Quiz

What is a SIP?

A: A collection of programs, policies and rules adopted by States and approved by EPA to attain and maintain the NAAQS

B: State-issued, EPA-approved orders requiring pollution control at individual companies

C: Other actions listed in the Code of Federal Regulations Title 40, Chapter I, Part 52

D: Enough paperwork to fill an 8x8 room from floor to ceiling

E: All of the above
The State Implementation Plan (SIP): the backbone of attainment

- SIPs are the framework that provides control measures to “clean the air” so the area reaches attainment with the NAAQS by attainment deadlines.
- CAA requires a general plan to achieve the NAAQS in all areas of the country and a specific plan for each nonattainment area.
- SIPs are developed by States (and locals), and after notice and public hearing, submitted to EPA for approval through Federal rulemaking.
- After EPA approval, SIPs and associated control measures are enforceable at both the state and national levels.
SIP Components: CAA '110(a)(2)

- Legal Authority (E)(H)
- Adequate Resources (E)
- Enforcement (C)
- Consultation & Notification (J)(M)
- Title V Operating Permit Program (C)(L)
- Air Quality Monitoring (B)
- Emissions Inventories (F)
- Emergency Episode Plan (G)
- Air Quality Modeling (K)
- Emission Limiting Rules and Regs (A)(D)(J)
- Source Emissions Monitoring (F)
- New Source Review (C)
- Attainment Demonstration (I)
'110 SIP Components (A)-(G)

- **Emission controls:** Section 110(a)(2)(A) requires necessary emission limits and other control measures as are necessary to carry out provisions of the Clean Air Act.

- **Ambient air quality monitoring/data system:** Section 110(a)(2)(B) requires SIPs to provide for setting up and operating ambient air quality monitors, collecting and analyzing data and making these data available to EPA upon request.

- **Program for enforcement of control measures:** Section 110(a)(2)(C) requires SIPs to include a program providing for enforcement of measures and regulation of new/modified (permitted) sources.

- **Interstate transport:** Section 110(a)(2)(D) requires SIPs to include provisions prohibiting any source or other type of emissions activity in one State from contributing significantly to nonattainment in another State or from interfering with measures required to prevent significant deterioration of air quality or to protect visibility.

- **Adequate resources:** Section 110(a)(2)(E) requires SIPs to provide assurances that the State will have provide adequate funding, personnel and legal authority for implementation of their SIPs.

- **Stationary source monitoring system:** Section 110(a)(2)(F) requires SIPs to require, as prescribed by EPA, emissions monitoring for stationary sources, and to submit periodic emissions reports.

- **Emergency power:** Section 110(a)(2)(G) requires SIPs to provide authority for emergency actions to protect public health and emergency episode plans to implement the authority.
'110 SIP Components (H)-(M)

- **Provisions for SIP revision due to NAAQS changes or findings of inadequacies**: Section 110(a)(2)(H) requires SIPs to provide for future SIP revisions in response to changes in the NAAQS, availability of improved methods for attaining the NAAQS, or in response to a call that the SIP is inadequate.

- **Attainment planning**: Section 110(a)(2)(I) requires areas designated as nonattainment to meet the applicable nonattainment planning requirements of part D, title I of the Act.

- **Section 121 consultation**: Section 110(a)(2)(J) requires that SIPs meet applicable requirements of section 121 relating to consultation.

- **Section 127 public notification**: Section 110(a)(2)(J) requires that SIPs meet applicable requirements of section 127 relating to public notification.

- **PSD and visibility protection**: Section 110(a)(2)(J) also requires that SIPs meet applicable requirements of part C related to prevention of significant deterioration and visibility protection.

- **Air quality modeling/data**: Section 110(a)(2)(K) requires that SIPs provide for performing air quality modeling for predicting effects on air quality of emissions from any NAAQS pollutant and submission of air quality modeling data to EPA upon request.

- **Permitting fees**: Section 110(a)(2)(L) requires each major stationary source to pay permitting fees to cover the cost of reviewing, approving, implementing and enforcing a required permits.

- **Consultation/participation by affected local entities**: Section 110(a)(2)(M) requires that SIPs provide for consultation and participation by local political subdivisions affected by the SIP.
Compliance and Enforcement

- EPA approved SIPs are enforceable by either the State or EPA
- States establish through their SIPs, schedules of compliance for sources subject to the SIP
  - States have primary enforcement authority
  - EPA may take actions if warranted or needed
- EPA can “call” a SIP if it is insufficient or for failure to implement (see '110(k)(5))
  - Sanctions may apply (see '110(m) and '179)
Air Quality Management Cycle

