

# Annual PM<sub>2.5</sub> NAAQS Revision: Technical Challenges

Rocky Mountain EHS Peer Group

Denver, Colorado

October 24, 2024

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# Agenda

- PM<sub>2.5</sub> NAAQS timeline
- Review of current and potential new PM<sub>2.5</sub> nonattainment areas and designation process/timing
- Air quality modeling issues
- Overview and timing of the PM<sub>2.5</sub> nonattainment new source review permitting process



## PM<sub>2.5</sub> NAAQS Timeline

- March 6, 2024 – U.S. EPA finalizes the lowered annual PM<sub>2.5</sub> NAAQS at 9 µg/m<sup>3</sup>.
- April 30, 2024 – EPA released “Effective Permitting Tools for PM<sub>2.5</sub>” to put links to their guidance all in one place, have been talking to states about available options to be flexible.
- April 30, 2024 – Annual SIL lowered from 0.2 µg/m<sup>3</sup> to 0.13 µg/m<sup>3</sup> in updated guidance.
- May 6, 2024 – Effective date of the lowered PM<sub>2.5</sub> NAAQS and SIL.
- May 16, 2024 – FR notice to adjust Federal Equivalent Method (FEM) monitors (Teledyne T640) that have shown approximately 20% high bias when compared with Federal Reference Method (FRM) monitors.

# PM<sub>2.5</sub> NAAQS Timeline

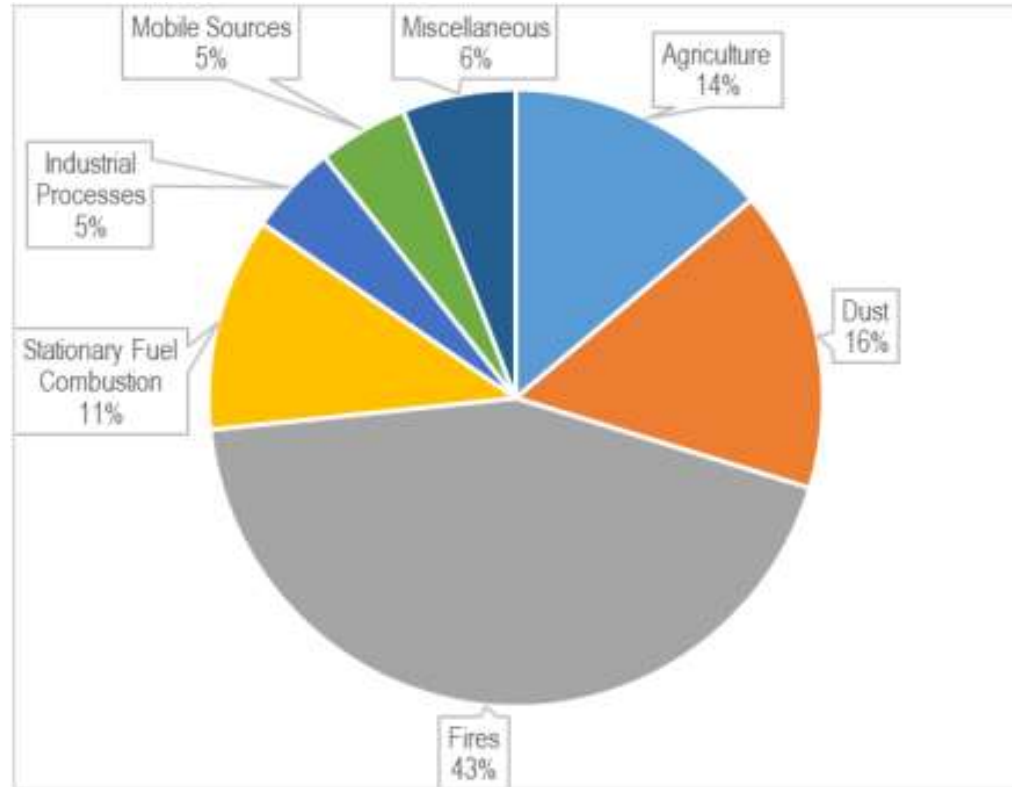
- 2-year clock for states to submit (by February 7, 2025) and U.S. EPA to approve annual PM<sub>2.5</sub> attainment designations (by February 7, 2026).
- States then have 18 months to develop their nonattainment State Implementation Plans (SIPs) to get area(s) back into attainment (by December 7 2027).
  - U.S. EPA has 1-year to review and approve
  - SIP could include PM<sub>2.5</sub> Reasonably Available Control Technology (RACT) or air quality modeling requirements.
- February 7, 2032, is the target attainment date.
  - If area is not in attainment by then, classification changed from moderate to serious.



