



October 10, 2011

Docket ID No. EPA-HQ-OAR-2007-1145  
Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

RE: Proposal regarding secondary standards for NOx and SOx, 76 Fed. Reg. 46084 (8-1-2011),  
Docket ID No. EPA-HQ-OAR-2007-1145

We have the following comments on the above-referenced proposal regarding secondary national ambient air quality standards (NAAQS) for oxides of nitrogen and sulfur (collectively, “NOx and SOx”). These comments are submitted on behalf of the Appalachian Mountain Club, National Parks Conservation Association, Sierra Club and Clean Air Council.

## Introduction

EPA’s proposal to do nothing to strengthen the secondary standards for NOx and SOx beyond protections provided by current standards is unlawful, arbitrary, and irresponsible. The agency acknowledges, as it must, that current standards for these pollutants are not requisite to protect public welfare. The agency’s Policy Assessment (PA), Integrated Science Assessment (ISA), and notice of proposed rulemaking (NPRM) all find that many of the nation’s rivers and lakes suffer significant harm due to acid deposition linked to NOx and SOx air pollution. In the Adirondacks, for example, trout are missing from 44% of evaluated lakes due to acidification. In the Shenandoah area, 85% of streams have chronic acidity impacting fisheries. Other waters at high risk include those in northern Appalachians, the mountainous West, and the upper Midwest. EPA staff, the Clean Air Scientific Advisory Committee (CASAC), and the National Park Service have all found that current standards for NOx and SOx do not adequately protect against acid deposition and other environmental harms.

The time has clearly come for stronger welfare-based standards to protect our rivers and lakes from the devastation caused by acid rain, and to protect terrestrial ecosystems from deposition-related acidification and nutrification damage. The proposal itself acknowledges this need. But instead of setting national ambient air quality standards requisite to prevent the severe harms of NOx and SOx deposition to public welfare, EPA proposes to allow those adverse effects to continue. That approach flagrantly violates the Clean Air Act (the Act) and arbitrarily abdicates EPA’s responsibility under that law.

### 1. Secondary Standard Must Protect Against Any Adverse Effects on Public Welfare

The Clean Air Act instructs the Administrator to set national secondary standards that are “requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such pollutant in the ambient air.” 42 U.S.C. § 7409(b); *see also* S. Rep. 101-228, 101<sup>st</sup> Cong., 1<sup>st</sup> Sess at 81 (1989) (“Where an environmental harm would occur at ambient concentrations below the level which is protective of human health, more stringent

secondary standards are to be promulgated.”). Welfare effects, in turn, are expansively defined and EPA must consider the full range of welfare effects resulting from NOx and SOx, including “effects on soils, water, crops, vegetation...animals, wildlife...and on personal comfort and well-being.” 42 U.S.C. §7602(h). The NPRM correctly notes based on extensive evidence in the record that adverse welfare effects of NOx and SOx include harmful acidification and nutrification of rivers, lakes, and terrestrial ecosystems.

EPA must set the secondary standards at a level requisite to protect public welfare “from any known or anticipated adverse effects associated with the presence” of NOx and SOx in the ambient air. Id. §7409(b)(2). EPA may not consider implementation costs in setting the secondary standard. *Whitman v. American Trucking Assn's*, 531 U.S. 457, 471 n.3 (2001). Further, EPA cannot meet its responsibility under the Act by simply making the secondary NAAQS identical to the primary NAAQS absent a well-supported determination that the primary NAAQS are requisite to protect public welfare. *American Farm Bureau Federation v. EPA*, 559 F.3d 512, 528-31 (D.C. Cir. 2009).

