

FLIN FLON AREA QUARTERLY AIR QUALITY REPORT: JANUARY, FEBRUARY AND MARCH 2009

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

Report Contents:

- Overall [summary](#) of air quality monitoring results in the Flin Flon area.
- Chart depicting [air quality warnings](#) (summarized monthly) issued since the commencement of this program.
- Chart depicting values in [excess of the 1-hour MAL](#) (Maximum Acceptable Level) for SO₂ (summarized monthly) at each site.
- Chart depicting values in excess of the 1-hour and 24-hour 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

JANUARY, FEBRUARY AND MARCH 2009

Monitoring Activity

The results from the continuous outdoor sulphur dioxide (SO₂) monitoring and particulate matter (PM) sampling (including analysis for selected heavy metals) conducted by Manitoba Conservation and Hudson Bay Mining and Smelting Co., Limited (HBM&S) in the Flin Flon area form the basis of this report.

During the first quarter of 2009, ambient SO₂ concentrations continued to decline as in past quarterly results. A number of days with elevated levels of particulate matter (fine "dust") continued to be recorded at the Creighton monitoring site and this is attributed to the smoke generated by local wood-burning for heating purposes.

Sulphur Dioxide

Selected statistics are shown in the attached graphs. An overview of air quality warnings issued to the Flin Flon area was also included.

During this quarter, exceedances to the 1-hour Maximum Acceptable Level for sulphur dioxide (Manitoba Ambient Air Quality Criteria is 0.34 parts per million) were observed primarily in the "uptown" area of Flin Flon. In January, 3 hours at the Provincial Building air quality monitoring site and 1 hour at the Staff House air quality monitoring site were recorded to be above the 1-h MAL. During the months of February and March, only 1 hour for each month (Provincial building and Creighton monitoring sites) were recorded to exceed the Ambient Air Quality criteria.

The exceedance at the Creighton monitoring site at the end of March was due to a "looping" plume from the HBM&S stack. All other exceedances appear to have resulted from fugitive gas releases associated with the tapping of matte from the reverberatory furnace (as reported by HBM&S). These are gases that are released into the air closer to ground level (and not exhausted through the tall stack) and, therefore, are not subject to as much air dispersion and dilution. HBM&S is investigating possible options for addressing these releases.

The World Health Organization (WHO) daily maximum exposure guideline of 0.05 parts per million (ppm) was exceeded for several days during this quarter primarily in January and mostly at the Provincial Building monitoring site.

Particulate Matter (PM)/ Heavy Metals (HM)

TSP (Total Suspended Particulates), selected heavy metals, PM₁₀ and PM_{2.5} (fine particulate ≤ 10 microns and ≤ 2.5 microns, respectively) concentrations recorded from all sites have been tabulated over the following time frames: for the most recent 12 months to the end of March 09, and for the entire sampling period of over 20 years.

Daily TSP levels (including the larger-sized or coarse dust particles) measured in the first quarter of 2009 were below the Manitoba Ambient Air Quality Criteria of 120 µg/m³ (24-hour average) at all sites. Coarse particulate matter usually arises from wind-swept ground dust or vehicle-entrained street materials whose entrainment is minimized by snow cover during winter months.

Fine particulate (PM₁₀) levels were continuously measured (24/7) at the Provincial Building and Creighton monitoring sites. Elevated levels of PM₁₀ above the Manitoba criteria of 50 µg/m³ (24-hour average) were recorded for 3 days at the Creighton monitoring site. These exceedances were associated with the smoke in the air generated by wood-burning.

Continuous (24/7) monitoring of very fine particulate matter (PM_{2.5}) was also conducted at the Provincial Building and Creighton monitoring sites. PM_{2.5} is the fraction of the total dust in the ambient air most closely associated with human health impacts. During this quarter, PM_{2.5} levels were above the 24-hour Canada-Wide Standards of 30 µg/m³ for 13 days at the Creighton monitoring site. These exceedances were associated with the smoke in the air generated by wood-burning.

The concentrations of selected heavy metals were within the Manitoba Ambient Air Quality Criteria at all monitoring sites except for 5 days when elevated arsenic levels were recorded (January 7th and 20th, February 12th and 15th, and March 17th) at the Provincial Building monitoring site.

