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resources & energy

Utility Mercury and Air Toxics Standards (MATS) Rule

Cross State Air Pollution Rule (CSAPR) / Clean Air Interstate Rule (CAIR)

Regulation Update

Jay Weist - Director, Business Development

EE Meeting – September 12, 2012

EcoNomics

CSAPR Status

Outline

- History 101
- Utility MATS
  - Title III HAPS
  - Rule Summary
  - Status
- CSAPR / CAIR
  - Title I New Source Review
  - Non-attainment
  - CAIR/CSPAR Review
  - CAIR/CSAPR Status
  - Other Considerations

History 101

History 101 – In the beginning….

The legal authority for Federal programs/regulations regarding air pollution control is based on the Clean Air Act (CAA).

History Lesson

- Air Pollution Control Act of 1955 – the first Federal legislation involving air pollution; it provided Federal funds for research
- Clean Air Act of 1963 – the first Federal legislation regarding air pollution control; it established a Federal program within the U.S. Public Health Service and authorized research into techniques for monitoring and controlling air pollution.
- Air Quality Act 1967 – expand Federal government activities; enforcement proceedings were initiated in areas subject to interstate air pollution transport. As part of these proceedings, the federal government for the first time conducted extensive ambient monitoring studies and stationary source inspections

History 101

History Lesson...continued

- Clean Air Act of 1970 (1970 CAA) – authorized the development of comprehensive Federal and state regulations to limit emissions from both stationary (industrial) sources and mobile sources. Four major regulatory programs affecting stationary sources were initiated:
  - National Ambient Air Quality Standards (NAAQS),
  - State Implementation Plans (SIPs),
  - New Source Performance Standards (NSPS), and
  - National Emission Standards for Hazardous Air Pollutants (NESHAPs).

  Enforcement authority was substantially expanded.

  The adoption of this legislation occurred at approximately the same time as the National Environmental Policy Act that established the U.S. Environmental Protection Agency (EPA).

  The EPA was created on May 2, 1971 in order to implement the various requirements included in the Clean Air Act of 1970

History 101

History Lesson...continued

- Clean Air Act Amendments of 1977 (1977 CAAA) – major permit review requirements were established to ensure attainment and maintenance of the NAAQS.
  - provisions for the Prevention of Significant Deterioration (PSD) of air quality in areas attaining the NAAQS and
  - requirements pertaining to sources in non-attainment areas for NAAQS

History 101

History Lesson...continued

- Clean Air Act Amendments of 1990 (1990 CAAA) – substantially increased the authority and responsibility of the Federal government. The 1990 CAAA consists of the nine separate Titles:
  - Title I – Provisions for Attainment and Maintenance of NAAQS
  - Title II – Provisions Related to Mobile Sources
  - Title III – Hazardous Air Pollutants
  - Title IV – Acid Deposition (Acid Rain) Control
  - Title V – Operating Permits
  - Title VI – Stratospheric Ozone Protection
  - Title VII – Provisions Related to Enforcement
  - Title VIII – Miscellaneous Provisions (including visibility and information gathering on greenhouse gas [GHG] and global climate change)
  - Title IX – Clean Air Research Programs.

Utility MATS

Title III – Hazardous Air Pollutants (HAPs)

- 188 chemicals
- Major source
  - 10 tons per year of any one of the 188 HAPs
  - 25 tons per year of any combination of the 188 HAPs
- MACT
  - Top 12% of Best Controlled Sources
- TRI
- CEMS

Title III – HAPs

National Emission Standards for Hazardous Air Pollutants (NESHAP)

- Established for categories of major sources of Hazardous Air Pollutants (HAP)
- Reflects the maximum degree of reduction in emissions of HAP that is achievable, taking into consideration:
  - Cost
  - Non-air quality health and environmental impacts
  - Energy requirements

  (Referred to as maximum achievable control technology [MACT] or as mercury and air toxics standards [MATS])
- However, the Administrator may consider health threshold levels, with an ample margin of safety, when establishing emission standards

Utility MATS

- Finalized on December 21, 2011
- Compliance Date: April 16, 2015
- A one-year compliance extension is available on a case-by-case basis from the state permitting authority. An additional year must be necessary to complete the installation of pollution control equipment required to comply with the rule. CAA 112(i)(3)(B).

- EPA Office of Enforcement and Compliance Assurance guidance allows up to a year extension for units critical to system reliability even if the units will not be retrofitted. Administrative Order under CAA 113(a)(4).

