

FLIN FLON AREA QUARTERLY AIR QUALITY REPORT: JULY, AUGUST AND SEPTEMBER 2008

To inform interested parties about air quality in the Flin Flon area, Manitoba Conservation issues on a quarterly basis an overview summary of levels in the community measured both by itself and Hudson Bay Mining and Smelting Co., Limited. Manitoba Conservation strives to make these quarterly reports available within two months of quarter-end.

Report Contents:

- Overall [summary](#) of air quality in the Flin Flon area.
- Chart depicting [air quality warnings](#) by month issued since commencement of this program.
- Chart depicting values in [excess of the 1-hr MAL](#) (Maximum Acceptable Level) for SO₂ by month at each site.
- Chart depicting values in excess of the 1-hr and 24-hr MAL for SO₂ during [each month](#) in this quarter.
- [Table depicting statistics](#) on selected heavy metals and particulate matter over the last year, as well as the entire sampling period.
- Chart depicting daily levels of total [suspended particulate matter](#) at each site since 1996.
- Chart depicting average daily levels of fine particulate matter ([PM₁₀](#) and [PM_{2.5}](#)) in the Flin Flon area.

SUMMARY OF AIR QUALITY WITHIN THE FLIN FLON AREA

JULY, AUGUST AND SEPTEMBER 2008

Monitoring Activity

Continuous outdoor sulphur dioxide (SO₂) monitoring and ongoing particulate matter (PM) sampling (including analysis for selected heavy metals) by Manitoba Conservation and by Hudson Bay Mining and Smelting Co. Limited (HBM&S) were maintained in the Flin Flon area and form the basis for this report.

Air quality during the third quarter of 2008 for sulphur dioxide showed improvement from previous quarters. Several days of elevated particulate matter (fine "dust") levels were recorded both at the Provincial and Creighton sites due to smoke from forest fires.

Sulphur Dioxide

Selected statistics are shown in the attached graphs. An overview of air quality warnings issued to the community is also included.

During this quarter, exceedances of the Manitoba provincial 1-hr Maximum Acceptable Level (MAL) for sulphur dioxide of 0.34 parts per million (ppm) were observed at several of the sites, though at a reduced frequency compared to recent months. In July, 4 hours were determined to be above the 1-hr MAL in the "uptown" area (4th, 12th and 25th at the Provincial and Staffhouse monitoring locations). In August, 2 hours were recorded to be above the 1-hr MAL at the Aqua Centre location (on the 7th and 28th). During September, no hours were measured above the MAL.

All of the hours with elevated readings appear to arise from poor dispersion of the stack plume due to unfavourable weather conditions. This causes the stack plume to settle onto the community, rather than getting dispersed while traveling aloft and away from the community.

The World Health Organization (WHO) daily maximum exposure guideline of 0.05 ppm was not exceeded during any days in this quarter.

Particulate Matter (PM)/ Heavy Metals (HM)

TSP (Total Suspended Particulate) levels along with selected heavy metal concentrations and PM₁₀ and PM_{2.5} (fine particulate ≤ 10 microns and ≤ 2.5 microns, respectively) statistics for all sites have been tabulated over the following time frames: for the 12 month period ending September 2008, and for the entire sampling period of up to 19 years.

Daily TSP levels (including the larger-sized or coarse dust particles) measured in the third quarter of 2008 were below the Manitoba provincial air quality objective of 120 µg/m³ at all sites. The highest levels measured during this period were: the Provincial Bldg. site - 113 µg/m³ on August 7th and at Creighton - 116 µg/m³ on July 1st. Coarse particulate matter usually arises mostly from wind-swept ground dust or vehicle-entrained street material.

Fine particulate (PM₁₀) levels were continuously measured 24/7 at the Provincial and Creighton monitoring sites. Elevated levels of PM₁₀ above the Manitoba criteria of 50 µg/m³ / day were recorded on 3 days at the Provincial Bldg site, 1 day at the Ruth Betts School monitoring site and 3 days at the Creighton site - cause is likely smoke in air from forest fires.