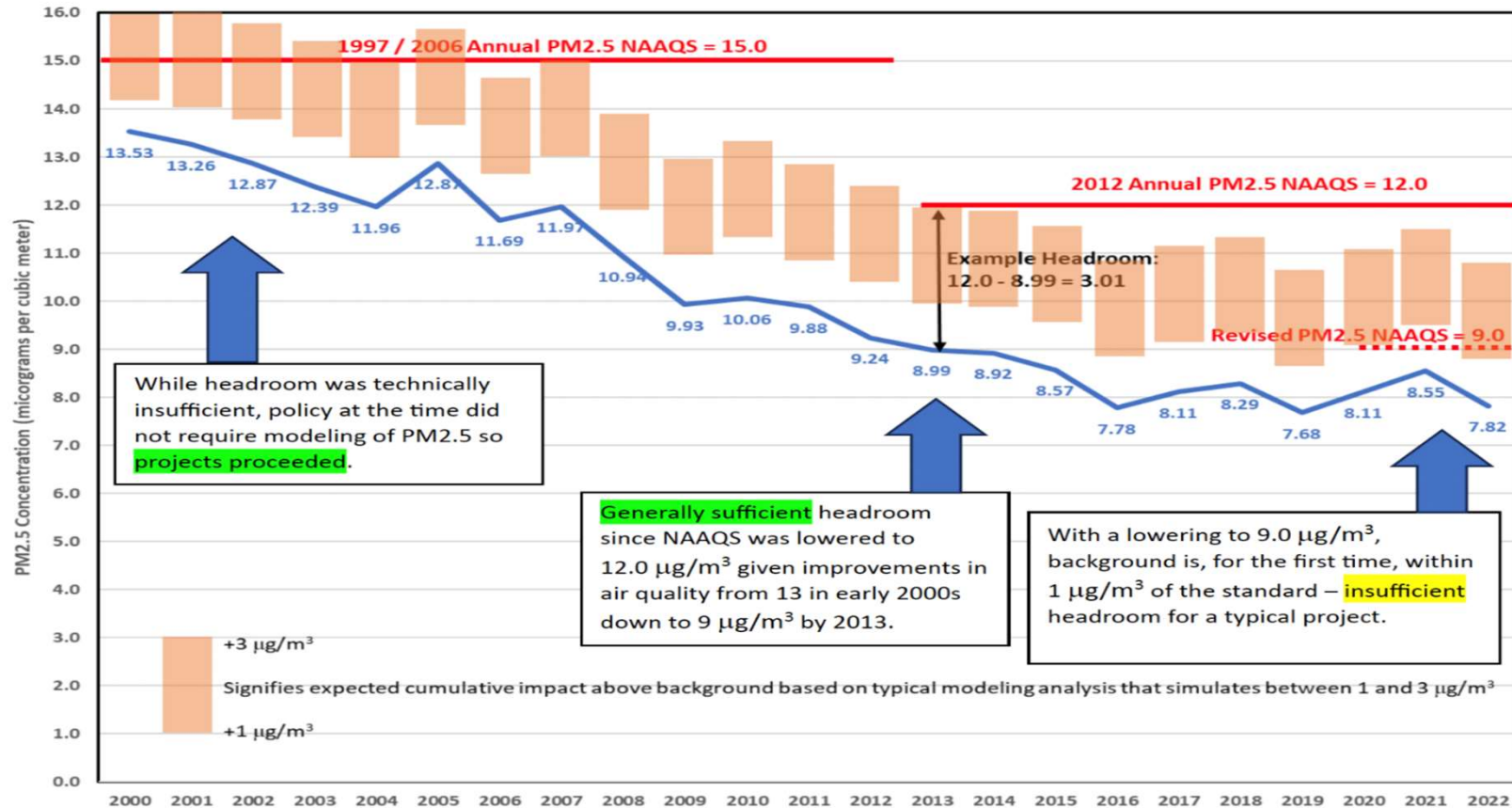


# PM<sub>2.5</sub> Emissions Sources

Percent Contribution of Primary PM<sub>2.5</sub> National Emissions by Source Sectors, 2017 NEI Data