Pollutant	Emission Limit [1]		Applicability
Particulate Matter (filterable)	0.030 **lb/MMBtu** 8.0 x **10^{-3} lb/MMBtu**	0.30 **lb/MW-hr** 9.0 x **10^{-2} lb/MW-hr**	Existing Coal-fired Unit [Surrogate for Total Non-Hg HAP Metals] Solid oil derived fuel
Total Non-Hg HAP Metals	5.0 x **10^{-5} lb/MMBtu** 4.0 x **10^{-5} lb/MMBtu**	0.50 **lb/GW-hr** 6.0 x **10^{-1} lb/GW-hr**	Existing Coal-fired Unit [Surrogate for Individual HAP Metals] Existing Solid oil derived fuel
Antimony (Sb)	0.8 **lb/Tbtu** 0.8 **lb/Tbtu**	8.0 x **10^{-3} lb/GW-hr** 8.0 x **10^{-3} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Arsenic (As)	1.1 **lb/Tbtu** 0.3 **lb/Tbtu**	2.0 x **10^{-2} lb/GW-hr** 5.0 x **10^{-3} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Berylium (Be)	2.0 x **10^{-1} lb/Tbtu** 6.0 x **10^{-2} lb/Tbtu**	2.0 x **10^{-3} lb/GW-hr** 6.0 x **10^{-4} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Cadmium (Cd)	3.0 x **10^{-1} lb/Tbtu** 3.0 x **10^{-1} lb/Tbtu**	3.0 x **10^{-3} lb/GW-hr** 4.0 x **10^{-3} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Chromium (Cr)	2.8 **lb/Tbtu** 0.8 **lb/Tbtu**	3.0 x **10^{-2} lb/GW-hr** 2.0 x **10^{-2} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Cobalt (Co)	8.0 x **10^{-1} lb/Tbtu** 1.1 **lb/TBtu**	8.0 x **10^{-3} lb/GW-hr** 2.0 x **10^{-2} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Lead (Pb)	1.2 **lb/Tbtu** 0.8 **lb/Tbtu**	2.0 x **10^{-2} lb/GW-hr** 2.0 x **10^{-2} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Manganese (Mn)	4.0 **lb/Tbtu** 2.3 **lb/Tbtu**	5.0 x **10^{-2} lb/GW-hr** 4.0 x **10^{-2} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Nickel (Ni)	3.5 **lb/Tbtu** 9.0 **lb/Tbtu**	4.0 x **10^{-2} lb/GW-hr** 2.0 x **10^{-1} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Selenium (Se)	5.0 **lb/Tbtu** 1.2 **lb/Tbtu**	6.0 x **10^{-2} lb/GW-hr** 2.0 x **10^{-2} lb/GW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Hydrogen Chloride (HCl)	2.0 x **10^{-3} lb/MMBtu** 5.0 x **10^{-3} lb/MMBtu**	2.0 x **10^{-2} lb/MW-hr** 8.0 x **10^{-2} lb/MW-hr**	Existing Coal-fired Unit Existing Solid oil derived fuel
Sulfur Dioxide (SO_2)	2.0 x **10^{-1} lb/MMBtu** 3.0 x **10^{-1} lb/MMBtu**	1.5 **lb/MW-hr** 2.0 **lb/MW-hr**	Existing Coal-fired Unit [Surrogate for HCl, only if WFGD or DFGD installed] Existing Solid oil derived fuel
Mercury (Hg)	4.0 **lb/Tbtu** 0.2 **lb/Tbtu**	4.0 x **10^{-2} lb/GW-hr** 2.0 x **10^{-3} lb/GW-hr**	Existing Coal-fired Unit (Moisture and Ash Free Coal <8,300 Btu/lb) Existing Solid oil derived fuel
Mercury (Hg)	1.2 **lb/TBtu**	1.3 x **10^{-2} lb/GW-hr**	Existing Coal-fired Unit (Moisture and Ash Free Coal ≥8,300 Btu/lb)

Pollutant	Emission Limit [1]		Applicability Continental Non-continental
Particulate Matter (filterable)	0.030 **lb/MMBtu**	0.30 **lb/MW-hr**	Existing Liquid Oil-fired Unit [Surrogate for Total HAP Metals]
Total HAP Metals	8.0 x **10^{-4} lb/MMBtu** 6.0 x **10^{-4} lb/MMBtu**	8.0 x **10^{-3} lb/GW-hr** 7.0 x **10^{-3} lb/GW-hr**	Existing Liquid Oil-fired Unit [Surrogate for Individual HAP Metals]
Antimony (Sb)	13.0 **lb/Tbtu** 2.2 **lb/Tbtu**	0.20 **lb/GW-hr** 2.0 x **10^{-2} lb/GW-hr**	Existing Liquid Oil-fired Unit
Arsenic (As)	2.8 **lb/Tbtu** 4.3 **lb/Tbtu**	3.0 x **10^{-2} lb/GW-hr** 8.0 x **10^{-2} lb/GW-hr**	Existing Liquid Oil-fired Unit
Berylium (Be)	2.0 x **10^{-1} lb/Tbtu** 6.0 x **10^{-1} lb/Tbtu**	2.0 x **10^{-3} lb/GW-hr** 3.0 x **10^{-3} lb/GW-hr**	Existing Liquid Oil-fired Unit
Cadmium (Cd)	3.0 x **10^{-1} lb/Tbtu** 3.0 x **10^{-1} lb/Tbtu**	2.0 x **10^{-3} lb/GW-hr** 3.0 x **10^{-3} lb/GW-hr**	Existing Liquid Oil-fired Unit
Chromium (Cr)	5.5 **lb/Tbtu** 31.0 **lb/Tbtu**	6.0 x **10^{-2} lb/GW-hr** 3.0 x **10^{-1} lb/GW-hr**	Existing Liquid Oil-fired Unit
Cobalt (Co)	21.0 **lb/Tbtu** 1.1 x **10^{2} lb/TBtu**	0.30 **lb/GW-hr** 1.40 **lb/GW-hr**	Existing Liquid Oil-fired Unit
Lead (Pb)	8.1 **lb/Tbtu** 4.9 **lb/Tbtu**	8.0 x **10^{-2} lb/GW-hr** 8.0 x **10^{-2} lb/GW-hr**	Existing Liquid Oil-fired Unit
Manganese (Mn)	22.0 **lb/Tbtu** 20.0 **lb/TBtu**	0.30 **lb/GW-hr** 0.30 **lb/GW-hr**	Existing Liquid Oil-fired Unit
Nickel (Ni)	1.1 x **10^{2} lb/Tbtu** 4.7 x **10^{2} lb/TBtu**	1.10 **lb/GW-hr** 4.10 **lb/GW-hr**	Existing Liquid Oil-fired Unit
Selenium (Se)	3.3 **lb/Tbtu** 9.8 **lb/TBtu**	4.0 x **10^{-2} lb/GW-hr** 0.20 **lb/GW-hr**	Existing Liquid Oil-fired Unit
Hydrogen Chloride (HCl)	2.0 x **10^{-3} lb/MMBtu** 2.0 x **10^{-4} lb/MMBtu**	1.0 x **10^{-2} lb/MW-hr** 2.0 x **10^{-3} lb/MW-hr**	Existing Liquid Oil-fired Unit
Hydrogen Fluoride (HF)	4.0 x **10^{-4} lb/MMBtu** 6.0 x **10^{-5} lb/MMBtu**	4.0 x **10^{-3} lb/MW-hr** 5.0 x **10^{-4} lb/MW-hr**	Existing Liquid Oil-fired Unit
Mercury (Hg)	2.0 x **10^{-1} lb/Tbtu** 4.0 x **10^{-2} lb/Tbtu**	2.0 x **10^{-3} lb/GW-hr** 4.0 x **10^{-4} lb/GW-hr**	Existing Liquid Oil-fired Unit

