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

UALR Bowen School of Law  
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# Trinity Consultants



- 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

# 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?



# Acronyms

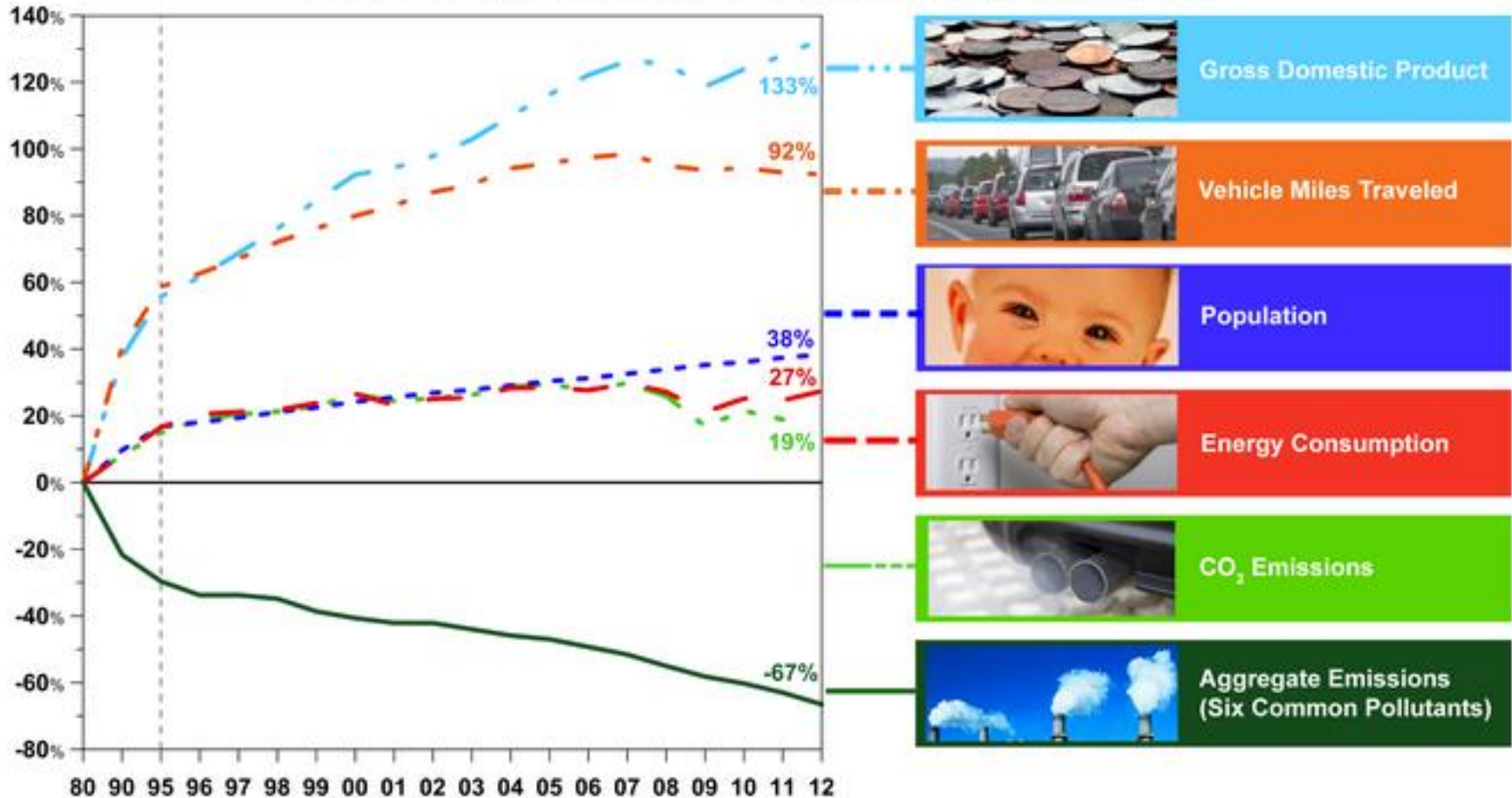
- > CAA: Clean Air Act
- > HAP: Hazardous Air Pollutant (187 compounds listed in CAA Section 112)
- > NAAQS: National Ambient Air Quality Standards
- > NESHAP: National Emission Standard for HAP (defines MACT, also called “MACT Standards”, contained in 40 CFR 63)
- > NSPS: New Source Performance Standards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

Comparison of Growth Areas and Emissions, 1980–2012



Source: <http://www.epa.gov/airtrends/aqtrrends.html#comparison>

# Goal of 1970 Clean Air Act Amendments

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***“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)**



# 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 ( $\mu\text{g}/\text{m}^3$ )	(ppm)	Secondary ( $\mu\text{g}/\text{m}^3$ )	(ppm)	Form (i.e., How Standard is Applied)
<b>PM<sub>10</sub></b>	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
<b>PM<sub>2.5</sub></b>	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
<b>SO<sub>2</sub></b>	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
<b>NO<sub>2</sub></b>	Annual	(100)	0.053	(100)	0.053	Annual arithmetic mean
<b>Ozone</b>	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
<b>CO</b>	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
<b>Lead</b>	Calendar Quarter	1.5	--	1.5	--	Maximum arithmetic mean

