

# Air Quality in Alberta January to March, 1998

Alberta Environmental Protection continuously monitors air quality in Edmonton (3 stations), Calgary (3 stations), Fort Saskatchewan and Fort MacKay. Air quality parameters monitored at Alberta Environmental Protection stations include carbon monoxide, dust and smoke (the coefficient of haze), oxides of nitrogen, ozone, total hydrocarbons, hydrogen sulphide, sulphur dioxide, carbon dioxide, ammonia and particulates (PM<sub>10</sub> and PM<sub>2.5</sub>). The Index of the Quality of the Air (IQUA) is calculated at the Edmonton, Calgary and Fort Saskatchewan stations. The IQUA converts air parameter concentrations into *Good*, *Fair*, *Poor* and *Very Poor* air quality ratings.

## Highlights

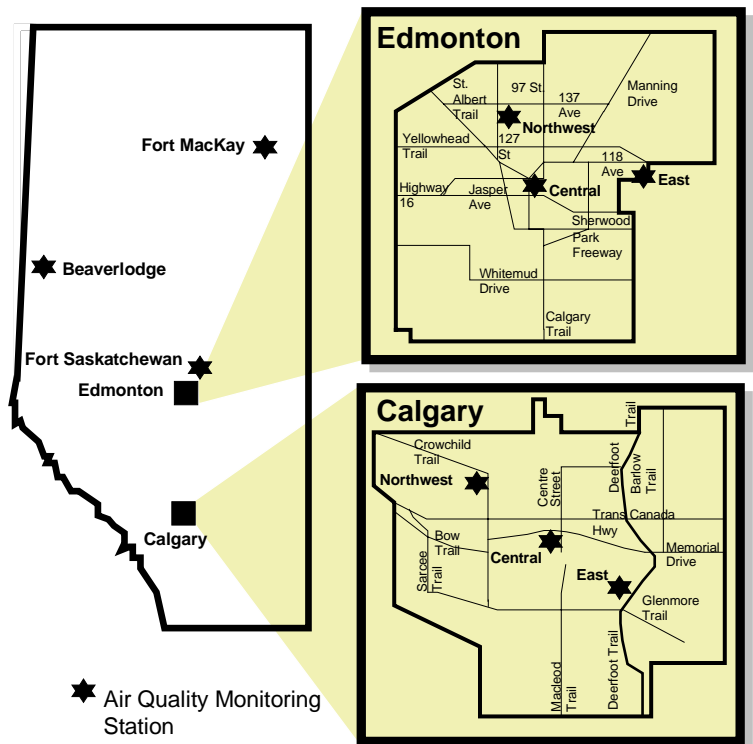
**Air quality was Good 100% of the time at all Edmonton monitoring stations in the first quarter of 1998.** Good air quality was reported over 98% of the time at the Calgary and Fort Saskatchewan monitoring stations. Air quality conditions in the first quarter of 1998 were close to the same or better than the 10-year average (1988 to 1997) at all monitoring stations.

**Poor and Very Poor air quality did not occur at any monitoring stations in January, February or March, 1998.**

**Air quality guidelines for dust and smoke, and carbon monoxide were occasionally exceeded in the first quarter of 1998.** The 1-hour guideline for carbon monoxide was exceeded at 7 p.m. on January 14 at the Calgary East station. The 8-hour guideline was exceeded on January 14 at the Calgary Central and Calgary East stations, and on January 26 at the Edmonton Northwest station. The monthly guideline for dust and smoke was exceeded in January at the Calgary East station. Exceedances of air quality guidelines for carbon monoxide and dust and smoke were due to vehicle exhaust emissions and traffic movement combined with stagnant weather conditions (strong temperature inversions and light winds).

**Carbon monoxide concentrations were from 8 to 25% lower than the 10-year average at Alberta monitoring stations.** Dust and smoke levels were lower than the 10-year average (12 to 24%) at Edmonton monitoring stations and higher than the 10-year average (15 to 72%) at Calgary monitoring stations. Total hydrocarbon concentrations were from 4 to 24% higher than the 10-year average at Edmonton and Calgary monitoring stations. Higher dust and smoke and hydrocarbon levels may be related to the combination of weather conditions (more stagnant weather) and increased vehicle traffic.

**Air quality guidelines for nitrogen dioxide and sulphur dioxide were not exceeded in the first quarter of 1998.** With the exception of the Calgary East station, nitrogen dioxide concentrations were close to the same as the average over the last ten years at all stations. The average nitrogen dioxide concentration was 16% higher than the 10-year average at the Calgary



For current air quality conditions call **427-7273** in Edmonton and **250-2099** in Calgary.

