

**TransAlta Utilities Inc./EPCOR Generation Inc. Wabamun-Genesee  
Area Air Monitoring Programs**

**2006 Third Quarter Report**

**Ambient Air Quality Monitoring Program  
Acid Deposition Assessment Program  
Mercury Assessment Program**

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## EXECUTIVE SUMMARY

TransAlta Utilities Inc. and EPCOR Generation Inc. operate four coal-fired thermal generating plants – Sundance, Keephills, Wabamun, and Genesee – located in the Wabamun-Genesee area of west-central Alberta. The generating plants operate under Alberta Environmental Protection and Enhancement Act approvals. Under their approvals, the generating plants are committed to conducting special environmental monitoring programs. Three environmental monitoring programs conducted on an on-going manner include:

- Regional ambient air monitoring program.
- Acid deposition assessment program.
- Mercury assessment program.

This quarterly report summarizes key results of data collected for these programs in the third quarter (July, August, and September) of 2006. Completeness of monitoring data, quarterly summary statistics for selected air quality parameters, and contraventions of approval terms and applicable air quality monitoring objectives are summarized and discussed.

### **Regional Ambient Air Program**

There were no instances of invalid or missing data for intermittent PM<sub>10</sub> and PM<sub>2.5</sub> samples. There were three instances of invalid or missing passive results for the third quarter. Data capture rates for continuous monitoring parameters at all air monitoring stations were well above the 90% criterion on a monthly basis as stipulated in the Air Monitoring Directive (1989). High uptimes indicate that equipment in the continuous air monitoring network was generally well-maintained.

One contravention of approval terms and applicable air quality monitoring objectives were reported for the July to September 2006 period. The NO/NO<sub>2</sub>/NO<sub>x</sub> sensor at the Wagner air monitoring station was removed from service near the end of July due to damage caused by static on the telephone line. This was reported to Alberta Environment on August 17, 2006 under reference #175470. The sensor was not returned to service until August 29, resulting in 8.3% uptime during August. The sensor has been functioning properly since.

### **Acid Deposition Assessment Program**

There were two incidents of invalid or missing data in the third quarter of 2006 for the acid deposition program integrated TSP samples. All data capture rates were above 90% for the continuous monitoring program in the third quarter. Capture rates for continuous monitoring parameters at the Violet Grove AMS in July were below 94% due to data acquisition failure.

### **Mercury Assessment Program**

There were no notable issues with the mercury assessment program in the third quarter. Conversion of this site to the National Acid Deposition Program's Mercury Deposition Program (MDN) was completed in July 2006.

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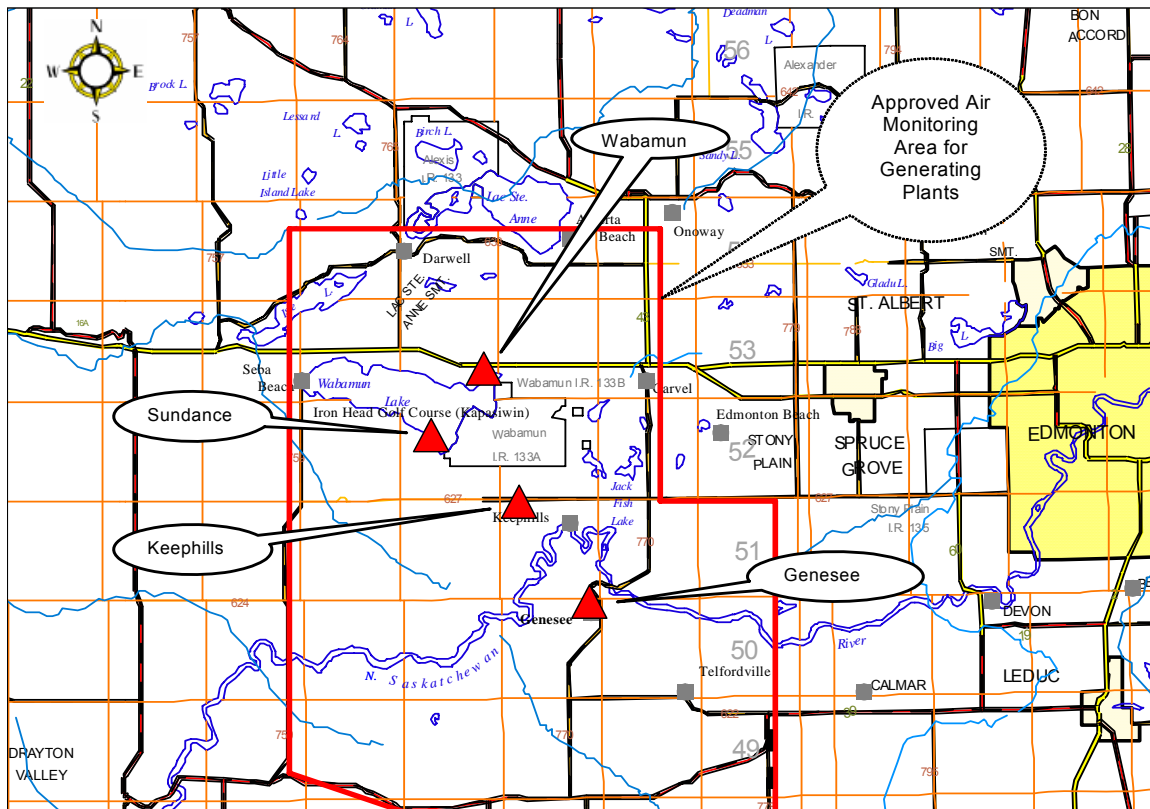
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## ABBREVIATIONS