2. *EPA must adopt more protective secondary standards for NOx and SOx because the existing standards for those pollutants are not requisite to protect public welfare*

The NPRM correctly finds that the existing secondary standards for NOx and SOx are not requisite to protect public welfare from those pollutants. That finding is well supported by the evidence and findings in the ISA, PA, CASAC letters, Risk/Exposure Assessment (REA), and the NPRM itself. For example, as noted in the NPRM, “[t]he ISA, REA, and PA all conclude that the current standards are not adequate to protect against the adverse impacts of aquatic acidification on sensitive ecosystems.” 76 Fed. Reg. at 46108. The REA “concludes that there is significant risk to sensitive terrestrial ecosystems from acidification at atmospheric concentrations of NO<sub>2</sub> and SO<sub>2</sub> at or below the current standards.” Id. The REA also concludes that the current standards “are not adequate to protect against anticipated adverse impacts from N nutrient enrichment in sensitive ecosystems.” Id. 46109. CASAC concluded that “[t]he levels of the current NOx and SOx secondary NAAQS are not sufficient, nor the forms of those standard appropriate, to protect against adverse depositional effects; thus a revised NAAQS is warranted.” Id. 46110. Based on these findings and evidence on which they are based, the NPRM concludes that “the current NO<sub>2</sub> and SO<sub>2</sub> secondary standards are not adequate to provide appropriate protection against deposition-related effects associated with oxides of nitrogen and sulfur.” Id. There is further no question, based on the record and findings in the above-referenced documents, that the depositional effects caused by NOx and SOx air pollution are adverse effects on public welfare within the meaning of section 109 of the Act.

Given the clear evidence and findings that the currents standards do not provide requisite protection against adverse public welfare effects, EPA must adopt more protective standards that provide requisite protection. EPA does not have the option of simply continuing the status quo level of protection, as it proposes in the NPRM.<sup>1</sup> The language of the Act is unambiguous on

---

<sup>1</sup> EPA is proposing to retain the existing secondary standards for NO<sub>2</sub> and SO<sub>2</sub>, and to set secondary standards identical to the primary NO<sub>2</sub> and SO<sub>2</sub> NAAQS. This approach provides no additional protection beyond already-existing standards.

this score: “Any national secondary ambient air quality standard . . . shall specify a level of air quality the attainment and maintenance of which in the judgment of the Administrator . . . is requisite to protect the public welfare from any known or anticipated adverse effects associated with the presence of such air pollutant in the ambient air.” CAA §109(b)(2) (emphasis added). See also id. §109(d)(1)(requiring any revision of the NAAQS to be “in accordance” with §109(b)). Given that EPA itself concedes that the secondary standards it proposes are not in fact requisite to protect the public welfare from any known or anticipated adverse effects, and given that the record compels such a finding, the agency cannot satisfy its duty under §109 by adopting those standards. Instead, EPA must adopt standards that “specify a level of air quality” that is “requisite to protect public welfare from any known or anticipated adverse effects.”

EPA cannot evade this duty by citing alleged uncertainties or data gaps that it claims make selection of the required standard difficult. The statute does not limit EPA’s standard-setting duty – that is, its duty to set NAAQS requisite to protect public welfare - to situations where information is perfect, data complete, and uncertainties limited. Rather, EPA must use its best judgment to specify, based on the Air Quality Criteria, CASAC advice, and its review of the relevant factors, a standard that meet the statutory mandate. It cannot lawfully refuse to identify a level of protection that is requisite to protect public welfare, and instead adopt (or retain) standards it knows are not adequate to protect public welfare. *American Farm Bur.*, 559 F.3d at 530-31. See also, e.g., *Coalition of Battery Recyclers Assn v. EPA*, 604 F.3d 613, 621 (D.C. Cir. 2010)(in face of uncertainty, EPA must use its judgment to meet the statutory mandate to set standards); *Public Citizen v. FMCSA*, 374 F.3d 1209, 1221 (D.C. Cir. 2004)(in face of uncertainty, agency must “exercise its expertise to make tough choices about which of the competing estimates is most plausible, and to hazard a guess as to which is correct, even if ...the estimate will be imprecise”).

For all the foregoing reasons, the proposal in the NPRM violates the Clean Air Act. EPA must adopt more protective secondary NAAQS for NOx and SOx that are requisite to protect the public welfare from any known or anticipated adverse effects. Further, EPA’s failure to establish any target levels that agency has determined to provide requisite protection for aquatic and terrestrial ecosystems against the adverse welfare effects of NOx and SOX-related deposition deprives the agency’s proposal of any reasoned basis.