Utility MATS Rule Summary
NESHAPs [For New Sources]

Pollutant	Emission Limit [1]	Applicability
Particulate Matter (filterable)	7.0 x **10^{-3} lb/MW-hr**	New Coal-fired Unit [Surrogate for Total Non-Hg HAP Metals]
Total Non-Hg HAP Metals	6.0 x **10^{-2} lb/GW-hr**	New Coal-fired Unit [Surrogate for Individual HAP Metals]
Antimony (Sb)	8.0 x **10^{-3} lb/GW-hr**	New Coal-fired Unit
Arsenic (As)	3.0 x **10^{-3} lb/GW-hr**	New Coal-fired Unit
Berylium (Be)	6.0 x **10^{-4} lb/GW-hr**	New Coal-fired Unit
Cadmium (Cd)	4.0 x **10^{-4} lb/GW-hr**	New Coal-fired Unit
Chromium (Cr)	7.0 x **10^{-3} lb/GW-hr**	New Coal-fired Unit
Cobalt (Co)	2.0 x **10^{-3} lb/GW-hr**	New Coal-fired Unit
Lead (Pb)	2.0 x **10^{-3} lb/GW-hr**	New Coal-fired Unit
Manganese (Mn)	4.0 x **10^{-3} lb/GW-hr**	New Coal-fired Unit
Nickel (Ni)	4.0 x **10^{-2} lb/GW-hr**	New Coal-fired Unit
Selenium (Se)	6.0 x **10^{-3} lb/GW-hr**	New Coal-fired Unit
Hydrogen Chloride (HCl)	4.0 x **10^{-4} lb/MW-hr**	New Coal-fired Unit
Sulfur Dioxide (SO_2)	0.40 **lb/MW-hr**	New Coal-fired Unit [Surrogate for HCl, only if WFGD or DFGD Installed]
Mercury (Hg)	4.0 x **10^{-2} lb/GW-hr**	New Coal-fired Unit (Moisture and Ash Free Coal <8,300 Btu/lb)
Mercury (Hg)	2.0 x **10^{-4} lb/GW-hr**	New Coal-fired Unit (Moisture and Ash Free Coal ≥8,300 Btu/lb)

Utility MATS - Status

- December 2000, EPA finding it was “appropriate and necessary” to regulate Hg emissions from coal-fired Utility Units
- January 2004, EPA proposed to revise December 2000 finding and remove coal- and oil-fired Utility Units from Section 112(c) source category list
- 30-Jan-2004, EPA proposed two alternatives to control Hg: MACT and Cap-and-Trade
- 29-Mar-2005, Final rule to remove coal- and oil-fired Utility Units from Section 112(c) source category list
- 18-May-2005, CAMR Cap-and-Trade final
- 8-Feb-2008, Delisting of Utility Units from Section 112 source category list and subsequent CAMR vacated by DC Circuit Court of Appeals
- 3-May-2011, NESHAP for new and existing EGUs proposed by EPA
- 16-Feb-2012, NESHAP for new and existing EGUs finalized by EPA
- 2-Aug-2012, Partial Stay of effectiveness of final NESHAP for new EGUs published

CSAPR / CAIR

Title I – New Source Review (NSR)

- Non-attainment areas (areas not meeting NAAQS)
- OTR, CAIR
- Major Sources (100 tons/year)
- Major Modifications
- LAER (No economics)
- NOx / VOC Offset Ratios and Major Sources for Ozone Nonattainment Areas

• Extreme	1.5:1	10 / 10 TPY
• Severe	1.3:1	25 / 25 TPY
• Serious	1.2:1	50 / 50 TPY
• Moderate (OTR)	1.15:1	100 / 50 TPY
• Marginal	1.1:1	100 / 50 TPY

