2. Results

The following results represent emissions from point, area and mobile sources in the Great Lakes region. These results are based on 1997 data. The regional emission inventory includes emissions from 675 distinct source categories and 1467 distinct processes. The source categories include emissions from 16 area sources, 8 on-road vehicle categories, 10-non-road vehicle categories, aircraft, and locomotives. Definitions of point and area sources are dependent on data collection methods, as reporting requirements for air toxics emissions are different from state to state, one emission source defined as an area source in one state may be covered as a point source in other states. Although these categories are covered by all states, some states and the province of Ontario may not estimate emissions for some area source categories due to the coverage of point sources and resource restrictions. For example, the Marine Vessel Loading, Ballasting, and Transit category is covered in point sources for Illinois and Indiana. No emissions were estimated for this area source category from these states.

Emissions from All Sources

The 1997 emissions were estimated for 82 target compounds, however, data were only available to obtain emissions for 75 air toxins, including 16 polycyclic aromatic hydrocarbons (PAHs), 47 non-metal compounds and 12 metal compounds. Table 2-1 shows pollutant names and estimated emissions from point, area and mobile sources. Among the 75 pollutants, 73 pollutants are emitted from point sources, 65 pollutants are emitted from area sources, and 33 from mobile sources. Area sources dominate the total emissions for 15 PAHs, 16 non-metal compounds, and 1 metal compound. Point sources are responsible for more than two thirds of total emissions for 1 PAH, 22 non-metal compounds and 11 metal compounds. Mobile sources are responsible for most emissions of 11 non-metal compounds. Among the 75 pollutants, toluene was estimated to have the highest emissions at 516,504,563 pounds, while 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) emissions are the lowest recorded at about 0.12 pounds.

Specific Pollutants

A closer look was taken at the top five non-metal compounds and the top five metal compounds according to the emission totals. The source contribution of emissions for the selected 10 pollutants was analyzed by category for area and mobile sources, and the first two digits of the SIC codes for point sources. The most significant source categories and their contributions are shown in Tables 2-2 and 2-3. The selected pollutants are toluene, xylenes (includes o, m, and p), benzene, formaldehyde, methyl chloroform, manganese, lead, copper, nickel and chromium.

Table 2-1 shows the total regional emissions by source category and their percent contributions to the total emissions. More than 60 percent of the regional emissions of benzene, formaldehyde, toluene, and xylenes (isomers and mixture) are attributed to mobile

sources. Emissions of methyl chloroform are dominated by area sources, with a contribution of 97%. Point sources dominate the emissions of the top five metal compounds.

The results shown in Table 2-1 indicate that on-road mobile sources are the most significant contributors to overall mobile source emissions. A close look was taken at the eight subcategories of highway vehicles. Table 2-2 shows that Light Duty Gasoline Vehicles (LDGV) is the dominant subcategory for on-road mobile source emissions, responsible for about 25% of the emissions of toluene, xylenes and benzene. LDVG and Heavy Duty Diesel Vehicles (HDDV) contribute in equal amounts (about 15% each) to the total emissions of formaldehyde. The most significant contributor to the emissions of methyl chloroform is Degreasing Equipment. This area source category accounts for about 68% of the total regional emissions.

In contrast with the top five non-metal compounds, point sources dominate the emissions of the top five metal compounds, accounting for more than 90% contributions. As shown on Table 2-3, the most significant source category for manganese, lead, copper and nickel is Primary Metal Industries (SIC code 33xx). Chromium emissions are dominated by the Metal Mining industry (SIC code 10xx).

Detailed emission distributions by standard industrial classification (SIC) codes and source classification codes (SCC) are shown in tables 2-1 through 2-4 and figures 2-1 through 2-77.