Internet:  
[www.gov.ab.ca/~env/air.html](http://www.gov.ab.ca/~env/air.html)

East station. Average sulphur dioxide concentrations were lower than the 10-year average at the Edmonton East and Fort MacKay stations and higher than the 10-year average at the Calgary East station.

☞ **Air quality guidelines for hydrogen sulphide were exceeded at the Calgary East station.** The 1-hour guideline was exceeded at 6 p.m. on January 14. The 24-hour guideline for hydrogen sulphide was exceeded on January 14, January 16 and January 18. These exceedances were caused by emissions from the local sewage treatment facility during stagnant weather conditions.

☞ **The 1-hour guideline for ozone was not exceeded in January, February or March of 1998.** However, the 24-hour guideline for ozone was exceeded frequently, especially in March, at rural monitoring stations. These exceedances were caused by natural

processes such as transport from the ozone rich upper troposphere to the ground-level due to normal atmospheric mixing. Air quality guidelines for ozone are currently under review by a federal-provincial committee.

☞ **The Wood Buffalo Environmental Association, located in northeastern Alberta, was officially established in January of 1998.** This zone took over the operations of the Fort McMurray air quality monitoring station on January 1. The focus of the Wood Buffalo Zone is to develop an effective and efficient regional air monitoring system that will provide scientifically credible information on air quality and its effects on human health and the environment. Air quality monitoring in the Fort MacKay area will also become the responsibility of the Wood Buffalo Zone later this year.

### Number of Times Air Quality Guidelines were Exceeded - January to March, 1998

Station	Carbon Monoxide		Dust and Smoke	Hydrogen Sulphide		Nitrogen Dioxide		Ozone		Sulphur Dioxide	
	1-hour	8-hour	monthly	1-hour	24-hour	1-hour	24-hour	1-hour	24-hour	1-hour	24-hour
Edmonton Central	0	0	0	n/a	n/a	0	0	0	5	n/a	n/a
Edmonton Northwest	0	1	0	n/a	n/a	0	0	0	11	n/a	n/a
Edmonton East	0	0	0	0	0	0	0	0	19	0	0
Calgary Central	0	2	0	n/a	n/a	0	0	0	0	n/a	n/a
Calgary Northwest	0	0	0	n/a	n/a	0	0	0	18	n/a	n/a
Calgary East	1	1	1	1	3	0	0	0	3	0	0
Fort Saskatchewan	0	0	0	0	0	0	0	0	21	0	0
Beaverlodge	n/a	n/a	n/a	n/a	n/a	0	0	0	55	n/a	n/a
Fort MacKay	n/a	n/a	n/a	0	0	n/a	n/a	n/a	n/a	0	0
Guideline	13 ppm	5 ppm	90% of values < 1 COH unit	0.01 ppm	0.003 ppm	0.21 ppm	0.11 ppm	0.082 ppm	0.025 ppm	0.17 ppm	0.06 ppm

n/a Parameter not monitored or data not available.

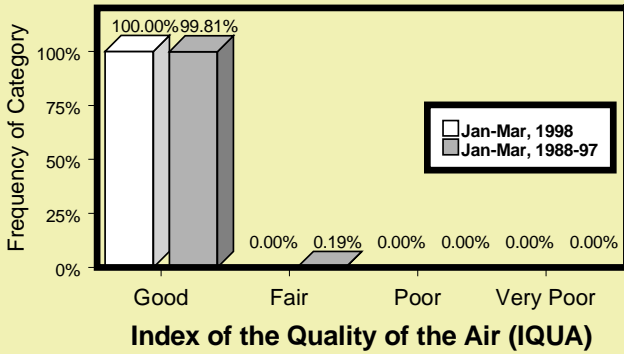
### The Index of the Quality of the Air

The index of the quality of the air (IQUA) provides the public with a meaningful measure of outdoor air quality. The IQUA is calculated every hour at all Edmonton, Calgary, Fort Saskatchewan and Fort McMurray monitoring stations. From this index, we know whether the air quality is Good, Fair, Poor or Very Poor. The air pollutants used to calculate the IQUA are carbon monoxide, dust and smoke, nitrogen dioxide, ozone and sulphur dioxide. Good, Fair, Poor and Very Poor air quality categories are directly related to guidelines under Alberta's Environmental Protection and Enhancement Act, and National Air Quality Objectives.