**ESTABLISH GOALS**
- Scientific Research
- National Ambient Air Quality Standards (NAAQS)

**DETERMINE NECESSARY REDUCTIONS**

**DESIGN CONTROL STRATEGIES**
- National Rules
- RACT/RACM

**IMPLEMENT**
- State Implementation Plans (SIPs)
- Permits (NSR, Title V)
- Compliance & Enforcement

**EVALUATE RESULTS**
- Assess Progress
- Evaluate Effectiveness & Efficiency
- Revise Approach

**MONITORING**
- Emissions Inventories
- Data Analysis & Modeling
### Establishing Goals: Ongoing NAAQS Reviews

<table>
<thead>
<tr>
<th>MILESTONE</th>
<th>POLLUTANT</th>
<th>Ozone</th>
<th>Lead</th>
<th>NO₂ Primary</th>
<th>SO₂ Primary</th>
<th>NO₂/SO₂ Secondary</th>
<th>PM</th>
<th>CO</th>
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<tbody>
<tr>
<td>Final Integrated Review Plan</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>August 2007</td>
<td>September 2007</td>
<td>December 2007</td>
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<td>Document Oct 2006</td>
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<td>September 2009</td>
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<td>1st draft Staff Paper</td>
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# Current NAAQS

<table>
<thead>
<tr>
<th>Compounds</th>
<th>Primary Standard</th>
<th>Secondary Standard</th>
<th>Average Type</th>
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<tbody>
<tr>
<td><strong>Carbon Monoxide (CO)</strong></td>
<td>Primary</td>
<td>Secondary</td>
<td>8-hour Average</td>
</tr>
<tr>
<td>9 ppm (10 mg/m³)</td>
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<tr>
<td>35 ppm (40 mg/m³)</td>
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<tr>
<td><strong>Nitrogen Dioxide (NO₂)</strong></td>
<td>Primary &amp; Secondary</td>
<td>Annual Arithmetic Mean</td>
<td></td>
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<tr>
<td>0.053 ppm (100 µg/m³)</td>
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<tr>
<td><strong>Ozone (O₃)</strong></td>
<td>Primary &amp; Secondary</td>
<td>1-hour Average</td>
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<tr>
<td>0.12 ppm (235 µg/m³)</td>
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<tr>
<td>0.08 ppm (157 µg/m³)</td>
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<tr>
<td><strong>Lead (Pb)</strong></td>
<td>Primary &amp; Secondary</td>
<td>Quarterly Average</td>
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<tr>
<td>1.5 µg/m³</td>
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<tr>
<td><strong>Particulate (PM 10)</strong></td>
<td>Primary &amp; Secondary</td>
<td>Annual Arithmetic Mean</td>
<td>24-hour Average</td>
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<tr>
<td>50 µg/m³</td>
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<tr>
<td>150 µg/m³</td>
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<tr>
<td><strong>Particulate (PM 2.5)</strong></td>
<td>Primary &amp; Secondary</td>
<td>Annual Arithmetic Mean</td>
<td>24-hour Average</td>
</tr>
<tr>
<td>15 µg/m³</td>
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<tr>
<td>35 µg/m³</td>
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<tr>
<td><strong>Sulfur Dioxide (SO₂)</strong></td>
<td>Primary</td>
<td>Secondary</td>
<td>3-hour Average</td>
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<td>0.03 ppm (80 µg/m³)</td>
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<tr>
<td>0.14 ppm (365 µg/m³)</td>
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<tr>
<td>0.50 ppm (1300 µg/m³)</td>
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</table>
Simplified NAAQS Planning Schedule

- New/Revised NAAQS: -0-
- Area Designations: +2 yrs
- Section 110 “Infrastructure SIP”: +3 yrs*
  - Also Nonattainment New Source Review & Conformity
- Section 110 “Nonattainment SIP”: +5 yrs*

- Attainment
  - Subpart 1: ≪7+ yrs
  - Subpart 2: ≪5+ yrs

* EPA SIP review/approval response times see '110(k)(1)&(2)
# Implementation Timeline for Current PM and Ozone Standards

<table>
<thead>
<tr>
<th>Milestone</th>
<th>1997 8-Hr Ozone</th>
<th>1997 PM2.5</th>
<th>2006 PM2.5</th>
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<tbody>
<tr>
<td>Effective Date</td>
<td>September 1997</td>
<td>September 1997</td>
<td>December 2006</td>
</tr>
<tr>
<td>Designation Recommendations to EPA</td>
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<td></td>
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<tr>
<td>Final Designation (Effective)</td>
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<tr>
<td>“Infrastructure SIP” Due</td>
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<tr>
<td>“Attainment Demonstration” SIP Due</td>
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<tr>
<td>Attainment Dates</td>
<td></td>
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</tbody>
</table>

- **1997 8-Hr Ozone**
  - **1997 PM2.5**
  - **2006 PM2.5**

- **Effective Date**:
  - September 1997
  - September 1997
  - December 2006

- **Designation Recommendations to EPA**:
  - July 2003
  - February 2004
  - December 2007