*3. The secondary standard developed in the PA, a combined NOx/SOx standard that links ambient air quality to an ecosystem indicator, is appropriate, founded in science, and necessary for protection of public welfare*

In the PA, EPA staff have developed a new approach for a combined NOx/SOx standard to protect rivers and lakes from acid deposition. The use of a multi-pollutant standard is practical and necessary for protecting surface waters from acidification where both of these pollutants are the major contributors. The standard would be set in the form of an aquatic acidification index (AAI), a measure of the acid neutralizing or buffering capacity of rivers and lakes. This new approach is warranted as an ecologically relevant standard where the environmental indicator is linked with the ambient concentrations of NOx and SOx. Unlike traditional clean air standards, a higher AAI is more protective than a lower one because it

reflects greater protection from acidification. Acid deposition from NOx and SOx pollution lowers the ability of rivers and lakes to neutralize acid, so higher levels of NOx and SOx air pollution translate into a lower actual AAI. EPA staff has recommended an AAI standard in the range of 20 (least protective) to 75 (most protective) ueq/L (microequivalents per liter), to be achieved as a 3 to 5 year average. The stringency of the standard will also be affected by the percentage of waters sought to be protected in each region. Staff has recommended consideration of a range from 70<sup>th</sup> percentile (least protective) to 90<sup>th</sup> percentile (most protective) for this purpose. CASAC and the National Park Service have both advised EPA that the AAI standard developed in the PA is a sound and meritorious approach to providing requisite protection of public welfare from the adverse effects of acid deposition due to NOx and SOx air pollution.

#### *4. EPA's reliance on uncertainty as a grounds for failing to propose protective standards is irrational, arbitrary, and legally flawed*

The NPRM agrees that there is a “strong scientific basis” for the AAI standard. It further recognizes that the AAI standard addresses the combined effects of deposition from NOx and SOx, takes into account relevant variations in different parts of the country, and is well grounded in the science. Further, the NPRM highlights some key findings of the PA demonstrating that the AAI performs well in identifying areas known to have adverse aquatic acidification effects based on an assessment conducted to look at alternative levels and forms. “These results reflect the first application of a nationwide model that integrates water quality and atmospheric processes at a national scale and provides findings that are consistent with our basic understanding of the extent of aquatic acidification across the U.S. What is particularly noteworthy is that this model is not initialized with a starting ANC based on water quality data, which likely would result in a reproduction of water quality observations. Rather, this standard reflects the potential of the changes in atmospheric concentrations of NOy and SOx to induce long-term sustained changes in surface water systems. *The fact that the patterns of adversity based on applying this standard are commensurate with what is observed in surface water systems provides confidence in the basic underlying formulation of the standard.*” 76 Fed. Reg. at 46129 (emphasis added). Nonetheless, EPA refuses to propose adoption of the AAI standard because, the agency asserts, there are uncertainties in determining the actual degree of protection that would be afforded in different areas of the nation by any specific target ANC level and percentile of water bodies that would be chosen. EPA claims that these uncertainties “are of such nature and magnitude that there is no reasoned way to choose” specific nationwide target ANC levels or percentiles of water bodies.” 76 Fed. Reg. at 46134-35. As further explained below, this rationale is based on legally flawed assumptions and arbitrary analysis.

First, as noted above, uncertainty cannot provide a lawful basis for adopting NAAQS that are not requisite to protect public welfare, or for failing to adopt NAAQS that do provide the requisite protection.

Second, EPA bases its uncertainty rationale on a misreading of the Supreme Court’s statement in *Whitman* that NAAQS should be no more or less stringent than necessary. The Court did not hold, as EPA seems to suggest, that the agency is foreclosed from setting a standard unless it can identify with mathematical precision a “perfect” standard level that is free

from any noteworthy uncertainty. To the contrary, the Court recognized that uncertainties often inhere in the standard setting process, and that in such cases the statute requires EPA to exercise its judgment to set the appropriate standard. 531 U.S. at 474 (“[W]e have never demanded . . . that statutes provide a “determinate criterion” for saying “how much [of the regulated harm] is too much. . . [O]zone and particulate matter are ‘nonthreshold’ pollutants that inflict a continuum of adverse health effects at any airborne concentration greater than zero, and hence require the EPA to make judgments of degree. ‘[A] certain degree of discretion, and thus of lawmaking, inheres in most executive or judicial action.’”) (citations omitted).

