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# Clean Air Act: Stationary Source Permits and Other Technical Topics

UALR Bowen School of Law
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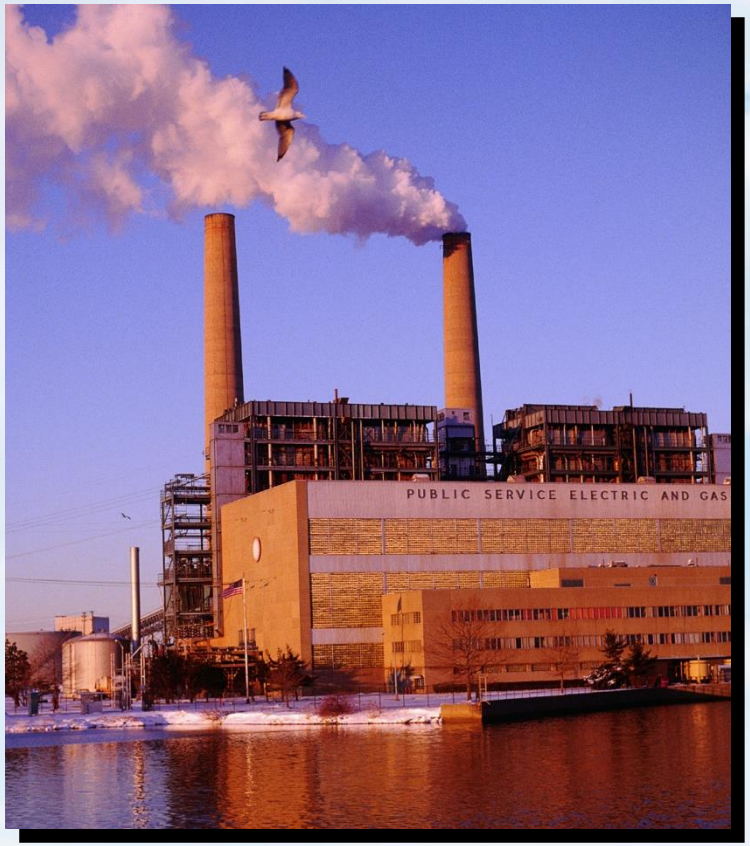


- Founded in 1974
- 40+ locations nationwide, China, and Middle East
- 1,400 projects per year
- Environmental consulting services for “smokestack” industry
- Expertise in CAA permitting, modeling, regulatory compliance, and auditing
- Overall environmental management support

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# Outline

- Background on CAA & Permits
- Who Needs a Permit?
  - See example Arkansas Lime Permit
- Where Do You Get a Permit?
- How Do You Get a Permit?
  - See example Arkansas Lime Permit Application
- How Do Permittees Comply With Permits?

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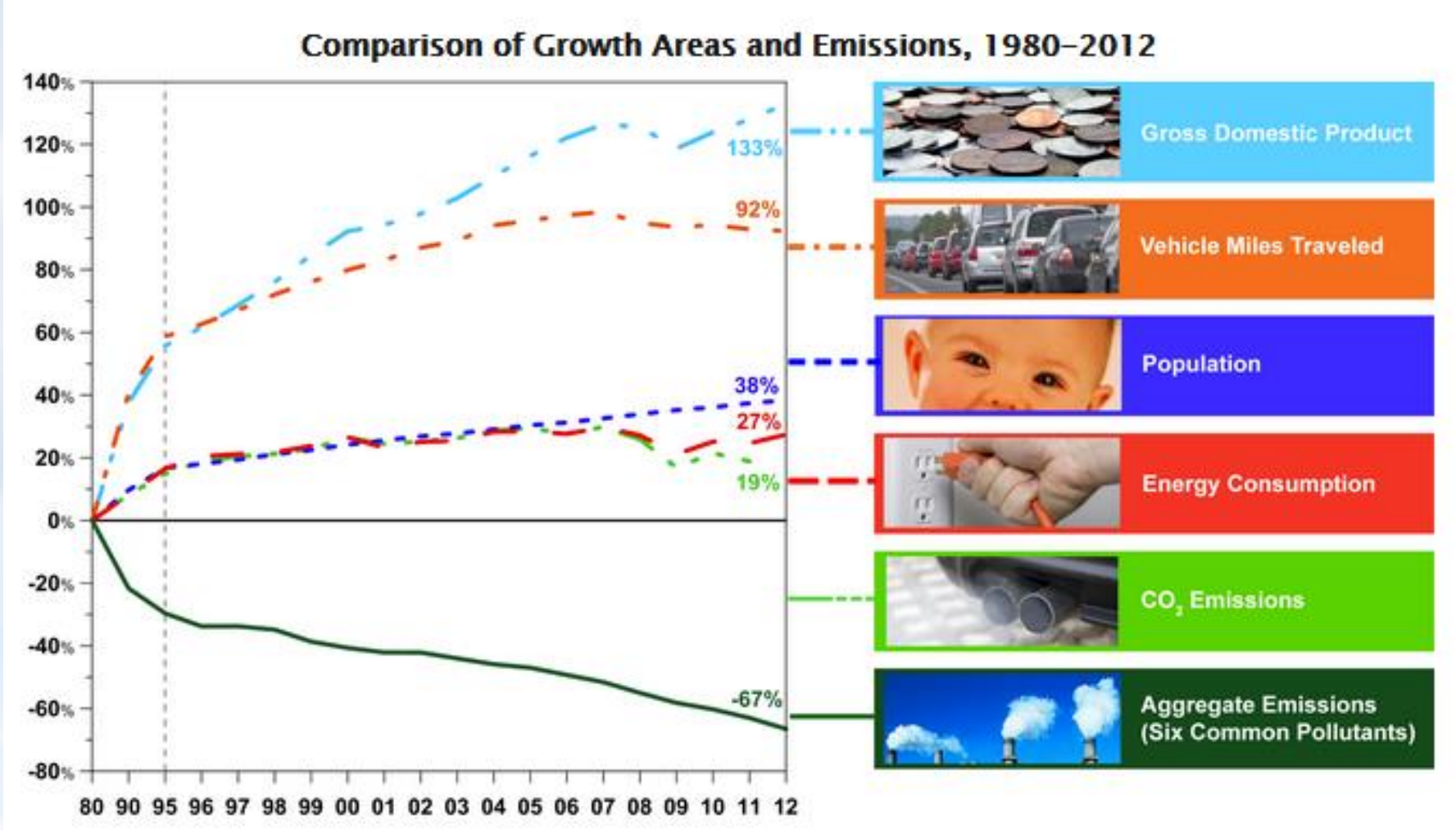
# Acronyms