SEE NAAQS HANDOUT

# National Ambient Air Quality Standards

Pollutant	Avg. Period	NAAQS ( $\mu\text{g}/\text{m}^3$ )
PM <sub>10</sub>	24-Hr	150
PM <sub>2.5</sub>	Annual / 24-Hr	15 / 35
SO <sub>2</sub>	<i>Annual</i>	80*
SO <sub>2</sub>	<del>24-Hr</del>	<del>365*</del>
SO <sub>2</sub>	<i>1-Hr</i>	<i>196</i>
NO <sub>2</sub>	Annual	100
NO <sub>2</sub>	<i>1-Hr</i>	<i>188</i>
Ozone	8-Hour	137 (0.070 ppm)
CO	8-Hr / 1-Hr	10,000 / 40,000
Lead	Rolling 3-Month	0.15

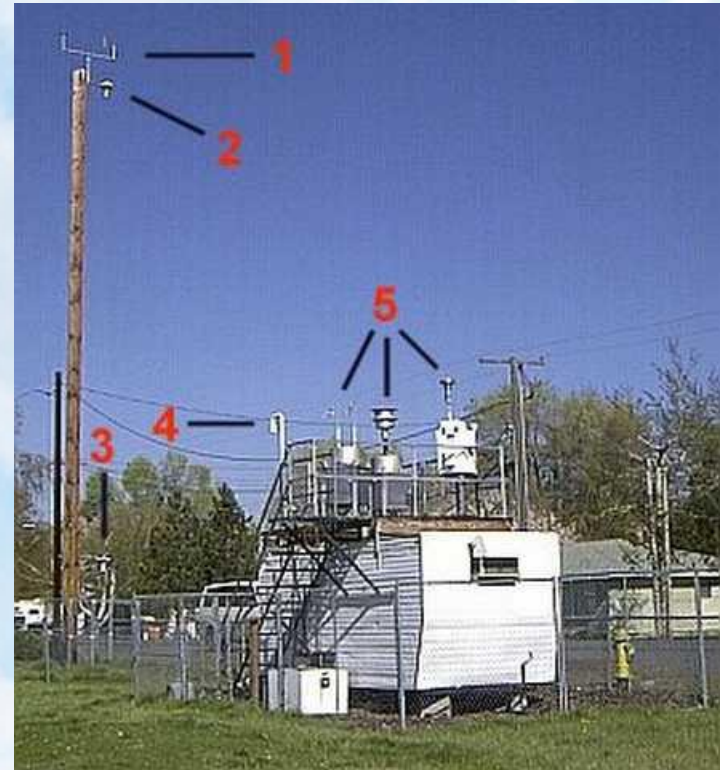
\* SO<sub>2</sub> Annual and 24-Hr revoked 8/23/2011.

# Measurement of Ambient Air Pollution

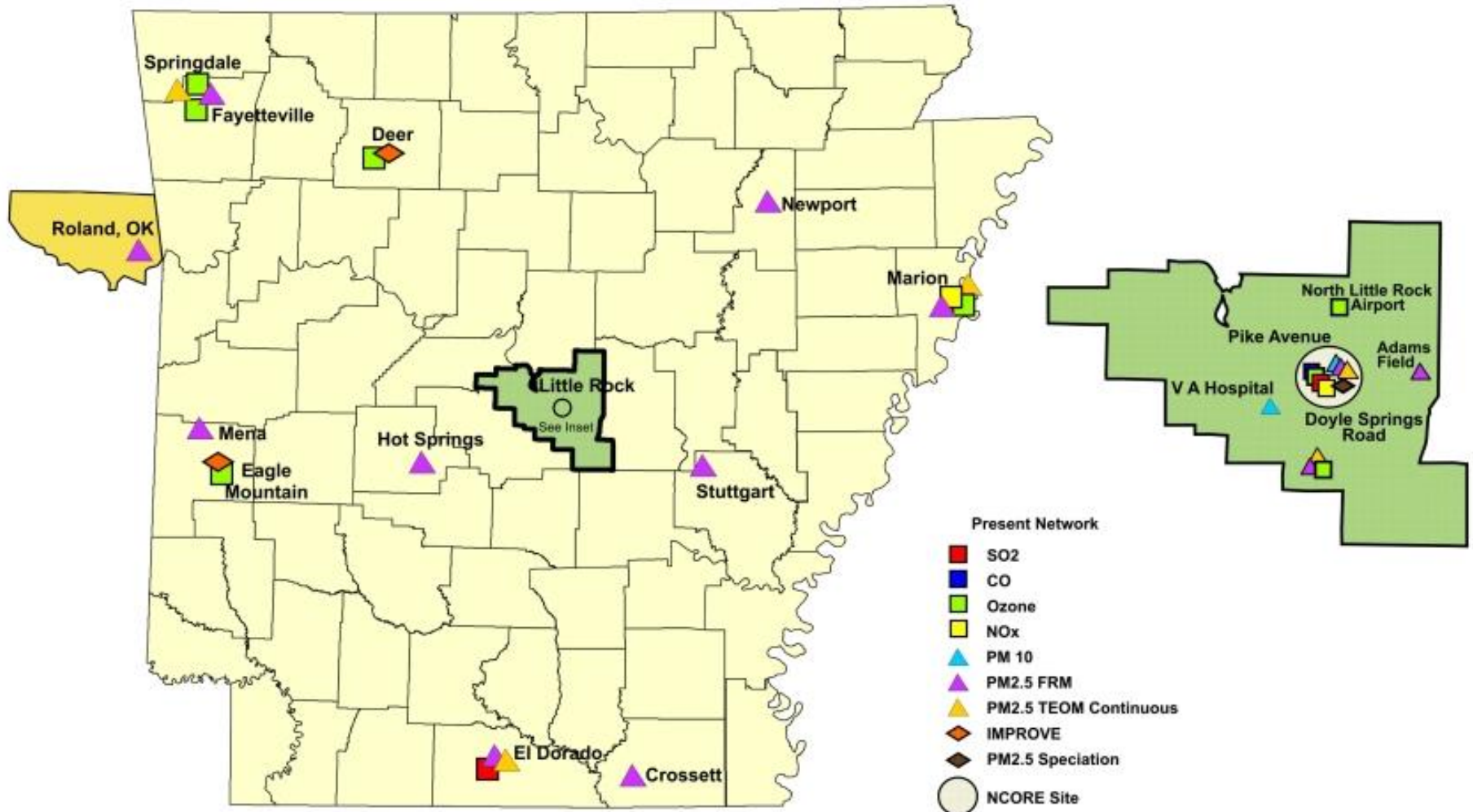
- > State and Federal ambient monitoring networks
- > “Nonattainment” designations
  - ❖ Generally based on 3-years of data
- > Areas can move in and out of Nonattainment



