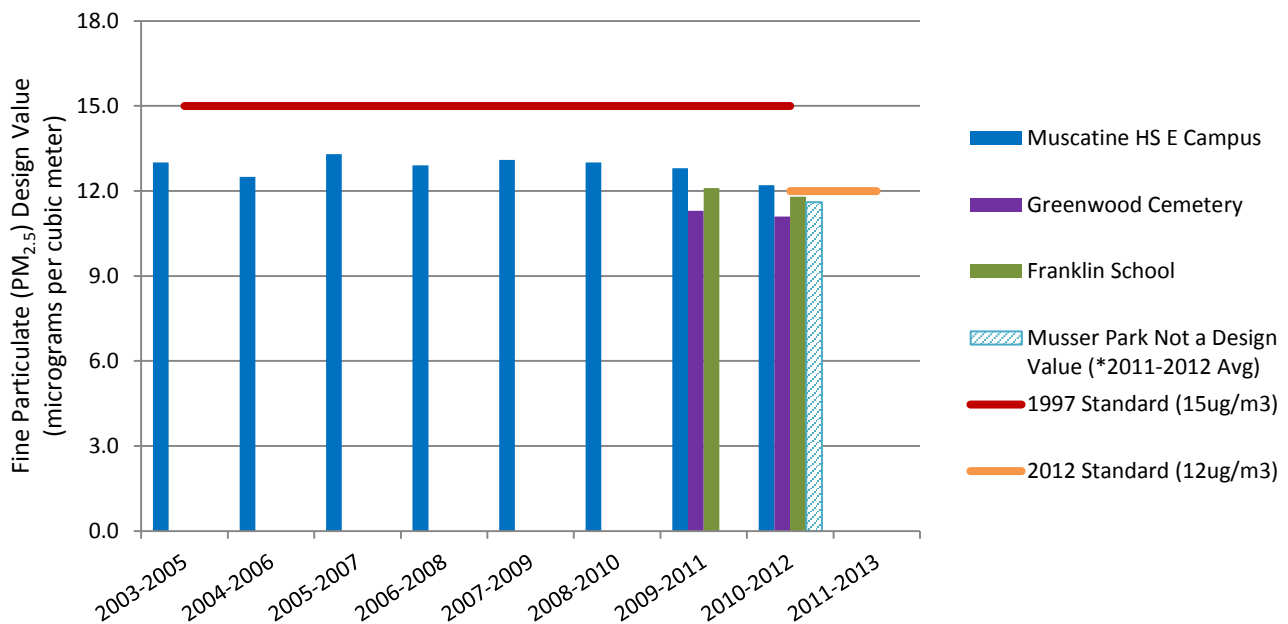


## Attachment A

Table 1: 2010-2012 Annual PM<sub>2.5</sub> Design Values

Monitoring Location	Monitor ID	Annual PM <sub>2.5</sub> Design Value (µg/m <sup>3</sup> )
Muscatine HS E Campus (Garfield)	191390015	12.2
Muscatine, Franklin School	191390018	11.8
Keokuk, Fire Station	191110008	11.4
Davenport, Hayes School	191630020	11.3
Davenport, Adams Sch.	191630018	11.2
Muscatine, Greenwood Cemetery	191390016	11.1
Council Bluffs, Franklin Sch.	191550009	11.1
Davenport, 10th and Vine	191630015	11.0
Clinton, Rainbow Park	190450021	10.7
Iowa City, Hoover Sch.	191032001	10.5
Waterloo, Water Tower	190130009	10.4
Cedar Rapids, Public Health	191130040	10.3
Sioux City, Bryant School	191930019	9.9
Des Moines, Public Health	191530030	9.7
Clive, Indian Hills School	191532510	9.6
Lake Sugema	191770006	9.6
Viking Lake State Park	191370002	9.2
Emmetsburg, College	191471002	8.8

Figure 1: Monitored Fine Particulate in Ambient Air in Muscatine Compared to the Annual Standard





## Attachment B

### Annual PM<sub>2.5</sub> Nonattainment Boundary Recommendation for Muscatine, Iowa

#### Summary

On December 14, 2012, the U.S. Environmental Protection Agency (EPA) revised the primary annual National Ambient Air Quality Standard (NAAQS) for fine particulate matter (PM<sub>2.5</sub>) from 15.0 µg/m<sup>3</sup> to 12.0 µg/m<sup>3</sup>, based on the latest public health studies. Under the provisions of section 107(d)(1)(A) of the Clean Air Act, within one year after EPA promulgates a new NAAQS, states must recommend area designations to EPA. States review the most recent monitoring data to develop their recommendations on whether the monitoring data shows each county or portion thereof in attainment, nonattainment, or unclassifiable with the NAAQS.

