# Navigating the Clean Air Act

**Robynn Andracsek, P.E.**
randracsek@burnsmcd.com
**816-377-1288**

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# Navigating the Clean Air Act

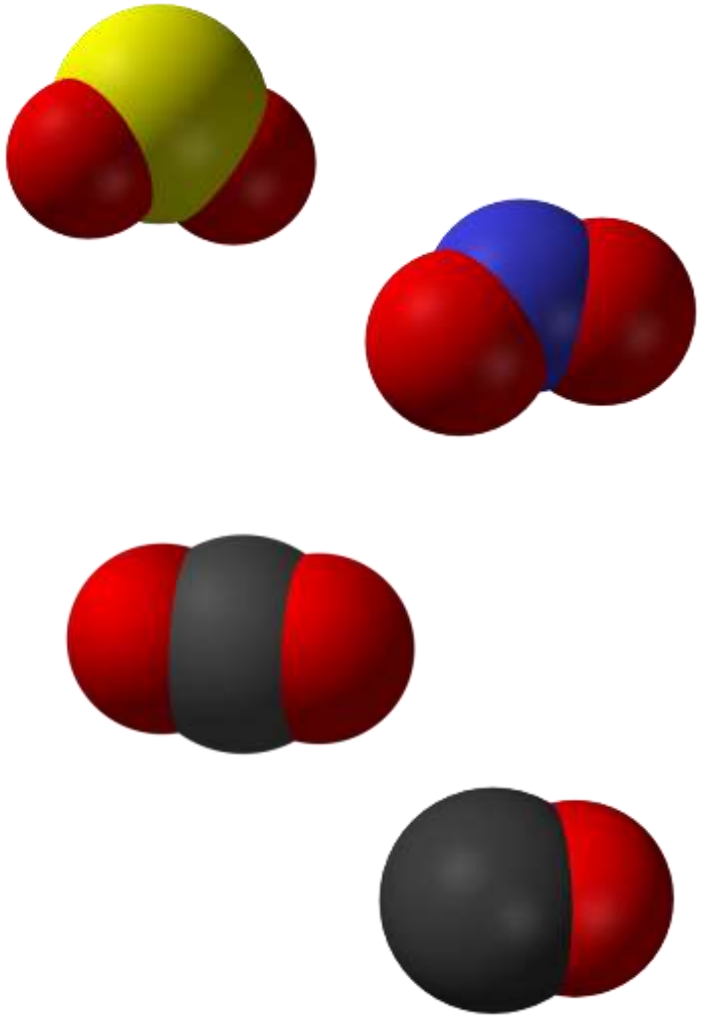
Basics

- Single Source
- Major Thresholds
- Dispersion Modeling

Examples

- University of Kansas Hospital Authority
- Parkland Health and Hospital System
- Penn State

# Pollutants



- Nitrogen Oxides ($NO_x$)
- Particulate Matter
  - Less than 10 microns ($PM_{10}$)
  - Less than 2.5 microns ($PM_{2.5}$)
  - Filterable plus condensable
- Sulfur Dioxide ($SO_2$ )
- Ozone/Volatile Organic Compounds (VOC)
- Carbon Monoxide (CO)
- Lead (Pb)
- Carbon Dioxide Equivalents ($CO_2e$)

# Single Source Determination

1. Belong to the same industrial grouping
   - Standard industrial classification (SIC) code
2. Are located on one or more contiguous or adjacent properties
3. Are under the common control of the same person or persons under common control