# Air Pollution Monitoring Stations



# Air Pollution Monitors in Arkansas



# 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

# **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?



# 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

# Pollutants & Emitting Processes

<b>FEDERALLY REGULATED POLLUTANT</b>	<b>TYPICAL EMITTERS</b>
<b>PARTICULATE MATTER (DUST &amp; SMOKE) (PM, PM<sub>10</sub>, PM<sub>2.5</sub>)</b>	<b>MATERIAL HANDLING, FUEL COMBUSTION, WELDING</b>
<b>NITROGEN OXIDES (NO<sub>x</sub>)</b>	<b>FUEL COMBUSTION</b>
<b>SULFUR DIOXIDE (SO<sub>2</sub>)</b>	<b>FUEL COMBUSTION, OIL AND GAS OPERATIONS, PETROCHEMICAL PLANTS, PRIMARY AND SECONDARY METALS</b>
<b>CARBON MONOXIDE (CO)</b>	<b>FUEL COMBUSTION</b>
<b>VOLATILE ORGANIC COMPOUNDS (VOC)</b>	<b>PAINTING &amp; SOLVENT USE OPERATIONS, PETROCHEMICAL PLANTS, GASOLINE STORAGE/TRANSFER</b>
<b>HAZARDOUS AIR POLLUTANTS (HAP)</b>	<b>PAINTING OPERATIONS, OIL &amp; GAS OPERATIONS, PETROCHEMICAL PLANTS, PRIMARY AND SECONDARY METALS</b>

# Obvious Emission Units

> Fuel burning equipment



> Other equipment with visible emissions  
(smoke or dust)



# 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



# Where Do You Get An Air Permit?

# Where?

## Air Permitting Authorities

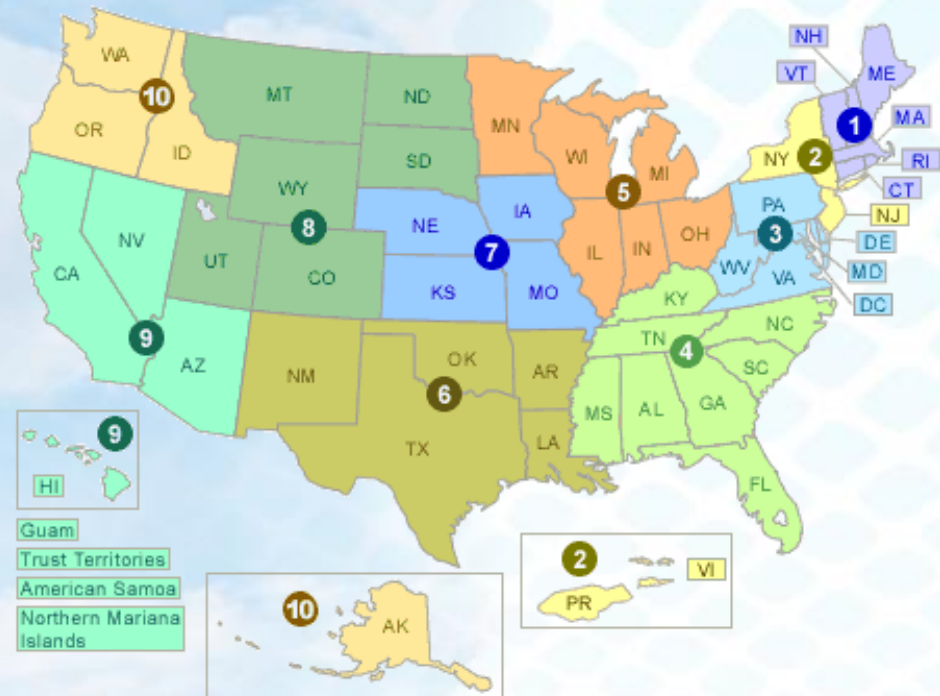
### > Usually State Agencies

- ❖ 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

# When Must You Get A Permit?





# 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

# 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



# When?

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

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

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

# YES! Types of Operating Permits

**Title V Minor Sources**



**State Operating Permit (SOP)**

(aka Synthetic Minor SOP, Basic SOP)