- CAA: Clean Air Act
- HAP: Hazardous Air Pollutant (187 compounds listed in CAA Section 112)
- NAAQS: National Ambient Air Quality Standards
- NESHAP: National Emission Standard for HAP (defines MACT, also called "MACT Standards", contained in 40 CFR 63)
- NSPS: New Source Performance Standards (contained in 40 CFR 60)
- SIP: State Implementation Plan

# Acronyms (cont'd.)

- NSR: New Source Review (refers to the pre-construction air permit process)
- PSD: Prevention of Significant Deterioration (the federal major source construction permit program)
- PTE: Potential To Emit
- SIP: State Implementation Plan (think of it as the state regulations)
- Tpy: Tons Per Year
- VOC: Volatile Organic Compound (defined in 40 CFR 51.100(s))

# CAA: A Regulatory Success Story




Source: http://www.epa.gov/airtrends/aqtrends.html#comparison

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# Goal of 1970 Clean Air Act Amendments

***"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."***

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# 1970 CAA

- Establish benchmarks - NAAQS
  - Control emissions of air pollutants where necessary to protect and enhance air quality
- Federal programs regulating certain industries and sources (e.g., NSPS, NESHAP)
  - Control emissions of air pollutants where practically and economically feasible
  - See Handout of "NSPS by Industry"
- Require states to develop "State Implementation Plans" (SIPs)
  - **Including, Review of new/modified stationary sources (permitting)**

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# 1970 CAA - NAAQS

- Six criteria pollutants (7 if you count the two forms of particulate) used as indicators of air quality
- Maximum ambient concentration levels
  - Adverse effects on human health or public welfare can occur above these levels
  - Set at levels safe for "most sensitive individual"
- Areas where measured air concentrations exceed the NAAQS designated as "nonattainment"

## National Ambient Air Quality Standards (NAAQS)

| Pollutant | Averaging Period | Primary ($\mu g/m^3$) | Primary (ppm) | Secondary ($\mu g/m^3$) | Secondary (ppm) | Form (i.e., How Standard is Applied) |
|---|---|---|---|---|---|---|
| **$PM_{10}$** | Annual | 50 | -- | 50 | -- | Annual arithmetic mean, averaged over 3 years |
| | 24-hour | 150 | -- | 150 | -- | 99th percentile of concentrations in a given year, averaged over 3 years |
| **$PM_{2.5}$** | Annual | 15 | -- | 15 | -- | Annual arithmetic mean from single or multiple monitors, averaged over 3 years |
| | 24-hour | 65 | -- | 65 | -- | 98th percentile of concentrations in a given year, averaged over 3 years |
| **$SO_2$** | Annual | (80) | 0.03 | -- | -- | Annual arithmetic mean |
| | 24-hour | (365) | 0.14 | -- | -- | Not to be exceeded more than once per calendar year |
| | 3-hour | -- | -- | (1,300) | 0.5 | Not to be exceeded more than once per calendar year |
| **$NO_2$** | Annual | (100) | 0.053 | (100) | 0.053 | Annual arithmetic mean |
| **Ozone** | 8-hour | (157) | 0.08 | (157) | 0.08 | 3-year average of annual 4th highest daily maximum 8-hour concentrations |
| | 1-hour | (235) | 0.12 | (235) | 0.12 | Not to be exceeded more than 3 times in 3 consecutive years |
| **CO** | 8-hour | (10,000) | 9 | -- | -- | Not to be exceeded more than once per calendar year |
| | 1-hour | (40,000) | 35 | -- | -- | Not to be exceeded more than once per calendar year |
| **Lead** | Calendar Quarter | 1.5 | -- | 1.5 | -- | Maximum arithmetic mean |

SEE NAAQS HANDOUT

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# National Ambient Air Quality Standards

| Pollutant | Avg. Period | NAAQS ($\mu g/m^3$) |
|---|---|---|
| $PM_{10}$ | 24-Hr | 150 |
| $PM_{2.5}$ | Annual / 24-Hr | 15 / 35 |
| ~~$SO_2$~~ | ~~*Annual*~~ | ~~*80**~~ |
| ~~$SO_2$~~ | ~~*24-Hr*~~ | ~~*365**~~ |
| *$SO_2$* | *1-Hr* | *196* |
| $NO_2$ | Annual | 100 |
| *$NO_2$* | *1-Hr* | *188* |
| Ozone | 8-Hour | 137 (0.070 ppm) |
| CO | 8-Hr / 1-Hr | 10,000 / 40,000 |
| Lead | Rolling 3-Month | 0.15 |

** SO2 Annual and 24-Hr revoked 8/23/2011.*

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# Measurement of Ambient Air Pollution

- State and Federal ambient monitoring networks
- "Nonattainment" designations
  - Generally based on 3-years of data
- Areas can move in and out of Nonattainment

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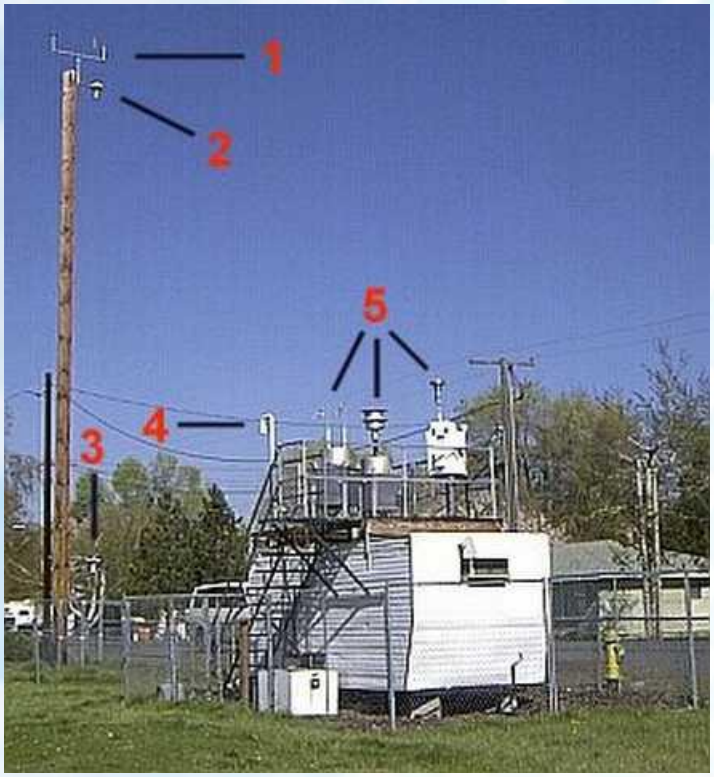
# Air Pollution Monitoring Stations

