



Lead: Human Exposure and Health Risk Assessments for Selected Case Studies

Volume I. Human Exposure and Health Risk Assessments - Full-scale

2.3 ASSESSMENT SCENARIOS

The design of the scenarios assessed for each case study includes aspects particular to air concentrations of Pb (Section 2.3.1), surface soil/dust concentrations of Pb (Section 2.3.3) and background (Section 2.3.2). As the scenarios are primarily distinguished by the differences in air concentrations, we generally refer to the different assessment scenarios as air quality scenarios in this document (including the appendices). The different air quality scenarios include current conditions, meeting the current NAAQS of $1.5 \mu\text{g}/\text{m}^3$ (maximum quarterly average) and meeting several alternate, lower NAAQS.

2.3.1 Air Concentrations

The air concentrations assessed in the different air quality scenarios include current conditions, meeting the current NAAQS of $1.5 \mu\text{g}/\text{m}^3$ (maximum quarterly average) and meeting several alternate, lower NAAQS. In consideration of the range of levels suggested by CASAC (Henderson, 2007a), the alternate NAAQS scenarios included in the assessment are: $0.5 \mu\text{g}/\text{m}^3$, $0.2 \mu\text{g}/\text{m}^3$ and $0.05 \mu\text{g}/\text{m}^3$ as maximum monthly averages, and $0.2 \mu\text{g}/\text{m}^3$ as a maximum quarterly average. In response to discussion at the August 2007 meeting of the CASAC Pb Panel to extend lower the range of alternate levels considered, an alternate NAAQS scenario of $0.02 \mu\text{g}/\text{m}^3$, as a maximum monthly average, is also included in the additional analyses presented in Chapter 5. While the current and alternate NAAQS scenarios are characterized by quarterly or monthly averaging times, it is the associated annual average ambient air concentrations that are then used in the risk assessment⁶.

The current conditions scenario, performed for the general urban and secondary Pb smelter case studies, is intended to generally reflect recent conditions for these case studies based on data available for the characterization. For example, for the urban case study, air Pb levels for current conditions are based on 2003-2005 air quality data (Appendix A). For the secondary Pb smelter case study, for which we used air quality modeling, air Pb levels for current conditions are based on emissions characterizations drawn from currently available emissions information and recent meteorological data (see Appendix E).

The current NAAQS attainment air quality scenario was performed for the primary Pb smelter case study, for which current monitoring data indicate exceedance of the current Pb

⁶ Use of the annual average concentration is consistent with the temporal period of this input to the primary blood Pb model (Appendix H) and also the generally longer term resolution of the blood Pb metrics associated with the concentration-response functions (“concurrent” and “lifetime average”) (Lanphear et al., 2005).