$PM_{2.5}$ Primer on Nonattainment Permitting: Nonattainment Challenges

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Susan Barnes, Principal Consultant

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Agenda

1. NAAQS Update
2. What happens now?
3. New Source Review (NSR) related requirements
4. What should facilities do now?

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Updated $PM_{2.5}$ NAAQS

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National Ambient Air Quality Standards (NAAQS)

- Section 109 of the Clean Air Act (CAA) requires EPA to set the NAAQS for pollutants considered harmful to public health and the environment, and identifies two types of NAAQS:

1. **Primary** standards set limits to protect public health, including the health of sensitive populations like asthmatics, children and the elderly
2. **Secondary** standards set limits to protect public welfare, including protection against visibility impairment and damage to animals, crops, vegetation and buildings

- The CAA also requires EPA review the NAAQS and the science upon which they are based **every five years** and revise the NAAQS if necessary. However, because the process is lengthy, reviews are rarely completed within that timeframe.

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$PM_{2.5}$ NAAQS – Finalized March 6, 2024

Pollutant - Averaging Period	Previous ($\mu g/m^3$)	Updated - 2024 ($\mu g/m^3$)
PM_{10} – 24 hour	150	150
$PM_{2.5}$ – 24 hour	35	35
$PM_{2.5}$ – Annual	12	9

Standards

- $PM_{2.5}$ NAAQS reductions have potential to significantly impact manufacturing operations in a variety of ways…

Other Items – Not discussed further today

- Air Quality Index calculation changes
- $PM_{2.5}$ Ambient Monitoring
  - Calculations
  - Design criteria
  - "Next gen" incorporation

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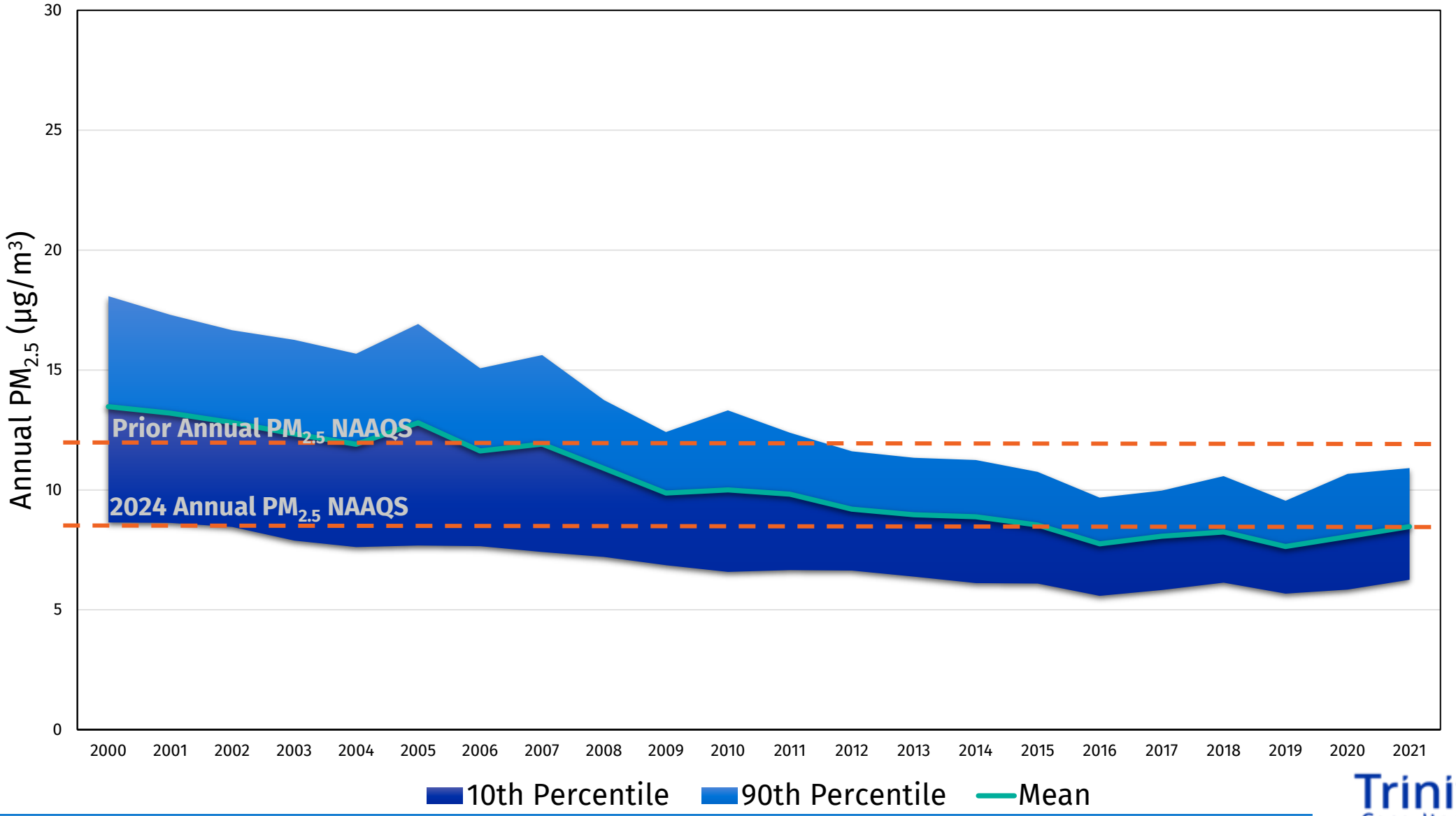
National Trend of Annual $PM_{2.5}$ (2000-2021)



