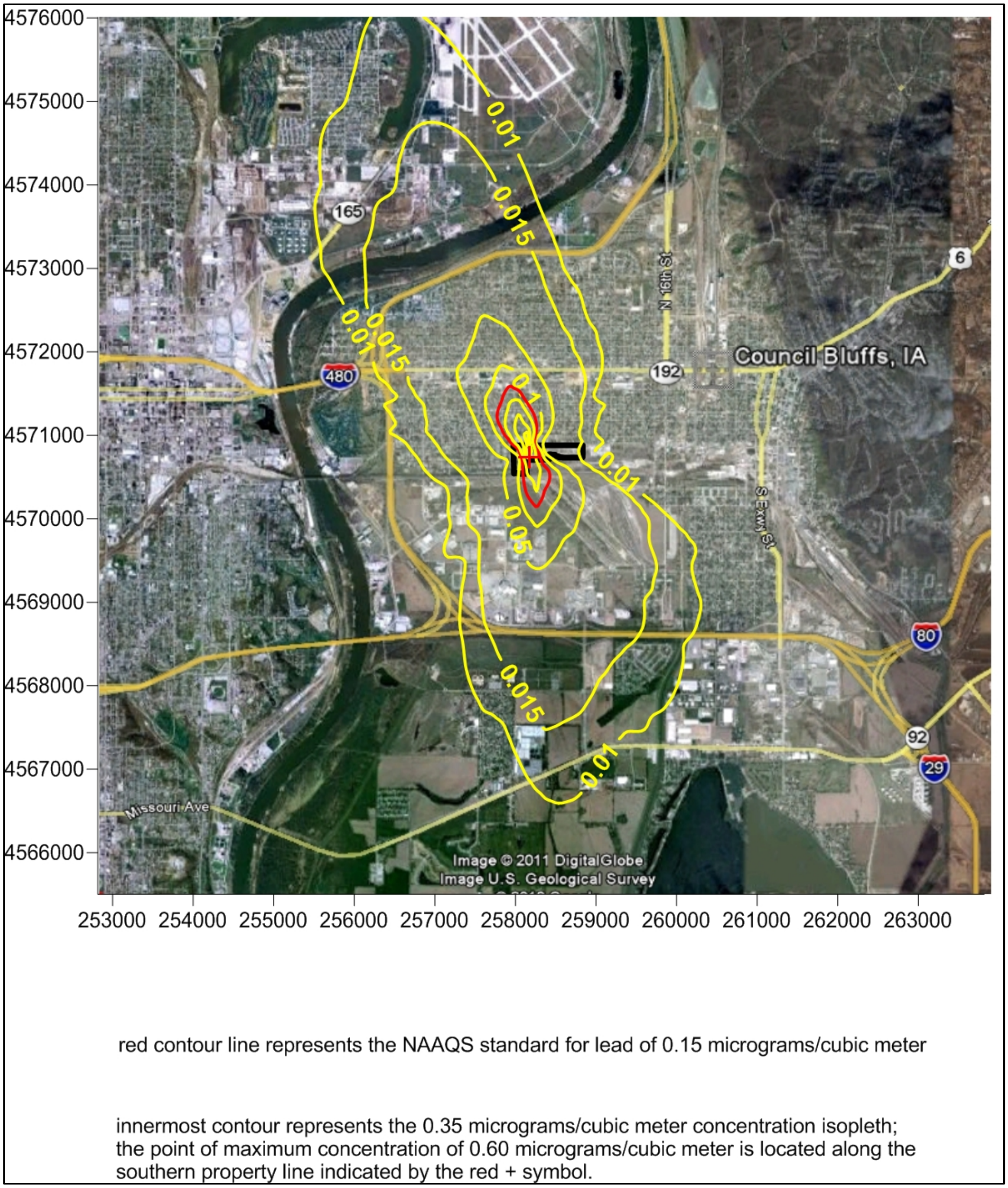


Figure 8. Modeled concentrations due to lead emissions for Scenario A (absent baghouse control). The location of the highest predicted lead concentration is at UTM coordinates 258176 m (easting) and 4570749 m (northing), NAD83. This is along the south fence line near stack EP2.

