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March 28, 2023

Via Regulations.gov
The Honorable Administrator Regan
U.S. Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Re: Comments from the American Iron and Steel Institute on EPA's Proposed Reconsideration of the National Ambient Air Quality Standard for Particulate Matter, Docket No. EPA-HQ-OAR-2015-0072

Dear Administrator Regan:

Thank you for the opportunity to comment on the EPA's Proposed Reconsideration of the National Ambient Air Quality Standard for Particulate Matter (88 FR 5558, January 27, 2023). The American Iron and Steel Institute (AISI) serves as the voice of the North American steel industry in the public policy arena and advances the case for steel in the marketplace as the preferred material of choice. AISI also plays a lead role in the development and application of new steels and steelmaking technology. AISI is comprised of member companies, including electric arc furnace (EAF) and integrated steelmakers, and associate members who are suppliers to or customers of the steel industry.

The attached comments detail AISI's significant concerns regarding this proposal. If EPA finalizes a rule to lower the particulate matter NAAQS standard within the range proposed, the rule would have devastating economic impacts on the domestic iron and steel industry. The following comments form a strong basis for why EPA should not finalize requirements establishing a more stringent $PM_{2.5}$ NAAQS at this time. Fundamentally, AISI requests that EPA retain the $PM_{2.5}$ NAAQS at the current annual and 24-hour levels.

The below comments detail our primary concerns with EPA's proposal:

- An assessment of costs and burdens from a more stringent $PM_{2.5}$ NAAQS is warranted in this rulemaking since this is a reconsideration of a prior NAAQS rulemaking, and not a required NAAQS 5-year review. The proposed rulemaking will have a dramatic cost impact on the iron and steel industry. Based on the need for states to develop implementation plans that demonstrate modeled attainment and the necessity to impose costly control requirements on existing sources, AISI estimates total capital investments for United States steel producers to comply with the most stringent level EPA proposed (i.e., 8 μg/m3) to be approximately $9.3 billion and the total annualized costs are calculated to be $3.1 billion per year.

- This proposed rule, combined with all the other Clean Air Act rules impacting the steel industry, place domestic steel producers under serious economic pressures and could make domestic production uncompetitive compared to imported steel. The current $PM_{2.5}$ annual NAAQS is well below $PM_{2.5}$ emission standards imposed by other nations that actively compete in global steel markets. Thus, the significant compliance costs incurred by the steel industry in the United States could lead to the loss of steel production and jobs in the U.S., and could further result in higher GHG-intensity steel being imported into the U.S.

- EPA has not fully evaluated all of the existing "on the books" controls to determine their impact on current and future $PM_{2.5}$ reductions, nor has EPA identified potential controls for key industry sectors such as the iron and steel sector.

- Likewise, the cost of controls for a new steel plant project in a nonattainment area, which could include most of the country depending on the selected $PM_{2.5}$ NAAQS concentration, are substantial enough to alter the economic viability of any such proposed project. A revised $PM_{2.5}$ NAAQS would likely also result in numerous lost opportunities for economic growth and development from the inability to permit projects.

- Given the stringency and complexities of the standards being considered, AISI believes it is imperative that EPA provide an orderly and technically sound implementation plan for any new standard. One significant concern is nonattainment New Source Review Permitting and the mandate to acquire "offsets." Adequate offsets are necessary for any permitting project in a nonattainment area, yet more than half of the states that are important to the iron and steel industry do not currently have any formal or even informal offset banking program, and of the states that do have such a program, most do not maintain a readily available online list of $PM_{2.5}$ offsets.

- For steel mills located in attainment areas, economic development projects that will benefit the environment will face substantial obstacles to adequately conduct a satisfactory air dispersion model demonstration due to overly conservative modeling techniques.

Please do not hesitate to have your staff contact Paul Balserak, our Vice President for Environment (202.452.7122), if you have any questions.

Sincerely,

Kevin Dempsey
President and Chief Executive Officer

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COMMENTS OF THE

AMERICAN IRON AND STEEL INSTITUTE

on

Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter

88 Fed. Reg. 5558 (January 27, 2023)

Docket ID No. EPA-HQ-OAR-2015-0072

Submitted March 28, 2023

Executive Summary

The American Iron and Steel Institute (AISI) submits these comments in response to the U.S. Environmental Protection Agency's (EPA) Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter, 88 Fed. Reg. 5558 (January 27, 2023). AISI serves as the voice of the North American steel industry in the public policy arena and advances the case for steel in the marketplace as the preferred material of choice. AISI also plays a lead role in the development and application of new steels and steelmaking technology. AISI is comprised of member companies, including electric arc furnace (EAF) and integrated steelmakers, and associate members who are suppliers to or customers of the steel industry.

AISI has prepared the below comments to detail our primary objections with EPA's proposal. Providing focused comments, however, was hindered by the fact that EPA did not propose a single definitive NAAQS level, but instead proposed a range of $PM_{2.5}$ concentrations (9-10 $\mu g/m^3$ on an annual basis) and even requested comments on concentrations of 8 $\mu g/m^3$ and 11 $\mu g/m^3$. Nonetheless, the following comments form a strong basis for why EPA should not finalize requirements establishing a more stringent $PM_{2.5}$ NAAQS at this time. Fundamentally, AISI requests that EPA retain the $PM_{2.5}$ NAAQS at the current annual and 24-hour levels.

The bullet points below emphasize AISI's comments and concerns with the proposed $PM_{2.5}$ NAAQS revision, with more detailed explanation following the summary:

- A robust steel industry is critical to the health and security of our country and the proposed rule will be detrimental to the industry and the environment. The steel industry in the United States employs approximately 136,000 people and indirectly supports nearly two million jobs. The steel industry also contributes more than $520 billion to the economy when considering the direct, indirect, and related impacts. This proposed rule will increase production costs, will place the steel industry in an economic disadvantage to international competitors, and will increase global emissions of pollutants.

- An assessment of costs and burdens from a more stringent $PM_{2.5}$ NAAQS is warranted in this rulemaking since this is a reconsideration of a prior NAAQS rulemaking, and not a required NAAQS 5-year review. The proposed rulemaking will have a dramatic cost impact on the iron and steel industry. Based on the need for states to develop implementation plans that demonstrate modeled attainment and the necessity to impose costly control requirements on existing sources, AISI estimates total capital investments for United States steel producers to comply with the most stringent level EPA proposed (*i.e.*, 8 $\mu g/m^3$) to be approximately **$9.3 billion** and the total annualized costs are calculated to be **$3.1 billion** per year. To comply with the *least* stringent level EPA proposed of 11 $\mu g/m^3$ AISI estimated total capital investments for U.S. steel producers to come in at almost $1.4 billion.

- This proposed rule, combined with all the other Clean Air Act rules impacting the steel industry, place domestic steel producers under serious economic pressures and could make domestic production uncompetitive compared to imported steel. The current $PM_{2.5}$ annual NAAQS is well below $PM_{2.5}$ emission standards imposed by other nations that actively

compete in global steel markets. Thus, the significant compliance costs incurred by the steel industry in the United States could lead to the loss of steel production and jobs in the U.S., and could further result in higher GHG-intensity steel being imported into the U.S.

- EPA has not fully evaluated all the existing "on the books" controls to determine their impact on current and future $PM_{2.5}$ reductions, nor has EPA identified potential controls for key industry sectors such as the iron and steel sector.

- Likewise, the cost of controls for a new steel plant project in a nonattainment area, which could include most of the country depending on the selected $PM_{2.5}$ NAAQS concentration, are substantial enough to alter the economic viability of any such proposed project. A revised $PM_{2.5}$ NAAQS would likely also result in numerous lost opportunities for economic growth and development from the inability to permit projects.

- Given the stringency and complexities of the standards being considered, AISI believes it is imperative that EPA provide an orderly and technically sound implementation plan for any new standard. One significant concern is nonattainment New Source Review permitting and the mandate to acquire "offsets." Adequate offsets are necessary for any permitting project in a nonattainment area, yet more than half of the states that are important to the iron and steel industry do not currently have any formal or even informal offset banking program, and of the states that do have such a program, most do not maintain a readily available online list of $PM_{2.5}$ offsets.

- For steel mills located in attainment areas, economic development projects that will benefit the environment will face substantial obstacles to adequately conduct a satisfactory air dispersion model demonstration due to overly conservative modeling techniques.

- Until EPA provides implementation guidance to state and local air pollution control agencies, EPA must not revise the current annual $PM_{2.5}$ NAAQS.

I. A Robust Steel Industry is Critical to the Health and Security of Our Country and the Proposed Rule Will Be Detrimental to the Industry and the Environment.

AISI is proud of the fact that the American steel industry employs approximately 136,000 people in the United States and indirectly supports nearly two million jobs. The steel industry contributes more than $520 billion to the United States economy when considering the direct, indirect, and related impacts. From national security supply chain production to major economic impact in states and local communities across the country, the American steel industry is one of the nation's most critical manufacturing sectors. However, EPA must be aware that this rule will be detrimental to steelmaking facilities and will put the nation's steelmakers under significant increased regulatory burden.

EPA's proposed rule will put additional economic pressure on the steel industry that faces rising inflation and significant competition from foreign markets. International steel competitors are not subject to the stringent environmental protection requirements that currently apply here in

the United States. In fact, no country or the European Union imposes an annual $PM_{2.5}$ ambient air standard below 15 $\mu g/m^3$ including:

- European Union:[1] 20 $\mu g/m^3$
- India: [2] 40 $\mu g/m^3$
- China: [3] 35 $\mu g/m^3$
- Japan: [4] 15 $\mu g/m^3$
- Russia: [5] 25 $\mu g/m^3$

Implementing this standard at any of the proposed more stringent levels further disadvantages the production of steel in the domestic United States. Increased regulatory costs from a new, more stringent $PM_{2.5}$ standard would also increase the overall cost per ton of steel made. An increase in the cost to make steel can negatively impact United States steel producers' ability to adequately compete in the global marketplace. These costs could be devastating and could potentially lead to steel plant closures in the United States.

Additionally, notwithstanding the fact that both China and India have weak $PM_{2.5}$ ambient air standards and weak PM controls for steel plants, China produces over half the world's steel and India's steel production is the second largest in the world and is projected to grow dramatically in the coming years. Therefore, AISI is concerned that a revised stringent $PM_{2.5}$ NAAQS standard could result in steel plant closures within the United States that would lead to increased challenges to the industry's international competitiveness and would additionally be detrimental to the environment.

Furthermore, EPA's proposed NAAQS levels and reconsideration for $PM_{2.5}$ runs in direct opposition to the current EPA policy on managing climate issues. The more stringent the $PM_{2.5}$ NAAQS levels EPA selects, the more counterproductive it is to EPA's stated climate change objectives in the following ways as it relates to steel producers:

- The $PM_{2.5}$ NAAQS implementation will create new and large energy demands related to operating air pollution control equipment and implementing PM reduction practices – *i.e.*, all these efforts will result in new and materially large emissions from fossil fuel combustion for electrical generation to support these new needs.

- To the extent that the NAAQS disrupts the operation of existing steel production facilities through the inability to expand, build or modify mills in the domestic United States, this rulemaking will be an advantage to producers of steel outside the United States, which on average have markedly higher GHG intensities. It will also induce additional Scope 3 emissions for global transport of steel for our domestic uses. This outcome runs in direct opposition to the current federal government's directives to make lower embodied carbon steel domestically.

[1] https://www.transportpolicy.net/standard/eu-air-quality-standards/
[2] https://www.transportpolicy.net/standard/india-air-quality-standards/
[3] https://www.transportpolicy.net/standard/china-air-quality-standards/
[4] https://www.transportpolicy.net/standard/japan-air-quality-standards/
[5] https://www.jstor.org/stable/resrep24367.14?seq=13. See Annex 28.

The rulemaking will also impede investments in new and innovative GHG reduction projects in this sector by diverting capital away from GHG reduction projects and into "anti-GHG" reduction projects related to reducing $PM_{2.5}$ emissions to extremely low levels.

American steel producers already work hard to reduce their environmental impacts even while producing the advanced and highly recyclable steel that our economy needs. This is, of course, consistent with the goals of the Clean Air Act, where Congress directed EPA "to protect and enhance the quality of the Nation's air resources" with the purpose of promoting both "the public health and welfare and the productive capacity of its population."[6]

II. Consideration of Costs and Burdens from a Revised $PM_{2.5}$ Standard is Warranted for This Rulemaking Since it is a Reconsideration.

EPA stated in the proposed rulemaking that costs are not considered in establishing a new NAAQS level, citing the Supreme Court's decision in *American Trucking Association*.[7] However, EPA's proposed rule is a reconsideration of a prior NAAQS rulemaking, and is not a statutorily-required NAAQS assessment under Section 109(d)(1) of the Clean Air Act. The court decision that EPA relied upon, however, addressed a NAAQS that was being reviewed in conjunction with the Clean Air Act mandatory 5-year review.[8] That is not the case here. This proposed rule is a discretionary "reconsideration" of EPA's 2020 decision to not revise the $PM_{2.5}$ NAAQS.[9] Therefore, EPA has wide discretion in assessing impacts from the proposed rule, including economic impacts and regulatory burdens.

Such consideration of economic impacts in NAAQS reconsiderations is an established precedent. In 2011, the Obama Administration's Office of Information and Regulatory Affairs sent EPA a letter directing it to withdraw the 2011 Ozone NAAQS reconsideration. In doing so, the Obama Administration noted that "finalizing a new standard now is not mandatory and could produce needless uncertainty" in light of the need to "minimize regulatory costs and burdens, particularly in this economically challenging time."[10] As noted by the Obama Administration in 2011, reconsideration "would be problematic in view of the fact that a new assessment, and potentially new standards, will be developed in the relative near future."[11]

Based on this precedent, the assessment of regulatory costs and burdens is entirely appropriate for this rulemaking. Therefore, AISI assessed costs and burdens to the iron and steel industry from the proposed rule. Those costs and burdens are discussed below and are included in Appendix A.