Continuous (24/7) monitoring of very fine particulate matter (PM_{2.5}) was also conducted at the Provincial and Creighton monitoring sites. PM_{2.5} is the fraction of the total dust in air most closely associated with human health impacts. During this quarter, PM_{2.5} levels were above the daily Canada-wide Standard of 30 µg/m³ for 3 days at the Provincial site and 5 days at the Creighton site - these levels were associated with heavy smoke in air from forest fires and were most noticeable on July 1st, 25th and 26th.

Concentrations of selected heavy metals, such as lead and arsenic in air, were within the Manitoba provincial air quality guidelines at all sites.

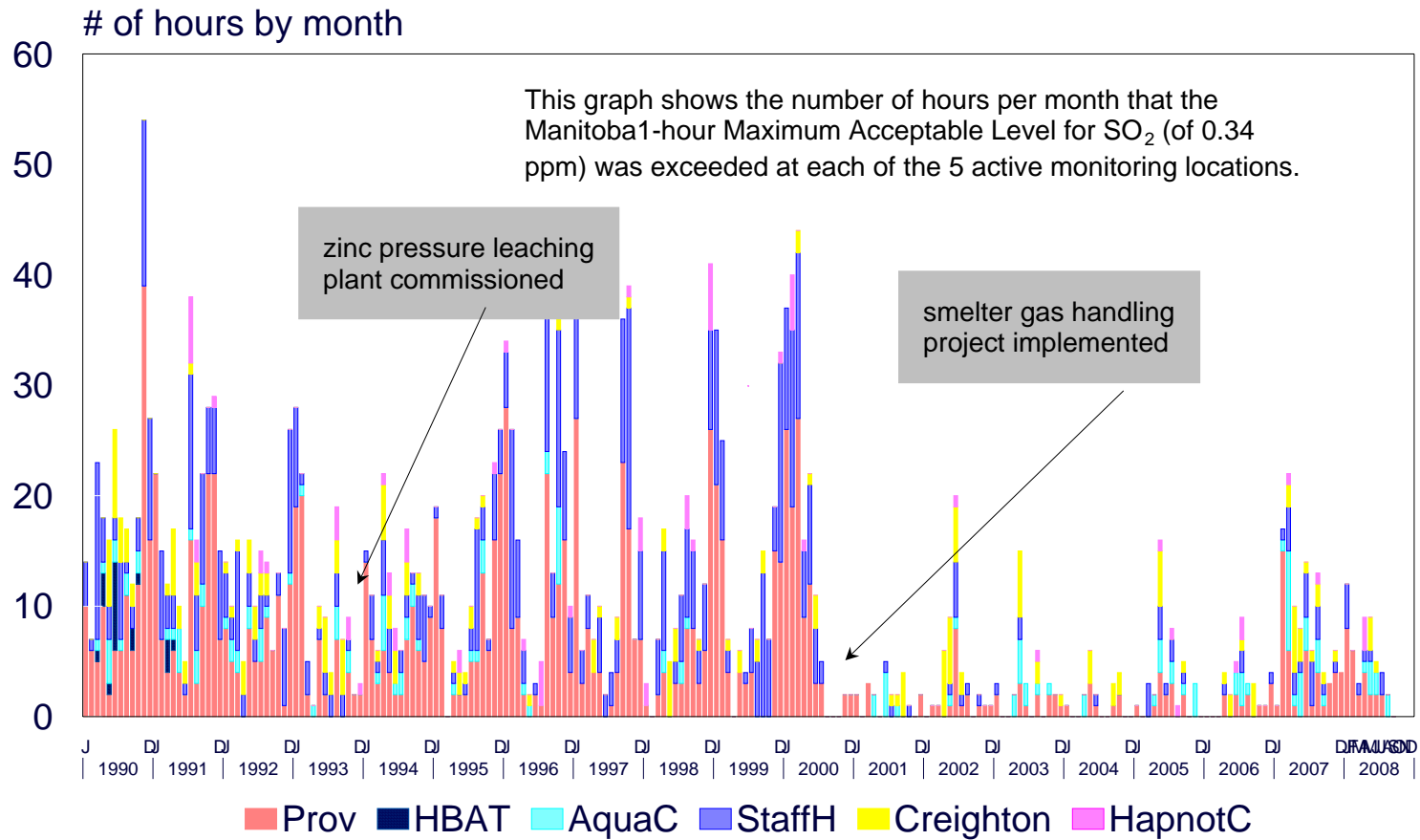
Additional Information

- Details on hourly and daily air concentrations of sulphur dioxide and an analysis of air quality warnings recorded compared with those issued, along with abatement actions taken by HBM&S, have been filed with the Manitoba Environment Act Public Registry at 160-123 Main Street, Winnipeg, MB, and at the Flin Flon Public Library; File 1095.30.