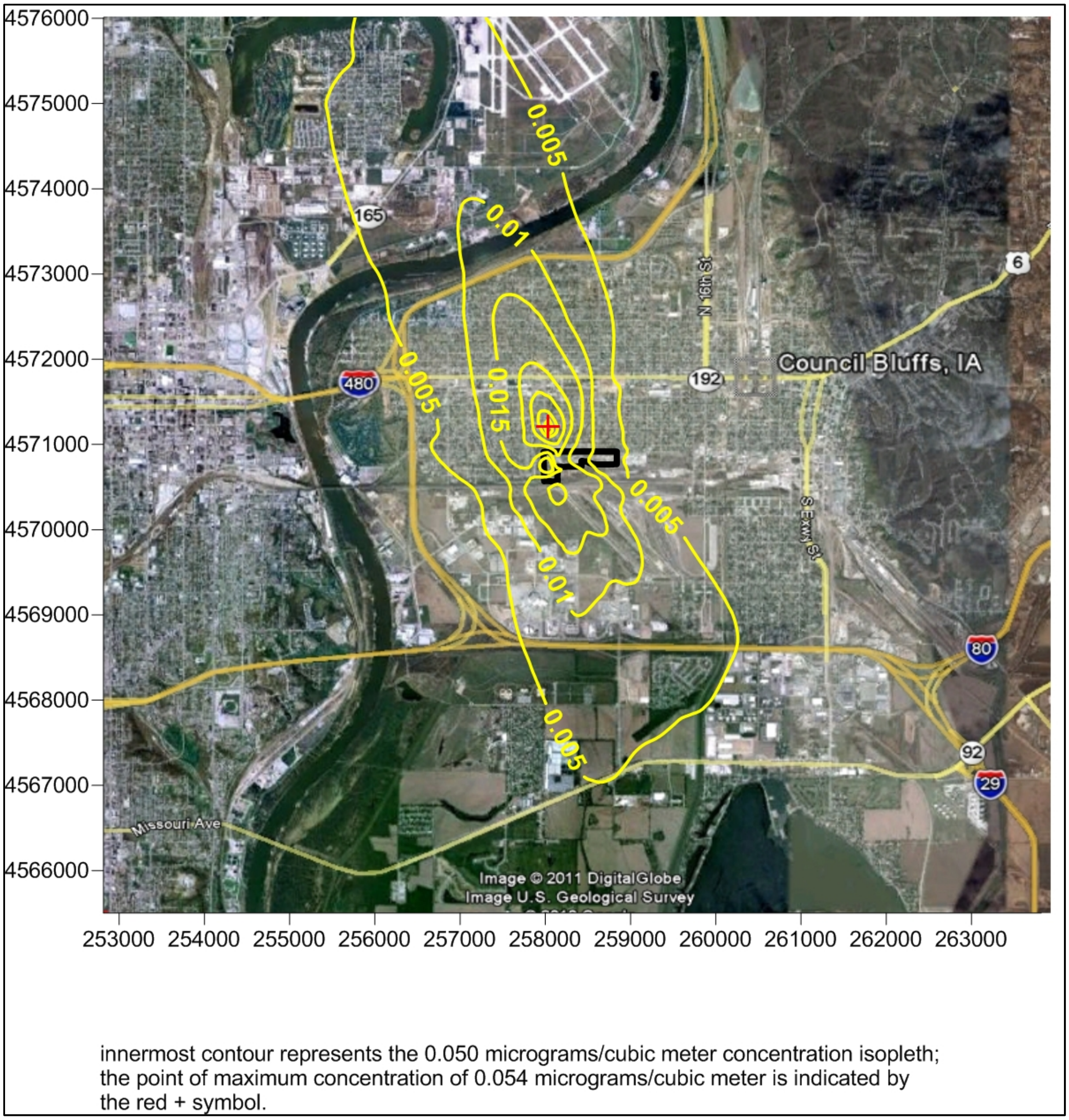


Figure 9. Modeled concentrations due to lead emissions for Scenario B (baghouse control). The location of the highest predicted lead concentration is at UTM coordinates 258026 m (easting) and 4571199 m (northing), NAD83. This is just north of the facility in a residential area.

Topography

Council Bluffs is located on the eastern banks of the Missouri river and extends eastward into Pottawattamie County. The topography of Pottawattamie county consists of flat river bottoms in width from 3 to 10 miles along the Missouri River. Bluffs extending 100 to 300 feet above the river plain demark the extent of the generally level bottomlands. Moving eastward beyond the bluffs the topography transitions into areas of steep ravines and hills, followed by gently rolling prairie (http://past2present.org/own/counties/Pottawattamie.htm).

Figure 10 provides a graphical display of the topographical features around the Omaha/Council Bluffs region. Figure 11 provides the same information but greater detail by narrowing the extent of the plot. The area surrounding Griffin Pipe consists of flat river bottom, and therefore characteristically displays negligible changes in elevation. Increases in elevation predicate the confines of river flow and logically the topography moving into Nebraska west of the Missouri River displays increases in elevation. The topographic features into Omaha are more gradual and less pronounced than those found east of Council Bluffs into the bluffs and Loess Hills area. The topography of the area does not exhibit features that would create a consistent barrier capable of segregating the area into distinct airsheds.

The ASOS station used in the modeling and windrose analysis is located within the same river bottom topology as Griffin Pipe. Any potential topographical influences on meteorological (particularly wind patterns) are inherently reflected through the meteorological conditions considered within both the dispersion modeling and meteorological analyses previously discussed. Topography was not a factor in establishing the proposed nonattainment boundaries.

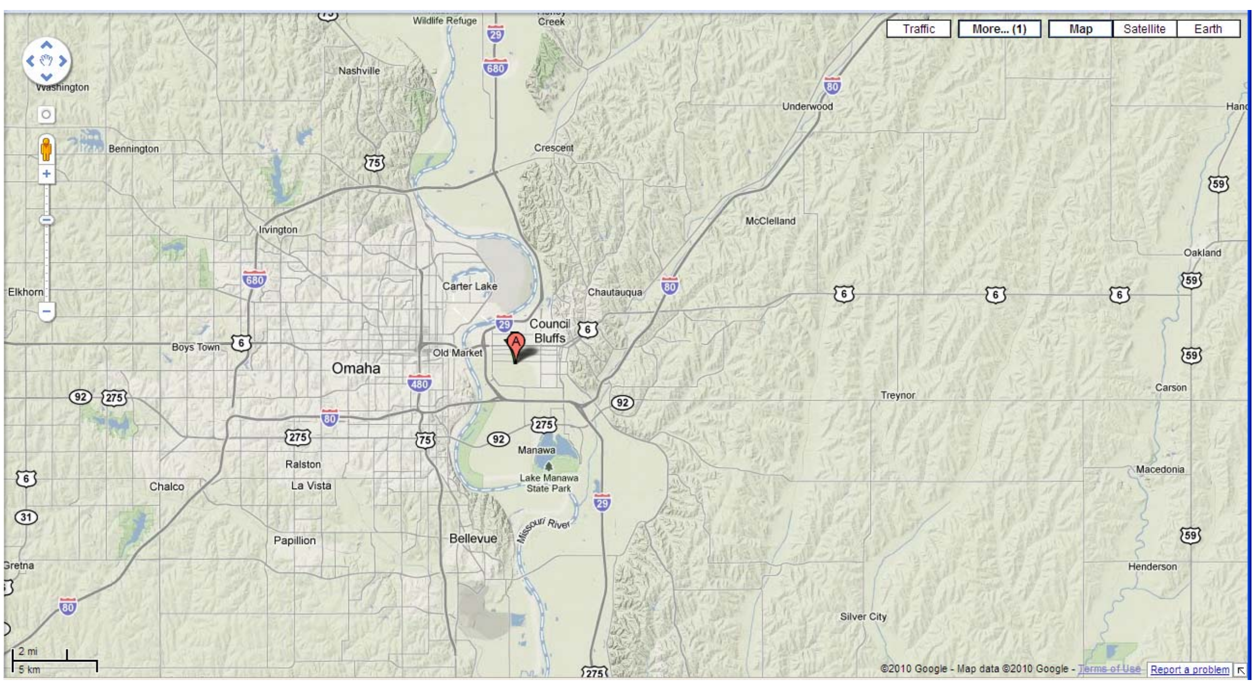


Figure 10. Topography in the area surrounding the city of Council Bluffs. The approximate location of Griffin Pipe is indicated by the red "A" label.