AAAQO	Alberta ambient air quality objective
AMS	air monitoring station
Ca <sup>2+</sup>	calcium ion
EPEA	Environmental Protection and Enhancement Act
HNO <sub>2</sub>	nitrous acid
HNO <sub>3</sub>	nitric acid
K <sup>+</sup>	potassium ion
Mg <sup>2+</sup>	magnesium ion
MW	megawatts
Na <sup>+</sup>	sodium ion
NAPS	Nation Air Pollutant Surveillance
NH <sub>4</sub> <sup>+</sup>	ammonium ion
NO <sub>2</sub>	nitrogen dioxide
NO <sub>3</sub> <sup>-</sup>	nitrate ion
O <sub>3</sub>	ozone
PM <sub>2.5</sub>	particulate matter ≤2.5 µm diameter
PM <sub>10</sub>	particulate matter ≤10 µm diameter
Q3	third quarter
RH	relative humidity
SO <sub>2</sub>	sulphur dioxide
SO <sub>4</sub> <sup>2-</sup>	sulphate ion
SW	surface wetness
T <sub>2</sub>	ambient temperature at 2 m above ground
T <sub>10</sub>	ambient temperature at 10 m above ground
TSP	total suspended solids
WDR	wind direction
WSP	wind speed

# 1 Introduction

TransAlta Utilities (TransAlta) [www.transalta.com] and EPCOR Generation Inc. (EPCOR) [www.epcor.ca] operate four coal-fired thermal generating plants (generating stations) – Wabamun, Sundance, Keephills, and Genesee - located in the Wabamun-Genesee area of west-central Alberta. The location of these generating plants is shown in Figure 1. Collectively, the four generating plants have a net generating capacity of 4,277 MW.



**Figure 1 Coal fired generating plant locations in the Wabamun-Genesee area.**

Wabamun generating plant is the oldest of TransAlta's three generating plants in the Lake Wabamun area. It is near the Village of Wabamun and has a net generating capacity of 279 MW. Only one generating unit was in operation at the Wabamun generating plant in 2006. The remaining three units were retired in 2002 (Unit 3) and 2004 (Units 1 and 2).

The TransAlta Sundance generating plant consists of six generating units, and is the largest, coal-fired generating plant in western Canada. Sundance is situated on the south shore of Lake Wabamun approximately 70 kilometres (km) west of Edmonton, Alberta (Figure 1). The plant has been in operation since 1970, with steady expansion from a single original generating unit to six generating units throughout the 1970s. Sundance currently has a net generating capacity of 2,020 megawatts (MW). The Keephills generating plant is located 5 km southeast of Wabamun Lake (Figure 1). It has a net generating capacity of 766 MW, and consists of two generating units. Keephills has been in operation since 1983.

The Genesee generating plant consists of three generating units located 50 km southwest of Edmonton (Figure 1). EPCOR fully owns and operates Units 1 and 2, which have a combined net generating capacity of 762 MW. These units have been in operation since 1994 and 1989, respectively. Genesee 3 (Unit 3), commissioned in 2005, is a 50/50 joint venture between TransAlta and EPCOR. Genesee 3 has a net generating capacity of 450 MW.

## 1.1 Environmental Monitoring Programs for Generating Plants

The generating plants operate under Alberta Environmental Protection and Enhancement Act (EPEA) approvals listed in Table 1. Under their EPEA approvals, the generating plants are committed to conducting special environmental monitoring programs. These programs are designed to:

- Identify and quantify ambient levels and deposition patterns of chemical species of potential concern that are associated with generating plant emissions.
- Generate an inventory of representative baseline data for the chemicals of potential concern.
- Provide data for assessing long-term impacts and for evaluating and implementing air quality management plans.

**Table 1 Alberta Environmental Protection and Enhancement Act (EPEA) operating approvals for four generating plants in the Wabamun-Genesee area.**

Facility	Capacity (MW, net)	Location	Approval No. (as amended)	Applicable Approval Terms
Wabamun	279	2,3,10,11-53-04 W5M	10323-02-00	6.1.18 to 6.1.24; 6.1.32 to 6.1.34
Sundance	2,020	3,4,8,9,10,16,17,20, and 31-52-04 W5M	9830-01-00	13.1.18 to 13.1.24; 13.1.32 to 13.1.34
Keephills	766	36-51-04 W5M	10324-01-00	6.1.18 to 6.1.24; 6.1.32 to 6.1.37
Genesee	1,212	25-50-03 W5M	773-02-00	7.1.1 to 7.1.9

### 1.1.1 Ambient Air Quality Monitoring Program

A component of the special environmental monitoring programs is an ambient air quality monitoring program. The ambient air quality monitoring program consists of the following elements:

- A continuous monitoring program consisting of four air monitoring stations (AMSs) (Figure 2) – Powers, Meadows, Wagner, and Genesee. Sulphur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and a number of meteorological parameters are measured at all four stations, particulate matter with aerodynamic diameter less than or equal to 2.5 microns (PM<sub>2.5</sub>) is measured at the Powers and Genesee AMS, and ozone (O<sub>3</sub>) is measured at the Genesee AMS.