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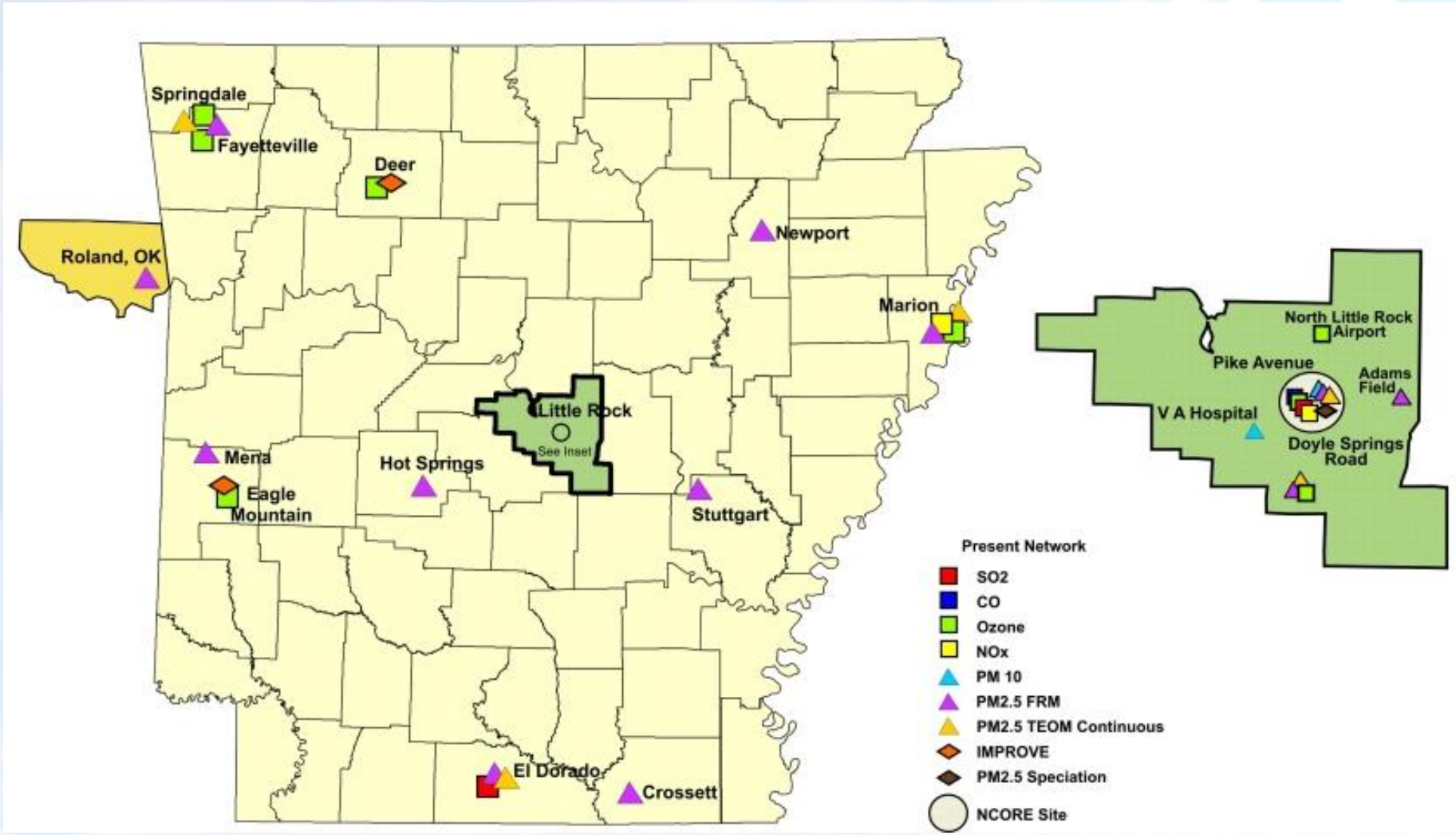
# Air Pollution Monitors in Arkansas

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# Major New Source Review (NSR) Permitting Program

- Air permitting for construction of new major sources or major modifications to existing sources
  - Prevention of Significant Deterioration (PSD)
  - Nonattainment Area Review
- Most every state also has a Minor NSR Permit Program
  - As defined in their SIP and SIP Regulations

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# NSR Construction Permits

## Minor NSR Source

**SIP**
**Construction Permit**
**(aka Permit To Construct, Permit to Install (OH), Notice of Construction (WA))**

## Major NSR Source

**Major NSR**
**Permit**
**(PSD permit in attainment area, NNSR permit in NA areas)**

# Who Needs A Permit?

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# Applicability of Air Permits

- New or modified "sources" of air emissions
  - "Source" is an entire industrial facility, i.e., power plant, oil refinery, paper mill, saw mill
  - Residential usually excluded
  - Mobile source emissions excluded
  - Commercial/educational/govt sites ARE often regulated
    - E.g., Hospitals, universities, military

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# Pollutants & Emitting Processes

| FEDERALLY REGULATED POLLUTANT | TYPICAL EMITTERS |
|---|---|
| PARTICULATE MATTER (DUST & SMOKE) (PM, $PM_{10}$, $PM_{2.5}$) | MATERIAL HANDLING, FUEL COMBUSTION, WELDING |
| NITROGEN OXIDES ($NO_X$) | FUEL COMBUSTION |
| SULFUR DIOXIDE ($SO_2$) | FUEL COMBUSTION, OIL AND GAS OPERATIONS, PETROCHEMICAL PLANTS, PRIMARY AND SECONDARY METALS |
| CARBON MONOXIDE (CO) | FUEL COMBUSTION |
| VOLATILE ORGANIC COMPOUNDS (VOC) | PAINTING & SOLVENT USE OPERATIONS, PETROCHEMICAL PLANTS, GASOLINE STORAGE/TRANSFER |
| HAZARDOUS AIR POLLUTANTS (HAP) | PAINTING OPERATIONS, OIL & GAS OPERATIONS, PETROCHEMICAL PLANTS, PRIMARY AND SECONDARY METALS |

# Obvious Emission Units

- Fuel burning equipment

- Other equipment with visible emissions (smoke or dust)

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# Not-So-Obvious Emission Units

- Volatile liquid storage tanks
  - Solvent, gasoline
- Surface coating operations (painting)
- Use of cleaning solvents
- Welding
- Piping & equipment fugitive leaks
- Wastewater treatment operations

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# Where Do You Get An Air Permit?

