

# National Ambient Air Quality Standards Fall 2010 Update



**Regional Air Quality Meeting  
October 26, 2010**

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# Current Schedule for Ongoing NAAQS Reviews (Sept 2010)

MILESTONE	POLLUTANT						
	NO <sub>2</sub> Primary	SO <sub>2</sub> Primary	Ozone Reconsideration	CO	PM	NO <sub>2</sub> /SO <sub>2</sub> Secondary	Lead
NPR	<u>Jun 26, 2009</u>	<u>Nov 16, 2009</u>	Jan 6, 2010	<u>Jan 28, 2011</u>	Feb 2011	<u>July 12, 2011</u>	Nov 2013
NFR	<u>Jan 22, 2010</u>	<u>Jun 2, 2010</u>	Oct 29, 2010	<u>Aug 12, 2011</u>	Oct 2011	<u>Mar 20, 2012</u>	Sept 2014

NOTES:

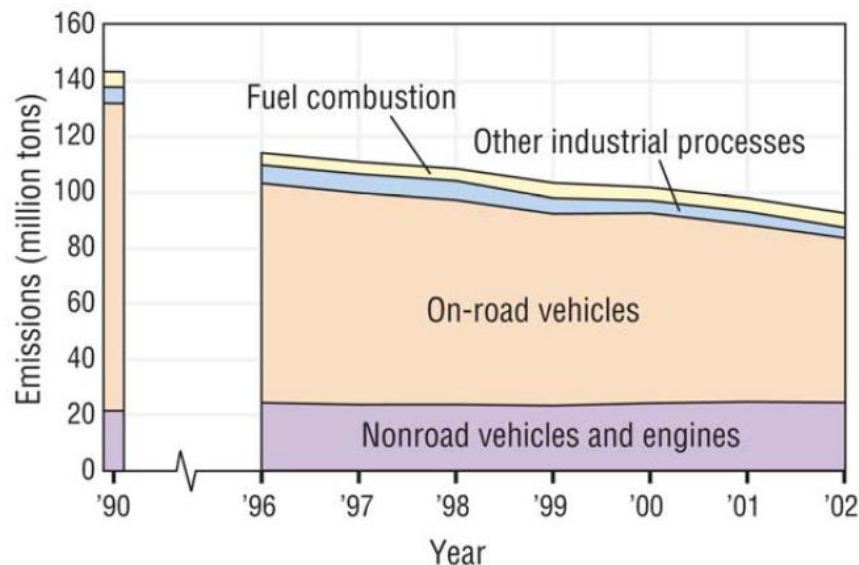
- Underlined dates indicate court-ordered or settlement agreement deadlines
- Next Ozone Review: Proposal in Jun 2013 and Final in Mar 2014
- More information about all ongoing reviews available at: <http://www.epa.gov/ttn/naaqs/>

## January 2010 Ozone NAAQS Proposal: Overview

- On January 6, 2010, as part of its reconsideration of the Ozone NAAQS, EPA proposed to set different standards than those set in 2008
- Specifically, EPA proposed:
  - To set the level of the primary 8-hour ozone standard to a level within the range of 0.060-0.070 parts per million (ppm)
  - To establish a new cumulative, seasonal secondary standard within a range of 7-15 ppm-hours
- EPA plans to issue final standards around the end of October

## CO NAAQS Review

- Current standards set in 1971: 9 ppm, 8-hour average and 35 ppm, 1-hour average (not to be exceeded more than once per year)
- Final Policy Assessment issued October 22, 2010 (<http://www.epa.gov/ttn/naaqs/standards/co/data/20101022copafinal.pdf>)
- Rulemaking schedule (court-ordered): Proposal January 28, 2011; Final August 12, 2011
- Nationally and in urban areas, generally, mobile sources dominate emissions; 35% reduction in national-scale anthropogenic CO emissions between 1990 and 2002



# CO Policy Assessment & CASAC Comments

Note: first draft policy assessment reviewed by CASAC focused on 8-hour (controlling) standard with much less consideration of 1-hour standard

## CASAC:

- Agreed with staff's initial conclusion that available evidence supports **retaining or revising** the current 8-hour standard
- Did not concur with option revoking the 1-hour standard
  - Stated 1-hour standard might provide protection independent of that provided by 8-hour standard
- Expressed “preference” for lower standards, but did not recommend specific levels

## Final Policy Assessment:

- Focusing more on 1-hour standard, concludes it is appropriate to consider either:
  - Retaining current standards
  - Revising current 1-hour standard (15-5 ppm, 99<sup>th</sup> percentile daily maximum) and retaining/revising 8-hour form/level accordingly

## PM NAAQS Review: Schedule

- Final Integrated Science Assessment – Dec 2009
- Risk and Exposure Assessments
  - Quantitative Health Risk Assessment finalized June 2010
  - Urban-Focused Visibility Assessment finalized July 2010
- Final Policy Assessment – Oct/Nov 2009
- Proposed rulemaking – February 2011
- Final rulemaking – October 2011