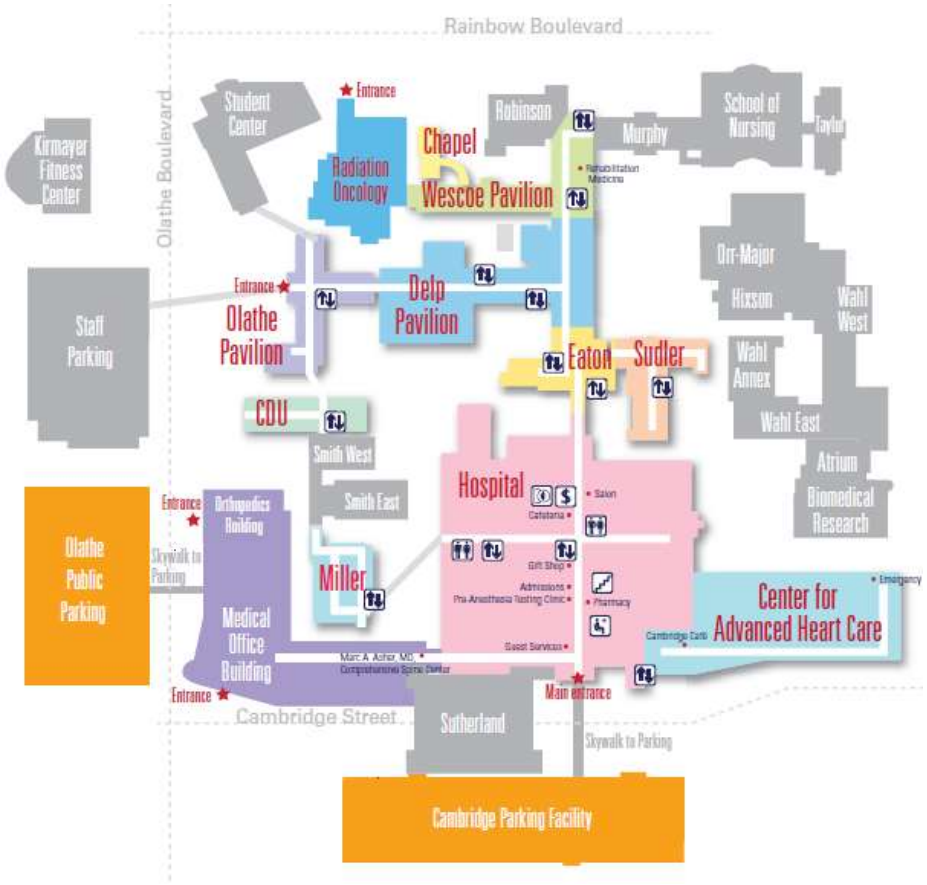
www.tceq.state.tx.us/assets/public/permitting/air/Guidance/Title_V/site.pdf

# Single Source Example: Parkland Hospital


- Expansion and eventual replacement
- Old hospital across the highway
- Non-attainment area

## Ruled a Single Source

# Single Source Example: University of Kansas




Statutory language separating the two entities:

- University of Kansas Hospital Authority
  - Medical Office Building (MOB)
  - Bell Hospital and Center for Advanced Heart Care (CAHC/Bell)
  - Central Utility Plant (CUP)
- KU Medical Center
  - Several boilers
  - Emergency generators
  - Animal/medical waste incinerator
  - Crematorium

**Ruled Separate Sources**

# Major Source Construction Thresholds

Must know if facility is major or minor before you can determine what the major project thresholds are

- Existing facility PSD status (major/minor)
  - Greenfield or brownfield site?
  - Greenfield is automatically an existing minor source
- Is facility a listed source?
  - Probably not for this audience (e.g. coal utilities, chemical plants)
- Attainment area or non-attainment area
  - Lower thresholds for pollutants of concern in non-attainment areas

PSD = Prevention of Significant Deterioration

# Ton Per Year Thresholds for Attainment Areas

| | CO | $NO_x$ | $SO_2$ | VOC | $PM_{10}$ | $PM_{2.5}$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|
| Facility Thresholds | | | | | | | |
| Major Facility | 250 | 250 | 250 | 250 | 250 | 250 | 100,000 |
| Major Project Thresholds | | | | | | | |
| at a Minor Facility | 250 | 250 | 250 | 250 | 250 | 250 | 100,000 |
| at a Major Facility | 100 | 40 | 40 | 40 | 15 | 10 | 75,000 |

If one pollutant exceeds major facility thresholds,
then all pollutants must compare to the major project at major facility thresholds.

Non-attainment areas have lower thresholds, specific to that area.