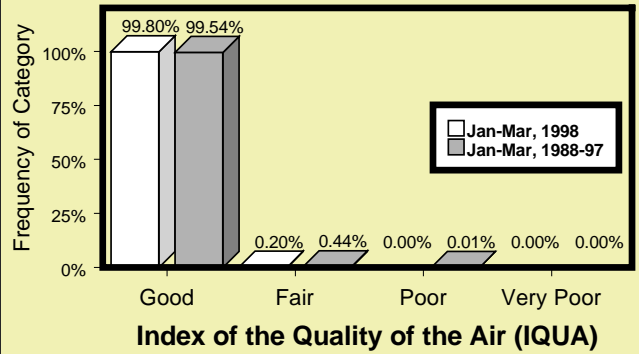
IQUA rating	Description
<b>Good</b>	Desirable range: no known harmful effects to soil, water, vegetation, animals, materials, visibility or human health. The long-term goal is for air quality to be in this range all of the time in Canada.
<b>Fair</b>	Acceptable range: adequate protection against harmful effects to soil, water, vegetation, animals, materials, visibility and human health.
<b>Poor</b>	Tolerable range: not all aspects of the environment are adequately protected from possible adverse effects. Long-term control action may be necessary, depending on the frequency, duration and circumstances of the readings.
<b>Very Poor</b>	Intolerable range: in this range, continued high readings could pose a risk to public health.

Source: Environment Canada. 1980. Guideline for a short-term air quality index. A report by the Federal-Provincial committee on Air Pollution.

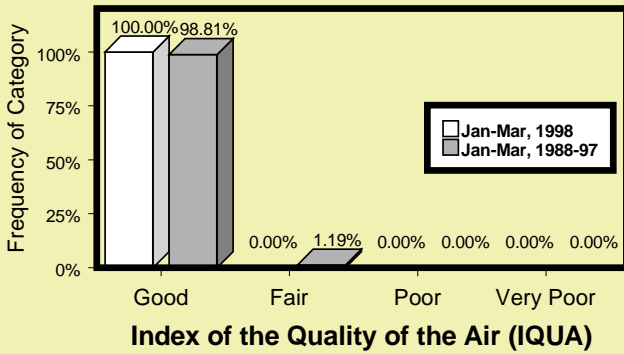
### Edmonton Central



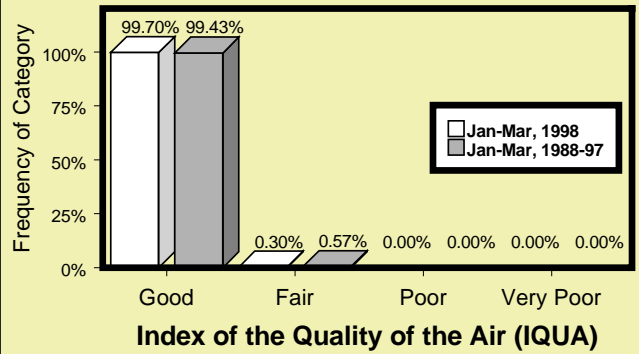
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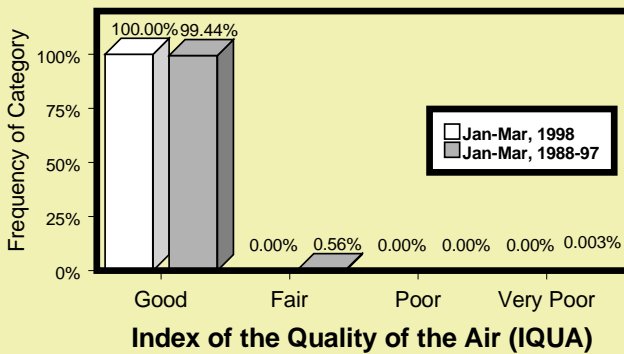
### Edmonton Northwest



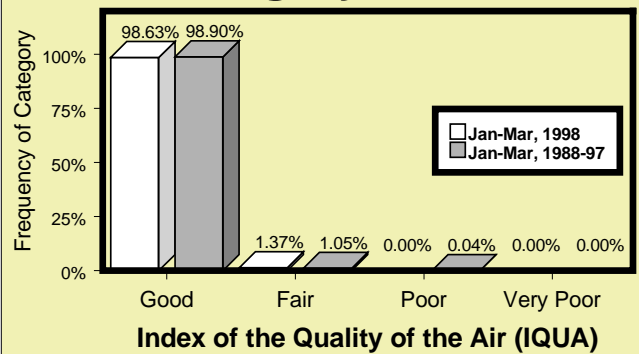
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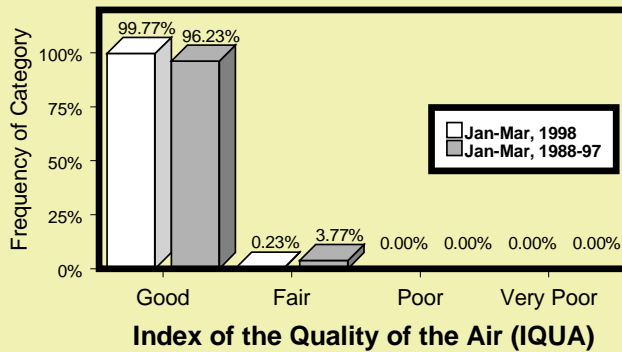
### Edmonton East