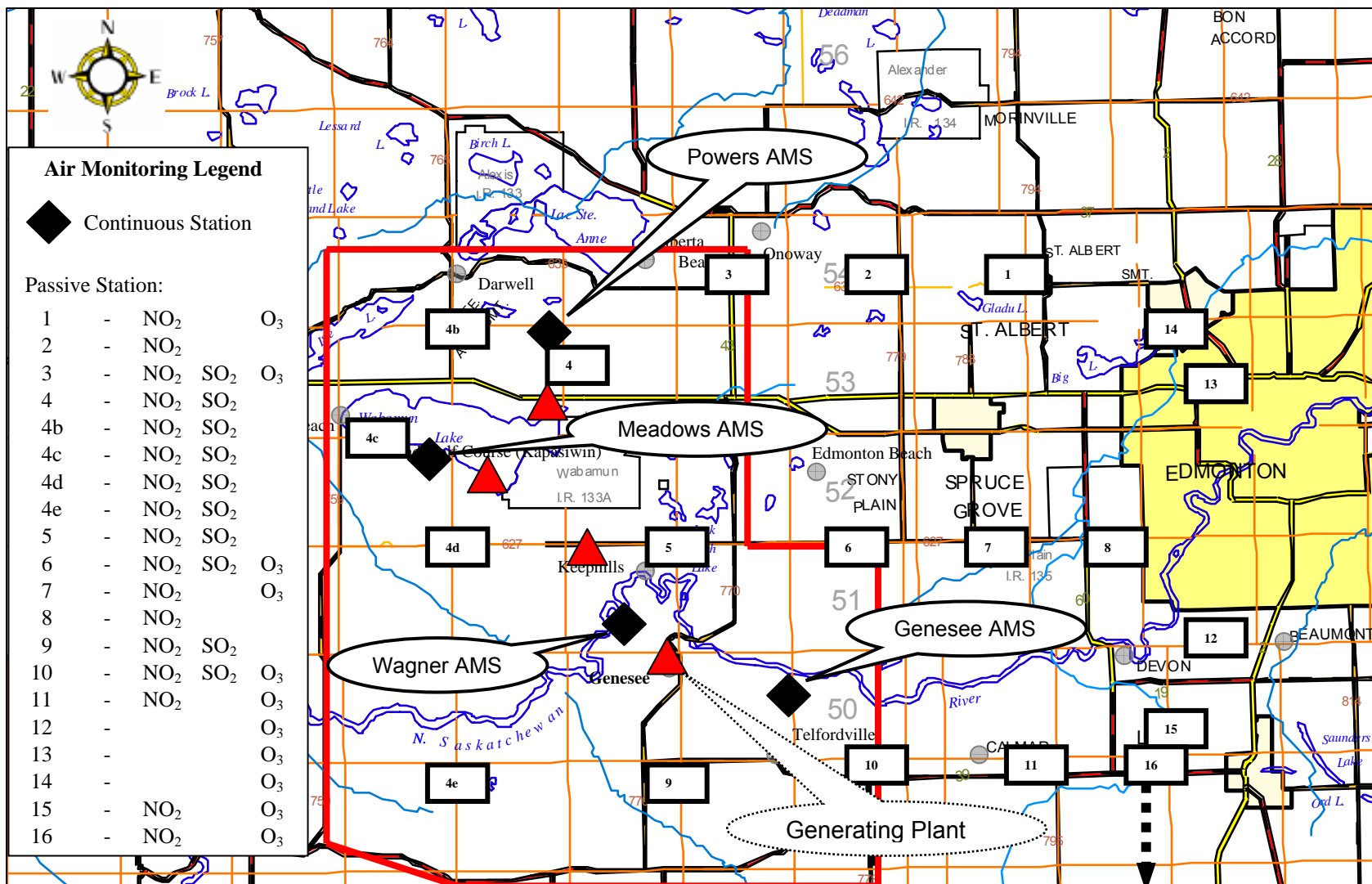


Figure 2 Continuous and passive monitoring locations in Wabamun-Genesee area.

- An integrated monitoring program (integrated monitoring for 24 hours every 6 days) for particulate matter with aerodynamic diameter less than or equal to 10 microns (PM<sub>10</sub>), and PM<sub>2.5</sub>, and metals speciation of PM<sub>2.5</sub> at two locations – Powers AMS and Genesee AMS.
- A passive monitoring program with monthly passive monitoring at 21 stations in the Wabamun-Genesee area measuring NO<sub>2</sub>, SO<sub>2</sub>, and O<sub>3</sub> at selected stations. Nineteen stations are shown in Figure 2. Two additional stations (15 and 16) were added in February 2006. These stations are located outside of the area shown in Figure 2 in the lower right hand corner and monitor NO<sub>2</sub> and O<sub>3</sub>.

**Table 2 Schedule for components of the ambient air quality monitoring program in the Wabamun-Genesee area.**

Parameter	Continuous	Sampled intermittently – every 6 <sup>th</sup> day according to NAPS schedule	Sampled monthly (passives)
SO <sub>2</sub>	•		•
NO <sub>2</sub>	•		•
O <sub>3</sub>	•		•
PM <sub>10</sub>		•	
PM <sub>2.5</sub>	•	•	
Wind speed and direction, temperature, relative humidity)	•		

### 1.1.2 Acid Deposition Assessment Program

Another component of the special environmental monitoring programs is an acid deposition assessment program. The acid deposition assessment program includes wet and dry deposition monitoring of sulphur and nitrogen species that are important contributors to acid deposition in the Wabamun-Genesee area.

Two dedicated acid deposition monitoring sites are operated in the Wabamun-Genesee area. These sites are the Genesee air monitoring station (Figure 2) and the Violet Grove air monitoring station. The four coal-fired generating plants are located at distances of 8 to 33 km away from the Genesee AMS. The Violet Grove station is not shown in Figure 2 as it is located outside of the area shown in this figure in the lower left-hand corner. The four generating plants are located at distances of 55 to 60 km away from the Violet Grove station.

The following parameters are currently measured at these two stations:

#### Wet Deposition

Wet deposition monitoring involves collecting rain and snow samples using a precipitation sampler at the Genesee AMS. Precipitation samples are retrieved from the field monthly or as necessary (e.g., after intense precipitation events) and sent to Alberta Research Council (Vegreville, AB) for chemistry analysis.



## **Dry Deposition**

Dry deposition monitoring involves measuring and recording concentrations of the following atmospheric pollutants and meteorological parameters at Genesee AMS and Violet Grove AMS:

### *Atmospheric Pollutants*

Atmospheric pollutants measured for dry deposition include eleven species:

- Continuous measurements for SO<sub>2</sub> and NO<sub>2</sub>.
- Monthly integrated annular denuder samples for HNO<sub>3</sub> and HNO<sub>2</sub>.
- One 24-hour integrated particulate matter (TSP) sample collected every 6<sup>th</sup> day for Na<sup>+</sup>, K<sup>+</sup>, Mg<sup>2+</sup>, Ca<sup>2+</sup>, NH<sub>4</sub><sup>+</sup>, SO<sub>4</sub><sup>2-</sup>, and NO<sub>3</sub><sup>-</sup>.

### *Meteorological Parameters*

Hourly average measured values were obtained for the following meteorological parameters:

- Wind speed (WSP).
- Wind direction standard deviation (WDR).
- Relative humidity (RH).
- Surface wetness (SW).
- Air temperature at surface (2 m), T<sub>2</sub>.
- Air temperature at standard height (10 m), T<sub>10</sub>; or difference in air temperature at standard height and surface.