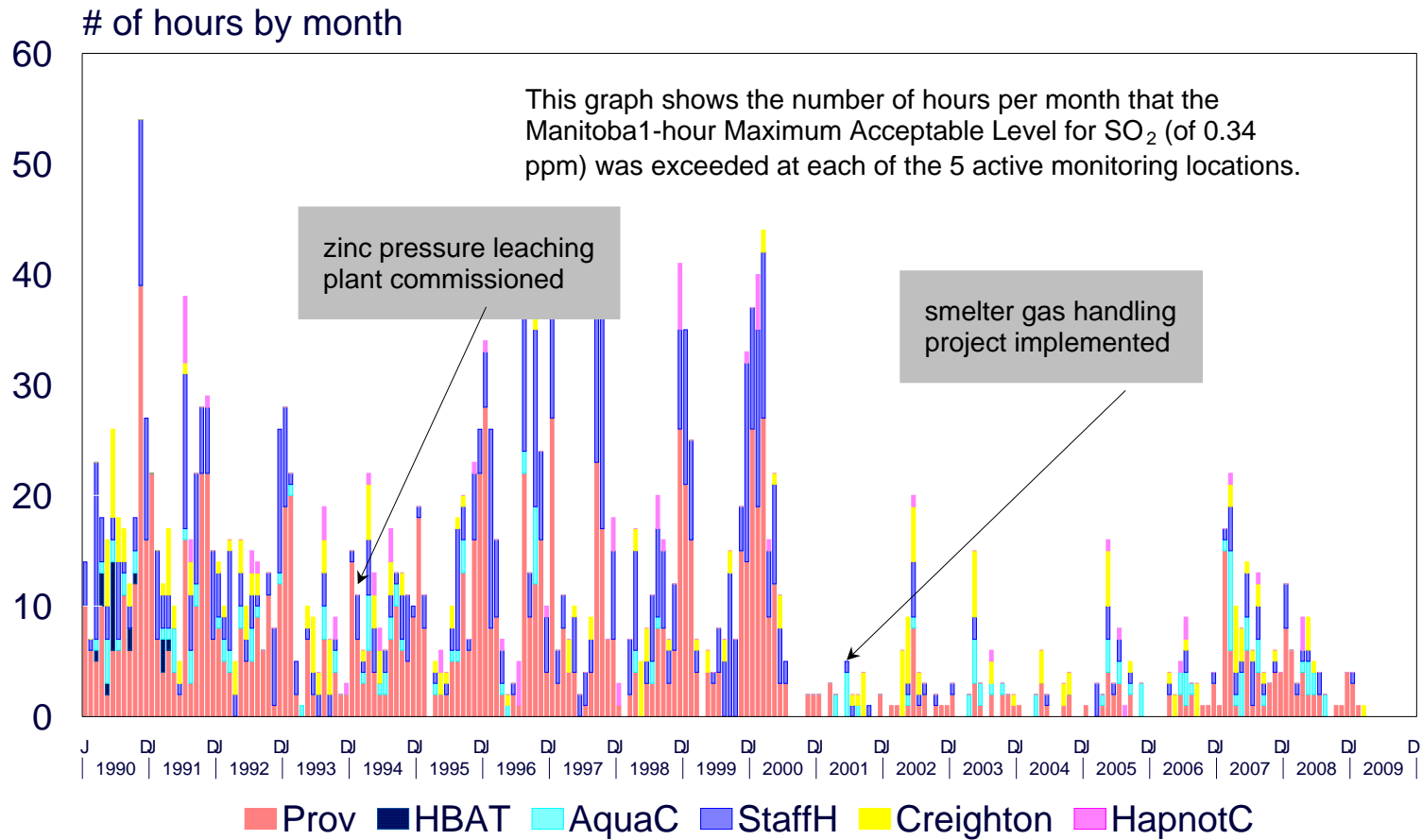
Additional Information

Details on the hourly and daily ambient air concentrations of sulphur dioxide and air quality warnings issued to the Flin Flon area, 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.