- NOx Offsets (ERC)
- NOx Allowances

Title I – NSR…continued

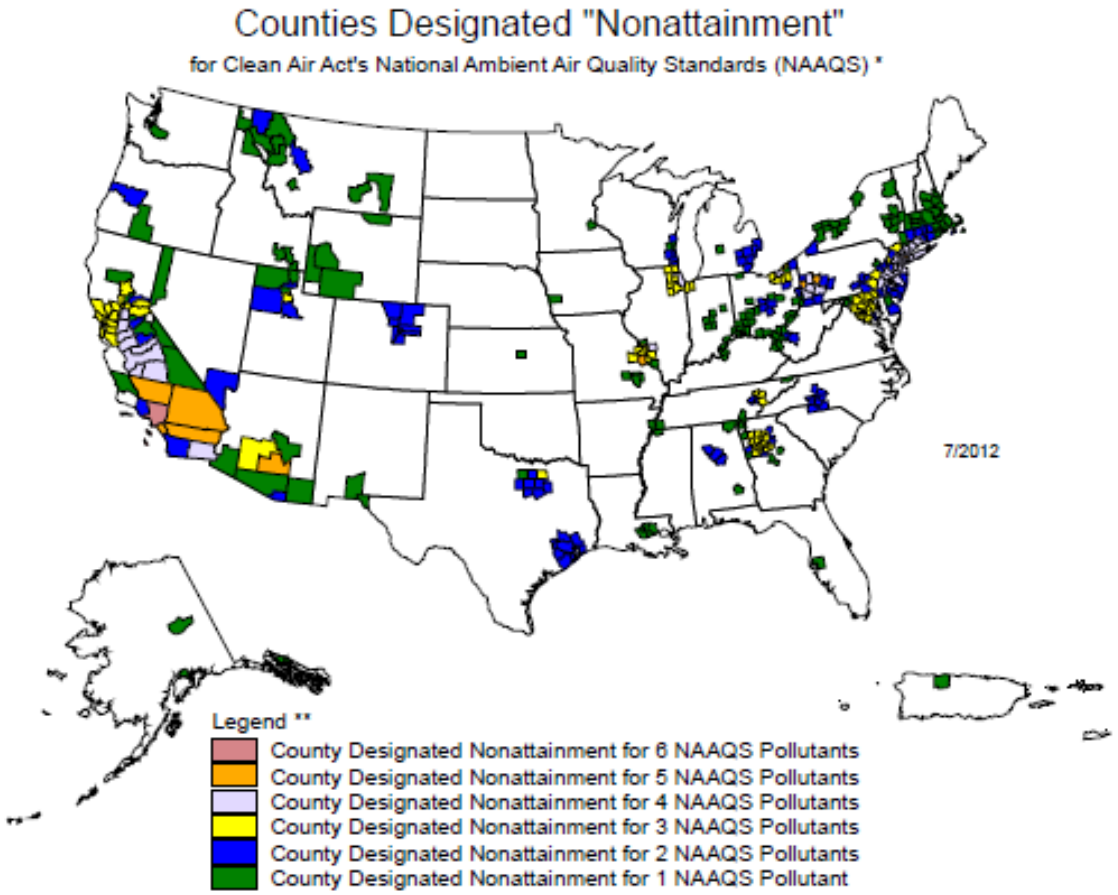
Significant Net Emission Rate Increases for NSR

POLLUTANTS	**EMISSIONS RATE, (tons per year)**
GHG's (CO_2 eq.) New source (Modifications)	100,000 (75,000)
Carbon Monoxide (Serious NA)	100 (50)
Nitrogen Oxides (Serious/Severe NA)	40 (25)
Sulfur Dioxide	40
Particulate Matter (PM/PM-10/PM-2.5)	25/15/10
Ozone (VOC) (Serious/Severe NA)	40 (of VOC's) (25)
Lead	0.6

Title I – NSR…continued

- Lowest achievable emission rate (LAER not MACT)
  - For any source, the more stringent rate of emissions based on the following:
    - The most stringent emissions limitation which is contained in the implementation plan of any State for such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or
    - The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within the stationary source.
    - In no event shall the application of this term permit a proposed new or modified stationary source to emit any pollutant in excess of the amount allowable under applicable NSPS.

Title I – NSR...continued



Guam - Piti and Tanguisson Counties are designated nonattainment for the SO2 NAAQS

* The National Ambient Air Quality Standards (NAAQS) are health standards for Carbon Monoxide, Lead (1978 and 2008), Nitrogen Dioxide, 8-hour Ozone (1997 and 2008), Particulate Matter (PM-10 and PM-2.5 (1997 and 2006)), and Sulfur Dioxide.

** Included in the counts are counties designated for NAAQS and revised NAAQS pollutants. 1-hour Ozone is excluded. Partial counties, those with part of the county designated nonattainment and part attainment, are shown as full counties on the map.

Title I – CAIR

CAIR has been vacated/stayed/remanded, new regulatory requirements are coming!!!

- The final Clean Air Interstate Rule (CAIR) covers 28 eastern states and the District of Columbia. Air emissions in these states contribute to unhealthy levels of ground-level ozone, fine particles or both in downwind states.

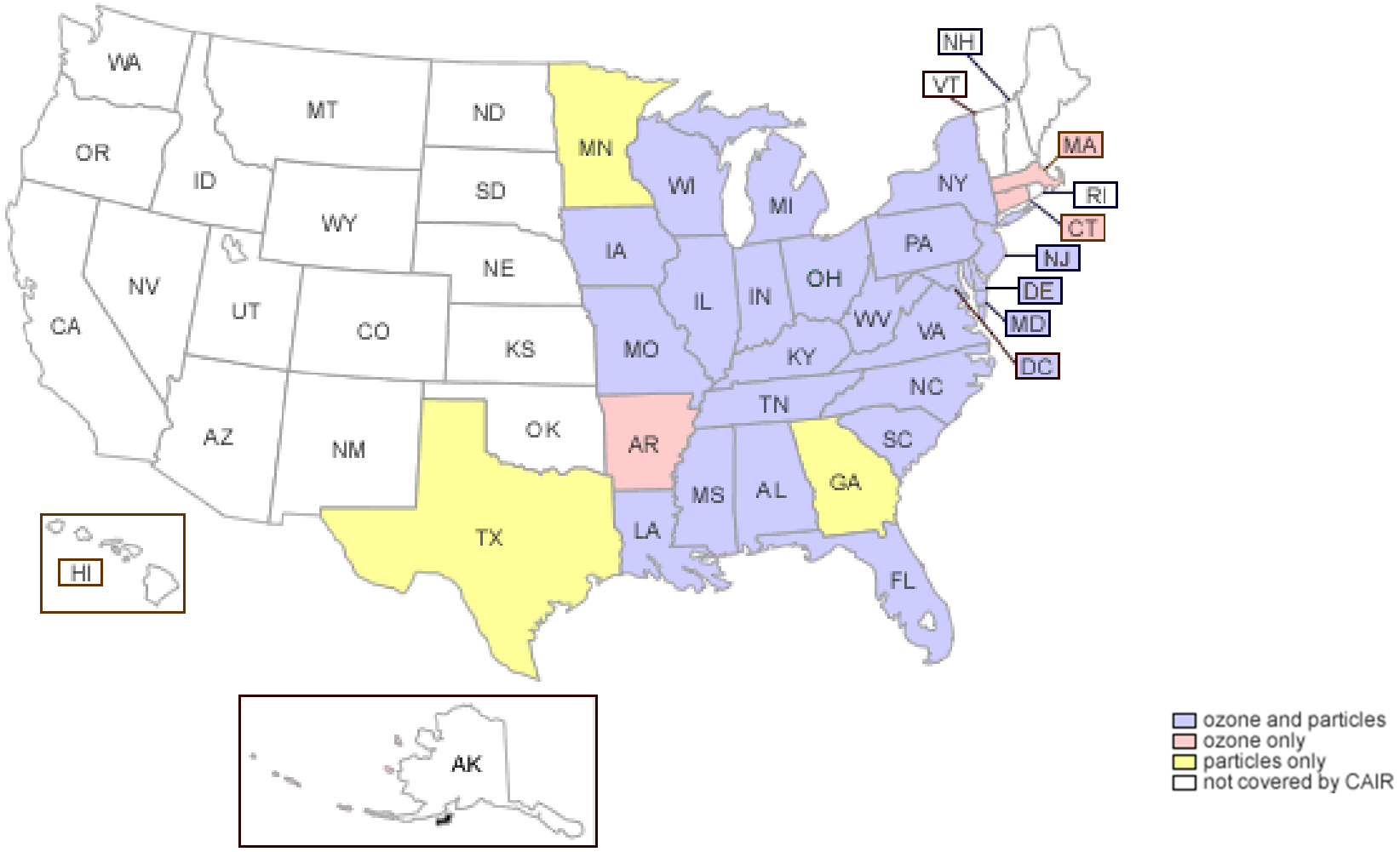
Title I – Clean Air Transport Rule (CATR)

