Chapter 1
Introduction

At its October 10, 1997 meeting, the SCAQMD Governing Board directed staff to conduct a major air toxic evaluation program, referred to as MATES II (Multiple Air Toxics Exposure Study) to quantify the current magnitude of population exposure risk from existing sources of selected air toxic contaminants. This program was more comprehensive than a similar study conducted over a decade ago in MATES I, in that more sites were sampled, more toxic compounds were analyzed, and other elements such as microscale modeling were also incorporated into the study. The AQMD conducted this study in three parts addressing; (1) Air Toxic Monitoring; (2) Air Toxic Emissions Inventory Enhancements; and (3) Air Toxic Modeling and Risk Assessment.

Air Toxic Monitoring

The Air Toxic Monitoring portion of the program includes two key elements: 10 fixed sites characterizing neighborhood - scale considerations over a one-year period and a complementary microscale study using three mobile platforms to sample for one month at each of 14 additional locations. The microscale sites were selected to reflect potential localized influences of toxic emitting sources near residential neighborhoods. Sampling began in April 1998 and concluded in the middle of June 1999. Over 4,500 air samples were collected for analysis. Both AQMD and the California Air Resources Board (ARB) laboratories cooperatively shared the analytical burden. Chapter 3 discusses in further detail the monitoring element of the study. Also shown in the chapter are carcinogenic risks at the various sampling locations tallied from the measured toxic concentrations.
The carcinogenicity of different compounds, used to determine carcinogenic risk, is determined by both the U. S. Environmental Protective Agency (USEPA) and by the office of the California Environmental Protection Agency (CalEPA) through a very comprehensive and lengthy process. The District uses the unit risk factors (URF) developed by the CalEPA in calculating risk for various programs. This component of the methodology is especially important in the case of diesel particulate, which has been recently identified as a toxic air contaminant (TAC) by CalEPA. Appendix I-A contains the URF for various compounds. A brief discussion on the uncertainties associated with risk calculations is included in Chapter 3.

Air Toxic Emissions Inventory Enhancement

The emissions inventory update included the analysis of all sources of toxic emissions from a regional point of view (point, area, and mobile sources); plus the considerations of microinventories around each of the 14 microscale sites. Significant efforts were made to spatially allocate emissions for gasoline service stations, perchloroethylene dry cleaning operations, and chrome-plating operations. Lastly, the diesel particulate emission

inventory for the South Coast Air Basin (Basin) was improved by identifying additional sources, other than on-road diesel engines. The emission inventory methods and results are presented in Chapter 4.

Air Toxic Modeling

Two- and three-dimensional fields of the necessary meteorological variables were developed using the meteorological model called CALMET for the fixed site sampling period, April 1998 to March 1999. Air quality dispersion modeling was performed using the Urban Airshed Model (UAM), the model used for ozone air quality analysis. Model performance was evaluated for the individual compounds at the ten fixed monitoring sites. From the model-simulated concentration fields, carcinogenic risks were totaled from the individual compound risks using the CalEPA unit risk factors and shown spatially for the Basin. In addition, to quantify local impacts of major industrial activities upwind of residential areas, microscale modeling was conducted at 10 microscale sites. The methods and results of the air quality modeling and risk assessment are discussed and shown in Chapter 5.

To provide guidance through the development of MATES II, the AQMD established an Air Toxics Study Technical Review Group (ATSTRG) that included experts in air monitoring, toxic emissions inventories, modeling, and risk assessment. The objective of the ATSTRG was to provide technical guidance to the AQMD. Table 1-1, and Appendix I-B contain the names of the members of the ATSTRG.

This report provides technical information on various elements of sampling techniques; emissions inventory methodologies for regional and local purposes; and risk analysis based on toxic air quality data collected from fixed sites and microscale sites; as well as regional and microscale air toxic modeling. Numerous appendices contain the detailed technical information that may be of interest to specific audiences.

Table 1-1
Air Toxics Study Technical Review Group
Member List

Member Name:	Affiliation:
Dr. Robert Blaisdell	Cal EPA Office of Environmental Health Hazard Assessment
Dr. Steve Colome	IES/CES
Dennis Fitz	University of Riverside/CE-CERT
Neil Frank	EPA/Office of Air Quality Planning and Standards
Dr. John Froines	UCLA School of Public Health
Fred Lurmann	Sonoma Technology, Inc.
Melanie Marty	Cal EPA Office of Environmental Health Hazard Assessment
Dr. Rueben McDavid	OSHA Assessments and Community Relations
Bill Piazza	Communities for a Better Environment
Dr. Shankar Prasad	California Air Resources Board
Dr. Richard O. Richter	Exponent
Robert Sanford	Energy and Environmental Research (EER)
Dr. Mark Saperstein	Western States Petroleum Association (WSPA)
Carolyn Suer	California Air Resources Board
Millie Yamada	Northrop/Grumman