[Return](#)

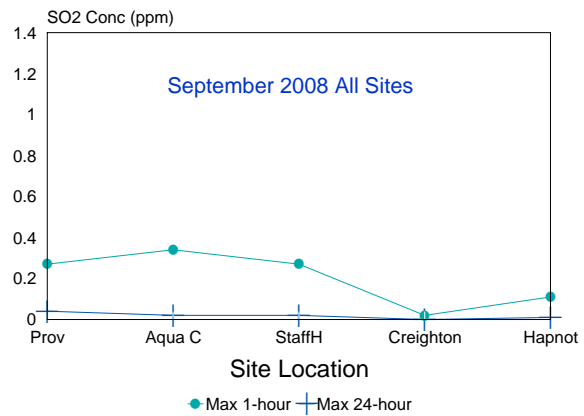
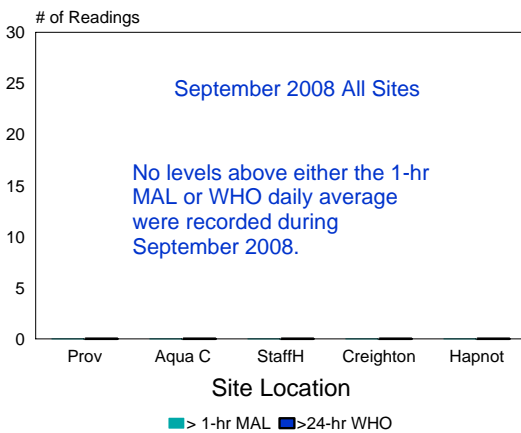
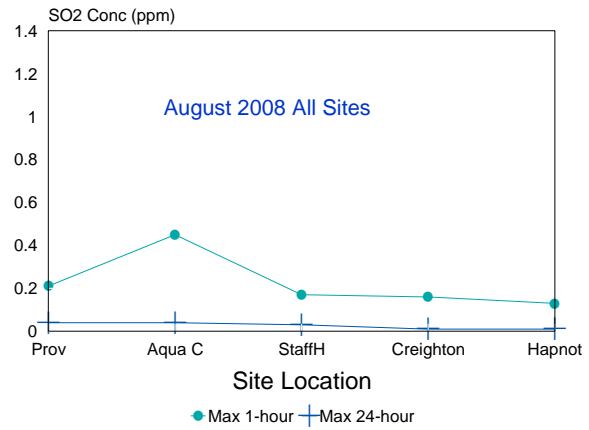
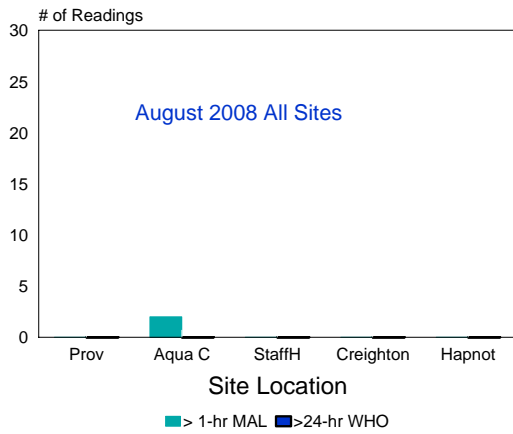
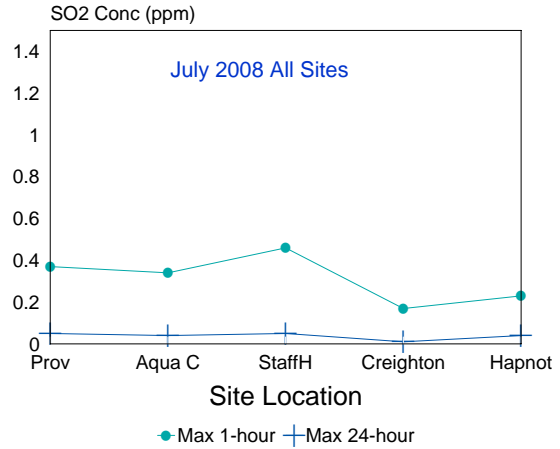
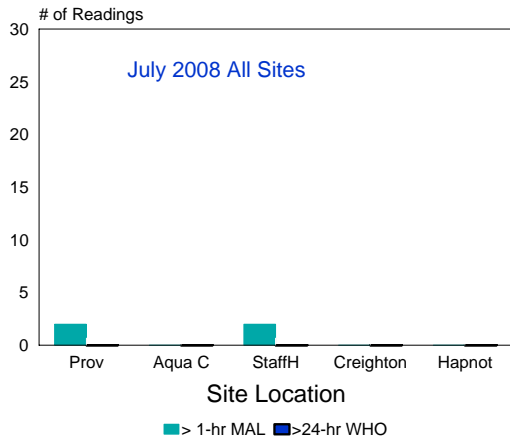
Flin Flon Area Air Quality