# Construction Thresholds Example: Parkland

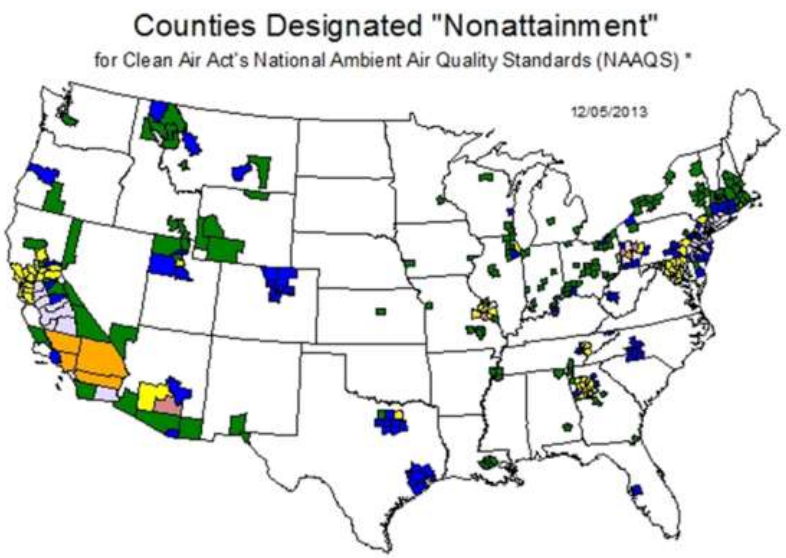
- Existing PSD minor facility (old hospital)
- Dallas ozone non-attainment area (VOC and $NO_x$)

| | CO | $NO_x$ | $SO_2$ | VOC | $PM_{10}$ | $PM_{2.5}$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|
| Existing Equipment Subtotal | 22.14 | 29.75 | 0.50 | 1.79 | 6.66 | 6.66 | 30,379 |
| New Equipment Subtotal | 34.02 | 20.08 | 6.44 | 3.60 | 9.89 | 9.89 | 99,944 |
| Grand Total | 56.16 | 49.82 | 6.94 | 5.38 | 16.55 | 16.55 | 130,324 |
| Major Facility Thresholds | 250 | 50 | 250 | 50 | 250 | 250 | 100,000 |
| Major Project Thresholds | 250 | 50 | 250 | 50 | 250 | 250 | 100,000 |

# Construction Thresholds Example: KUHA

| | CO | $NO_x$ | $SO_2$ | VOC | $PM_{10}$ | $PM_{2.5}$ | $CO_2e$ |
|---|---|---|---|---|---|---|---|
| MOB | 3.56 | 5.35 | 0.64 | 0.12 | 2.37 | 2.37 | 2,927 |
| CUP | 75.34 | 87.75 | 26.06 | 5.34 | 38.81 | 38.81 | 59,043 |
| CAHC | 6.55 | 44.13 | 1.28 | 2.65 | 1.11 | 1.11 | 4,134 |
| Total PTE | 85.44 | 137.24 | 27.98 | 8.11 | 42.29 | 42.29 | 66,105 |
| Conditioned PTE | 85.44 | 99.00 | 27.98 | 8.11 | 42.29 | 42.29 | 66,105 |
| Title V Thresholds | 100 | 100 | 100 | 100 | 100 | 100 | 100,000 |
| Major Facility Thresholds | 250 | 250 | 250 | 250 | 250 | 250 | 100,000 |
| Major Project Thresholds | 250 | 250 | 250 | 250 | 250 | 250 | 100,000 |

# Dispersion Modeling




- **Goal:**
  - **"To protect and enhance the quality of the nation's air resources so as to promote the public health and welfare and productive capacity of its population."**

- **National Ambient Air Quality Standards (NAAQS)**
  - **Established to protect sensitive populations**
  - **Elderly, Children, Asthmatics**

www.epa.gov/air/oaqps/greenbk/mapnpoll.html

# Modeling Standards

- Significance Levels
  - Modeling and Monitoring
- National Ambient Air Quality Standards
  - Ceiling of air quality pollution allowed
  - All sources plus add in background
- Prevention of Significant Deterioration Increment
  - Incremental degradation allowed above baseline in areas with good air quality
  - Only sources modified after baseline date
  - Specifies the maximum extent to which the ambient concentration may be allowed to increase above the legally defined baseline concentration in an area with clean air.