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[6] 42 U.S.C. § 7401(b)(1).
[7] 88 Fed. Reg. 5558, 5564 (January 27, 2023).
[8] *See, Whitman v. American Trucking Association*, 531 U.S. 457 (2001).
[9] 88 Fed. Reg. 5558, 5567 (January 27, 2023).
[10] Letter from C. Sunstein, Administrator Office of Information and Regulatory Affairs OMB, to Administrator Jackson, EPA, September 21, 2011.
[11] *Id.*

III. The Increased Extent of $PM_{2.5}$ Nonattainment Areas and Those Areas in Attainment Just Below Design Values Would Encompass Most of the United States Iron and Steel Production.

Upon finalizing a new PM standard, states will be required to determine the extent of any nonattainment areas based on ambient monitors and modeling. AISI, however, retained Alpine Geophysics to conduct a study of projected $PM_{2.5}$ nonattainment areas based on the annual standard ranges of 8.0 to 11.0 $\mu g/m^3$.

To conduct this study, Alpine Geophysics first identified all steel mills in the United States with steel melting operations (*i.e.*, an EAF, or a Blast Furnace and Basic Oxygen Furnace (BOF)). Also included are coke plants and Direct Reduced Iron (DRI) plants. These facilities were then plotted on a United States map. Importantly, please note that assessing only these plants does substantially understate the overall negative impacts on the steel industry, which would otherwise include steel plants without steel melting operations, and other industrial plants that are part of the vast supply chain for steel.

Alpine Geophysics then used the maximum annual 2019-2021 $PM_{2.5}$ design values to represent each monitored county. For non-monitored counties, Alpine Geophysics used a standard method of geospatial interpolation ("kriging") that is used where spatially-related data has been collected and estimates of "fill-in" data are desired in the locations (spatial gaps) between the actual measurements. For these non-monitored counties, this inverse-distance weighted averaging method used the five closest monitored values.

The generated maps then identify for each potential $PM_{2.5}$ standard:

- Those counties that would be nonattainment (identified in red);
- Those counties that would be attainment but only with between 1-3 $\mu g/m^3$ of headroom (the concentration below the standard) (identified in orange) and;
- Those counties that would be attainment with more than 3 $\mu g/m^3$ of headroom (identified in green).

The iron and steel plants were then plotted on the maps with blue stars. The following five figures graphically demonstrate the extreme expansion of nonattainment or close-to-nonattainment areas with the increasing lower $PM_{2.5}$ standards.

Figure 1. County status at 12 µg/m^3.

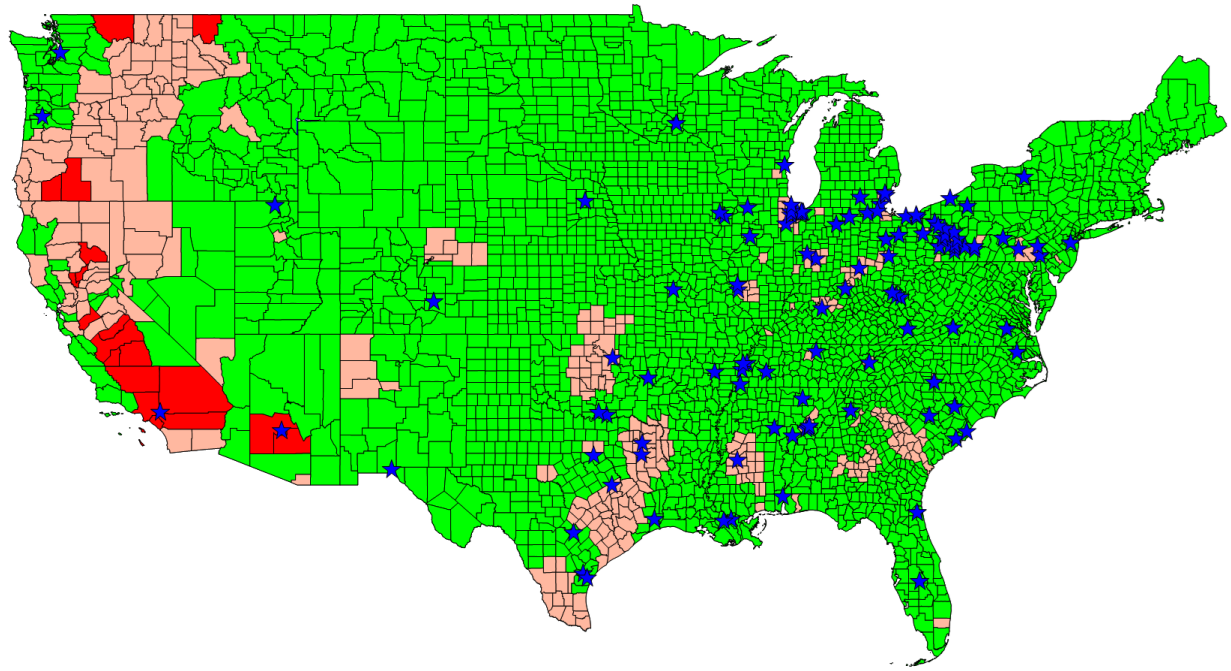


Figure 2. County status at 11 µg/m^3.

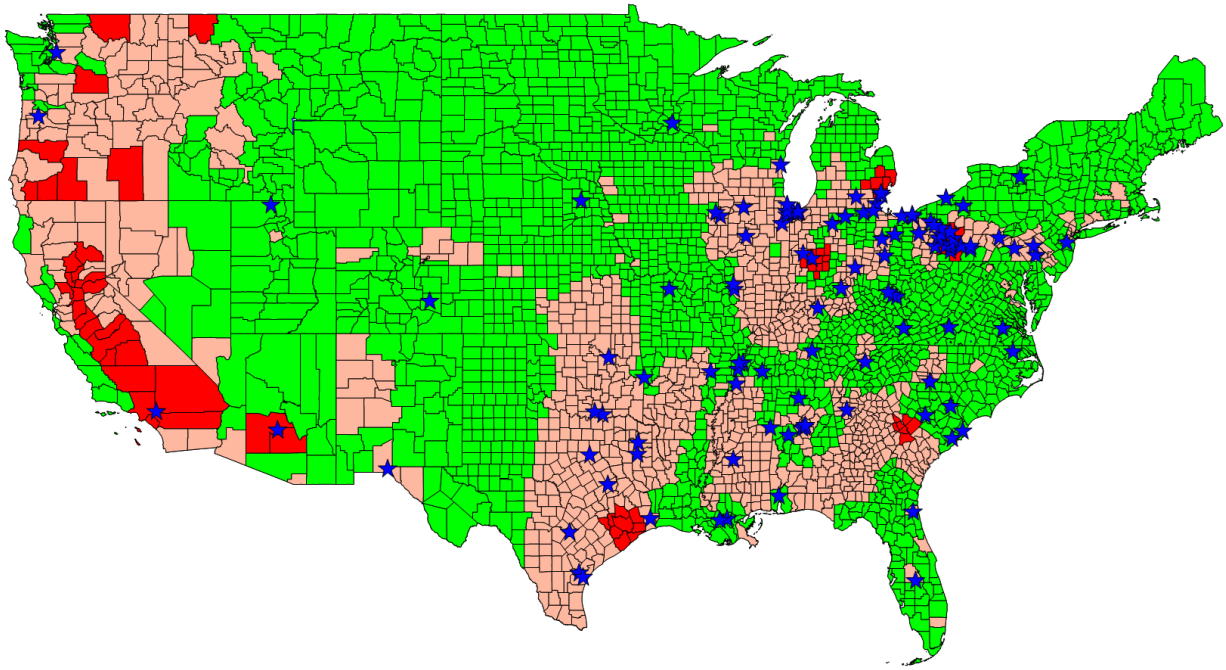


Figure 3. County status at 10 µg/m^3.

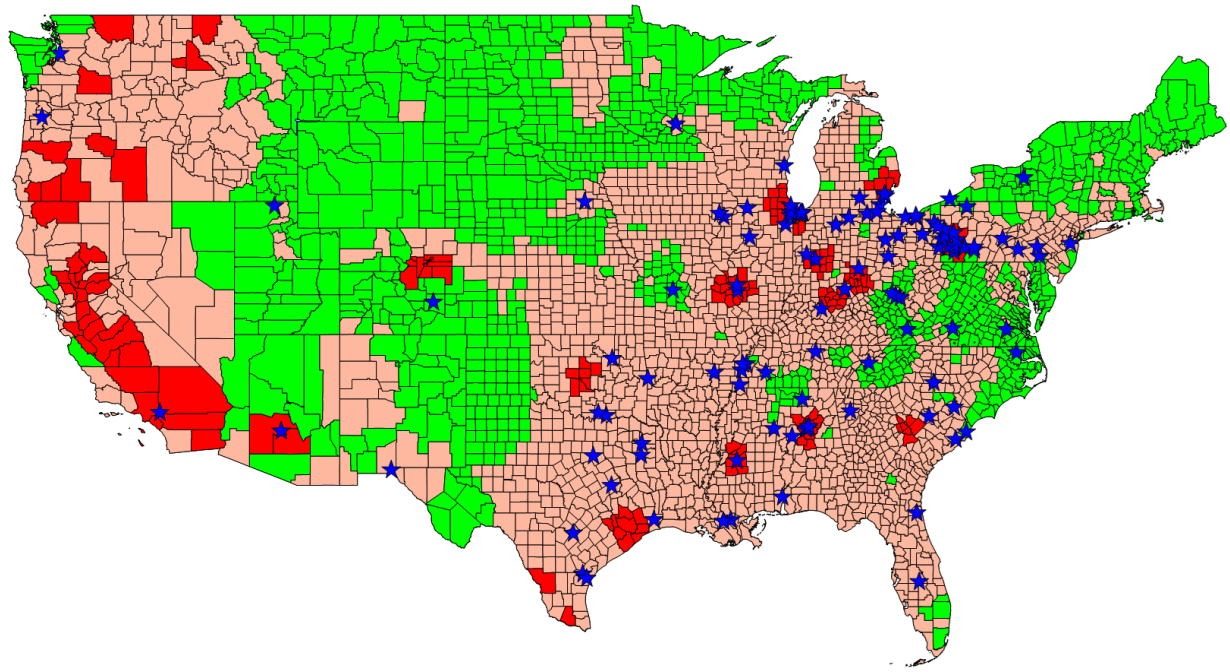


Figure 4. County status at 9 µg/m^3.

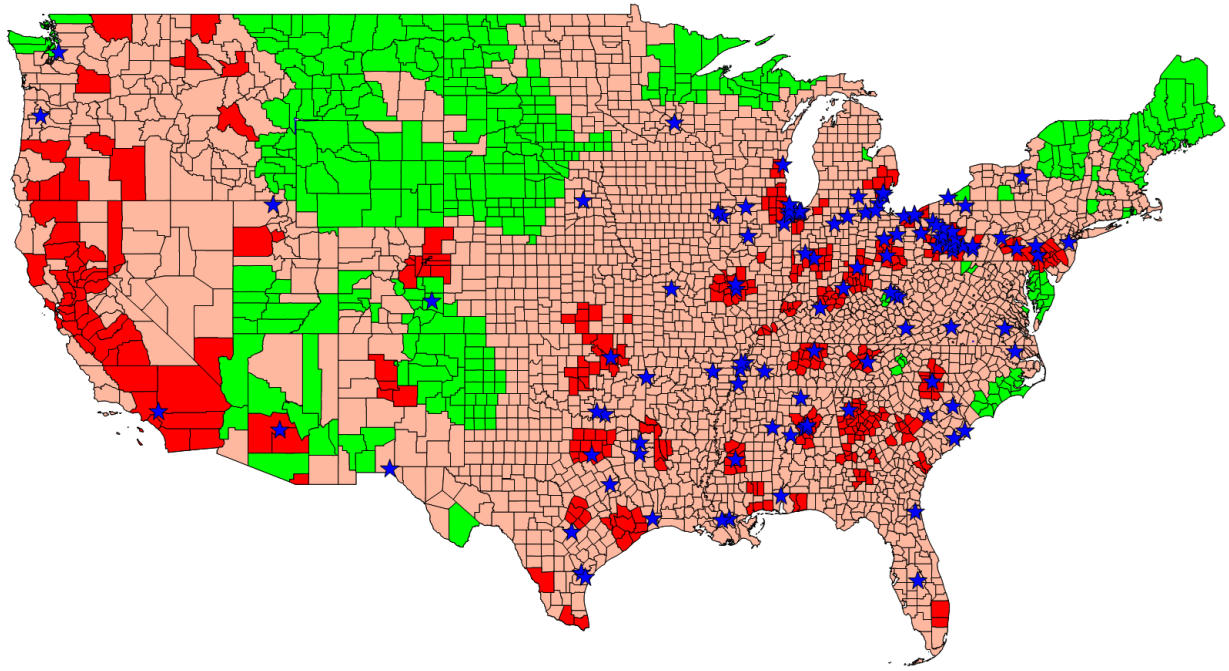
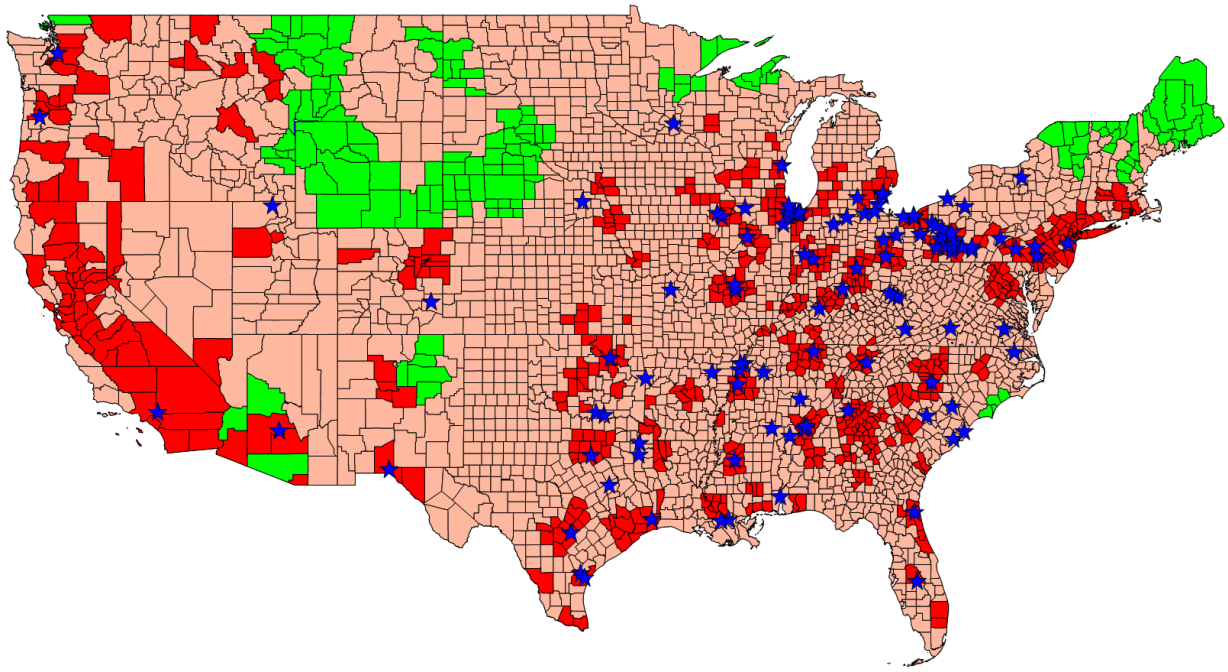


Figure 5. County status at 8 µg/m^3.