Exceedances of the 1-hr MAL for SO₂



[Return](#)

FLIN FLON SULPHUR DIOXIDE MONITORING



[Return](#)

Flin Flon Heavy Metals and Particulate Summaries

Total Suspended Particulates (TSP) Particulate Matter 100 µm and smaller in diameter

	Site/Time Period	Sample Range		Geometric Mean		# of Samples > MAL	
		Dec. '88 – Sep. '08	Oct. '07- Sep. '08	Dec. '88 – Sep. '08	Oct. '07- Sep. '08	Dec. '88 – Sep. '08	Oct. '07- Sep. '08
PM	Prov.	0-468	3-178	35	27	180*	2 *
	R.B.	0-423	5-93	20	19	8 *	0 *
	C./S.P.	0-235	--	16	--	5 *	--
	Cr. Sch.	1-3601	5-120	23	21	24 *	0 *
Pb	Prov.	0.00-13.11	0.01-2.76	0.10	0.07	17 (3) *	1 (1) *
	R.B.	0.00-3.09	0.01-0.77	0.05	0.03	0 *	0 *
	C./S.P.	0.00-1.75	--	0.05	--	0 *	--
	Cr. Sch.	0.01-3.39	0.01-0.46	0.03	0.02	0 *	0 *
As	Prov.	0.000-1.380	0.002-0.869	0.018	0.019	108 **	8 **
	R.B.	0.000-0.524	0.000-0.524	0.006	0.003	4 **	2 **
	C./S.P.	0.000-0.282	--	0.003	--	0 **	--
	Cr. Sch.	0.000-4.548	0.000-0.089	0.004	0.003	6 **	0 **

Concentration results are shown in units of micrograms of mass per cubic metre ($\mu\text{g}/\text{m}^3$) of air per 24-hour averaging period.

Prov. = Provincial Building monitoring site (Man. Conservation) [to September 30, 2008]

R.B. = Ruth Betts monitoring site (HBM&S)

C./S.P. = Centoba / Sewage Plant monitoring site (HBM&S)

Cr. Sch. = Creighton School monitoring site (HBM&S) [all HBM&S sites to September 30, 2008 for TSP and heavy metals except as follows - Sewage Plant to November 10, 2002 then Hi-Vol moved to Creighton School where sampling was daily from November 13 through December 12, 2002 and every second day from December 18, 2002]

Annual range October 1, 2007 to September 30, 2008 inclusive for all sites (thus no data for Sewage Plant site - see note above.).

PM₁₀ (Inhalable Particulates) Particulate Matter 10 µm and smaller in diameter.

	Site/Time Period	Sample Range		Geometric Mean		# of Samples > MAL	
		Dec. '96 – Sep. '08	Oct. '07- Sep. '08	Dec. '96 – Sep. '08	Oct. '07- Sep. '08	Dec. '96 – Sep. '08	Oct. '07- Sep. '08
PM _{2.5}	Prov.	0.00-56.93	0.04-56.93	3.89	4.61	15 ****	7 ****
PM ₁₀	Prov.	0.30-248.5	2.18-80.58	14.52	13.13	254 ***	15 ***
	R.B.	1-66	1-47	10	10	3 ***	0 ***
	S.P.	2-50	--	9	--	0 ***	--
	Cr. Sch.	3-93	--	15	--	1 ***	--
D-PM ₁₀	Cr. Sch.	0-152.1	0.4-84.2	16.11	16.45	45 ***	5 ***
D-PM _{2.5}	Cr. Sch.	0-80.1	0-80.1	8.82	10.98	73 ****	12 ****

Concentrations are shown in units of micrograms of mass per cubic metre ($\mu\text{g}/\text{m}^3$) of air per 24-hour averaging period.