# More Than Just Emissions

Figure 1. Diesel Generator, 15 feet tall stack, 5 lb/hr NO2, rain cap

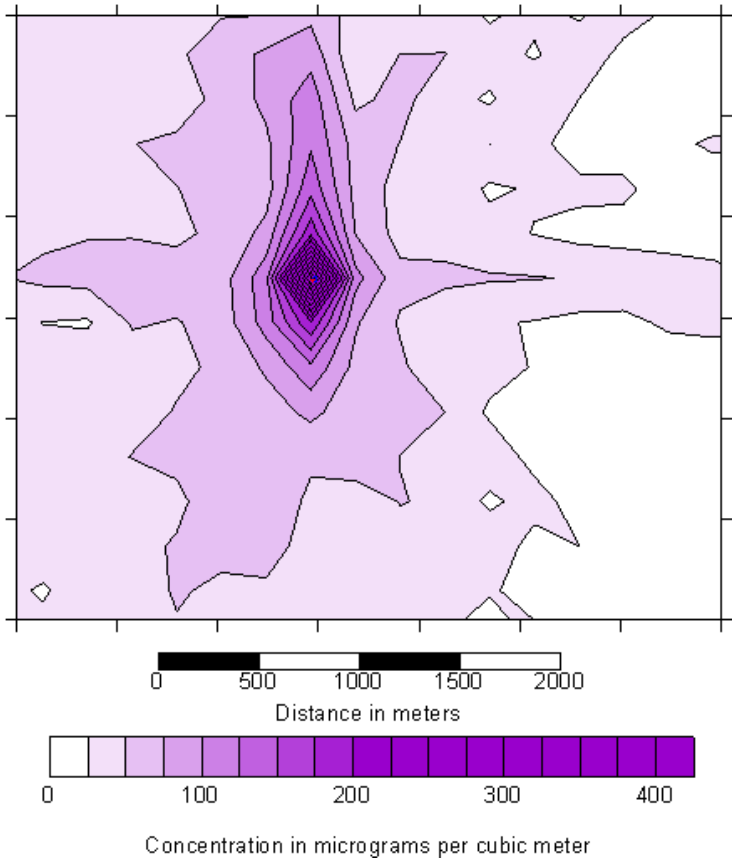
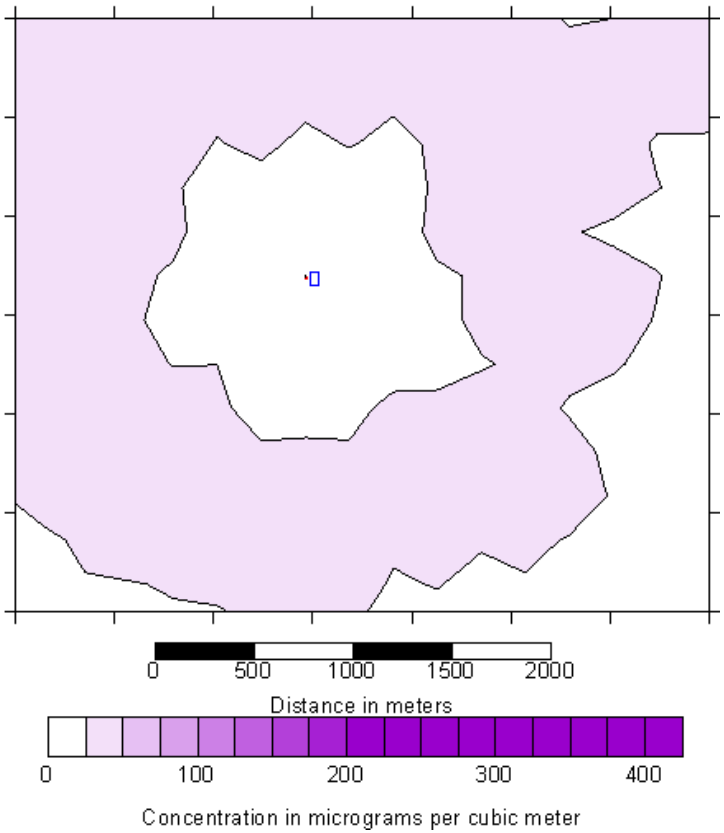