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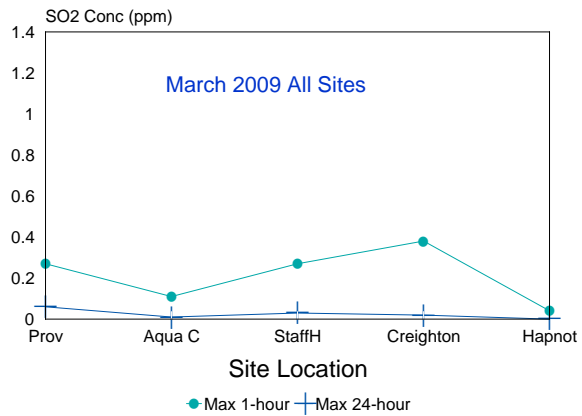
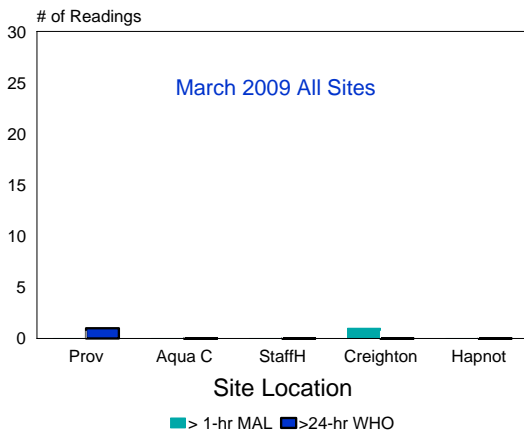
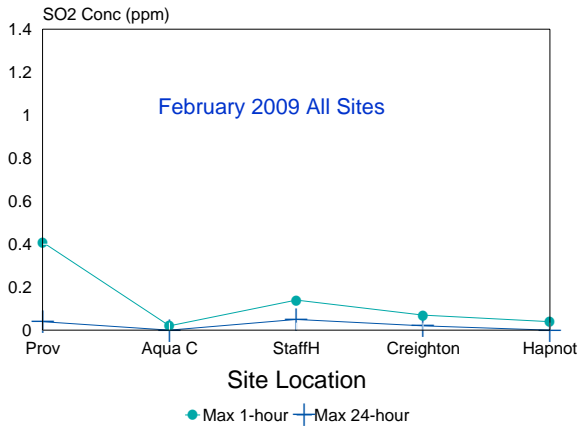
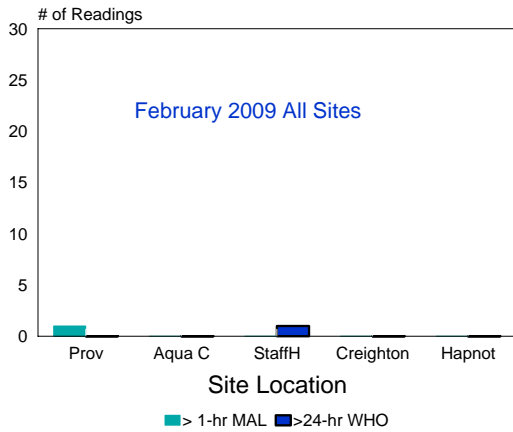
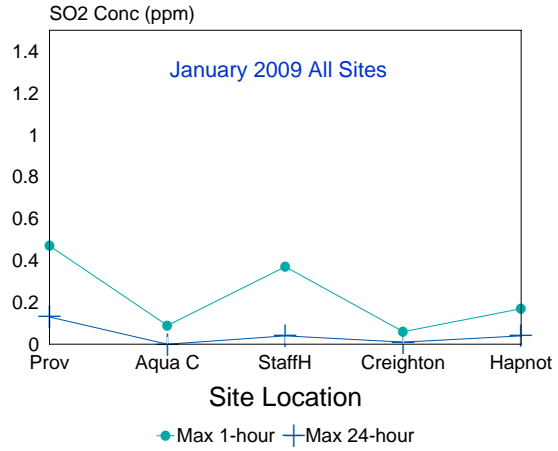
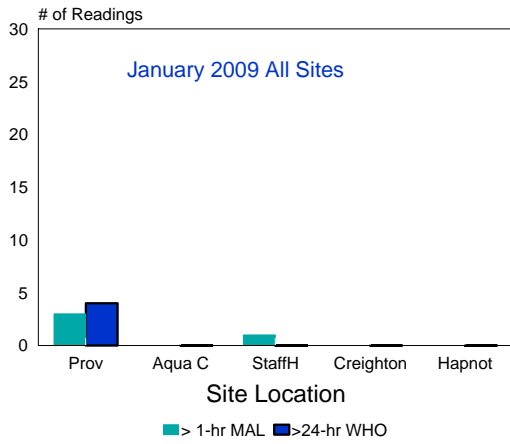
Flin Flon Area Air Quality

Exceedances of the 1-hr MAL for SO₂



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FLIN FLON SULPHUR DIOXIDE MONITORING