Based on the Design Value (DV) estimations by county and census of United States EAF and Blast Furnace/BOF shops, we expect the following occurrence of steel mills in nonattainment, near nonattainment, and attainment areas for each possible level of NAAQS.

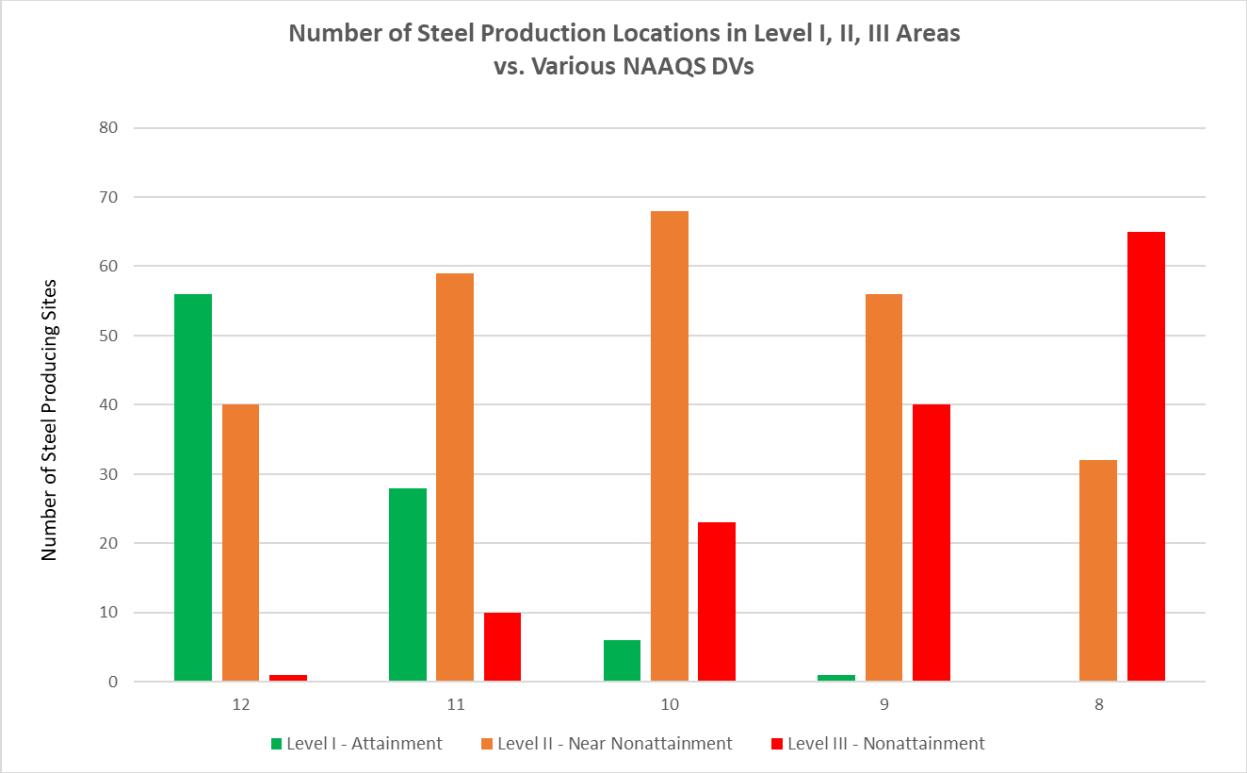
Table 1a. Census of Steel Production Locations in Various Levels of Attainment. (Number of Facilities)

NAAQS Level	Number of Mills in Various Levels by Proposed NAAQS DV				
	12 µg/m^3	11 µg/m^3	10 µg/m^3	9 µg/m^3	8 µg/m^3
Level I – Attainment	56	28	6	1	0
Level II – Near Nonattainment	40	59	68	56	32
Level III – Nonattainment	1	10	23	40	65

Table 1b. Census of Steel Production Locations in Various Levels of Attainment. (% of Facilities)

NAAQS Level	Number of Mills in Various Levels by Proposed NAAQS DV				
	12 µg/m^3	11 µg/m^3	10 µg/m^3	9 µg/m^3	8 µg/m^3
Level I – Attainment	58%	29%	6%	1%	0%
Level II – Near Nonattainment	41%	61%	70%	58%	33%
Level III – Nonattainment	1%	10%	24%	41%	67%

Figure 6. Census of Steel Production Facilities in Various Levels of Attainment.



As this data illustrates, there is a large shift in the number of locations that move from attainment to nonattainment when the NAAQS level progresses from the highest to lowest Design Value. Of course, this results from an increase in the number of counties expected to be near or above the lower Design Values being considered. At 8 $\mu g/m^3$, no steel production facilities are expected to be in attainment areas with headroom of more than 3 $\mu g/m^3$ – meaning all United States steel production facilities will be adversely impacted at this Design Value if it selected as a final NAAQS value, either through attainment State Implementation Plan (SIP) actions or through a constrained ability to invest in new projects. The situation is similarly adverse even at a NAAQS at the 10 $\mu g/m^3$ level. At that level, only one in 20 steel production locations is in an attainment area with headroom of more than 3 $\mu g/m^3$.

IV. A More Stringent $PM_{2.5}$ NAAQS Will Impose Costly Direct and Indirect Impacts on Steel Mills in or Near Nonattainment Areas That Will be Subject to New $PM_{2.5}$ SIP Regulations.

For areas that are designated nonattainment under a new, more stringent $PM_{2.5}$ standard, states will be required to implement not only Reasonably Available Control Technology (RACT), but also enforceable emission limitations or control measures "as may be necessary or appropriate to provide for attainment of such standard."[12] These requirements would be incorporated into

[12] 42 U.S.C. § 7502(c)(1) and (c)(6).

SIPs. States may also need to obtain reductions from sources near but not actually in nonattainment areas if sufficient reductions cannot be achieved in the nonattainment area itself.

Thus, while the Clean Air Act requires RACT controls for nonattainment areas, the Act also requires additional necessary emission reductions to provide attainment of the standard, based on a modeling demonstration. Given the complexity of demonstrating compliance with very low NAAQS using existing modeling tools, it can be reasonably anticipated that RACT level controls for existing steel mills will be insufficient to meet SIP modeling requirements. In fact, for the combination of low-level NAAQS and low-level fugitive sources that are not handled well in modeling, it is likely that Lowest Achievable Emission Rate (LAER) or better controls will be necessary to model attainment demonstrations (including in cases where the modeled nonattainment is "fictitious" and not a real monitored violation of the standard). Therefore, it is reasonable to assume that steel mills in nonattainment areas or located near a nonattainment area could be expected to install extreme direct $PM_{2.5}$ emissions controls.

Steel production sources, however, that emit even modest amounts of $PM_{2.5}$ are already highly regulated and controlled. This is particularly true when reviewing particulate matter control at a typical integrated steel mill or EAF steel mill. EAF mills, for example, will already have two to three levels of $PM_{2.5}$ emissions controls to meet the current NAAQS (*e.g.*, internal hoods with baghouses, building enclosures, etc.).

Thus, given the high degree of existing particulate matter control at steel mills and other PM-generating sources, states are going to have to focus on harder-to-control or more-expensive-to-control sources to achieve necessary enforceable emission limitations or control measures. Facility roadways would need to be managed to an extreme degree (far better than most public highways). Additional buildings and enclosures and controls would be needed in order ensure that even the smallest emitting sources will show compliance with a model or control requirement. It is expected, therefore, that state agencies will have a difficult time developing attainment demonstration plans.

To assess the potential significant cost impact of LAER controls on steel plant projects that could be required due to the greatly expanded nonattainment areas from more stringent $PM_{2.5}$ standards, AISI retained Trinity Consultants for the analysis. The analysis assessed varying design values for the NAAQS, the United States fleet of steel producers (defined as those mills with either EAF or Blast Furnace with BOF and their location relative to areas that: (1) meet the proposed standard; (2) meet the standard with a small margin below the proposed standard; or (3) do not meet the proposed $PM_{2.5}$ NAAQS.

The analysis was completed following these procedures:

- A list of U.S. iron and steel mill facilities provided by AISI, their locations, and their approximate annual liquid metal production rates was compiled. This list of facilities is included in Attachment A.

- For a hypothetical EAF mill and a hypothetical Blast Furnace/BOF mill with known annual liquid metal production rates, $PM_{2.5}$ cost control scenarios were developed. This allowed

the development of cost factors in terms of dollars per ton of liquid steel produced that were used in later steps of this analysis. Note that the analysis did not include potential additional costs for precursor controls, such as those for nitrogen oxides (NO_x) and sulfur dioxide (SO_2).

- For each type of steel mill, three control scenario tiers were developed to approximate the expected level of controls required to comply with the NAAQS. These were:

    - Level I – Located in an attainment area (green on maps). Mills located in attainment area with significant compliance margin below the design value. In these cases, only regional transport-type schemes (which would be focused on secondary $PM_{2.5}$ that was not a part of this evaluation) would apply to these sources. Furthermore, constraints to expansion activities are minimal.

    - Level II – Located in areas near nonattainment Design Values (orange on maps). Mills located in areas that are near nonattainment levels that have NAAQS within three micrograms per cubic meter of the Design Value. These sources are likely to be required to apply reasonable or best available control technologies (RACT/BACT) or be drawn in through hot-spot or regional modeling demonstrations as potentially significant contributors. Ability to expand capacity would be at least moderately constrained.

    - Level III – Located in nonattainment areas (red on maps). Mills located in nonattainment areas. These sources will likely be required to apply LAER or better controls to comply with SIP requirements. Ability to expand would be greatly constrained.

- Utilizing the DVs provided by Alpine Geophysics, Trinity assigned a control scenario level for each mill at the proposed NAAQS $PM_{2.5}$ level (*i.e.*, at 8, 9, 10, 11 and 12 $\mu g/m^3$) based on each facility's physical location. Using the unit cost per ton of liquid steel factors computed for the hypothetical mills discussed above, cost estimates for controls at each mill were made by multiplying a mill's reported liquid metal production rates by the unit cost factors for the corresponding control level for each DV.

- The summation of costs for the U.S. fleet of steel mills represents the total projected cost impacts to steel producers.

The supporting information for the calculations for this analysis are included in Appendix A.

The economic assessment identified the following potential implications of this proposed rule to existing steel producers should the lowest NAAQS DV being considered become the final NAAQS:

- Total capital investments for United States steel producers to comply with the most stringent level being considered is estimated to be **$9.3 billion**. Total capital investments represent the capital investment required for the sector to install controls to meet the

standard. To comply with the *least* stringent level EPA proposed of 11 $\mu g/m^3$ AISI estimated total capital investments for U.S. steel producers to come in at almost $1.4 billion.

- Total annualized costs are estimated to be **$3.1 billion** per year for compliance with a standard of 8 $\mu g/m^3$. This value provides the normalized annual costs to comply with the standard and is the sum of annual operation and maintenance for controls plus annual amortized costs for the initial capital invested.

Separately, as the control levels required to meet the standard increase, the cost per ton pollutant removed increases dramatically. The incremental cost for the industry rises along a steepening curve as the final selected DV becomes more stringent. The costs per ton of $PM_{2.5}$ removed increases by an additional estimated annualized cost amount of $217,000 per ton if the standard is reduced by 1 $\mu g/m^3$ from 12 to 11 $\mu g/m^3$. The incremental costs rise to $937,900 per ton of $PM_{2.5}$ removed if the selected standard were lowered by 1 $\mu g/m^3$ from 9 to 8 $\mu g/m^3$.

Thus, the costs implications to the production of domestic steel, the lowest GHG intense fleet of the major steel producing countries, could be substantial and materially detrimental to the financial viability of the industry. This is inconsistent with EPA's policies on climate change.

V. EPA's Regulatory Impact Analysis Significantly Underestimates the Costs of the Rule to the Steel Sector and the U.S. Economy at Large.

EPA's view of costs to regulated sources and the U.S. economy are incomplete and underestimate the cost for the following major reasons:

- EPA presented costs in 2017 dollars and did not present estimates in current year dollars which would reflect the sizeable rise in inflation between 2017 and 2023.[13]

- EPA's forecast model is insufficient in assessing costs where technology-forcing control requirements are necessary to demonstrate compliance with strict standards.

- EPA has taken for granted "on the books" emission reductions from large portions of the national $PM_{2.5}$ inventory, namely mobile sources and potentially EGUs, in a presumed glidepath that has included no costs associated with that glidepath nor does it seek to challenge that portion of its contribution to controls well beyond the glidepath. This omission results in a false presumption that the least cost control for compliance falls on stationary sources and makes the rule appear far more cost effective than it really is in EPA's assessment.[14] This omission is particularly glaring in that EPA has presumed that incremental costs for sources other than mobile and EGUs are acceptable without a

[13] See Table 4-2, Regulatory Impact Analysis for the Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter. U.S. EPA December 2022. EPA-452/P-22-001.
[14] See Page 3-3, Regulatory Impact Analysis for the Proposed Reconsideration of the National Ambient Air Quality Standards for Particulate Matter. U.S. EPA December 2022. EPA-452/P-22-001 (stating "we did not apply controls to EGUs or mobile sources.")

comparison to incremental costs for additional controls on those large components of the national inventory.

