

Air Dispersion Modeling

Air Quality Permitting Requirements

In the past two years, the National Ambient Air Quality Standards (NAAQS) permitting requirements have become more stringent for NO_x and SO₂ emissions. This has complicated obtaining permits for new or changed facilities such as stationary engines and other facilities that have air emissions.

To avoid delays in permitting, it is now common to include air dispersion modeling as part of a permit application. These models are used to determine compliance with the NAAQS, and other regulatory requirements such as New Source Review (NSR), Prevention of Significant Deterioration (PSD) and the State of Michigan Air Toxics Screening Levels (R 336.1225) regulations.

Dispersion Modeling

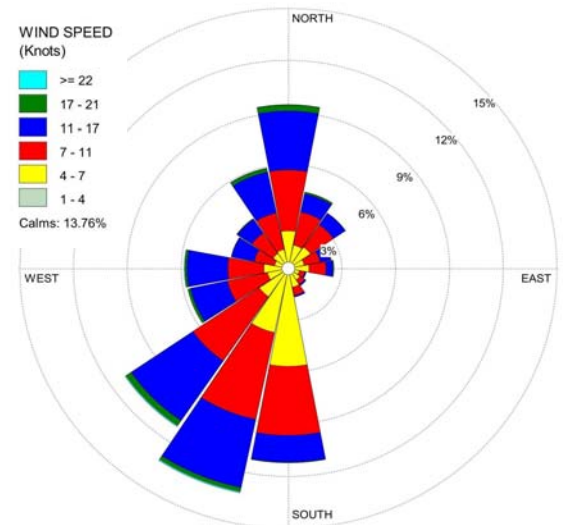
Dispersion modeling uses mathematical formulations to characterize the atmospheric processes that disperse a pollutant emitted by a source. Based on emissions and meteorological inputs, a dispersion model can be used to predict concentrations at selected down-wind receptor locations.



The use of certain software systems are preferred by regulatory agencies when evaluating permits applications. By using the preferred dispersion software models, permitting can be expedited.

Both the Michigan Department of Environmental Quality – Air Quality Division and the United States EPA prefer the models that are calculated by the AERMOD software. The software provides a steady state dispersion model designed for short range (up to 50 kilometers) dispersion of air emissions from stationary sources. Gosling Czubak uses this software.

The software uses surface air and upper air meteorological data representative of the general area being modeled. Because the terrain can also affect emission dispersion, the model also allows for inputs of terrain data that provides a physical relationship between terrain features and the behavior of emission plumes. This allows the dispersion model to simulate the effects of air flowing over or diverging around hills.



Sample modeling wind dispersion vectors

Modeling Inputs

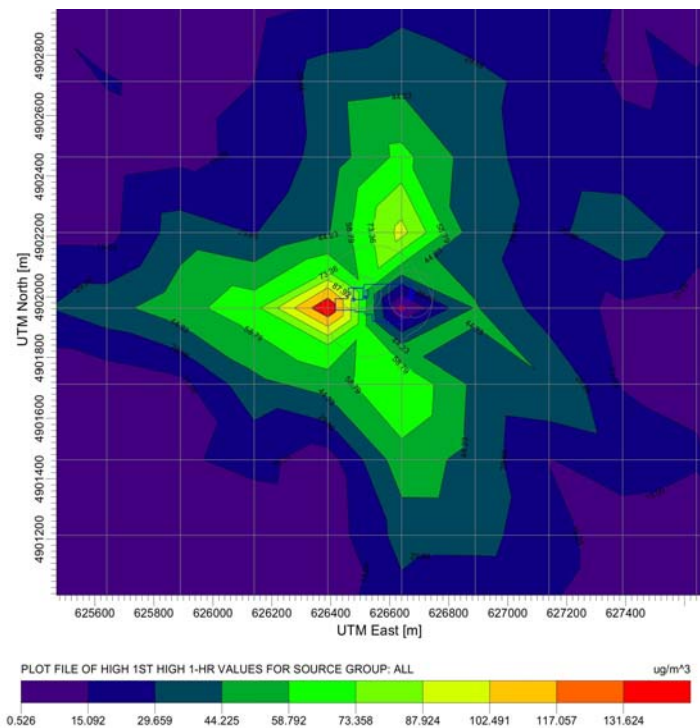
The modeling requires some information from the owner. This typically includes stack and building heights, building dimensions, latitude/longitude coordinates, emission rates, exit gas velocity, and exit gas temperatures. If CADD drawings of the buildings are available, they can be imported into the model.

Modeling Results and Iterations

After Gosling Czubak constructs and runs the dispersion model, we compare it to the applicable regulatory standards. It is not unusual for the model to predict that some emissions from the facility will not meet several regulatory requirements. This is where the value of the model can be realized.

By altering some of the input data, such as increasing a stack height or installation of a control device such as a catalyst, we can run additional iterations of the dispersion model and determine changes to the system that will achieve permitting requirements.

This can save the owner time and money by submitting a permit application that meets the requirements.



Sample model output showing emission concentrations near a source

If you would like to know about air permitting or air dispersion modeling, please contact Sean Craven at Gosling Czubak for more information (800) 962-1062.



Gosling Czubak
engineering sciences, inc.

Gosling Czubak

1280
Business Park Dr.
Traverse City, MI
49686-8607

Telephone:
231-946-9191
1-800-968-1062

Fax:
231-941-4603

Website:
goslingczubak.com

Subpart W –Greenhouse Gas Reporting Update

On September 27, 2011, the EPA issued a rule that finalized amendments to the Best Available Monitoring Methods (BAMM) provisions in Subpart W of the Greenhouse Gas regulations. With these amendments, owners and operators of facilities covered by Subpart W are now permitted to implement BAMM for calendar year 2011 without being required to submit a request for approval from the Administrator. In addition, EPA has expanded the types of emission sources that are permitted to use BAMM in 2011 without being required to submit a request for approval from the Administrator.

These amendments give owners and operators additional time to request use of BAMM beyond 2011. Owners and operators must submit a notice of intent by December 31, 2011 indicating a plan to use BAMM in 2012. These changes will aid oil and gas operators who may not be current with greenhouse gas recordkeeping and reporting.

On August 4, 2011, the EPA issued proposed technical corrections, clarifications, and other amendments to Subpart W. These corrections are actions taken by EPA to amend Part 98 and are intended to correct technical and editorial errors. They also address a number of specific issues identified as a result of working with reporters during rule implementation and outreach. The proposed technical corrections will not change the overall requirements of the rule but should provide more consistency with the calculation, monitoring, and data reporting requirements.

Insights is intended to provide discussion and information concerning environmental issues and is not intended to provide legal advice. © 2011GCES

1-800-968-1062 www.goslingczubak.com