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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 – Mar. '09	Apr. '08- Mar. '09	Dec. '88 – Mar. '09	Apr. '08- Mar. '09	Dec. '88 – Mar. '09	Apr. '08- Mar. '09
PM	Prov.	0-468	7-178	34	28	181*	3 *
	R.B.	0-423	2-93	19	14	8 *	0 *
	C./S.P.	0-235	--	16	--	5 *	--
	Cr. Sch.	1-3601	3-120	22	17	24 *	0 *
Pb	Prov.	0.00-13.11	0.02-2.76	0.10	0.08	19 (5) *	3 (3) *
	R.B.	0.00-3.09	0.01-0.48	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	0.02	0.02	0 *	0 *
As	Prov.	0.000-1.380	0.002-0.692	0.019	0.022	117 **	9 **
	R.B.	0.000-0.524	0.000-0.166	0.006	0.005	4 **	0 **
	C./S.P.	0.000-0.282	--	0.003	--	0 **	--
	Cr. Sch.	0.000-4.548	0.000-0.145	0.003	0.002	6 **	0 **

Concentration results are shown in units of micrograms of mass per cubic metre (µg/m³) of air per 24-hour averaging period.

Prov. = Provincial Building monitoring site (Man. Conservation) [to March 31, 2009]

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 March 31, 2009 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 April 1, 2008 to March 31, 2009 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 – Mar. '09	Apr. '08- Mar. '09	Dec. '96 – Mar. '09	Apr. '08- Mar. '09	Dec. '96 – Mar. '09	Apr. '08- Mar. '09
PM _{2.5}	Prov.	0.00-56.93	0.04-56.93	3.88	4.21	15 ****	5 ****
PM ₁₀	Prov.	0.30-248.5	2.84-80.58	14.29	13.04	256 ***	13 ***
	R.B.	1-66	3-59	10	9	4 ***	1 ***
	S.P.	2-50	--	9	--	0 ***	--
	Cr. Sch.	3-93	--	15	--	1 ***	-- ***
D-PM ₁₀	Cr. Sch.	0-152.1	1.3-84.2	16.04	17.48	50 ***	9 ***
D-PM _{2.5}	Cr. Sch.	0-80.1	0.5-80.1	8.69	9.78	90 ****	25 ****

Concentrations are shown in units of micrograms of mass per cubic metre (µg/m³) of air per 24-hour averaging period.

Prov. = Provincial Building real-time continuous PM₁₀ & PM_{2.5} monitoring site (Man. Conservation)[to March 31, 2009]

R.B. = Ruth Betts monitoring site (HBM&S) [from June 8, 1996 to March 31, 2009 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 March 31, 2009. Annual range April 1, 2008 to March 31, 2009 inclusive for all sites.

* In comparison to the Manitoba Ambient Air Quality Objective (or Guideline) of 120 µg/m³ for TSP and 5 µg/m³ for Pb and as of July 1, 2005 2 µg/m³ for Pb (number in bracket indicates the number above the new standard)

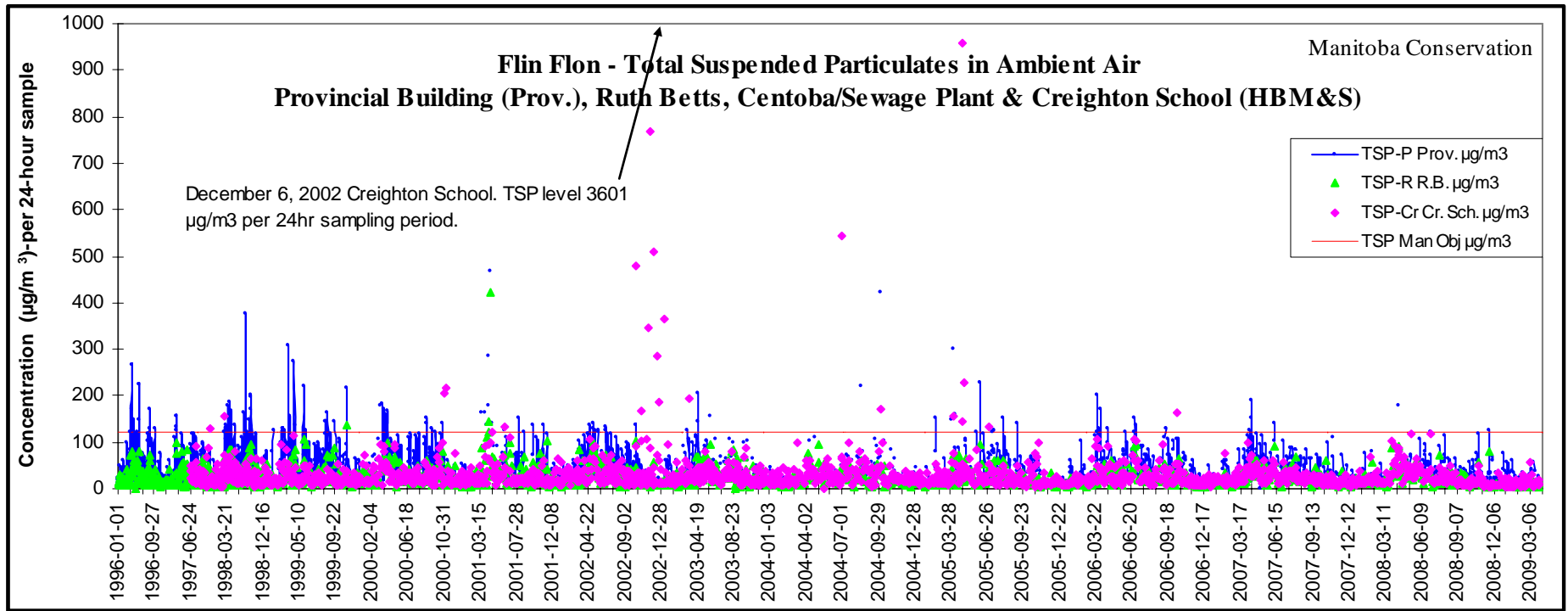
** In comparison to Guidelines (24 hours) [0.3 µg/m³ for As]