## Major Issues in this Review: PM<sub>2.5</sub> Primary

- **2006 Review:** revised primary 24-hour PM<sub>2.5</sub> standard from 65 to 35 µg/m<sup>3</sup>; retained primary annual PM<sub>2.5</sub> standard at 15 µg/m<sup>3</sup>
- **CASAC expressed serious concerns** with decision not to revise annual standard
- **D.C. Circuit Court remanded primary annual PM<sub>2.5</sub> standard** (Feb 2009): EPA failed to adequately explain why the annual standard provided the required protection from effects associated with both *long-term* and *short-term exposures*, or from *effects in children and other susceptible populations*
- **Now: substantial new health evidence**, including extended analyses of seminal epidemiological studies of long- and short-term PM<sub>2.5</sub> exposures
  - Evidence of associations is now stronger
  - Effects have been observed **at ambient concentrations allowed by current standards**, with **no discernible thresholds** below which effects would not occur
  - Important uncertainties remain including understanding the **relative toxicity** of the different components in the fine particle mixture

## PM<sub>2.5</sub> Primary Standards: Staff and CASAC Conclusions

- **Adequacy:** CASAC supports staff conclusion that currently available evidence clearly calls into question adequacy of protection afforded by current suite of PM<sub>2.5</sub> standards
- **Indicator and Averaging time:** Staff concludes that it is appropriate to consider retaining PM<sub>2.5</sub> mass-based indicator and annual and 24-hour averaging times
  - CASAC concurs with these staff conclusions and urges EPA to “reinvigorate” research on chemical components, sources, and ultrafine particles to inform future reviews
- **Levels:** CASAC supports range of levels identified by staff in draft Policy Assessment
  - Annual standard (generally controlling): Consider revising level within a range of 13-11  $\mu\text{g}/\text{m}^3$
  - 24-hour standard (supplemental protection): Consider retaining level at 35  $\mu\text{g}/\text{m}^3$ , in conjunction with revising the level of the annual standard; alternatively, consider revising level to 30  $\mu\text{g}/\text{m}^3$
- **Form:** CASAC concurs with staff conclusion that consideration be given to revising form of annual standard to eliminate spatial averaging provisions

## Major Issues in this Review: $PM_{10-2.5}$

- Protection against exposures to thoracic coarse particles ( $PM_{10-2.5}$ ) is provided by current 24-hour  $PM_{10}$  standard, with its one-expected-exceedance form and a level of  $150 \mu\text{g}/\text{m}^3$
- **2006 Review:** Retained the 24-hour  $PM_{10}$  standard and eliminated the annual standard
  - In subsequent litigation, D.C. Circuit Court upheld the Agency's decisions and supporting rationale
- **Current Review:** Major decision is whether to retain or revise the current standard
  - There are a number of new thoracic coarse particle health studies available since the last review, but considerable uncertainty remains
  - Compared to fine particles, the implications of the evidence and uncertainties for standard-setting are less clear

## PM<sub>10</sub> Standard: Health Evidence in Current Review

- There is an expanded body of epidemiologic evidence (~50 new studies) available in this review
  - Associations with PM<sub>10-2.5</sub> are generally positive, but frequently not statistically significant
  - Positive associations have been reported in a few locations likely to have met the current PM<sub>10</sub> standard during the study period
- Some limited support for the plausibility of associations is provided by a small number of controlled human exposure studies
- However, important uncertainties complicate our interpretation of the evidence

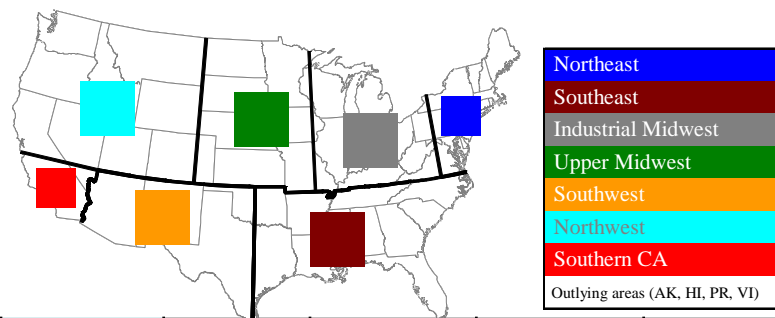
## PM<sub>10</sub>: CASAC and Staff Conclusions

- **Adequacy:**
  - Staff concluded that consideration could be given to retaining or revising the current PM<sub>10</sub> standard, depending on the weight placed on the evidence and uncertainties
  - CASAC concluded that the available evidence, while limited, is sufficient to call into question the level of protection provided by the current standard
    - CASAC recommended that consideration be given to revising the current 24-hour PM<sub>10</sub> standard in order to increase public health protection
    - CASAC did not support the option of retaining the current standard
- **Indicator:** CASAC agrees with staff conclusion that the available evidence supports retaining the current PM<sub>10</sub> indicator
  - CASAC also “vigorously” recommended deploying a network of PM<sub>10-2.5</sub> monitors to allow future exploration of the appropriateness of PM<sub>10-2.5</sub> as indicator
- **Averaging Time:** CASAC agrees with staff conclusion that available evidence supports consideration of retaining a 24-hour standard and not setting a long-term standard