Third, neither the PA nor the CASAC review support EPA’s claim that uncertainties are so great as to render the AAI standard arbitrary or irrational. To the contrary, the PA concluded that “the confidence level in the information and processes associated with the linkages from ecological effects to atmospheric conditions through deposition and ecosystem modeling is very high.” PA at 7-67. Specifically addressing the Administrator’s concern as to the quantification of various elements of the AAI, the PA found that the AAI equation performed well in a cumulative analysis of uncertainty, with the mean value of results being “very close” to the observed values in the two regions analyzed. Id. 7-68. It also found that there was “no apparent directional bias in the certainty regarding the biological, chemical and physical processes incorporated in the AAI.” Id. 7-69. Of particular significance is the PA summary of the assessment of the alternative standards, 76 Fed. Reg. at 46129-30, discussed above, that touts the confidence in the formulation of the standard. The PA recognizes that selection from among alternative standards will necessarily reflect consideration of the uncertainties inherent in the relevant evidence and in the quantitative impact assessment of exposure and risks to sensitive ecosystems, but nowhere does it suggest that this task cannot be reasonably accomplished. Indeed, the PA goes on to propose specific ranges for the level of the standard, and discusses in detail various criteria to weigh in selecting a standard within that range. PA 7-78 to -80. This analysis refutes the NPRM’s claim that there is “no reasoned way” to choose a specific nationwide target ANC level or percentile of water bodies. Likewise, the PA does not support the NPRM’s claim that data gaps are so great as to preclude reasoned selection of a standard here. The PA itself nowhere states, but to the contrary finds the data sufficient to make reasoned judgments about the likely performance of the AAI standard. The NPRM cites no technical analysis and provides none of its own evidence supporting its bare assertions to the contrary (at 46134-35), and therefore those assertions are arbitrary. Nor does the NPRM explain why the uncertainties it cites are so substantial and material as to render the AAI standard irrational and unusable.

Likewise, CASAC found the facts and analysis sufficient to support the AAI standard, and did not (as EPA misleadingly implies) find that uncertainties were so great as to militate against moving forward with that standard. CASAC found that the PA was “appropriate for use in determining a secondary standard to help protect aquatic ecosystems from acidifying deposition of oxides of sulfur and nitrogen,” and that EPA staff had done “a commendable job” in developing the AAI approach. CASAC letter of May 17, 2011 to Administrator Lisa Jackson at 2 (CASAC Ltr). CASAC expressly supported the potential choices/ranges presented by EPA staff on the indicators, form, averaging time, and level that should be considered for a secondary NOx-SOx NAAQS. Id. While CASAC identified areas for improvement in future work, overall it found that the PA provided relevant scientific information needed for a revision of the

standards. CASAC plainly did not share the view expressed by EPA for the first time in the NPRM that uncertainties were too great to make a reasoned assessment of the level of protection that the AAI standard would provide in different regions. According to CASAC, when the percentile ranges are combined with alternative levels within the staff-recommended ANC range of 20 to 75 microequivalents per liter (ueq/L), “the results using the AAI point to the ecoregions across the country that would be expected to require additional protection from acidifying deposition.” Id. 9. CASAC further found that “[r]easonable choices were made [in the PA] in developing the form” of the AAI standard, and that the PA’s “combined recommendations provide the Administrator with a broad but reasonable range of minimally to substantially protective options for the standard.” Id. CASAC specifically agreed with EPA staff’s recommendation that the level of the AAI standards should be within the range of 20 and 75 ueq/L. Id at 10. Although CASAC did identify some uncertainties and potential areas for improvement, these were labeled as “residual” concerns, or matters that could be addressed either within the context of the AAI approach or in future research after implementation of the AAI standard began.