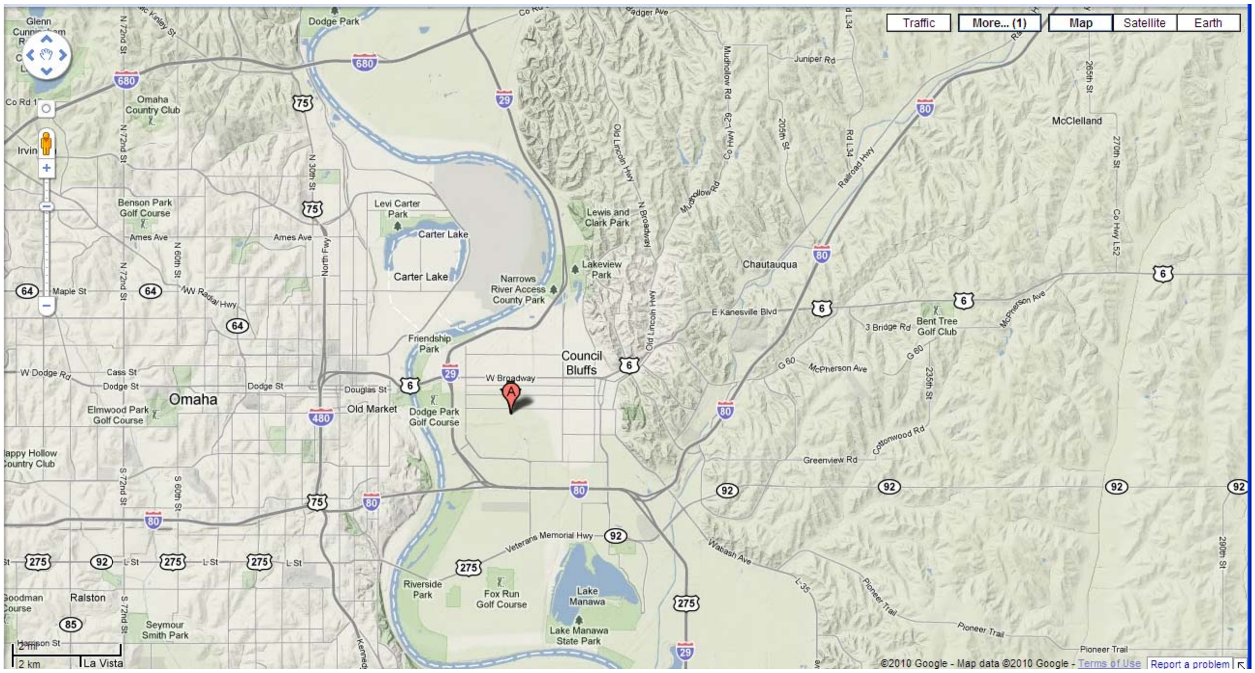


Figure 11. Topography in the area surrounding the city of Council Bluffs. The approximate location of Griffin Pipe is indicated by the red “A” label.

Population Density / Urbanization

Pottawattamie County is the second largest county in Iowa by area, covering 950 square miles, which is 68.4% larger than the average value of 564 square miles. Council Bluffs is the county seat and largest incorporated city within Pottawattamie County (see Table 10). Outside of Council Bluffs, Pottawattamie County is predominantly rural. Harrison and Mills counties are also predominantly rural, with the smallest populations and populations densities of all counties in the metropolitan statistical area (MSA). This information is supportive of recommending a small nonattainment boundary within Council Bluffs.

Pottawattamie County is one of eight counties within the Omaha NE / Council Bluffs IA MSA (see Figure 12) . The counties within the MSA consist of Pottawattamie, Harrison, and Mills Counties in Iowa, and Cass, Douglas, Sarpy, Saunders and Washington Counties in Nebraska. The Omaha/Council Bluffs MSA is the largest core based statistical area containing Iowa counties, with a July 1, 2009 population estimate by the U.S. Census bureau of 849,517.[11] The population of Pottawattamie County in 2009 was estimated at 90,224, or roughly 10.6% of the total MSA population. County population estimates and population density data are provided in Table 11. Populations densities in the Iowa counties are all below 100 persons per square mile. Populations and population densities in Douglas and Sarpy Counties in Nebraska are considerably higher, a reflection of their smaller size and larger urban populations. While populations and populations densities are higher in the MSA counties in Nebraska, these facts are not a pertinent surrogate for lead and does not suggest that these areas should be included in the lead nonattainment area.

Table 10. Incorporated cities in Pottawattamie County, and populations.

City	Population	City	Population
Council Bluffs	61,324	Underwood	688
Carter Lake	3,248	Carson	668
Avoca	1,610	Minden	564
Oakland	1,487	Crescent	537
Treynor	950	Macedonia	325
Walnut	877	Hancock	207
Neola	845	McClelland	129
Shelby	696		

Data from Iowa League of Cities: http://www.iowaleague.org/aboutcities/CitiesInIowa.aspx?c=-2

[11] http://www.census.gov/popest/metro/CBSA-est2009-annual.html

Table 11. Population, population density, and county area from the U.S. Census Bureau.

County	Population Estimate (July 1, 2009)	Population Density (persons/ sq mi)	County Area (sq mi)
Harrison County, IA	15,328	22.0	697
Mills County, IA	15,002	34.3	437
Pottawattamie County, IA	90,224	94.9	950
Cass County, NE	25,485	45.7	557
Douglas County, NE	510,199	1553.3	328
Sarpy County, NE	153,504	642.3	239
Saunders County, NE	20,057	26.7	750
Washington County, NE	19,718	50.6	390