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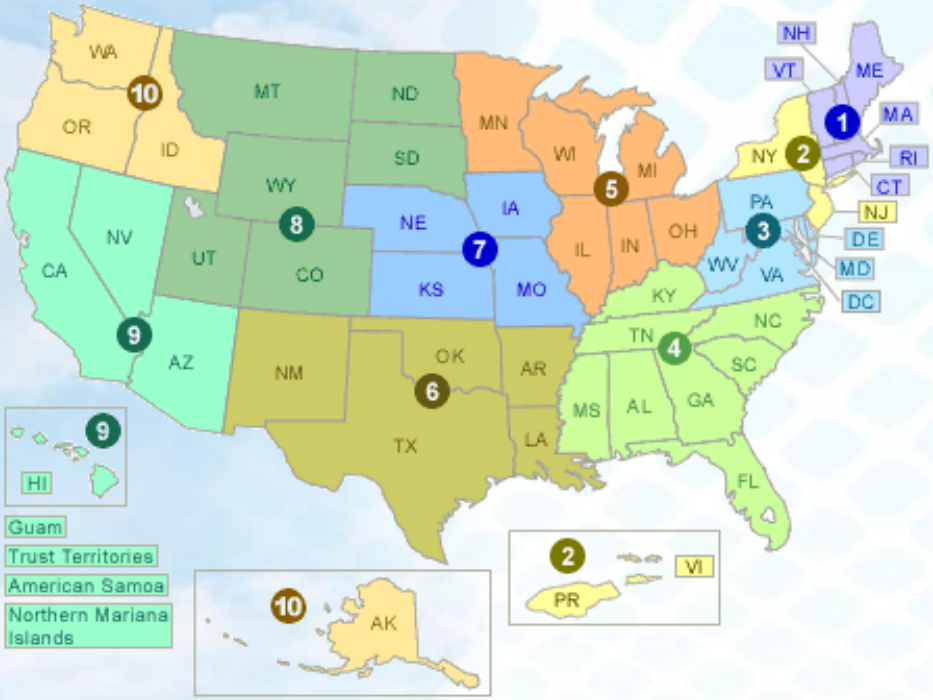
# Where?

## Air Permitting Authorities

- Usually State Agencies
  - Arkansas DEQ, Georgia EPD, Indiana DEM
  - Or City/County Agencies
    - Shelby County (TN) Health Dept – Pollution Control Section
- U.S. EPA has Federal lands (Indian Tribes) and oversight on the States




U.S. EPA's 10 Regions

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# When Must You Get A Permit?


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# When?

## What Triggers Permitting Action

- NEW "greenfield" facility or new air pollution emitting equipment installed at existing facility
- Existing equipment/processes to be physically MODIFIED so that process rates and/or emissions rates increase
- Need to CHANGE LIMIT in an existing air permit (production rates, raw material parameters, new applicable regulation in effect)
- Applicability based on POTENTIAL TO EMIT (PTE)

# When?

## Typical Exemptions from Permitting

- Increasing hours of operation (unless prohibited by a current permit limit)
- Increasing production rate without a capital expenditure (unless prohibited by a current permit limit)
- Adding insignificant or *deminimis* equipment (as defined by your state rules)
- CHECK your state rules for details

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# When?

## Typical Construction Permit Applicability

- Any new, relocated, modified, or reactivated source
- Source emission increase greater than: (varies by State)
  - tons per year (tpy)
  - pounds per day
  - pounds per hour
  - Permit trigger amount varies by local area's attainment status

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# When?

## Typical Construction Permit Applicability *(cont'd)*

- Almost always, sources must obtain a permit prior to commencement of construction, modification, or operation

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# What If My Source is Not New and Was Never Modified, Relocated, or Reactivated? Do I Still Need A Permit?

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# YES! Types of Operating Permits

## Title V Minor Sources

**State Operating Permit (SOP)**

**(aka Synthetic Minor SOP, Basic SOP)**

## Title V Major Sources

**Title V Operating Permit**

**(aka Part 70 permit)**

*Many states have a combined construction/operating permit program (a 1-permit system). Others have a 2-permit system.*

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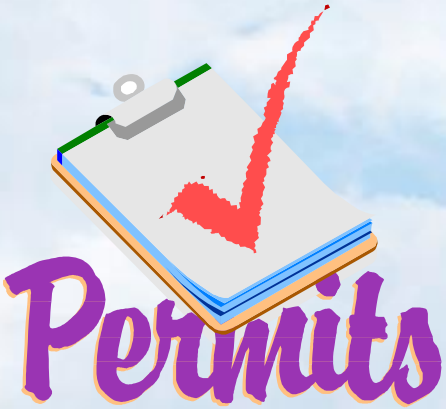


# PART 70/TITLE V OPERATING PERMIT PROGRAM REQUIREMENTS

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# Title V Permits

- Most state programs began ~1995-1998
- Required ALL major sources to obtain federally approved, state administered operating permits
- All CAA "applicable requirements" in one document
- Requires annual compliance certifications & semi-annual compliance monitoring reports
- Renewed every 5 years
- Synonyms
  - "Part 70 Permit"
  - "Title V Permit"
  - "Major Source Operating Permit"