All areas of the state, except one, show attainment with the NAAQS, or are unclassifiable. The PM<sub>2.5</sub> monitor located at Muscatine High School East Campus has a 2010-2012 annual design value that exceeds 12.0 µg/m<sup>3</sup>, indicating that the area should be recommended for a designation of “nonattainment” with the annual PM<sub>2.5</sub> NAAQS. A modeling analysis was conducted by the Iowa Department of Natural Resources (DNR) regarding possible limitations of the extent of the area of nonattainment in Muscatine with the annual PM<sub>2.5</sub> NAAQS.

As summarized herein, the recommended boundaries within the City of Muscatine characterize the area where violations of the annual PM<sub>2.5</sub> NAAQS extend, and include sources that are significant contributors to those violations. This document provides technical support for this recommendation. Dispersion modeling is appropriate because the boundary recommendation in Muscatine County is not influenced by secondary formation of PM<sub>2.5</sub> beyond the inclusion of a representative background concentration. This dispersion modeling analysis combines emissions data and federally enforceable emissions limits, meteorological conditions, terrain information, and background concentrations in a peer-reviewed regulatory approach to produce air quality data immediately relevant to a boundary recommendation.

#### Dispersion Modeling Inputs

The modeling analysis was conducted using the most recent version of EPA’s regulatory dispersion model, AERMOD (version 12345), National Elevation Dataset (NED) terrain elevations, and building downwash parameters for all point sources. As previously approved by EPA in the modeling protocol for the SIP call modeling demonstration, meteorological data from the Davenport ASOS site for the period 2008-2012 were used. The following major sources of PM<sub>2.5</sub> were included in the analysis:

- Grain Processing Corporation (GPC)
- Muscatine Power & Water (MPW)
- Union Tank Car (UTLX)

These sources were chosen because they were included in the 24-hour PM<sub>2.5</sub> State Implementation Plan deficiency modeling demonstration for Muscatine, and as part of that analysis were determined to be important contributors to PM<sub>2.5</sub> concentrations in the area. Hourly PM<sub>2.5</sub> emission rates used in the SIP call modeling for these three facilities were used in this analysis. The emissions inventories for MPW and UTLX utilized in the modeling were based on the post-control PM<sub>2.5</sub> emissions levels used in modeling for the 24-hour PM<sub>2.5</sub> SIP call analysis because those emission levels have been permitted and are federally enforceable. For

GPC, the pre-control PM<sub>2.5</sub> emissions levels from the SIP call were used because the control strategy for GPC is still in the final stages of being permitted and made federally enforceable.

**Dispersion Modeling Results**

Two modeling analyses were conducted: a culpability test of the impact of each facility at the East Campus monitor location, and a full grid analysis to determine the extent of the predicted exceedances.

East Campus Monitor Exceedance Culpability

The results of the culpability analysis indicated that neither MPW nor UTLX PM<sub>2.5</sub> emissions are predicted to have a significant contribution at the East Campus monitor location. The results also indicate that GPC emissions have a significant PM<sub>2.5</sub> contribution. The maximum contributions from these facilities at the monitor location are summarized in Table 1.

Table 1. Maximum Contribution to Predicted Annual PM<sub>2.5</sub> Concentrations at East Campus.

Facility	Maximum Contribution (µg/m <sup>3</sup> )	Significant Impact Level (µg/m <sup>3</sup> )
GPC	2.81	0.3
MPW	0.27	
UTLX	0.07	

Full Grid Analysis

To evaluate the special extent of the area being impacted by PM<sub>2.5</sub> emissions, the dispersion modeling receptor grid was centered on the East Campus monitor location and extended out to ten kilometers. Receptors that fell on the property of any of the three facilities were omitted from the analysis. Receptor spacing varied as follows:

- 0-0.5 km: 50-meters
- 0.5-1.5 km: 100-meters
- 1.5-3 km: 250-meters
- 3-5 km: 500-meters
- 5-10 km: 1,000-meters

A default background concentration of 10.5 µg/m<sup>3</sup> was added to the results of the analysis. This background value is the annual PM<sub>2.5</sub> 2010-2012 design concentration for the Iowa City monitor. The use of this monitor to represent PM<sub>2.5</sub> background values in Muscatine was previously approved by EPA in the modeling protocol used to address recent exceedances of the 24-hour PM<sub>2.5</sub> standard in the Muscatine area.

The modeling analysis results indicate that the combined emissions from the modeled sources will result in predicted exceedances of the annual PM<sub>2.5</sub> NAAQS in the vicinity of the Muscatine industrial area adjacent to the Mississippi River.