Proposed Transport Rule, CAIR Replacement regulations are here!!!

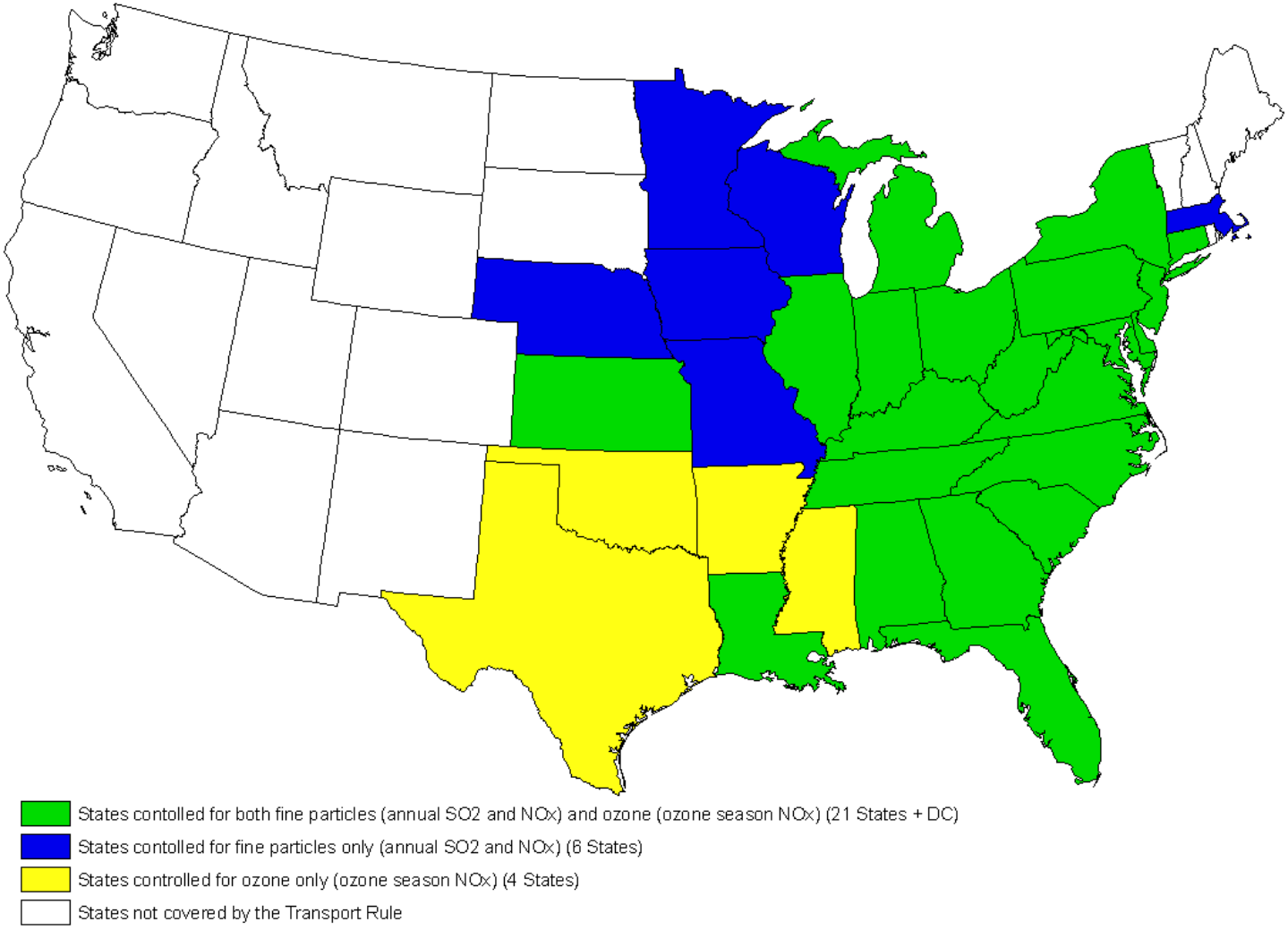
The proposed Transport Rule (TR) covers 31 eastern states and the District of Columbia.

- 28 states would be required to reduce both annual SO_2 and NOx emissions to help downwind states attain annual and 24-hour PM2.5 air quality standards .
- 26 states would be required to reduce NOx emissions during the hot summer months of the ozone season to help downwind states attain ozone air quality standards.