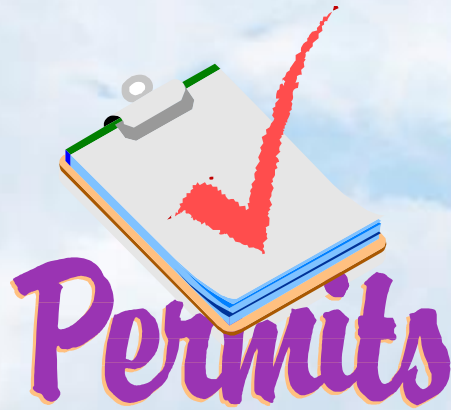
**Title V Major Sources**



**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.*



**PART 70/TITLE V  
OPERATING PERMIT PROGRAM  
REQUIREMENTS**

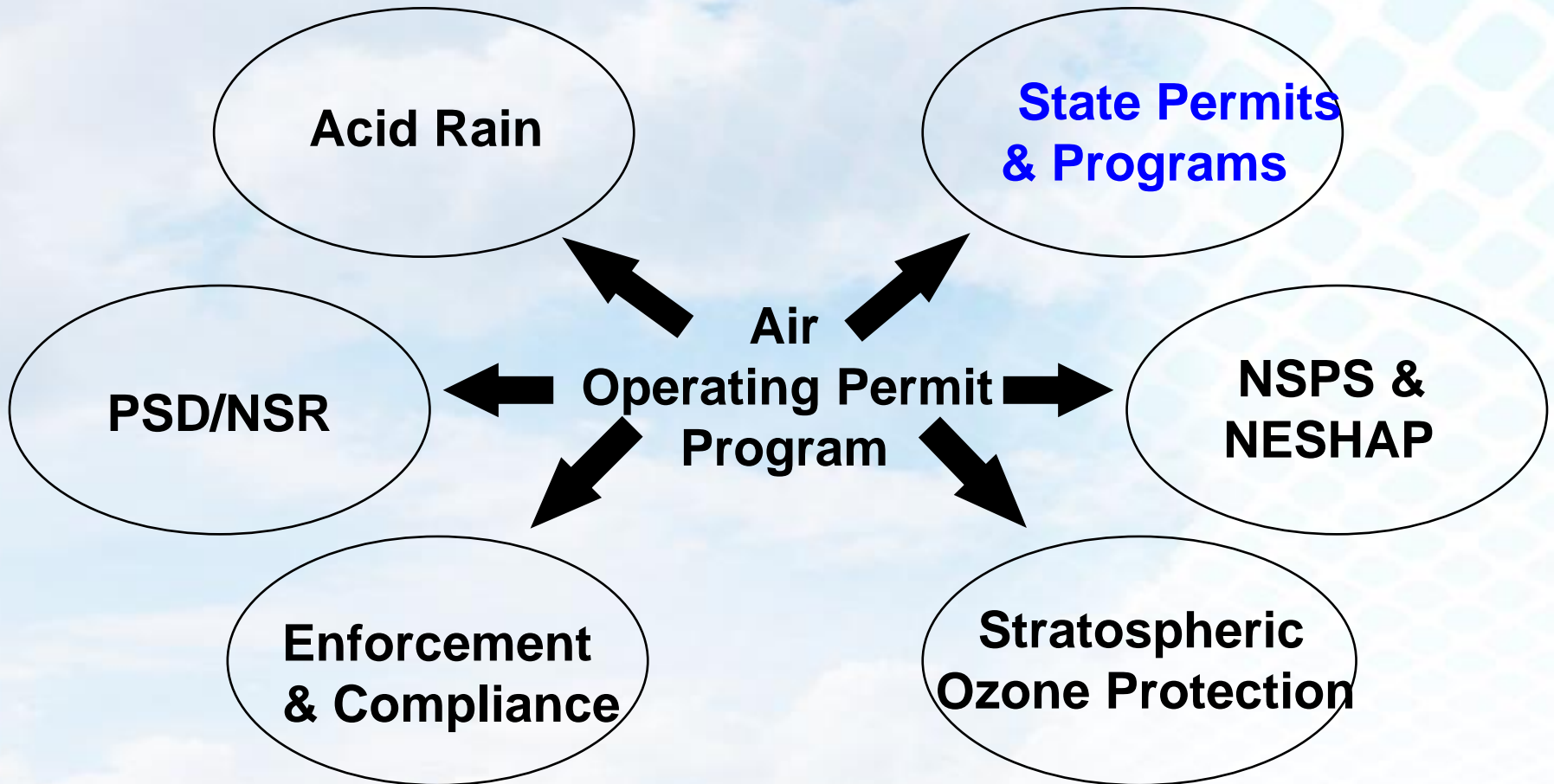
# Title V Permits

- > 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”



