Iowa
State Implementation Plan

Fine Particulate Matter
Muscatine, Iowa

Iowa Department of Natural Resources
Environmental Services Division
Air Quality Bureau
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(DRAFT)

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i. Executive Summary

On July 14, 2011, the U.S. Environmental Protection Agency (EPA) Region 7 found that the Iowa State Implementation Plan (SIP) was substantially inadequate to maintain the 2006 24-hour National Air Quality Standard (NAAQS) for fine particulate matter (PM2.5) in Muscatine County, Iowa (76 FR 41424). PM2.5 measurements from a PM2.5 monitor located at Garfield School (also referred to as Muscatine High East Campus) show that the site oscillates in and out of attainment with the 2006 24-hour PM2.5 NAAQS. Recent three year design values including 2005-2007, 2007-2009, and 2008-2010 have violated the 24-hour PM2.5 NAAQS.

EPA's finding requires the State to revise the SIP and include measures to attain and maintain the 2006 24-hour PM2.5 NAAQS in Muscatine. Specifically, EPA required that the SIP revision include a modeling demonstration showing the reductions needed to attain and maintain the PM2.5 NAAQS, control measures necessary to attain and maintain the PM2.5 NAAQS, and enforceable commitments to adopt and implement contingency measures if the PM2.5 NAAQS is not attained or maintained at the violating monitor.

The Iowa Department of Natural Resources (DNR) determined that three major sources of air pollution in the Muscatine area significantly contribute to predicted (modeled) PM2.5 exceedances of the standard in the vicinity of the Garfield School monitor. These facilities are Grain Processing Corporation (GPC), Muscatine Power & Water (MPW), and Union Tank Car Company (UTLX). The DNR collaborated with these facilities to develop air pollution control measures that will result in expeditious attainment of the 24-hour PM2.5 NAAQS through reductions of ambient air impacts of PM2.5 emissions from each facility.

Changes that have been made or will be made at these facilities generally include various combinations of the following:

- Installation of new particulate controls or improvements to existing particulate controls on a number of sources;
- Cessation of operation of various existing equipment;
- Replacement of several existing operations with new, more efficient equipment ;
- Regular sweeping and watering of road surfaces;
- Increasing select stack heights; and
- Restricting operation of certain processes.

It is estimated that PM2.5 emissions from these three facilities combined will be reduced by nearly 370 tons per year from 2007 and 2008 actual emissions levels. The majority of the PM2.5 emissions reductions will come from GPC. Control measures at MPW and UTLX will be fully implemented during 2013. Due to the scale and complexity of the changes at GPC, GPC has developed a phased implementation schedule that begins in 2013 and concludes in December 2016. The controls and other changes that will be implemented at GPC are also estimated to result in significant emissions reductions for several other regulated air pollutants.

Based on the planned schedule for implementation of the control strategy and on-going implementation of federal regulations that will continue to reduce regional levels of PM2.5, DNR believes that attainment requirements established by EPA in the SIP call can be achieved by the end of calendar year 2017.

1. Background

National Ambient Air Quality Standards for PM2.5

Revisions to the fine particulate matter less than or equal to 2.5 microns (PM2.5) National Ambient Air Quality Standards (NAAQS) were published by the U.S. Environmental Protection Agency (EPA) in the Federal Register on October 17, 2006. EPA lowered the 24-hour average standard from 65 micrograms per cubic meter (ug/m3) to 35 ug/m3. The Iowa Department of Natural Resources (DNR) has adopted by reference the revised 2006 standard into 567 Iowa Administrative Code Chapter 28.

On December 14, 2012, EPA revised the annual PM2.5 NAAQS to improve public health protection. EPA strengthened the primary annual average standard first set in 1997 for PM2.5 from 15 µg/m3 to 12 µg/m3. The secondary annual average standard remained at 15 µg/m3.

The primary NAAQS define levels of air quality which are necessary to protect public health. The secondary NAAQS define levels of air quality which protect public welfare from any known or anticipated adverse effects of a pollutant. The PM2.5 NAAQS are shown in Table 1.

Fine particulate matter (PM2.5) consists of solids and liquids with a nominal aerodynamic diameter less than or equal to 2.5 micrometers. Significant impacts on human health and welfare are associated with PM2.5 exposure. An extensive body of scientific evidence shows that exposure to fine particle pollution can cause premature death and adverse cardiovascular effects, including increased hospital admissions and emergency department visits for heart attacks and strokes. Contact with fine particulate pollution also causes respiratory effects, including asthma attacks. The people most at risk from exposure to PM2.5 include people with heart or lung disease (including asthma), older adults, children, and people of lower socio-economic status.

Table 1. National Ambient Air Quality Standards for PM2.5

Pollutant	Averaging Time	Level	Form
Primary	Annual	12 µg/m3	annual mean, averaged over 3 years
	24-hour	35 µg/m3	98th percentile, averaged over 3 years
Secondary	Annual	15 µg/m3	annual mean, averaged over 3 years
	24-hour	35 µg/m3	98th percentile, averaged over 3 years

Muscatine, Iowa

Muscatine has a population of 22,886 people (2010 U.S. Census), and is located along the western shore of the Mississippi River in Muscatine County, adjacent to the border between Iowa and Illinois. Most of the town is situated on low bluffs approximately 45-60 meters above the Mississippi River. Immediately to the south and southwest of the bluffs lies a large flood plain. The plain is approximately 3 meters above the river. Land use in the area of the plain from the bluff line to approximately 2.5 kilometers south of the bluffs, to approximately 1 kilometer west of the river, consists of industrial development, residential housing, and general commercial use.

Muscatine PM2.5 Air Quality Data

The 24-hour averaged, or daily, PM2.5 standard "…is met when the 3-year average of the 98th percentile of 24-hour concentrations is equal to or less than 35 µg/m3. The computation of this 3-year average of the 98th percentiles of 24-hour concentrations is commonly referred to as the design value and is based on the most recent three years of quality assured data" (Final PM2.5 SIP Call, 76 FR 41424; p 41425).

The Garfield[1] School PM2.5 monitor site (Site ID 191390015) in the city of Muscatine, Iowa, is a neighborhood spatial scale site intended to measure population exposure to ambient PM2.5 concentrations. The site is located approximately 500 meters west of Grain Processing Corporation, a major source of PM2.5 emissions in the area. Land use within two kilometers of the Garfield School monitor site includes residential and commercial properties, other schools, city parks and athletic complexes, day care facilities, and a cemetery.

The site includes a PM2.5 monitor on a daily operating schedule that has measured violations of the 24-hour PM2.5 NAAQS. Historical design values for this site (Table 2) show that the site oscillates in and out of attainment with the 2006 24-hour PM2.5 NAAQS. Recent design values including 2005-2007, 2007-2009, and 2008-2010 have violated the 24-hour PM2.5 NAAQS (see also Figure 1). In addition to the PM2.5 filter samplers on the roof of Garfield School, the DNR also operates a continuous monitor in a trailer on the school grounds. The continuous PM2.5 monitoring data is used for real time reporting of the air quality index, and the filter sampler data is used for establishing NAAQS compliance.

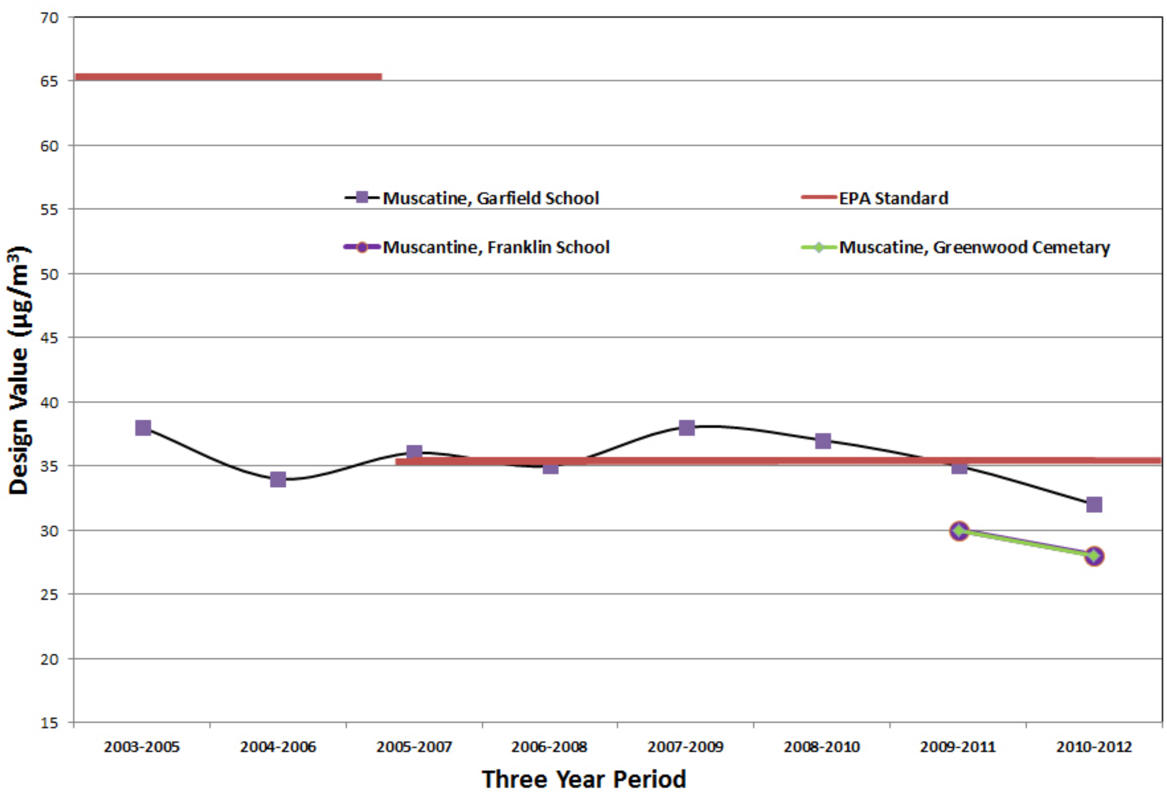
Table 2. Historical 24-hour Averaged PM2.5 Design Values at the Garfield School monitor

Monitoring Years	Design Value (µg/m3)
2003–2005	38
2004–2006	34
2005–2007	36
2006–2008	35
2007–2009	38
2008–2010	37
2009-2011	35
2010-2012	32

The DNR currently operates three other PM2.5 monitor sites in Muscatine. One site is located at Greenwood Cemetery, a second at Franklin School, and a third at Musser Park. Current design values at the Greenwood Cemetery and Franklin School sites are less than the 24-hour PM2.5 NAAQS (Figure 1).

[1] In 2012 the Garfield School Building (which formally housed an elementary school) became the new home of the East Campus of Muscatine High. For monitor location identification purposes, the rooftop monitor site is now referred to as the Muscatine High E. Campus-Rooftop site. For brevity and consistency with the identification of this monitoring site in 76 FR 41424, the school will continue to be referred to as Garfield School in this document.

Figure 1. Muscatine PM2.5 24-hour Design Value Trends



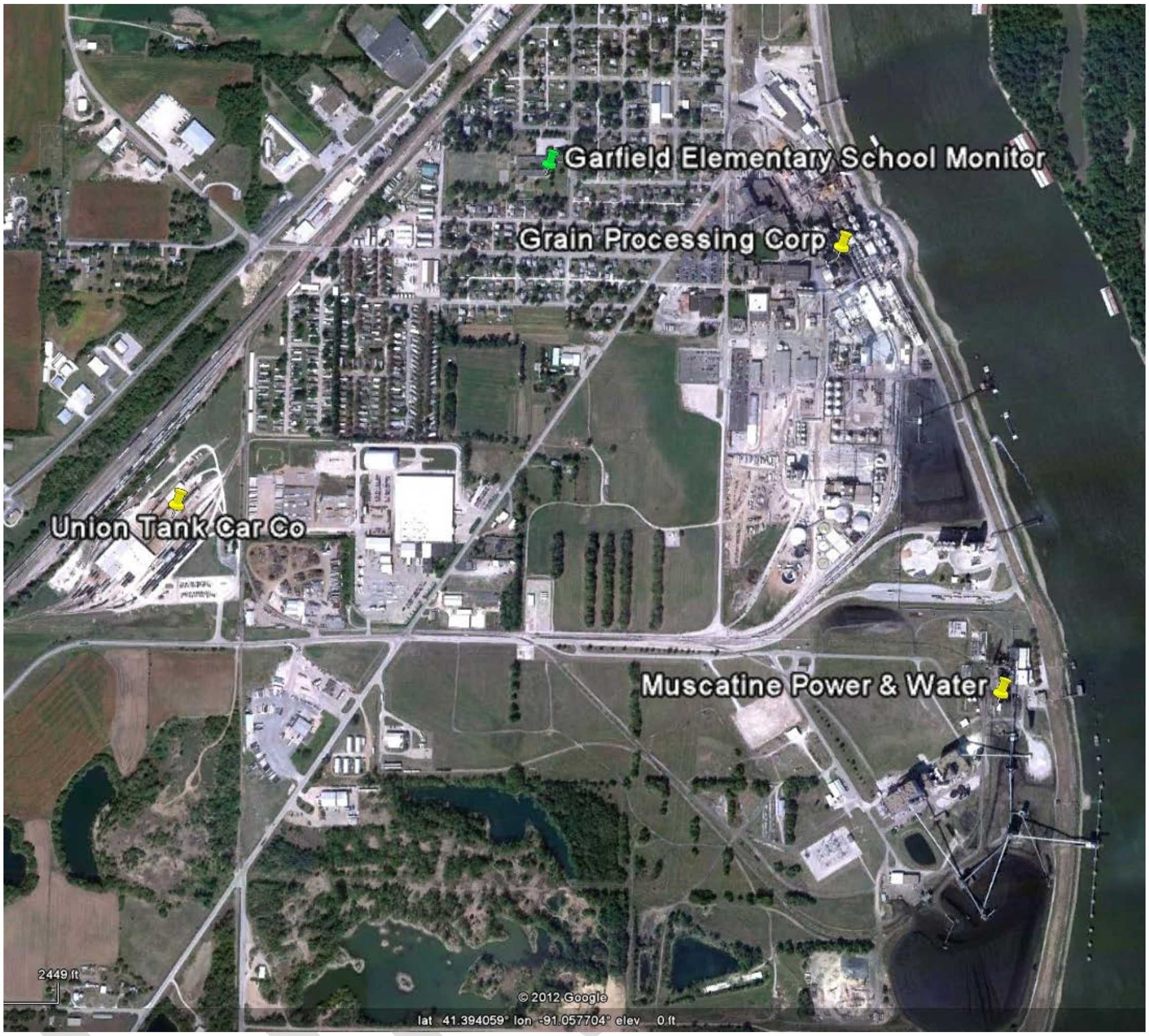
The Musser Park PM2.5 monitor began operation on January 1, 2011. No design value can be determined for this site as only two years of data are available. This monitor recorded 98th percentile values of 30.6 and 25.0 µg/m3 for 2011 and 2012, respectively.

Affected Facilities

There are three major facilities in the Muscatine area that were determined to be significant contributors to predicted (modeled) exceeedances in the vicinity of the Garfield School monitor. (See Attachment A for additional information on the determination of affected facilities.) The facilities that were included in the PM2.5 control strategy are Grain Processing Corporation, Muscatine Power & Water, and Union Tank Car. The location of these facilities relative to the location of the Garfield School monitor is depicted in Figure 2.

The largest source of PM2.5 near the Garfield School monitor is Grain Processing Corporation (GPC). GPC is approximately 500 meters east/southeast of the monitor. GPC is located immediately adjacent to the river between 1500 and 2200 meters south of the bluff line. GPC processes grain into industrial, beverage and fuel-grade ethanol, as well as a variety of grain based food products, industrial products and animal feeds. The GPC facility currently includes nearly 200 PM2.5 emission points, including coal and gas-fired boilers, dryers, coolers and associated material handling and storage equipment.

Figure 2. Affected Facility Locations Relative to Garfield School Monitor



The Muscatine Power & Water (MPW) municipal electrical generating station is located approximately 1.6 kilometers south and east of the monitor. MPW is located immediately adjacent to the river and GPC, approximately 2.5 kilometers south of the bluff line. Primary sources of PM2.5 at MPW include three coal-fired boilers, Units 7, 8, & 9, and associated material handling and storage equipment.

The Union Tank Car Company (UTLX) facility is approximately 1.6 kilometers southwest of the monitor. UTLX supplies and reconditions rail tank cars for use through rental agreements. UTLX is not a major source of PM2.5 but is located near the monitor and was found to contribute to predicted violations of the PM2.5 NAAQS in the area addressed by the PM2.5 control strategy. The primary sources of PM2.5 from UTLX are from the removal of paint from rail tank cars, repair of rail tank cars and spraying new paint on the rail tank cars.

2. SIP Call

The Muscatine area is currently designated as attainment of the 2006 24-hour PM2.5 NAAQS. However, EPA determined that the current State Implementation Plan (SIP) was inadequate to maintain attainment with the 2006 24-hour PM2.5 NAAQS due to the Garfield School PM2.5 monitor recording data violating the standard. A final rule stating that the Iowa SIP was inadequate to maintain the 2006 24-hour average PM2.5 NAAQS in Muscatine County was published in the Federal Register on July 14, 2011 (76 FR 41424) and was effective on August 15, 2011. EPA's authority for this action is found in section 110(k)(5) of Clean Air Act.

This finding, referred to as a 'SIP Call,' requires the state to revise the SIP and include measures to attain and maintain the NAAQS. The SIP revision must include several elements, summarized as:

1) An emissions inventory of sources expected to contribute to the violating monitor,
2) A modeling demonstration showing the reductions needed to attain and maintain the PM2.5 NAAQS,
3) Control measures necessary to attain and maintain the PM2.5 NAAQS,
4) Enforceable commitments to adopt and implement contingency measures if the PM2.5 NAAQS is not attained or maintained at the violating monitor.

The SIP revision was originally due February 15, 2013, consistent with the Clean Air Act which provides up to eighteen months for a state to submit a SIP revision following a finding of inadequacy (CAA 110(k)(5)). To allow the state adequate time to complete administrative processing and submittal of the SIP document, this due date was extended to May/June 2013.

Emissions Data

The SIP call includes the required submittal of an emissions inventory, consistent with 40 CFR 51.114(a), for all sources and source types of PM2.5 emissions that could be expected to contribute to PM2.5 concentrations at the violating monitor. The average 2007 and 2008 facility-wide actual emissions from the facilities shown to contribute significantly to violations of the 24-hour PM2.5 NAAQS are provided in Table 3. The actual emissions represent direct PM2.5 emissions that were reported by the facilities to the DNR on the annual emissions inventory questionnaires. These average emissions were also used as the baseline for calculating the PM2.5 emissions reductions resulting from implementation of the PM2.5 control strategy. Emissions of PM2.5 precursors that may contribute to violations are accounted for in background concentrations included in the air dispersion model.

The DNR did not identify any other potential emissions sources in the area of the violating monitor, such as area and mobile sources, as contributing significantly to the NAAQS violations. Background concentrations are added to modeled results to account for the regional transport of fine particulate matter and any unidentified local sources such as mobile and area sources not explicitly included in the model.

Table 3. Facility-Wide Actual PM2.5 Emissions

Facility Name	Facility ID	Actual PM2.5 Emissions (tons/year)
Grain Processing Corporation	70-01-004	537.6
Muscatine Power & Water	70-01-011	58.3
Union Tank Car Company	70-01-048	3.0
Total		598.9

Modeling Demonstration

The SIP call requires the DNR to submit a modeling demonstration (consistent with Appendix W to 40 Code of Federal Regulations (CFR) Part 51) showing what reductions will be needed to attain and maintain the PM2.5 NAAQS in Muscatine. The modeling methodology, model option selections and inputs, and model results used by the DNR to identify the reductions needed to attain and maintain the PM2.5 NAAQS in Muscatine are provided in Attachment A of this SIP document.

DNR's proposed modeling methodology and model option selections were provided to EPA in an April 29, 2010 protocol. This protocol was approved with revisions on February 10, 2011. The protocol was amended in February 2013 to address updates in the meteorological data and methodology for accounting for PM2.5 background contributions. The modeling demonstration was completed using the EPA approved protocol with the February 2013 amendment.

Control Measures

Control measures were developed based on dispersion modeling and facility operational considerations. These control measures provide for expeditious attainment of the 24-hour PM2.5 NAAQS through reductions of ambient air impacts of PM2.5 emissions from operations at GPC, MPW, and UTLX. The control measures at these facilities combine to constitute the PM2.5 control strategy for the Muscatine area.

GPC

Changes that have been made or will be made to sources at GPC to reduce PM2.5 emissions, the impacts of the PM2.5 emissions, and the associated timelines for implementing the changes are specified in Attachment B. GPC's control measures will be made federally enforceable through an Administrative Consent Order (ACO) and subsequent issuance of air construction permits. When completed, these documents will be submitted as amendments to the PM2.5 SIP for Muscatine.

A summary of control measures being implemented by GPC include:

- New particulate controls or improvements to existing particulate controls on a number of sources;
- Cessation of operation of various existing equipment;
- Replacement of several existing operations with new, more efficient equipment ;
- Regular sweeping and watering of road surfaces;
- Increasing select stack heights; and
- Restricting operation of certain processes.

Full implementation of the control measures at GPC will reduce PM2.5 emissions from GPC by an estimated 367.9 tons per year.

Other control measures include restricting public access to the levee that is located between GPC's property and the Mississippi River. Beginning July 14, 2013, GPC will restrict public access to the levee by posting signs warning of restricted access on the north and south fence lines that intersect the levee. A third sign will be posted in the area of highest modeled concentrations prohibiting loitering and fishing. In-person surveillance of the levee will be conducted by GPC security staff periodically throughout the day with documentation as to surveillance times and locations. This levee plan will be included in a future permit to ensure on-going implementation and enforceability.