Figure 2. Coal-fired Boiler, 600 feet tall stack, 1000 lb/hr NO2, vertical, unobstruced exhaust




**Emergency Generator**

**Coal-fired Boiler**

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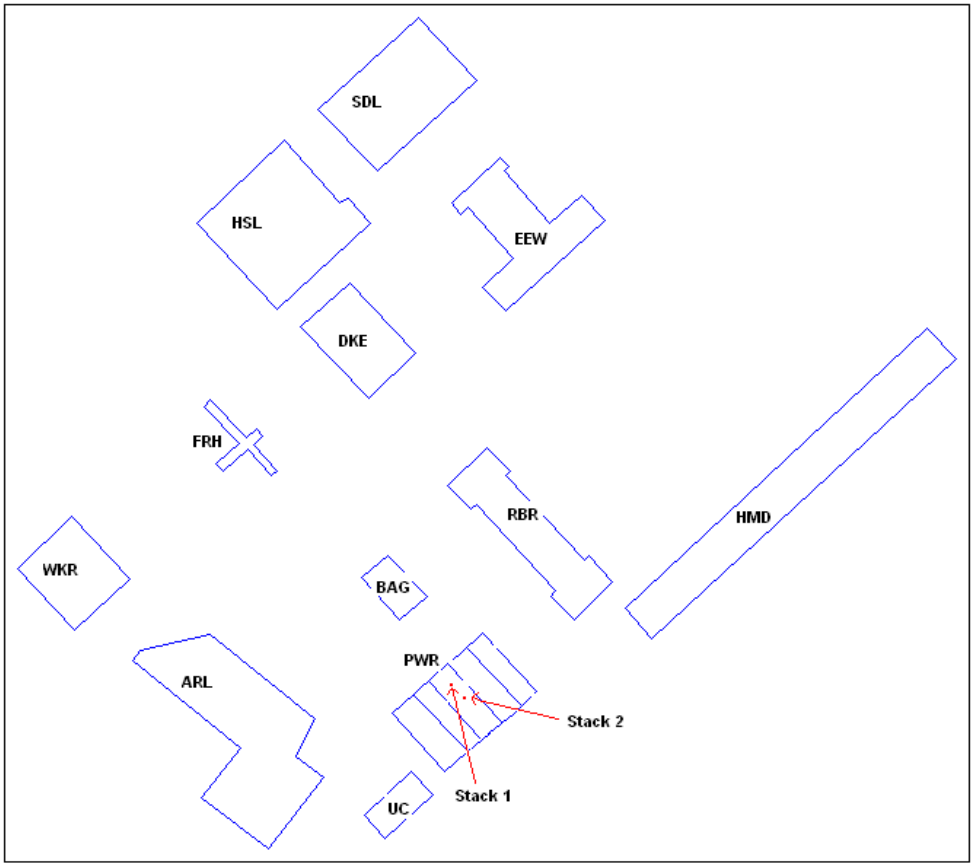
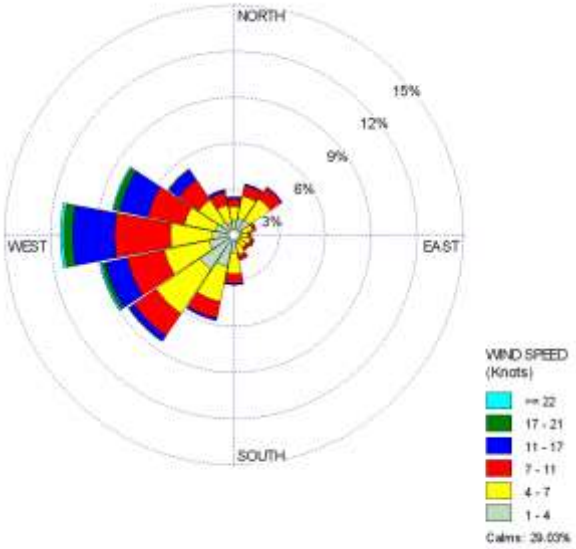
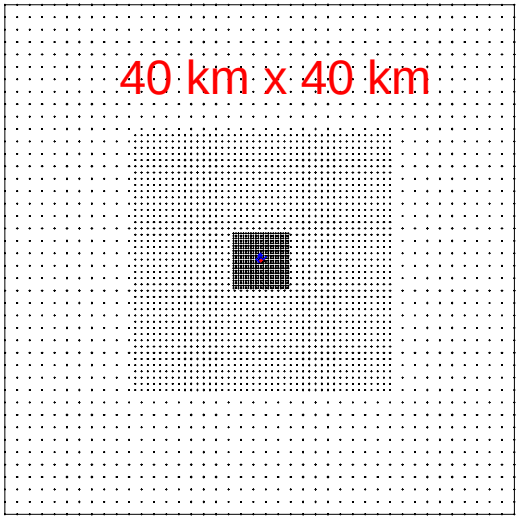
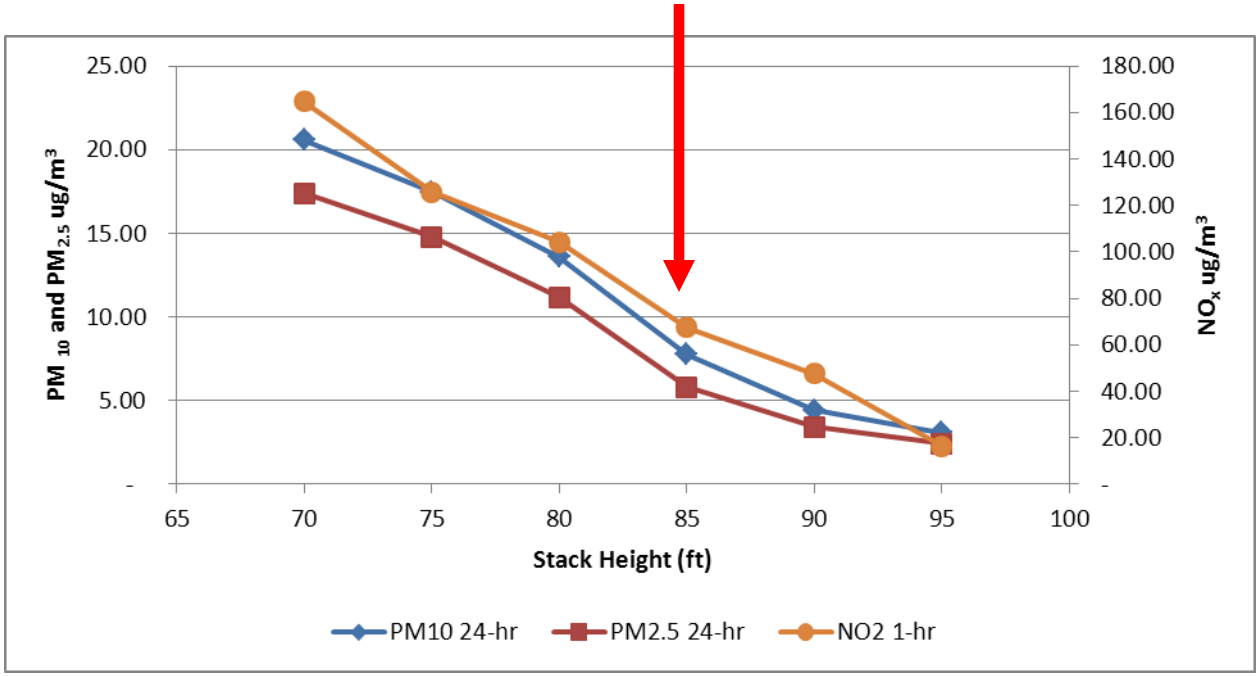
# Modeling Example: Penn State

- Convert four coal boilers to fire natural gas and fuel oil
- Need to determine the minimum recommended stack height for the two new stacks
- Each of the new stacks will serve two of the converted boilers



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# Summary

- Define the “source”
  - Make sure the permitting authority agrees
- Determine your permitting thresholds
  - Must understand where you are starting from in order to know how much you can add
- Dispersion modeling
  - Not always triggered