## PM<sub>10</sub>: Potential Alternative Standards (cont.)

- **Form:** CASAC agrees with staff conclusion that it is appropriate to consider revising the form to the 98<sup>th</sup> percentile of the annual distribution of 24-hour PM<sub>10</sub> concentrations, averaged over 3 years
- **Level:**
  - Staff concluded that consideration could be given to PM<sub>10</sub> standard levels from **85 μg/m<sup>3</sup> down to 65 μg/m<sup>3</sup>** (in conjunction with a 98<sup>th</sup> percentile form) with the upper part of the range supported by the strongest evidence
    - Range of levels supported in the draft Policy Assessment was based primarily on consideration of the 98<sup>th</sup> percentile PM<sub>10</sub> concentrations in U.S. study locations
      - Also considered what level (with a 98<sup>th</sup> percentile form) would be “generally equivalent” nationally to the current standard
  - CASAC agreed that it is appropriate to consider standard levels from 85 to 65 μg/m<sup>3</sup>; but **recommended** setting the level in the range of **75 to 65 μg/m<sup>3</sup>**

# Estimates of Counties/Population Not Likely to Meet Current and Potential Alternative PM<sub>10</sub> Standards



Region >		All U.S.	Northeast	Southeast	Industrial Midwest	Upper Midwest	Southwest	Northwest	Southern California
Total # of counties >		307	37	57	50	40	25	77	18
Total population >		120,090	15,397	27,181	21,352	5,917	11,112	15,270	22,695
Current Standard	# counties	42	0	3	0	2	11	14	11
	Population (thousands)	30,044	0	4,626	0	43	5,485	1,906	17,724
3-year average 98 <sup>th</sup> percentile > 87 µg/m <sup>3</sup>	# counties	37	0	2	2	2	11	10	9
	population	20,515	0	4,063	507	552	5,924	1,789	7,421
3-year average 98 <sup>th</sup> percentile > 85 µg/m <sup>3</sup>	# counties	39	0	2	3	2	12	10	9
	population	21,887	0	4,063	1,789	552	6,014	1,789	7,421
3-year average 98 <sup>th</sup> percentile > 80 µg/m <sup>3</sup>	# counties	39	0	2	3	2	12	10	9
	population	21,887	0	4,063	1,789	552	6,014	1,789	7,421
3-year average 98 <sup>th</sup> percentile > 75 µg/m <sup>3</sup>	# counties	55	0	3	6	5	13	15	12
	population	35,703	0	4,626	3,491	637	6,131	2,570	17,986
3-year average 98 <sup>th</sup> percentile > 70 µg/m <sup>3</sup>	# counties	71	0	4	7	7	13	27	12
	population	43,823	0	4,644	8,868	881	6,131	5,052	17,986
3-year average 98 <sup>th</sup> percentile > 65 µg/m <sup>3</sup>	# counties	87	2	4	9	10	14	33	13
	population	49,394	775	4,644	10,421	1,029	7,507	5,989	18,739

## Major Issues in this Review: Secondary PM<sub>2.5</sub> Standard (Visibility)

- **2006 Review:** Final rule set secondary PM standards identical to primary standards
- **CASAC expressed serious concern** that the final decision did not adopt a sub-daily standard consistent with CASAC recommendation
- **D.C. Circuit Court remanded secondary PM<sub>2.5</sub> standard as unreasonable and contrary to law** due to failure to set a target level of protection for visibility effects and to consider the role of relative humidity in PM-related visibility impairment

## Secondary PM<sub>2.5</sub> Standard (Visibility)

- **PM<sub>2.5</sub> impairs visibility by scattering and absorbing light, referred to as light extinction**
  - Light extinction depends upon particle composition and relative humidity
  - Light extinction can be directly measured, but no FRM is currently available
  - Light extinction can be calculated from data on PM<sub>2.5</sub> mass and component concentrations and relative humidity (using existing monitoring network)
- **Urban-focused visibility assessment** estimated large percentage of days would exceed even highest target protection level in areas across the U.S. upon just meeting current standards

## PM<sub>2.5</sub> Secondary Standards: Staff and CASAC Conclusions

- **Adequacy:** CASAC agreed with staff conclusions that current information clearly calls into question the adequacy of the current standards; current standard levels too high, averaging times too long, and mass-based indicator does not fully reflect PM-related impairment of visibility
- **Approach to defining a distinct secondary standard:** Draft Policy Assessment focuses on a new speciated PM<sub>2.5</sub> calculated light extinction indicator, with a 1-hour averaging time
  - Recognizes challenges in translating 24-hour speciation data into hourly values