Data from U.S. Census Bureau: http://www.census.gov/popest/gallery/maps/

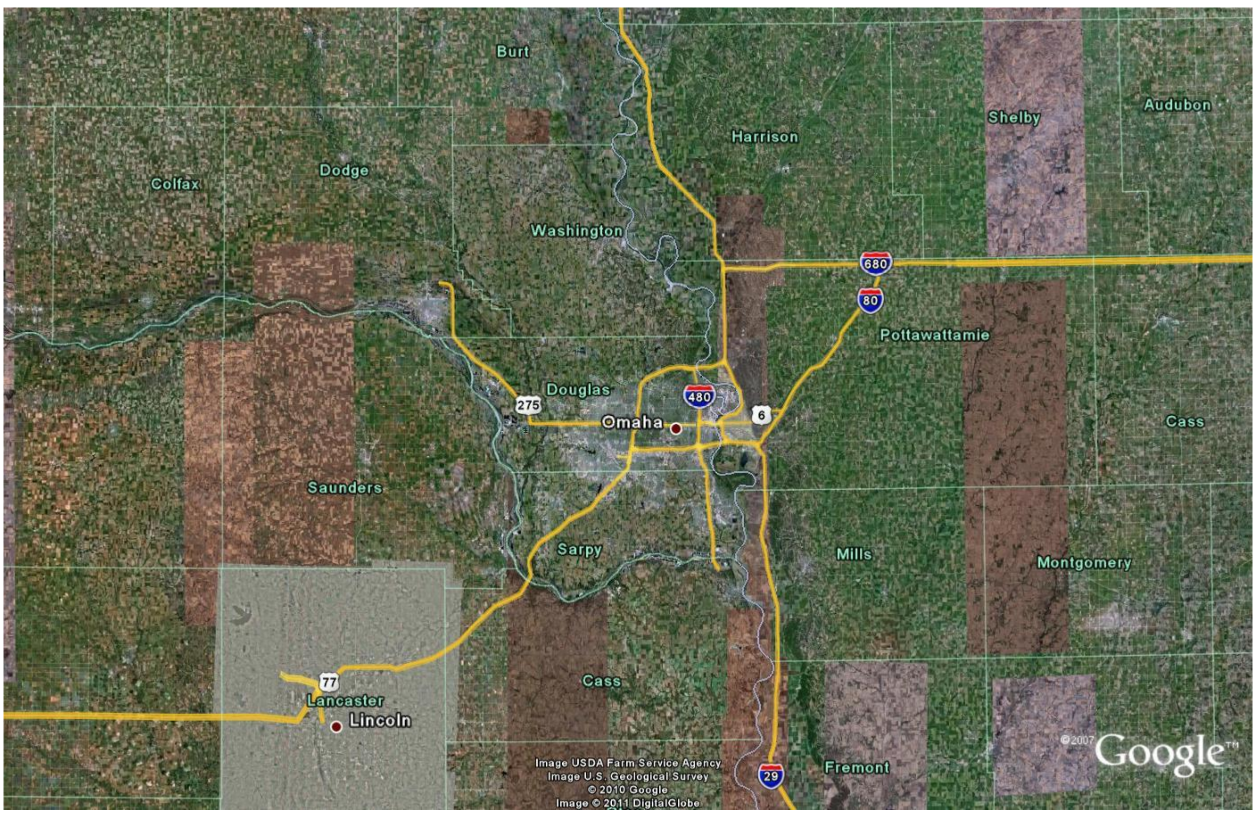


Figure 12. Overview of the Omaha/Council Bluffs region. The metropolitan statistical area consists of the following eight counties: In Iowa - Harrison, Pottawattamie, and Mills. In Nebraska - Washington, Douglas, Sarpy, Cass, and Saunders.

Populations by census tracts in Pottawattamie county are provided in Figure 13. The rural nature of most of Pottawattamie County, particular into the eastern portions of the county, can be inferred from the figure by considering the low populations counts in combination with the large size of the census tracts.

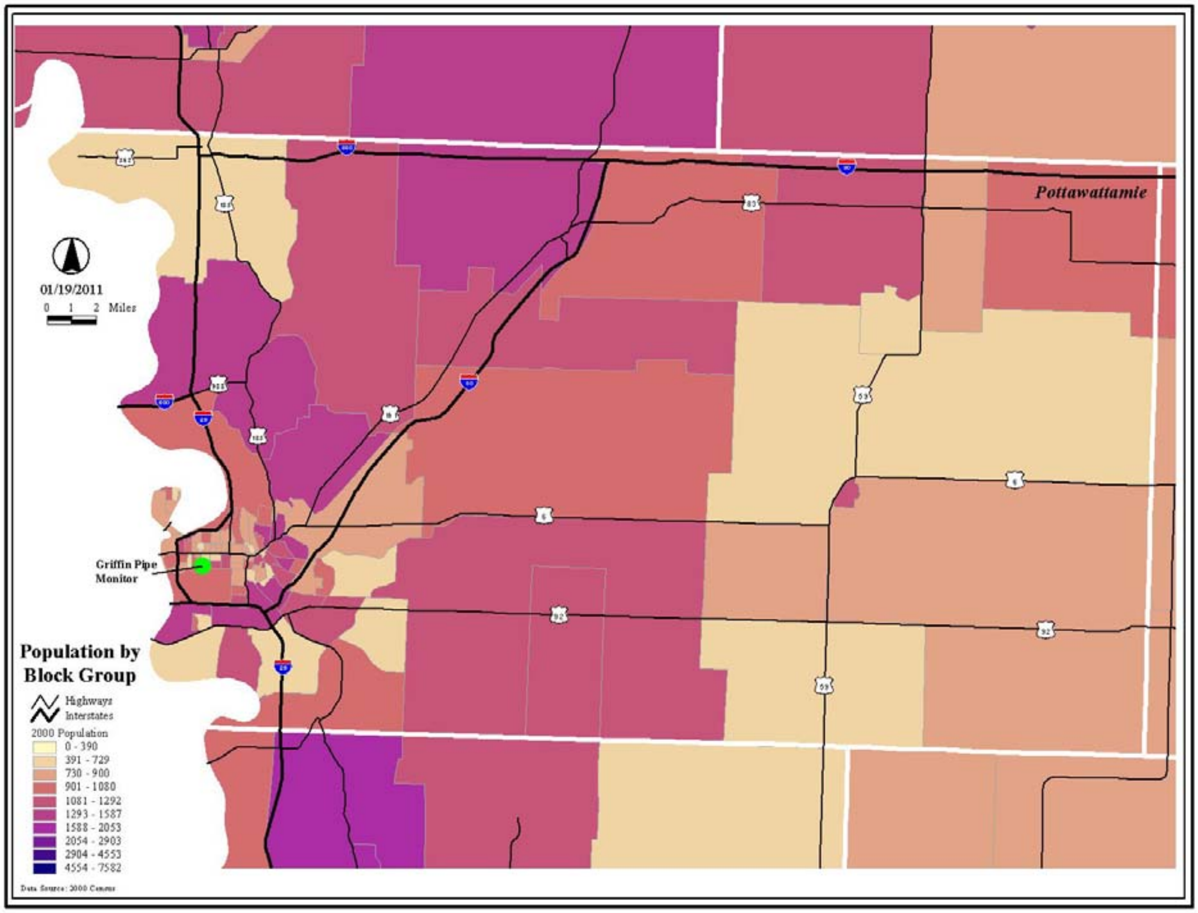


Figure 13. Population by Census Tract data for Pottawattamie County (2000 census data). The 2010 Census was not available in time to incorporate.