Prov. = Provincial Building real-time continuous PM₁₀ & PM_{2.5} monitoring site (Man. Conservation)[to September 30, 2008]

R.B. = Ruth Betts monitoring site (HBM&S) [from June 8, 1996 to June 30, 2008 for PM₁₀]

S.P. = Sewage Plant monitoring site (HBM&S) [from June 8, 1996 to December 7, 2002 for PM₁₀]

Cr. Sch. = Creighton School monitoring site (HBM&S) [from December 15, 2002 to May 22, 2003 every second day for PM₁₀ and metals] On May 23, 2003 a R&P Dichotomous Partisol Sampler was installed at this site. It has provided daily 24-hr samples except for when there were instrument problems. The Partisol Sampler draws ambient air through a PM10 size selective head and the sample is split internally to give a PM_{2.5} (fines) [D-PM_{2.5}] and PM_{2.5-10} (coarse) [D-PM_{2.5-10}] sample. D-PM₁₀ is the sum of D-PM_{2.5} and D-PM_{2.5-10}. Sample results to September 30, 2008. Annual range October 1, 2007 to September 30, 2008 inclusive for all sites.

* In comparison to the Manitoba Ambient Air Quality Objective (or Guideline) of 120 $\mu\text{g}/\text{m}^3$ for TSP and 5 $\mu\text{g}/\text{m}^3$ for Pb and as of July 1, 2005 2 $\mu\text{g}/\text{m}^3$ for Pb (number in bracket indicates the number above the new standard)

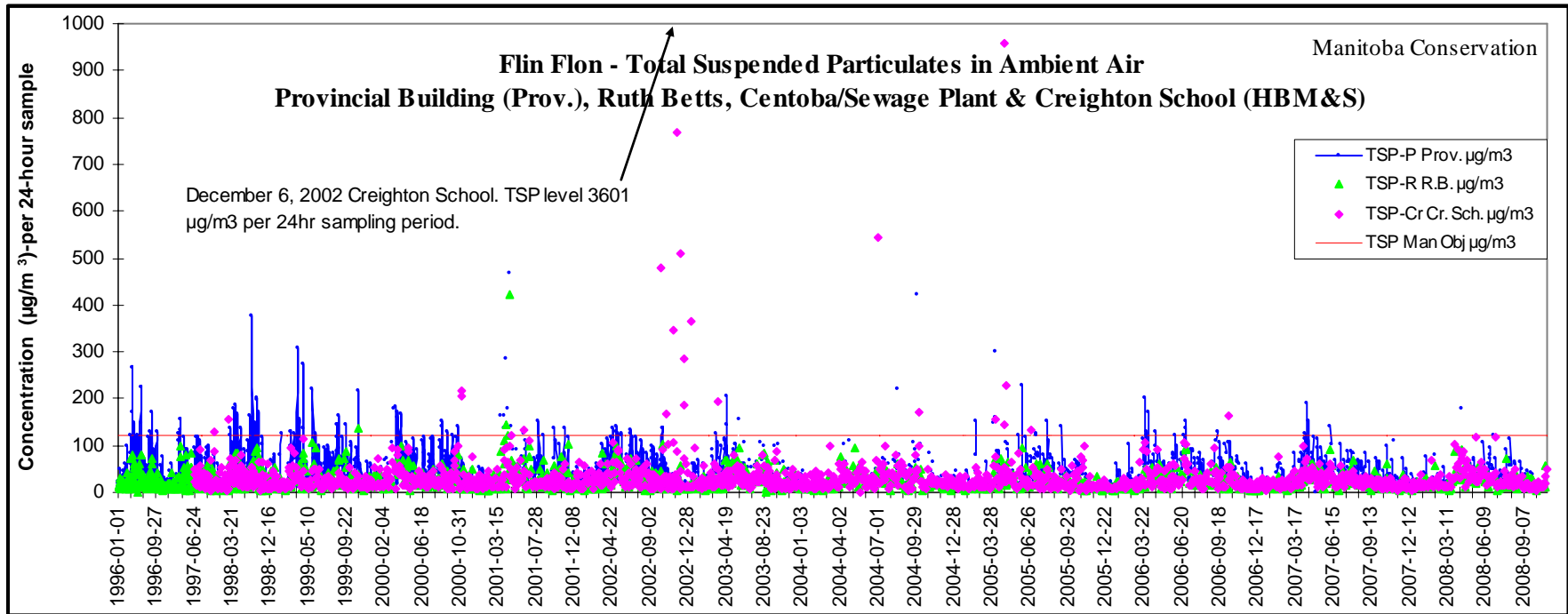
** In comparison to Guidelines (24 hours) [0.3 $\mu\text{g}/\text{m}^3$ for As]

