



Estimation and Evaluation of Cancer Risks Attributed to Air Pollution in Southwest Chicago

Final Summary Report

Submitted To:

**U.S. EPA Region 5
Air and Radiation Division**

By:

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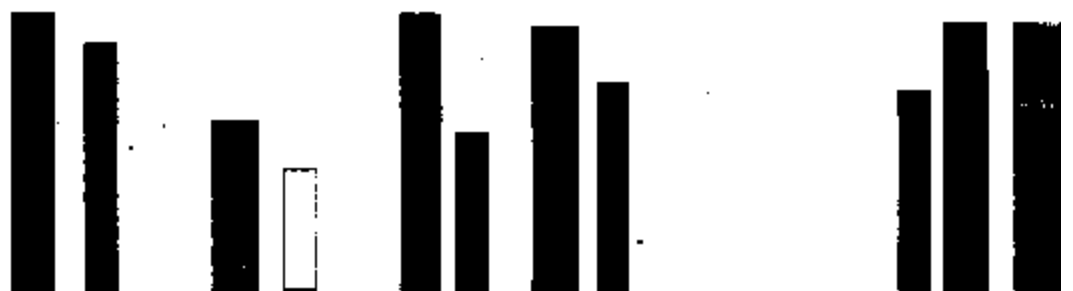


TABLE 3
ADDITIONAL SOURCES AND ESTIMATED EMISSIONS

Facility Name	Pollutant	Emissions
KOPPERS, INC.		
From State permit	Styrene	0.4 tons/yr
CORN PRODUCTS		
From the final report of <u>Air Toxics Emission Inventories for the Lake Michigan Region</u>	Arsenic	36.0 lbs/yr
	Cadmium	3.8 lbs/yr
	Total Chromium	33.4 lbs/yr
	Formaldehyde	348.8 lbs/yr
	Benzene	4.0 lbs/yr
GE PCB RECLAMATION FACILITY		
From RCRA, EPA ID ILD070015714	Tetrachloroethylene	0.002 lbs/yr
GRACE SPECIALTY CHEMICALS		
From TRI data	Formaldehyde	230 lbs/yr
SUN CHEMICAL		
From RCRA (Proposed incinerator, project has been withdrawn by the company)	Arsenic	0.142 lbs/yr
	Benzene	2.212 lbs/yr
	Beryllium	0.030 lbs/yr
	Cadmium	0.048 lbs/yr
	Chromium	7.048 lbs/yr
ROBBINS INCINERATOR*		
From State permit (Proposed)	Arsenic	20.148 lbs/yr
	Cadmium	16.644 lbs/yr
	Total Chromium	289.080 lbs/yr
	Dioxins	2.000 ng/m ³
AIRCRAFT EMISSIONS AT MIDWAY AIRPORT		
	Benzene	8.99 tons/yr
	1,3-Butadiene	7.60 tons/yr
	Formaldehyde	62.86 tons/yr
	Particulate Matter (Piston Engines)	1.23 tons/yr
	Particulate Matter (Turbojet/Turboprop Engines)	48.87 tons/yr
ROAD VEHICLE EMISSIONS FROM PARKING LOTS AT MIDWAY AIRPORT		
	Benzene	0.332 tons/yr
	1,3-Butadiene	0.055 tons/yr
	Formaldehyde	0.118 tons/yr
	Particulate Matter (Diesel Vehicles)	0.190 tons/yr
	Particulate Matter (Gasoline Vehicles)	0.068 tons/yr

Cancer cases attributed to the Midway mobile sources were also studied by refined source types and by pollutant. Table B.16 provides a cross reference list of cancer contribution by mobile source origin and by pollutant.

TABLE B.16
CANCER CASES BY POLLUTANT BY SOURCE CATEGORY

Pollutant	Emission Source	Annual Concentrations ($\mu\text{g}/\text{m}^3$)	Individual Cancer Risks	Lifetime Cancer Cases
1,3-Butadiene	All Aircraft	2.87E+00	8.03E-04	1.21
	All Vehicles	1.97E-02	5.51E-06	0.01
Formaldehyde	All Aircraft	2.38E+01	3.09E-04	0.47
	All Vehicles	4.15E-02	5.39E-07	0.001
POM/Particulate Matter	Turbine Aircraft	1.63E+01	2.76E-04	0.39
	Piston Aircraft	4.61E-01	7.37E-06	0.008
	Gasoline Vehicles	2.43E-02	1.24E-06	0.0023
	Diesel Vehicles	6.73E-02	1.14E-06	0.0021
Benzene	All Aircraft	3.40E+00	2.82E-05	0.041
	All Vehicles	1.10E-01	9.15E-07	0.0017

From Table B.16, we found that 1,3-butadiene is the most significant contributor to cancer risk in the area. Approximately one case, or 57% of the total cancer cases attributed to the identified Midway air pollution is caused by 1,3-butadiene. Formaldehyde and particulate emissions each contributes roughly 20% of the total cancer cases (about a half case respectively). Cancer cases due to benzene emissions from Midway, on the other hand, are negligible in comparison to the total cancer cases of 2.

Overall, emissions from aircraft operated at Midway in 1990 contribute up to 99% of the total cancer cases. This was expected since the vehicular emissions estimated at Midway are insignificant compared to the aircraft emissions at Midway. Figures B.5 - B.10 portray the cancer cases at the receptor grid network by pollutant and by emission source.