The National Park Service, which manages parks in a wide range of ecosystem types and locations, likewise found that the staff’s proposed AAI approach was “scientifically sound and that available information on ecosystems, atmospheric processes, and deposition are sufficient to apply this approach national to protect acid-sensitive aquatic ecosystems.” Letter of March 26, 2010, from Christine L. Shaver, National Park Service, to Kyndall Barry, Science Advisory Board at 3.

The NPRM does not and cannot offer a reasoned explanation for rejecting the PA CASAC, and Park Service recommendations. The mere fact that there are some uncertainties, and that data for some regions is less complete than others, hardly shows that reasoned judgments cannot be made in choosing the level and percentile numbers for an AAI standard. Both the PA and CASAC identified reasonable factors to guide those choices, and EPA fails to provide a reasoned basis for concluding that those factors are insufficient to support rational decision-making. No where does EPA offer a rational explanation as to why the uncertainties it identifies are of such a magnitude as to preclude setting any AAI or other ecologically relevant standard at all, or consider ways in which uncertainties could be accounted for in selecting the target ANC and percentile levels. In reality, no rational explanation exists.

The NPRM’s rationale is also arbitrary because it is flatly inconsistent with EPA’s approach in adopting other NAAQS. For example, EPA did not allow inadequacies in monitoring data to derail revised primary NAAQS for NO<sub>2</sub> or SO<sub>2</sub> (in 2010) despite the fact that large portions of the nation are without any monitors at all for these pollutants, and despite the lack of monitoring data to describe spatial variability of these pollutants in the West.

Finally, the outcome of EPA’s proposed approach here is irrational in the extreme. In essence, the agency is asserting that because data gaps might in some cases make the AAI approach somewhat conservatively biased, the remedy is to provide no additional protection at all, even in the most extreme cases. For example, EPA has found that ANC levels of less than 0 ueq/ result in complete loss of fish populations; 0-20 ueq/L can result in fish kills and sharp declines in zooplankton, and 20-50 ueq/L results in a great reduction in fish species (i.e., more

than half of expected species can be missing). 76 Fed. Reg. 46094. To allow such extreme adverse welfare impacts to occur flagrantly violates the mandate in section 109 of the Act. Even if the AAI approach developed by staff is in some cases conservatively biased (and we do not concede this is the case), that bias can hardly justify allowing air pollution levels that are so high as to produce fish kills or significant species reductions.

*5. The proposal to adopt the revised primary NO<sub>2</sub> and SO<sub>2</sub> NAAQS as secondary NAAQS is illegal and arbitrary*

Given the findings in the PA, CASAC analysis, and the NPRM itself that current standards are not requisite to protect public welfare as required by section 109 of the Act, EPA cannot possibly fulfill its legal duties under section 109(b)(2) by merely setting the secondary standards for NO<sub>x</sub> and SO<sub>x</sub> at the same level as the primary standards. As discussed above, the record plainly does not support a finding that the primary standards alone are requisite to protect public welfare as required by that subsection. EPA does not claim otherwise, nor does it provide a reasoned explanation for concluding otherwise. The agency asserts that setting the secondary standards at the same levels as the primary will “directionally provide some degree of additional protection” for public welfare, but that finding does not satisfy the statutory mandate, which requires the secondary standards to “protect the public welfare from *any* known or anticipated adverse effects,” not merely provide “some” additional protection. Further, establishing secondary standards identical in form and level to the primary standards is arbitrary given that EPA concedes that such standards are neither ecologically relevant nor sufficient to protect against adverse welfare effects.