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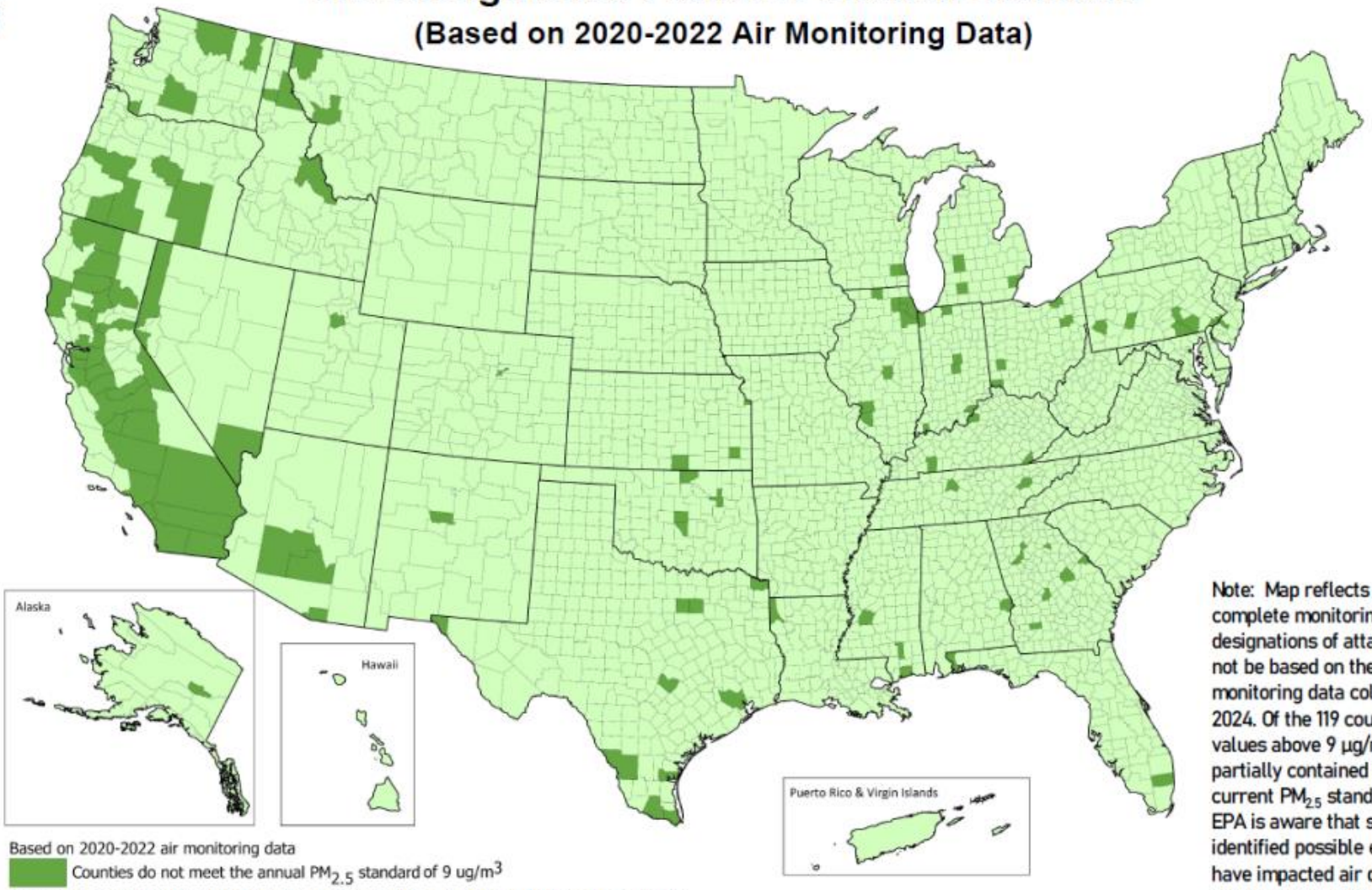
What Happens Now?