Table 2 below shows the comparison of EPA's RIA total costs for the country by PM NAAQS level (adjusted from 2017 for inflation) compared to those costs AISI estimated for the steel sector alone.

Table 2. Comparison Showing EPA's Underestimated Cost Impacts of the Proposed NAAQS.

PM NAAQS Level	Total Annualized Costs (millions, current dollars)				
	12 µg/m^3	**11 µg/m^3**	**10 µg/m^3**	**9 µg/m^3**	**8 µg/m^3**
AISI – Steel Sector[15]	$36	$393	$1,345	$2,163	$3,096
EPA – Nationwide[16]	na	na	$118	$483	$2,230
Difference	na	na	*($1,227)*	*($1,680)*	*($866)*

AISI believes the above comparison of results provides compelling evidence that EPA has vastly underestimated the costs for achieving the proposed PM NAAQS standards. The overall result of the impacts of EPA's RIA cost assumptions makes the proposed rule appear far more palatable from an economic standpoint while underestimating the disproportionate impact on steel production (and other non-EGUs) sources.

VI. A More Stringent $PM_{2.5}$ NAAQS Will Result in Extreme Air Permitting Challenges for Steel Mills Located in New Nonattainment Areas.

A finalization of the more stringent proposed $PM_{2.5}$ NAAQS will have significant repercussions on the ability of the iron and steel industry to expand and modernize existing steel plants and construct new steel plants. Given the importance of the steel industry to the national economy and to national security, these burdens are pertinent to EPA's considerations of the appropriate level to set the $PM_{2.5}$ NAAQS.

A new $PM_{2.5}$ NAAQS of the level proposed by EPA will result in a significant increase in nonattainment areas. Under the Clean Air Act, the construction of a new major source or the major modification of an existing major source in a nonattainment area is subject to the requirements to obtain emission offsets, to install LAER controls and to conduct an Alternative Analysis.[17] As discussed in the sections below, these requirements will have a dramatic impact on the iron and steel industry.

A. The Lack of Formal State Offset Banking Programs and the Limited Availability of $PM_{2.5}$ Offsets Will Result in the Inability of Iron and Steel Mills to Expand in Nonattainment Areas.

A key requirement of nonattainment New Source Review (NSR) is that new major stationary sources or major modifications of existing major stationary sources cannot be

[15] See Appendix A for analysis of impacts to the steel sector.
[16] Represents EPA's total annualized cost values from Table 4-2 of the RIA inflated to current dollars.
[17] 42 U.S.C. § 7503(a).

constructed in a nonattainment area unless the increased emissions attributed to the new source or the major modification to a source are offset by reductions in emissions from existing facilities in the same geographic area.[18] Such offsets can be obtained by reducing or eliminating emissions from other facilities the company owns or by buying emission credits from another company.[19]

These nonattainment NSR offset requirements can create a substantial impediment to steel mill development projects in nonattainment areas. The practical reality is that if a steel mill is looking to expand production capacity, for instance by constructing a new EAF, it is unlikely that the mill has operating sources that it can shutdown to generate offsets. Therefore, any required offsets must originate from other companies or sources.

There is substantial difficulty, however, in obtaining offsets from third-parties. The Clean Air Act does not create an emission banking program for offsets. States are free to develop and implement such a program, but they are not required to do so. AISI has assessed the availability and accessibility of offset banking programs in the primary states that the iron and steel industry has production locations in. Specifically, AISI assessed the twenty-one states identified as having steel mills with steel melting operations.[20] Of those twenty-one states, eleven do not have any formal or informal offset banking program whatsoever.[21] Of the ten remaining states, nine have a regulatory offset banking program[22] and one has a program based on guidance.[23]

For those states that do have formal and accessible offset banking programs, AISI further assessed the current availability of $PM_{2.5}$ offsets. Most of the states with an offset banking program, however, do not maintain an online database of potentially available offsets. Therefore, real time assessment of available offsets was not possible. Of the few states that do maintain online databases of available offsets, the availability of $PM_{2.5}$ offsets was either very limited or non-existent.[24]

Of course, current availability of $PM_{2.5}$ offsets has limited correlation to the potential of offsets in the future with the potential introduction of wide-spread $PM_{2.5}$ nonattainment areas. In addition, delegated permitting authorities are generally slow to implement and establish offset banking requirements. Furthermore, when meeting attainment demonstrations is complex, permitting authorities are conflicted between allowing an offset banking system to flourish versus simply capturing reductions for attainment SIP demonstration purposes (thus negating their use in an offset program).

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[18] 42 U.S.C. § 7503(a)(1)(A).
[19] *Id.*
[20] See, Appendix A.
[21] Arkansas, Florida, Illinois, Iowa, Kentucky, Michigan, Mississippi, Nebraska, South Carolina, Tennessee, and Washington.
[22] Alabama, Missouri, New York, North Carolina, Ohio, Pennsylvania, Texas, Utah and West Virginia.
[23] Indiana.
[24] See, New York (https://www.dec.ny.gov/docs/air_pdf/ercregistry.pdf); North Carolina (https://deq.nc.gov/about/divisions/air-quality/air-quality-permitting/emissions-reduction-credits/ercs-registry-information-faq/use-and-expiration#Available); Ohio (http://wwwapp.epa.ohio.gov/dapc/ERC/doc/PM2_5v.htm); Pennsylvania (https://files.dep.state.pa.us/Air/AirQuality/AQPortalFiles/Permits/erc/ERC_PA_Report.pdf); Texas (https://www2.tceq.texas.gov/airperm/index.cfm?fuseaction=reg.erc); Utah (https://deq.utah.gov/air-quality/emission-credits-offset-registry); and West Virginia (https://dep.wv.gov/daq/EmissionTrading/Pages/EmissionTradingProgramRegistry.aspx).

A further complicating factor with nonattainment NSR offsets is that the purchase of offsets is an unregulated private-party activity. Currently there are no public exchange for offsets, as there are in many of EPA's cap and trade programs where the cost can be identified and tracked. Thus, even if offsets are available in the market, their ability to be used or to be used at an economically identifiable level is often compromised.

As proscribed in the Clean Air Act and implemented over decades, the use of offsets is not a simple matter. In fact, even with a robust offset program, the costs for private offsets transactions can be enormous due the basics of supply and demand. It would not be unusual to see potential projects required to obtain offsets being burdened with millions of dollars of increased costs simply to satisfy this requirement.

Based on these analyses of state offset banking programs and availability of $PM_{2.5}$ offsets, AISI has significant concerns about the ability to increase the production capacity at the majority of the United States steel industry that would find itself in nonattainment areas with a lowering of the $PM_{2.5}$ standard. In developing the nonattainment NSR program and the offset requirement, Congress certainly did not intend that the program would result in stagnant or non-existent growth in nonattainment areas. Yet with the offset issues identified by AISI, that is exactly what will happen with substantially lowered $PM_{2.5}$ standards. That is an untenable position for the steel industry that is critical to the United States economy and national defense.

B. The Requirement to Adopt LAER Controls for Nonattainment New Source Review Projects Will Considerably Increase Steel Plant Development Costs.

Under the Clean Air Act, the construction of a new major source or the major modification of an existing major source in a nonattainment area is subject to the requirements to install Lowest Achievable Emission Rate (LAER) controls.[25] LAER controls require controls at least as effective as the best controls used by an existing source of the same kind, with no consideration of costs.

As discussed in detail above, AISI retained Trinity to assess the potential costs to the steel industry associated with the likely need for LAER-level controls in order for states to adequately model compliance with more stringent $PM_{2.5}$ standards. That analysis also provides the basis to determine the costs for LAER controls for the construction or major modification of a new steel mill in a nonattainment area.

Trinity's assessment indicates that the cost of $PM_{2.5}$ controls for a steel mill in a nonattainment area could potentially be hundreds of millions of dollars in capital costs. Similarly, this is a good proxy for the incremental cost for controls for new mill subject to LAER versus a mill constructed in an attainment area or another county where only BACT or NSPS level controls would be expected. These costs are substantial enough to alter the economic viability of a steel mill or a proposed project in a nonattainment area.

[25] 42 U.S.C. § 7503(a)(2).

VII. A More Stringent $PM_{2.5}$ NAAQS Will Result in Extreme Air Permitting Challenges for Steel Mills Located in Attainment Areas.

The bifurcation of the NSR program into attainment and nonattainment areas was developed in part to promote reasonable growth in attainment areas. Thus, the attainment Prevention of Significant Deterioration (PSD) program is more flexible in that regard by not requiring offsets and by requiring less stringent Best Available Control Technology (BACT) and not LAER. However, the PSD program for major new sources or major modifications of existing major sources in attainment areas does require air dispersion modeling to ensure that the new or expanded source does not "cause or contribute" to an exceedance of the NAAQS. Some states also require similar NAAQS compliance demonstrations for minor modifications.

Due to the currently stringent $PM_{2.5}$ NAAQS and the need to include background concentrations, including from naturally-occurring sources, the iron and steel industry has regularly found PSD modeling to be a significant challenge. This challenge will increase substantially with a more stringent $PM_{2.5}$ NAAQS as proposed by EPA, to the extent that many projects may no longer be viable due to the modeling requirement.

Specifically, background concentrations are added to model results for NAAQS air dispersion modeling analyses and are intended to represent concentrations "attributable to natural sources, other unidentified sources in the vicinity of the project, and regional transport contributions from more distant sources."[26] These background contributions are often obtained from ambient monitors located in the vicinity of a project location.

However, since states have limited resources, ambient monitors are most often sited and operated in locations where relatively high concentrations are expected. That is, monitors are intentionally sited where ambient concentrations are expected to be high. Therefore, truly representative background concentrations may not be readily available for use in air dispersion modeling.

Based on 2019-2021 monitor data provided by EPA to support the $PM_{2.5}$ NAAQS reconsideration, the average annual $PM_{2.5}$ concentration across all United States monitors is approximately 7.9 $\mu g/m^3$.[27] Using this concentration as a typical example of background that would be used in a NAAQS modeling analysis, the amount of headroom (*i.e.*, the concentration available for modeling concentrations attributable to explicitly modeled, non-background sources) is 4.1 $\mu g/m^3$ with respect to the current NAAQS of 12 $\mu g/m^3$. If the NAAQS is lowered to 10 $\mu g/m^3$ this headroom will be reduced to 2.1 $\mu g/m^3$ and if the NAAQS is lowered to 9 $\mu g/m^3$ this headroom will be reduced to 1.1 $\mu g/m^3$.

This means that for the purposes of air dispersion modeling, the range of proposed lowered NAAQS will be two to four times more stringent than the existing annual NAAQS. In many areas that would presumably be designated as attainment with respect to the revised NAAQS, monitor data is even closer to the NAAQS, making the stringency of the NAAQS with respect to air

[26] 40 CFR 51, Appendix W, Section 8.3.

[27] Available at www.epa.gov/system/files/documents/2023-01/Fine%20Particle%20Concentrations%20for%20Counties%20with%20Monitors.pdf

dispersion modeling requirements even tighter. Monitor data in certain areas are also impacted heavily by emissions from fires (prescribed burns and wildfires), which can further limit available headroom for permitting new sources in areas where fires are prevalent due to source types that may be infrequent and difficult to control.[28]

In addition to the typical use of conservatively high background concentrations because monitors are sited where high concentrations are expected, other layers of conservatism are built into regulatory air dispersion modeling analyses. These multiple layers of conservatism include:

- Worst-case emission rates are assumed to occur continuously, so that the worst-case emissions are assumed to occur at the time of worst-case meteorology for dispersion, even though worst-case, permitted emission rates are expected to rarely, if ever, occur.

- All sources in the model (both at the source being permitted and nearby sources) are assumed to emit at their worst-case emission rates simultaneously. This approach provides an unrealistic estimate of the combined impacts of multiple nearby sources.

- The quality of data available for modeling of nearby sources can result in overestimates of $PM_{2.5}$ concentrations. For simplicity, many sources continue to report $PM_{2.5}$ emissions that are equal to PM or PM_{10} emissions for air permitting or air emission inventories. This is convenient for sources not completing air permit modeling, but an added layer of over-conservatism for sources completing modeling.

- In recent years, EPA has updated guidance to require consideration of both primary $PM_{2.5}$ concentrations and concentrations of $PM_{2.5}$ associated with secondary formation from precursor emissions. EPA's Modeled Emission Rates for Precursors (MERPs) guidance has provided a tool to address secondary formation of $PM_{2.5}$ in a quantitative manner, but it has been implemented in a conservative manner. Use of the default MERPs assumes that the design concentration associated with direct $PM_{2.5}$ emissions occurs at the same time and location as the peak concentration associated with secondary $PM_{2.5}$ formation. In reality, peak concentrations associated with direct emissions occur at the facility fenceline in many situations and peak concentrations due to secondary formation may occur further away from the source, after emissions have traveled and had time for atmospheric chemical reactions to occur.

- EPA's guidance for the use of the same MERPs concentration in the significant impact level (SIL), NAAQS, and PSD Increment analysis is overly conservative for the NAAQS and PSD Increment analyses. The current MERPs values available from EPA uses the first high modeled concentration for a particular annual emission rate from a hypothetical source. This response ratio is appropriate to use for SIL modeling which is based on first high modeled impacts for both short term and annual standards. However, the form of the short term $PM_{2.5}$ NAAQS is a 98^{th} percentile concentration, not a peak concentration. Therefore, a 98^{th} percentile modeled concentration associated with a particular annual

[28] U.S. EPA, Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter, EPA-452/R-22-004, May 2022, Appendix C; https://www.pnas.org/doi/10.1073/pnas.1804353115.

precursor emission rate should be derived from a model completed for hypothetical sources for a 24-hour $PM_{2.5}$ NAAQS analysis. For a particular emission rate, the 98th percentile concentration will be lower than the first highest concentration; therefore, use of the same MERPs values for all standards results in an overestimate of concentrations for comparison with the form of the percentile-based NAAQS.

These conservative assumptions, when compounded, result in regulatory air dispersion modeling analysis results that do not reflect reality. This traditional approach of modeling analyses, including layer after layer of conservative assumptions, will constrain the ability of sources to permit new projects, if permitting is even possible at all under a reduced $PM_{2.5}$ NAAQS. This factor compounded with the known inaccuracy of dispersion models creates seriously adverse consequences when attempting to demonstrate compliance with low standards. In fact, it can often result in fictitious exceedances and related unnecessary applications of controls on sources.