Higher detail of populations by census tract near the Griffin Pipe monitor, and in the Council Bluffs area, is provided in Figure 14. Locations generally north of the monitor are delineated by smaller census tracts and are best characterized as residential. Areas generally south of Griffin Pipe contain a mix of open spaces, rail track, business, hotel, convention, and retail options. As expected, higher population counts and population densities are found in the residential areas generally north of the facility.

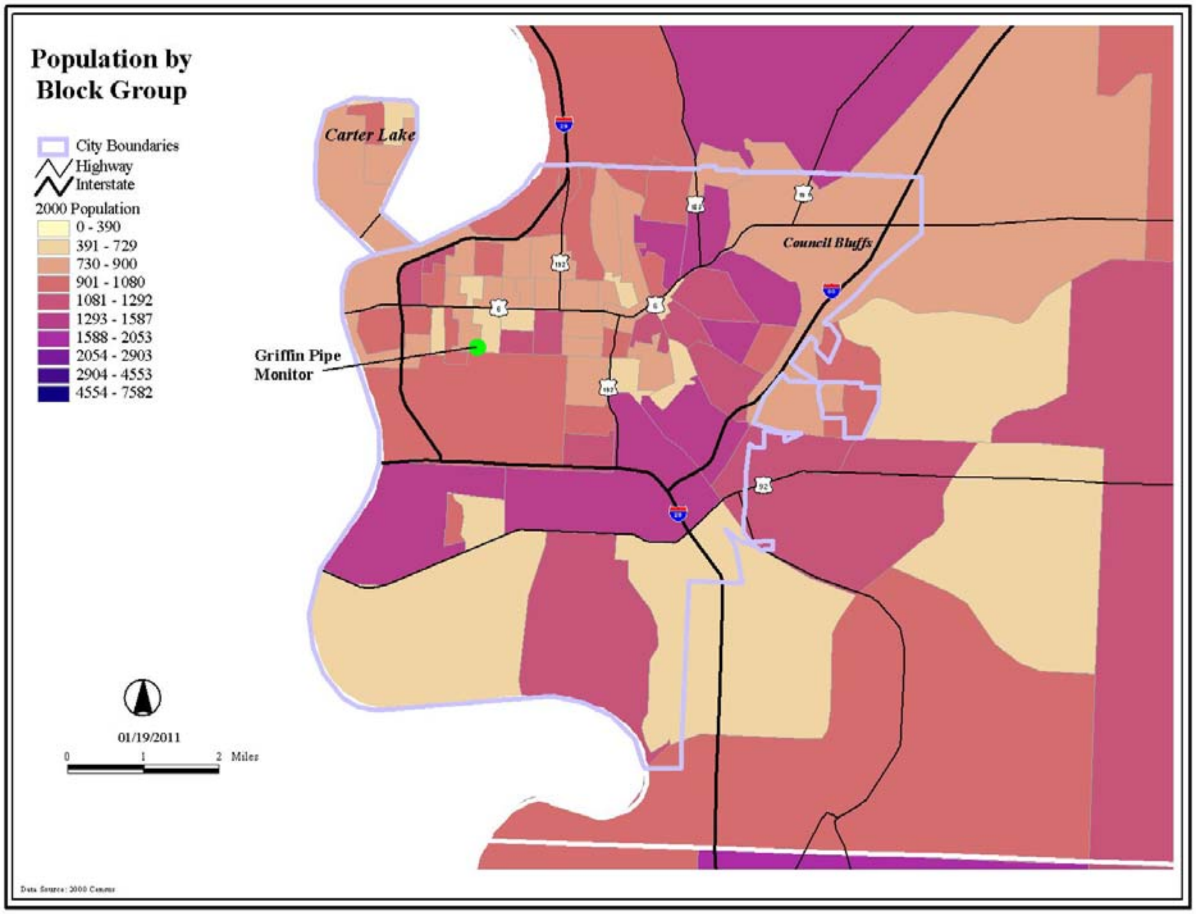


Figure 14. Population by Census Tract data for Council Bluffs (2000 census data). The 2010 Census was not available in time to incorporate.

Jurisdictional Boundaries

The city boundary of Council Bluffs (and Carter Lake) can be found in Figure 14 (above). The city of Council Bluffs covers approximately 39.7 square miles[12]. The data analyzed previously in this document indicates the only source of lead causing a violation of the lead NAAQS is Griffin Pipe Products Company. No other sources have been identified which are causing or contributing to the lead NAAQS violations. Based on these considerations, the city boundary can be considered too large to be used in setting the perimeter of the lead nonattainment boundary.

The township and section boundaries intersecting Council Bluffs are shown in Figure 15. Section boundaries provide an opportunity to establish definitive boundaries from a legally precise and tractable perspective. From a visual perspective their descriptive abilities are limited as they are not directly viewable on location. The use of section boundaries also limits the formation of boundaries specifically tailored for the unique and more common circumstance encountered with lead where a NAAQS violation results from emissions from a single industrial facility.

The use of roadways to define the nonattainment perimeter can be a useful means of boundary delineation. Compared with township sections, roadways are more intuitive from a public perspective as they are visible and less likely to bisect residential, commercial, or industrial properties. The use of roadways can enhance development of nonattainment boundaries that are more precisely tailored to define the limited extent of the area where lead concentrations may exceed the lead NAAQS.