Initial Designations

- NAAQS became effective May 5, 2024
- States have one year to recommend their designations for EPA review
- Final designations for attainment/nonattainment from EPA due within 2 years after promulgation of revised NAAQS
  - Will likely consider monitoring data through 2024
  - Not necessarily just the county where the monitor is located

Most Counties with Monitors Already Meet the Strengthened Particle Pollution Standard

(Based on 2020-2022 Air Monitoring Data)



Based on 2020-2022 air monitoring data

Counties do not meet the annual $PM_{2.5}$ standard of 9 ug/m^3

This information is provided for illustrative purposes only and is not intended to predict the outcome of any forthcoming designations process.

Note: Map reflects monitored counties with complete monitoring data. Future final designations of attainment/nonattainment will not be based on these data, but likely on monitoring data collected between 2022 and 2024. Of the 119 counties with 2020-2022 design values above 9 µg/m^3, 59 counties are totally or partially contained in nonattainment areas for current $PM_{2.5}$ standards. In years 2021 and 2022, EPA is aware that some states have already identified possible exceptional events that may have impacted air quality in the US and may be relevant to designations decisions.

https://www.epa.gov/system/files/documents/2024-02/2024-pm-naaqs-final-2020-22-dv-map.pdf

State Implementation Plan (SIP) Updates

- All states, regardless of attainment status, must submit an Infrastructure SIP to EPA that includes:
  - How the state will implement, maintain, and enforce the new NAAQS
  - Due 3 years from effective date of the new NAAQS (May 5, 2027)
  - Initial step is the Attainment SIP for nonattainment areas…

SIP Elements

- A control strategy for regulated pollutants (direct $PM_{2.5}$ and all or some of its precursors)
  - Reasonably Available Control Measures (RACM)
  - Reasonably Available Control Technology (RACT)
- Regional modeling to assess the effect of proposed controls
- Reasonable further progress (RFP) to demonstrate how expeditiously state can achieve the NAAQS
- Quantitative milestones and contingency measures
- Nonattainment NSR (NNSR) permitting program
- Base year emissions inventory
- Attainment projected emissions inventory
- Due within 18 months of the effective designation date under the revised NAAQS

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RACT

- RACT is *the lowest emission limitation that a particular source is capable of meeting (by the application of control technology) that is reasonably available considering technological and economic feasibility.*
- Required in SIPs for nonattainment (or maintenance) areas
  - Appear in the state regulations
- Based on Control Techniques Guidelines (CTG) document published by EPA
- Applies to sources in nonattainment areas meeting defined thresholds
  - Source category specific application
    - Boiler must meet X lb/MMBtu emission limit
    - Fugitive dust mitigation work practice standards
  - Trend towards case-by-case RACT evaluations?

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Permitting Program Changes

- Permitting requirements for nonattainment areas that have historically been attainment will mirror those of larger cities that struggle with ozone
- The regulated pollutants for $PM_{2.5}$ nonattainment areas include
  - Direct $PM_{2.5}$ and the precursor pollutants SO_2 and NO_X
  - VOC and NH_3 may also be regulated unless state demonstrates they are not significant contributors
- New nonattainment classifications may initially be "moderate" with a major source threshold of 100 tpy
  - Will reduce to 70 tpy if area later reclassified as "serious" nonattainment (i.e., does not achieve attainment in the prescribed six-year timeframe)

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New Source Review Related Requirements

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Major Construction Permits

Federal (Major) NSR

PSD

For pollutants in attainment with the NAAQS

NNSR

For pollutants not in attainment with the NAAQS

NSR Construction Permits - Key Requirements Comparison

PSD

- Best Available Control Technology (BACT)
- Conduct air dispersion modeling analyses to demonstrate compliance with the NAAQS and the PSD Increment concentrations