Steel facilities can at times be sources of fugitive emissions, which can be a main driver of modeled direct $PM_{2.5}$ concentrations even at relatively low emission rates if fugitive sources, such as roadway dust, storage piles, material transfer points, etc., are located relatively close to facility fencelines. While the AERMOD model includes source types (*e.g.*, volume source, area source, etc.) that are commonly used for modeling of fugitive sources, most field study databases that have been used to evaluate AERMOD are for tall, point source stacks and not fugitive source types. As point sources are more controlled to meet BACT or LAER requirements, fugitive source emissions may become a more substantial driver of maximum modeled concentrations. To provide more certainty in the model results, AISI encourages EPA to consider undertaking additional field studies to better understand AERMOD performance for fugitive emission sources.

To the extent the final rule includes any lowering of the $PM_{2.5}$ standard, AISI strongly encourages EPA to implement adjustments to its modeling guidance to mitigate the extreme challenges that will result from a more stringent standard. Without adjustments to modeling guidance, EPA runs the risk of creating insurmountable obstacles to continued investment in new and modernized iron and steel operations. The following are recommended areas of focus for revisions to EPA modeling guidance:

- A less conservative approach to defining background concentrations must be developed as the NAAQS continues to get closer and closer to natural background. EPA can provide additional guidance to clarify that representative background concentrations are more important than using data from a nearby monitor. EPA can also provide additional guidance to clarify that care should be taken to avoid double counting of concentrations by explicitly modeling nearby sources that are most appropriately considered using the background concentration. EPA can provide additional guidance to clarify that exceptional events should be excluded from monitor data when defining background.

- EPA should continue development of tools to provide easy-to-use, but less conservative estimates of $PM_{2.5}$ concentrations due to precursor emissions. The assumption that the peak primary and secondary $PM_{2.5}$ concentrations occur at the same time and location is very conservative. Additionally, EPA's guidance to use the same MERPs concentration in the significant impact level (SIL), NAAQS, and PSD increment analysis should be

reconsidered so that a response factor for annual emissions versus concentrations in the form of the relevant standard is used for NAAQS and PSD increment analyses.

- EPA should continue to consider a more realistic approach to defining "ambient air," particularly in the case of annual standards, such as the reduced $PM_{2.5}$ NAAQS. The latest guidance, which continues to require a barrier to access by the general public, even on property owned by the permittee and for annual standards, is unrealistically conservative. Requiring modeling analyses to assume that a member of the general public is trespassing on company owned land for an annual period is unrealistic and overly conservative. Similarly, the assumption that a member of the general public will be present for an entire year on a roadway, rail line, or in a river or other body of water that is located adjacent to an industrial facility is unrealistic and overly conservative.

In summary, steel mills located in attainment areas, and particularly in areas that are monitored just below the Design Values (*i.e.*, close to nonattainment), face substantial obstacles in being able to adequately conduct a satisfactory PSD air dispersion model due to existing high background concentrations and layers upon layers of modeling conservatism. As such, the ability to invest in additional production capacity and new equipment where demonstration of compliance with the NAAQS is required to obtain various air quality permits would be severely compromised by a new more stringent $PM_{2.5}$ NAAQS. This is contrary to the Clean Air Act's purpose for the PSD program, which is to "insure that economic growth will occur in a manner consistent with the preservation of existing clean air resources."[29]

VIII. A More Stringent $PM_{2.5}$ Standard Would Unnecessarily Add to the Significant Existing Clean Air Act Federal Regulatory Burden on the Iron and Steel Industry.

The iron and steel industry understands the need for appropriate pollution control to ensure the protection of our nation's natural resources. However, the iron and steel industry is one of the most highly-regulated industries as it relates to particulate matter.

Specifically, the iron and steel industry is regulated by a long list of federal regulations that directly control particulate matter through mass-based limits or opacity standards, as well as the use of particulate matter controls as a surrogate for other pollutants. This very long list includes Standards of Performance for Secondary Emissions from Basic Oxygen Process Steelmaking Facilities; Standards of Performance for Steel Plants: Electric Arc Furnaces and Argon-Oxygen Decarburization Vessels; Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units; Standards of Performance for Lime Manufacturing Plants; NESHAP for Coke Oven Batteries; NESHAP for Steel Pickling; NESHAP for Lime Manufacturing Plants; NESHAP for Coke Ovens: Pushing, Quenching and Battery Stacks; NESHAP for Industrial, Commercial and Institutional Boilers and Process Heaters; NESHAP for Integrated Iron and Steel Manufacturing Facilities; NESHAP for Taconite Iron Ore Processing; NESHAP for Electric Arc Furnace Steelmaking Facilities; and Regional Haze Best Available Retrofit Program, among other federal regulations and regulatory programs.

[29] 42 U.S.C. § 7470(3).

This current regulatory burden is substantially compounded by a long list of federal environmental regulations addressing particulate matter along with other pollutants which, depending on the final outcome, could have dramatic cost implications for the industry. These proposed or soon-to-be-proposed air rules include proposed revisions to the Standards of Performance for Electric Arc Furnaces; and Risk and Technology Reviews for the NESHAPs for Integrated Iron and Steel Manufacturing Facilities, Coke Batteries: Pushing, Quenching and Battery Stacks, Coke Ovens and Taconite Ore Processing.

All of these concurrent and substantially overlapping federal regulatory burdens result in an extreme cost for regulatory compliance at iron and steel companies. A more stringent $PM_{2.5}$ NAAQS would only compound this overall burden. This is particularly troubling since iron and steel mills are already extensively controlled for particulate matter. As such, a new lower $PM_{2.5}$ standard that will have dramatic negative impacts in particular on iron and steel plants is therefore unfounded and unnecessary.

IX. The Proposed Rule Contains Numerous Implementation Aspects That Are Unnecessary, Problematic or Should Be Revised.

In addition to discussing EPA's basis for the proposed more stringent $PM_{2.5}$ standard, EPA also includes in the preamble to the proposed rule discussion on numerous implementation issues. AISI has assessed many of those issues and offer the following comments.

A. State Implementation Guidance is Necessary Prior to Finalizing the Regulation.

In the event EPA decides to lower the $PM_{2.5}$ NAAQS, AISI believes that EPA must provide considerable and, perhaps unique, discretion in implementation of the standard. In particular, EPA should not finalize the regulation until it addresses and finalizes numerous technical factors to allow for a more orderly process, including:

- Sufficient time for offset banks to be established and populated.
- Robust and accurate state $PM_{2.5}$ inventories that are certified and model ready, including an accurate accounting of mobile source emissions.
- Initial designation timing should only follow implementation of an appropriate state and national network of ambient monitors.
- Issuance of new guidance and tools related to SIP demonstration modeling.
- Generic federal RACT for $PM_{2.5.}$
- Implementation of a waiver program from pre-construction permitting for $PM_{2.5}$ pollution control projects.
- Development of LAER for the 28 industrial source categories and identify a "menu of options" to provide specificity and certainty in nonattainment projects, and ensure industrial sources are not overcontrolled.

Delaying finalization of a new NAAQS, which EPA has discretion to do, would mitigate many technical issues that otherwise might create unintended consequences from an early implementation.

B. Modeling of Future Control Strategies.

Modeling to evaluate future control strategies to demonstrate compliance with the NAAQS for nonattainment areas using photochemical grid models, such as CAMx or CMAQ, can be complicated, costly, and put a strain on state modeling resources. A sudden increase in the number of nonattainment areas that would be the result of a reduction in the NAAQS will require the development of area-specific modeling analyses to show a path to future attainment. Many states do not take on photochemical modeling routinely and will need to train staff and/or use and pay outside organizations to complete this modeling. This additional burden on state agencies could reduce their ability to meet staffing needs to continue to review modeling analyses to support economic growth throughout their states. AISI requests that EPA consider the costs to state agencies in the cost/benefit analysis included with the rulemaking. AISI also encourages EPA to develop guidance and work with states to ease the burden of additional modeling that will be a direct outgrowth of the rulemaking if the NAAQS is reduced.

C. Monitoring Network Issues.

In a November 23, 2022, letter from the Association of Air Pollution Control Agencies (AAPCA) to EPA, AAPCA provided comments on issues with the comparability of ambient particulate matter concentration data obtained from federal reference method (FRM) monitors and federal equivalent method (FEM) monitors.[30] As discussed by AAPCA, in certain instances FEMs can result in Design Values that are meaningfully higher than design values from collocated FRMs. For example, data downloaded from EPA's $PM_{2.5}$ Continuous Monitor Comparability Assessments site for two Region V sites with collocated FRM and FEM monitors (AQS IDs 39-035-0038 and 39-035-0060) shows that the FEM monitors have high biases approaching 20% on an annual basis comparing FEM data to FRM data for 2021.[31]

AAPCA as a group of state agencies asked EPA to "consider the use of correction factors developed for collocated FRMs and FEMs."[32] As EPA recognizes, CASAC also suggested this approach.[33] Yet EPA appears to dismiss this suggestion in favor of "a national solution in factory calibrations of approved FEMs through a firmware update."[34] A generic firmware approach is not expected to accurately correct the varying site-to-site bias resulting in sites with remaining high bias causing nonattainment.

AISI shares this concern and requests that EPA resolve this issue prior to moving forward with implementation of a revised $PM_{2.5}$ NAAQS, including the process of making designations of areas as attainment or nonattainment with respect to the revised NAAQS. AISI also agrees with EPA that data that are not from FRMs or FEMs, such as satellite-based measurements and those from low cost, portable air sensors, must not be used for regulatory purposes including $PM_{2.5}$ designation determinations due to their known high bias.[35]

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[30] J. Sloan, Association of Air Pollution Control Agencies, to P. Tsirigotis, U.S. EPA, November 23, 2022 (AAPCA Letter) (Attachment B).
[31] https://www.epa.gov/outdoor-air-quality-data/pm25-continuous-monitor-comparability-assessments
[32] 88 Fed. Reg. at 5672; AAPCA Letter, at p. 2.
[33] 88 Fed. Reg. at 5682.
[34] 88 Fed. Reg. at 5670.
[35] 88 Fed. Reg. 5679-5680

The core technical element to implementation of the NAAQS program is a robust, repeatable, and reliable monitoring network. In the United States, EPA, states and other stakeholders operate a wide range of ambient monitors for various technical purposes. Given the need for high quality and consistent data to assess NAAQS, especially those set at relatively low levels as is being proposed here, ensuring standard practices and QA/QC is paramount to the implementation. Therefore, we recommend that any implementation rule be based on monitors that fully meet the requirements of 40 C.F.R. 50, 53, and 58 and related QA/QC assessments.

In terms of implementation rule attainment strategies, it is critical to fully characterize the sources of emissions. For $PM_{2.5}$, the investigation into the sources only begins with the measurement of total $PM_{2.5}$. It is well understood that $PM_{2.5}$ may consist of varying constituents of air pollutant species including, but not limited to, organics, nitrates, sulfates, and other inert materials. Fully characterizing and understanding the speciation of an area's $PM_{2.5}$ is absolutely critical for regulators so they may design and efficiently implement an attainment SIP. Failure to understand speciation leaves the implementing agency with a guessing game on where to focus control strategies. To this end, it is imperative that any $PM_{2.5}$ NAAQS implementation require speciation analyses to support good and proper regulatory implementation of the standard.

D. Holistic Consideration of Proposed Rule Impacts.

EPA in its reconsideration needs to fully assess the interaction of a low-level NAAQS and the intricacies of the NSR program, both major and minor. Under the PSD program, BACT review will become far more complex and perhaps involve differing means to assess primary and precursor controls for $PM_{2.5}$. Under the nonattainment NSR program, the Alternatives Analysis requirement could become a component that is subjected to extended review with expanded Environmental Justice initiatives by EPA. It is also not well understood where EPA's recent initiatives to review state minor NSR program will interact with NAAQS attainment and maintenance.

Overall, there appears to be growing areas where EPA policies, like Environmental Justice, and laws and regulations like PSD and nonattainment NSR, enter a very complicated dynamic when policy and law conflict instead of working in a harmonized fashion. For example, EPA in this reconsideration is clearly advocating for a NAAQS that could include an ample margin of safety while simultaneously sponsoring Environmental Justice policy that seek to apply a redundant margin of safety below the NAAQS. This policy outcome is flawed in that it goes beyond EPA's mandate in the Clean Air Act to balance human health and a productive United States economy.

X. AISI Supports the Conclusions Reached by the NAAQS Regulatory Review and Rulemaking Coalition and the Midwest Ozone Group.

AISI has primarily focused its comments on the harmful impacts of the proposed rule on the iron and steel industry. Nonetheless, AISI has serious concerns regarding the overall legal and technical sufficiency of the proposed rule. AISI is a member of the NAAQS Regulatory Review

and Rulemaking Coalition (NR3) and the Midwest Ozone Group (MOG) and supports and adopts the comments that NR3 and MOG have submitted on this proposed rule.[36]

AISI supports the conclusions set forth by NR3. NR3 identifies that procedures in this discretionary reconsideration depart from the standard 5-year review, and that EPA must consider costs and burdens to state and local regulators and to industry. Furthermore, EPA must review the entire record, including from the 2020 review of the NAAQS. NR3 concludes that EPA has not justified revision of the current primary $PM_{2.5}$ standard as there is an absence of evidence of different health effects, greater health risk, or different "at risk" populations. NR3 shares AISI's viewpoints that EPA must delay the effective date of any new NAAQS to address challenging implementation issues, and that EPA should update its permitting and modeling requirements to eliminate excessive conservatism. NR3 notes that EPA's Regulatory Impact Analysis is seriously deficient as it does not capture the uncertainty of public health benefits from a lowered standard and understates costs and economic impacts.

NR3 highlights the fact that EPA must explain why it differed from any pertinent findings, recommendations, and comments of a Clean Air Scientific Advisory Committee (CASAC) in the docket, consistent with the Clean Air Act that requires any NAAQS proposal be accompanied by a statement setting forth "any pertinent findings, recommendations, and comments" of the CASAC and that, "if the proposal differs in any important respect from any of these recommendations, an explanation of the reasons for such differences." [37] Legally, EPA's prior reliance on the findings, recommendations, and comments of the disbanded CASAC are pertinent because they are clearly a relevant factor that EPA must consider in its reconsideration. EPA did not do so here.