[12] http://en.wikipedia.org/wiki/Council_Bluffs

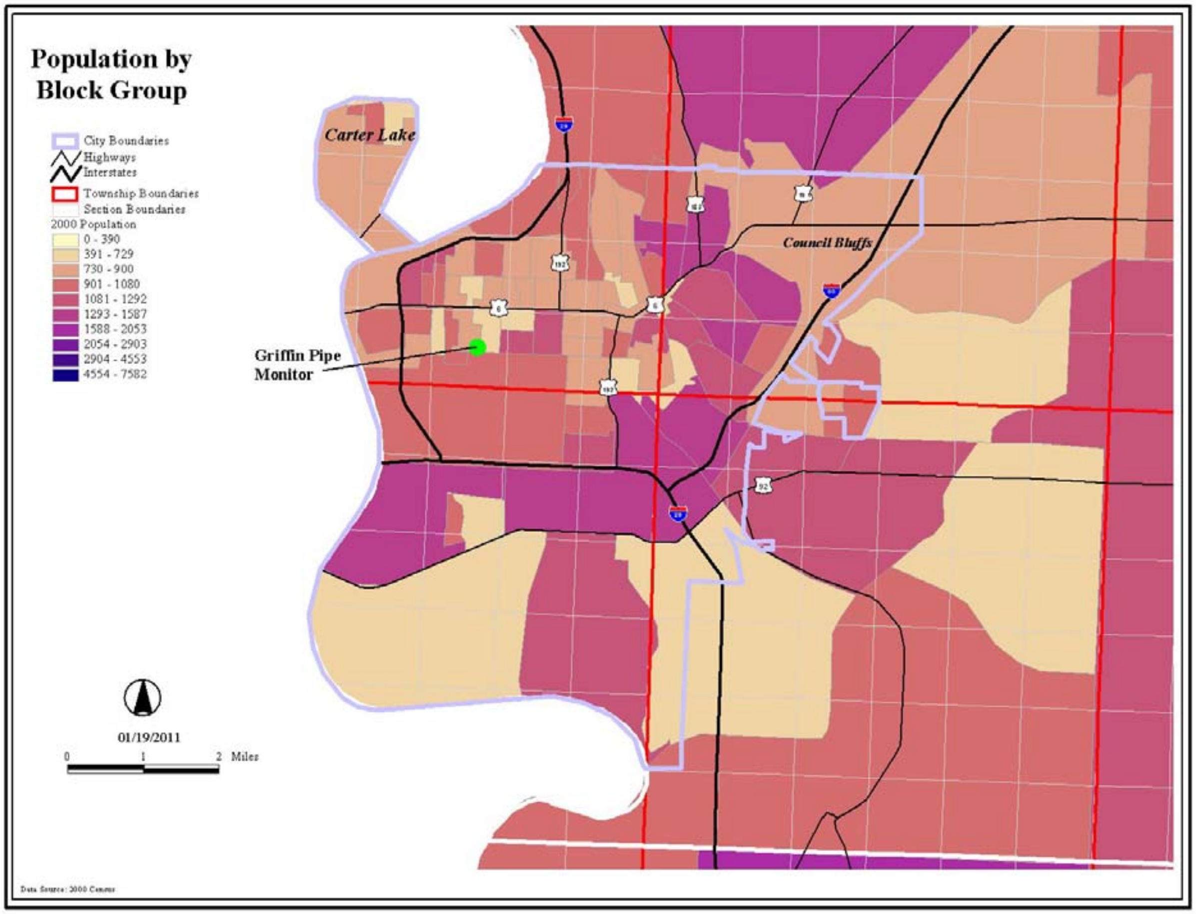


Figure 15. Township (red) and section (white) lines intersecting Council Bluffs.

Growth

Population growth by county between 2000 and 2009 in the Omaha-Council Bluffs metropolitan statistical area has been calculated by the U.S. Census Bureau, and is provided in Table 12. Growth in Pottawattamie County was reported to be 2.8 percent, representing an increase in population of 2,417 people. Considerably higher growth rates were observed in the more urbanized counties of Douglas and Sarpy, NE. Growth in population can create a potential for emissions increases. Emissions of pollutants such as NOx and VOCs may increase with population growth, given possible increases in vehicular traffic, consumer products utilization, and supporting commercial and retail activities. Lead emissions increases are not suspected of being significantly linked to population growth. No increases in lead emissions are expected as a result of changes in population in the Omaha/Council Bluffs area. The data does not support expansion of the nonattainment boundary.

Table 12. Population Growth between 2000 and 2009 in the Omaha/Council Bluffs Metropolitan Statistical Area.

County	Population (July 1, 2009)	Population Growth, 2000-2009 (Number)	Population Growth, 2000-2009 (Percent)
Harrison County, IA	15,328	-338	-2.2
Mills County, IA	15,002	455	3.1
Pottawattamie County, IA	90,224	2,417	2.8
Cass County, NE	25,485	1,151	4.7
Douglas County, NE	510,199	46,614	10.1
Sarpy County, NE	153,504	30,909	25.2
Saunders County, NE	20,057	227	1.1
Washington County, NE	19,718	938	5.0

Data from U.S. Census Bureau: http://www.census.gov/popest/gallery/maps/

Population growth projections for Pottawattamie County, developed by Woods & Poole Economics, Inc. and obtained from the State Data Center of Iowa,[13] are shown in Figure 16. Between 2010 and 2020 the population of Pottawattamie County is predicted to increase by 401, or ~0.45%. Predicted growth between 2010 and 2040 is estimated at 2,036 or ~2.27%. The projected population growth is not expected to correlate with increases in lead emissions. Changes in industrial activities or other growth factors which would impact lead concentrations in the area can be difficult to forecast, but significant changes which would cause a lead emissions increase are not foreseen at this time. The data do not refute the use of a nonattainment boundary which is smaller than the presumptive county boundary.

[13] "*Projections of Total Population for U.S., Iowa, and its Counties: 2010-2040, COPYRIGHT 2009*", available from the State Data Center of Iowa at http://data.iowadatacenter.org/browse/projections.html

