

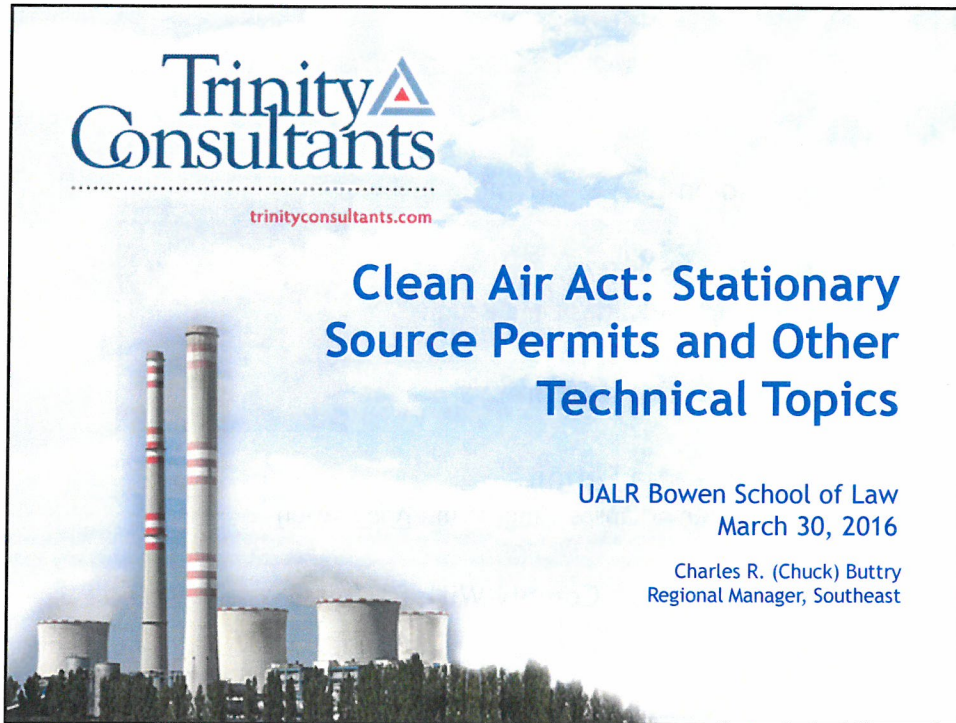


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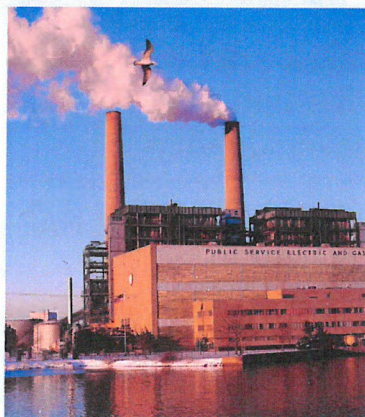
Clean Air Act: Stationary Source Permits and Other Technical Topics

UALR Bowen School of Law
March 30, 2016

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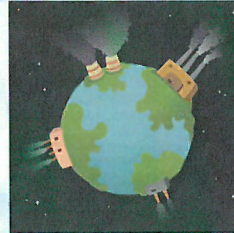


- Founded in 1974
- 40+ locations nationwide, China, and Middle East
- 1,400 projects per year
- Environmental consulting services for “smokestack” industry
- Expertise in air permitting, modeling, regulatory compliance, and auditing
- Overall environmental management support

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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

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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))

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Clean Air Act (CAA)

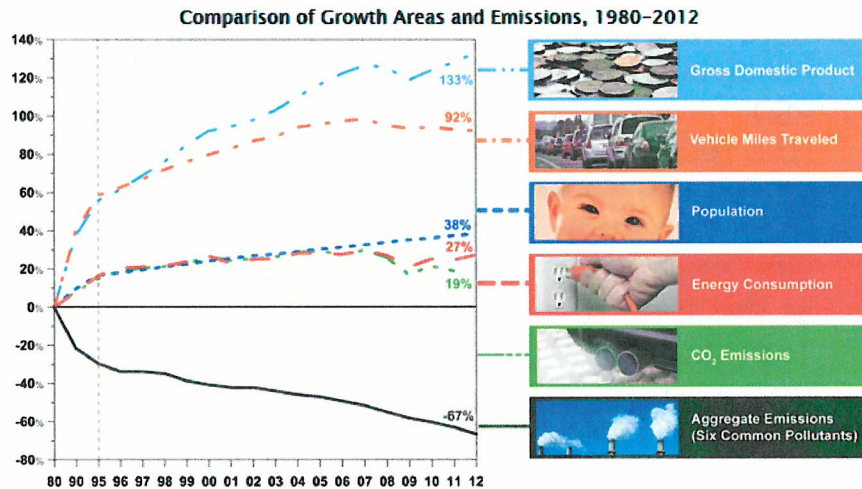
1963, 1965, 1967, 1970, 1977, 1990

- > Title I - Air pollution prevention and control
- > Title II - Moving sources
- > Title III - General
- > Title IV - Acid deposition control
- > Title V - Federal operating permits
- > Title VI - Stratospheric ozone protection