AISI likewise supports the conclusions set forth by MOG. MOG identifies the fact that air quality for PM has improved significantly in recent years due to actual reductions in PM emissions. This is due to on-the-books controls with predicted continued reductions for future years. MOG further identifies the fact that mere compliance with the current PM NAAQS is not a basis for further reductions in the NAAQS, and that the lack of consensus among CASAC members questions the merit in revising the standard. MOG shares AISI's viewpoint that EPA should delay the effective date of the rule, specifically until it releases the revised 2032 modeling platform so that future projections with on-the-books controls can be assessed. Consistent with AISI's discussion related to the rule impact on the iron and steel industry, MOG notes the significant implications for permitting and the substantial negative impact on the nation's economy. Finally, MOG identified numerous implementation issues, including the need for additional time for new or moved $PM_{2.5}$ monitors, impacts from combining data from multiple monitors, integration of the exceptional events exclusion, and a request for guidance on the Good Neighbor provisions of the Clean Air Act.

XI. Requests by AISI Regarding the Proposed Rule.

In this comment letter, AISI has provided substantial evidence of the dramatic costs and burdens likely to impact the iron and steel industry if EPA lowers the $PM_{2.5}$ NAAQS. From

[36] Issues and concerns raised through AISI's comments, including comments of its associations such as NR3 and MOG, can serve as an objection pursuant to Section 307(d)(7)(B) of the Clean Air Act, 42 U.S.C. § 7607.
[37] 42 U.S.C. § 7607(d)(3).

potential "beyond-LAER" costs from SIP regulations in order for states to demonstrate attainment through modeling, to the potential inability to obtain offsets or conduct a passing air dispersion model that could cancel growth projects, the costs and burdens would result in widespread and significant impacts on the industry. As this rulemaking is a reconsideration of the 2020 $PM_{2.5}$ NAAQS rulemaking, EPA must take into account these costs and burdens. As such, AISI requests that EPA maintain the $PM_{2.5}$ NAAQS at the current levels.

APPENDIX A

Trinity Memo: Economic Impact Assessment for Controlling Direct $PM_{2.5}$ From United States Steel Production Facilities

Trinity Consultants

MEMORANDUM

To: American Iron and Steel Institute

From: Mike Remsberg, PE, Ron Hawks, and Colin Wandell – Trinity Consultants

Date: March 24, 2023

RE: Economic Impact Assessment for Controlling Direct $PM_{2.5}$ From US Steel Production Facilities

In order to assess the potential cost impact of lowest achievable emission rate (LAER) controls (or other state implementation plan (SIP) required controls) on steel production facilities that could be required due to the greatly expanded nonattainment areas from more stringent ambient air quality standards on particulate matter equal to or less than 2.5 microns in diameter ($PM_{2.5}$), the American Iron and Steel Institute (AISI) retained Trinity Consultants (Trinity). Trinity's analysis took into account the varying design values (DVs) for the annual National Ambient Air Quality Standards (NAAQS) that were proposed or on which the Environmental Protection Agency (EPA) is taking comment, the U.S. fleet of steel producers (defined as those with either electric arc furnaces (EAFs) or blast furnace (BFs) and/or basic oxygen furnaces or process (BOF or BOP) shops), and their location relative to areas that meet, barely meet, or do not meet the proposed $PM_{2.5}$ NAAQS. Our study focused on direct $PM_{2.5}$ emissions and not the more uncertain landscape of emissions of precursors to $PM_{2.5}$ that could become an important factor in regional transport SIP rulemakings. Given the time constraints to prepare these analyses and the wide range of DVs the EPA has proposed, these estimates are preliminary in nature, though we expect them to be directionally informative for the impacts for the steel production sector in the U.S.

Technical Approach

Trinity adopted the following approach for our analysis:

- A list of U.S. iron and steel mill facilities provided by the American Iron and Steel Institute (AISI), their locations, and their approximate annual liquid metal production rates was compiled. This list of facilities is attached. Note that this analysis did not include potential controls at coke plants or Direct Reduced Iron (DRI) plants given the differences in their configurations and control scenarios from steel mills.

- For a hypothetical EAF mill and a hypothetical BF/BOF mill with known annual liquid metal production rates, $PM_{2.5}$ cost control scenarios were developed. This allowed us to develop cost factors in terms of dollars per ton of liquid steel produced that were used in later steps of this analysis. Note that the analysis did not include potential additional costs for precursor controls, such as those for nitrogen oxides (NO_x) and sulfur dioxide (SO_2).

- For each type of steel mill, three control scenario tiers were developed to approximate the expected level of controls required to comply with the NAAQS. These were:

  - Level I – Located in an attainment area [green on maps]. Mills located in attainment area with significant compliance margin below the design value. In these cases, Trinity assumed that only regional transport-type schemes (focused on secondary $PM_{2.5}$; not a focus of our evaluation) would apply to these sources. Furthermore, constraints to expansion activities are minimal.

  - Level II – Located in areas near nonattainment Design Values (DVs) [orange on maps]. Mills located in areas that are near nonattainment levels that have NAAQS within three micrograms per cubic

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meter of the DV. These sources are likely to be required to apply reasonable or best available control technologies (RACT/BACT) or be drawn in through hot-spot or regional modeling demonstrations as potentially significant contributors. Ability to expand capacity would be at least moderately constrained.

- Level III – Located in nonattainment areas [red on maps]. Mills located in nonattainment areas. These sources will likely be required to apply LAER or better controls to comply with SIP requirements. Ability to expand would be greatly constrained.

- Utilizing the DVs provided by Alpine Geophysics, Trinity assigned a control scenario level for each mill at the proposed NAAQS $PM_{2.5}$ level (i.e., at 8, 9, 10, 11 and 12 micrograms per cubic meter ($\mu g/m^3$)) based on each facility's physical location. Using the unit cost per ton of liquid steel factors computed for the hypothetical mills discussed above, cost estimates for controls at each mill were made by multiplying a mill's reported liquid metal production rates by the unit cost factors for the corresponding control level for each DV.

- The summation of costs for the U.S. fleet of steel mills represents the total projected cost impacts to steel producers.

Main Control Scenario Definitions

Trinity has not attempted to assess the technical feasibility of the control scenarios outlined in this analysis. However, we believe these are technology options that steel manufacturers will need to evaluate and install as result of this rulemaking. The table below summarizes the Level I, II, and III control scenarios.

- Level I Control Scenario: The default assumption, given the location in an attainment area, is that no additional controls would be required for direct PM emissions.

- Level II Control Scenario: Given the potential to be a significant contributor of emissions to a non-attainment area or to be drawn into demonstrating compliance through regional modeling, the control strategy consisted of:

  - For main process equipment and all ancillary units with dust collection, we assumed that this equipment would be subject to use of higher performance filter media in existing control equipment.
  - For fugitive sources, we assumed that enhanced sweeping and flushing of all plant roadways would be needed, along with a moderate level of control for process fugitives.

- Level III Control Scenario: Given being located in a nonattainment area and SIP modeling requirements, we have assumed that LAER or better controls would be necessary to comply with the NAAQS.

  - Redundant PM controls on all major process units (EAFs, BOFs, BFs) with Wet Electrostatic Precipitators (WESPs) following primary and secondary PM control.
  - Enhanced (or new) building enclosures for various shops to minimize fugitive emissions.
  - Additional new controls on outdoor activities including slag processing.
  - New Baghouses (BHs) and upgraded media throughout the facility.
  - Paving all currently unpaved plant roads with regular sweeping and/or watering and repaving existing paved roads.
  - All outdoor stockpiles and slag processing activities will be enclosed in buildings.

Summary of Results

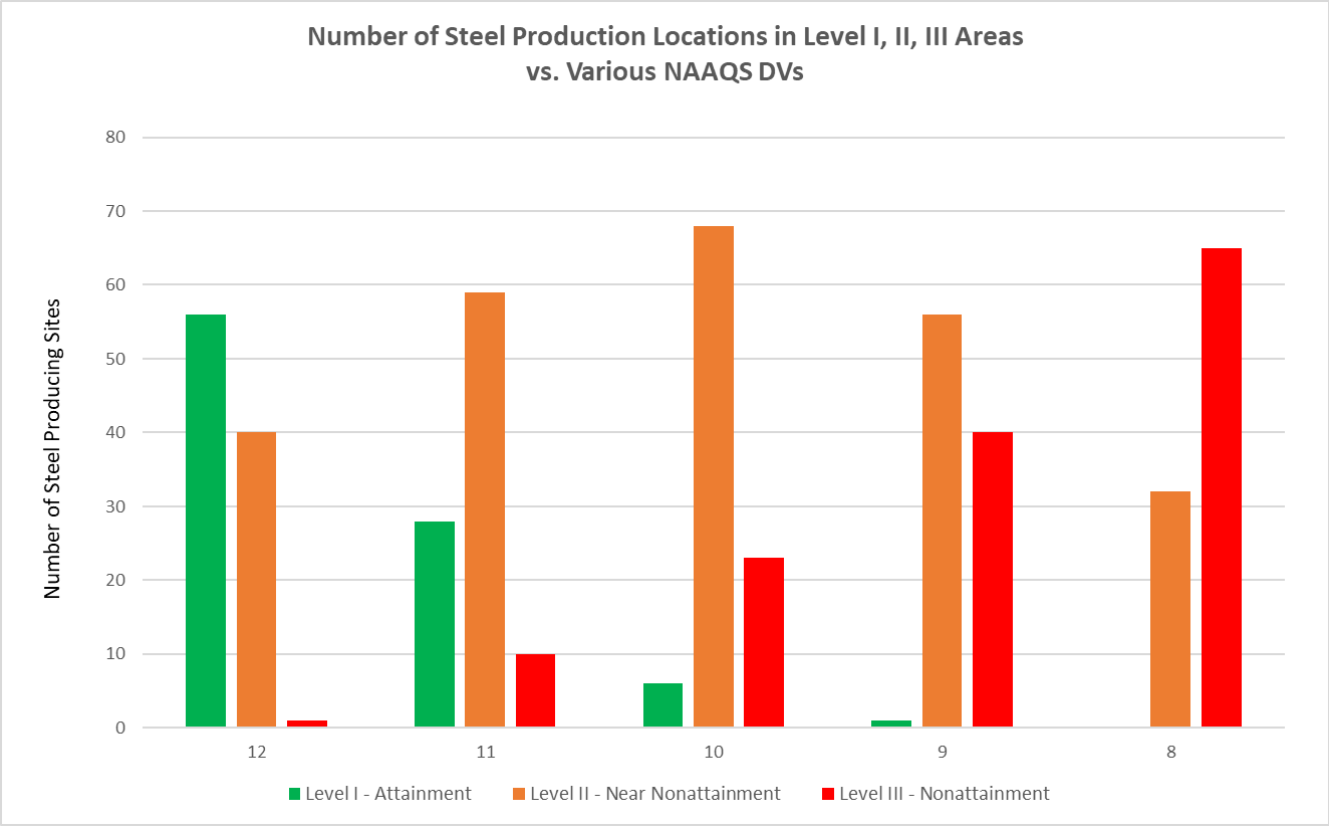
Below is summary of results for our analysis indicating the scope, breadth, and disparate impacts to the steel production sector.

Based on the DV projections by county and census of U.S. EAF/BOF shops, we expect the following occurrence of steel mills in nonattainment, near nonattainment, and attainment areas for each possible level of NAAQS.

Table 1. Census of Steel Production Facilities in Various Levels of Attainment

NAAQS Level	Number of Mills in Various Levels by Proposed NAAQS DV				
	12 µg/m³	11 µg/m³	10 µg/m³	9 µg/m³	8 µg/m³
Level I – Attainment	56	28	6	1	0
Level II – Near Nonattainment	40	59	68	56	32
Level III – Nonattainment	1	10	23	40	65

Figure 1. Census of Steel Production Locations in Various Levels of Attainment



TCI Costs for Steel Producers at Various $PM_{2.5}$ NAAQS Levels

Based on our analysis, we estimate that industry's compliance costs in terms of total capital invested (TCI) are as follows at the varying proposed standard levels. To arrive at the nationwide costs for the sector, we applied the following steps as outlined in the technical approach:

- Determined the level of control expected based on the location of each mill from the AISI facility list at each proposed NAAQS level based on the expected attainment, near nonattainment, and nonattainment DVs (i.e., Levels I, II, and III).

- Determined the compliance costs for each location, TCI in Table 2 and total annualized costs (TAC) in Table 3, by scaling the respective hypothetical mill costs by the liquid steel production level for each shop as compared to the hypothetical reference mill (and the specific mill's steel production process type).

- Summed the costs for all the facilities to estimate the nationwide sector cost.

Table 2. Nationwide Total Capital Investment for Steel Production Facilities to Comply with the Proposed NAAQS at Various DVs

NAAQS DVs	12 µg/m³	11 µg/m³	10 µg/m³	9 µg/m³	8 µg/m³
Nationwide TCI ($2023)	$65,000,000	$1,364,000,000	$4,951,000,000	$7,109,000,000	$9,329,000,000

Table 3. Nationwide Total Annualized Costs for Steel Production Facilities to Comply with the Proposed NAAQS at Various DVs

NAAQS DVs	12 µg/m³	11 µg/m³	10 µg/m³	9 µg/m³	8 µg/m³
Nationwide TAC[1] ($2023)	$36,000,000	$393,000,000	$1,345,000,000	$2,163,000,000	$3,096,000,000

Based on our analysis, the impacts to the steel producers in the U.S. is estimated to be extensive depending on the final DV EPA selects for the $PM_{2.5}$ NAAQS:

- Total capital investments for United States steel producers to comply with the most stringent level being considered is estimated to be **$9.3 billion.** TCI represents the capital investment required for the sector to initial install controls to meet the standard.
- Total annualized costs are estimated to be **$3.1 billion** per year. This value provides the normalized annual costs to comply with the standard and is the sum of annual operation and maintenance for controls plus annual amortized costs for the initial capital invested.