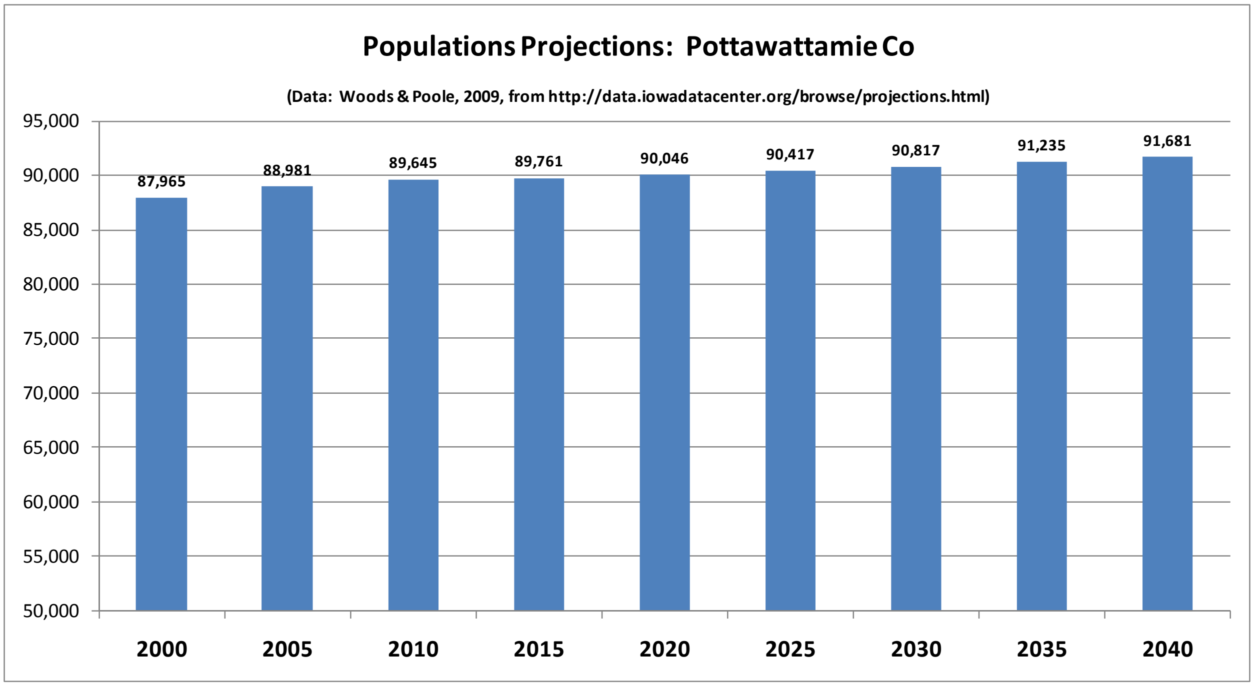


Figure 16. Population projections for Pottawattamie County. Data estimates calculated by Woods & Poole Economics, Inc, 2009. Data available from the State Data Center of Iowa at: http://data.iowadatacenter.org/browse/projections.html.

Public Comments

A public meeting was held in Council Bluffs, IA, on February 16, 2011, starting at 9:30 am at the Community Hall located at 205 South Main Street. Comments received included a statement to expand the nonattainment area boundary. Several comments suggested narrowing the extent of the boundary. No specific alternative boundaries were received at the meeting. General comments on the narrowing of the boundary included comments to reduce the eastern and western extent of the boundary, as well as a reduction in the area covered in the southwestern portion of the boundary. On March 7, 2011, IDNR received a written comment recommending specific changes which would alter the southwestern portion of the boundary, with the effect of excluding some locations in this area (see Appendix A).

Modifying the southwestern boundary to incorporate the comments provided March 7, 2011, would require the projection of roadway paths beyond their current extents. Narrowing the boundaries of the nonattainment area would make them more difficult to identify, visualize, and describe. Supporting evidence was not provided to substantiate the suggestions. No changes in the boundaries were made from the proposal presented at the public meeting.

Recommended Nonattainment Boundaries

Based upon a cumulative weight of evidence analysis, the IDNR has developed a boundary for consideration associated with lead NAAQS violations at the Griffin Pipe monitor. An overview of the boundary is shown in Figure 17, with the description provided in Table 13. A more detailed view is provided in Figure 18. The area is defined using roadways. Roadways provide a means of intuitively defining, visualization, and communicating the extent of the nonattainment boundary.

The proposed nonattainment boundary utilizes the analysis of the eight factors, and considers the modeled lead NAAQS concentrations from the pre-PSD permitting activities, to inform the extent of the boundaries. The modeled data incorporates meteorology, emissions, potential topographical influences upon airflow, and the science behind pollutant dispersal to provide a comprehensive dataset for use in design of the recommended boundary. The proposed boundary includes virtually all areas with modeled maximum 3-month average concentrations at or above 0.05 ug/m3. Griffin Pipe is the only source of lead emissions in the area which can be considered to be causing the lead NAAQS violations. No other sources were identified as contributing to the lead NAAQS violations in the area.

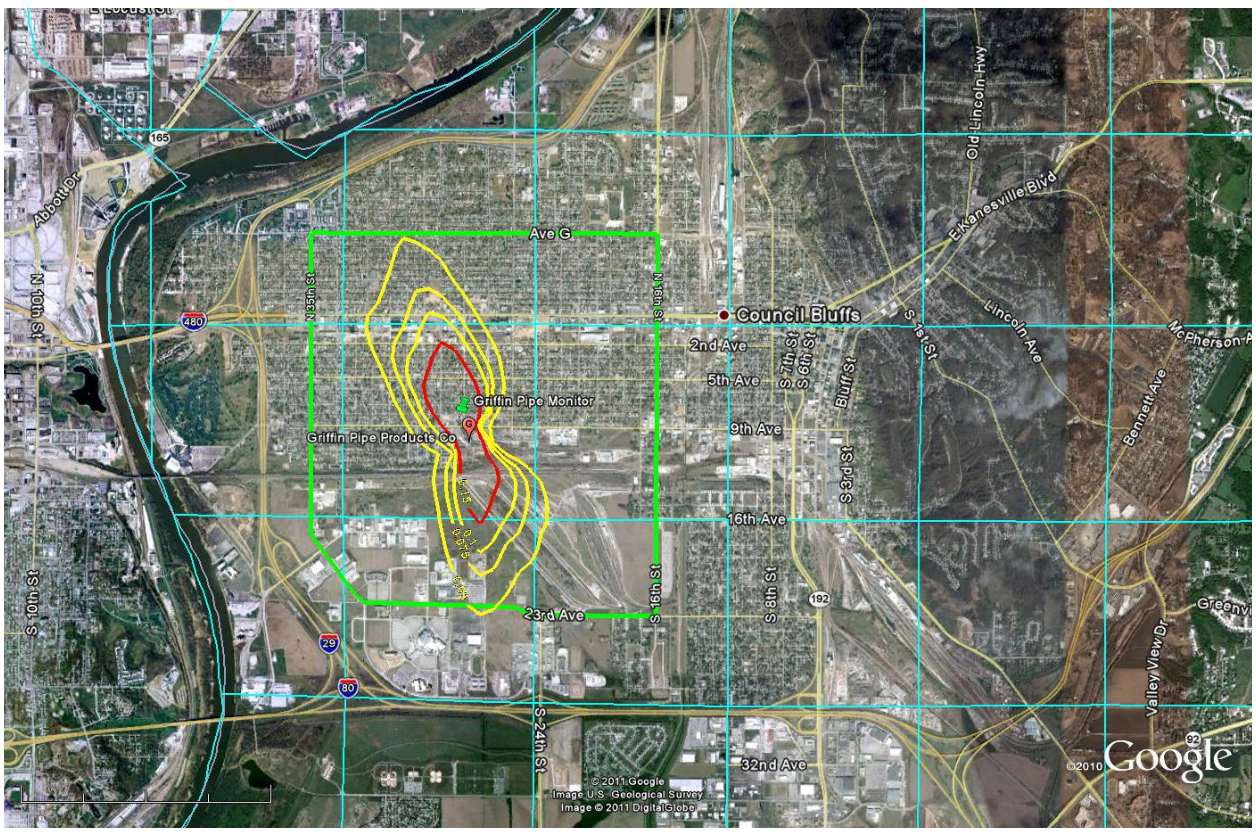


Figure 17. Proposed nonattainment boundary in Council Bluffs. The boundary is outlined in green. Section lines are indicated in light blue, as are the state boundaries. The extent of the predicted NAAQS violations from modeling Scenario A (pre-PSD controls) is shown in red, and associated lower concentration contours are plotted in yellow.