# Why is this important now?

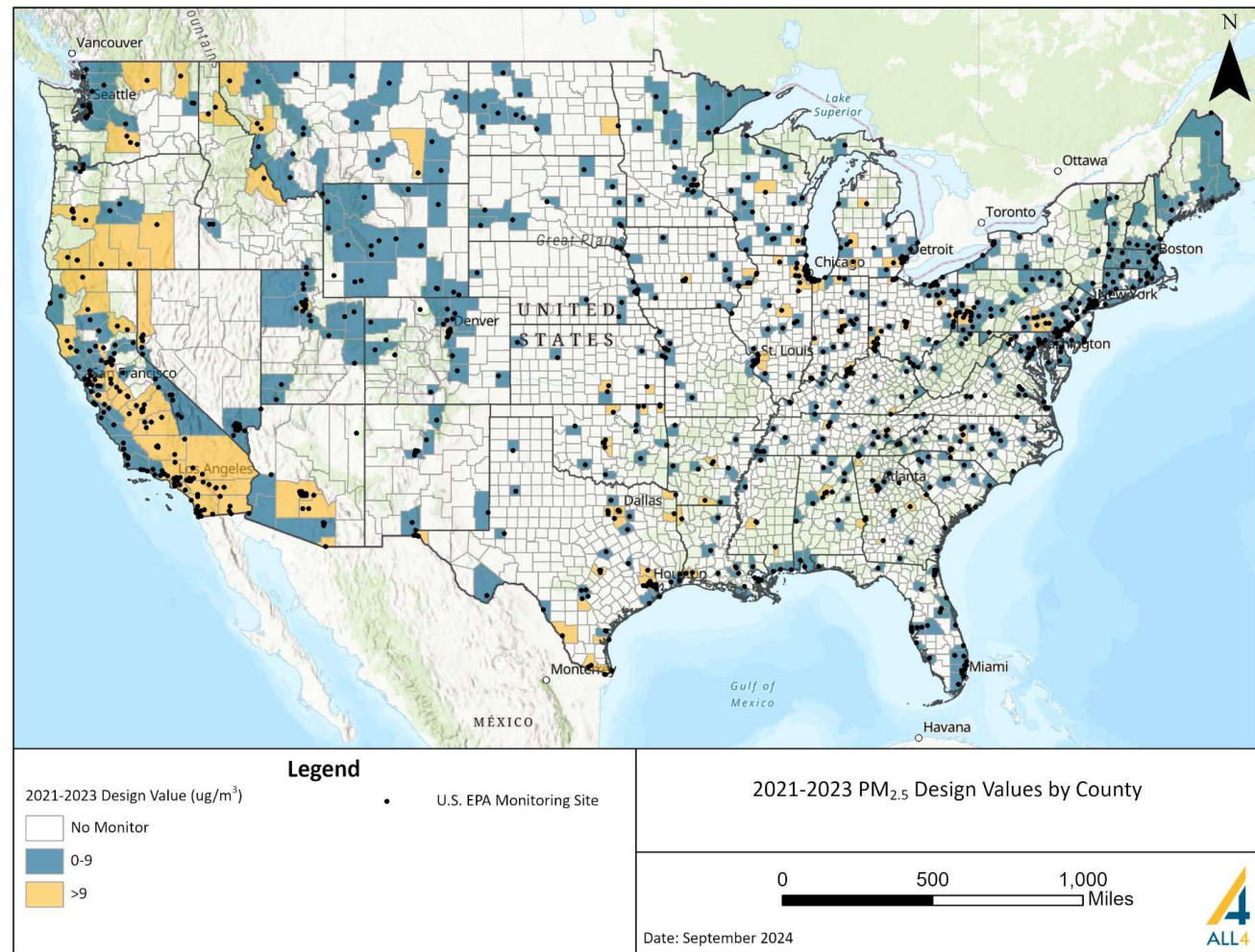


EPA, Particulate Matter Trends (<https://www.epa.gov/air-trends/particulate-matter-pm25-trends>)