# Title V Operating Permit

The Single Enforcement Document



# 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

# 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)

# What Goes Into An Air Permit Application?

# 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

# 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]

# 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)



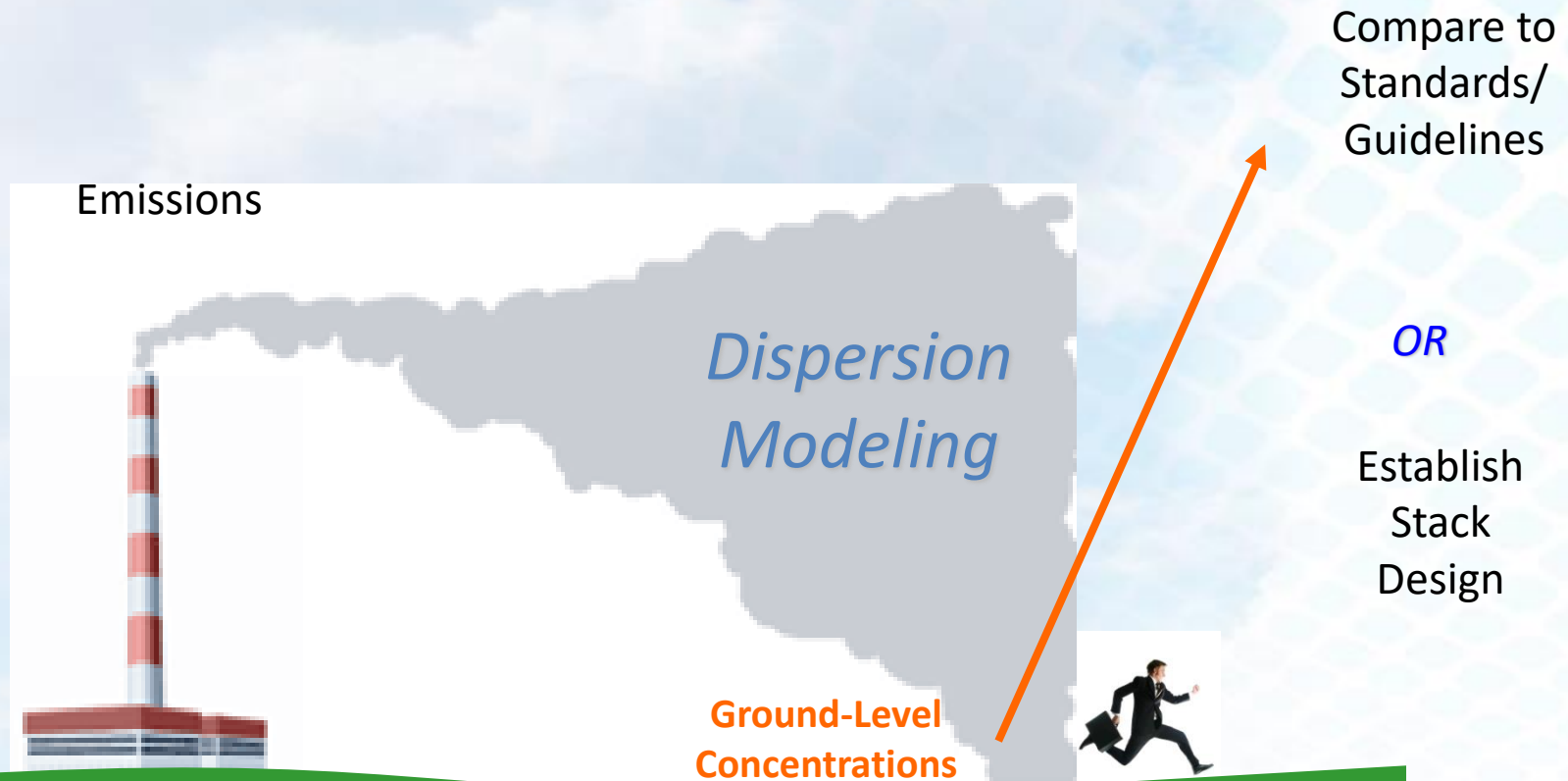
# ***What Is Air Quality Dispersion Modeling?***



