

Influence and Policy Implications of International Emissions in the Northern Wasatch Front Ozone Nonattainment Area

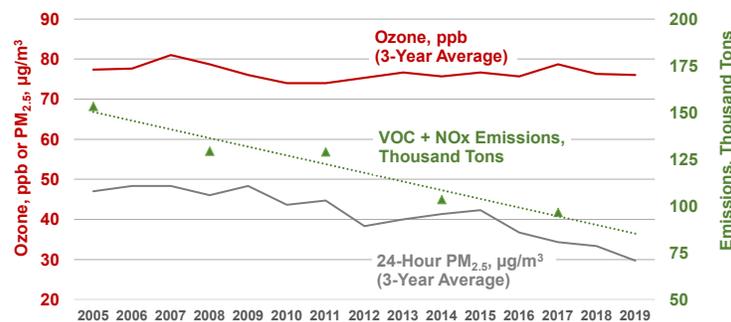
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We will explain the difficulty of reducing ozone levels in the Northern Wasatch Front (NWF) as evidenced by its history of emissions and air quality trends, and the resulting policy ramifications under the Clean Air Act (CAA). We explain the conceptual model for ozone transport from Asia to the intermountain west and results of detailed photochemical modeling using the Comprehensive Air Quality Model with extensions (CAMx) and Community Multiscale Air Quality (CMAQ) models. These results show that international anthropogenic sources significantly influence NWF ozone and that the NWF should qualify for a demonstration under §179B of the CAA, i.e., that the area meets the 2015 ozone National Ambient Air Quality Standard (NAAQS) “but for” the influence of international anthropogenic emissions.

In 2018, EPA designated the NWF as Marginal nonattainment for the 2015 ozone NAAQS. Despite large reductions in ozone precursor emissions, volatile organic compounds (VOC) and nitrogen oxides (NOx), ozone in the NWF has not improved in recent years. Yet these same reductions have been highly effective at reducing PM_{2.5}:

Figure 1. Comparison of ozone and PM_{2.5} trends with emissions reductions



Furthermore, the number of ozone exceedances per year has not reduced since at least 2008. This recent history suggests that the State cannot expect more reductions of VOC and NOx in the NWF to support ozone attainment at least unless very large reductions can be achieved.

Various studies show significant amounts of international emissions influence on the intermountain west. Modeling results reported in the EPA 2015 whitepaper on background ozone show that only a small portion of Wasatch Front ozone results from man-made (anthropogenic) emissions from within Utah.

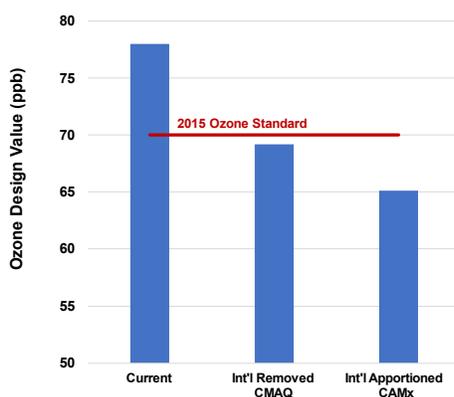
The Utah emissions inventory for 2017 shows that 61% of NWF anthropogenic emissions of ozone precursors come from mobile sources. The Federal government, not Utah, controls regulations for mobile source emissions. Another 26% comes from area sources, but in the past, some Utah residents and elected officials opposed Utah regulation of area sources. The CAA focuses some of the requirements for nonattainment areas on major point sources, yet these major point sources contribute only marginally to NWF air quality, accounting for 13% of NWF anthropogenic ozone precursor emissions.

Thus, of the small portion of NWF ozone formed by emissions in Utah, the majority of that will either be difficult to control or is not under Utah regulatory purview. The NWF failed to attain the standard at Marginal (based on 2018 to 2020 ozone monitoring data), making it subject to bump-up to the next higher ozone nonattainment classification, Moderate, requiring even more stringent local emission reductions on an untenable timeline.

On the other hand, if EPA approves a §179B demonstration, the area may remain at its current nonattainment classification and must fulfill all of the requirements of that classification but will not suffer any of the ramifications of failing to attain the standard including bump-up to a higher nonattainment classification.

Ramboll conducted preliminary photochemical modeling to examine the international contribution to the NWF using two methods described in EPA’s modeling guidance. Both methods show that the NWF meets the “but for” criterion of CAA §179B:

Figure 2. Results from modeling the influence of man-made international emissions on NWF ozone



The modeling indicates an ozone season average of 9.9 ppb of international influence at the controlling NWF monitor.

The modeling exercises indicate that the global transport mechanism is persistent throughout the summer, with substantial international impact to the NWF on all days throughout the ozone season, consistent with the conceptual model of long-range ozone transport provided in the EPA guidance for §179B demonstrations and scientific literature. The transport is not a discrete event occurring only on high ozone days nor does it occur due to ephemeral weather-induced events. (But the CAA §179B provision does not require that international emissions be event driven.)

The NWF should meet the “but for” criterion of CAA §179B. A 179B demonstration provides the most viable, perhaps the only viable, path forward for the NWF ozone nonattainment area.