Note: Titles refer to CAA as amended, not to titles of the 1990 Clean Air Act Amendments

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CAA: A Regulatory Success Story

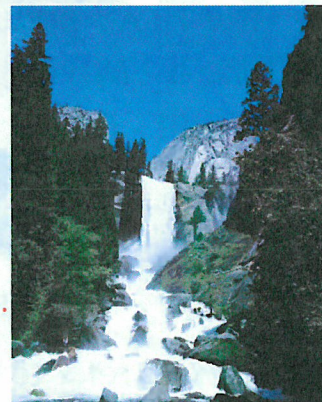


Source: <http://www.epa.gov/airtrends/aqtrends.html#comparison>

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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”

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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)
PM ₁₀	Annual	50	--	50	--	Annual arithmetic mean, averaged over 3 years
	24-hour	150	--	150	--	98th 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)	0.03	(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

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National Ambient Air Quality Standards

Pollutant	Avg. Period	NAAQS ($\mu\text{g}/\text{m}^3$)
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	147 (0.075 ppb)
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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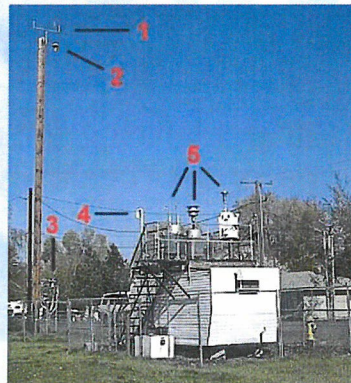
Measurement of Ambient Air Pollution

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



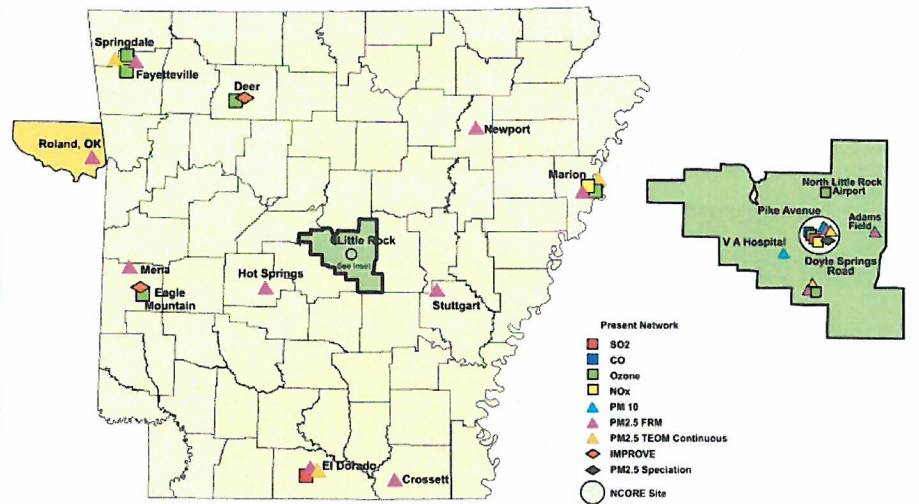
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Air Pollution Monitoring Stations



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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,
NA NSR permit in NA areas)

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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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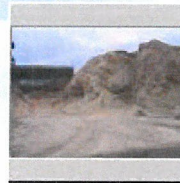
Pollutants & Emitting Processes

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

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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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- [illegible]

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)**

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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.