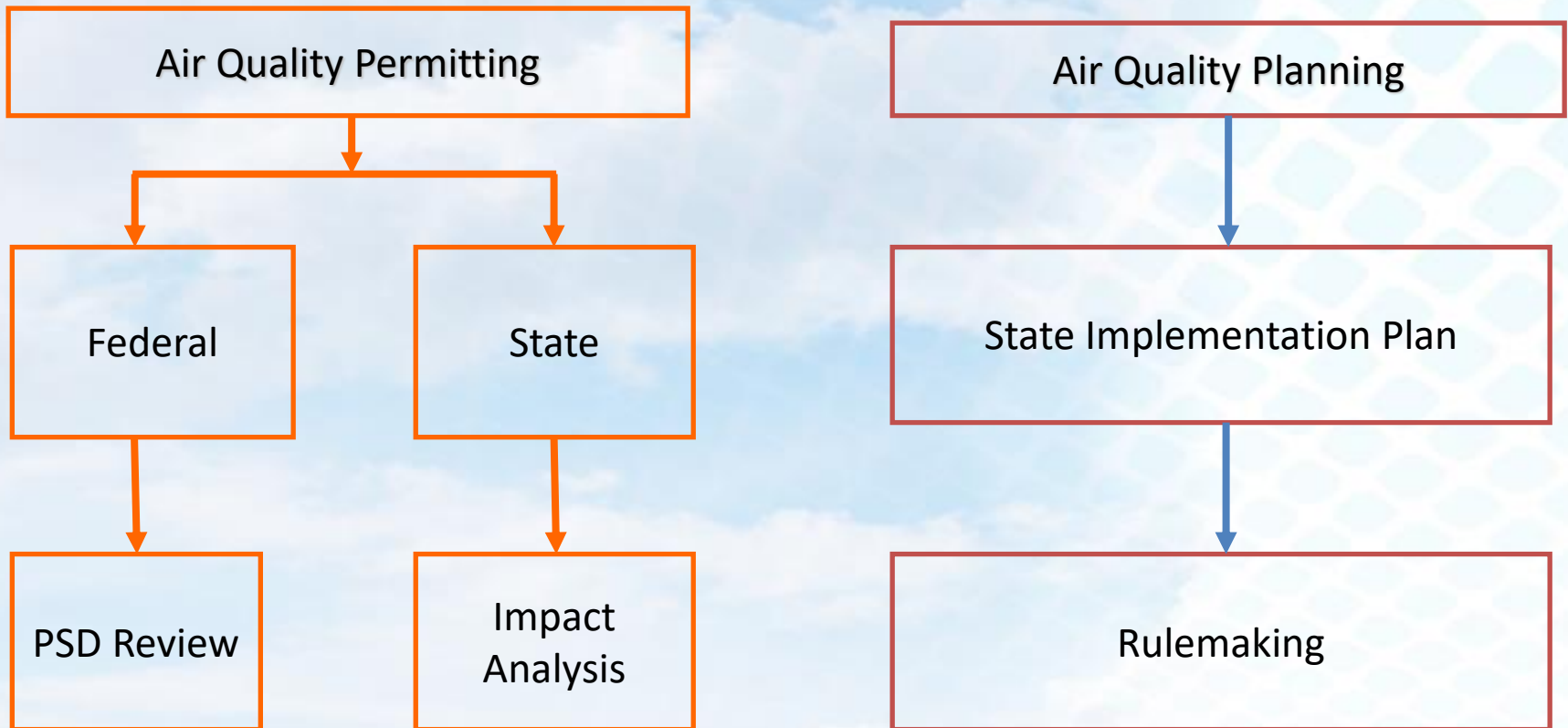
EAST RIVER FROM THE THIRTIETH STORY OF THE SHELTON  
HOTEL, NEW YORK, 1928

Georgia O'Keefe

# Purpose of Dispersion Modeling



# When is Modeling Required?

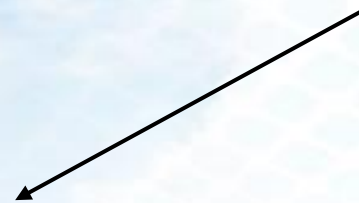
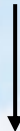
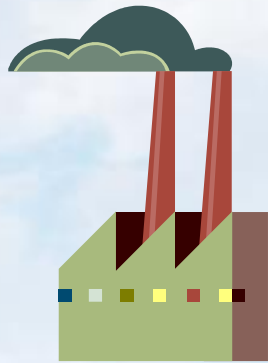


*\* For projects that do not trigger a Federal review, modeling for criteria pollutants (NAAQS) may be requested by State or County agency*

