

Appendix C

Air Quality

PRINCIPAL POLLUTANTS OF THE AIR BASIN

Dust, mist, ash, smoke and fumes are some common liquid and solid particles founding the atmosphere. In urban and industrial regions such as the Bay Area, particulate emissions are caused predominately by human activities. Typical sources of particulate generation are quarrying of minerals, operation of vehicles and equipment, refining of crude oil, and manufacturing chemicals. Industrial dust is formed by grinding or pulverizing materials, as in cement production. Earth-moving operations, especially farming and construction, and grading for construction also cause large amounts of dust to enter into the air. Smoke composed of carbon and other products of incomplete combustion, such as open fires and fireplace, are the most obvious from of particulate pollution. Natural sources of particles include wind eroding the earth and plant-based pollen, chemical emissions and dust. Very small particles in the air also are a major contributor to low atmospheric visibility typical in the Bay Area.

Very small and light particles remain airborne for some time and can be inhaled by people. The larger of the inhaled particles are not able to reach the lungs and are caught and expelled by the natural processes to the human body. However, very small inhaled particles can reach the lungs and can

remain there for long periods of time, adversely affecting sensitive persons having problems with asthma, bronchitis, and even lung cancer in heavily polluted urban areas. Some airborne particles are toxic in themselves or become toxic when they combine with other products. There are no significant sources of toxic air pollutants in the Cupertino area.

In the South Bay subregion between 1995 and 2000 the Federal Air Quality Standard of 150 mg/m³ for particulates was never exceeded, while the California Air Resource Standard of 50 mg/m³ was exceeded between 1 and 4 days per year, as measured at the nearest San Jose stations. The federal annual geometric mean reached 70% of the standard of 30 mg/m³ in the San Jose area during the same period. The primary non-vehicular source of particulates in Cupertino is the Hanson Permanente Cement plant. From BAAQMD records of the most recent year ending June 2001, the Hanson plant emitted 245.9 tons of particulates into the air. A majority of these particulates are heavy and settle to the ground within a few hundred feet of the plant.

Carbon Monoxide (CO)

Carbon monoxide is an odorless, invisible gas that is a product of incomplete combustion. CO displaces oxygen in the blood,



diminishing a person's capacity to perform mentally and physically. Carbon monoxide is especially dangerous indoors, when ventilation is inadequate. About 70 percent of carbon pollution in the Bay Area is emitted from motor vehicles. A substantial amount comes from burning wood in fireplaces and wood stoves. Higher concentrations of CO are found near major roadways and are increased as traffic and congestion increases. However, because of State and Federal controls on new car emissions over the past thirty years and voluntary efforts to reduce wood burning, no CO standards have exceeded in the Bay Area in the past six years.

Ozone

Unlike other pollutants, ozone is not emitted into the atmosphere, but in the most important product of atmospheric photochemical reactions. Photochemical air pollution—or smog—results from a chemical reaction between nitrogen oxides and reactive organic gases under the influence of sunlight. The atmospheric pollutants involved in smog and ozone formation are emitted from combustion, manufacturing, production of chemicals, and vehicle operation. Various factors affect this process, including the quantity of gases present, the volume of air available for dilution, the temperature,

and the intensity of the ultraviolet light from the sun. Ideal conditions occur in the summer and early fall on warm, windless, sunny days that have a serious inversion of the normal temperature distribution of the atmosphere. The major effects of photochemical smog are aggravation of respiratory diseases, eye irritation, visibility reduction and vegetation damage.

Vehicles are the greatest sources of smog-producing gases in the Bay Area, providing more than 50 percent of the reactive organic gases and nitrogen oxides. California's automobile control program together with the District's regulatory controls have significantly reduced excesses of the national standard from a high of 65 days to exceedances in 1969. In June of 1995, the District achieved EPA attainment status for the national ozone 12 pphm 1-hour standard, based upon five years of compliance. However, due to ozone excesses during 1995, 1996, and 1998 the District is again a nonattainment area for the ozone standard. In the 1996 to 2000 period the San Jose and South Bay area experienced 0 to 4 exceedances of the Federal standard and 0 to 5 exceedances of the 9 pphm 1 hour ARB standard. Under adverse weather conditions occurring in 1995 the South Bay had 14 ozone exceedances.

