

# Critique of the Second External Review Drafts of the Welfare Risk and Exposure Assessment and the Policy Assessment for the Review of the Ozone NAAQS

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We believe there are a number of key issues with the current draft of the Welfare Risk and Exposure Assessment (REA; US EPA, 2014a) and Policy Assessment (PA; US EPA, 2014b), as described below. Overall, EPA has not demonstrated that adopting a cumulative metric as the secondary O<sub>3</sub> standard provides any greater protection of welfare than what is provided by the current primary standard. As a result, the current standard provides a requisite level of welfare protection.

## **(1) The redundancy of the proposed cumulative secondary standard**

EPA's cumulative standard, commonly called W126, is redundant. The intent of this cumulative metric is to provide a more biologically-relevant measure of O<sub>3</sub> exposure than the current 8-hour average exposure metric. However, as repeated throughout the PA [p. 1-13; p. 1-27; p. 1-37; p. 1-39; p. 5-65; p. 6-41], there is no scientific support for a threshold O<sub>3</sub> level below which no vegetation effects are likely to occur. As such, selecting a level and a form for a secondary O<sub>3</sub> standard is bound to be uncertain and arbitrary. In addition, the air quality modeling presented in the REA demonstrates that, by just meeting the existing standard (75 ppb), W126 concentrations would already be within the range recommended by EPA [*i.e.*, 7-15 ppm-hrs or somewhat higher; Table 4-1 and Figures 4-7, 4-9, and 4-10 in REA]. More specifically, EPA concludes that the reductions in W126 between recent air quality and air quality just meeting the existing standard are much larger than the additional reductions in W126 air quality by just meeting the alternative standards (*i.e.*, 15 ppm-hrs [Figure 4-10 in REA]; 11 ppm-hrs [Figure 4-12 in REA], and 7 ppm-hrs [Figure 4-14 in REA]). Indeed, EPA also concludes in the PA [p. 6-15] that there is a fairly strong, positive degree of correlation between the existing standard and the proposed alternate standard (this is also very clearly depicted in Figures 4-15 and 4-16 in the REA). In other words, the current standard is an effective surrogate of the alternative form described by EPA. Therefore, there is no need to implement EPA's alternative form of the secondary standard, especially since the current standard is just being implemented.<sup>1</sup>

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<sup>1</sup> Note that public comments have already been submitted by several U.S. delegates and senators to CASAC in advance of the ozone review panel meeting on March 25-27, 2014, requesting that EPA consider the "no change" option given that the current standard is just being implemented. [CASAC Ozone Review Panel Meeting - Public Comments](#)

**(2) The uncertainty with the cumulative O<sub>3</sub> concentration estimates**

EPA has recognized several uncertainties related to the air quality analyses it performed in the REA (Section 8.5.1). For example, air quality monitors are more densely positioned near urban centers, which required extrapolations of O<sub>3</sub> concentrations over large portions of the nation because of a limited monitoring networks in rural areas in the West, Northwest, Southwest, and West North Central. Furthermore, W126 estimates can be highly variable from year to year, such that the selection of different years for the analysis can lead to significantly different exposure estimates.

**(3) The uncertainty with the Concentration-Response Functions (CRFs) used to develop the proposed cumulative standard**

EPA's welfare risk analysis relies on variable and uncertain CRFs. EPA acknowledged in the Integrated Science Assessment that few of the studies that form the basis of the CRFs included W126 measurements or the data needed to compute such measurements (Section 9.6.3 in ISA; US EPA, 2013). Given that W126 estimates generated in the air quality analyses [see key issue 2] were used as inputs for the CRFs, EPA is compounding uncertainties from exposure estimates and the CRFs. For example, EPA acknowledged that CRFs are only available for 12 tree species and that further studies are needed to determine how accurately these reflect the larger suite of tree species in the U.S (Table 6-27 in REA, and p. 5-28 and p. 6-49 in PA). All CRFs are based on seedling studies and these seedling CRFs were shown to either over- or underestimate biomass losses in mature trees in 6 of the 12 evaluated tree species, and no information was presented for the other 6 tree species in the REA (Tables 6-5 and 6-27 in REA and p. 6-30 in PA). While EPA cites two recent free-air carbon dioxide enrichment (FACE) studies as validation for using available CRFs, these studies also carry significant uncertainties (Section 9.6.3 in ISA). For example, these studies were conducted using only two exposure levels (ambient [3-4 ppm-hr] and elevated [28-46 ppm-hr]), which were well outside the range of the proposed W126 standard (7-15 ppm-hr). Also, only two species (soybean and aspen) were assessed in these new studies, which is problematic given the large variability in O<sub>3</sub> sensitivity between different tree and crop species as illustrated in the REA. Taken together, there is significant uncertainty and variability in the CRFs on which welfare risk estimates are based, and these are not resolved by the evidence presented in the REA.

**(4) The limitations associated with implementing the proposed cumulative standard**

Although EPA states in the PA that it can consider programmatic stability in determining the form of the NAAQS (p. 4-6; p. 4-7; p. 6-11; p. 4-64), it has provided limited discussion regarding implementation

issues with the proposed alternative form of the secondary standard (p. 6-48). Since, the existing monitoring network has been developed over decades to meet the current form of the O<sub>3</sub> standard, there are likely to be substantial challenges associated with adopting a new form of the secondary standard. Current information provided in the O<sub>3</sub> standard has not addressed whether current monitoring programs, modeling tools, or reporting plans are sufficient to successfully implement a new form of the standard.

In conclusion, EPA states in the REA that just meeting the current standard would effectively result in a reduction of O<sub>3</sub> concentrations and welfare risks commensurate with the range of the cumulative standard described in the REA and PA. Given this, and given the highlighted issues with the cumulative standard, adopting such a standard is unwarranted.

## References

US EPA. 2013. "Integrated Science Assessment for Ozone and Related Photochemical Oxidants (Final)." EPA/600/R-10/076F. 1251p., February.

US EPA. 2014a. "Welfare Risk and Exposure Assessment for Ozone (second External Review Draft)." EPA-452/P-14-003a. 305 p., February.

US EPA. 2014b. "Policy Assessment for the Review of the Ozone National Ambient Air Quality Standards (Second External Review Draft)." EPA-452/P-14-002. 510p., January.