Due to the scale and complexity of the changes at GPC, GPC has developed a phased implementation schedule that begins in 2013 and concludes in December 2016. GPC's rationale supporting a phased implementation of control measures is provided in Attachment C. Given the extent and number of the modifications being made, the DNR believes that the schedule projected by GPC for implementation of the proposed control measures is realistic and achievable, and will allow for the 24-hour PM2.5 NAAQS to be attained as expeditiously as possible in the area.

To further reduce emissions in the area, GPC has also voluntarily implemented a corn truck queuing and idling policy. This policy is designed to reduce overall corn truck wait time, and will result in lower emissions of PM2.5 from truck idling. GPC has significant daily corn truck traffic at the facility. As the corn is delivered, each truck is graded by GPC and then proceeds to the unloading stations. Prior to grading as well as prior to unloading, corn trucks can experience wait time at GPC's facility. During the wait time, the corn trucks may be running in an idle mode. Reductions in this idling time will be achieved through scheduling and processing practices described in GPC's policy and the use of more orderly queuing procedures. These voluntary actions on the part of GPC will reduce PM2.5 emissions and emissions of oxides of nitrogen and sulfur dioxide, pollutants which can react in the atmosphere to generate additional PM2.5 emissions from the corn trucks, and alleviate some of the truck traffic congestion in the vicinity of the facility.

MPW

A detailed summary of the control measures for MPW is included in Attachment D. MPW's control measures are made federally enforceable through the issuance of air construction permits (Attachment E).

Control measures being implemented by MPW include:

- Regular watering of road surfaces;
- Paving one unpaved road and water road surfaces;
- Removing lime silo and mixing tank, 3 diesel engines, and wet fly ash truck loading;
- Restricting operation of certain processes;
- Reducing the capacity on the limestone hopper loading and handling systems;
- Installing a roofed enclosure with three sides on the limestone hopper;
- Reducing the size of the coal pile, limestone pile, and synthetic gypsum pile; and
- Increasing the stack height and reconfiguring the coal reclaim handling dust collector and the dust collector for the coal crusher feeders.

Full implementation of the control measures at MPW will reduce PM2.5 emissions from MPW by an estimated 0.7 tons per year.

UTLX

A detailed summary of the control measures for UTLX is included in Attachment F. UTLX's control measures are made Federally enforceable through the issuance of air construction permits (Attachment G).

Control measures being implemented by UTLX include:

- Installation of new particulate controls on a number of emission points;
- Increasing select stack heights; and

- Restricting operation of certain processes.

Full implementation of the control measures at UTLX will reduce PM2.5 emissions from UTLX by an estimated 0.3 tons per year.

PM2.5 Emissions Reductions Summary

The estimated net reductions in PM2.5 emissions from the 2007 and 2008 baseline actual emissions as a result of implementing the control measures at GPC, MPW, and UTLX is summarized in Table 4. The majority of the PM2.5 reductions will come from GPC. The need for GPC to make the largest emissions reductions is consistent with the level of GPC's PM2.5 emissions and model predictions of the magnitude and frequency of GPC's contributions to predicted exceedances.

Table 4. Summary of Estimated PM2.5 Emissions Reductions from Implementation of Control Strategy

Facility	Actual Emissions (tons/year)*	Reductions (tons/year)	Estimated Percent Reduction
GPC	537.6	367.9	68.4%
MPW	58.3	0.7	1.2%
UTLX	3.0	0.3	10.0%
Total	598.9	368.9	61.6%

* Based on average of 2007 and 2008 production data

Co-Benefits of Emissions Reductions at GPC

The controls and other changes that will be implemented at GPC to affect the PM2.5 emissions reductions may also result in emissions reductions (or co-benefits) for several other regulated air pollutants emitted by GPC. Reductions in emissions of these other pollutants is not a requirement of the plan, but is viewed by the DNR as having a positive or beneficial impact on the air quality in Muscatine. The estimated percentage reduction of these air pollutants by 2017 are summarized in Table 5.

Table 5. Estimated Co-Beneficial Emissions Reductions in Emissions from 2011 to 2017 at GPC*

Pollutant	Estimated Percentage Reduction
Sulfur Dioxide (SO2)	84
Hazardous Air Pollutants (HAPs)	82**
Volatile Organic Compounds (VOC)	48
Nitrogen Oxides (NOx)	18
Carbon Monoxide (CO)	13

*These emission estimates were provided by GPC and have not been verified by DNR.

**Seventy-one percent of the reduction is due to decreased Hydrogen Chloride (HCl) emissions from the coal-fired boilers.

Projected Attainment Date

The State was required in EPA's SIP call (76 FR 41424) to establish a specific date by which the Muscatine area will attain the 2006 PM2.5 NAAQS. EPA's expectation as stated in the SIP call was that the date for attainment would be the first full calendar year following the implementation of controls. Based on DNR's model predictions of the impact of implementation of the PM2.5 control strategy in Muscatine, the design value trends in Figure 1, and on-going implementation of Federal regulations that will reduce

PM2.5 background levels on a regional scale, the DNR believes the attainment requirements established by EPA in the SIP call can be achieved by the end of calendar year 2017. This projection is contingent on the successful implementation of control strategies being fully implemented on the schedules provided by the facilities.

Contingency Measures

EPA indicated in the SIP Call (76 FR 41424) that the requirement to implement contingency measures would be triggered if the 98th percentile value for the calendar year after completion of implementation of the control strategies, or in any subsequent year, exceeded the 24-hour PM2.5 standard at the Garfield School monitor. The DNR believes that this criteria for triggering local contingency measures is not practical as it fails to consider the potential role of regional (non-local) events. The criteria also fail to account for the documented year-to-year variability of meteorological conditions. The annual variability of meteorological conditions is currently accounted for in the form of the 24-hour PM2.5 standard by using a three year average of 98th percentile values. EPA's criteria for triggering contingency measures unnecessarily establish a more stringent form of the 24-hour PM2.5 NAAQS that would only be applied in the Muscatine area.

Based on these considerations, DNR will use a violation of the PM2.5 design value as measured at the Garfield School monitor to determine whether contingency measures as specified below should be implemented. Given that the PM2.5 control strategy will not be fully implemented until the end of 2016, the first PM2.5 design value that will be considered by DNR will be 2017-2019 design value.

Ambient Air Quality Monitoring

DNR will maintain the current PM2.5 ambient air monitoring network in Muscatine unless circumstances beyond its control (for example, loss of federal air monitoring funding, or revocation of site access by property owners) force it to abandon air monitoring sites. Air monitoring data from filter sampling sites is available one to two months after the sampling day. Air monitoring from the continuous PM2.5 monitor in Muscatine is available in real time.

Contingency Plans

In the event that the 2017-2019 24-hour PM2.5 design value, or subsequent design values, exceeds the 24-hour PM2.5 NAAQS at the Garfield School monitor, DNR will require the submission of an emissions control program from applicable sources in the area. The determination of sources that may be required to submit an emissions control program will be based on evaluation of the causes of the design value violation and may include but is not limited to requirements for additional control equipment, or changes in work practices and operations. Measures contained in the emissions control program will be feasible to implement within 24-months after the Garfield School monitor shows a design value that exceeds the PM2.5 NAAQS.

DNR will use available and applicable tools and technical analyses to identify source culpability for violations of the PM2.5 NAAQS. DNR has statutory authority to address any violations of the NAAQS that may be identified in the future (Iowa Code 455B.133 et. seq.). If necessary, DNR may exercise its authority (Code of Iowa 455B.134) to issue orders consistent with rules to cause the abatement or control of air pollution to ensure that the NAAQS are not violated.

As outlined below, DNR already has statutory and administrative rule provisions in place that will support the submission and implementation of an emissions control program in an expeditious and timely fashion.

Permitting Mechanisms: The construction of new or modified sources which may impact the maintenance of attainment is regulated by 567 IAC paragraph 22.3(1)"b," which requires that the expected emissions from the proposed source, in conjunction with all other emissions, will not prevent the attainment or maintenance of the ambient air quality standards. Paragraph 567 IAC 22.3(3)"f" establishes additional authority for DNR to establish more stringent emissions standards and to require the installation of additional control equipment for portable equipment to ensure the attainment or maintenance of ambient air quality standards.

DNR has the authority to modify a condition of approval or an existing permit for a major stationary source or an emission limit contained in an existing permit for a major stationary source if necessary to attain or maintain the NAAQS (567 IAC 22.3(5)).

The impact of major stationary sources on ambient air quality is also regulated under regulations at 567 IAC chapter 33 “Special regulations and construction permit requirements for major stationary sources – Prevention o significant Deterioration (PSD) of air quality.”

Emissions Monitoring: The DNR may require specific source monitoring for those sources most significant to attainment of the PM2.5 NAAQS in the area. Emissions monitoring will be accomplished through periodic stack testing, as detailed in the construction permits issued to facilities, and review of this data by the DNR. These tests will ensure that the emissions limitations in the permits that were used to show modeled attainment of the NAAQS are not exceeded. In addition, recordkeeping and reporting requirements established in the construction permits will provide DNR with a mechanism to monitor and check the operations of the facilities and their emissions sources.

Compliance Verification: Persons responsible for equipment are required to provide to the DNR information necessary to characterize emissions at the facility (567 IAC subrule 21.1(3)). Facilities in the Title V operating permit program, which includes GPC, MPW and ULTX, are required to identify instances of deviations from permit requirements in semi-annual reports to the DNR, including deviations attributable to upset conditions, the cause of the deviations, and any corrective actions or preventive measures taken (567 IAC subrule 22.108(5)). In addition, facilities are required to report and take corrective action in response to incidences of excess emissions (567 IAC chapter 24). Chapter 24 establishes DNR’s authority to require the establishment of maintenance plans where a continued pattern of excess emissions indicates inadequate operation or maintenance of equipment.

The provisions of 567 IAC Chapter 25 allows DNR to require monitoring and reporting of emissions for certain equipment. Under the same provisions DNR can conduct or require the facility to conduct emission tests to determine emissions.

DNR field inspectors have authority to conduct onsite inspections to review the compliance status of the facility (Iowa Code section 455B.103(4)). While conducting an investigation DNR personnel may, at any reasonable time, enter in and upon any private or public property to investigate any actual or possible violation, provided the owner or a person in charge is notified.

3. Administrative Materials

The Administrative Materials discussed below are discussed in the same order as listed in Section 2.1 of Appendix V of 40 CFR Part 51 (Criteria for Determining the Completeness of Plan Submissions).

Submittal Letter

A formal letter of submittal from the Governor of the State of Iowa, requesting EPA approval of the proposed revision to the SIP for the State of Iowa, was included with the SIP submittal.

Evidence of State Adoption

Subsequent to a 30-day public notice and a public hearing, the Iowa Environmental Protection Commission, on DATE, approved this plan for submittal to EPA as a revision of the State's Implementation Plan for PM2.5 for the Muscatine area. The DNR followed all applicable procedural requirements of the State's laws and constitution in obtaining the adoption of this plan.

Necessary Legal Authority

The DNR is the regulatory agency with primary responsibility for outdoor air quality permitting and compliance activities in the state of Iowa. The DNR's authority is set forth in chapter 455B of the Code of Iowa and implemented through 567 Iowa Administrative Code (IAC) chapters 10 and 20-35, and 561 IAC chapters 2 and 7. The DNR's permitting and compliance programs, and rules, have previously been approved by EPA as part of the State of Iowa's SIP.

The State of Iowa has the necessary legal authority under State statute to adopt and implement this plan. Iowa Code section 455B.133(3) provides that the Iowa Environmental Protection Commission shall "adopt, amend, implement, or repeal emission limitations or standards for the atmosphere of this state on the basis of providing air quality necessary to protect the public health and welfare." The federal National Ambient Air Quality Standard for PM2.5 is adopted by reference at 567 IAC chapter 28. Iowa Code section 455B.134 (9) states that it is the duties of the director to "issue orders consistent with rules to cause the abatement or control of air pollution, or to secure compliance with permit conditions."

Evidence of Public Notice

Notice of the DNR's intention to revise the PM2.5 State Implementation Plan for the Muscatine area and providing a 30-day public comment period and hearing was published on DATE in the Muscatine Journal. Proof of publication is included in Attachment H. The public comment period was started on DATE, and extended through DATE.

Copies of the proposed SIP revision were made available to the public for their review during the comment period at the following locations: Muscatine Public Library, and the DNR Air Quality Bureau records center in Windsor Heights, Iowa.

Certification of Public Hearing

In accordance with the information provided in the published public hearing notices, a public hearing was held from TIME on DATE, in the Location. List attendees.

Compilation of Public Comments and the State's Responses

Written comments from NAMES regarding the proposed SIP revision were received during the public comment period in a letter dated…(complete as appropriate)

Process for SIP Revisions

Facilities included in the control strategy may request modification of construction permits or administrative consent orders included in the SIP by written application to the DNR as provided for in 567 IAC 22.7. Written application for modifications to construction permits or administrative consent orders shall include all necessary construction permit application forms. The forms shall be completed in their entirety. Modifications to construction permits may result in the requirement for the affected facility to complete a modeled attainment demonstration using approved dispersion modeling techniques, if requested by DNR. All construction permit modifications shall be placed on a 30-day public notice prior to approval of the modification. Once issued, the modified permits or administrative consent orders will be submitted to EPA for incorporation into the SIP and are subject to federal approval.

Attachment A.   Modeling Demonstration

Dispersion Modeling Demonstration for the Muscatine PM2.5 SIP

Project Purpose and Scope

On July 14, 2011 EPA Region 7 found that the Iowa State Implementation Plan (SIP) was substantially inadequate to maintain the 2006 24-hour National Air Quality Standard (NAAQS) for fine particulate matter (PM2.5) in Muscatine County, Iowa. As part of this finding, the Iowa Department of Natural Resources (DNR) is required to submit a modeling demonstration consistent with Appendix W to 40 CFR Part 51 showing what reductions will be needed to attain and maintain the PM2.5 NAAQS in Muscatine. This section outlines the modeling methodology used by the DNR to identify the reductions needed to attain and maintain the PM2.5 NAAQS in Muscatine.

Model Selection and Options

Air Quality Model Selection: The dispersion model used for this analysis was the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). The most current version of AERMOD available at the time was used for each step in the development of the SIP modeling demonstration. All analyses were conducted with EPA's regulatory default options. The final cumulative PM2.5 emissions control strategy modeling was conducted using AERMOD version 12345.

Extent of Receptor Grid: The 2008 Technical Support Document developed by the DNR to evaluate proposed PM2.5 non-attainment boundaries in Muscatine County strongly suggested that the Grain Processing Corporation (GPC) had a controlling role in causing or contributing to the monitored exceedances in Muscatine, therefore emissions from GPC were used to determine the extent of the receptor grid for the PM2.5 SIP modeling. This initial modeling used GPC's 2006-2008 PM2.5 actual emissions, 2006-2008 meteorological data, and a receptor grid with 1-kilometer receptor spacing that extended 50 kilometer from the GPC facility. Based on this initial analysis, it was determined that the grid should extend approximately five kilometers from the GPC property boundary. The final grid used in the remaining modeling for the PM2.5 emissions reduction strategy was extended to include the full property boundaries of all facilities with PM2.5 emissions included in the modeling for the emissions reduction strategy.

Receptor Grid Spacing: The receptor grid spacing used in the emissions reduction strategy analysis was consistent with Iowa's guidelines for both PSD and non-PSD modeling, with 50-meter spacing along all facility property boundaries. The one exception to this was the HNI HON Downtown facility where no facility boundary was evaluated. This facility is located in downtown Muscatine, consists of several buildings and it was unclear at the time where the property boundary was located. All area outside of the buildings was considered as ambient air. The 50-meter grid spacing extends from the GPC property boundary 0.5 kilometers, 100-meter spacing out to 1.5 kilometers, 250-meter spacing out to 3 kilometers and 500-meter spacing beyond 3 kilometers.

Terrain Elevations: The most recent version of AERMAP was used to import terrain and source elevations from the National Elevation Dataset (NED) in North American datum 1927. Facilities located along the Mississippi River have a levee that is approximately 9 meters higher than the normal river level. Elevations of receptors located along this levee are reflected in the elevations derived from the NED.

Downwash: All building downwash analyses were conducted using the most recent version of EPA's Building Profile Input Program with Plume Rise Enhancements (BPIP-Prime).

Meteorological Data: For all stages of development of the PM2.5 emissions reduction strategy modeling, the most recent and representative meteorological data were used. At the time that the initial modeling was conducted to determine the extent of the grid, develop the emissions inventory, and for the baseline modeling analyses, the Cedar Rapids meteorological station had been determined to be representative for the modeling domain. A detailed representivity analysis to support the use of the Cedar Rapids meteorological data is included in Appendix A of this modeling demonstration . These analyses were conducted using the surface station data from Cedar Rapids and upper air data from Davenport and used consecutive years from the most recent, readily available 5-year period (2004 – 2008), per section 8.3.1.2 of 40 CFR Part 51 Appendix W.

Meteorological data for the entire state was revised in November 2011 and again in January 2013. The revised November 2011 meteorological data used the most recent, readily available five-year period (2005 – 2009), included new sites, incorporated the recent upgrades to AERMET, and included one minute wind data. Use of new sites and additional refinement of the representativeness of the data resulted in a change from the Cedar Rapids to the Davenport meteorological data set for the PM2.5 emissions reduction strategy modeling. The representivity analysis to support the switch to the Davenport data is included as an addendum to Appendix A of this modeling demonstration. This meteorological data was re-processed in January 2013 due to a new version of AERMET released by EPA on December 17, 2012. The final cumulative PM2.5 emissions reduction strategy modeling was conducted using the 2005 – 2009 Davenport meteorological data processed with AERMET version 12345.

Modeling Methodology

Phased Analysis: Although the EPA finding that required this analysis occurred in June of 2011, the initial modeling to develop an emissions reduction strategy for Muscatine began in September 2009. Preliminary baseline modeling was conducted between 2009 and 2011 to determine the size of the receptor grid, which facility emissions to include in the analyses, and then determining which of those facilities would be part of the emissions control strategy. This baseline modeling was further revised in 2011.

Following the preliminary analyses, a three phased analysis to develop the final emissions control strategy was conducted between 2011 and 2013. Phase I required individual facilities included in the emissions reduction strategy to submit a model demonstrating that potential PM2.5 emissions from their facility would not cause highest, first-high predicted concentrations over 35 $\mu g/m^3$. For Phase II the DNR combined these individual facility-wide modeling analyses into a cumulative model along with the emission rates from the other facilities in the Muscatine SIP analysis. The other facilities included in the SIP analysis were evaluated at emissions that reflect their highest PM2.5 emission rates when operating at maximum capacity. Phase III mitigated the predicted exceedances and determined the reductions necessary to attain and maintain the 24-hour PM2.5 NAAQS in Muscatine.

Inventory Development: A modeling analysis was conducted for all major facilities located within 50 kilometers of the Muscatine ambient air monitor at Garfield School (also referred to as Muscatine High School East Campus) to develop the inventory of sources to include in the Muscatine PM2.5 SIP modeling. Any major source with a significant impact (1.2 $\mu g/m^3$ for the 24-hour averaging period) within the five kilometer receptor grid was included in the PM2.5 SIP modeling.

These facilities were evaluated at their actual PM2.5 emission rates based on the average of their 2007 and 2008 emissions data as reported by the facilities in their annual Title V Emissions Inventory Questionnaires. Fugitive emissions from the facilities located within the five kilometer receptor grid were also included in the evaluation. The major facilities that were evaluated for inclusion in the SIP modeling are listed Table 1 along with their locations as listed in their Title V operating permits.

Differing methods of evaluation were used for the facilities located within and outside of Muscatine. Major facilities located within Muscatine were modeled using their actual stack parameters and actual site layouts. Although the site locations for MidAmerican Louisa Generating Station, SSAB/Multiserve and Central Iowa Power Coop are listed in their Title V permits as being located in Muscatine, in actuality they are located outside the city of Muscatine: MidAmerican Louisa Generating Station is located approximately 9.5 kilometers to the south of the Garfield School monitor. SSAB/Multiserve and Central Iowa Power Coop are located over 20 kilometers to the northeast of the monitor. Major facilities located outside the city of Muscatine were evaluated with emissions exhausting from the one stack determined to have the highest PM 2.5 emission rate. This represents an acceptable approximation for more distant sources, and allowed for more reasonable model run times.

All major facilities located outside the city of Muscatine had highest, first-high predicted impacts below the significant impact level of 1.2 $\mu g/m^3$. The highest predicted impact from any one of these major facilities was 0.47 $\mu g/m^3$ from Central Iowa Power Coop. Therefore the major facilities located outside of Muscatine were not included in the PM2.5 SIP modeling. Emissions from the major facilities located outside of Muscatine are considered to be accounted for in the inclusion of a background concentration to the model results.