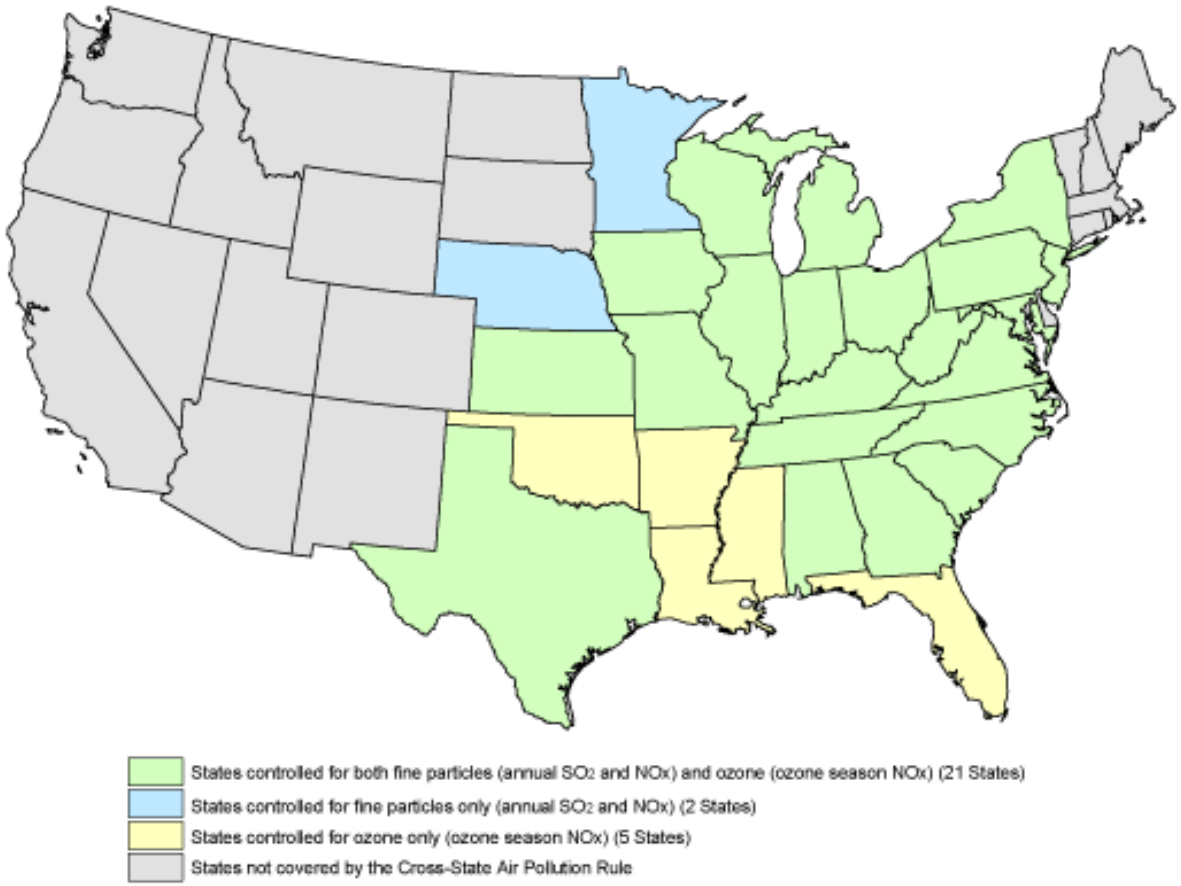
Title I – CAIR...continued



Title I – CATR...continued



Title I – CSAPR…continued



CAIR/CATR/CSAPR - Key Elements

- Fine solid or liquid particles less than 2.5 microns
  - Able to easily reach deep into lungs
- Sources of PM2.5
  - Direct - Combustion activities and Industrial processes
    - Diesel engines
  - Secondary particles formed in the atmosphere from chemical reactions including sunlight and water vapor
    - Sulfates,
    - Nitrates,
    - Organic carbon
- PM2.5 control is related to SO_2 and NOx control
- Geographic scope based on air quality impact of emissions (SO_2 and NOx) from individual states on eight-hour ozone and PM2.5 non-attainment

CAIR - Key Elements...continued

- Sets an emission reduction requirement in the affected region through capping EGU emissions at levels that EPA believes are cost effective for the power sector
  - Annual emission caps for a two-phase program:

	By 2009$_{(NOx)}$ 2010$_{(SO_2)}$	By 2015 and Beyond
SO_2	3.7 million tons (50%)	2.6 million tons (65%)
NOx	1.5 million tons (45%)	1.3 million tons (55%)

  - Ozone Season emission caps for a two-phase program:

	By 2009(NOx)	By 2015 and Beyond
NOx	0.58 million tons (47%)	0.48 million tons (55%)

- Caps would cover the affected 28 states and DC

CAIR - Key Elements...continued

- Allocates NOx and SO_2 budgets
  - Considering emission reduction required by state
  - NOx emissions based on 0.15 lb/MMBtu 2009-2014 and 0.125 lb/MMBtu 2015 and beyond
  - SO_2 emissions based on 0.5 of 2010 SO_2 allowances for 2010-2014 and 0.35 of 2010 SO_2 allowances for 2015 and beyond
- Allows states flexibility on how to achieve the reductions
  - Includes sources to control and whether to join the trading program

CSAPR - Key Elements...continued

- Proposing Federal Implementation Plan for each affected state to reduce air pollution that *significantly* affects another state
- States may choose to develop state plans to achieve required reductions and may choose which types of sources to control
- Sets emission reduction requirement capping EGU emissions
  - Annual emission caps for the program:

	By 2014 and Beyond
SO_2	2.4 million tons (73%)
NOx	1.2 million tons (54%)

  - Ozone Season emission caps for the program:

	By 2014 and Beyond
NOx	0.60 million tons (54%)

- Proposing pollution limit (or budget) for each of the 31 states and DC; allows intrastate and limited interstate trading among EGUs