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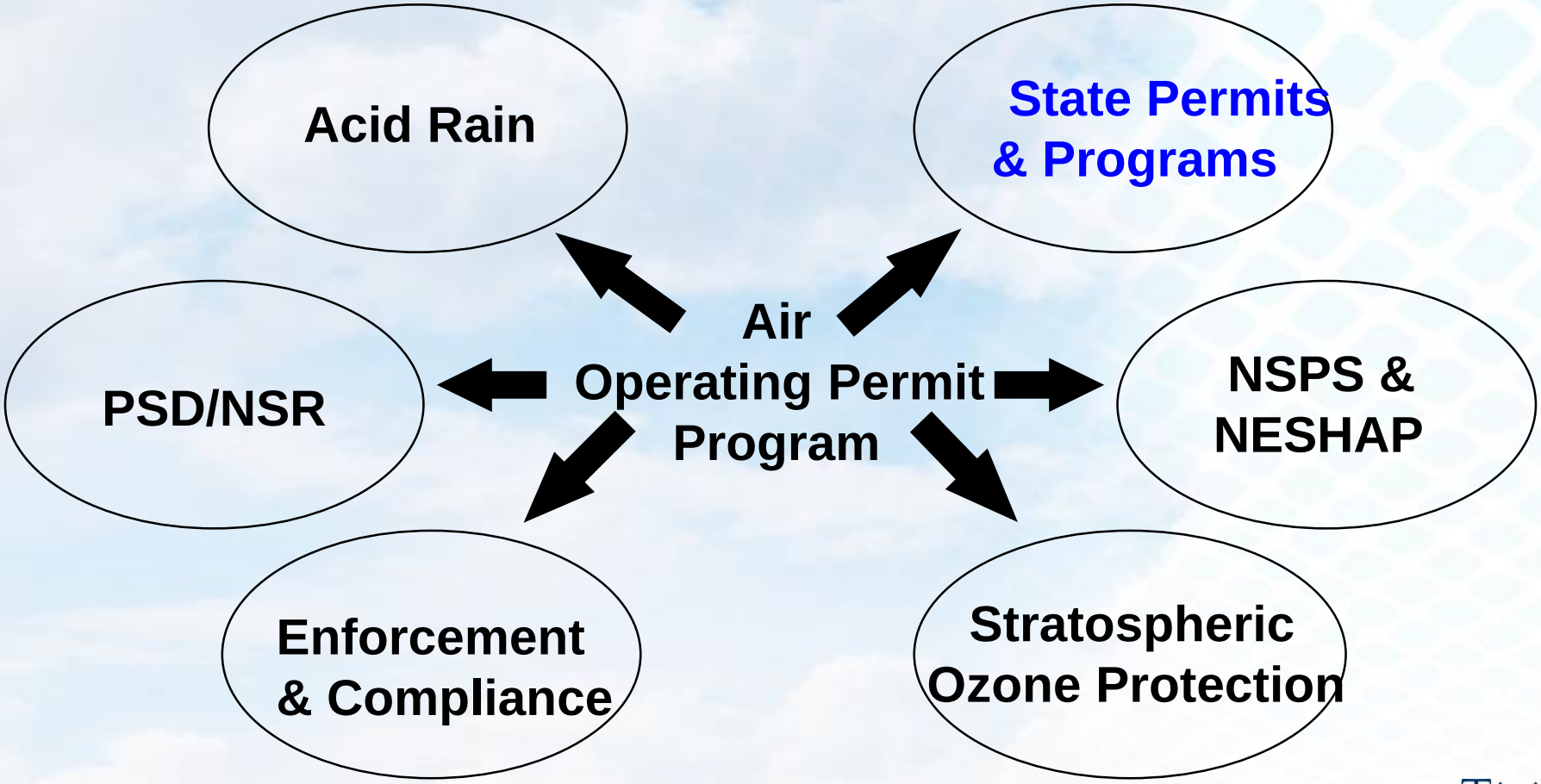
# Title V Operating Permit

**The Single Enforcement Document**

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# When?

## Major vs. Minor Sources

- "Major Source" status based on facility total emissions (per pollutant)
- NSR/PSD Major: PTE >250 tpy of any NSR regulated pollutant
- HAP Major: PTE >10 tpy any HAP or >25 tpy of combined HAPs
- Title V/Part 70 Major: PTE >100 tpy of any regulated pollutant, or HAP Major
- Minor = Anything that's not major
- Existing (or future) permits can synthetically "limit" your PTE

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# What is Potential To Emit?

- Maximum capacity to emit at current physical or operational design assuming 8760 hr/yr of operation
- Limits on physical or operational design (or on emissions) can be considered if Federally Enforceable (e.g., FE permit limits)
- Example: Physical capacity to emit assuming continuous operation is 500 tpy, but permitted emission limits total 50 tpy. Your PTE is 50 tpy.


# Arkansas Air Permits

## Minor Sources

**Regulation 18/19 Permit**

**(also called Air Code, SIP, minor source permit)**

## Major Sources (PTE>100 tpy FRP, 10 tpy HAP, 25 tpy HAPs)

**Regulation 26 Permit**

**(also called Title V permit)**

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# What Goes Into An Air Permit Application?

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# See Example Applications

- Site plans, process description, and equipment information
- Emission estimates
- Applicable CAA regulations
- Control Technology Evaluation (BACT), if req'd
- Air Quality Analysis (Monitoring and/or Modeling), if req'd
- State Forms and Certification by Responsible Official

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# How?
## Permitting Process

1. Facility submits complete permit application
2. State conducts technical review, Q&A, and prepares Draft Permit
3. Draft Permit is public noticed in newspapers of general circulation
4. Usually, a 30-day period for submittal of public comments (and facility comments) is required. [Some minor permit modifications avoid public comment]

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# How?
# Permitting Process (cont'd)

5. Public Hearing (optional) - May be requested by public [Usually only for large or controversial facilities]
6. State responds to comments and issues Final Permit
7. An appeal process is available to permittees & the public to force reconsideration of permit decisions (e.g., ADPC&E Reg. 8)

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# *What Is Air Quality Dispersion Modeling?*

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EAST RIVER FROM THE THIRTIETH STORY OF THE SHELTON HOTEL, NEW YORK, 1928 Georgia O'Keefe