NNSR

- Lowest Achievable Emission Rate (LAER)
- Emission offset acquisition
- Alternatives analysis
- *May be more state specific nuances for nonattainment areas*

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Lowest Achievable Emission Rate (LAER)

- *Most stringent emissions limitation contained in any SIP or achieved in practice*
  - Can disqualify SIP limits for which no emission units in source category can meet
- LAER is the emission rate that can be achieved by any or all of the following:
  - Add-on control technology
  - Process changes
  - Changes in raw materials
- Unlike BACT, there are no economic, energy, or other environmental factors allowed to disqualify a process/technology
  - Exception – if no one in industry could bear the costs
- Case-by-case determination with little negotiating room

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Emission Offset Requirement

- To facilitate growth in a nonattainment area, the Clean Air Act requires that increases be "offset" with actual reductions
  - Same pollutant
  - Same nonattainment area
- Offset ratios
  - Marginal nonattainment area – 1.1 : 1
  - Moderate nonattainment area – 1.15 : 1
- Where do you get offsets?
  - Some states have banking programs
  - Outside brokers often buy and sell offsets
- How much do offsets cost?
  - Supply and demand
  - Different depending on pollutant type and specific location

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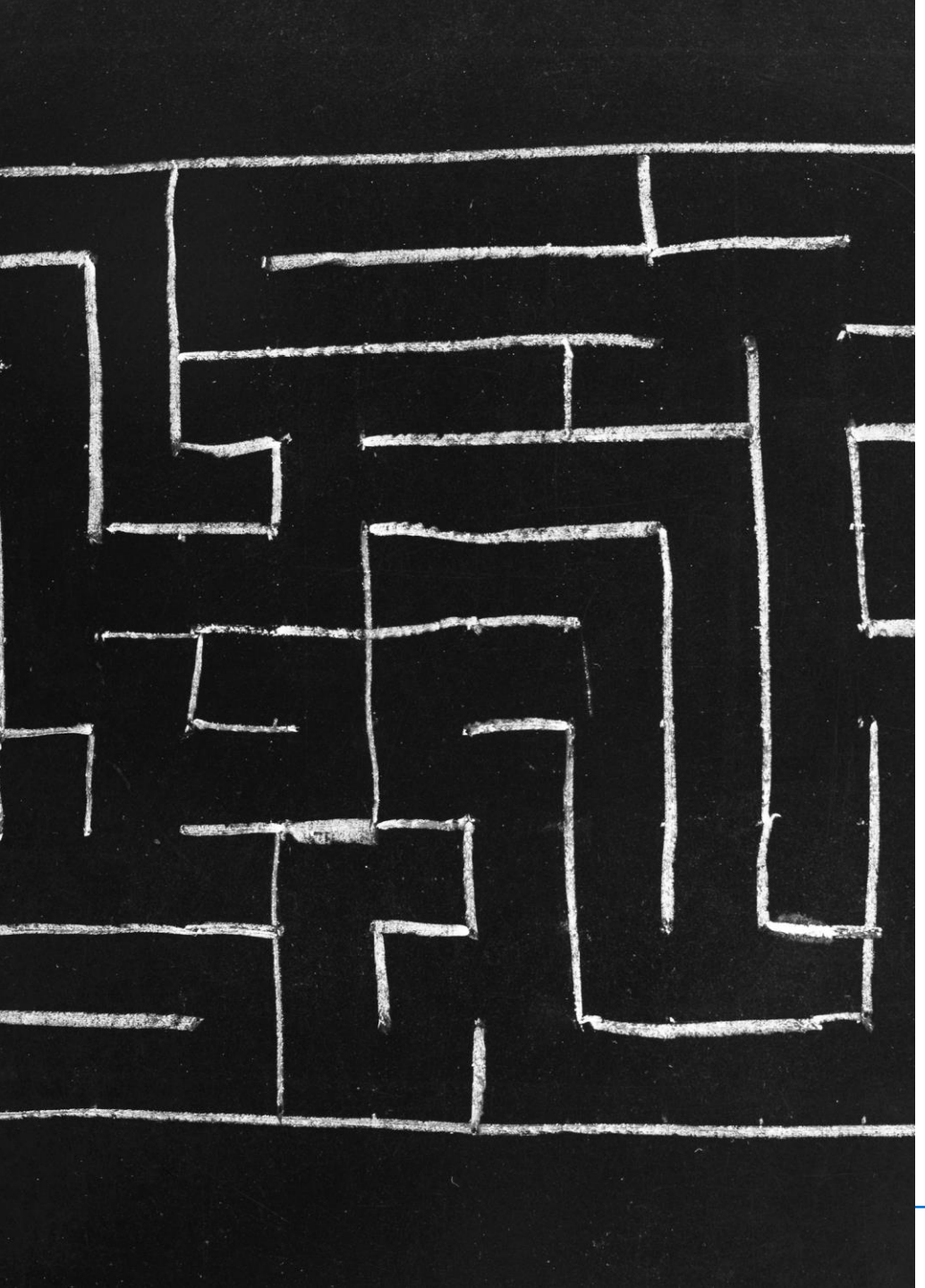