*** Based on the Manitoba Guideline of 50 µg/m³ **** Based on Canada-Wide Standard of 30 µg/m³

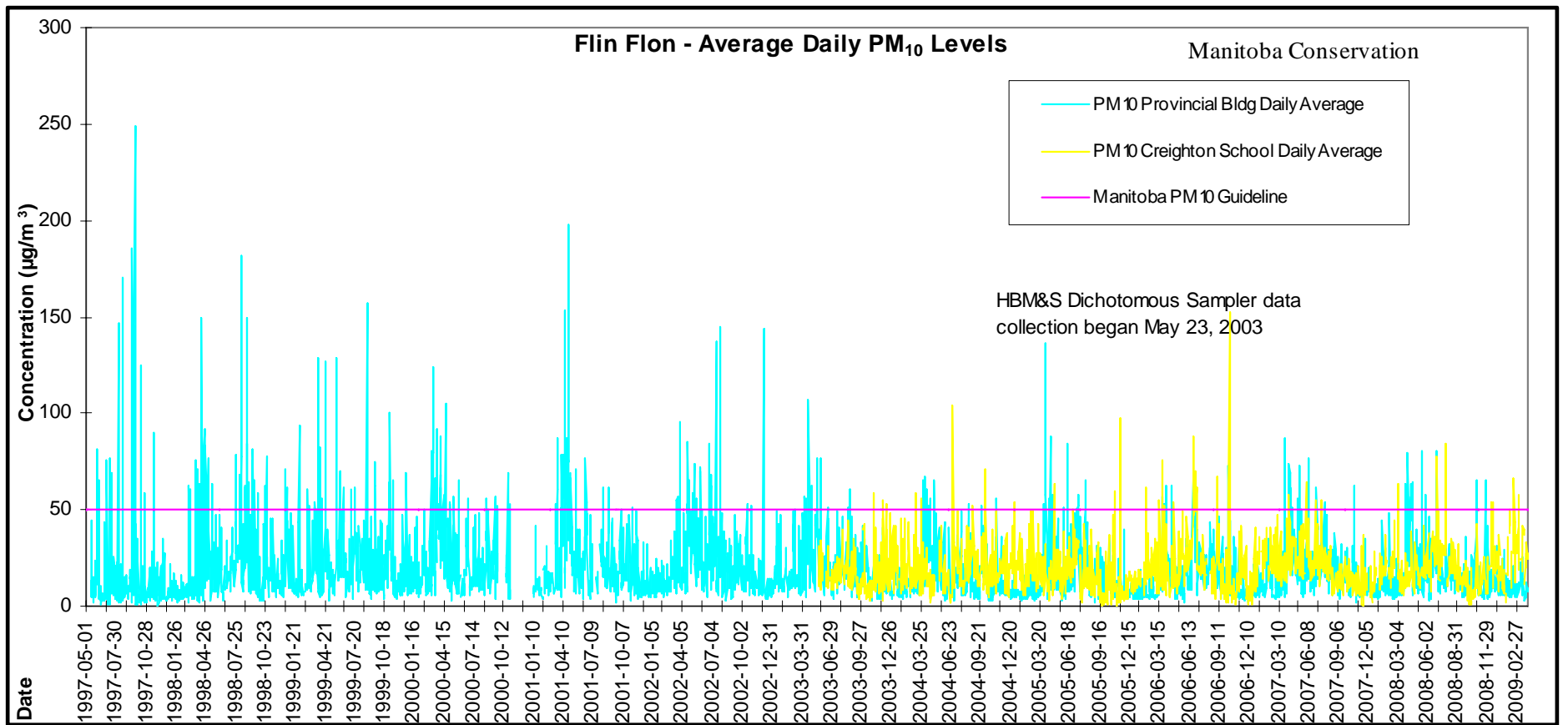