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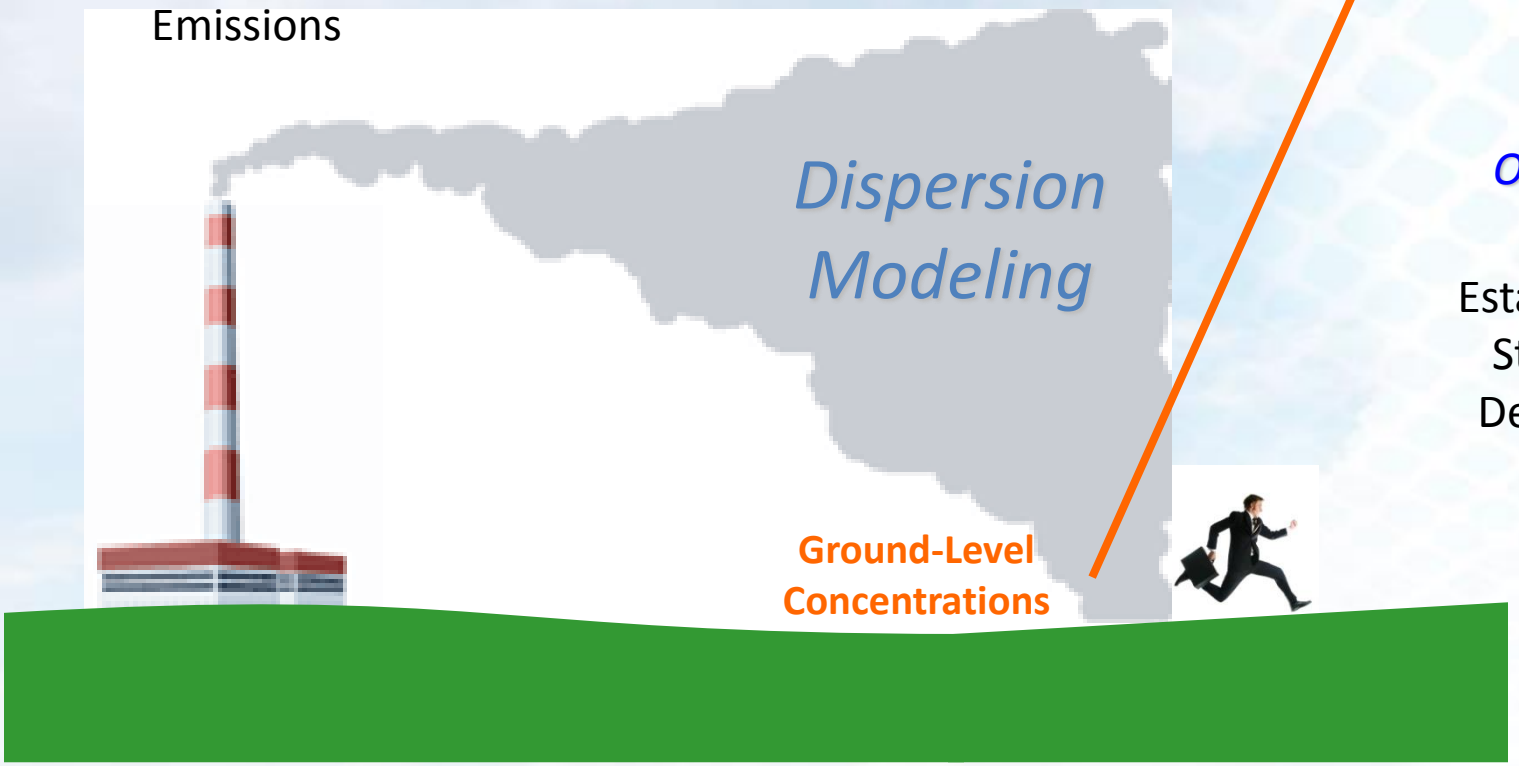
# Purpose of Dispersion Modeling

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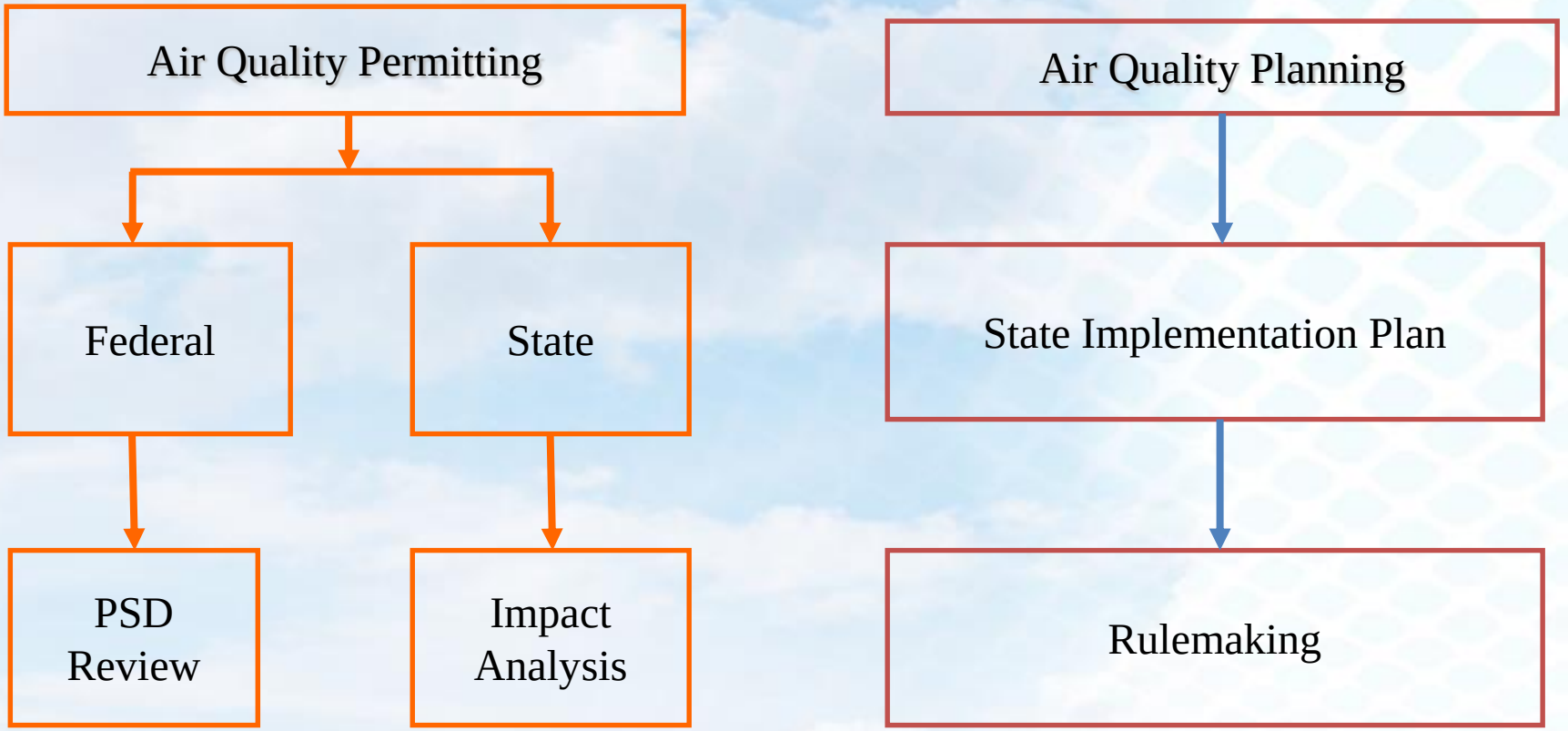
# When is Modeling Required?