## **1.1.3 Mercury Assessment Program**

The mercury assessment program consists of wet and dry deposition monitoring. The objective of this program component is to quantify wet and dry deposition rates of mercury in the Wabamun-Genesee region to better understand potential effects of generating plant emissions on receptors in the area. Wet deposition monitoring is conducted at the Genesee air monitoring station (Figure 2). Wet deposition samples are collected on a weekly basis from this station. A full dry deposition monitoring component was designed with the approval of Alberta Environment and implementation is being planned for 2007.

## **1.2 Purpose of Report**

This quarterly report summarizes key results of data collected in the third quarter (July, August, and September) of the calendar year 2006. Specifically, completeness of monitoring data, quarterly summary statistics for selected air quality parameters, and contraventions of approval terms and applicable air quality monitoring objectives are summarized and discussed.

## 2 Results and Discussion

### 2.1 Regional Ambient Air Quality Monitoring Program

#### 2.1.1 Data Completeness

Data capture rates for PM<sub>10</sub> and PM<sub>2.5</sub> intermittent samples are listed in Table 3. There were no instances of invalid or missing data for intermittent PM<sub>10</sub> and PM<sub>2.5</sub> samples.

**Table 3 Data capture rates for intermittent PM<sub>10</sub> and PM<sub>2.5</sub> monitoring during third quarter 2006.**

	Powers AMS				Genesee AMS			
Month:	7	8	9	Q3	7	8	9	Q3
PM <sub>10</sub> :	5/5	5/5	5/5	15/15	5/5	5/5	5/5	15/15
PM <sub>2.5</sub> :	5/5	5/5	5/5	15/15	5/5	5/5	5/5	15/15

Note: 7 = July; 8 = August; 9 = September.

Data capture rates for the passive samples are presented in Table 4. There were three instances of invalid or missing passive results for the third quarter of 2006: i) SO<sub>2</sub> at station 10 (July), ii) NO<sub>2</sub> at station 3 (July), and iii) NO<sub>2</sub> at Genesee AMS (September).

**Table 4 Data capture rates for passive monitoring parameters during third quarter 2006.**

Parameter	Capture Rate
NO <sub>2</sub>	52/54
SO <sub>2</sub>	32/33
O <sub>3</sub>	36/36

Note: Data capture rates expressed as number of valid samples /total number of samples.

Third quarter (Q3) 2006 uptimes for continuous monitoring equipment and air monitoring stations are summarized in Table 5. Data capture rates for continuous monitoring parameters at all air monitoring stations were well above the 90% criterion on a monthly basis as stipulated in the Air Monitoring Directive (1989), except as noted. High uptimes indicate that equipment in the continuous air monitoring network was generally well-maintained.

The NO/NO<sub>2</sub>/NO<sub>x</sub> sensor at the Wagner air monitoring station (AMS) was removed from service near the end of July due to damage caused by static on the telephone line. This was reported to Alberta Environment on August 17, 2006 under reference #175470. The sensor was not returned to service until August 29, resulting in 8.3% uptime during August. The sensor has been functioning properly since.

**Table 5 Data capture rates (%) for continuous monitoring parameters during Q3 2006.**

	Powers AMS				Meadows AMS				Wagner AMS				Genesee AMS			
Month:	7	8	9	Q3	7	8	9	Q3	7	8	9	Q3	7	8	9	Q3
NO <sub>2</sub>	99.9	99.9	99.9	99.9	98.9	100	99.9	99.6	91.1	<b>8.3</b>	98.9	<b>66.1</b>	100	100	100	100
SO <sub>2</sub>	99.9	99.9	99.9	99.9	98.9	100	99.9	99.6	97.2	100	99.0	98.7	100	100	100	100
O <sub>3</sub>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	100	100	100
PM <sub>2.5</sub>	97.8	99.2	98.5	98.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	99.5	99.5	99.6	99.5
WSP	99.9	100	100	99.9	99.2	100	100	99.7	99.9	100	100	99.9	100	100	100	100
WDR	99.9	100	100	99.9	99.2	100	100	99.7	99.9	100	100	99.9	100	100	100	100
T <sub>2</sub>	99.9	100	100	99.9	98.8	100	99.9	99.6	99.9	99.9	99.9	99.9	100	100	99.2	99.7
T <sub>10</sub>	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100	100	99.2	99.7
RH	99.9	100	100	99.9	98.8	100	99.9	99.6	99.9	100	100	99.9	100	100	99.2	99.7

Note: Note: 7 = July; 8 = August; 9 = September.

WSP = wind speed.

WDR = wind direction.

T<sub>2</sub> = temperature at 2 metre height above ground.

T<sub>10</sub> = temperature at 10 metres height above ground.

RH = relative humidity.

n/a = not applicable.

Bolded values indicate <90% uptime.