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PART 70/TITLE V OPERATING PERMIT PROGRAM REQUIREMENTS

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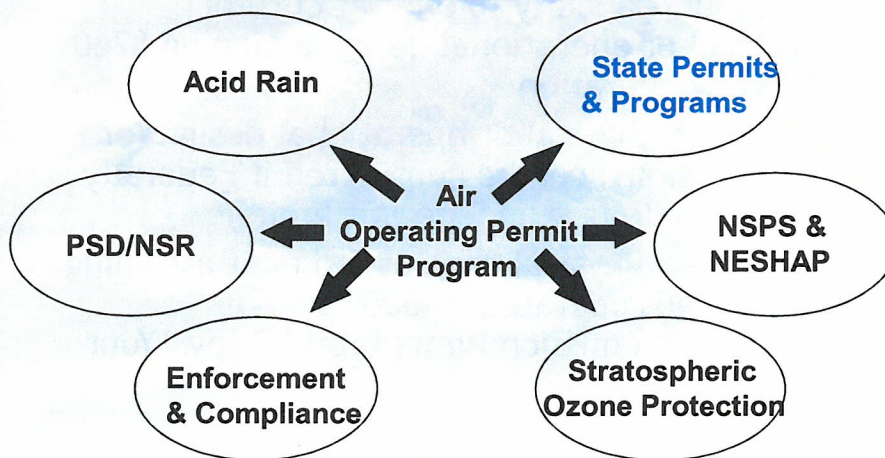
Title V Permits

- > 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.

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Arkansas Air Permits

Minor Sources

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



**Regulation 18/19
Permit**

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



**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



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?

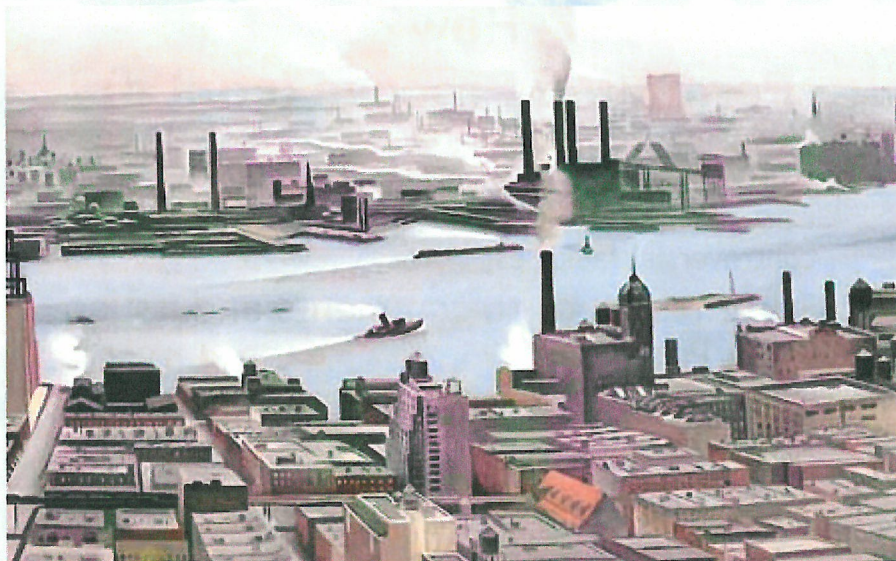
Permitting Process (cont'd)

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)

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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

Emissions

*Dispersion
Modeling*

Ground-Level
Concentrations

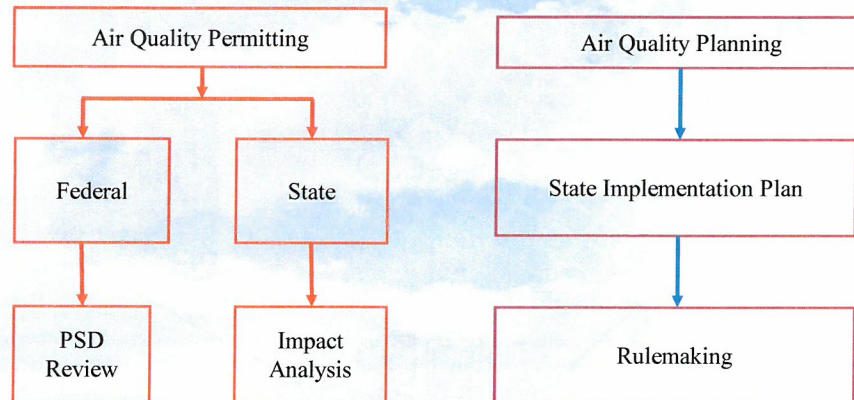
Compare to
Standards/
Guidelines

OR

Establish
Stack
Design

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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