*6. EPA must set the AAI and percentiles at the most protective ends of the ranges recommended in the PA and endorsed by CASAC*

Because the secondary standards must protect against any known or anticipated adverse affects on public welfare, EPA must set the AAI index at least at the most protective end of the range recommended in the PA – that is, at 75 ueq/l. As noted by the National Park Service (letter to SAB of 3-26-10), the ‘ISA and REA clearly show that biota are generally not harmed at ANC values greater than 100 ueq/l, whereas at ANC values below 100 ueq/l, fish fitness and community diversity begin to decline. The Park Service’s comments to CASAC of February 10, 2011 further cite evidence of adverse impacts as ANC decreases below 100 ueq/l, noting in particular information that the number of fish species in Shenandoah National Park decreased significantly below an ANC of 100 ueq/l. Indeed, these considerations would support setting the AAI at a level of 100 ueq/l – i.e., even higher than the top end of the PA range, and indeed the Park Service comments so state. EPA must also set the percentile of critical loads to protect at the 95<sup>th</sup> percentile, as recommended by the Park Service’s 2-10-11 comments to CASAC. As noted in those comments, a critical load to protect the 70th percentile would not protect very sensitive lakes in places like Rocky Mountain National Park, while a 95<sup>th</sup> percentile would provide protection to “that population of sensitive lakes that are often found in our most prized and endangered national parks and wilderness areas.” The PA notes that the 95<sup>th</sup> percentile is widely used throughout Europe to protect natural areas from acidification and the adverse effects of nitrogen enrichment, and EPA offers no reasoned basis for providing less protection

in the U.S. This level of protection is required by the statute's command to protect against *any* known or anticipated adverse effects on public welfare.

*7. Monitoring is not a substitute for the secondary standards required by the statute.* In lieu of adopting secondary standards that comply with section 109(b) of the Act, EPA proposes a very limited monitoring program. Monitoring, however, is simply not a substitute for providing the requisite protection mandated by the statute against adverse welfare impacts. Indeed, monitoring by itself provides no protection at all, much less requisite protection, against such impacts. Moreover, EPA offers no assurances that it will adopt a requisite standard after it completes this additional monitoring. Nor does EPA explain how the limited additional monitoring it proposes will resolve the alleged uncertainties that underlie its refusal to set protective secondary standards.

*8. The proposal fails to address adverse welfare effects from nitrification – including terrestrial, freshwater, and coastal.*

EPA concedes that even the AAI approach would not assure adequate protection of ecosystems from adverse effects due to nitrification from deposition impacts of NOx and SOx. The Park Service expressly identified this deficiency:

...[A] standard proposed for aquatic acidification is not likely to protect streams, lakes, and terrestrial ecosystems that are nitrogen-limited. In particular, as discussed in the REA, nitrogen-limited western alpine lakes and sensitive terrestrial ecosystems respond to levels of nitrogen deposition well below the levels that would cause acidification in these systems. Because we are concerned that the public may not understand that acidification-based secondary standards will not be protective of such ecosystems, we encourage EPA to move promptly to propose appropriate secondary standards to protect these ecosystems, based on currently available critical loads. . . . We also encourage EPA to address coastal eutrophication due to atmospheric nitrogen deposition. While atmospheric deposition is only one of several contributors to nitrogen loading in coastal estuaries, it is important to reduce atmospheric contributions to improve the viability of these systems.

National Park Service letter to SAB, 3-26-10, at 1-2. The NPRM itself identifies adverse nitrification impacts from NOx and SOx-related deposition, including significant adverse impacts in estuaries such as Chesapeake Bay.

For all the foregoing reasons, the proposal is legally deficient and arbitrary because it fails to set out NAAQS requisite to protect public welfare against adverse effects from excess nitrogen loadings, both terrestrial and aquatic. Again, EPA's claims of uncertainties and information gaps that allegedly make it difficult to develop standards to protect against such adverse effects are not legally adequate grounds for failing to adopt standards providing requisite protection.

*9. Illegal to include implementation concerns* The NPRM cites various alleged difficulties in implementing an AAI standard. Although EPA asserts that it did not factor these alleged difficulties into its proposal, the fact that they are mentioned and discussed undermines that

claim. Under *Whitman*, EPA may not lawfully consider implementation concerns in adopting NAAQS. The only relevant and permissible consideration in developing secondary standards is the protection needed to prevent any known or potential adverse effects on public welfare from the presence of the pollutant(s) in the ambient air.

Sincerely,

*/s/ David S. Baron*

David S. Baron  
Attorney