Table 1. Major Facilities within 50 Kilometers of the Garfield School Monitor

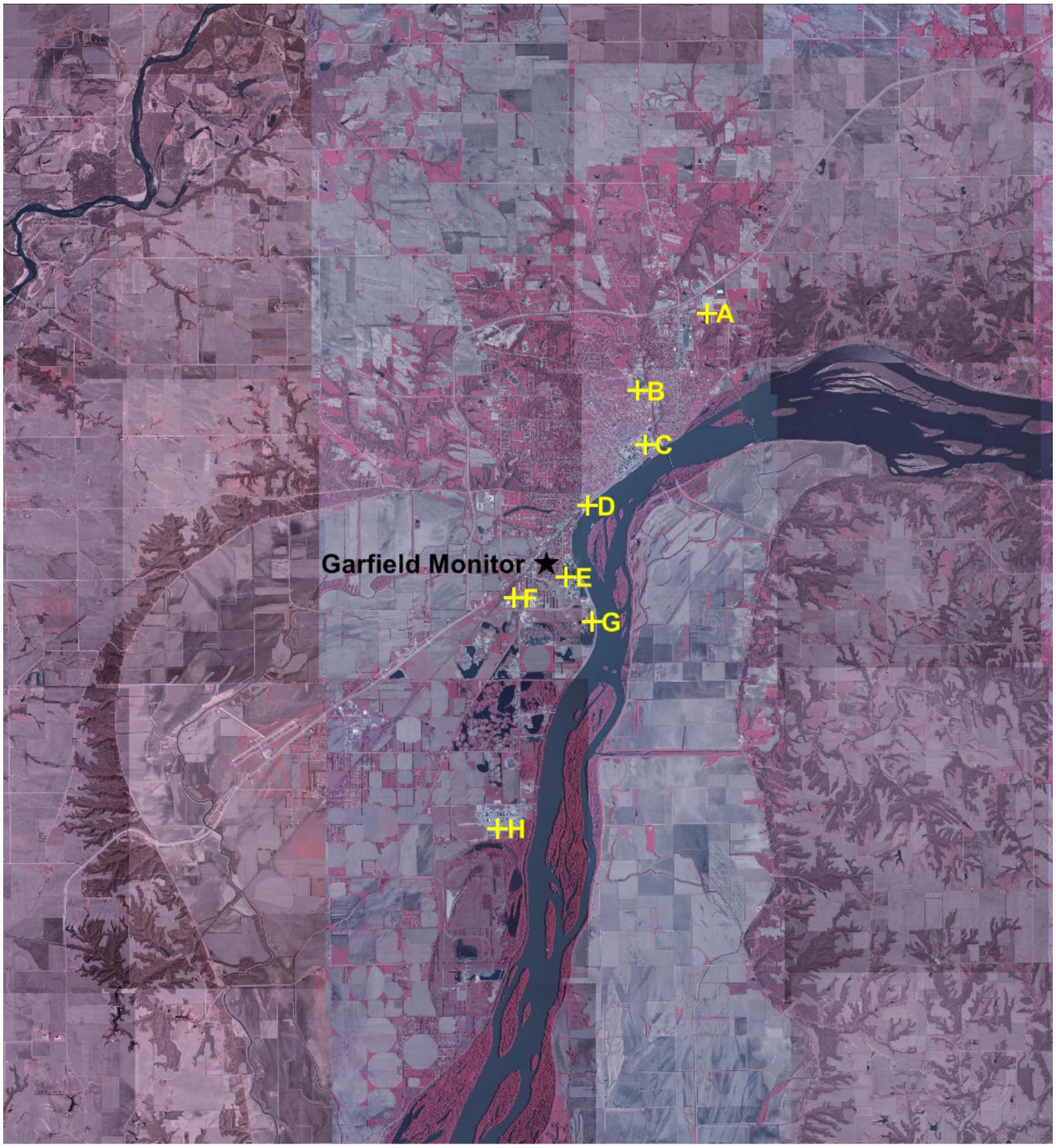
Facility	Site City
Gerdau Ameristeel US Inc.	Wilton
Xerxes Corporation	Tipton
United States Gypsum	Mediapolis
IAC Iowa City, LLC	Iowa City
University of Iowa - campus	Iowa City
University of Iowa - power plant	Iowa City
Enterprise NGL Pipeline	Iowa City
Loporex, Inc.	Iowa City
Iowa City Sanitary Landfill	Iowa City
MidAmerican Energy Corporation -Coralville turbines	Coralville
Magellan Pipeline Company, LP	Coralville
Natural Gas Pipeline Co. of America - Columbus Junction	Columbus Junction
Natural Gas Pipeline Co. of America - Letts	Letts
ALCOA, Inc.	Riverdale
Blackhawk Foundry & Machine Company	Davenport
Linwood Mining & Minerals Corporation	Davenport
Nichols Aluminum	Davenport
Nichols Casting	Davenport
John Deere Davenport Works	Davenport
Scott County Landfill	Davenport
Sivyer Steel	Bettendorf
MidAmerican Company – Riverside Station	Bettendorf
Arch Mirror North	Bettendorf
Veolia Water NA	Bettendorf
Lafarge North America, Inc.	Buffalo
ACO YP, Inc	Riverdale
ACH Foam Technologies, LLC	Washington
MidAmerican Energy Company - Louisa Generating Station	Muscatine
Grain Processing Corporation	Muscatine
SSAB/Multiserve	Muscatine
Central Iowa Power Coop – Fair Station	Muscatine
H J Heinz Company, LP	Muscatine
HNI Allsteel Muscatine Components	Muscatine
HNI HON Downtown	Muscatine
McKee Button Company	Muscatine
Monsanto Company	Muscatine
Muscatine Power & Water	Muscatine
Union Tank Car Company	Muscatine

All major facilities located within the city of Muscatine had highest, first-high predicted impacts greater than the PM2.5 significant impact level of 1.2 $\mu g/m^3$ and therefore were included in the PM2.5 SIP modeling analysis. These eight facilities and their highest predicted impacts within the five kilometer grid are listed in Table 2. The relative locations of the major facilities in Muscatine to the Garfield School monitor are shown in Figure 1.

Table 2. Facilities Predicted to have at least a Significant Impact (SIL = 1.2 $\mu g/m^3$)

Facility	H1H impact within the grid
Grain Processing Corporation (GPC)	98.4
H J Heinz Company , LP	1.7
HNI Allsteel	2.5
HNI HON Downtown	21.6
McKee Button Company	4.0
Monsanto Company	39.6
Muscatine Power & Water (MPW)	38.5
Union Tank Car Company	93.4

Figure 1. Location of Major Facilities in Muscatine



A - HON Allsteel
B - H J Heinz
C - HON Oak Steel
D - McKee Button
E - Grain Processing Corporation
F - Union Tank Car
G - Muscatine Power & Water
H - Monsanto

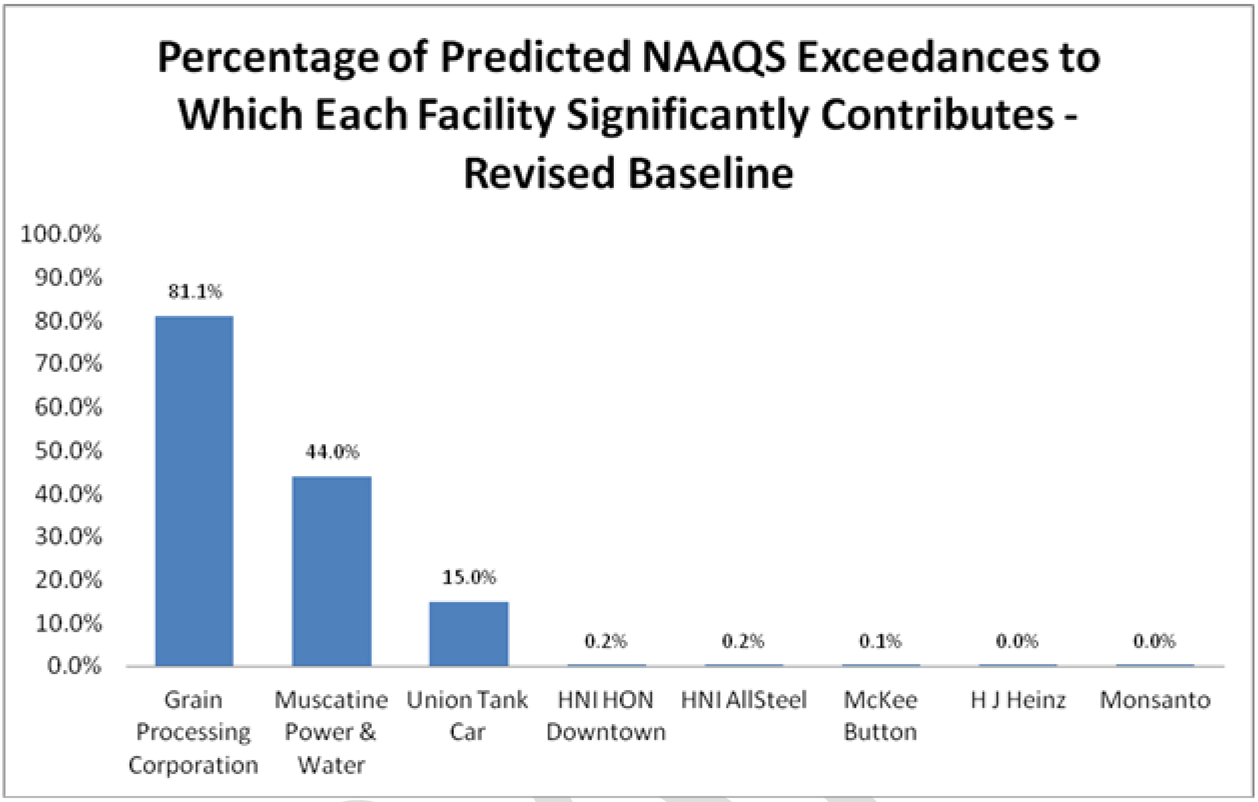
Preliminary Baseline Modeling: The eight facilities determined to be part of the PM2.5 SIP analysis were evaluated to determine which of these facilities should be part of the PM2.5 emissions control strategy. Individual modeling analyses were conducted for each of the eight facilities identified to be included in the PM2.5 SIP modeling using their actual emission rates. The results from these individual analyses were combined in a Microsoft Access database to determine the percentage of predicted NAAQS exceedances to which each facility significantly contributed. The preliminary baseline modeling results indicated that four facilities (GPC, MPW, Union Tank Car, and Monsanto) each had a significant contribution to at least one percent of the predicted 24-hour NAAQS exceedances.

Revised Baseline Modeling: The four facilities identified as having a significant contribution to at least one percent of the predicted PM2.5 NAAQS exceedances in the preliminary baseline analysis were contacted to inform them of the initial baseline modeling results. The DNR modeling files and emissions data was provided to allow the facilities to review the DNR data including the DNR determined potential and actual PM2.5 emission rates for their facilities. Revised information was provided by these four facilities. In addition, updated information was provided for the two HNI facilities (Allsteel and HON Downtown).

The baseline modeling analyses was re-accomplished with the revised data and the percentage of predicted NAAQS exceedances to which each facility significantly contributed was determined. A chart depicting the percent of NAAQS exceedances that each facility had a significant contribution to was developed. The revised baseline analysis indicated that GPC, MPW and Union Tank Car each had a significant contribution to at least one percent of the predicted 24-hour NAAQS exceedances. Monsanto had less than 0.005 percent contribution to any predicted 24-hour NAAQS exceedance, and was no longer considered to be part of the PM2.5 emission control strategy. The chart of the percentage of predicted 24-hour PM2.5 NAAQS exceedances to which each facility significantly contributed is shown in Figure 2.

Cumulative Modeling: A three phased approach was used to develop the PM2.5 emission control strategy. For Phase I, the facilities determined to be part of the emission control strategy (GPC, MPW, and Union Tank Car) were required to submit a modeling scenario for their individual facility with predicted highest, first-high impacts below the 24-hour NAAQS of 35 $\mu g/m^3$ using potential emission rates and excluding background concentrations. Since these facilities were determined to be a part of the emissions control strategy, the potential emission rates used in the cumulative modeling analysis for the SIP submittal will become the facility’s permitted emission rates.

Figure 2. Revised Baseline Modeling Results



In Phase II, the DNR combined the data from the individual facilities into one cumulative modeling analysis. The submitted individual modeling scenarios for these three facilities were combined with emissions from the remaining five facilities that are part of the SIP. Since these five facilities are not considered to be part of the emissions reduction strategy, their modeled emission rates were based on the highest predicted PM2.5 emission rates when the source is operating at maximum capacity. These emission rates will not become their permitted emission rates, with the exception of Monsanto. The Monsanto facility requested that their modeled PM2.5 emission rates become enforceable. These PM2.5 emission rates were made enforceable through modified air construction permits issued October 24, 2012. This cumulative analysis evaluated the highest, eighth-high concentrations including background concentrations (see background discussion in the section below). The Phase II modeling analysis continued to result in numerous predicted exceedances of the NAAQS.

Phase III of the analysis evaluated facility-wide contributions to the predicted exceedances, including background concentrations, to develop the final emissions control strategy. Results from the Phase II modeling analysis were provided to GPC, MPW and Union Tank Car along with the specific receptor locations with predicted exceedance of the NAAQS where only their individual facility had a significant contribution. These facilities were then required to submit modeling analyses that either demonstrated that there were no longer any predicted exceedances of the NAAQS at these receptor locations, or that their facility no longer had a significant contribution to any of these NAAQS exceedances. The final cumulative analysis resulted in predicted exceedances of the 24-hour PM2.5 NAAQS, however the three facilities determined to be part of the mitigation strategy do not cause any predicted exceedances and do not have a significant contribution to any predicted exceedance.

Background Value Selection: Background values are intended to account for emissions from natural sources, nearby minor sources not included in the analysis, unidentified sources, and the secondary formation of PM2.5 emissions from nearby facilities. Based on discussions with monitoring staff and EPA Region VII, the Iowa City monitoring site was initially determined to be representative of background concentrations for Muscatine. The Iowa City 24-hour 98th percentile monitored PM2.5 concentration for 2006-2008 was 29.0 $\mu g/m^3$.

Current EPA PM2.5 modeling guidance (March 2010 Stephen Page memorandum) indicates that combining the highest average of the maximum modeled 24-hour averages across five years of meteorological data with the monitored 24-hour design value may be overly conservative. This guidance also states that in some cases "…a Second Tier modeling analysis may be considered that would involve combining the monitored and modeled PM2.5 concentrations on a seasonal or quarterly basis, and re-sorting the total impacts across the year to determine the cumulative design value." At this time no additional guidance has been provided by EPA on the details of this approach or the circumstances where this approach may be appropriate.

On January 7, 2011, the National Association of Clean Air Agencies (NACAA) PM2.5 Modeling Implementation Workgroup provided EPA with recommendations regarding PM2.5 background concentrations for ambient air quality demonstrations required for New Source Review. In this document NACAA recommends that EPA include the option of a "Paired-Sums" approach where continuous data from a single monitor site could be combined with modeled concentrations prior to determining the design value.

Because a more refined approach was required for this situation, the DNR used a "Paired-Sums" approach for the cumulative modeling analyses. A data set of hourly background values was developed for the 2005 - 2009 period. The data was based on monitored concentrations from Iowa City with missing data filled (by order of preference) from Davenport, Des Moines, or the highest value observed at the Iowa City monitor (by month of year).

The AERMOD dispersion model version 11059 was enhanced in February 2011 to allow users to specify background concentrations to be added to the impacts from modeled emissions sources to determine cumulative impacts. Specifying background concentrations is discussed in section 2.5 of EPA's addendum to the AERMOD user's guide (version 12345). This section warns that since modeled concentrations are not calculated for hours with calm or missing meteorological data, background concentrations are also omitted for those hours, possibly resulting in lower than expected background concentration. A scaling factor was developed by the DNR to alleviate the potential of underestimating the background contribution due to any calm hours in the meteorological data.

Modeled Emission Rates and Stack Parameters

The 24-hour PM2.5 emission rates and source release parameters for the emission sources at GPC, MPW and Union Tank Car are summarized in the attached spreadsheets:

- PM25 SIP Modeling Parameters – GPC.xlsx
- PM25 SIP Modeling Parameters – MPW.xlsx
- PM25 SIP Modeling Parameters – UTC.xlsx

All point sources with a horizontal, downward or obstructed discharge were modeled with an exit velocity set equal to 0.001 m/s per the DNR modeling guidelines. This allows for buoyancy-induced plume rise while restricting momentum-induced plume rise that is prevented by a non-vertical stack.

Dispersion Modeling Results

The final cumulative Muscatine PM2.5 SIP modeling analysis resulted in predicted exceedances of the 24-hour PM2.5 NAAQS, however the three facilities determined to be part of the mitigation strategy, GPC, MPW and Union Tank Car do not cause any predicted exceedances and do not have a significant contribution to any predicted exceedance.

The model results of the highest, eighth-high modeled impact s (including the "paired-sums" background concentrations) indicate that predicted concentrations remain above the 24-hour PM2.5 NAAQS at fifteen receptor locations in the vicinity of the HJ Heinz and HNI HON Oak Steel facilities. The highest contribution to these exceedances by any facility in the mitigation strategy is 0.8 $\mu g/m^3$. Predicted exceedances in the vicinity of these two facilities will be resolved through DNR construction permit program and will not be addressed as part of the SIP evaluation.

At the remaining 3,987 receptors in the grid, the highest, eighth-high predicted impact (including the "paired-sums" background concentrations) was 35.29 $\mu g/m^3$. Per conversation with EPA Region VII, modeled concentrations below 35.49 $\mu g/m^3$ are sufficient for demonstrating compliance with the 24-hour PM2.5 NAAQS. This modeling analysis was conducted consistent with Appendix W to 40 CFR Part 51 and demonstrates what reductions will be needed to attain and maintain the PM2.5 NAAQS in Muscatine.

Appendix A

Introduction

This is an analysis of the representativeness of the Cedar Rapids meteorological data for use in the ongoing PM2.5 modeling in the Muscatine area. During a conference call on July 13, 2010 EPA Region VII indicated that this analysis should address the differences in surface characteristics between the Cedar Rapids measurement site and the application site in Muscatine. EPA and DNR agreed that the analysis should focus on the area near the Grain Processors Corp (GPC) facility, and that the analysis would be applicable for the entire modeling domain. Due to the expansive nature of the GPC facility, the DNR proposed to center the analysis on the GEP stack (EP001). EPA approved this approach, and EPA and DNR also agreed that the analysis should consider the variation of surface characteristics from different wind direction sectors due to the proximity of the Mississippi River immediately to the East of the facility.

The comments provided by EPA on the proposed modeling protocol indicated that this analysis should follow the requirements of 40 CFR, Part 51, Appendix W, Section 8.3 **[1]**. This section states that the representativeness of meteorological data is dependent on four factors:

- Instrument Exposure – The exposure of the meteorological monitoring site.
- Temporal Proximity – The period of time during which data are collected.
- Spatial Proximity – The proximity of the meteorological monitoring site to the area under consideration.
- Geographic Features and Land Cover – The complexity of the terrain.

Each of these criteria is covered in detail in the Department's "Meteorological Data Representivity Analysis" document **[2]**. The information in that document that directly applies to this analysis, as well as the requested comparison of surface characteristics at the measurement and application sites is presented herein.

Instrument Exposure

Instrument exposure refers to the ability of the instruments to measure meteorological conditions without the influence of manmade or natural obstructions. If obstructions are present, they can influence the measurements of the meteorological monitoring site. For example, a tree located near an instrument tower could alter the speed and direction of the wind at the instrument. These effects, or any others like them, are not desirable, and any instrument affected by such local-scale influences should not be used to develop meteorological data for use in a dispersion model.

The Cedar Rapids meteorological site is an Automated Surface Observing Station (ASOS), and is located at the Cedar Rapids airport. Airport-based ASOS stations are purposely sited with good exposure so that they may provide accurate weather information for the aviation community. It is stated that "the NWS will follow the guidelines documented in the Federal Standard for Siting Meteorological Sensors at Airports" when siting ASOS stations **[3]**. These standards include siting and exposure requirements that limit the effects of any obstructions within 1000 feet of the anemometer **[4]**. Because of this it was determined that instrument exposure would not affect the representativeness of the Cedar Rapids data.

Temporal Proximity

"Consecutive years from the most recent, readily available 5-year period are preferred" for use with regulatory air dispersion modeling analyses **[1]**. At the time this analysis began, 2008 was the most recent year available. Therefore the years 2004 – 2008 were used in the processing of the AERMOD meteorological data set.

Spatial Proximity

The nearest existing meteorological site is at the Muscatine airport. This site is only 5 miles to the West, and within the river valley in which the entire modeling domain is located. However, the Muscatine data contains over 20% calms. Model concentrations tend to increase during periods of low wind speeds. Unfortunately, calms are generally reported during these same periods. Since AERMOD interprets calms as missing data, excessive amounts of calms during low wind speed periods would result in an overall reduction in predictions during the period with the highest likely concentration. This sort of under-prediction bias is not desirable, and thus the Muscatine data was eliminated as a possibility for this analysis.

The three nearest meteorological stations for which the Department has processed data for use in AERMOD are Moline, IL (29 miles); Burlington, IA (43 miles); and Cedar Rapids, IA (48 miles). For reasons described in the following section, Cedar Rapids was chosen as the most representative of these nearby stations.

Geographic Features and Land Cover

Geographic features can affect meteorological patterns in an area due to uneven heating and cooling of land and water, and physical redirection of atmospheric flow. It is difficult to quantify these effects analytically, but they can be observed to some extent by reviewing historical measurements. As described in the Department's "Meteorological Data Representivity Analysis" document, wind roses can be used to view the wind patterns caused by terrain influences. It can be assumed that two locations with similar wind roses either have similar terrain effects, or that the terrain does not significantly alter the mesoscale atmospheric flow.

As stated in the previous section, the Muscatine airport is located within the river valley included in the modeling domain, but is unusable for the modeling analysis because of the large number of missing data. Even so, because of the proximity of the Muscatine airport to the modeling domain, the data that is available can be used as a comparison to other sites with more complete records. The wind rose for the Muscatine airport and the three next nearest sites for which the Department has AERMOD-ready meteorological data are shown in Figures A1 – A4 **[2]**.

The nearest site, Moline, is the least similar to the wind rose observed at Muscatine. That location was eliminated as a possibility, leaving two sites. Both Burlington and Cedar Rapids have wind roses that are very similar to the wind rose from Muscatine. However, the dominant wind directions appear rotated approximately 40 degrees clockwise at Burlington, as does the direction of the most common lower wind speed (which is an important consideration for design concentrations). On the other hand the dominant wind directions at Cedar Rapids match those observed at the Muscatine airport very well.

In EPA's comments to the original modeling protocol for this analysis, concern was expressed that using wind roses alone as a surrogate for terrain and land cover influences may not be sufficient in this application. Specific concern was expressed regarding the ability of the Cedar Rapids data to accurately represent the planetary boundary layer in the modeling domain due to differences in surface roughness between airports and industrial sites.