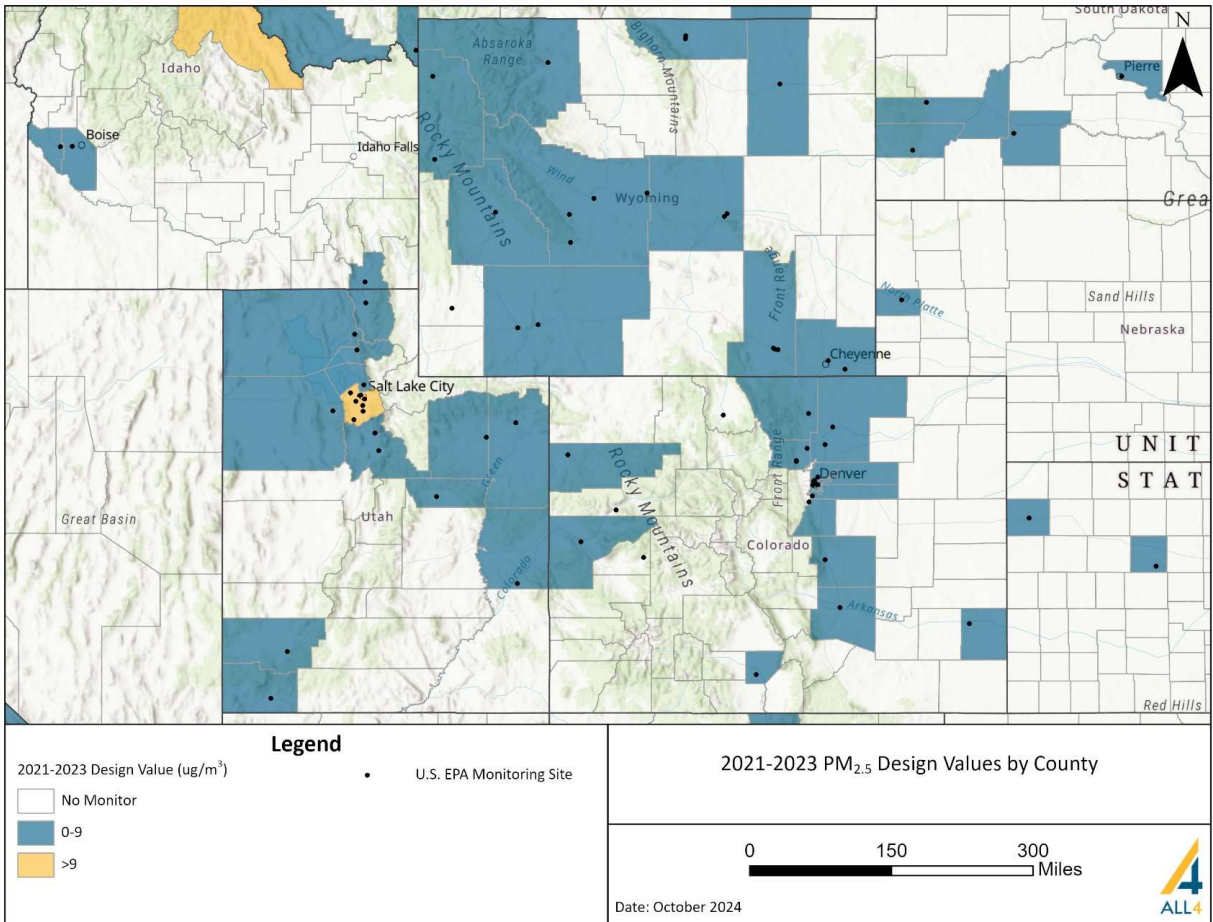


# Current and Potential Nonattainment Areas

- 136 counties out of 636 with monitors have design values greater than the annual  $PM_{2.5}$  NAAQS according to published 2021-2023 design values.
- 2021-2023 design values include FEM monitor adjustments but not removal of exceptional events.
- Attainment determinations will be based on 2022-2024 design values.