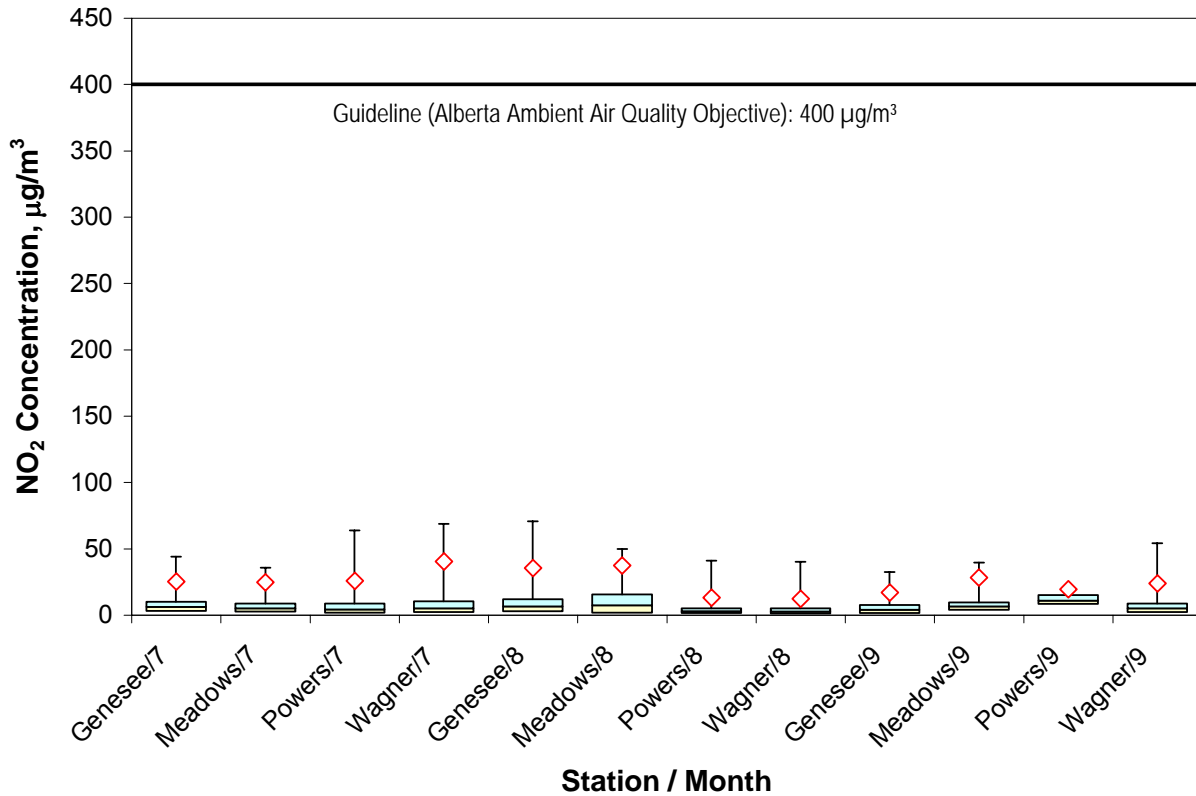
## 2.1.2 Summary Statistics

One method of displaying a set of air quality data is with box-and-whisker plots. Box-and-whisker plots are helpful in interpreting the distribution of data. These plots only illustrate certain statistics rather than all the data. Box-and-whisker plots presented here show five values for individual pollutants collected at each station during Q3 2006:

- 25<sup>th</sup> percentile (bottom of box)
- 50<sup>th</sup> percentile (horizontal line within box)
- 75<sup>th</sup> percentile (top of box)
- 98<sup>th</sup> percentile (diamond)
- maximum (top T)

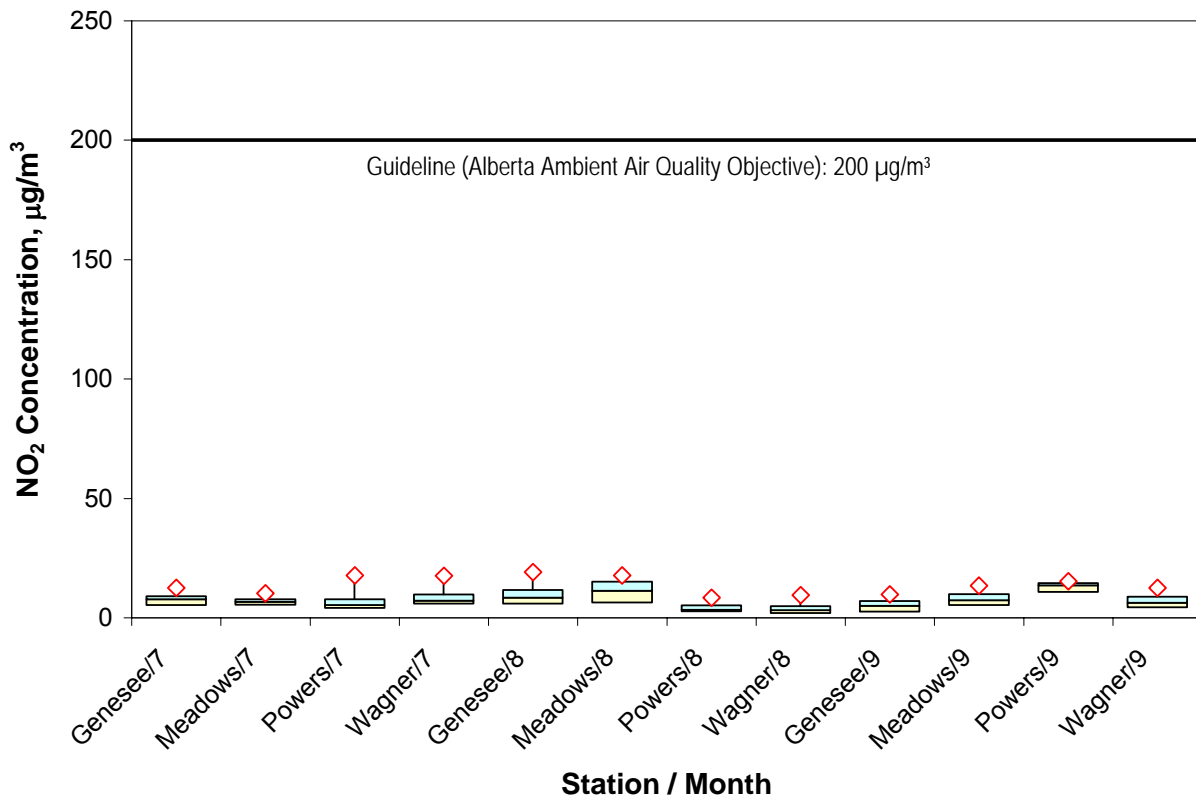
The bottom whisker is not shown in plots presented here because the values represented by bottom whiskers are unessential for data interpretation. Box-and-whisker plots are presented for Q3 2006 for the following:

- 1-hour average NO<sub>2</sub> concentrations from continuous monitoring (Figure 3)
- 24-hour average NO<sub>2</sub> concentrations from continuous monitoring (Figure 4)
- 1-hour average SO<sub>2</sub> concentrations from continuous monitoring (Figure 5)
- 24-hour average SO<sub>2</sub> concentrations from continuous monitoring (Figure 6)
- 1-hour average O<sub>3</sub> concentrations from continuous monitoring (Figure 7)
- 8-hour average O<sub>3</sub> concentrations from continuous monitoring (Figure 8)
- 24-hour average PM<sub>2.5</sub> concentrations from continuous monitoring (Figure 9)
- 24-hour average PM<sub>10</sub> concentrations from intermittent monitoring (Figure 10)
- 24-hour average PM<sub>2.5</sub> concentrations from intermittent monitoring (Figure 11)



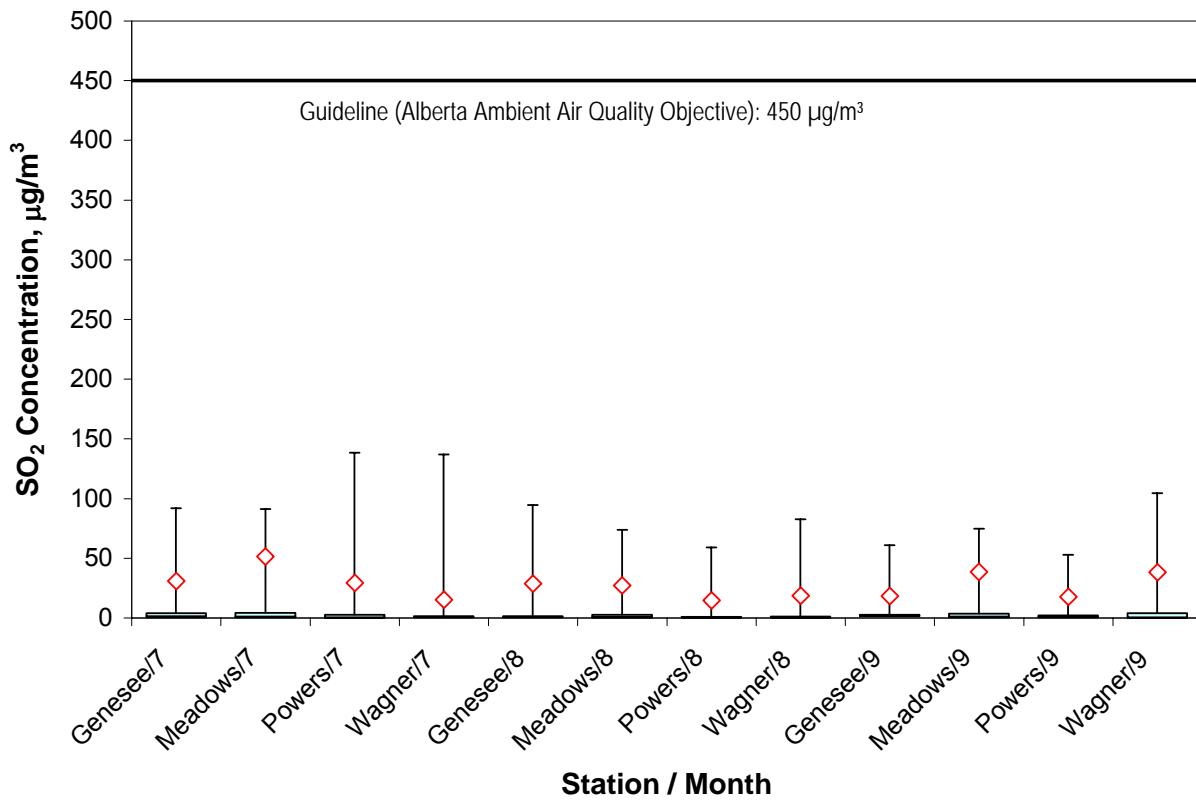
**Figure 3** Box-and-Whisker plot of 1-hour average NO<sub>2</sub> concentrations from continuous monitoring at selected stations in central Alberta (Q3 2006).

Note: 7 = July; 8 = August; 9 = September; 25th %ile (bottom of box);  
 50th %ile (horizontal line within box); 75th %ile (top of box);  
 98th percentile (diamond); maximum (top T)



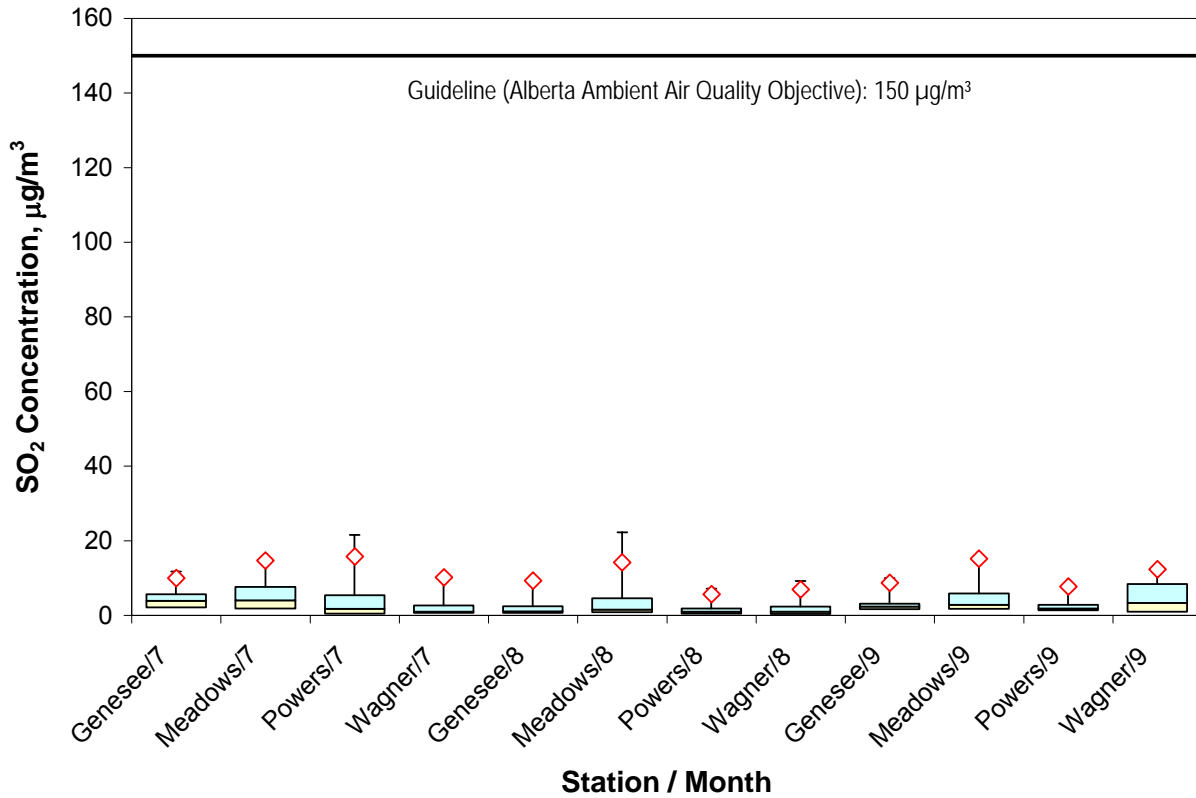
**Figure 4** Box-and-Whisker plot of 24-hour average NO<sub>2</sub> concentrations from continuous monitoring at selected stations in central Alberta (Q3 2006).