MAL - Maximum Acceptable Level

revised May 29, 2009

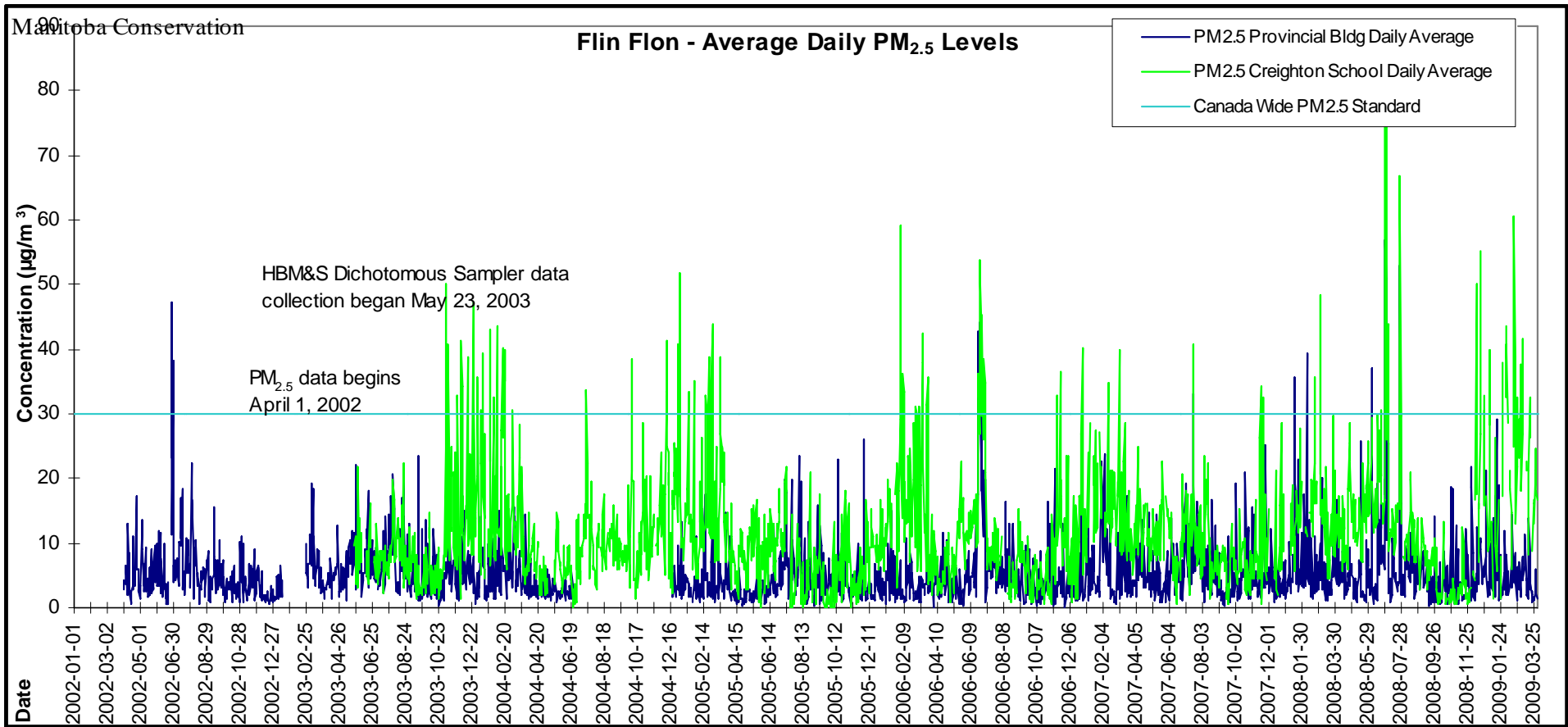
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