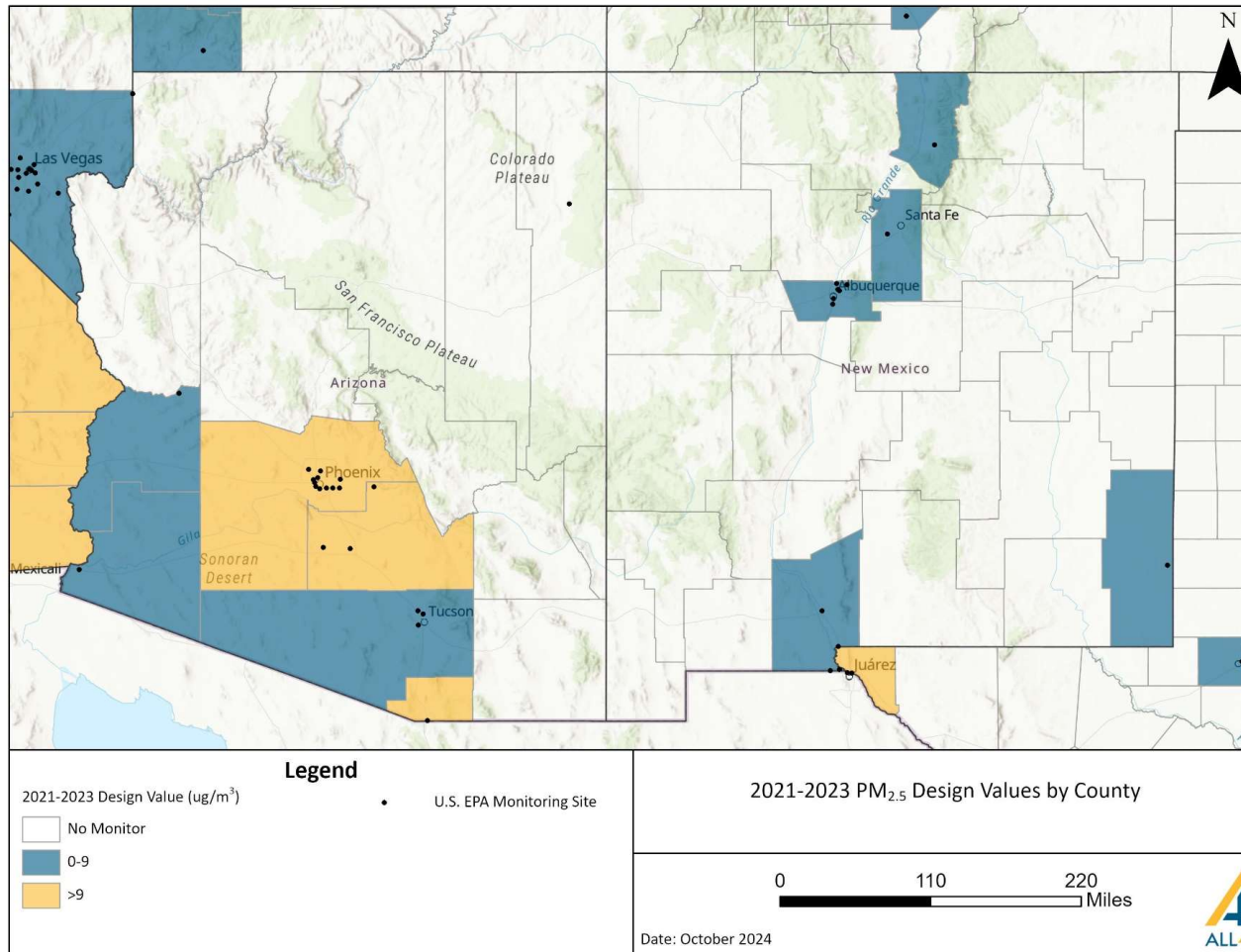


# Current and Potential Nonattainment Areas





# Current and Potential Nonattainment Areas





# Exceptional Events

- There are five categories of Exceptional Events noted in the rule
  - Fireworks displays
  - Prescribed fires
  - Wildfires
  - High wind dust events
  - Stratospheric intrusions