Note: 7 = July; 8 = August; 9 = September; 25th %ile (bottom of box);  
 50th %ile (horizontal line within box); 75th %ile (top of box);  
 98th percentile (diamond); maximum (top T)



**Figure 5** Box-and-Whisker plot of 1-hour average SO<sub>2</sub> concentrations from continuous monitoring at selected stations in central Alberta (Q3 2006).

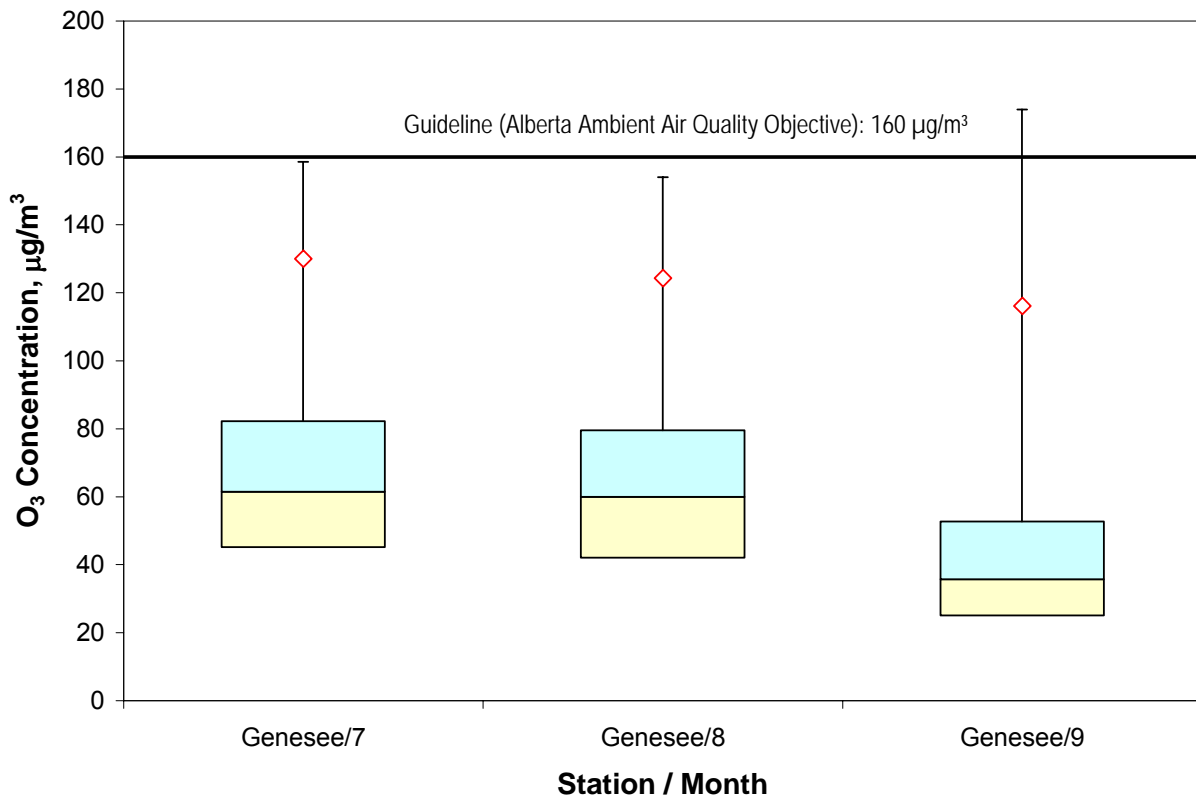
Note: 7 = July; 8 = August; 9 = September; 25th %ile (bottom of box);  
 50th %ile (horizontal line within box); 75th %ile (top of box);  
 98th percentile (diamond); maximum (top T)



**Figure 6** Box-and-Whisker plot of 24-hour average SO<sub>2</sub> concentrations from continuous monitoring at selected stations in central Alberta (Q3 2006).