Based on the AERMOD Implementation Guide, a comparison of the surface characteristics between the National Weather Service (NWS) measurements site and the facility location, coupled with a determination of the importance of those differences relative to predicted concentrations, is appropriate in this case **[5]**.

An AERSURFACE analysis was conducted for both the Cedar Rapids meteorological site and the area around the GPC facility. The analysis at GPC was centered on the GEP stack at the facility as agreed upon by EPA Region VII. Of main concern with regard to the representivity of the surface characteristics is the notable contrast between the low roughness of the Mississippi River to the East of the modeling domain and the high roughness of the industrial area to the West (where surface roughness varies from near zero over the river to nearly one meter over the land). Whereas the surface roughness around the meteorological measurement site is much more homogenous, with nearly the entire area being either cropland or grassland with only a scattering of other land use types. The most notable variation in surface roughness around the meteorological measurement site is the change from croplands in the south to grassy areas around the runways to the north (where surface roughness varies from around 0.1 meters over the grassy areas to 0.2 meters over the cropland in the summer and early fall, and is nearly identical during the remainder of the year). For this reason, it was decided to focus on the application site when selecting the sectors to be analyzed. Therefore, results were calculated for two separate sectors. Sector 1 covers wind directions from 0 to 140 degrees and encompasses wind directions that cross the river at the application site. Sector 2 covers the remainder of the compass directions (140 – 360 degrees) and represents wind directions that cross the land at the application site. See Figure A5 for a depiction of the National Land Cover Data (NLCD) and the two sectors used in the analysis.

Figure A1. Muscatine Wind Rose

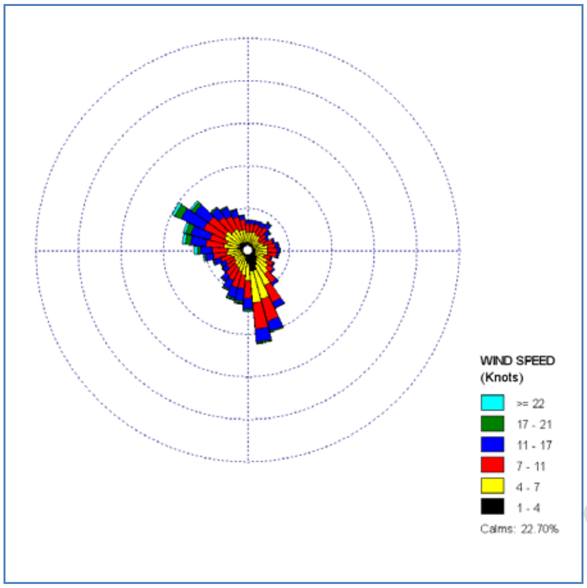


Figure A2. Burlington Wind Rose

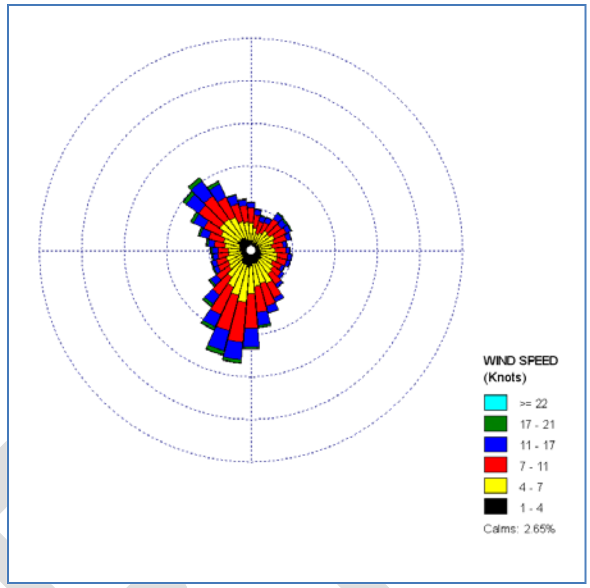


Figure A3. Cedar Rapids Wind Rose

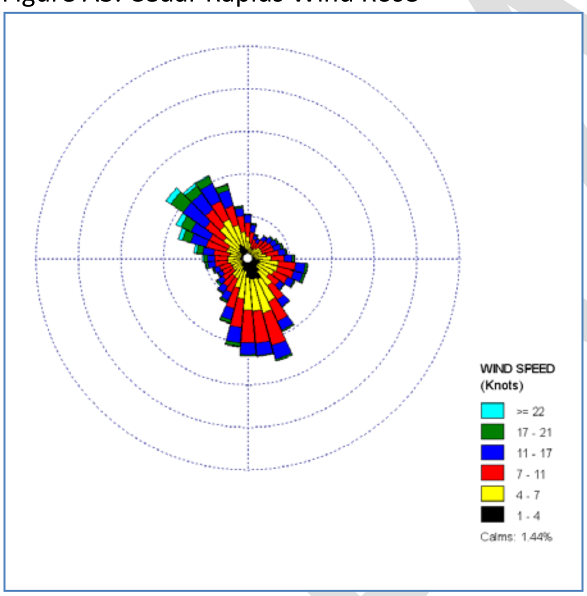
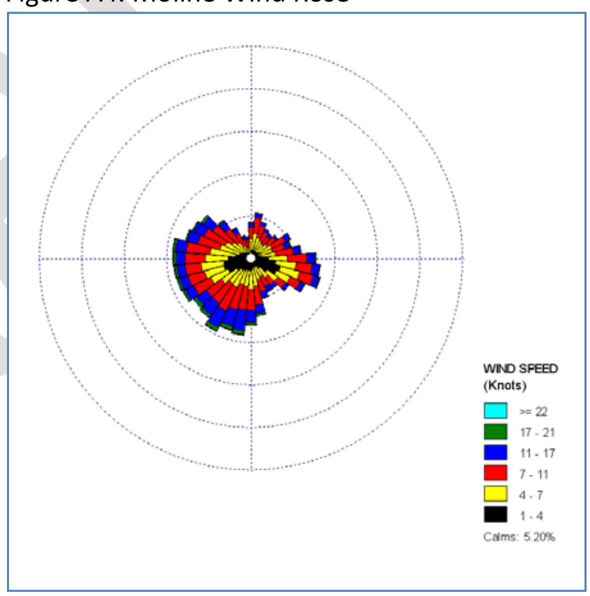


Figure A4. Moline Wind Rose



The net differences between the measurement and application sites are presented in Table A1. Positive numbers indicate a higher value at the measurement site, while negative numbers indicate a lower value.

Table A1. Surface Characteristic Differences Calculated by AERSURFACE

Sector	Albedo	Bowen Ratio	Surface Roughness (m)
1 – Over River (0° – 120°)	+ 0.03	+ 0.06	+ 0.05
2 – Over Land (120° – 360°)	+ 0.03	+ 0.06	– 0.41
Average	+ 0.03	+ 0.06	– 0.18
Possible Range	0.1 – 0.6	0.1 – 6.0	0.0001 – 1.3

The albedo at both sites is very comparable. The albedo at the measurement site is slightly higher than at the application site. The net difference (+ 0.03) is equivalent to only 6% of the possible range of albedo values in AERSURFACE (0.1 – 0.6). This very small difference is not expected to have any significant effect on predicted concentrations.

The Bowen Ratio at both sites is also very comparable. The Bowen Ratio at the measurement site is slightly higher than at the application site. The net difference (+ 0.06) is equivalent to only 1% of the possible range of Bowen Ratio values in AERSURFACE (0.1 – 6.0). This very small difference is not expected to have any significant effect on predicted concentrations.

As expected, the difference in surface roughness between the two sites is more significant than the other two surface characteristics. For the over-river sector, the surface roughness is only slightly higher at the measurement site than at the application site. However, for the over-land sector, the surface roughness is much lower at the measurement site than at the application site. The net differences for sectors 1 and 2 (+ 0.05 and – 0.41) are equivalent to 4% and 32% of the possible range of surface roughness values in AERSURFACE (0.0001 – 1.3).

A known issue with the use of the 1992 NLCD in AERSURFACE is the fact that transportation areas (low roughness) are included in the same category as residential and industrial areas (high roughness). The AERSURFACE user guide estimates that roads and runways would have a roughness value of 0.05 meters (based on the bare rock/sand/clay category), and residential and industrial areas have a roughness value of between 0.54 meters and 1.0 meter. AERSURFACE also assumes that the roughness value for industrial areas not at an airport already contain 20% transportation (estimated using the bare rock/sand/clay category). Low intensity residential assumes no transportation, but does include 10% grassy areas (also a lower roughness value). High intensity residential includes neither transportation nor grassy areas **[6]**.

Further investigation of the application site indicates that the amount of Industrial and Residential land use in the area is greatly over-estimated in the 1992 NLCD. For this reason a separate analysis was performed outside of AERSURFACE to determine the extent of the over-estimation.

An aerial photograph from 2009 (Figure A6) was examined and several types of general land use were manually applied based on the image (Figure A7). As can be seen when comparing Figures A5 and A7, there is a large portion indicated as Industrial or Residential (shades of red and pink in Figure A5) in the 1992 NLCD where the true land cover is either roadways, parking lots or barren ground (yellow in Figure A7), or grassy areas (light green in Figure A7). The result is an overestimation of the surface roughness values when using AERSURFACE.

To determine the effect that this discrepancy has on the roughness values the percentage of mislabeled Residential and Industrial land cover in sector 2 was determined. This was accomplished by overlaying that portion of the manual land use analysis indicated as roadway, barren or grassland on areas in the 1992 land use image that were indicated as being either Industrial or Residential (see Figure A8). Only areas that were originally labeled as either Industrial or Residential in the 1992 NLCD are shown. Areas that were neither Residential nor Industrial, or that were not in Sector 2, are shown in white. The areas that are still depicted in shades of red and pink were correctly labeled as Residential or Industrial. The areas depicted in yellow are areas that should have been labeled as roadways or as barren land. The areas depicted in light green are areas that should have been labeled as grassland.

Figure A5. 1992 National Land Cover Data with Analysis Sectors.

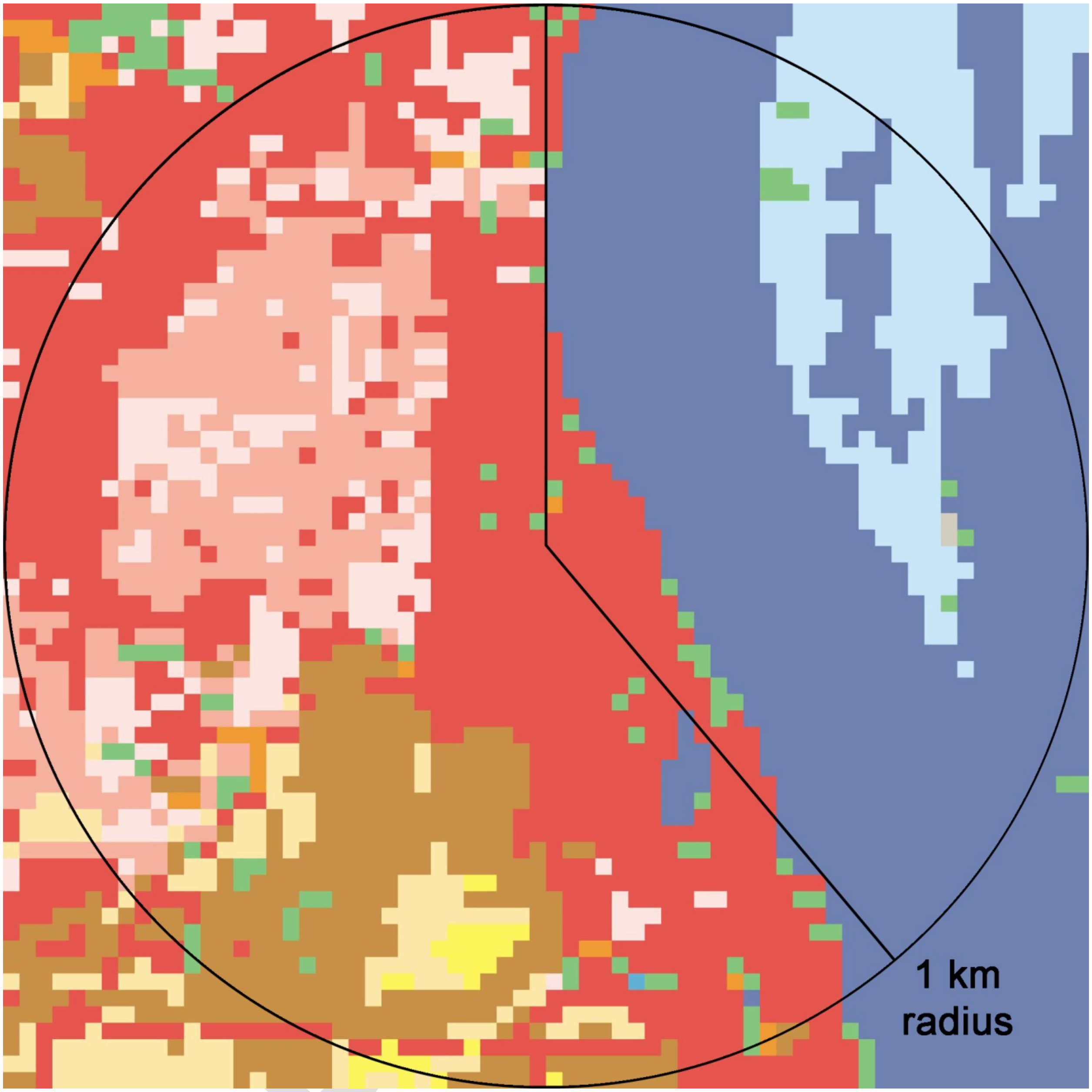


Figure A6. 2009 Aerial Photograph with Analysis Sectors

Figure A7. Manual Land Use Analysis Using 2009 Aerial Photograph

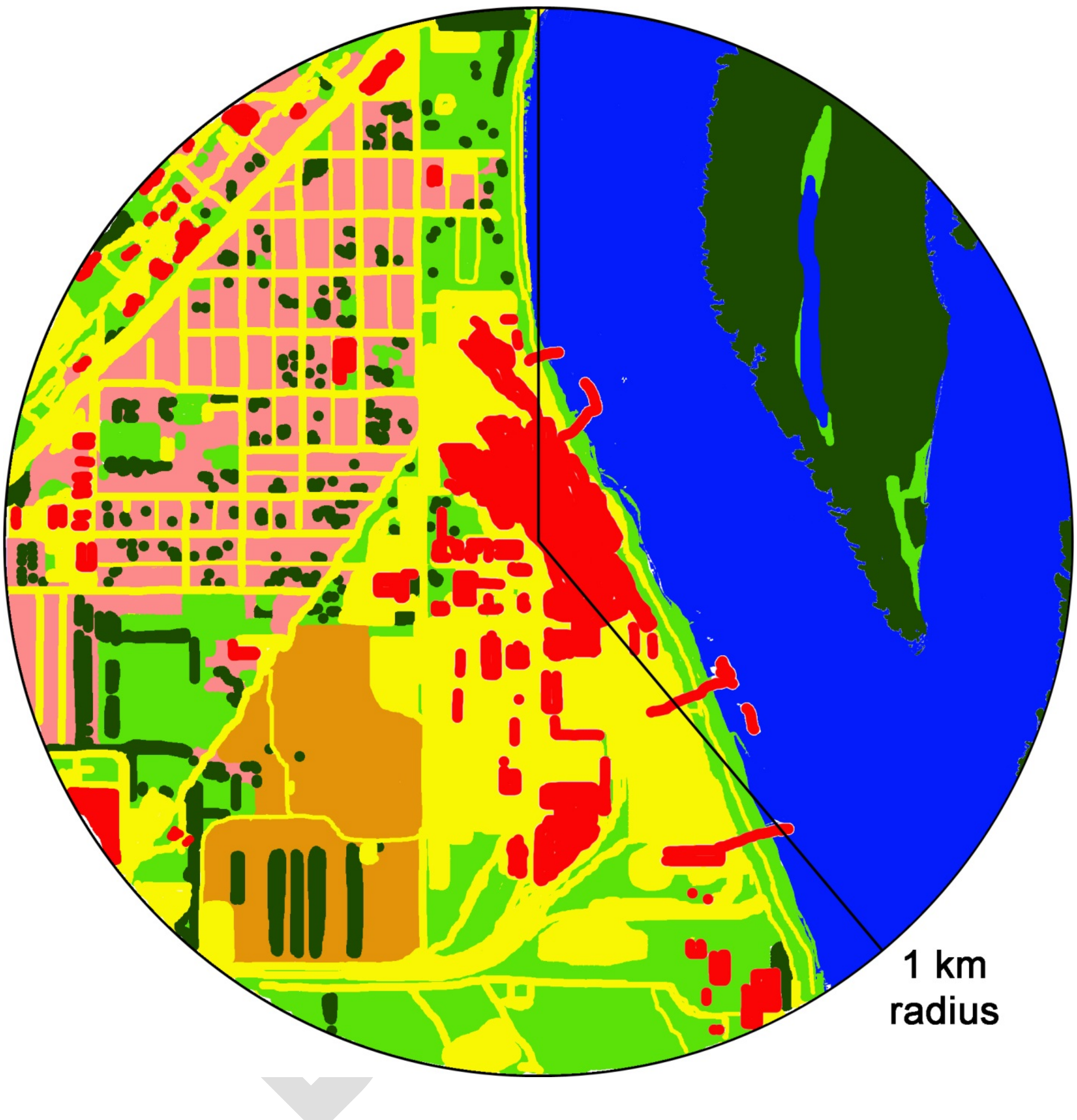
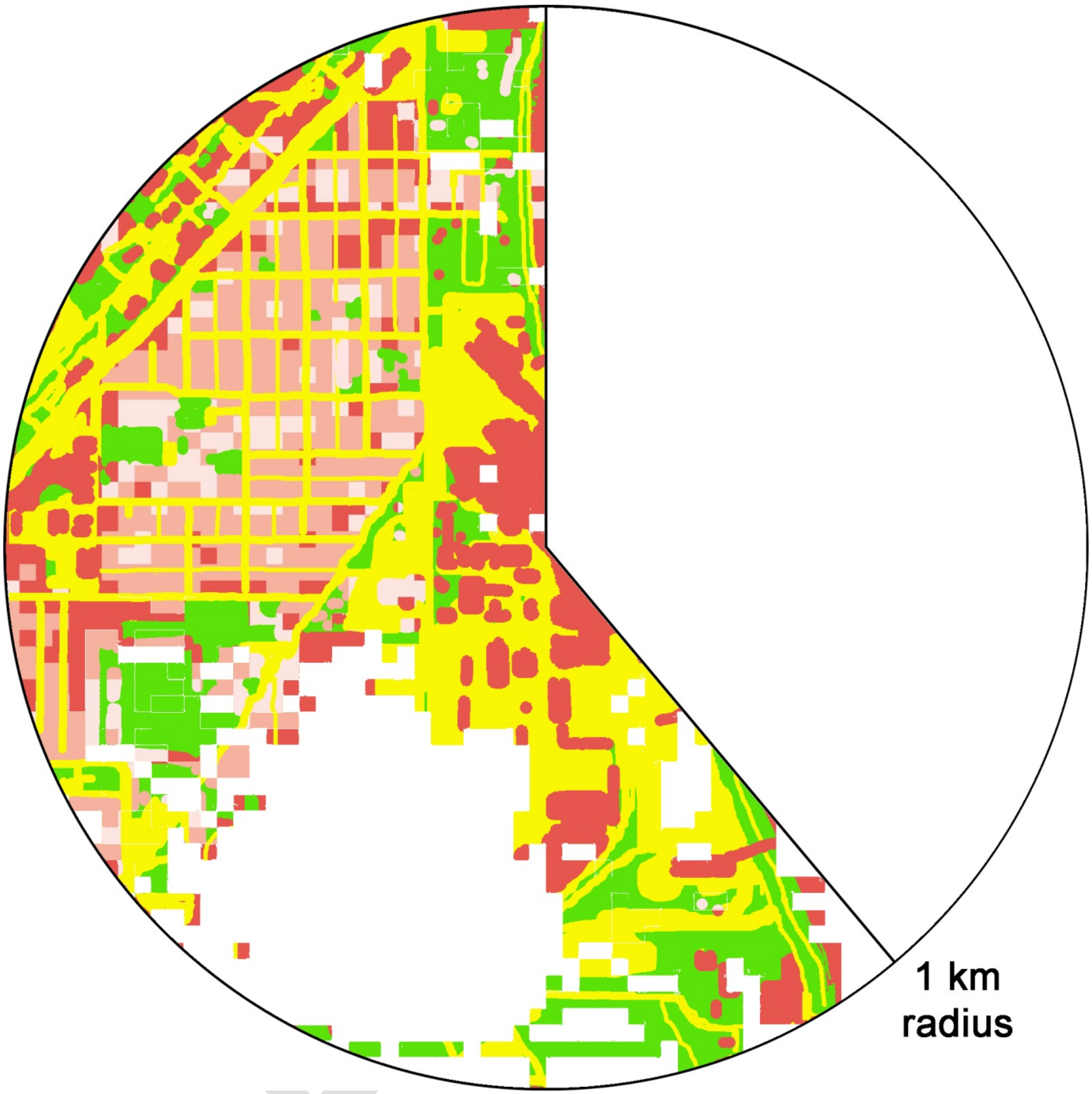