As a preliminary view into incremental costs for varying degrees of control, we have also attempted to make an initial incremental cost-effectiveness analysis from our study. If we assume that the Level II controls reduce site-wide $PM_{2.5}$ emissions by 40% and Level III controls reduce site-wide $PM_{2.5}$ by 70%, the projected cost per ton removed and incremental cost effectiveness are shown in the table below:

[1] TAC was estimated by applying a Capital Recovery Factor (CRF) for 15 years at 7% interest.

Table 4. Nationwide Average Costs per ton $PM_{2.5}$ Removed and Incremental Costs at Various NAAQS DVs[2]

Estimated Costs	$/ton Removed – National Average Costs				
	12 µg/m³	11 µg/m³	10 µg/m³	9 µg/m³	8 µg/m³
TCI - $/ton removed	$22,200	$298,800	$654,800	$823,400	$968,900
Incremental TCI - $/ton removed		$792,500	$1,197,500	$2,011,500	$2,231,700
TAC - $/ton removed	$12,300	$86,100	$177,900	$250,500	$321,600
Incremental TAC - $/ton removed		$217,800	$317,800	$762,500	$937,900

As expected, as the control levels required to meet the standard increase the cost per ton pollutant removed increases dramatically. The incremental costs for the industry rise along a steepening curve as the final selected DV becomes more stringent. We estimate that the costs per ton of $PM_{2.5}$ removed increases by an additional annualized cost amount of $217,000 per ton if the standard reduced by 1 µg/m³ from 12 to 11 µg/m³. Whereas the incremental costs rise to $937,900 per ton of $PM_{2.5}$ removed if the selected standard were lowered by 1 µg/m³ from 9 to 8 µg/m³.

ATTACHMENT

AISI List of Locations with Melting Operations at Expected NAAQS DVs

[2] Cost per ton removed based on nationwide estimate of sitewide $PM_{2.5}$ from facilities included in study and assumption of overall $PM_{2.5}$ reduced by various control levels defined in this memo. Incremental costs are estimated additional reductions nationwide divided by the difference in nationwide costs for each µg/m³ more stringent the proposed standard is.

AISI List of Locations with Melting Operations at Expected NAAQS DVs

Company	City	County	State	Furnace Type	Mapped Value by County (ug/m3)	Melt Capacity (stpy)	Proposed NAAQS Standard and Associated Control Level (ug/m3)				
							12	11	10	9	8
Alton Steel	Alton	Madison County	IL	EAF	10.2	800,000	Level II	Level II	Level III	Level III	Level III
Arkansas Steel Associates	Newport	Jackson County	AR	EAF	8.2	301,000	Level I	Level II	Level II	Level II	Level III
ATI Flat Rolled Products	Brackenridge	Allegheny County	PA	EAF	11.2	397,000	Level II	Level III	Level III	Level III	Level III
Carpenter Technology Corp.	Reading	Berks County	PA	EAF	8.3	450,000	Level I	Level II	Level II	Level II	Level III
Carpenter Technology Corp.	Latrobe	Westmoreland Cou	PA	EAF	11.2	56,000	Level II	Level III	Level III	Level III	Level III
Cascade Steel Rolling Mills	McMinnville	Yamhill County	OR	EAF	8.9	882,000	Level I	Level II	Level II	Level II	Level III
Charter Manufacturing	Cuyahoga Heights	Cuyahoga County	OH	EAF	9.5	650,000	Level II	Level II	Level II	Level III	Level III
Charter Manufacturing	Saukville	Ozaukee County	WI	EAF	9.4	600,000	Level II	Level II	Level II	Level III	Level III
Cleveland Cliffs, Inc.	Butler	Butler County	PA	EAF	11.2	849,000	Level II	Level III	Level III	Level III	Level III
Cleveland Cliffs, Inc.	Mansfield	Richland County	OH	EAF	8.1	601,000	Level I	Level II	Level II	Level II	Level III
Cleveland Cliffs, Inc.	Dearborn	Wayne County	MI	BOF	11.5	2,601,000	Level II	Level III	Level III	Level III	Level III
Cleveland Cliffs, Inc.	Middletown	Butler County	OH	BOF	11.0	2,701,000	Level II	Level II	Level III	Level III	Level III
Cleveland Cliffs, Inc.	Coatesville	Chester County	PA	EAF	9.4	880,000	Level II	Level II	Level II	Level III	Level III
Cleveland Cliffs, Inc.	Steelton	Dauphin County	PA	EAF	9.5	1,100,000	Level II	Level II	Level II	Level III	Level III
Cleveland Cliffs, Inc.	Chesterton	Porter County	IN	BOF	10.4	5,071,000	Level II	Level II	Level III	Level III	Level III
Cleveland Cliffs, Inc.	Cleveland	Cuyahoga County	OH	BOF	9.5	4,519,000	Level II	Level II	Level II	Level III	Level III
Cleveland Cliffs, Inc.	East Chicago	Lake County	IL	BOF	10.4	7,496,000	Level II	Level II	Level III	Level III	Level III
Cleveland Cliffs, Inc.	Riverdale	Cook County	IL	BOF	10.4	1,102,000	Level II	Level II	Level III	Level III	Level III
Commercial Metals Company	Birmingham	Jefferson County	AL	EAF	11.0	720,000	Level II	Level II	Level III	Level III	Level III
Commercial Metals Company	Cayce	Lexington County	SC	EAF	7.8	855,000	Level I	Level I	Level II	Level II	Level II
Commercial Metals Company	Durant	Bryan County	OK	EAF	8.7	397,000	Level I	Level II	Level II	Level II	Level III
Commercial Metals Company	Jacksonville	Duval County	FL	EAF	8.6	680,000	Level I	Level II	Level II	Level II	Level III
Commercial Metals Company	Knoxville	Knox County	TN	EAF	9.1	600,000	Level II	Level II	Level II	Level III	Level III
Commercial Metals Company	Mesa	Maricopa County	AZ	EAF	13.0	390,000	Level III	Level III	Level III	Level III	Level III
Commercial Metals Company	Sayreville	Middlesex County	NJ	EAF	9.0	720,000	Level II	Level II	Level II	Level II	Level III
Commercial Metals Company	Seguin	Guadalupe County	TX	EAF	8.7	1,039,000	Level I	Level II	Level II	Level II	Level III
Ellwood Group	New Castle	Lawrence County	PA	EAF	8.6	452,000	Level I	Level II	Level II	Level II	Level III
Ellwood Group	Irvine	Warren County	PA	EAF	6.9	150,000	Level I	Level I	Level I	Level II	Level II
EVRAZ North America	Pueblo	Pueblo County	CO	EAF	5.7	1,213,000	Level I	Level I	Level I	Level I	Level II
Finkl Steel	Chicago	Cook County	IL	EAF	10.4	632,000	Level II	Level II	Level III	Level III	Level III
Gerdau Long Steel North America	Cartersville	Bartow County	GA	EAF	9.6	1,020,000	Level II	Level II	Level II	Level III	Level III
Gerdau Long Steel North America	Charlotte	Mecklenburg Coun	NC	EAF	9.1	516,000	Level II	Level II	Level II	Level III	Level III
Gerdau Long Steel North America	Jackson	Madison County	TN	EAF	7.2	842,000	Level I	Level I	Level II	Level II	Level II
Gerdau Long Steel North America	Midlothian	Ellis County	TX	EAF	9.2	1,932,000	Level II	Level II	Level II	Level III	Level III
Gerdau Long Steel North America	Petersburg	Independent City	VA	EAF	7.8	1,064,000	Level I	Level I	Level II	Level II	Level II
Gerdau Long Steel North America	St. Paul	Ramsey County	MN	EAF	8.0	553,000	Level I	Level II	Level II	Level II	Level II
Gerdau Long Steel North America	Wilton	Muscatine County	IA	EAF	8.3	355,000	Level I	Level II	Level II	Level II	Level III
Gerdau Special Steel North America	Fort Smith	Sebastian County	AR	EAF	7.9	496,000	Level I	Level I	Level II	Level II	Level II
Gerdau Special Steel North America	Jackson	Jackson County	MI	EAF	8.2	150,000	Level I	Level II	Level II	Level II	Level III
Gerdau Special Steel North America	Monroe	Monroe County	MI	EAF	8.7	600,000	Level I	Level II	Level II	Level II	Level III
GKN Hoeganaes Corp.	Gallatin	Sumner County	TN	EAF	9.1	331,000	Level II	Level II	Level II	Level III	Level III
JSW USA Steel	Mingo Junction	Jefferson County	OH	EAF	9.1	1,653,000	Level II	Level II	Level II	Level III	Level III
Liberty Steel Georgetown (formerly A	Georgetown	Georgetown Count	SC	EAF	6.5	1,001,000	Level I	Level I	Level I	Level II	Level II
Liberty Steel Keystone	Peoria	Peoria County	IL	EAF	8.7	882,000	Level I	Level II	Level II	Level II	Level III
Mid American Steel & Wire	Madill	Marshall County	OK	EAF	8.6	300,000	Level I	Level II	Level II	Level II	Level III
NLMK Indiana	Portage	Porter County	IN	EAF	10.4	750,000	Level II	Level II	Level III	Level III	Level III
North America Stainless	Ghent	Carroll County	KY	EAF	8.4	1,764,000	Level I	Level II	Level II	Level II	Level III
North American Höganäs	Hollsopple	Somerset County	PA	EAF	7.0	176,000	Level I	Level I	Level II	Level II	Level II

Company	City	County	State	Furnace Type	Mapped Value by County (ug/m3)	Melt Capacity (stpy)	Proposed NAAQS Standard and Associated Control Level (ug/m3)				
							12	11	10	9	8
North Star BlueScope	Delta	Fulton County	OH	EAF	7.7	3,307,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Hickman	Mississippi County	AR	EAF	7.6	2,701,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Auburn	Cayuga County	NY	EAF	6.2	550,000	Level I	Level I	Level I	Level II	Level II
Nucor Steel	Huger	Berkeley County	SC	EAF	7.1	3,258,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Birmingham	Jefferson County	AL	EAF	11.0	500,000	Level II	Level II	Level III	Level III	Level III
Nucor Steel	Brandenburg	Meade County	KY	EAF	7.7	1,323,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Trinity (Decatur)	Morgan County	AL	EAF	7.3	2,756,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Frostproof	Polk County	FL	EAF	8.2	380,000	Level I	Level II	Level II	Level II	Level III
Nucor Steel	Ghent	Carroll County	KY	EAF	8.4	3,307,000	Level I	Level II	Level II	Level II	Level III
Nucor Steel	Cofield	Hertford County	NC	EAF	6.4	1,700,000	Level I	Level I	Level I	Level II	Level II
Nucor Steel	Crawfordsville	Montgomery Coun	IN	EAF	9.3	2,540,000	Level II	Level II	Level II	Level III	Level III
Nucor Steel	Jackson	Hinds County	MS	EAF	10.1	500,000	Level II	Level II	Level III	Level III	Level III
Nucor Steel	Bourbonnais	Kankakee County	IL	EAF	9.1	875,000	Level II	Level II	Level II	Level III	Level III
Nucor Steel	Longview	Gregg County	TX	EAF	9.6	121,000	Level II	Level II	Level II	Level III	Level III
Nucor Steel	Marion	Marion County	OH	EAF	7.9	408,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Memphis	Shelby County	TE	EAF	8.6	982,000	Level I	Level II	Level II	Level II	Level III
Nucor Steel	Norfolk	Madison County	NE	EAF	7.3	1,250,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Seattle	King County	WA	EAF	8.7	942,000	Level I	Level II	Level II	Level II	Level III
Nucor Steel	Sedalia	Pettis County	MO	EAF	6.9	380,000	Level I	Level I	Level I	Level II	Level II
Nucor Steel	Darlington	Darlington County	SC	EAF	7.3	1,000,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Jewett	Leon County	TX	EAF	9.6	1,102,000	Level II	Level II	Level II	Level III	Level III
Nucor Steel	Tuscaloosa	Tuscaloosa County	AL	EAF	7.7	1,323,000	Level I	Level I	Level II	Level II	Level II
Nucor Steel	Plymouth	Box Elder County	UT	EAF	7.0	1,202,000	Level I	Level I	Level II	Level II	Level II
Nucor-Yamato Steel Co.	Blytheville	Mississippi County	AR	EAF	7.6	2,901,000	Level I	Level I	Level II	Level II	Level II
Optimus Steel Llc.	Beaumont	Jefferson County	TX	EAF	8.3	772,000	Level I	Level II	Level II	Level II	Level III
Outokumpu	Axis	Mobile County	AL	EAF	8.0	1,102,000	Level I	Level II	Level II	Level II	Level II
Republic Steel	Canton	Stark County	OH	EAF	9.5	904,000	Level II	Level II	Level II	Level III	Level III
SSAB Americas	Axis	Mobile County	AL	EAF	8.0	1,497,000	Level I	Level II	Level II	Level II	Level II
SSAB Americas	Montpelier	Muscatine County	IA	EAF	8.3	1,316,000	Level I	Level II	Level II	Level II	Level III
Standard Steel – Burnham	Burnham	Mifflin County	PA	EAF	8.2	230,000	Level I	Level II	Level II	Level II	Level III
Steel Dynamics Inc.	Pittsboro	Hendricks County	IN	EAF	12.0	799,000	Level II	Level III	Level III	Level III	Level III
Steel Dynamics Inc.	Butler	DeKalb County	IN	EAF	7.8	3,197,000	Level I	Level I	Level II	Level II	Level II
Steel Dynamics Inc.	Columbus	Lowndes County	MS	EAF	7.9	3,417,000	Level I	Level I	Level II	Level II	Level II
Steel Dynamics Inc.	Roanoke	Independent City	VA	EAF	7.8	650,000	Level I	Level I	Level II	Level II	Level II
Steel Dynamics Inc.	Huntington	Cabell County	WV	EAF	7.9	292,000	Level I	Level I	Level II	Level II	Level II
Steel Dynamics Inc.	Columbia City	Whitley County	IN	EAF	8.0	2,205,000	Level I	Level II	Level II	Level II	Level II
Steel Dynamics Inc.	Sinton	San Patricio Coun	TX	EAF	8.6	3,527,000	Level I	Level II	Level II	Level II	Level III
Sterling Steel Co. LLC	Sterling	Whiteside County	IL	EAF	8.4	1,202,000	Level I	Level II	Level II	Level II	Level III
TimkenSteel	Canton	Stark County	OH	EAF	9.5	2,127,000	Level II	Level II	Level II	Level III	Level III
TMK IPSCO	Beaver Falls	Beaver County	PA	EAF	11.2	496,000	Level II	Level III	Level III	Level III	Level III
United States Steel Corporation	Osceola	Mississippi County	AR	EAF	7.6	3,307,000	Level I	Level I	Level II	Level II	Level II
United States Steel Corporation	Fairfield	Jefferson County	AL	EAF	11.0	1,598,000	Level II	Level II	Level III	Level III	Level III
United States Steel Corporation	Gary	Lake County	IN	BOF	10.4	8,730,000	Level II	Level II	Level III	Level III	Level III
United States Steel Corporation	Granite City	Madison County	IL	BOF	10.2	3,000,000	Level II	Level II	Level III	Level III	Level III
United States Steel Corporation	Ecorse	Wayne County	MI	BOF	11.5	3,902,000	Level II	Level III	Level III	Level III	Level III
United States Steel Corporation	Braddock	Allegheny County	PA	BOF	11.2	2,961,000	Level II	Level III	Level III	Level III	Level III
Universal Stainless & Alloy Products	Bridgeville	Allegheny County	PA	EAF	11.2	105,000	Level II	Level III	Level III	Level III	Level III
Vallourec Star	Youngstown	Mahoning County	OH	EAF	7.4	799,000	Level I	Level I	Level II	Level II	Level II
Vinton Steel LLC	Vinton City	El Paso County	TX	EAF	8.9	300,000	Level I	Level II	Level II	Level II	Level III