Alternatives Analysis

- Applicant must consider alternatives to executing project in nonattainment area
  - Sites
  - Size
  - Production processes
  - Control techniques
- Do benefits SIGNIFICANTLY outweigh the environmental and social costs of the project?
- In some areas, this has been the biggest hurdle to nonattainment NSR permitting

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PSD Permit Modeling Challenges

- Increased likelihood that $PM_{2.5}$ modeling will be required
  - Recent guidance indicates modeling for direct $PM_{2.5}$ also required if triggering for precursors NO_X and SO_2
- Modeling will become more challenging
  - Monitored background concentrations close to the NAAQS level
  - Little “headroom” for projects to demonstrate compliance
- Transition timing from attainment to nonattainment
  - Issuance of a PSD permit may not be viable during transition phase (monitored data > standard)

What Should Facilities Do Now?

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Engage with Local Regulatory Agency - Designations

- Any agency or local interest group meetings/activities?
  - Engaging with stakeholders about what agencies are discussing and allow for feedback
- Follow state/local proposed designations for your area
- Follow EPA “120-day letter” responses to state/local proposals
- Follow EPA proposed designations in Federal Register

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Engage with Local Regulatory Agency – SIP Updates

- Anticipate that local agency may solicit data related to emissions and sources
  - Ensure your actual direct $PM_{2.5}$ and $PM_{2.5}$ precursor emissions inventory is complete, accurate, and fully representative of current plant sources
  - If you assume $PM=PM_{10}=PM_{2.5}$, may be time to re-evaluate assumptions
  - Consider stack testing to refine $PM_{2.5}$ emissions data
- RACT Rule Development
  - Consider obtaining site-specific estimates for potential control installation costs
  - Provide input on source category limit development
  - Advocate for case-by-case review process
- Environmental Justice (EJ) considerations may become interconnected to these updates
  - EPA theme and push
  - Do you know where the EJ areas of concern are for your state?
  - May be an opportunity to engage in agency's development of EJ program

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Plan Ahead Now – New Nonattainment Areas

- Review capital project plans
  - Can plans move forward now before designations are finalized?
  - Permitting will only become more challenging…and likely more costly
- Opportunities for generating emission offsets?
  - Timing considerations related to possible control requirements
  - If voluntarily install and make federally enforceable prior to RACT regulations, offsets could be generated
  - Once RACT regulations in place, no longer voluntary or eligible to be claimed as on offset
- If looking at longer term projects that cannot be permitted now, ensure project teams are considering the “alternatives analysis” that would be necessary for a NNSR project
  - Research as to expectation from state agency
  - Balancing this as part of their internal planning/consideration process

Plan Ahead Now – Attainment Areas – PSD Major Sources

Understand Site's Modeling Impact

- Are your sources alone able to meet the NAAQS?
- Representation of direct $PM_{2.5}$ emissions and inclusion of secondary impacts of NO_X and SO_2 per guidance
- Allows for identification of strategies to reduce impacts
  - Emission reductions
  - Improved dispersion characteristics (stack changes)
  - Property expansion?

Elements Outside Your Control

- Ambient monitored background concentrations
  - Unless you have your own monitor?
- Meteorological dataset updates
- Tweaks/changes to regulatory model
- Regional emission inventories

The more you know, the better prepared you can be….

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Key Takeaways

- Manufacturing facilities will face greater permitting challenges due to reduced $PM_{2.5}$ NAAQS
- Companies are encouraged to engage in all aspect of the designation process and local agency SIP updates
- Strategic planning for capital investment, operational flexibility needs, and possible regulatory control requirements is critical

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Questions?

Susan Barnes
Principal Consultant
O: (240) 379-6492
E: sbarnes@trinityconsultants.com