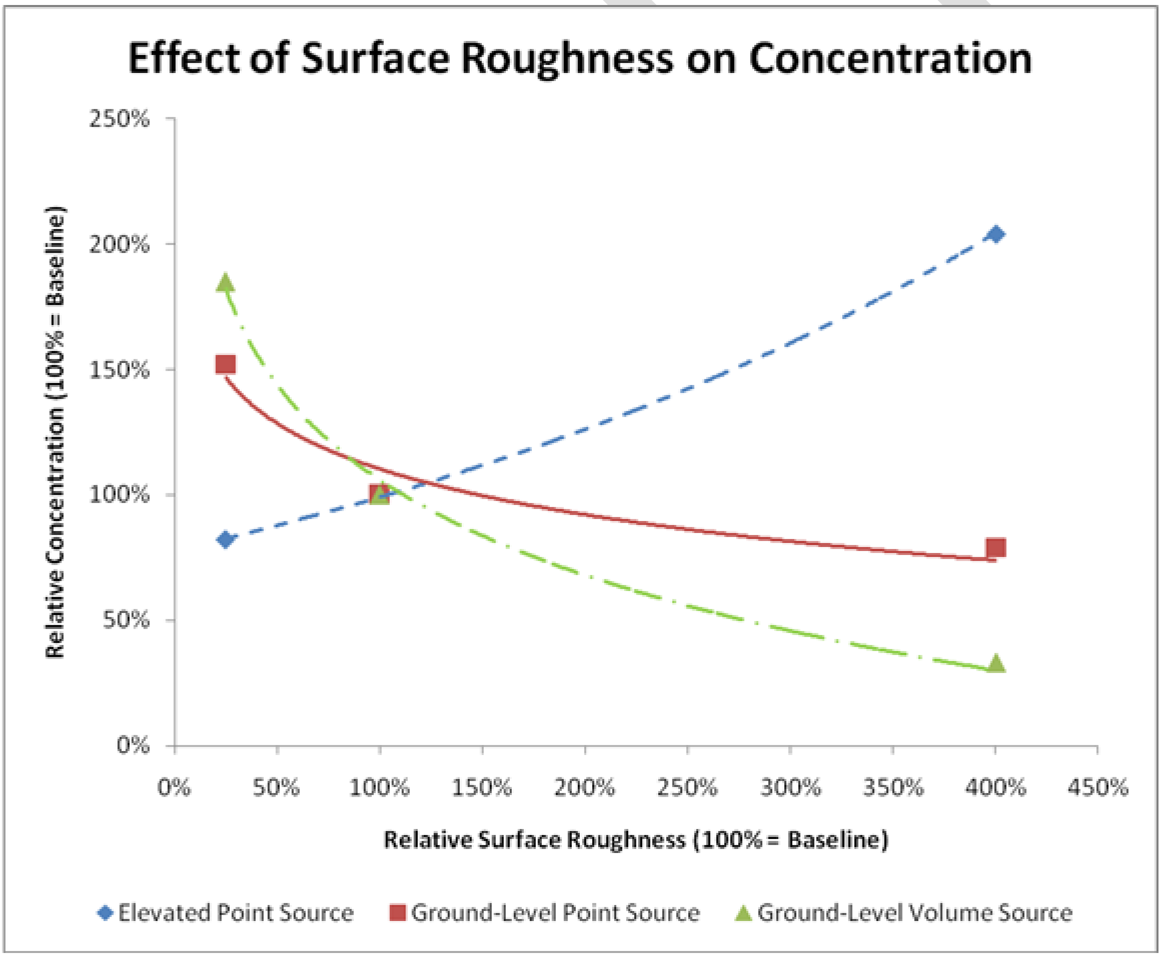
Figure A8. Evaluation of Mislabeled Residential and Industrial Areas in 1992 NLCD



This analysis indicates that approximately 58% of the flat open areas (roads, barren or grassland) in sector 2 were mislabeled as Industrial or Residential in the 1992 NLCD, greatly increasing the surface roughness calculated by AERSURFACE. A direct adjustment to the surface roughness calculated by AERSURFACE is not possible because it is based on a distance-weighted average. However, it is certain that the true roughness in this area is much lower than that calculated by AERSURFACE. In addition, this analysis was centered on the most concentrated area of Industry in the modeling domain. The surface roughness determined at this location is likely to be higher than at any other location in the modeling domain. Per the CFR, the surface characteristics at the measurement site should be compared to those that "generally describe the analysis domain" **[1]**. These things considered, the surface roughness in the over land sector is likely to be slightly higher, but generally similar to the general surface roughness of the measurement site.

As depicted in Figure A9, model concentrations tend to increase as surface roughness increases for elevated sources (due to an increased rate of mixing of emissions down to the surface), and to decrease as surface roughness increases for ground-based sources (due to increased dispersion in the lower portion of the boundary layer) **[7]**. Based on this, and the generally higher surface roughness seen in the over land sector, the application of Cedar Rapids meteorological data in the Muscatine modeling domain is expected to cause increased concentrations from elevated sources and decreased concentrations from ground-based sources in the Eastern portion of the modeling domain. The magnitude of these effects cannot be known, but it appears that the discrepancies between surface roughness at the measurement and application sites will be relatively small. As such, the effects on predicted concentrations are also expected to be relatively small.

Figure A9. Depiction of Model Sensitivity to Surface Roughness



Conclusion

The Cedar Rapids meteorological station easily meets the exposure, temporal proximity and spatial proximity criteria outlined in the CFR when applied in the Muscatine modeling domain. There is also good agreement between the sites for terrain influences, and the albedo and Bowen Ratio surface characteristics. The main concern between these sites is the surface roughness. As described herein, the differences in surface roughness between the two sites are relatively minor once the discrepancies in land cover data are considered. These minor differences are expected to increase predicted concentrations caused by some sources and decrease the concentrations caused by others. Given the good agreement of the majority of representivity criteria, and the counter-balancing effects of the minor surface roughness discrepancies, the Cedar Rapids meteorological data is considered representative of the Muscatine modeling domain.

References

1. Code of Federal Regulations, Title 40 (Protection of the Environment) Appendix W to Part 51 – Guideline on Air Quality Models, Section 8.3.

2. Iowa DNR – Air Quality Bureau, 2006. Meteorological Data Representivity Analysis, http://www.iowadnr.gov/air/prof/tech/files/representivity_analysis.pdf.

3. McCarthy, D. H. et al, 2005. Instrument Requirements and Standards for the NWS Surface Observing Programs (Land), p. 4. http://www.nws.noaa.gov/directives/sym/pd01013002curr.pdf.

4. Wright, J. M., 1994. Federal Coordinator for Meteorological Services and Supporting Research, Federal Standard for Siting Meteorological Sensors at Airports, Section 2.5. FCM-S4-1994 Washington D.C. http://www.ofcm.gov/siting/text/a-cover.htm.

5. U.S. EPA, 2009. AERMOD Implementation Guide. http://www.epa.gov/ttn/scram/7thconf/aermod/aermod_implmtn_guide_19March2009.pdf.

6. U.S. EPA, 2008. AERSURFACE User's Guide.

7. Long, G. E., Cordova, J. F. and Tanrikulu, S., 2004. An Analysis of AERMOD Sensitivity to Input Parameters in the San Fransisco Bay Area. 13th Conference on the Applications of Air Pollution Meteorology with the Air & Waste Management Association. p. 4.

Addendum to Appendix A of the Modeling Protocol for the Muscatine PM2.5 SIP Revision

The Department completed processing of a new meteorological data set for the period 2005 – 2009 for use in dispersion modeling analyses performed as part of the pre-construction permit application review process in February of 2013. Several additional sites were discovered that met the 90% data completeness requirement described in Appendix W, as well as having 1-minute data available to be used in the newest version of the AERMET meteorological data preprocessor. One of these additional sites is the Davenport airport (KDVN).

The Department has determined that the Davenport data is representative of the area being analyzed in the Muscatine PM2.5 SIP modeling, and will utilize 2005 – 2009 Davenport data for the remaining portions of the Muscatine PM2.5 SIP analysis instead of the 2004 – 2008 data from Cedar Rapids.

<u>Analysis of Wind Roses</u>

Shown below are the 2005 – 2009 wind roses for the meteorological sites in question (Figures 1 – 3). All three wind roses indicate similar predominant wind directions (NW and S). Both Cedar Rapids and Davenport include a similar amount of calm winds, while the Muscatine data includes a much larger percentage of calms. This higher percentage of calms is likely caused by the lower quality instrumentation at the Muscatine airport, and is one reason why the Muscatine data is inappropriate for use in the dispersion model.

To determine representivity the Department calculated the correlation coefficient between the wind roses at the various meteorological sites in and around Iowa. Figure 4 depicts different levels of correlation between the wind field at the Muscatine airport and the wind fields in other areas of the state. The blue-shaded area indicates a distance-weighted correlation coefficient of 0.9 or higher and the green-shaded area indicates a distance-weighted correlation coefficient of 0.8 or higher. All other areas have a correlation coefficient lower than 0.8. Based on this analysis, the data from Davenport were determined to be slightly more correlated to the data from Muscatine than are the data from Cedar Rapids.

<u>Analysis of Surface Characteristics</u>

Another concern expressed by EPA during the review process for the Muscatine PM2.5 SIP modeling protocol was the difference in surface characteristics around the meteorological data measurement site and the application site. A thorough analysis of the differences in surface characteristics between Cedar Rapids and the modeling domain in Muscatine was provided in the previously approved modeling protocol. The land use characteristics around the Davenport airport are very similar to those around the Cedar Rapids airport, resulting in very similar exposures for the meteorological instruments located at both locations. Aside from the airport runways and terminals, the areas surrounding both sites are comprised almost entirely of cropland. Therefore, switching from Cedar Rapids to Davenport data should have only a minimal effect on the surface characteristics analysis, and the assertions made in the analysis in the previously approved modeling protocol should remain valid.

Upper Air Data

Consecutive years of upper air data from Davenport were previously used with the Cedar Rapids surface data. Consecutive years of upper air data from Davenport will also be used with the Davenport surface data.

Figure 1. Muscatine

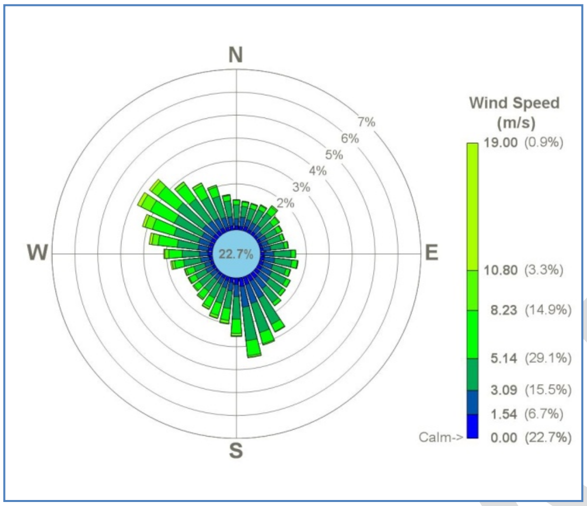


Figure 2. Davenport

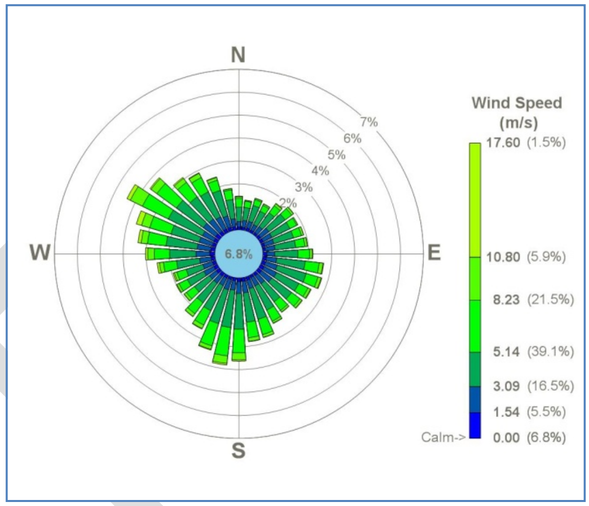


Figure 3. Cedar Rapids

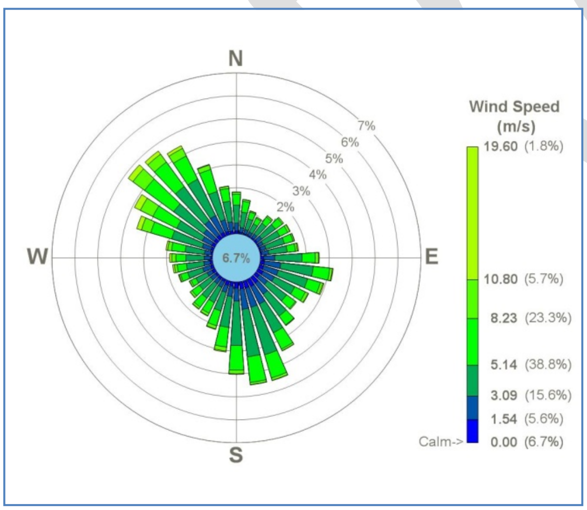
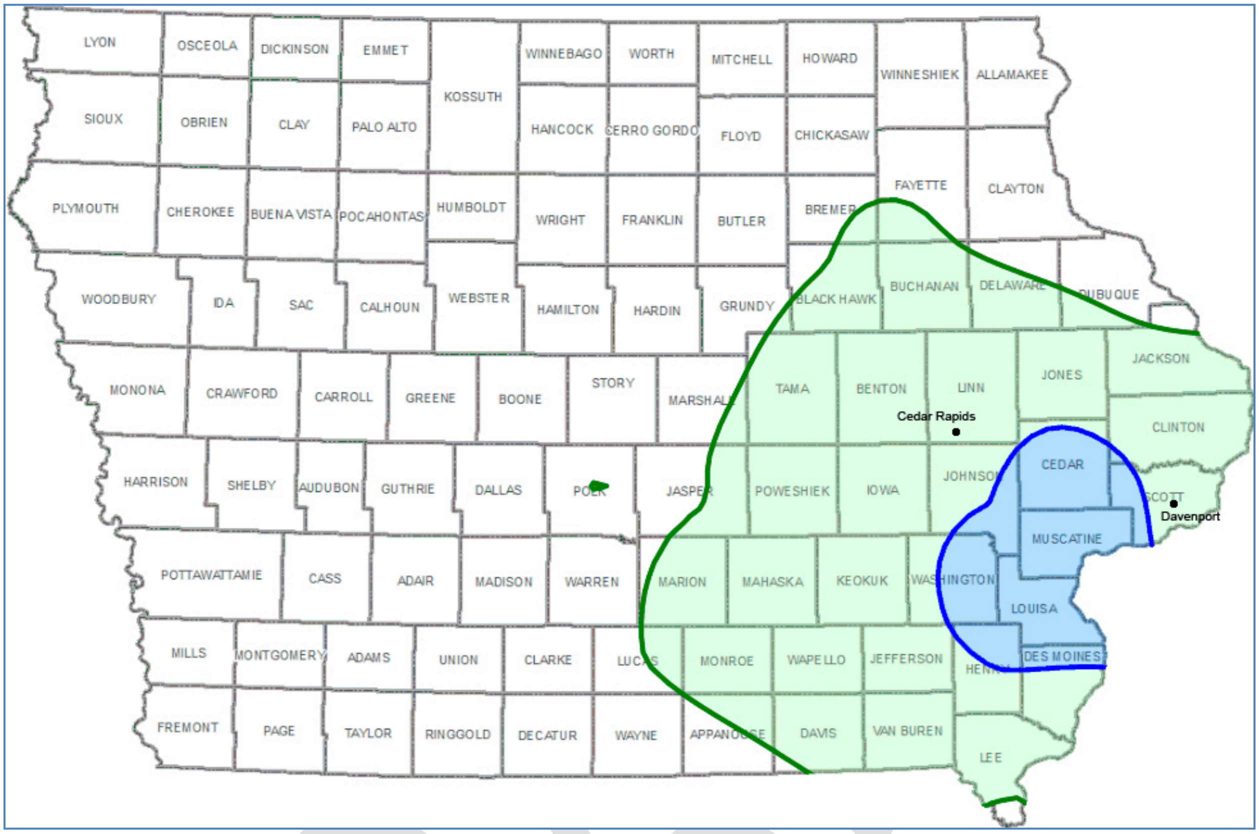


Figure 4. Distance-weighted Correlation to Muscatine Wind Field



[redacted]Attachment B. GPC Control Measures and Timeline

Attachment B - Grain Processing Corporation Control Measures and Timeline

LINE	SOURCE NAME	CURRENT PERMIT NUMBER	CURRENT CONTROL EQUIPMENT	EP ID	ADD CONTROL	MODIFY SOURCE PARAMETERS	ESTABLISH OPERATIONAL RESTRICTION	REQUIRED $PM_{2.5}$ EMISSION LIMIT (pounds/hour)	CONSTRUCTION/OPERATIONAL MODIFICATION COMPLETION DATE (no later than date listed below)	EMISSION LIMIT EFFECTIVE DATE (no later than date listed below*)	ESTIMATED ACTUAL PM2.5 EMISSIONS REDUCTION (TPY)	
1	GEP Stack (Blrs 1-4 and 6-7)	NONE	MULTICLONES / ESP ON BOILER 7 ONLY	EP1.0	add dry FGD, baghouse and carbon injection **OR**		limit boilers to gaseous fuels only	36.400	January 31, 2016	January 31, 2016	-254.4560	Boiler MACT Reductions
2	PH, Ash Silo	77-A-357-S1	BAGHOUSE	EP2.0				0.017	NA	July 14, 2013	0.0000	
3	WM, #1 Wet Germ Cyclone	NONE	CYCLONE	EP14.0				0.028	NA	July 14, 2013	0.0000	
4	WM, #1 & #2 Germ Dryers	79-A-194-S1	CYCLONE	EP15.0				0.239	NA	July 14, 2013	0.0000	
5	Starch, #1 P&S Dryer	NONE	NONE	EP24.1			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
6	Starch, #2 P&S Dryer	NONE	NONE	EP24.2			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
7	Starch, #3 P&S Dryer	NONE	NONE	EP24.3			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
8	Starch, #4 P&S Dryer	NONE	NONE	EP24.4			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
9	Starch, #1 P&S Dryer	NONE	NONE	EP25.1			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
10	Starch, #2 P&S Dryer	NONE	NONE	EP25.2			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
11	Starch, #3 P&S Dryer	NONE	NONE	EP25.3			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
12	Starch, #4 P&S Dryer	NONE	NONE	EP25.4			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
13	Starch, #1 P&S Dryer	NONE	AERODYNE	EP26.1			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.3386	based on average of 2007/2008 production data
14	Starch, #2 P&S Dryer	NONE	AERODYNE	EP26.2			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.3386	based on average of 2007/2008 production data
15	Starch, #3 P&S Dryer	NONE	AERODYNE	EP26.3			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.3386	based on average of 2007/2008 production data
16	Starch, #4 P&S Dryer	NONE	AERODYNE	EP26.4			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.3386	based on average of 2007/2008 production data
17	DH1, #1 Product Aerodyne	71-A-003	AERODYNE	EP28.1			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-0.4885	based on average of 2008/2009 production data
18	DH1, #2 Product Aerodyne	71-A-003	AERODYNE	EP28.2			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-0.4885	based on average of 2008/2009 production data
19	DH1, #3 Product Aerodyne	71-A-003	AERODYNE	EP28.3			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-0.4885	based on average of 2008/2009 production data
20	DH1, #1 Rotary Dryer	NONE	EXPANSION CHAMBER	EP32.1			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.2030	based on average of 2008/2009 production data
21	DH1, #2 Rotary Dryer	NONE	EXPANSION CHAMBER	EP32.2			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.2030	based on average of 2008/2009 production data
22	DH1, #3 Rotary Dryer	NONE	EXPANSION CHAMBER	EP32.3			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.2030	based on average of 2008/2009 production data
23	DH1, #4 Rotary Dryer	NONE	EXPANSION CHAMBER	EP32.4			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.2030	based on average of 2008/2009 production data
24	DH1, #5 Rotary Dryer	NONE	EXPANSION CHAMBER	EP32.5			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.2030	based on average of 2008/2009 production data
25	DH1, #6 Rotary Dryer	NONE	EXPANSION CHAMBER	EP32.6			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.2030	based on average of 2008/2009 production data
26	DH2, Gluten Day Bin	71-A-067-S3	BAGHOUSE	EP38.0			Impose $PM_{2.5}$ emission limit	0.027	NA	July 14, 2013	0.0000	
27	DH2, Rotary Dryer	74-A-130-S3	SCRUBBERS	EP40.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-23.8215	based on average of 2008/2009 production data
28	DH2, Dry End Pickup	NONE	CYCLONE	EP41.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-10.6935	based on average of 2008/2009 production data
29	DH2, #1 Mill Aerodyne	NONE	HE CYCLONE	EP42.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-0.4885	based on average of 2008/2009 production data
30	GP1, #1 & #2 Scrubber Units	75-A-087	SCRUBBERS	EP43.1	improve control of current scrubber by changing to higher collection efficiency packing and improving operation	increase stack height from 96 feet to 140 feet.		1.140	August 1, 2016	August 1, 2016	0.0000	GPC does not wish to claim any reduction in emissions due to better packing of scrubbers
31	GP1, #3 Unit Scrubber	75-A-089	SCRUBBER	EP46.0			permanently cease operation of emission unit(s)/ emission point	0.000	April 30, 2015	April 30, 2015	-4.7829	based on average of 2007/2008 production data
32	Starch, #7 P&S Dryer	72-A-155	HIGH EFFICIENCY CYCLONE	EP59.1			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
33	Starch, #7 P&S Dryer	72-A-155	HIGH EFFICIENCY CYCLONE	EP59.2			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
34	Starch, #7 P&S Dryer	72-A-155	HIGH EFFICIENCY CYCLONE	EP59.3			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
35	Starch, WHSE, Quonset Bulk Loading	02-A-952	BAGHOUSE	EP60.0				0.068	NA	July 14, 2013	0.0000	
36	Maltrin, #1 Spray Dryer	72-A-199-S1	SCRUBBER	EP66.0		increase stack height from 124 feet to 144 feet		0.872	September 1, 2016	July 14, 2013	0.0000	
37	Maltrin, Product Filter	NONE	BAGHOUSE	EP67.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.1167	based on average of 2007/2008 production data
38	Maltrin, Dust System Bag Filter	NONE	BAGHOUSE	EP68.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.1167	based on average of 2007/2008 production data
39	DH3, Primary Dryer (NW)	73-A-137	CYCLONE	EP79.0			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2013	December 31, 2013	-1.9285	based on average of 2007/2008 production data
40	DH3, Primary Dryer (SW)	73-A-138	CYCLONE	EP80.0			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2013	December 31, 2013	-1.9285	based on average of 2007/2008 production data
41	DH3, Primary Dryer (SE)	73-A-139	CYCLONE	EP81.0			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2013	December 31, 2013	-1.9285	based on average of 2007/2008 production data
42	DH3, Primary Dryer (NE)	73-A-140	CYCLONE	EP82.0			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2013	December 31, 2013	-1.9285	based on average of 2007/2008 production data