APPENDIX B

AAPCA November 23, 2022, Letter Addressing Particulate Matter Monitoring Method Comparability

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AAPCA THE ASSOCIATION OF AIR POLLUTION CONTROL AGENCIES

November 23, 2022

Mr. Peter Tsirigotis
Director, Office of Air Quality Planning and Standards (OAQPS)
Office of Air and Radiation (OAR)
U.S. Environmental Protection Agency (EPA)
109 T.W. Alexander Drive
Durham, NC 27709

Subject: Addressing particulate matter monitoring method comparability

Dear Director Tsirigotis:

This letter is to transmit from the Association of Air Pollution Control Agencies (AAPCA)[1] considerations for improving data comparability between federal reference methods (FRM) and federal equivalent methods (FEM)[2] for ambient air monitoring of particulate matter (PM). The U.S. Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards (OAQPS) recognizes the need to address comparability issues between FRMs and FEMs as well as to mitigate challenges for future PM National Ambient Air Quality Standards (NAAQS) attainment designations. State and local air agencies[3] are co-regulators under the federal Clean Air Act (CAA) with important on-the-ground expertise, including serving as primary monitoring entities for the NAAQS.

State and local agencies rely on U.S. EPA Office of Research and Development's (ORD) designation of an instrument as "equivalent" to an FRM, which is generally the sole assurance of comparable performance.[4] The current generation of FEM continuous monitors for fine particulate matter ($PM_{2.5}$) started being deployed nationwide in 2008,[5] and these monitors have increasingly been installed to replace aging monitoring infrastructure. Alongside advancements in AirNow, more agencies have acquired FEMs to also collect real-time data for Air Quality Index (AQI) monitoring purposes. When distributing American Rescue Plan (ARP) funding to agencies for air quality monitoring,[6] U.S. EPA further prioritized the transition to continuous monitoring for $PM_{2.5}$ from filter-based methods. AAPCA observes that air agencies are evaluating trends in data quality primarily from two approved methods[7] that make

[1] AAPCA is a national, non-profit, consensus-driven organization focused on assisting state and local air quality agencies and personnel with implementation and technical issues associated with the federal Clean Air Act. Created in 2012, AAPCA represents 48 state and local air pollution control agencies, and senior officials from 21 state environmental agencies currently sit on the AAPCA Board of Directors. AAPCA is housed in Lexington, Kentucky as an affiliate of The Council of State Governments. More about AAPCA is at: www.cleanairact.org.
[2] Methods for measuring ambient concentrations of specified air pollutants have been designated as "reference methods" or "equivalent methods" in accordance with 40 CFR Part 53. See U.S. EPA, "List of Designated Reference and Equivalent Methods," June 15, 2022.
[3] AAPCA, *State Air Trends & Successes: The StATS Report*, April 19, 2022.
[4] See 40 CFR Part 53 Subpart C – Procedures for Determining Comparability Between Candidate Methods and Reference Methods.
[5] U.S. EPA, "Ambient Air Monitoring and NAAQS Overview," August 23, 2022.
[6] EPA is distributing $22.5 million in direct awards under the ARP to state, tribal and local air agencies for criteria pollutant monitoring.
[7] The Met One BAM 1020 and 1022 utilize beta-attenuation and the Teledyne API T640 and T640x utilize light scattering for measurement.

up a significant majority of the $PM_{2.5}$ continuous FEM monitors currently in use. Critically and despite limited resources, agencies have maintained FRM monitors to meet collocation requirements and in response to known concerns over meaningful differences observed in the data collected from collocated FRM and FEM monitors.

U.S. EPA should incorporate insight from air agencies operating FEMs in the development of future guidance, policies, and rulemaking for the national monitoring network and PM NAAQS. Recent U.S. EPA presentations[8] have detailed demonstrated FRM/FEM comparability issues that are meaningfully significant in terms of monitoring air quality for public health and could have direct impacts on area designations and/or attainment status under the $PM_{2.5}$ NAAQS. AAPCA has identified several considerations for mitigating these challenges, which are summarized below with key concerns from air agencies as well as research from federal, state, and local partners.

Consider the use of correction factors developed for collocated FRMs and FEMs.
U.S. EPA's NCore Network[9] provides an example of the FRM/FEM comparability issues air agencies across the United States are experiencing. Using 10 years (2011 – 2020) of NCore data to analyze long-term trends and evaluate instrumentation using multipollutant measurements, U.S. EPA found that "the $PM_{2.5}$ FEM-FRM comparability throughout the NCore network depends on FEM type."[10] For instance, beta-attenuation FEMs generally exhibited low bias compared to FRMs throughout the NCore Network. Conversely, light scattering FEMs generally overpredicted FRM mass throughout the national monitoring network, and overpredictions were increasingly large during periods indicative of wildfire smoke. In this case, U.S. EPA's analysis to optimize data quality suggested that a correction factor might effectively improve comparability.

AAPCA recommends that when considering the application of a correction factor to data from collocated FRM/FEM PM samplers, U.S. EPA should allow state and local air agencies adequate flexibility in the development, use, and documentation of data adjustments. Air agencies can utilize collocated FRMs and FEMs within their own networks to develop location-specific adjustments; having the flexibility to account for geographic differences in the development of a correction factor may result in better FRM/FEM comparability and data quality. Furthermore, allowing flexibility regarding the scale and application of a correction factor might help to address regional differences in ambient air monitoring. For example, a broad regional adjustment could improve data quality from FEMs that are not collocated with FRMs; likewise, an adjustment developed for better performance during wildfire smoke or high dust events may be applicable for some, not all, of the regulatory monitoring network.

Grant state and local air agencies additional time and flexibility to evaluate FEMs.
State and local ambient air monitoring programs would benefit from additional flexibility and clarity when evaluating the performance and data quality from FEMs in their networks. Agencies using U.S. EPA's $PM_{2.5}$ Continuous Monitor Comparability Assessment[11] find that evaluated FEMs may pass the assessment initially but fail in consecutive years, underscoring this need.[12] Additional assessment tool

[8] See presentations from EPA's National Ambient Air Monitoring Conference (August 22 – 25, 2022) and AAPCA's 2022 Fall Business Meeting (September 28 – 30, 2022).
[9] More information about the National Core (NCore) multipollutant monitoring network is available here.
[10] U.S. EPA, "10 Years, 2011-2020, of the NCore Network: $PM_{2.5}$ FEMs vs FRMs," August 24, 2022.
[11] U.S. EPA, "Technical Note – $PM_{2.5}$ Continuous Monitor Comparability Assessment," updated May 18, 2018.
[12] South Coast AQMD, "Continuous $PM_{2.5}$ Road to Transition," August 24, 2022.

guidance for evaluating monitor comparability within networks may be appropriate. Continued consideration of special purpose monitor (SPM)[13] designations and related flexibilities are also an effective tool to help state and local agencies evaluate FEM performance.

Additionally, AAPCA members request that U.S. EPA allow an adequate period for agencies to evaluate forthcoming adjustments once applied. For example, the Teledyne Model T640 particulate instrument specifications state that the monitor's mass concentration accuracy "Exceeds US EPA PM_{10} FEM and Class III FEM $PM_{2.5}$ performance requirements for additive and multiplicative bias compared to FRM samplers"[14] and a firmware update with a data correction factor is expected. The potential impact of a network-wide firmware adjustment on the computation of design values,[15] which represent a three-year average and are used to designate and classify nonattainment areas as well as to assess progress towards meeting the PM NAAQS, is of critical concern for agencies operating Teledyne T640 instruments for regulatory monitoring. The Association urges U.S. EPA to prioritize flexibility and clarity for monitoring entities using and evaluating Teledyne's expected firmware update in any EPA policy memoranda, technical guidance, or rulemaking.

Appropriately qualify data for inclusion/exclusion in PM NAAQS attainment designations.
Given that in certain instances FEMs can result in annual and 24-hour design values that are meaningfully higher than the design values from collocated FRMs,[16] air agencies are concerned about biased design values leading to erroneous PM NAAQS attainment designations.[17] U.S. EPA has indicated that the final rule revising the $PM_{2.5}$ NAAQS will be issued in March 2023.[18] If U.S. EPA's final rule tightens either the primary or secondary NAAQS for $PM_{2.5}$, then within *one year* states and tribes will submit attainment recommendations to EPA using available air quality monitoring data. Following within *two years* after setting a new or revised NAAQS, "EPA must identify or 'designate' areas as meeting (attainment areas) or not meeting (nonattainment areas), the standards. Designations are based on the most recent set of air monitoring or modeling data characterizing an area."[19] During this process, AAPCA members anticipate distinct challenges associated with considering the available data from FEMs that may be affected by poor comparability as part of $PM_{2.5}$ NAAQS attainment recommendations and designations.

The Association emphasizes the importance of U.S. EPA working with state and local co-regulators to evaluate air quality monitoring data prior to issuing a final designation on whether an area is meeting a revised standard. U.S. EPA should prioritize feedback from air agencies regarding the handling of historical data impacted by instrument bias and grant agencies appropriate authority to correct, qualify, or exclude affected data, and properly document, before it is used to inform attainment designations. For example, U.S. EPA could allow states the option to apply the forthcoming Teledyne firmware update to previously certified $PM_{2.5}$ measurements; additionally, EPA could support streamlined processes for air agencies to flag potentially biased FEM or FRM data with, and provide evidence of, known quality

[13] See 40 CFR Part 58 Subpart C – Special Purpose Monitors.
[14] Teledyne Model T640 particulate instrument specifications are available here.
[15] EPA defines a design value as "a statistic that describes the air quality status of a given location relative to the level of the National Ambient Air Quality Standards (NAAQS)."
[16] South Coast AQMD, "Continuous $PM_{2.5}$ Road to Transition," August 24, 2022.
[17] More information on EPA's NAAQS Designations Process is available here.
[18] See EPA's *Spring 2022 Unified Agenda of Regulatory and Deregulatory Actions*, released June 21, 2022.
[19] See NAAQS Implementation Process.

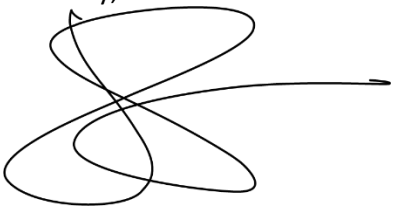
issues. Changes to design values after data certification and publication are precedented[20] and intended to result in the best available information for use in attainment determinations.

Utilize state and local air agency expertise to direct enhanced air quality monitoring activities. AAPCA appreciates that U.S. EPA has begun working with state, local, and tribal air agencies to implement two priority recommendations made by the U.S. Government Accountability Office (GAO) for the Agency to (1) establish an asset management framework for the monitoring system that includes key characteristics and (2) develop an air quality monitoring modernization plan that aligns with leading practices.[21] U.S. EPA OAR states in its final Fiscal Years 2023–2024 National Program Guidance (NPG) that "expected air agency activities" will support U.S. EPA in developing an asset management framework and ambient monitoring modernization plan in response to the GAO's findings.[22] Early and collaborative engagement with state and local air agencies will bring important expertise to the development of an asset management framework and modernization plan for the national monitoring network.

AAPCA further appreciates U.S. EPA maintaining the granting authority for $PM_{2.5}$ monitoring under Clean Air Act Section 103, as indicated by the Agency's removal of the request to transfer $PM_{2.5}$ monitoring from Section 103 to Section 105 in the FY 2023 NPG Monitoring Appendix.[23] Distributing funds for $PM_{2.5}$ monitoring under Section 103 of the Clean Air Act allows state and local agencies to best allocate resources for air quality planning and programs, whereas distributing funds under Section 105 could adversely impact state and local air agency budgets by requiring a match of up to 40 percent.

Thank you for considering the Association's comments on improving PM monitoring method comparability. AAPCA's state and local agency members look forward to working with U.S. EPA and the EPA Regional Offices in administering the national ambient air monitoring network. If you have any questions, please contact Mr. Jason Sloan, Executive Director, at jsloan@csg.org or (859) 244-8043.

Sincerely,



Jason E. Sloan
Executive Director, AAPCA

cc: Mr. Richard Wayland, EPA OAQPS
Mr. Scott Mathias, EPA OAQPS

[20] See a variety of reasons design values can change after the date of publication from U.S. EPA here.
[21] U.S. Government Accountability Office, *Air Pollution: Opportunities to Better Sustain and Modernize the National Air Quality Monitoring System*, November 12, 2020.
[22] U.S. EPA, "Office of Air and Radiation Final (OAR) FY 2023-2024 National Program Guidance," August 26, 2022.
[23] AAPCA's comments to U.S. EPA OAR for the Draft FY 2023 – 2024 NPG are available here. Response to Comments and Final FY 2023 – 2024 OAR NPG (August 26, 2022) are available here.