

Executive Summary

The California Air Resources Board (CARB) quantifies health impacts associated with exposure to airborne particulate matter (PM) as part of the development of control measures for PM, including those for ports and goods movement. The methodology that CARB staff uses for quantifying premature death and other health impacts associated with PM exposure is based on a peer-reviewed methodology developed by the U.S. Environmental Protection Agency (EPA) for their health risk assessments. This methodology is regularly updated by CARB staff as new epidemiological studies and other related studies are published that are relevant to California's health impact analyses. This report discusses the results of staff's review of the recent scientific literature related to the mortality effects associated with exposure to fine PM (PM_{2.5}) and presents revisions to the current methodology.

In this report, the relative risk of premature death associated with PM_{2.5} exposure was reevaluated based on a review of all relevant scientific literature, and a new relative risk factor was developed. This new factor is a 10% increase in risk of premature death per 10 µg/m³ increase in exposure to PM_{2.5} concentrations (uncertainty interval: 3% to 20%). Using this new factor, staff estimates that in the year 2005, diesel PM contributes to 3,500 premature deaths statewide (uncertainty interval 1,000 to 6,400). Also, staff estimates that exposure to ambient PM_{2.5} concentrations above 5 µg/m³ can be associated with about 18,000 premature deaths statewide annually, with uncertainty ranging from 5,600 to 32,000 deaths, based on 2004-2006 air quality data.

The methodologies and results presented in this report have been endorsed by our scientific advisors, Dr. Jonathan Levy of Harvard University, Dr. Bart Ostro of the Office of Environmental Health Hazard Assessment, and Dr. Arden Pope of Brigham Young University. This report underwent an external peer review by experts selected through an independent process involving the University of California at Berkeley, Institute of the Environment. The results of the peer review process have been incorporated into this report. In addition, all public comments received on the May 22, 2008 draft version of the report have been incorporated into this staff report. Specific responses to individual comments are addressed in Appendix 5.