43	DH2, Mill Aerodyne	73-A-135	AERODYNE	EP85.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-0.4885	based on average of 2008/2009 production data
44	Starch, #9 P&S Dryer, #1 Wet Stack	74-A-009	NONE	EP91.1			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
45	Starch, #9 P&S Dryer, #2 Wet Stack	74-A-009	NONE	EP91.2			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
46	Starch, #9 P&S Dryer	74-A-009	AERODYNE	EP91.3			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.3386	based on average of 2007/2008 production data
47	Starch, #10 P&S Dryer, #1 Wet Stack	74-A-010	NONE	EP92.1			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
48	Starch, #10 P&S Dryer, #2 Wet Stack	74-A-010	NONE	EP92.2			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
49	Starch, #10 P&S Dryer	74-A-010	AERODYNE	EP92.3			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.3386	based on average of 2007/2008 production data
50	Starch WHSE, So. Bulk Loading	75-A-246-S1	BAGHOUSE	EP95.0				0.068	NA	July 14, 2013	0.0000	
51	WM, #2 Wet Germ Cyclone	74-A-014	CYCLONE	EP96.0				0.013	NA	July 14, 2013	0.0000	
52	WM, #3 Germ Cyclone	74-A-015-S1	CYCLONE	EP97.0				0.134	NA	July 14, 2013	0.0000	
53	Expeller, Dry Germ Cyclone	74-A-016-S2	BAGHOUSE	EP98.0	replace cylone with baghouse	increase stack height from 75 feet to 98.67 feet and slight changes to other stack parameters (diameter, flowrate)		0.034	Already Complete	July 14, 2013	-2.0727	based on average of 2007/2008 production data
54	Starch, #8 P&S Dryer, #1 Wet Stack	74-A-008	HIGH EFFICIENCY CYCLONE	EP101.1			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.2310	based on average of 2008/2009 production data
55	Starch, #8 P&S Dryer, #2 Wet Stack	74-A-008	HIGH EFFICIENCY CYCLONE	EP101.2			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
56	Starch, #8 P&S Dryer	74-A-008	HIGH EFFICIENCY CYCLONE	EP101.3			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
57	PH, Blr #8	73-A-191	LOW NOX BURNERS	EP103.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
58	PH, Blr #9	74-A-159	LOW NOX BURNERS	EP104.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
59	DH4, #1 Rotary Dryer	75-A-210	EXPANSION CHAMBER	EP108.1			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-4.5020	based on average of 2008/2009 production data
60	DH4, #2 Rotary Dryer	75-A-211	EXPANSION CHAMBER	EP108.2			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-4.5020	based on average of 2008/2009 production data
61	DH4, #3 Rotary Dryer	75-A-212	EXPANSION CHAMBER	EP108.3			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-4.5020	based on average of 2008/2009 production data
62	DH4, #1 Mill Aerodyne	75-A-343-S1	AERODYNE	EP110.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2016	March 31, 2016	-2.7607	based on average of 2007/2008 production data
63	DH4, #2 Mill Aerodyne	75-A-344	AERODYNE	EP111.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.0465	based on average of 2008/2009 production data
64	DH4, #3 Mill Aerodyne	75-A-345	AERODYNE	EP112.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.0465	based on average of 2008/2009 production data
65	DH4, NO. 1 MILL PRODUCT	75-A-346-S1	BAGHOUSE	EP113.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2016	March 31, 2016	-0.1653	based on average of 2007/2008 production data
66	DH4, #2 Product Aerodyne	75-A-347	AERODYNE	EP114.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.0465	based on average of 2008/2009 production data
67	DH4, #3 Product Aerodyne	75-A-348	AERODYNE	EP115.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-1.0465	based on average of 2008/2009 production data
68	DH WHSE, #1 Feed Cooler	75-A-353-S1	BAGHOUSE	EP119.0	replace cylone with baghouse	increase stack height from 50 feet to 80 feet. Change stack from vertical obstructed to wertical unobstructed and slight changes to other stack parameters (diameter,flowrate)		0.100	Baghouse Already Complete/Stack Modification December 31, 2013	July 14, 2013	-1.9434	based on average of 2007/2008 production data
69	Starch, #11 P&S Dryer, #1 Wet Stack	76-A-209	NONE	EP121.1			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
70	Starch, #11 P&S Dryer, #2 Wet Stack	76-A-210	NONE	EP121.2			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.1208	based on average of 2007/2008 production data
71	Starch, #11 P&S Dryer	76-A-211	HIGH EFFICIENCY CYCLONE	EP121.3			permanently cease operation of emission unit(s)/ emission point	0.000	December 31, 2016	December 31, 2016	-0.3386	based on average of 2007/2008 production data
72	Starch, WHSE, Pearl Starch	76-A-262-S1	BAGHOUSE	EP122.0				0.064	NA	July 14, 2013	0.0000	
73	DH4, #4 Rotary Dryer	79-A-196	EXPANSION CHAMBER	EP125.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	March 31, 2015 or no later than 6 months after the start-up of any of the new emission unit associated with Dryer House 5, whichever is sooner	-4.5120	based on average of 2008/2009 production data
74	WM, #4 Germ Dryer	79-A-195-S1	CYCLONE	EP126.0				0.120	NA	July 14, 2013	0.0000	
75	DH4, #5 ROTARY DRYER	09-A-707-S1	EXPANSION CHAMBER	EP 127.0	Add wet scrubber to expansion chamber	increase stack height from 98 feet to 110 feet. Relocate stack to UTM 662038.24, 4584857.17 (NAD 27, Z15) and slight changes to other stack parameters (temp, flowrate, diameter)		0.180	November 1, 2016	November 1, 2016	-2.9502	based on average of 2007/2008 production data and assumed 90% reduction for wet scrubber
76	DH4, #4 Mill Aerodyne	80-A-113-S1	AERODYNE	EP128.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2016	March 31, 2016	-2.7607	based on average of 2007/2008 production data
77	DH4, #4 Product Aerodyne	80-A-114-S1	BAGHOUSE	EP129.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2016	March 31, 2016	-0.1653	based on average of 2007/2008 production data
78	STARCH WHSE, BAGGER DUST CONTROL	02-A-760-S1	BAGHOUSE	EP 130.0				0.030	NA	July 14, 2013	0.0000	
79	Maltrin, #3 Spray Dryer (E)	80-A-149-S4	VENTURI SCRUBBER	EP132.1	improve control of current venturi scrubber by adding packed bed sections and insulating the stack	increase stack height from 126 feet to 150 feet		0.900	September 1, 2016	September 1, 2016	-3.9609	based on average of 2007/2008 production data and assumed 90% reduction for wet scrubber
80	Maltrin, #3 Spray Dryer (W)	80-A-150-S4	VENTURI SCRUBBER	EP132.2	improve control of current venturi scrubber by adding packed bed sections and insulating the stack	increase stack height from 126 feet to 150 feet		0.900	September 1, 2016	September 1, 2016	-3.9609	based on average of 2007/2008 production data and assumed 90% reduction for wet scrubber
81	COPO, DISC DRYER PRODUCT HANDLING	NONE	BAGHOUSE	EP 133.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0022	based on average of 2008/2009 production data
82	CoPo, Disc Dryer Product Transfer	83-A-082	BAGHOUSE	EP134.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0022	based on average of 2008/2009 production data
83	MALTRIN #4, SPRAY DRYER (E)	85-A-031-S1	PACKED BED SCRUBBER	EP135.0		increase stack height from 94 feet to 164 feet		0.800	September 1, 2016	July 14, 2013	0.0000	
84	MALTRIN #4, SPRAY DRYER (W)	85-A-032-S1	PACKED BED SCRUBBER	EP136.0		increase stack height from 94 feet to 164 feet		1.000	September 1, 2016	July 14, 2013	0.0000	
85	DH4, #6 Rotary Dryer	85-A-033	EXPANSION CHAMBER	EP137.0	Add wet scrubber to expansion chamber	increase stack height from 98 feet to 110 feet. Relocate stack to UTM 662039.93, 4584853.45 (NAD 27, Z15) and slight changes to other stack parameters (temp, flowrate, diameter)		0.210	November 1, 2016	November 1, 2016	-4.4252	based on average of 2007/2008 production data and assumed 90% reduction for wet scrubber

86	DH4, #5 Milling Aerodyne	85-A-034	HIGH EFFICIENCY CYCLONE	EP138.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2016	March 31, 2016	-2.7607	based on average of 2007/2008 production data
87	DH4, #6 Milling Aerodyne	85-A-035-S1	HIGH EFFICIENCY CYCLONE	EP 139.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2016	March 31, 2016	-2.7607	based on average of 2007/2008 production data
88	DH4, #5 Product Aerodyne	85-A-036	HIGH EFFICIENCY CYCLONE	EP140.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2016	March 31, 2016	-5.5215	based on average of 2007/2008 production data
89	DH4, #6 Product Aerodyne	85-A-037	AERODYNE	EP141.0			permanently cease operation of emission unit(s)/ emission point	0.000	March 31, 2016	March 31, 2016	-5.5215	based on average of 2007/2008 production data
90	PH, Boiler #10	85-A-038	LOW EXCESS AIR	EP142.0		increase stack height from 70 feet to 110 feet		0.700	December 31, 2013	July 14, 2013	0.0000	
91	Starch, #1 Flash Dryer	85-A-039	SCRUBBER	EP143.0		increase stack height from 137 feet to 177 feet	Add burner and restrict fuel to natural gas only	2.640	December 31, 2016	July 14, 2013	0.3465	also includes converting dryer to direct fired as opposed to steam heated. Burner size is 46.5 MMBtu/hr based
92	Starch WHSE, Food Grade Bagger	90-A-307	BAGHOUSE	EP144.0	Install new baghouse	increase stack height from 33 feet to 140 feet		0.210	January 1, 2014	January 1, 2014	0.0000	
93	Starch WHSE, Food Grade Bagger	85-A-041	BAGHOUSE	EP145.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	not currently in operation so no reduction in emissions
94	WM, #1-4 Corn Cleaner	85-A-043-S1	BAGHOUSE	EP147.0		increase stack height from 16 feet to 80 feet		0.200	December 31, 2013	July 14, 2013	0.0000	
95	Starch WHSE, #1 Bin Vent	85-A-081-S1	BAGHOUSE	EP149.0				0.020	NA	July 14, 2013	0.0000	
96	Starch WHSE,#2 Bin Vent	85-A-082-S1	BAGHOUSE	EP150.0				0.020	NA	July 14, 2013	0.0000	
97	Starch WHSE, #3 Bin Vent	85-A-083-S1	BAGHOUSE	EP151.0				0.020	NA	July 14, 2013	0.0000	
98	Starch WHSE, #4 Bin Vent	85-A-084-S1	BAGHOUSE	EP152.0				0.020	NA	July 14, 2013	0.0000	
99	PH, Boiler #11	85-A-135	LOW EXCESS AIR	EP153.0		increase stack height from 70 feet to 110 feet		0.700	December 31, 2013	July 14, 2013	0.0000	
100	Maltrin, #1 Agglomerator	89-A-084	BAGHOUSE	EP154.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
101	Starch WHSE, Super Sacker	89-A-085	BAGHOUSE	EP155.0				0.068	NA	July 14, 2013	0.0000	
102	Maltrin, #2 Agglomerator	89-A-146	BAGHOUSE	EP156.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	has not operated since 2007
103	Maltrin, bagger	89-A-162-S1	BAGHOUSE	EP157.0				0.057	NA	July 14, 2013	0.0000	
104	Starch, #2 Flash Dryer	90-A-258	SCRUBBER	EP158.0		increase stack height from 139 feet to 179 feet	Add burner and restrict fuel to natural gas only	3.550	December 31, 2016	July 14, 2013	0.3465	also includes converting dryer to direct fired as opposed to steam heated. Burner size is 46.5 MMBtu/hr based
105	Starch WHSE, #5 Starch Silo (N)	90-A-259	BAGHOUSE	EP159.0				0.030	NA	July 14, 2013	0.0000	
106	Starch WHSE, #6 Starch Silo (E)	90-A-260	BAGHOUSE	EP160.0				0.030	NA	July 14, 2013	0.0000	
107	Starch WHSE, #7 Starch Silo (S)	90-A-261	BAGHOUSE	EP161.0				0.030	NA	July 14, 2013	0.0000	
108	Starch WHSE, #8 Starch Silo (W)	90-A-262	BAGHOUSE	EP162.0				0.030	NA	July 14, 2013	0.0000	
109	Starch WHSE, Track 3A Loadout	90-A-263	BAGHOUSE	EP163.0				0.083	NA	July 14, 2013	0.0000	
110	DH4, #7 Rotary Dryer	90-A-264	EXPANSION CHAMBER	EP164.0	Add wet scrubber to expansion chamber	increase stack height from 98 feet to 110 feet. Relocate stack to UTM 662041.71, 4584849.89 (NAD 27, Z15) and slight changes to other stack parameters (temp, flowrate, diameter)		0.210	November 1, 2016	November 1, 2016	-4.4252	based on average of 2007/2008 production data and assumed 90% reduction for wet scrubber
111	DH WHSE, #2 Feed Cooler	90-A-111	BAGHOUSE	EP167.0		increase stack height from 19 feet to 80 feet		0.110	December 31, 2013	July 14, 2013	0.0000	
112	Maltrin, #5 Spray Dryer (A Stack)	90-A-309-S1	SCRUBBER	EP168.0		increase stack height from 152 feet to 162 feet		0.873	September 1, 2016	July 14, 2013	0.0000	
113	Maltrin, #5 Spray Dryer (B Stack)	90-A-310-S1	SCRUBBER	EP169.0		increase stack height from 152 feet to 162 feet		0.753	September 1, 2016	July 14, 2013	0.0000	
114	Starch WHSE, #9 Starch Silo (NE)	90-A-359	BAGHOUSE	EP171.0				0.030	NA	July 14, 2013	0.0000	
115	Starch WHSE, #10 Starch Silo (NW)	90-A-360	BAGHOUSE	EP172.0				0.030	NA	July 14, 2013	0.0000	
116	GP2, #4 Gluten Flash Dryer	91-A-067-S2	SCRUBBER	EP173.0				1.010	NA	July 14, 2013	0.0000	
117	GP2, #4 Gluten Pre-Mill	91-A-068-S1	BAGHOUSE	EP174.0				0.150	NA	July 14, 2013	0.0000	
118	Maltrin, Product Silo Receiver (N)	91-A-069	BAGHOUSE	EP175.0				0.035	NA	July 14, 2013	0.0000	
119	Maltrin, Nuisance Duct Collector (W)	91-A-070	BAGHOUSE	EP176.0				0.034	NA	July 14, 2013	0.0000	
120	PH, Boiler #12	93-A-110	LOW NOX BURNERS	EP177.0				1.500	NA	July 14, 2013	0.0000	
121	WM, #5 Germ Dryer	91-A-176	CYCLONE	EP178.0				0.230	NA	July 14, 2013	0.0000	
122	GP2, #1 Feed Truck Loadout (West)	92-A-383-S1	BAGHOUSE	EP179.0		increase stack height from 38 feet to 75 feet and make stack vertical unobstructed instead of vertical obstructed		0.150	September 30, 2013	July 14, 2013	0.0000	
123	GP2, #2 Feed Truck Loadout (East)	92-A-385	BAGHOUSE	EP180.0		increase stack height from 38 feet to 75 feet and make stack vertical unobstructed instead of vertical obstructed		0.150	September 30, 2013	July 14, 2013	0.0000	
124	Elevator, South Corn Rail Receiving	76-A-264	BAGHOUSE	EP181.1				0.170	NA	July 14, 2013	0.0000	
125	Elevator, South Corn Truck Receiving	76-A-268	BAGHOUSE	EP181.2				0.125	NA	July 14, 2013	0.0000	
126	Maltrin, #1 Bulk Filter Aid Storage Bin (W)	93-A-032	BAGHOUSE	EP182.0			restrict operation to 1 out of 4 bins may be filled at a time	0.010	July 14, 2013	July 14, 2013	0.0000	currently bins are not filled more than one at a time
127	Maltrin, #2 Bulk Filter Aid Storage Bin (N)	93-A-033	BAGHOUSE	EP183.0			restrict operation to 1 out of 4 bins may be filled at a time	0.010	July 14, 2013	July 14, 2013	0.0000	currently bins are not filled more than one at a time
128	Maltrin, #3 Bulk Filter Aid Storage Bin (N)	93-A-034	BAGHOUSE	EP184.0			restrict operation to 1 out of 4 bins may be filled at a time	0.010	July 14, 2013	July 14, 2013	0.0000	currently bins are not filled more than one at a time
129	Maltrin, #1 Bulk Carbon Storage Bin (W)	93-A-035	BAGHOUSE	EP185.0			restrict operation to 1 out of 4 bins may be filled at a time	0.010	July 14, 2013	July 14, 2013	0.0000	currently bins are not filled more than one at a time
130	Maltrin, #6 Spray Dryer (Stack A)	94-A-055	SCRUBBER	EP186.0		increase stack height from 137 feet to 147 feet		0.663	September 1, 2016	July 14, 2013	0.0000	
131	Maltrin, #6 Spray Dryer (Stack B)	94-A-061	SCRUBBER	EP187.0		increase stack height from 137 feet to 147 feet		0.663	September 1, 2016	July 14, 2013	0.0000	
132	G-Starch, G-Starch Process	96-A-1028-S1	BAGHOUSE	EP188.0				0.774	NA	July 14, 2013	0.0000	
133	PH, LIme Silo	02-A-759	BIN VENT FILTER	EP189.0				0.012	NA	July 14, 2013	0.0000	
134	GP2, Gluten Loadout Transfer	02-A-781-S1	BAGHOUSE	EP190.1				0.021	NA	July 14, 2013	0.0000	
135	GP2, Gluten Truck Loadout	02-A-782-S1	BAGHOUSE	EP190.2				0.002	NA	July 14, 2013	0.0000	
136	PH, Bulk Salt Tank Vent	02-A-787	BIN VENT FILTER	EP191.0			limit operation to no more than 1 hour per day	0.200	July 14, 2013	July 14, 2013	0.0000	does not currently operate more
137	CoPo, Corn Bran Dryer	06-A-215	BAGHOUSE	EP192.0			permanently cease operation of emission unit(s)/ emission point	0.000	August 30, 2013	August 30, 2013	-0.0016	based on average of 2007/2008 production data and assumed 90% reduction for wet scrubber
138	WM, #3 Germ Transfer & Receiving	02-A-783-S1	CYCLONE	EP194.0				0.020	NA	July 14, 2013	0.0000	
139	DH4, Spent Germ Receiving	09-A-482-S1	BAGHOUSE	EP195.0		increase stack height from 30 feet to 66.5 feet		0.028	Already Complete	July 14, 2013	0.0000	
140	DH1, DH2 and DH4 Product Receiver Cyclone	10-A-563	BAGHOUSE	EP196.0	add baghouse to bypass stack			0.140	Already Complete	July 14, 2013	0.0000	theoretically a decrease but since bypass stack there is no way to quantify since GPC did not report these emis
141	Maltrin Hoffman Dust Collection	10-A-285	BAGHOUSE	EP197.0		vent source directly to atmosphere instead of inside production building		0.011	Already Complete	July 14, 2013	0.0000	
142	Germ Receiving Bin	NONE	NONE	EP198.0				0.009	NA	July 14, 2013	0.0000	
143	DH4, New Milling Unit	NONE	BAGHOUSE	EP199.0			replace existing DH4 milling aerodynes with new milling system with baghouse controL	0.640	March 31, 2016	March 31, 2016	2.8032	
144	Starch WHSE, Ind. Modified Starch	03-A-079	BAGHOUSE	EP471.0				0.065	NA	July 14, 2013	0.0000	
145	Elevator, Grain Unloading "A" & "B"	02-A-687-S2	BAGHOUSE	EP490.0				0.220	NA	July 14, 2013	0.0000	
146	GP1, Pneunatic Transport System	03-A-471	BAGHOUSE	EP531.0				0.122	NA	July 14, 2013	0.0000	
147	GP1, Hulls' Milling System	03-A-1369	BAGHOUSE	EP536.0				0.013	NA	July 14, 2013	0.0000	
148	Starch WHSE, Modified Starch Pneumatic	03-A-1370	BAGHOUSE	EP537.0				0.030	NA	July 14, 2013	0.0000	
149	Maltrin, #1 Spray Dryer System Cooler	03-A-1371	BAGHOUSE	EP538.0				0.100	NA	July 14, 2013	0.0000	
150	WWT, #1 Biogas Flare Stack	04-A-548	FLARE	EP542.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.7944	based on average of 2007/2008 production data and assumed 90% reduction for wet scrubber
151	WWT, #2 Biogas Flare Stack	04-A-549	FLARE	EP543.0			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.4926	based on average of 2007/2008 production data and assumed 90% reduction for wet scrubber
152	MASH FERMENTERS 1-29	05-A-926-S3	SCRUBBERS	EP544.0				0.185	NA	July 14, 2013	0.0000	
153	Expeller, #1 Spent Germ Pickup	06-A-1261	BAGHOUSES	EP545.0				0.365	NA	July 14, 2013	0.0000	
154	DH4, #3 Alpha Laval (formerly #4 Sharples)	11-A-338	NONE	EP546.0		vent source directly to atmosphere instead of inside production building	replace existing sharples with new alpha laval centrifuge	0.001	Already Complete	July 14, 2013	0.0044	
155	WWTP Anaerobic Digesters #1 - #3	11-A-661	BIOGAS DESULFURIZATION SYSTEM / FLARE	EP548.0			add source to replace EP542.0 and EP543.0	0.260	Already Complete	July 14, 2013	1.2870	assume no increase in particulate from addition of biogas desulfurization system
156	Tank 4C and 5C	NONE	FLARE	EP550.0				0.220	NA	July 14, 2013	0.0000	
157	East Tank and C-400 Thru Tanks	NONE	NONE	EP551.0				0.011	NA	July 14, 2013	0.0482	
158	DH5, SWISS COMBI DRYER	11-A-339	THERMAL OXIDIZER / SO2 SCRUBBER	EP600.0			replace existing DH1, DH2 and portions of DH4 and replace with new DH5	2.700	March 31, 2015	March 31, 2015	11.8260	
159	SPENT GERM PNEUMATIC TRANSPORT	11-A-340	BAGHOUSE	EP601.0			replace existing DH1, DH2 and portions of DH4 and replace with new DH5	0.030	March 31, 2015	March 31, 2015	0.1314	
160	CAGE MILL FEED BAGHOUSE	11-A-342	BAGHOUSE	EP603.0			replace existing DH1, DH2 and portions of DH4 and replace with new DH5	0.160	March 31, 2015	March 31, 2015	0.7008	