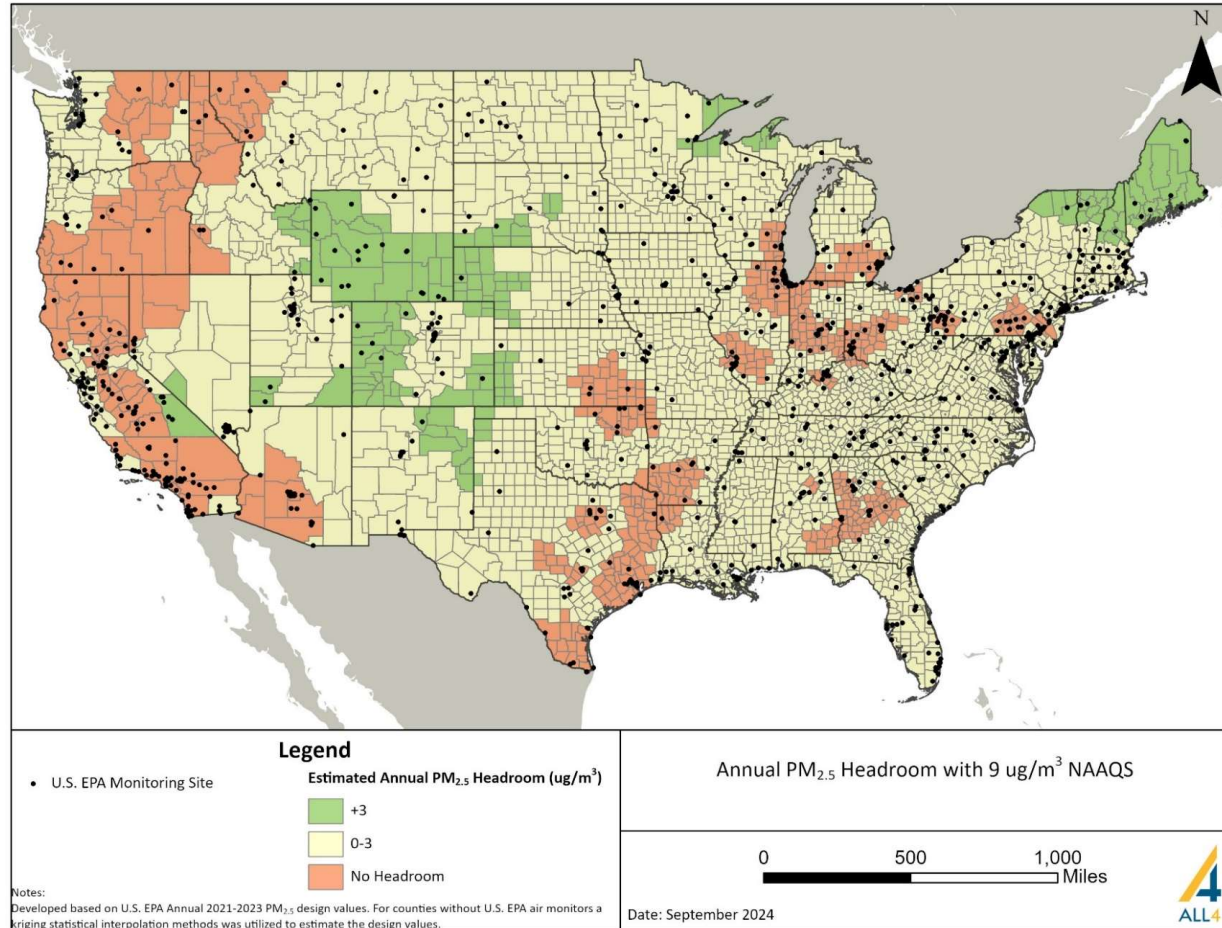


# PM<sub>2.5</sub> NAAQS Modeling Issues

- ❑ Lowered annual PM<sub>2.5</sub> NAAQS impacted air quality modeling permitting requirements immediately upon finalization of the new standard.
- ❑ PM<sub>2.5</sub> NAAQS modeling demonstration required when PSD triggered for primary PM<sub>2.5</sub> or Secondary PM<sub>2.5</sub> pollutants NO<sub>x</sub> or SO<sub>2</sub>.
- ❑ Utah, Colorado, and New Mexico have minor NSR modeling requirements for non-PSD permitting. Wyoming case-by-case

# PM<sub>2.5</sub> Headroom with 9 μg/m<sup>3</sup> NAAQS

- Biggest impact will be the reduced “headroom” when conducting NAAQS air quality modeling demonstrations that require the inclusions of background concentrations from representative ambient monitoring stations.
  - U.S. EPA’s current modeling guidance requires addition of design concentration to peak annual modeled concentration.