*** Based on the Manitoba Guideline of 50 $\mu\text{g}/\text{m}^3$ **** Based on Canada-Wide Standard of 30 $\mu\text{g}/\text{m}^3$

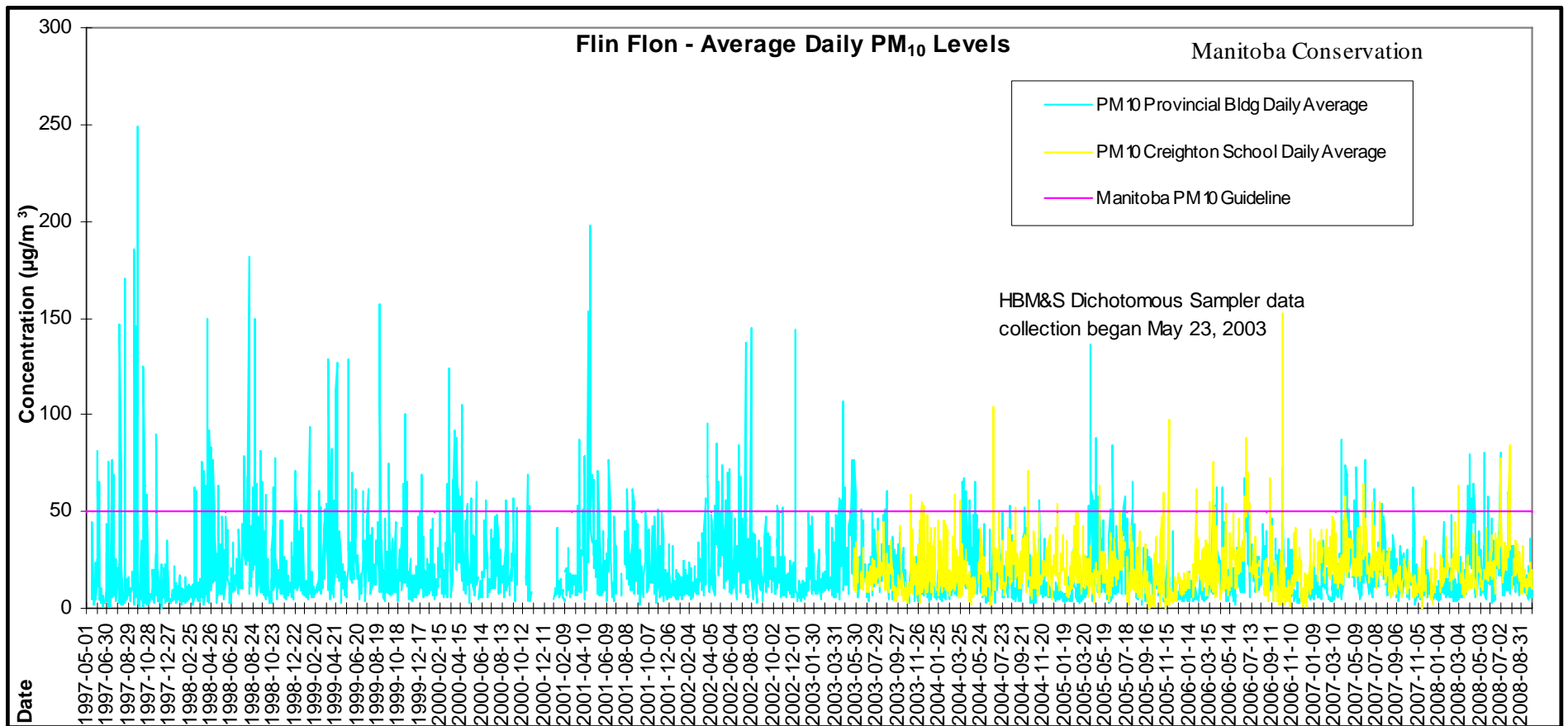