CSAPR - Key Elements...continued

- Allocates NOx and SO_2 budgets
  - Considering emission reduction required by state
  - Reductions are based on 2005 emission rates
  - Annual NOx allocations based on modeling and installation of "highly cost effective" controls, $500/ton NOx removed (1990$)
  - Ozone Season NOx allocations based on modeling and installation of "highly cost effective" controls, $1,500/ton NOx removed (1990$)
  - SO_2 emissions based on modeling and installation of "highly cost effective" controls, $2,000/ton SO_2 removed (1990$)
- Allows states flexibility on how to achieve the reductions
  - Includes sources to control and whether to join the trading program

CSAPR Status

- 12-May-2005, CAIR Revisions to NOx SIP Call (70FR25162.)
- 11-July-2008, CAIR Vacated by DC Circuit Court of Appeals (BUT Trading Program continued)
- 23-Dec-2008, CAIR Remanded without Vacatur by DC Circuit Court of Appeals (CAIR remains in effect until modified to meet 11-July-2008 opinion)
- 2-Aug-2010, Clean Air Transport Rule (CATR) proposed by EPA (to replace CAIR)
- 8-Aug-2011, CATR (aka CSAPR) finalized by EPA (replaces CAIR)
- 21-Aug-2012, CATR/CSAPR Vacated by DC Circuit Court of Appeals (CAIR remains in effect pending promulgation of a valid replacement)

Other Considerations

- Environmental Community
  - regulatory uncertainty as an opportunity to litigate
  - BART SIPs,
  - 126 petitions,
  - NAAQS limits and implementation

Clean Air Visibility Rule (CAVR)

- Visibility/haze – Regional Haze Rule - 2064
  - Promulgated August 1999
  - 156 Class 1 areas, mostly in Western states
    - National parks (>6,000 acres)
    - Wilderness areas (>5,000 acres)
    - National memorial parks (>5,000 acres)
    - International parks (in existence in 1977)
  - All states must participate
  - Units in these areas maybe subject to BART
    - Existing sources in service between 7-Aug-1962 and 7-Aug-1977
    - Emitting more than 250 tpy
  - CAIR controls can substitute for BART controls?

CAVR…continued

- Best Available Retrofit Technology (BART)
  - Emission limitation based on the degree of reduction achievable through the application of the best system of continuous emission reduction for each pollutant which is emitted by an existing stationary facility. The emission limitation must be established, on a case-by-case basis, taking into consideration:
    - the technology available,
    - the costs of compliance,
    - the energy and
    - non air quality environmental impacts of compliance,
    - any pollution control equipment in use or in existence at the source,
    - the remaining useful life of the source, and
    - the degree of improvement in visibility which may reasonably be anticipated to result from the use of such technology.

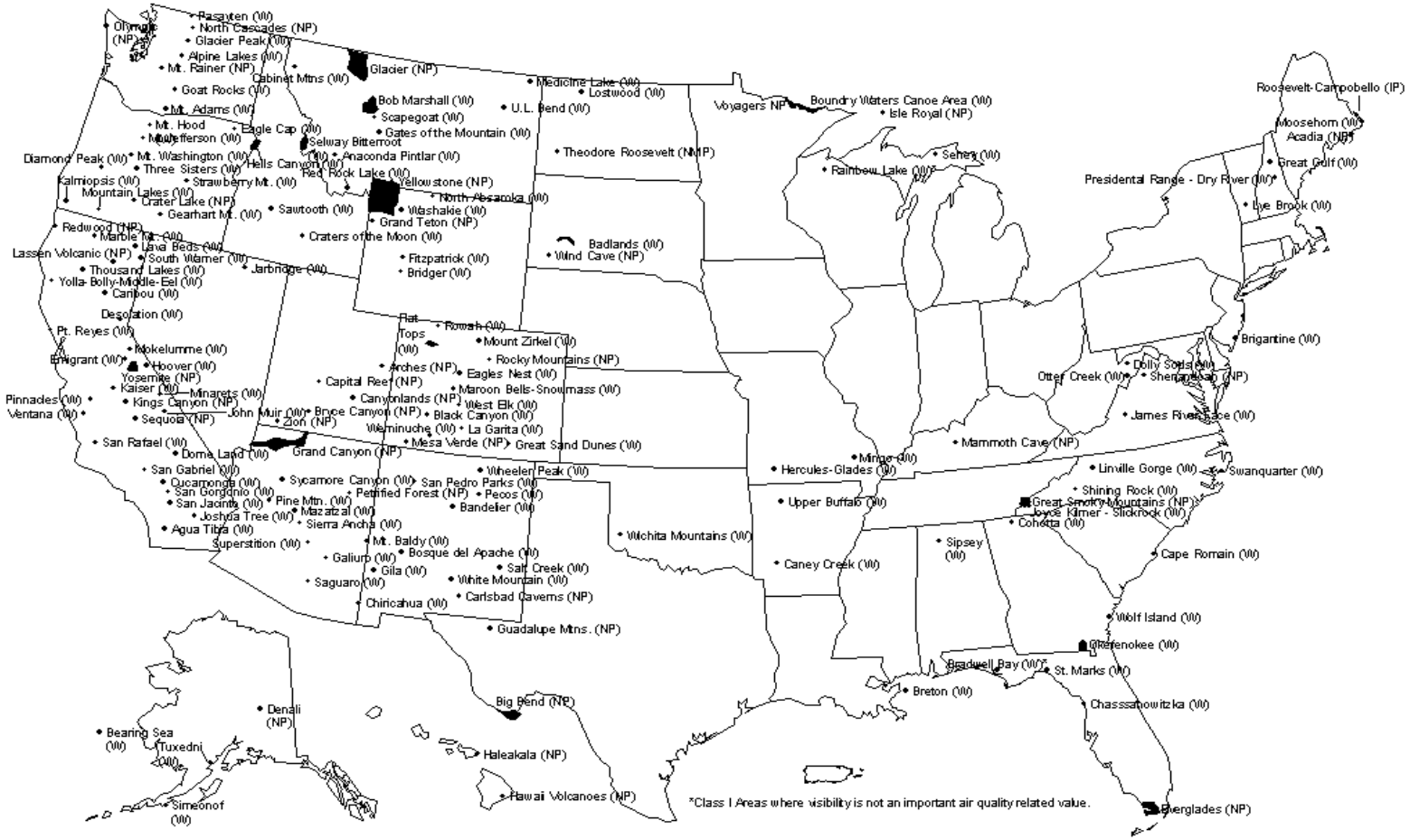
CAVR…continued

Presumptive Best Available Retrofit Technology (BART) For Coal-Fired Electric Generating Units >200 MW