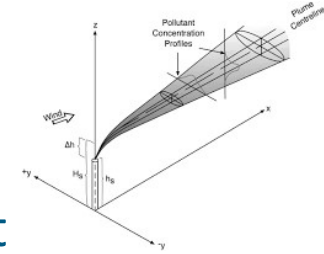


## Revised Annual PM<sub>2.5</sub> Significant Impact Levels

- On April 30<sup>th</sup>, U.S. EPA revised the Class I and Class II Significant Impact Levels (SILs) used as de minimis values in modeling:
  - Class II SIL: Revised to 0.13 µg/m<sup>3</sup> from 0.2 µg/m<sup>3</sup>.
  - Class I SIL: Revised to 0.03 µg/m<sup>3</sup> from 0.05 µg/m<sup>3</sup>.
- It will be very difficult to obtain modeling results that are below the revised SILs.
- Important note: Revised SIL's are recommended, not mandatory. Agencies may use old 0.3 µg/m<sup>3</sup> SIL at their discretion (ex: North Carolina, Iowa, Nebraska).

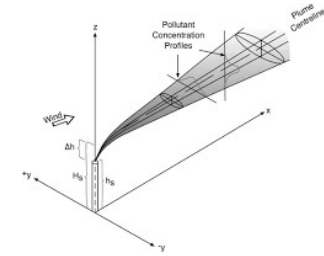
# Modeling Conclusions

- ❑ Major and minor NSR applications currently modeling against lowered PM<sub>2.5</sub> NAAQS.
- ❑ Direct PM<sub>2.5</sub> modeling is also triggered by triggering major PSD permitting for SO<sub>2</sub> and NO<sub>x</sub> precursor pollutants.
- ❑ The annual PM<sub>2.5</sub> SIL lowered to 0.13 µg/m<sup>3</sup>.





# Modeling Recommendations



- ❑ Take a look at the monitor data in your state - is it trending toward attainment or non-attainment? Are there opportunities to exclude atypical days in attainment areas for permitting?
- ❑ Look at your  $PM_{2.5}$  emissions inventory and identify opportunities to refine emissions calculations.
- ❑ Look at your site-wide air dispersion model setup and identify opportunities to improve dispersion – either less conservative modeling approaches or physical changes to exhaust points.
- ❑ Are there opportunities to reduce emissions cost effectively to improve ambient impacts or visibility impacts?

# Nonattainment NSR Permitting Requirements

- Nonattainment new source review (NNSR) permitting include additional/different requirements than PSD:
  - Purchasing Emission Reduction Credits (ERCs) for emissions increases.
  - Implementation of Lowest Achievable Emissions Rate (LAER) instead of Best Available Control Technology (BACT) (removes economic consideration)
  - Removes the Air Quality Modeling Requirement (still could be required at the state level)

NAAQS	Precursors	Non-attainment Classification	Major Source Threshold (tpy)	Significant Emissions Rate (tpy)
PM <sub>2.5</sub>	Direct	Moderate	100	10
PM <sub>2.5</sub>	Direct	Serious	70	10
PM <sub>2.5</sub>	SO <sub>2</sub> /NO <sub>x</sub> /VOC	Moderate	100	40
PM <sub>2.5</sub>	SO <sub>2</sub> /NO <sub>x</sub> /VOC	Serious	70	40
PM <sub>2.5</sub>	NH <sub>3</sub>	Moderate	100	TBD
PM <sub>2.5</sub>	NH <sub>3</sub>	Serious	70	TBD



# Nonattainment Area Requirements

- ❑ Emissions reduction credits (ERCs)
  - ❑ Purchase Emission Reduction Credits 1:1.15 (Moderate) or 1:1.2 (Serious) in the same nonattainment area.
  - ❑ Inter pollutant trading (IPT) of PM<sub>2.5</sub> precursors ERC for direct PM<sub>2.5</sub> **no longer allowed** under 40 CFR Part 51 Appendix S unless:

*“Instead, any ratio involving PM<sub>2.5</sub> precursors adopted by the state for use in the interpollutant offset program for PM<sub>2.5</sub> nonattainment areas must be accompanied by a technical demonstration that shows the net air quality benefits of such ratio for the PM<sub>2.5</sub> nonattainment area in which it will be applied.”*

# Questions or Comments?

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