### Calgary East



### Fort Saskatchewan



## Average Concentrations - January to March, 1998 <sup>a</sup>

Parameter	Monitoring Period	Edmonton Stations			Calgary Stations			Fort Saskatchewan	Beaverlodge	Fort MacKay
		Central	Northwest	East	Central	Northwest	East			
Carbon Monoxide (ppm)	Jan-Mar 1998	1.11	1.05	0.54	1.23	0.76	1.14	0.59	n/a	n/a
	Jan-Mar 1988-97	1.47	1.28	0.62	1.54	0.83	1.38	0.65	n/a	n/a
Coefficient of Haze (COH unit)	Jan-Mar 1998	0.19	0.22	0.22	0.29	0.17	0.45	0.15	n/a	n/a
	Jan-Mar 1988-97	0.23	0.29	0.25	0.25	0.10	0.32	0.14	n/a	n/a
Hydrogen Sulphide (ppm)	Jan-Mar 1998	n/a	n/a	0.001	n/a	n/a	0.001	0.001	n/a	0.000
	Jan-Mar 1988-97 <sup>b</sup>	n/a	n/a	0.001	n/a	n/a	0.001	0.000	n/a	0.000
Nitrogen Dioxide (ppm)	Jan-Mar 1998	0.033	0.030	0.025	0.040	0.025	0.039	0.019	0.007	n/a
	Jan-Mar 1988-97	0.035	0.029	0.024	0.040	0.024	0.033	0.019	n/a	n/a
Ozone (ppm)	Jan-Mar 1998	0.012	0.013	0.018	0.009	0.017	0.010	0.017	0.028	n/a
	Jan-Mar 1988-97	0.013	0.015	0.020	0.011	0.020	0.013	0.024	n/a	n/a
Sulphur Dioxide (ppm)	Jan-Mar 1998	n/a	n/a	0.003	n/a	n/a	0.005	0.003	n/a	0.002
	Jan-Mar 1988-97	n/a	n/a	0.004	n/a	n/a	0.004	0.003	n/a	0.004
Total Hydrocarbons (ppm)	Jan-Mar 1998	2.74	2.52	2.87	2.44	2.19	2.52	2.18	n/a	2.28
	Jan-Mar 1988-97	2.45	2.25	2.32	2.28	2.12	2.24	2.17	n/a	1.89
Carbon Dioxide (ppm)	Jan-Mar 1998	n/a	n/a	n/a	415	n/a	n/a	n/a	n/a	n/a
	Jan-Mar 1992-97	n/a	n/a	n/a	408	n/a	n/a	n/a	n/a	n/a
Particulate (PM <sub>10</sub> in µg/m <sup>3</sup> )	Jan-Mar 1998	n/a	11.8	n/a	15.4	n/a	n/a	n/a	n/a	n/a
	Jan-Mar 1994-97 <sup>c</sup>	n/a	16.9	n/a	14.6	n/a	n/a	n/a	n/a	n/a
Particulate (PM <sub>2.5</sub> in µg/m <sup>3</sup> )	Jan-Mar 1998	n/a	n/a	n/a	9.1	n/a	n/a	n/a	n/a	n/a
	Jan-Mar 1997 <sup>d</sup>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Ammonia (ppm)	Jan-Mar 1998	n/a	n/a	n/a	n/a	n/a	n/a	0.01	n/a	n/a
	Jan-Mar 1988-97	n/a	n/a	n/a	n/a	n/a	n/a	0.01	n/a	n/a

a All average values based on data collected from January to March.

b Average hydrogen sulphide at the Edmonton East station for Jan-Mar 1991-97

c Average PM<sub>10</sub> at the Calgary Central station for Jan-Mar 1996-97.

d PM<sub>2.5</sub> monitoring began in November of 1997 at the Calgary Central station.

n/a Parameter not monitored.