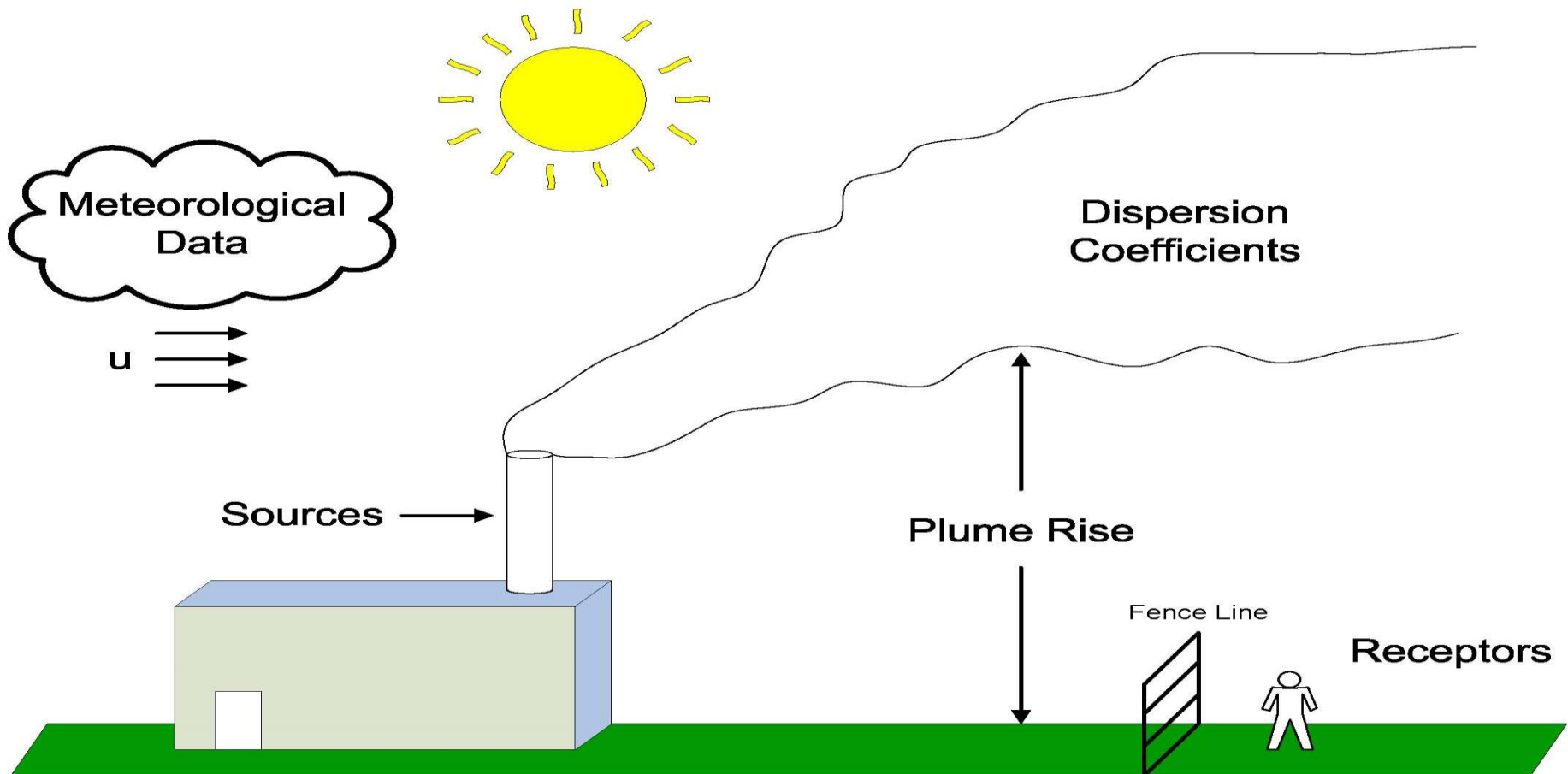
# Regulatory Models

- > U.S. EPA is technical lead
  - ❖ “Bare bones” models free at SCRAM website
  - ❖ GUI-enhanced versions for sale at [www.breeze-software.com](http://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

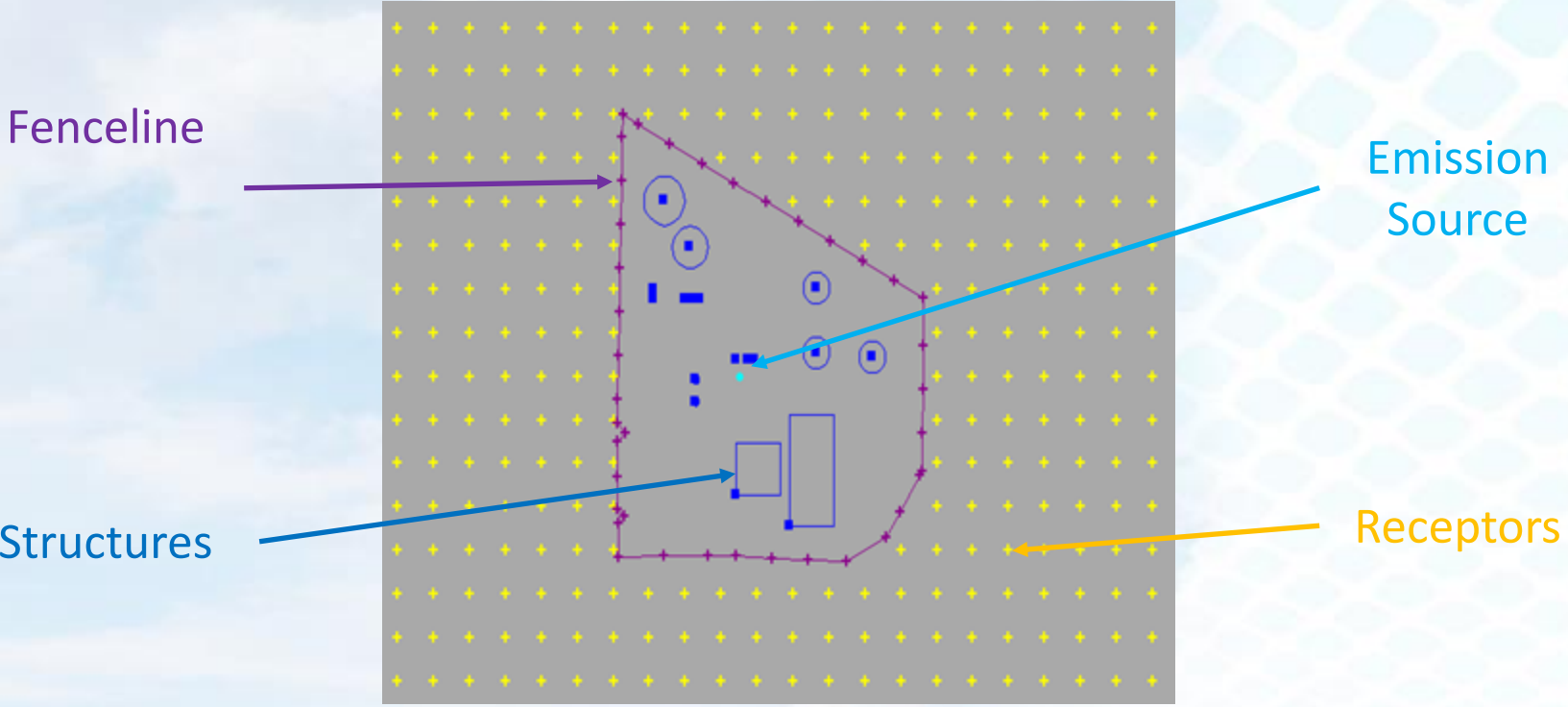
# What Goes Into Dispersion Modeling?