MAL - Maximum Acceptable Level

revised November 17, 2008

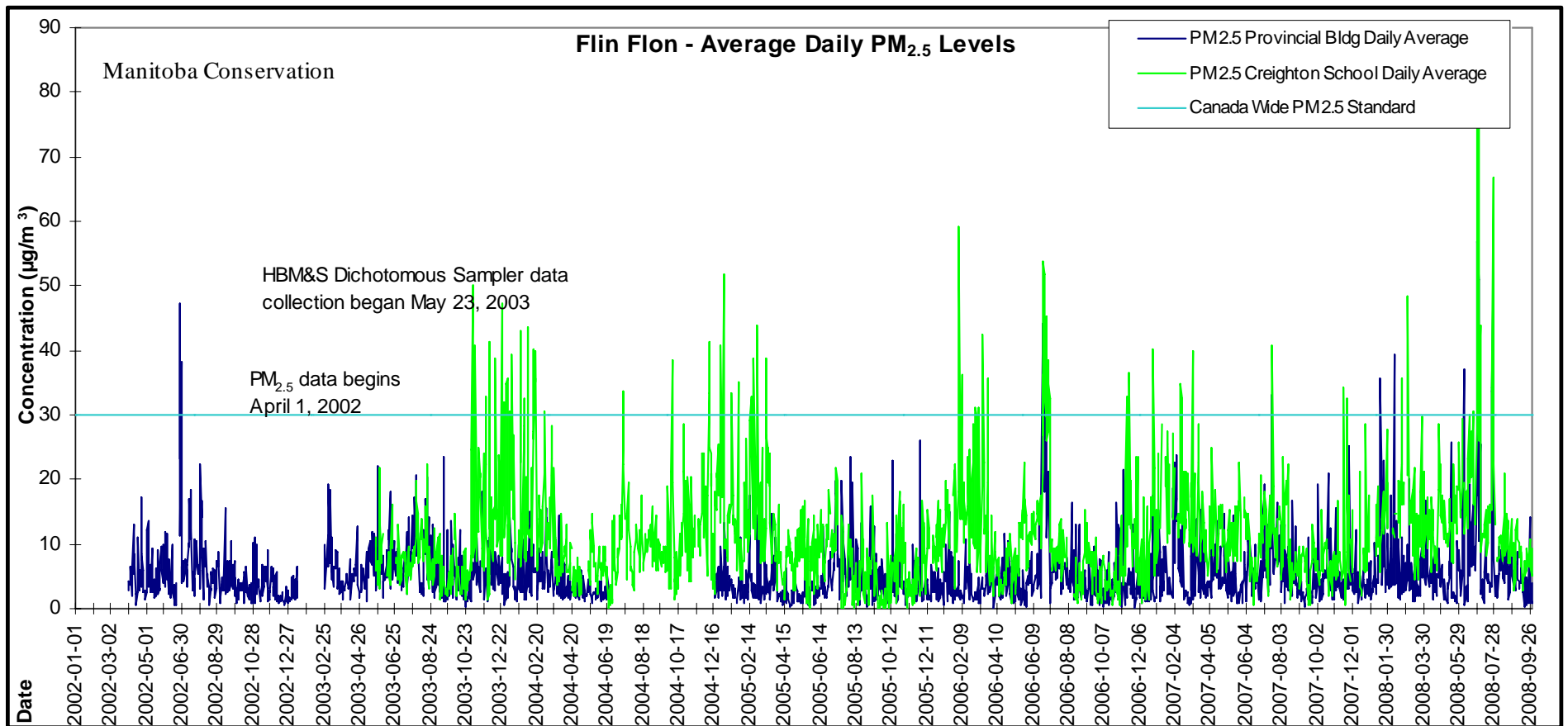
[Return](#)



[Return](#)



[Return](#)



[Return](#)