161	DH5, BUILDING SO2 SCRUBBER	NONE	SCRUBBER	EP605.0			replace existing DH1, DH2 and portions of DH4 and replace with new DH5	0.010	March 31, 2015	March 31, 2015	0.0438	
162	Grnd & Whole Grains Unloading (KENT)	NONE	CYCLONE	E1			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0047	based on average of 2007/2008 production data
163	Pellet Cooler (KENT)	NONE	CYCLONE	E2A			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0004	based on average of 2007/2008 production data
164	Pellet Cooler (KENT)	NONE	CYCLONE	E2B			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0002	based on average of 2007/2008 production data
165	Pellet Cooler (KENT)	NONE	CYCLONE	E2C			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0002	based on average of 2007/2008 production data
166	Pellet Screen (KENT)	NONE	CYCLONE	E3			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0009	based on average of 2007/2008 production data
167	Pellet Cooler (KENT)	03-A-1414-S3	BAGHOUSE	E4				0.086	NA	July 14, 2013	0.0000	
168	Ingredient Mixer (KENT)	NONE	CYCLONE	E5			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0807	based on average of 2007/2008 production data
169	SBM Bin (KENT)	NONE	NONE	E7a			limit operation to no more than 1 hour per day	0.020	NA	July 14, 2013	0.0000	does not currently operate more than requested restriction
170	SBM Bin (KENT)	NONE	NONE	E7b			limit operation to no more than 1 hour per day	0.020	NA	July 14, 2013	0.0000	does not currently operate more than requested restriction
171	SBM Bin (KENT)	NONE	NONE	E7c			limit operation to no more than 1 hour per day	0.020	NA	July 14, 2013	0.0000	does not currently operate more than requested restriction
172	SBM Bin (KENT)	NONE	NONE	E7d			limit operation to no more than 1 hour per day	0.020	NA	July 14, 2013	0.0000	does not currently operate more than requested restriction
173	SBM Bin (KENT)	NONE	NONE	E7e			limit operation to no more than 1 hour per day	0.020	NA	July 14, 2013	0.0000	does not currently operate more than requested restriction
174	SBM Bin (KENT)	NONE	NONE	E7f			limit operation to no more than 1 hour per day	0.020	NA	July 14, 2013	0.0000	does not currently operate more than requested restriction
175	Pellet Conveyor (KENT)	NONE	CYCLONE	E8			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	-0.0009	based on average of 2007/2008 production data
176	Loadout Bins (KENT)	NONE	NONE	E9a			limit operation to no more than 2.5 hours per day	0.077	NA	July 14, 2013	0.0000	does not currently operate more than requested restriction
177	Loadout Bins (KENT)	NONE	NONE	E9b			limit operation to no more than 2.5 hours per day	0.077	NA	July 14, 2013	0.0000	does not currently operate more than requested restriction
178	Loadout Bins (KENT)	NONE	NONE	E9c			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	have not operated since 2007
179	Loadout Bins (KENT)	NONE	NONE	E9d			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	have not operated since 2007
180	Pellet Cooler (KENT)	03-A-1415-S4	BAGHOUSE	E10				0.034	NA	July 14, 2013	0.0000	
181	Maltrin Storage Bins 1-4	NONE	BAGHOUSE/BIN VENT FILTERS	MALT14				0.034	NA	July 14, 2013	0.0000	
182	Maltrin Storage Bins 5-8	NONE	BAGHOUSE/BIN VENT FILTERS	MALT58				0.041	NA	July 14, 2013	0.0000	
183	Sulfur Burner	NONE	ABSORBTION TOWER	SULFURBURN			permanently cease operation of emission unit(s)/ emission point	0.000	January 1, 2014	January 1, 2014	0.0000	no emissions ever reported on EIQ. Cannot estimate impact from equipment shutdown.
184	COAL BARGE UNLOADING	NONE	NONE	COALBARG			operate only in the months March through November and a minimum daily average coal moisture content of 8.7%	0.060	NA	July 14, 2013	0.0000	is currently how facility operates since river closed to barge traffic outside of those months
185	COAL PILE	NONE	NONE	COAL PILE			no more than 266,263 tons per 12-month rolling period and a minimum daily average coal moisture content of 8.7%	Work Practice	NA	July 14, 2013	0.0000	
186	FEED BARGE UNLOADING	NONE	TELESCOPING SPOUT	FEEDBARG			operate only in the months March through November	0.020	NA	July 14, 2013	0.0000	is currently how facility operates since river closed to barge traffic outside of those months
187	FEED RAILCAR LOADING	NONE	SPOUT WITH SOCK	RAILCR1				0.004	NA	July 14, 2013	0.0000	
188	FEED RAILCAR LOADING	NONE	SPOUT WITH SOCK	RAILCR2				0.004	NA	July 14, 2013	0.0000	
189	WET FEED LOADING	NONE	NONE	WETFEED			loadout no more than 37,000 tons of wet feed per 12-month rolling period	0.003	NA	July 14, 2013	0.0000	not a reduction in actual loadout
190	CORN STORAGE PAD	NONE	NONE	CORNSTOR			permanently cease operation of emission unit(s)/ emission point	0.000	NA	August 30, 2013	0.0000	has not operated since approximately 2003
191	KENT FEEDS FLAT CORN STORAGE PAD	NONE	NONE	FLATSTOR			store no more than 26,000 tons of material per 12-month rolling period	0.002	NA	July 14, 2013	0.0000	no emissions ever reported on EIQ. Cannot estimate impact on emissions.
192	HAUL ROADS	NONE	NONE	ND	use PM10 efficient sweeper (a minimum of every other day)		silt loading of no more than 0.4 g/m2	Work Practice	NA	July 14, 2013	0.0000	
193	LEVEE	NONE	NONE	NONE			restrict access to levee by posting signs warning of restricted access on the north and south fence lines that intersect the levee. A third sign will be posted in the area of highest modeled concentrations prohibiting loitering and fishing. In-person surveillance of the levy will be conducted by GPC security staff periodically throughout the 24-hour day with documentation as to surveillance time and location.	NA	July 14, 2013	NA	0.0000	
	* If emission unit is operational before emission limit effective date, the date the unit becomes operational is the effective date of the PM2.5 emission limit									**TOTAL REDUCTIONS =**	-367.8561	
											68.43	
										APPROXIMATE 2007/2008 FACILITY-WIDE TOTAL ACTUAL EMISSIONS =	537.5958	

Attachment C. Rationale for GPC Schedule

Control Strategies for Muscatine, Iowa PM2.5 SIP Call
January 2, 2013

GPC Schedule

Action	Date	Comments	Completion Schedule Rationale & Comments
Decommission Corn Bran Dryer, Remove EP192.0	August 30, 2013	The corn bran dryer products will be produced out of state by another manufacturer beginning in late 2013. Therefore this source will be decommissioned.	Work underway to increase capacity and reliability of third party producer. Marketing has been made aware that it is imperative that 3rd party producer be at contracted capacity within 12 months. Regardless, we are committed to shutting down this dryer system in August 2013.
Decommission Corn Storage Pad Remove CORNSTOR	August 30, 2013	Due to lack of use in the past five years, the corn storage pad will be eliminated.	Process connections to pad area to be removed. Project will be completed by August 30, 2013.
Increase stack height of East and West Feed Loadout 37 feet to 75 feet EP79.0 & EP80.0	September 30, 2013		This project requires structural design and fabrication, stack design and fabrication, and installation. This is a relatively small project and can be completed in twelve months or less after permit approval.
Emission Changes to EP015, EP066, EP147, EP167, EP174, EP179, EP180, EP186, EP187, EP196, EP197, EP E4, EP E9A, EP E9B, EP E10	September 30, 2013	Permit modifications are needed to make the appropriate federally enforceable emission limitations. It is anticipated that all permit modifications will be completed by the end of September 2013.	No project or construction activities required. Only permit changes.
Decommission DH3 dryer Remove EP79.0, EP80.0. EP81.0, EP82.0	December 31, 2013		Requires modification of existing #10 conveyor, installation of a new 16" screw conveyor, and modifications of spouting from #1 Conveyor through new conveyor to the existing drag conveyor from DH3 to DH4. This project can be completed within 12 months.
Increase stack height of Corn Cleaner Baghouse (EP 147.0) up to 70 ft	December 31, 2013		This project is similar in scope and duration to East and West Feed Loadout Stack modifications. However, final stack height has not been finalized. We should be able to complete this project within 12 months after approval of permit applications.
Increase stack height of #1 & #2 Crown Coolers 30 feet to 80 feet EP 119.0 & EP 167.0	December 31, 2013		Again this project is similar in scope and complexity as the East and West Feed Loadout Baghouse Stacks. Completion of the project within 12 months after permit approval.
Increase stack height of Natural Gas Boilers #10 & #11 approx 40 feet to 110 feet each EP142.0 & EP 153.0	December 31, 2013		These are both larger stacks - 60" in diameter. Structural trusses or cages will have to be designed along with a slip joint stack extension for each boiler. A butterfly discharge isolation damper needs to be designed for each of these stacks, as well. This is a considerably more involved scope and design than say the East/West Feed Loadout stacks. Keeping in mind the number of stack extension projects potentially occurring in parallel, a project duration of approximately 12 months is anticipated after permit approval.
Install new baghouse and increase stack height to 140 feet on food grade starch bagger EP 144.0	January, 2014		We have a variance to begin work on this project. Scope of the project includes a new baghouse, relocation of slurry tank, new emissions stack, controls, and electrical. With design, procurement, construction in a dust hazard area - which requires coordinated process shutdowns, we expect this project to take 15 months to complete.
DH5 PM10 model sources with GPC particle size PM2.5 emission rates Add Sources EP600.0, EP601.0, EP602.0, EP603.0, EP604.0 & EP605.0 Remove Sources 28.1, 28.2, 28.3, & EP32.1 – EP32.6 Remove EP40.0, EP41.0, EP42.0 & 85.0 Remove EP108.1, 108.2, 108.3, & 125.0 Remove sources EP 111.0, 112.0, 114.0, & 115.0	March 31, 2015		These are the sources associated with DH5 coming on line and the existing dryer house sources that go out of service. DH5 is an extremely complex project, that must be designed, have materials procured, bid packages assembled, contracts awarded and construction completed for a dryer building, evaporator building, dewatering building, and milling building - all buildings contiguous. Also tie-ins to connect the DH5 process to the existing plant processes are complex and require coordinated, planned process shutdowns. Design, construction logistics, and complexity, dictate the March 31, 2015 completion of this large project. Work is already well underway for this substantial, multi-year project.
Decommission GP1 #3 Dryer (EP 46.0)	April 30, 2015		This project is tied to completion of the DH5 project and DH5's successful startup. DH5 startup is scheduled for March, 2015.
Limitations on Coal boilers to control particulate emissions	Janaury, 2016	GPC will meet requirements of 40CFRpart 63 DDDDD per January 2013 Boiler MACT requirements, as implemented and enforced by EPA.	GPC will evaluate options to control coal-firing or switch to alternate fuels to meet the requirments of the Boiler MACT Rules. Controlling coal fired emissions will take a minimum of three years to engineer and construct; switching of fuels will require consuming currently contracted coal and assuring that alternate fuel quantites are available and can be delivered to the power house.
DH4 milling systems through new baghouse Remove EP110.0, EP113.0, EP 138.0, EP139.0, EP140.0,& EP 141.0	March 31, 2016		This project requires a new multi-story process building; new pneumatic transport systems for product leaving dryers 5,6, and 7; a product pneumatic receiving baghouse; high static I.D. fan; airlock; spouting; and a 54" Stedman cage mill. This sizeable project scope's execution overlaps with the DH5 project execution, as well as several other environmental compliance projects'. This project also requires coordinated process shutdowns for the completion of tie-ins. Completion of this project overlaps with DH5 and completion is estimated to lag 12 months after DH5 startup. Startup of DH5 prior to completion of this project helps to mitigate DH4 process outages for tie-ins.

Control Strategies for Muscatine, Iowa PM2.5 SIP Call
January 2, 2013

GPC Schedule

Action	Date	Comments	Completion Schedule Rationale & Comments
Improve GP1 Units 1&2 Dryers' and Scrubber's performance and increase stack height to 140 feet Modify EP 43.1	August 1, 2016		Permit approval for the #8 Gluten Rotary Vacuum Filter at GP2 effectively will allow us to reduce average dewatering and drying load from GP1 and shift to GP2 Dryer. This will allow us to consistently run GP1 dryers at lower rates which will improve fine particulate emissions from these dryers and existing scrubber. The existing scrubber stack extension will require the design, fabrication and construction of a structural truss, tied back to the existing building steel, for structural support. Process shutdowns will have to be coordinated and completed to allow for tie-ins to complete this work. The large number of parallel engineering projects is a big factor in the completion timeframe of this subproject.
Modify #3 Maltrin Scrubber and add extensions to all Maltrin Stacks EP132.1, EP132.2, EP066.0, EP 135.0, EP136.0, EP168.0, EP169.0, 186.0, EP187.0	September 1, 2016		This is a fairly extensive and complex scope of work. Packed bed sections must be designed and added to both venturi scrubbers on SD #3, structural cages/trusses, as well as stack extensions, will have to be designed, fabricated, and installed for nine separate emission stacks on the Maltrin building roof. Process shutdowns must be planned and executed to complete numerous tie-ins. Again, this project work is happening in parallel to a considerable amount of project work for DH5, and other plant environmental improvements. Primary focus will be to address #3 Maltrin SD scrubbers first, then consecutive stack extensions will be address - all while minimizing process interruption and product availability for our customers. From a resource availability standpoint, we estimate approximately 18 months after DH5 startup for this subproject.
Install scrubbers on DH4 Rotary Dryers 5, 6, 7 & Relocate Stacks EP 127.0, EP137.0, & EP 164.0	November 1, 2016		There are similar considerations for this project, as the project above. Installation of three separate scrubber systems, including scrubbers, fans, circulation pumps, heat exchangers, and filters are required. Structural modifications are required at MR2 building to accommodate the scrubber equipment and stacks. Several process shutdowns must be coordinated and executed to tie-in new equipment to existing systems. This is a fairly complex subproject, and when coupled with a large number of parallel environmental projects, we expect this project to be completed 20 months after DH5 is up and operating. After DH5 is up and operating, we are in a better position to satisfy production/customer and business needs that will be negatively impacted by the DH4 production shutdowns associated with the installation of these scrubber systems.
Decommission all P & S dryers; Flash Dryers 1 & 2 on natural gas Remove EP24.1, EP24.2, EP24.3, EP24.4 EP25.1, EP25.2, EP25.3, EP25.4 EP26.1, EP26.2, EP26.3, EP26.4 EP91.1, EP91.2, EP91.3 EP92.1, EP92.2, EP92.3 EP121.1, EP121.2, EP121.3	December 31, 2016	The improvements to Flash Dryer 1 & 2 are required before decommissioning of the P&S Dryers can be requested due to customer requirements. There is a 12 month design, procurement and construction schedule for these dryers. Therefore these PM2.5 emission reductions will occur 12 months after final permits are received from the IDNR. Because of PSD requirements, which will be necessary to permit this conversion, we anticipate those permits not to be issued before Janaury 1, 2016.	Both flash dryers require a complete redesign of large inlet ductwork systems, including the design of burner sections and BMS (burner management systems), outside contractor review of burner design and fuel train safety provisions, removal of existing steam coils, steam and condensate handling piping and equipment. New ductwork modifications will be designed, built and installed to accommodate the new burner sections, and allow space for future heat recovery coils. Civil/Structural Design, burner/duct design, bid package generation, mechanical and electrical contracts, materials procurement, and construction of all the pieces, and coordination of process shutdowns for tie-ins, dictate that this project will require a duration of 12 months after permit approval.
Increase stack height of Flash Dryer #1 (EP 143.0) 40 feet to 177 feet Increase stack height of Flash Dryer #2 (EP 158.0) 40 feet to 179 feet	December 31, 2016	See notes above	Design evaluation has already started on this project. Overall project scope includes civil structural review of the connection points and design of the structural cages/trusses that will support the weight and lateral wind loading from 40 foot stack extensions. These stacks are large - 96" in diameter; structural loads from wind will be substantial. Design, procurement, construction - including coordinated process shutdowns, will require 12 months after permit approvals.