# Modeling Definitions - Other Parameters

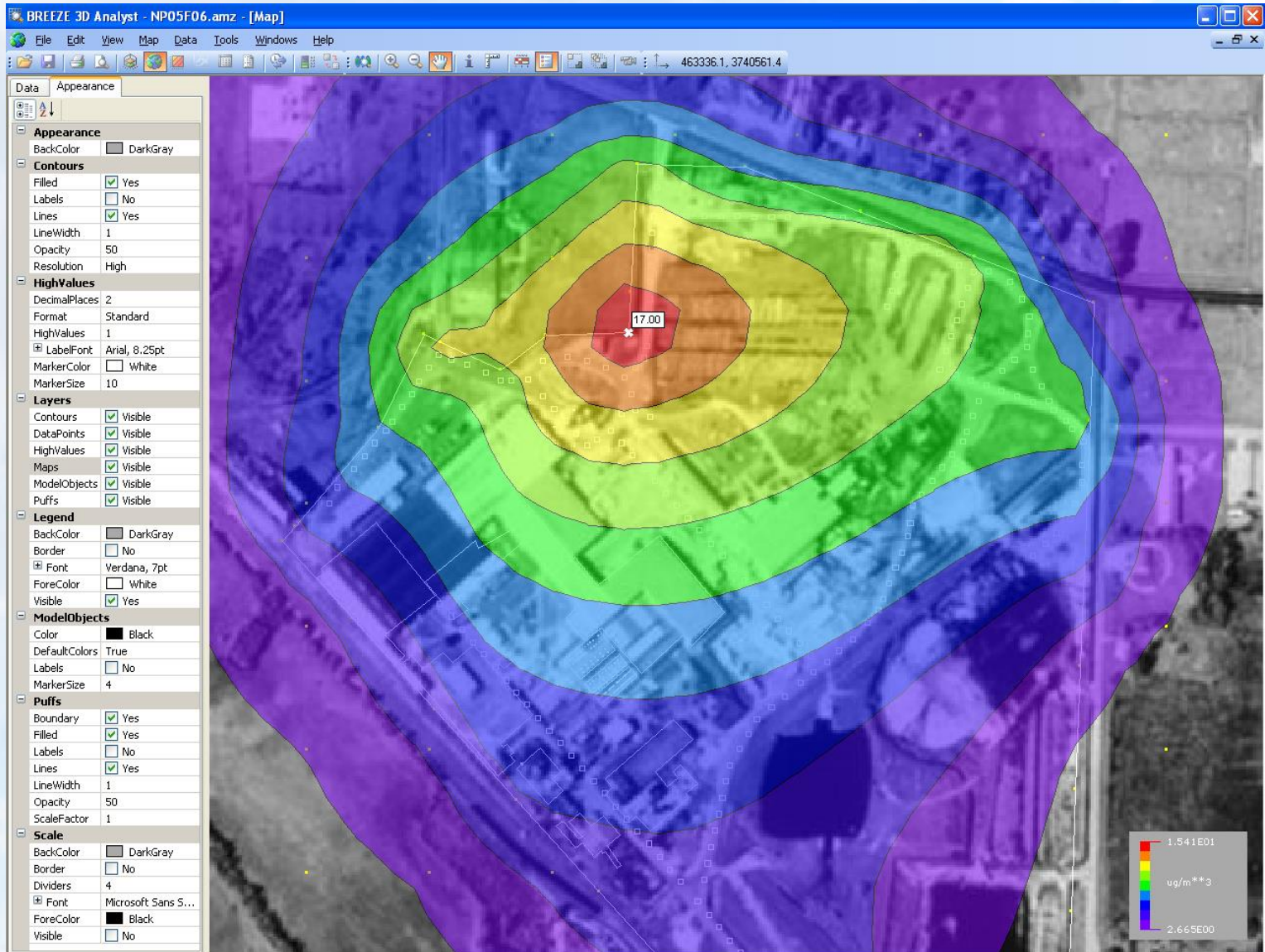


# Modeling - General Layout





# GIS View of Model Results



# How Do Permittees Comply with Air Permits?

# 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

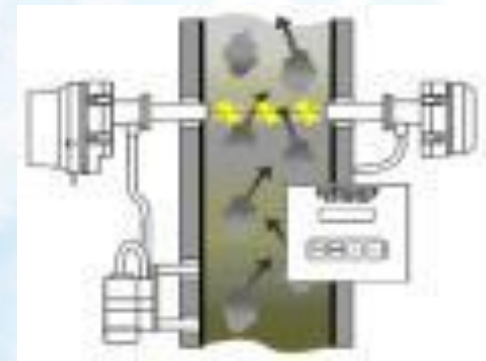


# Stack testing is a “dirty job”!

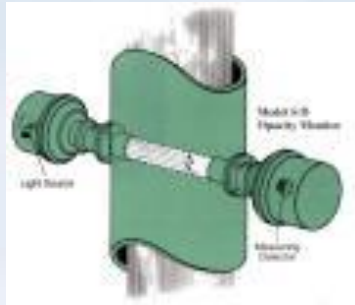


# Continuous Emissions -or- Opacity Monitoring Systems [CEMS/COMS]

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



# CEMS/COMS





# 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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