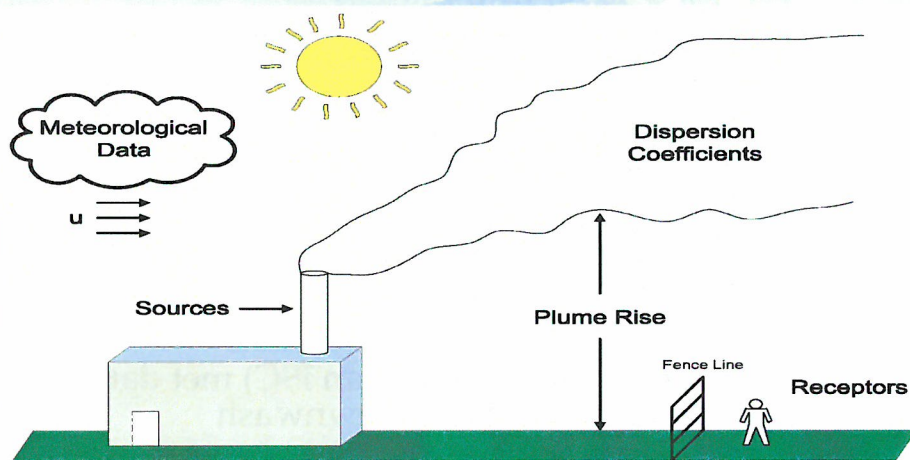
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What Goes Into Dispersion Modeling?



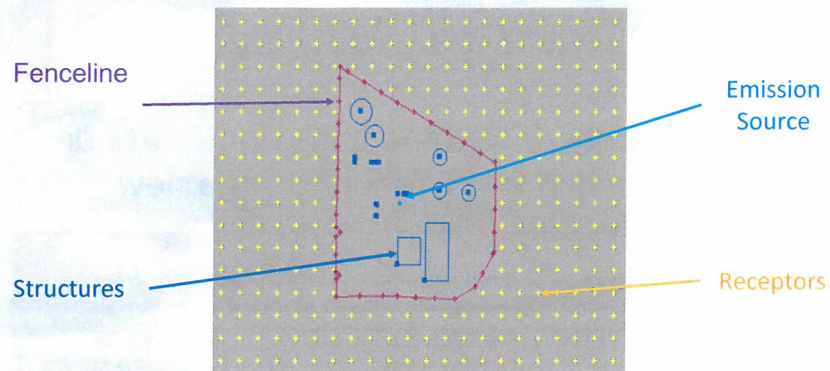
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Modeling Definitions - Other Parameters



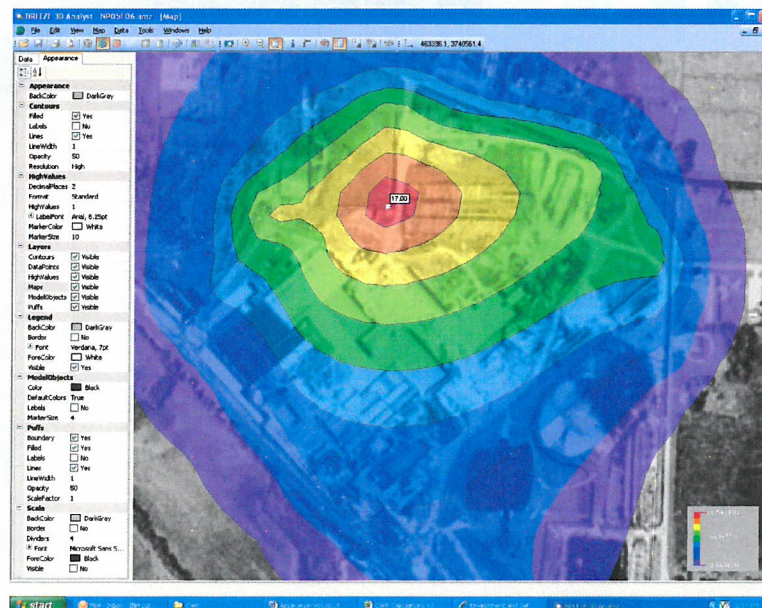
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Modeling - General Layout



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GIS View of Model Results



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Importance of Modeling

- > Can be the **critical path** item in a large or small permitting project timeline
- > May ultimately determine **emission limits** or **controls** beyond BACT required for a new project or facility
- > Members of the **public** may be concerned about modeling results



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How Do Permittees Comply with Air Permits?

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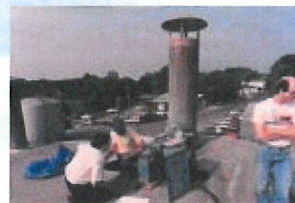
Complying with Permits

- > 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)

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Stack Testing

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



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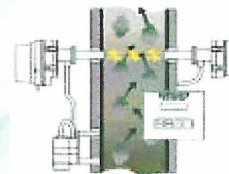
Stack testing is a “dirty job”!



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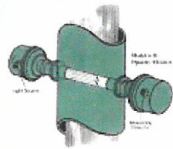
CEMS/COMS

- > 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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