

Rio Tinto  
4700 Daybreak Parkway  
South Jordan, Utah 84095  
USA  
T +1 801 204 2792  
M +1 801 739 3271  
[fred.turatti@riotinto.com](mailto:fred.turatti@riotinto.com)

**Dr. Fred Turatti, PhD**  
Principal Advisor  
Group Environment  
Rio Tinto

May 22, 2014

Dr. Christopher H. Frey  
Chair  
Clean Air Scientific Advisory Committee  
EPA Science Advisory Board (1400F)  
U.S. Environmental Protection Agency  
1200 Pennsylvania Avenue, NW.  
Washington, DC 20460

Re: Draft CASAC Report on Ozone Policy Assessment

Dear Dr. Frey:

Rio Tinto and its consultants have reviewed the May 5, 2014 draft of the Committee's Report on the ozone Policy Assessment (PA).<sup>1</sup> Rio Tinto urges the Committee to include in its final report a discussion of the uncertainties associated with the studies showing effects below 70 ppb.

The Committee's draft letter includes placeholders for final recommendations with respect to the level of the primary standard, to be completed following the Committee's May 28 teleconference. The draft summarizes the results of the scientific evidence for levels of 70 and 65 ppb, but does not discuss the uncertainties associated with that evidence.

The draft PA finds that the controlled human exposure studies of respiratory effects are most relevant for the short-term primary standard, and lists them in Table 3-1. Most of the studies failed to produce statistically significant results, and most were available in the last review, when EPA viewed them as too uncertain to support a standard below 75 ppb. EPA's approach was upheld by the federal courts.

It appears there are only three new studies in this area: Sheggle et al. 2009, Kim et al. 2011, and Brown et al 2008. Brown et al. is a reanalysis of the earlier Adams study that was not statistically significant. The reanalysis showed a significant effect on FEV1 but not respiratory symptoms. The Sheggle study

---

<sup>1</sup> In preparing this letter Rio Tinto was assisted by Dr. Mark Utell, Director, Occupational and Environmental Medicine Division, University of Rochester Medical Center. Dr. Utell is a former member of CASAC.

found no effects below 70 ppb. The Kim study found FEV1 decrements below 70 ppb but no respiratory symptoms. None of the studies show respiratory symptoms below 70 ppb. The database showing effects at 70 ppb remains conflicting and very small.

Significant uncertainties also are associated with the evidence at 60 ppb. The draft PA finds that prolonged exposures to an average O<sub>3</sub> concentration of 60 ppb results in group mean FEV1 decrements ranging from 1.8% to 3.6% (Adams 2002, 2006, Schelegle 2006, Kim 2011). Based on data from multiple studies, the weighted average group mean decrement was 2.7%, far below the 10% level at which the effect is considered significant. As discussed above, in some analyses, these group mean decrements in lung function were statistically significant (Brown, 2008) while in other analyses they were not (Adams, 2006, Schelegle, 2009). The Brown study is an EPA reanalysis of an earlier study that was not statistically significant, indicating at best a marginal effect. We are not aware of any study looking at reproducibility of responses at these low levels. In addition, the evidence for inflammation at 60 ppb has not been confirmed by any other group.

The epidemiological studies of effects at 60-70 ppb also are subject to significant uncertainty, summarized as follows in the draft PA:

1. The dose-response curve for short-term exposures in the range of 40-70 ppb remains unclear.
2. The dose-response curve at lower levels is similarly unclear for health endpoints reported in epidemiologic studies such as hospital admissions, ED visits, and premature mortality. In addition, the reported mortality relationship varies by region and it is unknown whether exposure errors or impacts of other co-pollutants may be obscuring potential population thresholds.
3. The extent to which the broad mix of co-pollutants in the ambient air (e.g., PM, NO<sub>2</sub>, SO<sub>2</sub>, etc.) may play a role in the observed associations between ambient ozone and adverse health effects remains unclear. Additionally, there remains uncertainty around the role of temperature as a potential confounder or effect modifier in epidemiologic models.
4. Most epidemiologic studies of short-term exposure effects remain subject to uncertainty due to use of ambient fixed-site data serving as a surrogate for ambient exposures, and to the difficulty of determining the impact of any single pollutant among the mix of pollutants in the ambient air. Measurements made at stationary

outdoor monitors have been used as independent variables for air pollution, but the accuracy with which these measurements actually reflect subjects' exposure is not yet fully understood.

5. There still remain substantial uncertainties in the characterization of 8-hr daily max ozone background concentrations.

We rely on the Committee to ensure that EPA's interpretations of the scientific evidence are reasonably balanced and necessary to protect public health and welfare. Such an approach necessarily involves a discussion of both the results of the studies at 60-70 ppb and the uncertainties associated with those results. We urge the Committee to include a summary of the relevant uncertainties in the final Report.

Respectfully submitted,

/s/ Fred Turatti

**Fred Turatti**