Attachment D. MPW Control Measures and Timeline

LINE	SOURCE NAME	DRAFT PERMIT NUMBER	CURRENT CONTROL EQUIPMENT	EP ID	ADD CONTROL	MODIFY SOURCE PARAMETERS	ESTABLISH OPERATIONAL RESTRICTION	REQUIRED $PM_{2.5}$ EMISSION LIMIT (pounds/hour)	CONSTRUCTION/OPERATIONAL MODIFICATION COMPLETION DATE (no later than date listed below)	EMISSION LIMIT EFFECTIVE DATE (no later than date listed below*)	ESTIMATED ACTUAL PM2.5 EMISSIONS REDUCTION (TPY)	
1	COAL HANDLING (RAIL UNLOADING)	93-A-288-S3	BAGHOUSE AND DUST SUPPRESSION SYSTEM	21				0.00121	NA	permit issuance date	0.0000	
2	COAL HANDLING (RAIL UNLOADING)	93-A-289-S3	BAGHOUSE AND DUST SUPPRESSION SYSTEM	22				0.00060	NA	permit issuance date	0.0000	
3	COAL HANDLING	93-A-290-S3	DUST SUPPRESANT SYSTEM	23A				0.0725	NA	permit issuance date	0.0000	
4	COAL PILE (RADIAL STACKER DISCHARGE)	13-A-139	NONE	24				0.0403	NA	permit issuance date	0.0000	
	COAL PILE (CONVEYOR TRUCK UNLOADING)		NONE				restrict operation to between 8am and 4pm	0.0014	July 14, 2013	permit issuance date	0.0000	
	COAL PILE (BULLDOZING)		NONE				restrict operation to between 6am and midnight	0.8877	July 14, 2013	permit issuance date	0.0000	
	COAL PILE (WIND EROSION)		NONE				reduce size of coal pile from 23 acres to 20 acres	Work Practice	July 14, 2013	July 14, 2013	-0.1423	estimate based on reduction of pile size
5	BARGE COAL UNLOADING	13-A-140	NONE	300			restrict operation to between 6am and midnight and only between the months of March through November	0.0431	July 14, 2013	permit issuance date	0.0000	
6	COAL HANDLING (COAL RECLAIM)	80-A-193-S3	BAGHOUSE	301		change stack to vertical release instead of horizontal and increase height from 7 feet to 10 feet		0.0167	July 14, 2013	permit issuance date	0.0000	
7	BARGE COAL UNLOADING (BUF DISCHARGE/UC-1 LOAD)	13-A-141	NONE	302			restrict operation to between 6am and midnight and only between the months of March through November	0.0431	July 14, 2013	permit issuance date	0.0000	
8	RECLAIM FEEDER/CONVEYORS (RF-2 DISCHARGE/RC-2 LOAD)	00-A-683-S1	NONE	310B			restrict operation to between 6am and 10pm	0.022	July 14, 2013	permit issuance date	0.0000	
9	LIVE COAL STORAGE SILO	80-A-194-S3	BAGHOUSE	311			restrict operation to between 6am and 10pm	0.103	July 14, 2013	permit issuance date	0.0000	
10	CONVEYORS (RC-2 DISCHARGE/LSCS-2 LOAD)	00-A-684-S1	NONE	311B			restrict operation to between 6am and 10pm	0.0218	July 14, 2013	permit issuance date	0.0000	
11	SILO FEEDER (SF1-4/LSC-1)	93-A-286-S4	BAGHOUSE AND DUST SUPPRESSION SYSTEM	312				0.0002	NA	permit issuance date	0.0000	
12	CONVEYORS (LSCS-2 DISCHARGE/SF-6 LOAD)	00-A-686-S1	NONE	312B				0.0058	NA	permit issuance date	0.0000	
13	CONVEYORS (SF-6 DISCHARGE / RC-3 LOAD)	00-A-687-S1	NONE	313B				0.0058	NA	permit issuance date	0.0000	
14	SILO FEEDER AND EPC-1 CONVEYOR LOAD	80-A-196-S3	BAGHOUSE	314				0.0155	NA	permit issuance date	0.0000	
15	UNIT 7 & 8 COAL CRUSHER FEEDERS	01-A-193-S2	BAGHOUSE	320		increase stack height from 14 feet to 24 feet		0.0823	July 14, 2013	permit issuance date	0.0000	
16	UNIT 7 & 8 COAL CRUSHERS	80-A-006-S3	BAGHOUSE	322				0.028	NA	permit issuance date	0.0000	
17	TRUCK UNLOADING - TRACK HOPPER A CONV.	13-A-153	NONE	330			restrict operation to between 8am and 4pm	0.0058	July 14, 2013	permit issuance date	0.0000	
18	TRUCK LOADING - TRACK HOPPER A CONV.	13-A-154	NONE	330A			restrict operation to between 8am and 4pm	0.0058	July 14, 2013	permit issuance date	0.0000	
19	CONVEYOR SYSTEM LOAD	80-A-007-S3	BAGHOUSE	333				0.061	NA	permit issuance date	0.0000	
20	CONVEYOR SYSTEM DISCHARGE	00-A-638-S1	BAGHOUSE	341				0.061	NA	permit issuance date	0.0000	
21	UNIT 9 CRUSHER HOUSE (DC-11 EXHAUST)	06-A-650-S2	BAGHOUSE	351				0.0341	NA	permit issuance date	0.0000	
22	PSC-9 CONVEYOR / 4 COAL SILOS	80-A-197-S2	BAGHOUSE	360				0.034	NA	permit issuance date	0.0000	
23	SOC-1 CONVEYOR DISCHARGE/RSC-1 CONVEYOR	93-A-287-S2	BAGHOUSE	370				0.00029	NA	permit issuance date	0.0000	
24	LIMESTONE HOPPER LOADING	13-A-155	NONE	40	add three-sided enclosure with roof		reduce capacity of system from 400 TPH to 200 TPH and restrict operation to between 8am and 4pm	0.1475	July 14, 2013	July 14, 2013	-0.0007	average of 2007/2008 EIQ assuming 41% reduction in emissions for reduced wind speed from enclosure
25	LIMESTONE HANDLING SYSTEM	80-A-202-S2	BAGHOUSE	41				0.088	July 14, 2013	July 14, 2013	0.0000	
26	LIMESTONE PILE (TRUCK UNLOADING)	13-A-142	NONE	45			reduce capacity of system from 400 TPH to 50 TPH and limit source to receiving no more than 6 loads of limestone per day and 90 tons per day. Restrict limestone delivery to between 6am and 4 pm	0.0625	July 14, 2013	July 14, 2013	0.0000	they currently do not receive more than 6 loads of limestone per day
	LIMESTONE PILE (WIND EROSION)		NONE				reduce size of limestone pile from 2 acres to 1 acre	Work Practice	July 14, 2013	July 14, 2013	-0.0456	estimate based on reduction of pile size
27	AUXILIARY BOILER (29.26 MMBTU/HR)	13-A-152	NONE	60				0.567	NA	permit issuance date	0.0000	
28	UNIT 7 BOILER (289 MMBTU/HR)	74-A-175-S3	MULTICLONE/ESP	70				8.57	NA	permit issuance date	0.0000	
29	UNIT 8 BOILER (870 MMBTU/HR)	95-A-373-P2	OFA/ESP	80				37.57	NA	permit issuance date	0.0000	
30	FLY ASH SILO/ DRY FLY ASH TRUCK LOADING	00-A-639-S1	CARTRIDGE FILTER	810				0.056	NA	permit issuance date	0.0000	
31	WET FLY ASH TRUCK LOADING	NA	NONE	811			permanently remove emission unit(s)	0.0000	NA	permit issuance date	-0.0009	
32	FLY ASH SILO	01-A-218-S1	BIN VENT FILTER	814			only one operation at a time: either truck loadout or silo filling	0.0013	July 14, 2013	July 14, 2013	0.0000	
33	ASH/SLAG STORAGE PILES (TRUCK LOADING)	13-A-143	NONE	860			restrict operation to between 7am and 7pm	0.0031	July 14, 2013	July 14, 2013	0.0000	
	ASH/SLAG STORAGE PILES (TRUCK UNLOADING)		NONE				restrict operation to between 7am and 7pm	0.0031	July 14, 2013	July 14, 2013	0.0000	
	ASH/SLAG PILE (BULLDOZING)		NONE				Restrict operation to between 7am and 7pm. Allow the operation of only one bulldozer instead of three	0.0742	July 14, 2013	July 14, 2013	-0.0228	estimate of removing additional bulldozers
	ASH/SLAG PILE (WIND EROSION)		NONE					Work Practice	NA	permit issuance date	0.0000	
34	UNIT 9 BOILER (1556 MMBTU/HR)	80-A-191-P2	2 ESP/2 SCRUBBERS	90				43.59	NA	permit issuance date	0.0000	
35	REVERSING CONVEYOR A (LOAD/DISCHARGE)	13-A-157	NONE	912A				0.00121	NA	permit issuance date	0.0000	
36	REVERSING CONVEYOR B (LOAD/DISCHARGE)	13-A-158	NONE	912B				0.00121	NA	permit issuance date	0.0000	
37	SYN. GYPSUM LOAD OUT CONVEYOR	13-A-144	BAGHOUSE	915A			restrict operation to between 7am and 7pm	0.00035	July 14, 2013	permit issuance date	0.0000	
38	SYN. GYPSUM LOAD OUT CONVEYOR	13-A-145	BAGHOUSE	915B			restrict operation to between 7am and 7pm	0.00035	July 14, 2013	permit issuance date	0.0000	
39	RADIAL STACKER LOAD/DISCHARGE	13-A-159	NONE	916B			reduce capacity of system from 40 TPH to 20 TPH and restrict operation to between 7am and 7pm	0.0012	July 14, 2013	permit issuance date	0.0000	
40	SYNTHETIC GYPSUM STORAGE PILE (TRUCK LOAD)	13-A-146	NONE	919			restrict operation to between 7am and 7pm	0.00121	July 14, 2013	permit issuance date	0.0000	
	SYNTHETIC GYPSUM STORAGE PILE (TRUCK LOAD TRAFFIC)		NONE				restrict operation to no more than 9 gypsum trucks per day and operation to between 7am and 7pm	Work Practice	July 14, 2013	July 14, 2013	0.0000	currently load out 2-3 trucks per day
	SYNTHETIC GYPSUM STORAGE PILE (RADIAL STACKER)		NONE				restrict operation to between 7am and 7pm	0.00121	July 14, 2013	permit issuance date	0.0000	
	SYNTHETIC GYPSUM STORAGE PILE (PILE FORM)		NONE				restrict operation to between 7am and 7pm	0.0125	July 14, 2013	permit issuance date	0.0000	
	SYNTHETIC GYPSUM STORAGE PILE (WIND EROSION)		NONE				reduce size of pile from 2 acres to 0.5 acres	Work Practice	July 14, 2013	July 14, 2013	-0.2273	based on reducing emissions from 0.0682 lb/hr to 0.0163 lb/hr
41	FLY ASH SILO	80-A-201-S1	BIN VENT FILTER	920				0.0058	NA	permit issuance date	0.0000	
42	FLY ASH STORAGE	80-A-200-S1	CARTRIDGE FILTER	920A	change stack to vertical unobstructed release and increase stack height from 12 feet to 13.83 feet		Allow only one of either EP920A or EP920B to operate at any one time	0.122	July 14, 2013	permit issuance date	0.0000	currently how emission units operate
43	FLY ASH STORAGE	13-A-147	CARTRIDGE FILTER	920B	change stack to vertical unobstructed release and increase stack height from 12 feet to 13.83 feet		Allow only one of either EP920A or EP920B to operate at any one time	0.122	July 14, 2013	permit issuance date	0.0000	currently how emission units operate
44	DRY FLY ASH TRUCK LOADING/ UNLOADING	13-A-148	ENCLOSED SPOUT	924			restrict operation to between 7am and 4pm	0.032	July 14, 2013	permit issuance date	0.0000	
45	DRY FLY ASH TRUCK UNLOADING	01-A-456-S1	NONE	925			restrict operation to between 7am and 4pm	0.040	July 14, 2013	permit issuance date	0.0000	
46	ASH SILOS/DRY ASH TRUCK LOADOUT	01-A-457-S4	BAGHOUSE	926			restrict operation to between 7am and 4pm	0.018	July 14, 2013	permit issuance date	0.0000	
47	FLY ASH HOPPER LOADING	04-A-617-S1	WIND SCREEN	926A2			restrict operation to between 7am and 4pm	0.0084	July 14, 2013	permit issuance date	0.0000	
48	FLY ASH PILE FORMATION	04-A-618-S1	NONE	926A3			restrict operation to between 7am and 4pm	0.00095	July 14, 2013	permit issuance date	0.0000	
49	HAUL ROAD FLY ASH PILE TO HOPPER	04-A-619-S1	DUST SUPPRESANT	926A4			restrict operation to between 7am and 4pm	Work Practice	NA	permit issuance date	0.0000	
50	FLY ASH VACUUM PUMP (5 GPH)	NA	NONE	928A			permanently remove emission unit(s)	0.0000	July 14, 2013	July 14, 2013	-0.0098	average of 2007/2008 EIQ
51	FLY ASH BLOWER DIESEL EXHAUST (2 GPH)	NA	NONE	928B			permanently remove emission unit(s)	0.0000	July 14, 2013	July 14, 2013	-0.0066	average of 2007/2008 EIQ
52	PORTABLE DIESEL GENERATOR (14.3 GPH)	NA	NONE	928C			permanently remove emission unit(s)	0.0000	July 14, 2013	July 14, 2013	-0.0060	average of 2007/2008 EIQ
53	HYDRATED LIME SILO	NA	BAGHOUSE	990			permanently remove emission unit(s)	0.0000	Already Complete	Already Complete	0.0000	emission unit(s) not used since at least 2007
54	HYDRATED LIME MIXING TANK	NA	NONE	991			permanently remove emission unit(s)	0.0000	Already Complete	Already Complete	0.0000	emission unit(s) not used since at least 2007
55	12 PORTABLE GASOLINE ENGINES (4.83 GPH TOTAL)	13-A-150	NONE	7890			restrict operation to between 6am and 10pm	0.0604	July 14, 2013	permit issuance date	0.0000	
56	PORTABLE DIESEL ENGINE (4.0 GPH TOTAL)	13-A-151	NONE	7892			restrict operation to between 6am and 10pm	0.187	July 14, 2013	permit issuance date	0.0000	
57	PORTABLE DIESEL ENGINE - WELL PUMP (24.6 GPH)	11-A-562-S1	NONE	V168				0.187	NA	permit issuance date	0.0000	
58	HAUL ROADS (POINT A - B)	13-A-160	NONE	9999	apply water to road surface to reduce silt content 50% from 13.5 g/m2 to 6.75 g/m2		gypsum operation: restrict operation between 7am and 7pm. Limestone operation: restrict operation between 6am and 4pm. Ash/Slag Operation: restrict operation between 7am and 7pm	Work Practice	July 14, 2013	permit issuance date	-0.0717	based on reducing silt on road surface from 13.5 g/m2 to 6.75 g/m2
59	HAUL ROADS (POINT B - C)	13-A-160	NONE	9999	apply water to road surface to reduce silt content 50% from 13.5 g/m2 to 6.75 g/m2		gypsum operation: restrict operation between 7am and 7pm. Limestone operation: restrict operation between 6am and 4pm. Ash/Slag Operation: restrict operation between 7am and 7pm	Work Practice	July 14, 2013	permit issuance date	-0.0631	based on reducing silt on road surface from 13.5 g/m2 to 6.75 g/m2
60	HAUL ROADS (POINT C - B) UNPAVED	13-A-160	NONE	9999	Pave road surface and apply water to road surface keep silt content at 6.75 g/m2		restrict operation between 7am and 7pm	Work Practice	July 14, 2013	permit issuance date	-0.0147	based on reducing silt on road surface from 13.5 g/m2 to 6.75 g/m2

Attachment D - Muscatine Power Water Control Measures and Timeline

LINE	SOURCE NAME	DRAFT PERMIT NUMBER	CURRENT CONTROL EQUIPMENT	EP ID	ADD CONTROL	MODIFY SOURCE PARAMETERS	ESTABLISH OPERATIONAL RESTRICTION	REQUIRED $PM_{2.5}$ EMISSION LIMIT (pounds/hour)	CONSTRUCTION/OPERATIONAL MODIFICATION COMPLETION DATE (no later than date listed below)	EMISSION LIMIT EFFECTIVE DATE (no later than date listed below*)	ESTIMATED ACTUAL PM2.5 EMISSIONS REDUCTION (TPY)	
61	HAUL ROADS (POINT C - D)	13-A-160	NONE	9999	apply water to road surface to reduce silt content 50% from 13.5 g/m2 to 6.75 g/m2		gypsum operation: restrict operation between 7am and 7pm. Limestone operation: restrict operation between 6am and 4pm. Ash/Slag Operation: restrict operation between 7am and 7pm	Work Practice	July 14, 2013	permit issuance date	-0.0985	based on reducing silt on road surface from 13.5 g/m2 to 6.75 g/m2
62	HAUL ROADS (POINT D - I)	13-A-160	NONE	9999			gypsum operation: restrict operation between 7am and 7pm. Limestone operation: restrict operation between 6am and 4pm	Work Practice	NA	permit issuance date	0.0000	
63	HAUL ROADS (POINT I - F)	13-A-160	NONE	9999			restrict operation between 7am and 7pm	Work Practice	NA	permit issuance date	0.0000	
64	HAUL ROADS (POINT I - E)	13-A-160	NONE	9999			restrict operation between 6am and 4pm	Work Practice	NA	permit issuance date	0.0000	
65	HAUL ROADS (POINT E - H) UNPAVED	13-A-160	NONE	9999			restrict operation between 6am and 4pm	Work Practice	NA	permit issuance date	0.0000	
66	HAUL ROADS (POINT A - G)	13-A-160	NONE	9999			restrict operation between 7am and 7pm	Work Practice	NA	permit issuance date	0.0000	
67	HAUL ROADS (POINT G - J) UNPAVED	13-A-160	NONE	9999			restrict operation between 7am and 7pm	Work Practice	NA	permit issuance date	0.0000	
68	HAUL ROADS (POINT J - J) UNPAVED - see above	13-A-160	NONE	9999			restrict operation between 7am and 7pm	Work Practice	NA	permit issuance date	0.0000	
69	LEVEE	13-A-161	NONE	LEVEE			restrict access to levee per plan included in construction permit	NA	July 14, 2013	NA	0.0000	
	* If emission unit is operational before emission limit effective date, the date the unit becomes operational is the effective date of the PM2.5 emission limit									TOTAL REDUCTIONS =	-0.7099	TONS
											1.22	% REDUCTION
									APPROXIMATE 2007/2008 FACILITY-WIDE TOTAL ACTUAL EMISSIONS =		58.2673	TONS

Attachment E. MPW Air Construction Permits

(See separate attachment document)

Attachment F. UTLX Control Measures and Timeline

Attachment F - Union Tank Car Control Measures and Timeline

LINE	SOURCE NAME	CURRENT PERMIT NUMBER	CONTROL EQUIPMENT	EP ID	ADD CONTROL	MODIFY SOURCE PARAMETERS	ESTABLISH OPERATIONAL RESTRICTION	REQUIRED PM2.5 EMISSION LIMIT (pounds/hour)	CONSTRUCTION/OPERATIONAL MODIFICATION COMPLETION DATE (no later than date listed below)	EMISSION LIMIT EFFECTIVE DATE (no later than date listed below*)	ESTIMATED PM2.5 EMISSIONS REDUCTION (TPY)	
1	Railcar Exterior Grit Blast Booth	93-A-251-S5	Baghouse	EP-1				0.0156	July 14, 2013	April 8, 2013	0.0000	
2	Railcar Interior Grit Blast (South)	93-A-252-S5	Baghouse and Panel Filter	EP-2	Add additional filter to reduce particulate emissions	emission point shall only vent inside production building		0.0095	September 30, 2013	September 30, 2013	-0.0004	
3	Railcar Interior Grit Blast (North)	93-A-253-S5	Baghouse and Panel Filter	EP-3	Add additional filter to reduce particulate emissions	emission point shall only vent inside production building		0.0095	September 30, 2013	September 30, 2013	-0.0004	
4	Railcar Vapor Removal & Flare	93-A-254-S3	Flare	EP-4				0.0075	NA	April 8, 2013	0.0000	
5	Railcar Exterior Painting	93-A-255-S7	Dry Filters	EP-5A				0.08	NA	April 8, 2013	0.0000	
6	Railcar Exterior Painting	96-A-629-S3	Dry Filters	EP-5B				0.08	NA	April 8, 2013	0.0000	
7	Railcar Exterior Painting	96-A-630-S5	Dry Filters	EP-5C				0.08	NA	April 8, 2013	0.0000	
8	Railcar Exterior Painting	96-A-631-S3	Dry Filters	EP-5D				0.08	NA	April 8, 2013	0.0000	
9	Railcar Interior Painting/Stencil & Touchup	96-A-636-S3	Pleated Filter	EP-6A	Add filter to reduce particulate emissions			0.021	September 30, 2013	September 30, 2013	-0.0162	
10	Railcar Interior Painting/Stencil & Touchup	00-A-529-S2	Pleated Filter	EP-6B	Add filter to reduce particulate emissions			0.021	September 30, 2013	September 30, 2013	-0.0162	
11	Railcar Interior Painting/Stencil & Touchup	00-A-530-S2	Pleated Filter	EP-6C	Add filter to reduce particulate emissions			0.021	September 30, 2013	September 30, 2013	-0.0162	
12	Railcar Interior Painting/Stencil & Touchup	00-A-531-S2	Pleated Filter	EP-6D	Add filter to reduce particulate emissions			0.021	September 30, 2013	September 30, 2013	-0.0162	
13	Railcar Interior Painting/Stencil & Touchup	00-A-532-S2	Pleated Filter	EP-6E	Add filter to reduce particulate emissions			0.021	September 30, 2013	September 30, 2013	-0.0162	
14	Railcar Interior Painting/Stencil & Touchup	00-A-533-S2	Pleated Filter	EP-6F	Add filter to reduce particulate emissions			0.021	September 30, 2013	September 30, 2013	-0.0162	
15	Railcar Interior Painting/Stencil & Touchup	93-A-256-S6	None	EP-6G				0.04	NA	April 8, 2013	0.0000	
16	Railcar Interior Painting/Stencil & Touchup	96-A-632-S5	None	EP-6H				0.04	NA	April 8, 2013	0.0000	
17	Railcar Interior Painting/Stencil & Touchup	96-A-633-S5	None	EP-6I				0.04	NA	April 8, 2013	0.0000	
18	Railcar Interior Painting/Stencil & Touchup	96-A-634-S5	None	EP-6J				0.04	NA	April 8, 2013	0.0000	
19	Railcar Interior Painting/Stencil & Touchup	96-A-635-S5	None	EP-6K				0.04	NA	April 8, 2013	0.0000	
20	Rubber Lining of Tank Cars	00-A-1089-S2	Cell Filter	EP-7A	Add filter to reduce particulate emissions			0.02	November 31, 2013	November 31, 2013**	-0.0208	
21	Rubber Lining of Tank Cars	00-A-1090-S2	Cell Filter	EP-7B	Add filter to reduce particulate emissions			0.02	November 31, 2013	November 31, 2013**	-0.0208	
22	Rubber Lining of Tank Cars	00-A-1091-S2	Cell Filter	EP-7C	Add filter to reduce particulate emissions			0.02	November 31, 2013	November 31, 2013**	-0.0208	
23	Rubber Lining Building Ventilation	10-A-043-S2	Cell Filter	EP-7D	Add filter to reduce particulate emissions	Changed stack orientation from horizontal to vertical, unobstructed		0.02	November 31, 2013	November 31, 2013**	-0.0208	
24	Rubber Lining Building Ventilation	10-A-044-S1	None	EP-7E			permanently cease operation of emission unit(s)/ emission point	0.000	Already Complete	Already Complete	0.0000	this emission point was never actually constructed so no reduction in emission from its removal.
25	Inline Tank Car Qualification Process	09-A-009-S2	Pleated Filter	9A	Add filter to reduce particulate emissions			0.027	September 30, 2013	September 30, 2013	-0.0213	
26	Inline Tank Car Qualification Process	09-A-010-S2	Pleated Filter	9B	Add filter to reduce particulate emissions			0.027	September 30, 2013	September 30, 2013	-0.0213	
27	Water Blast Operation	94-A-434-S2	None	EP-27				0.037	NA	April 8, 2013	0.0000	
28	Inline Tank Car Qualification Process	00-A-1086-S2	Pleated Filter	EP-M1	Add filter to reduce particulate emissions	Replace fan to increase airflow from 5000 scfm to 20,000 scfm		0.033	September 30, 2013	September 30, 2013	-0.0306	
29	Inline Tank Car Qualification Process	00-A-1087-S2	Pleated Filter	EP-M2	Add filter to reduce particulate emissions	Replace fan to increase airflow from 5000 scfm to 20,000 scfm		0.033	September 30, 2013	September 30, 2013	-0.0306	
30	Inline Tank Car Qualification Process	00-A-1088-S2	Pleated Filter	EP-M3	Add filter to reduce particulate emissions	Replace fan to increase airflow from 5000 scfm to 20,000 scfm		0.033	September 30, 2013	September 30, 2013	-0.0306	
	* If emission unit is operational before emission limit effective date, the date the unit becomes operational is the effective date of the PM2.5 emission limit									**TOTAL REDUCTIONS =**	-0.3156	TONS
	** Compliance with emission limit may occur sooner if UTLX determines can meet required emission limit of 0.02 lb/hr without additional control equipment										10.59	% REDUCTION
										APPROXIMATE 2007/2008 FACILITY-WIDE TOTAL ACTUAL EMISSIONS =	2.9802	TONS

Attachment G. UTLX Air Construction Permits

(See separate attachment document)

Attachment H. Proof of Publication