** For projects that do not trigger a Federal review, modeling for criteria pollutants (NAAQS) may be requested by State or County agency*

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# Regulatory Models

- U.S. EPA is technical lead
  - "Bare bones" models free at SCRAM website
  - GUI-enhanced versions for sale at www.breeze-software.com (and other vendors)
- AERMOD is latest regulatory model for near field, stationary source continuous releases
  - Uses more advanced (than ISC) met data, terrain data, building downwash

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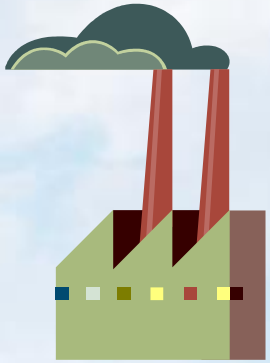
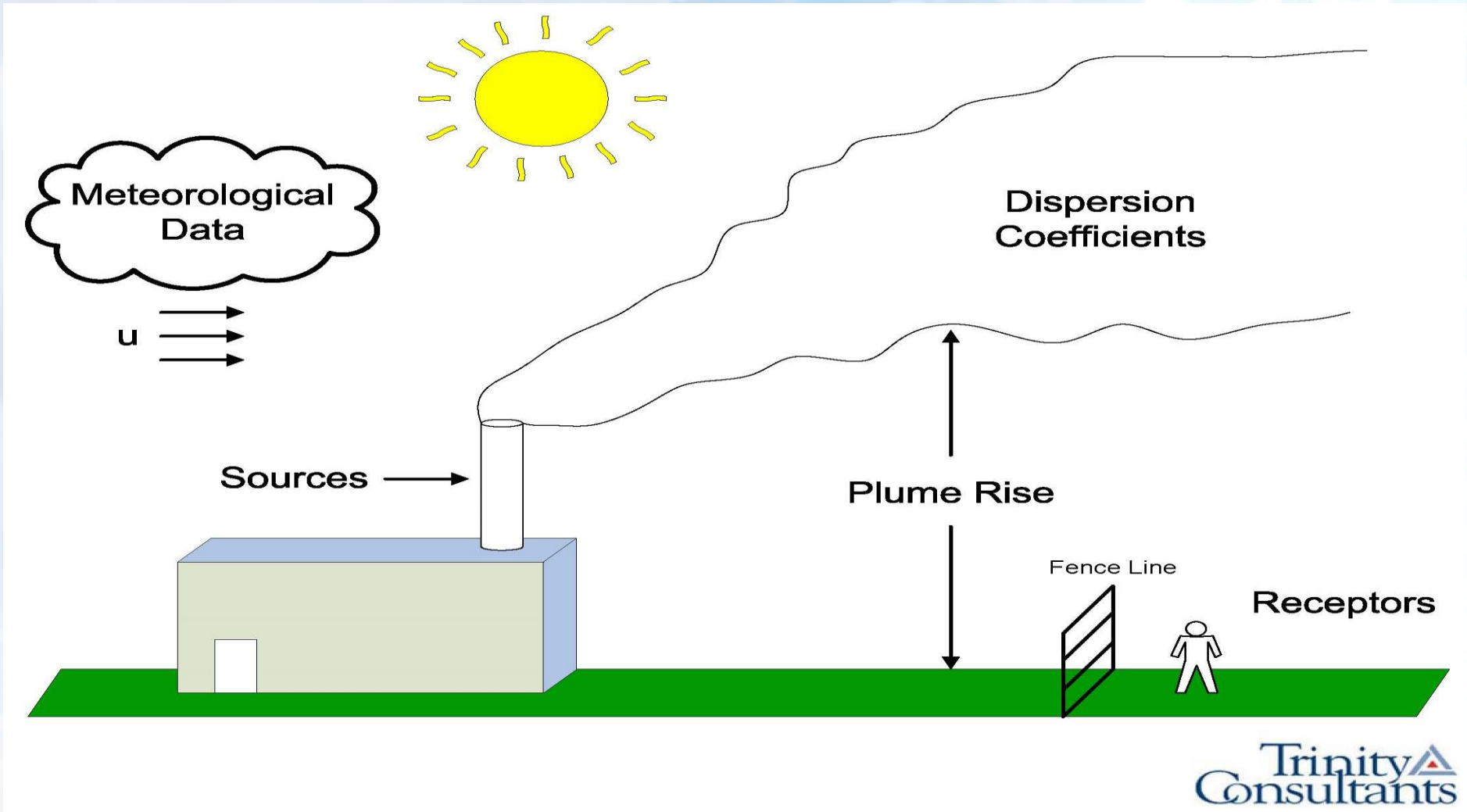
# What Goes Into Dispersion Modeling?



# Modeling Definitions – Other Parameters

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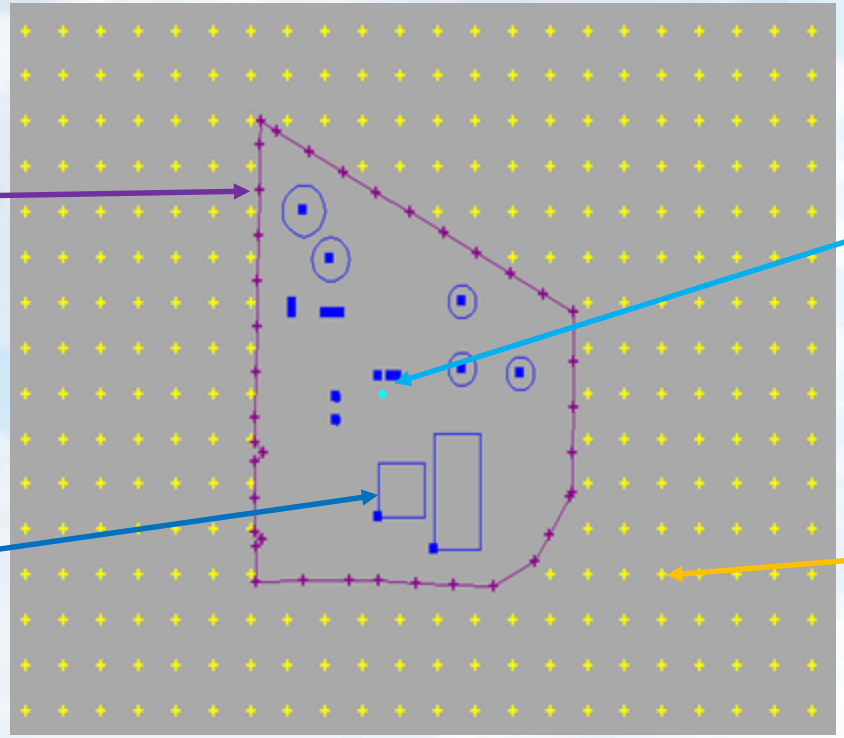
# Modeling – General Layout