Pollutant / Unit Type / Coal Type	**BART Emission Limit**
NOx / Dry-Bottom Wall-Fired / Bituminous	0.39 lbs/MMBtu
NOx / Dry-Bottom Wall-Fired / Sub-Bituminous	0.23 lbs/MMBtu
NOx / Dry-Bottom Wall-Fired / Lignite	0.29 lbs/MMBtu
NOx / Tangential-Fired / Bituminous	0.28 lbs/MMBtu
NOx / Tangential-Fired / Sub-Bituminous	0.15 lbs/MMBtu
NOx / Tangential-Fired / Lignite	0.17 lbs/MMBtu
NOx / Cyclone-Fired / Any	0.10 lbs/MMBtu
SO_2 / Any / Any	95% control or 0.15 lbs/MMBtu

40 CFR 51, Appendix Y, Guidelines for BART Determinations Under the Regional Haze Rule

Class I Areas

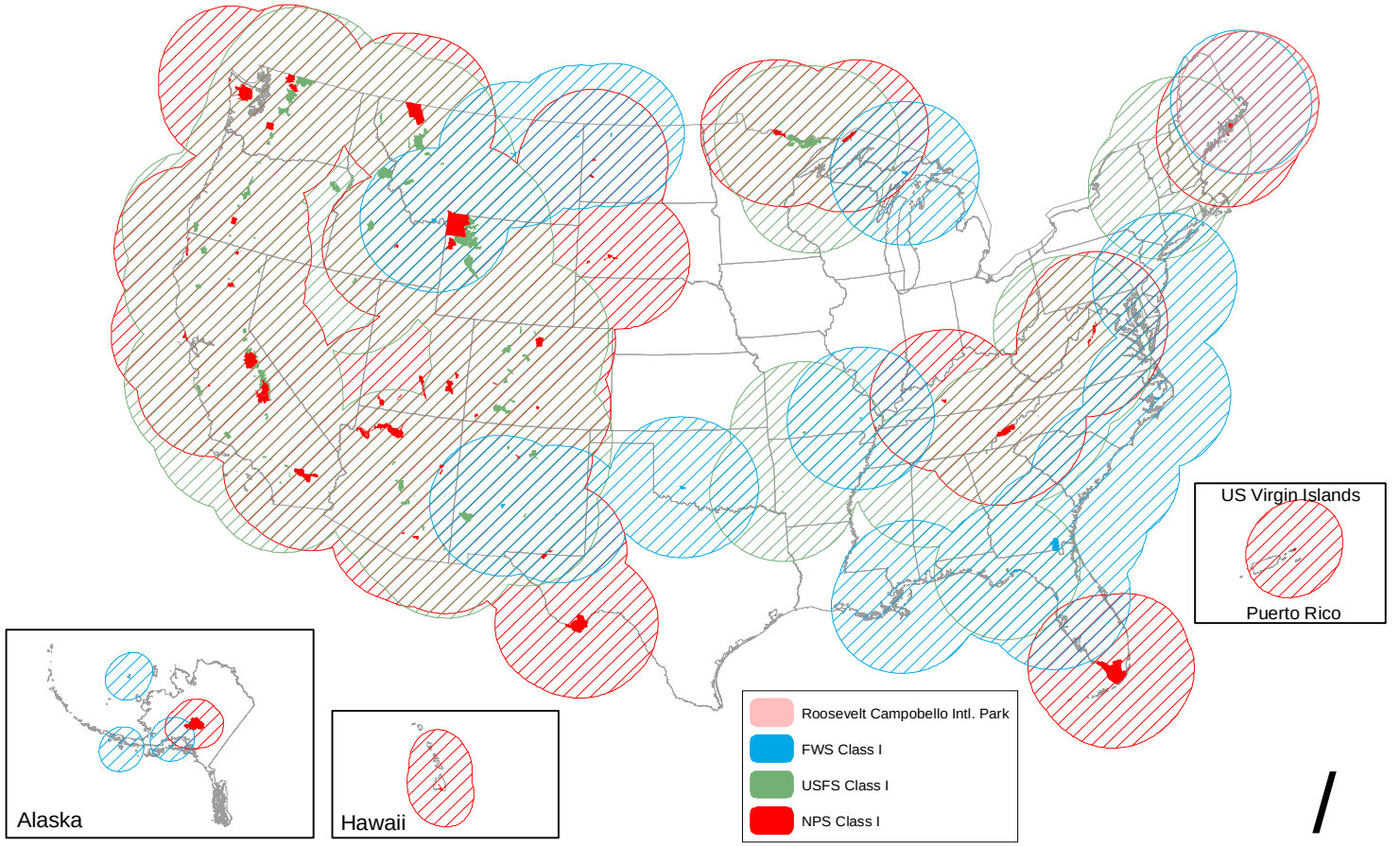


Map of 156 National Park and Wilderness Areas
Protected by EPA's Regional Haze Rule

Legend:
NP= National Park
W= Wilderness
IP = International Park

National Park Service
U.S. Department of the Interior

Areas within 300km of Class I Units



Produced by NPS Air Resources Division
Author: KLD

0 250 500 1,000 Km

October 2002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