**Proposed Nonattainment Boundary**

Based on the ambient air quality monitoring and the dispersion modeling analysis results, Iowa recommends that a small area of Muscatine County be classified as nonattainment for the annual PM<sub>2.5</sub> NAAQS.

Figure 1 identifies the recommended nonattainment boundary (green) and section lines (light blue). Major roads and highways are labeled for ease of identification. The suggested nonattainment boundary is contained within the Fruitland Township of Muscatine County and uses jurisdictional boundaries clearly defined by section numbers (Table 2).

Figure 1. Recommended Nonattainment Boundary.

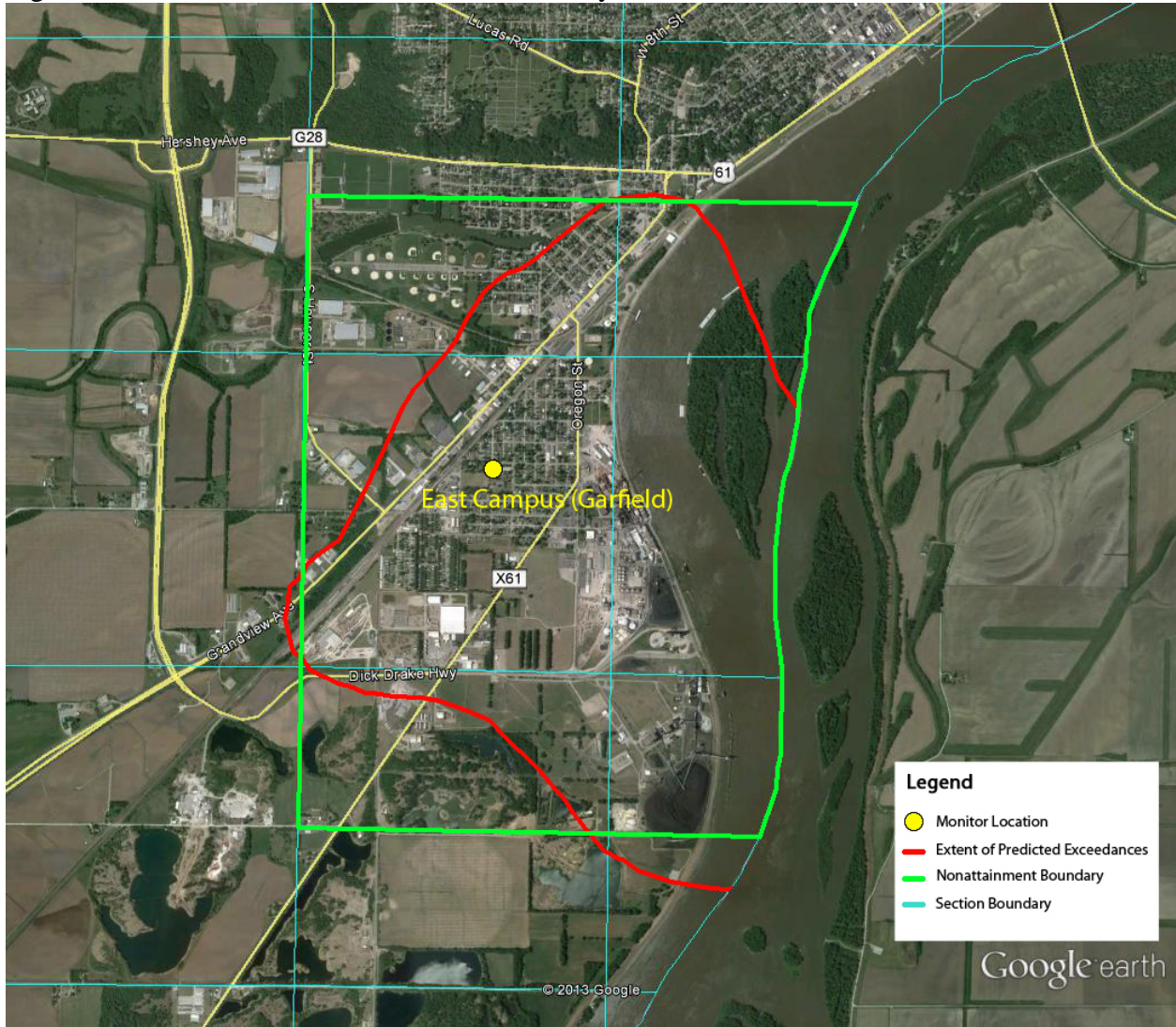


Table 2. Legal Description of Recommended Nonattainment Area.

Township	Sections
T76N R2W* (Fruitland township)	Southern half of 2 and 3 Entirety of 10 and 11 Northern half of 14 and 15

\*T = Township and R = Range.