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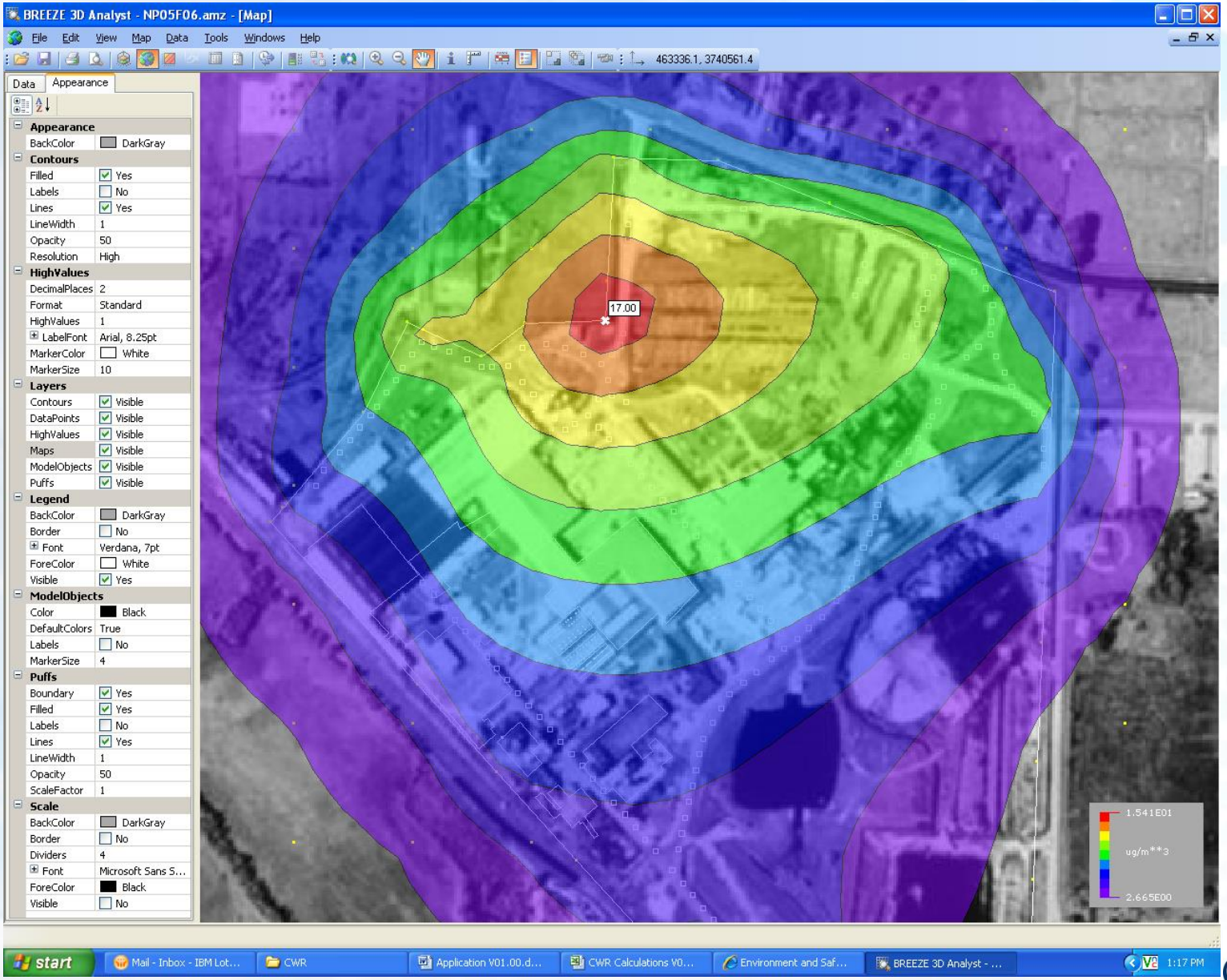
# GIS View of Model Results

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# How Do Permittees Comply with Air Permits?

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# Complying with Permits

- Every permit is unique - see Arkansas Lime
- Recordkeeping logs (fuel use, production)
- Daily, weekly, or monthly visible inspections
- Maintenance of pollution control equipment
- Regular stack testing
- Continuous Emissions Monitoring Systems (CEMS)
- Continuous Opacity Monitoring Systems (COMS)

# Stack Testing

- Physical measurement of actual emission rate
- Typical 3-hour test
- EPA Methods
- Stack testing companies

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# Stack testing is a “dirty job”!

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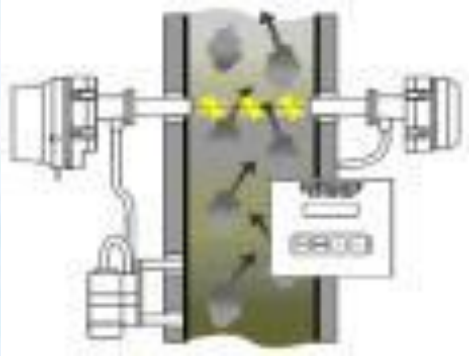
# Continuous Emissions -or- Opacity Monitoring Systems [CEMS/COMS]

- Permanently installed instruments on the stack
- Continuously sampling and measuring emissions
- $$$ to install and maintain
- Reserved for highest emitting units
- EPA Performance Specifications



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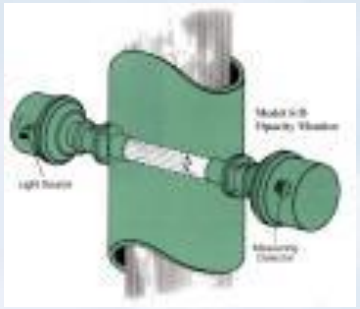
# CEMS/COMS

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# Great Truths of Stationary Source Air Permitting

- Air Permits regulate EQUIPMENT and EMISSIONS
  - If either changes, you probably need a permit
  - Even very small equipment can require a permit
- Air Permits must be obtained BEFORE constructing new emitting equipment
- Long lead times and highly technical analyses req'd for some permits
- Air permit compliance is often complicated and costly

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# Questions?

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