Table 13. Nonattainment boundary description for lead NAAQS violations occurring at the Griffin Pipe monitor.

Boundary Description	Boundary Definition
Northern Boundary	Avenue G
Southern Boundary	23rd Ave
Eastern Boundary	N 16th St / S 16th St
Western Boundary	N 35th St / S 35th St

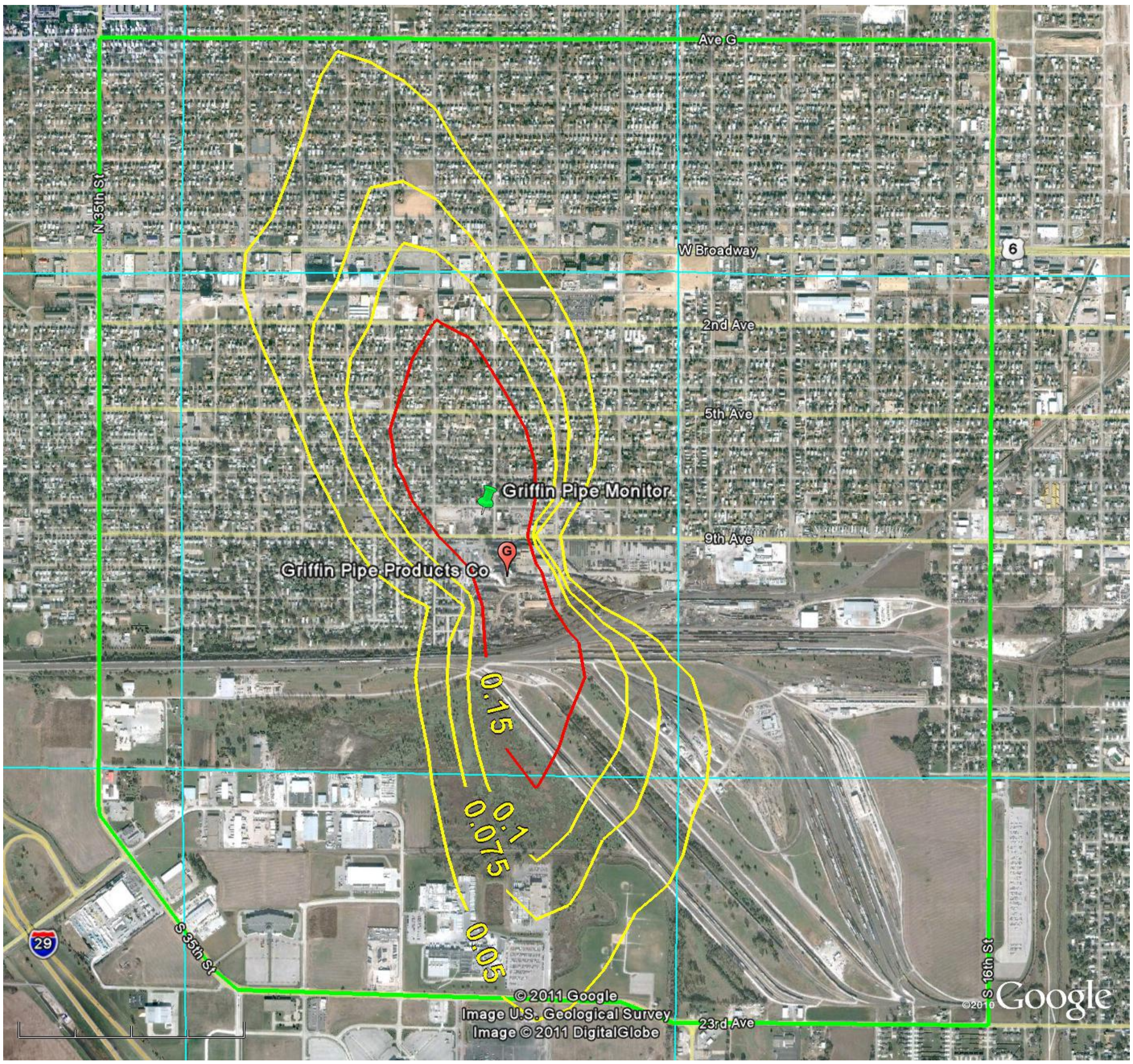


Figure 18. A higher resolution image of the recommended nonattainment boundary.

Appendix A. Written Public Comments

council bluffs IOWA'S LEADING EDGE
CHAMBER OF COMMERCE

149 W. Broadway
PO Box 1565
Council Bluffs, IA 51502

(800) 228-6878
(712) 325-1000
Fax: (712) 322-5698

www.councilbluffsiowa.com

March 4, 2011

Jim McGraw
Environmental Program Supervisor
Iowa DNR Air Quality Bureau
7900 Hickman Rd; Suite 1
Windsor Heights, IA 50324

REF: Council Bluffs Proposed Boundary Non-Attainment

Jim,

Thank you and staff for your presentation in regards to the proposed boundary here in Council Bluffs. I understand that we have an opportunity to respond to the boundary and allowed to give input to that boundary proposal. Given the information provided by you, I would like to provide for consideration to modify the proposed boundary.

I would propose moving the Southwest line closer to the point source by following the rail line that is north of Nebraska Ave. Therefore, follow 35th St south to 16th Ave and then go east along 16th approximately 3,200 linear feet. From this point, have the boundary go south on Nebraska Avenue to the southern border of 23rd Ave.

Thank you for the opportunity to respond with this request. If you or other IDNR staff have any questions, please feel free to contact me.

Respectfully,

Greg Halverson
Vice President

RECEIVED
MAR 07 2011