- **Final Designation (Effective)**:
  - April 2004 (June 2005)
  - December 2004 (April 2005)
  - December 2008 (early 2009)

- **“Infrastructure SIP” Due**:
  - September 2000
  - September 2000
  - Early 2010

- **“Attainment Demonstration” SIP Due**:
  - June 2007
  - April 2008 (RH Dec 2007)
  - Early 2012

- **Attainment Dates**:
  - June 2007 up to June 2024
  - April 2010 up to April 2015
  - Early 2014 up to Early 2019
Maximum Attainment Dates for 1997 8-Hr Ozone NA Areas

- **Subpart 2 Areas:**
  - Marginal – June 2007
  - Moderate – June 2010
  - Serious – June 2013
  - Severe 15 – June 2019
  - Severe 17 – June 2021
  - Extreme – June 2024

- **Subpart 1 Areas:**
  - DC Circuit Court vacated ozone implementation rule provisions for subpart 1 areas
  - Attainment date was June 2009 up to June 2014; will re-propose
Rules Governing Implementation

- Generally found in 40 CFR Part 51
- Clean Air Fine Particle (PM$_{2.5}$) Implementation Rule *(72 FR 20586, April 24, 2007)*
  - 40 CFR Subpart Z 51.1000
- Final Rule to Implement the 8-Hr Ozone NAAQS
  - Phase 1 *(see 69 FR 23951, April 30, 2004)*
  - Phase 2 *(see 70 FR 71612, Nov. 29, 2005)*
  - 40 CFR Subpart X 51.900
- Regional Haze Regulations *(64 FR 35714, July 1, 1999)*
  - 40 CFR Subpart P 51.300
Current Implementation Litigation

- **PM$_{2.5}$ Implementation Rule**
  - Several pending petitions for reconsideration
  - Petitions for judicial review

- **8-hr Ozone Phase 1 Rule**
  - DC Circuit Court partial vacatur
  - Affects subpart 1 classification (not designation)
  - Affects removal of certain 1-hr Ozone requirements (NSR applicability, section 185 fee programs, and contingency measures)

- **8-hr Ozone Phase 2 Rule**
  - Reconsiderations completed
  - Litigation moving forward, schedule pending
Designations

- EPA, with input from States, must determine which areas of the country fail to meet the NAAQS.
- EPA designates areas according to their air quality:
  - Attainment
  - Nonattainment
  - Unclassifiable
- EPA designates an area as "nonattainment" if it has air quality that does not meet the NAAQS, or if it contributes to air quality in a nearby area that does not meet the NAAQS.
Designations (cont.)

- Factors in deciding whether to include an area in the designated nonattainment area boundary:
  - Emission data
  - Air quality data
  - Population density and degree of urbanization (including commercial development)
  - Traffic and commuting patterns
  - Growth rates and patterns
  - Meteorology (weather/transport patterns)
  - Geography/topography (mountain ranges or other air basin boundaries)
  - Jurisdictional boundaries (e.g., counties, air districts, Reservations, metropolitan planning organizations (MPOs))
  - Level of control of emission sources

- State recommendations due no later than 1 year after new/revised standard

- EPA must issue designations within 2 years after new/revised standard; no less than 120 day notification to States if we modify their recommendations
1997 PM$_{2.5}$ Standard
Effective April 2005

1997 8-Hr Ozone Standard
Effective June 2004
Areas Redesignated Back to Maintenance

Areas NonAttainment for 8hr Ozone

Aug. 16, 2007
Status of Current PM$_{10}$ Nonattainment Areas
Based on 2004 – 2006 Air Quality

Legend
Nonattainment areas:
- Currently violating the PM$_{10}$ standards
- Meeting the PM$_{10}$ standards
- With incomplete data

<table>
<thead>
<tr>
<th>Nonattainment Areas</th>
<th>Number of Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently violating the PM$_{10}$ standards</td>
<td>11</td>
</tr>
<tr>
<td>Meeting the PM$_{10}$ standards</td>
<td>29</td>
</tr>
<tr>
<td>With incomplete data</td>
<td>7</td>
</tr>
<tr>
<td>Total Nonattainment Areas</td>
<td>47</td>
</tr>
</tbody>
</table>
Current nonattainment area (NAA) violates 24-hr NAAQS [29 areas]

Current NAA meets 24-hr NAAQS [10 areas]

• Sites in current NAA violate the 24-hr NAAQS [131 sites / 29 areas]

• Sites not in a current NAA violate the 24-hr NAAQS [48 sites / 32 areas]

• 48 violating sites outside of current NAA are located in 27 areas:
  • 25 CBSAs: Largest are Seattle, Sacramento, San Jose, Milwaukee, Salt Lake City.
  • 2 State-Counties (not part of a CBSA): Shoshone ID; Ravalli MT

