



WENCK  
Methods of NAAQS Compliance: A Case Study  
for Ambient Air Monitoring  
*Presented by*

Charlene Becka

# METHODS OF COMPLIANCE

## Air Dispersion Modeling

- Can be difficult to meet for short averaging periods (24-hr PM<sub>2.5</sub>, 1-hr NO<sub>2</sub>)
- Modeled exceedances do not indicate monitored concentrations above NAAQS
- Compliance can require expensive building/stack changes or stringent production or emission limits
- Permit conditions for remodeling for facility changes

## Ambient Air Monitoring

- High capital cost for monitoring equipment
- Long-term operational costs for the life of the monitor
- The risk of monitored readings above the NAAQS
  - Is it your neighbor?
- Currently, no endpoint for monitoring

# FACILITY OVERVIEW

Food manufacturing facility located south of Twin Cities.

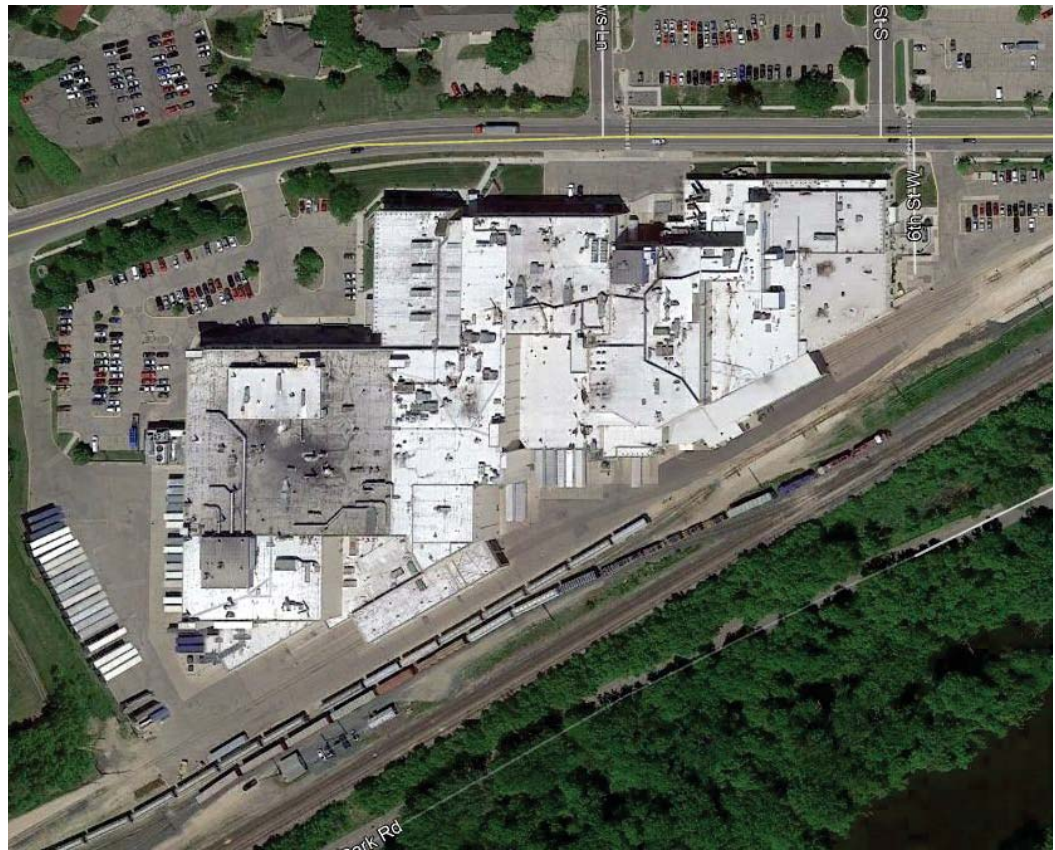
- Part 70/Synthetic Minor PSD source
- Mainly industrial sources of  $PM_{2.5}$ , small amount of combustion

Facility completed and demonstrated compliance with the  $PM_{10}$  NAAQS as a result of the “NAAQS note”.

$PM_{2.5}$  modeling required as part of the most recent Title V reissuance (2015).

# THE FACILITY

- Primarily stacks, some internally venting sources and fugitives
- Ambient air boundary close to state highway and neighbors



# MODELING COMPLIANCE

## PM<sub>2.5</sub> Modeling Results

- PM<sub>2.5</sub> modeling results exceeded the 24-hr NAAQS
- Modeling guidance required unrealistic treatments of certain sources (such as internally venting sources)
- Modeling and permitting costs ~\$50K
- Stack changes would cost ~\$5M

# PM<sub>2.5</sub> MODELING FOR MONITORING

Facility required to complete PM<sub>2.5</sub> modeling as part of siting monitor.

Currently there is no MPCA guidance on how to model for monitoring.

The goal is **not** to demonstrate compliance with the NAAQS.

# PM<sub>2.5</sub> MODELING PROCEDURE

Modeling did not follow MPCA guidance for NAAQS compliance:

- Receptors extended to 5 km (vs. 50 km in guidance).
- No background included.
- No nearby sources considered.
- No SIL modeling. Results followed form of the standard.
- Conservativisms removed (internally venting sources, paved roads) to avoid skewing maximum impact areas.

# PM<sub>2.5</sub> MODELING PROTOCOL


Submittal differed from traditional protocol

- **Not** required to go through e-Services.
- Submitted using AQDM-1.5, protocol resubmittal form.
- Submittal completed in narrative form.
- Frequent language regarding modeling for monitor siting, **not** compliance with NAAQS.

Approach was approved with minimal comments.



# PERMITTING IMPLICATIONS

- Major amendment required to change the permit to allow for monitoring instead or in addition to modeling.
  - Non-priority major amendment.
  - While the facility was in compliance with the current permit, they had to enter into a Schedule of Compliance (SOC) to allow for monitoring.
  - Note: the facility was not out of compliance, but SOC was the only avenue to allow for the change.
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# PROPOSED MONITORING PLAN

- Three monitors required at two location
  - Monitors sited based on modeled results
  - One location will have two monitors for redundancy
- Monthly calibrations
- Additional evaluations in the event of monitored values above NAAQS
  - Stack culpability determination. Facility has over 50 stacks. This is used to narrow down culpable sources.

# MONITORING COMPLIANCE

## Monitoring to Demonstrate Compliance

- Modeling to site monitor
- Monitoring plan creation
- Initial technology investment ~\$100K
- Annual operation costs ~\$50K

## SUMMARY

- With stack modifications, modeling has higher up-front costs, monitoring has ongoing costs.
- Modeling a good option for:
  - Facilities willing to take limits
  - Distant ambient boundary
  - “Ideal” stacks/sources
- Monitoring a good option for:
  - Tight ambient boundaries
  - Unable to accept limits or change stacks
  - Low actual emissions
  - Batch process that are not well represented in the model.

QUESTIONS





# WENCK

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Exceptional outcomes.