• States make initial recommendations for 24-hr designations using 2004-2006 data
Counties With Monitors Violating Alternative w126 Exposure Index Secondary Standard and 8-hour 0.070 Ozone Primary Standard
(Based on 2005 Air Quality Data for the w126 and 2003-2005 Air Quality Data for 0.070)

72 counties exceed a standard of 21 using the w126 exposure index
184 additional counties exceed a standard of 15 using the w126 exposure index for a total of 256
220 additional counties exceed a standard of 7 using the w126 exposure index for a total of 476
79 counties meet a standard of 7 using the w126 exposure index for a total of 555
Outlined in heavy black are the 533 counties that exceed the 0.070 alternate 8-hr primary standard

Notes:
1 w126 is out of 555 monitored counties in 2005
2 No monitored counties outside the continental U.S. violate
3 Monitored data can be obtained from the AQS system at http://www.epa.gov/ttn/airs/airsaqs/
4 These estimates are based on the most recent data (2005). EPA will not designate areas as nonattainment on these data, but likely on 2006 - 2008 data which we expect to show improved air quality.
Designing Control Strategies

- States must determine necessary level of reductions:
  - Correlating “base year” emissions and air quality levels, then projecting the level of emissions that will allow area to meet attainment by deadline
  - Determining appropriate mix of programs, controls that will achieve necessary emissions reductions (combination of State, local and Federal programs)
  - States do modeling; EPA provides support tools – air quality models, technical assistance, training

- States incorporate necessary controls into enforceable State Implementation Plan (SIP)

- Current air quality problems (ozone, PM, regional haze) involve extensive pollution transport so SIPs will rely on Federal programs to reach attainment
National Rules

- National/regional emissions caps (Title IV Acid Rain program, NOx SIP call, CAIR)
- Mobile source emissions standards
- New Source Review/Prevention of Significant Deterioration rules
- Consumer Products standards
- MACT standards (mainly toxics, but VOC controls affect ozone/PM)
- CTGs/ACTs – not national rules but important guidance for states
New Source Review

- CAA pre-construction permit program
  - Ensures air quality does not worsen where it is currently unhealthy
  - Ensures air quality does not significantly deteriorate where the air is currently clean
- Requires that a source install modern control equipment when it is built or when it makes a modification that increases emissions significantly
- Major and minor programs:
  - Major source Attainment NSR a.k.a. PSD ♦ attainment areas
  - Major source Nonattainment NSR ♦ nonattainment areas
  - Minor source NSR ♦ all other areas
New Source Review (cont.)

- Applies to emitters of NAAQS and other "regulated" pollutants
- Excludes air toxics (section 112 HAPs)
- Regulated Ozone pollutants are NOx and VOCs

Regulated PM$_{2.5}$ pollutants* are:
- direct PM$_{2.5}$ and SO$_2$ always
- NOx unless State gets waiver
- VOC and Ammonia only if State or EPA demonstrates it makes sense
- Ammonia only a "local" regulated pollutant

* Pending final PM2.5 NSR rule
Title V Operating Permit Program

- 1990 CAA established Title V to promote compliance
- Consolidates a facility's CAA requirements into one "enforcement" document.
- Contains:
  - Reporting and recordkeeping requirements and compliance schedule
  - Requires periodic certification of compliance with CAA.
  - Requires self-reporting of any violations
  - Allows inspections of the facility by the permitting authority
- Issued to:
  - All major sources (10/25 tpy toxics, 10/25/50/100 tpy VOC, 100 tpy other)
  - Plus some non-majors (e.g., MACT area sources, HWIs)
  - Around 17,000 major sources nation-wide (including about 100 on Tribal land)
  - Around 19,000 synthetic minor sources
- State establishes program and is the issuing authority (and fee collector) except on Tribal lands
- Renewed every 5 years or possibly sooner when source requirements significantly change
Transportation Conformity

- Required under CAA section 176(c) to ensure that federally supported highway and transit project activities are consistent with ("conform to") the purpose of the SIP (see 40 CFR Subpart T 51.930)

- Ensures transportation activities do not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant standards

- Applies to areas that are designated nonattainment, and those redesignated to attainment after 1990 ("maintenance areas" with SIPs developed under Clean Air Act section 175A) for transportation-related criteria pollutants: ozone, PM$_{2.5}$, PM$_{10}$, CO, NO$_2$
Public Involvement in SIP Development

- Review/comment on EPA implementation guidance/rules as they are being developed
- Review/comment on State- or Local-level analysis and plan development
  - Participate in stakeholder events/groups
  - Work directly with government officials
  - Review/comment on EPA approval actions
- Make EPA and other relevant authorities aware of implementation challenges