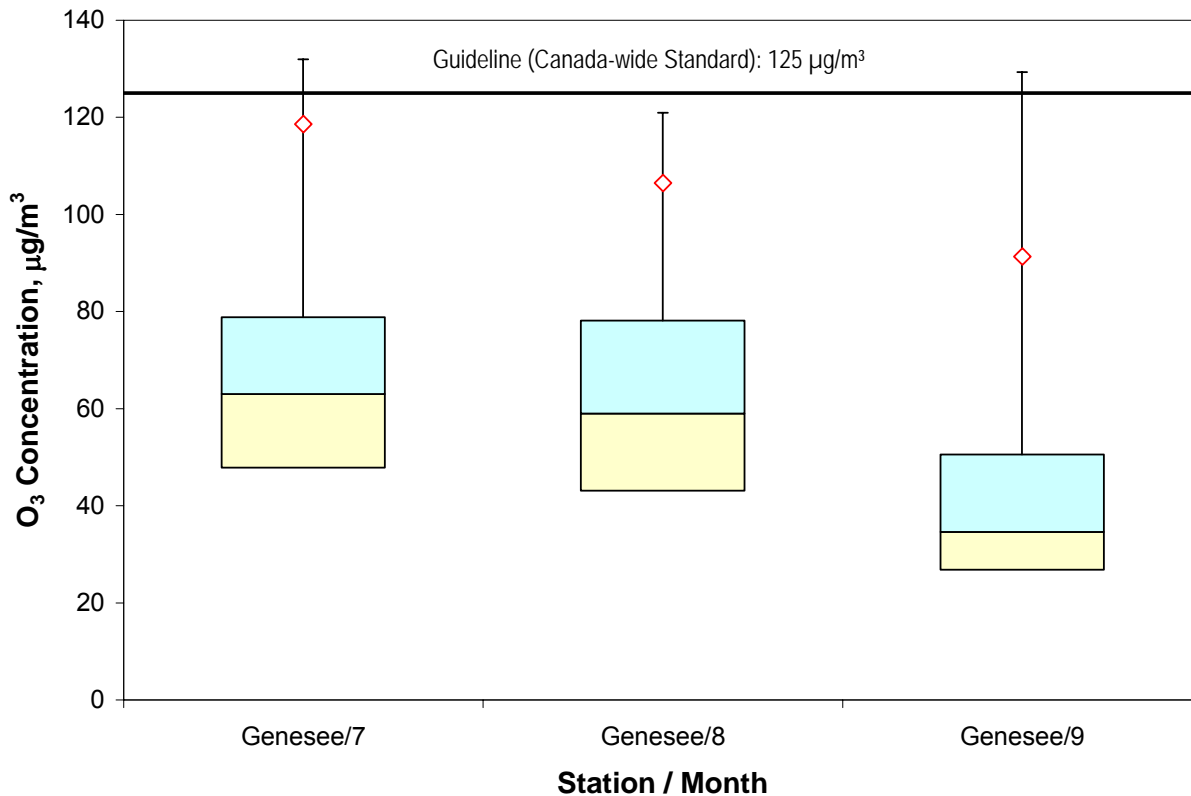
Note: 7 = July; 8 = August; 9 = September; 25th %ile (bottom of box);  
 50th %ile (horizontal line within box); 75th %ile (top of box);  
 98th percentile (diamond); maximum (top T)





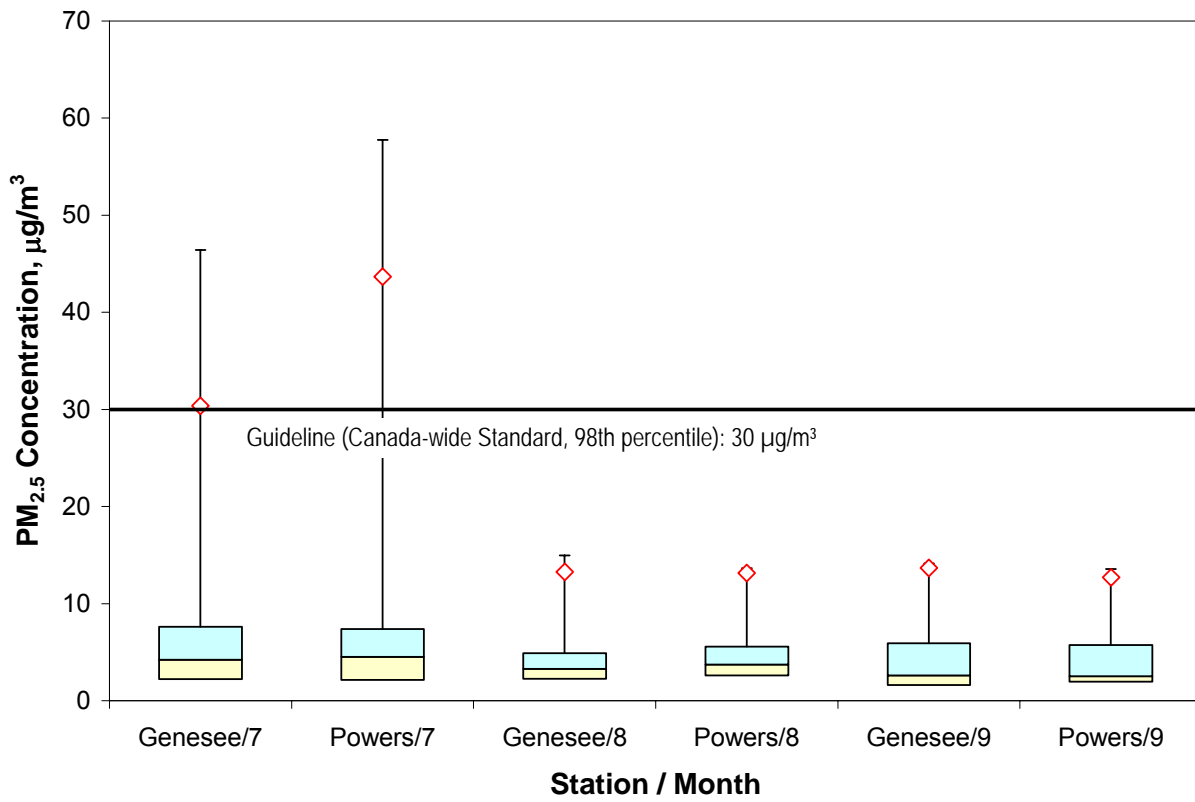
**Figure 7** Box-and-Whisker plot of 1-hour average  $\text{O}_3$  concentrations from continuous monitoring at Genesee station in central Alberta (Q3 2006).

Note: 7 = July; 8 = August; 9 = September; 25th %ile (bottom of box);  
 50th %ile (horizontal line within box); 75th %ile (top of box);  
 98th percentile (diamond); maximum (top T)



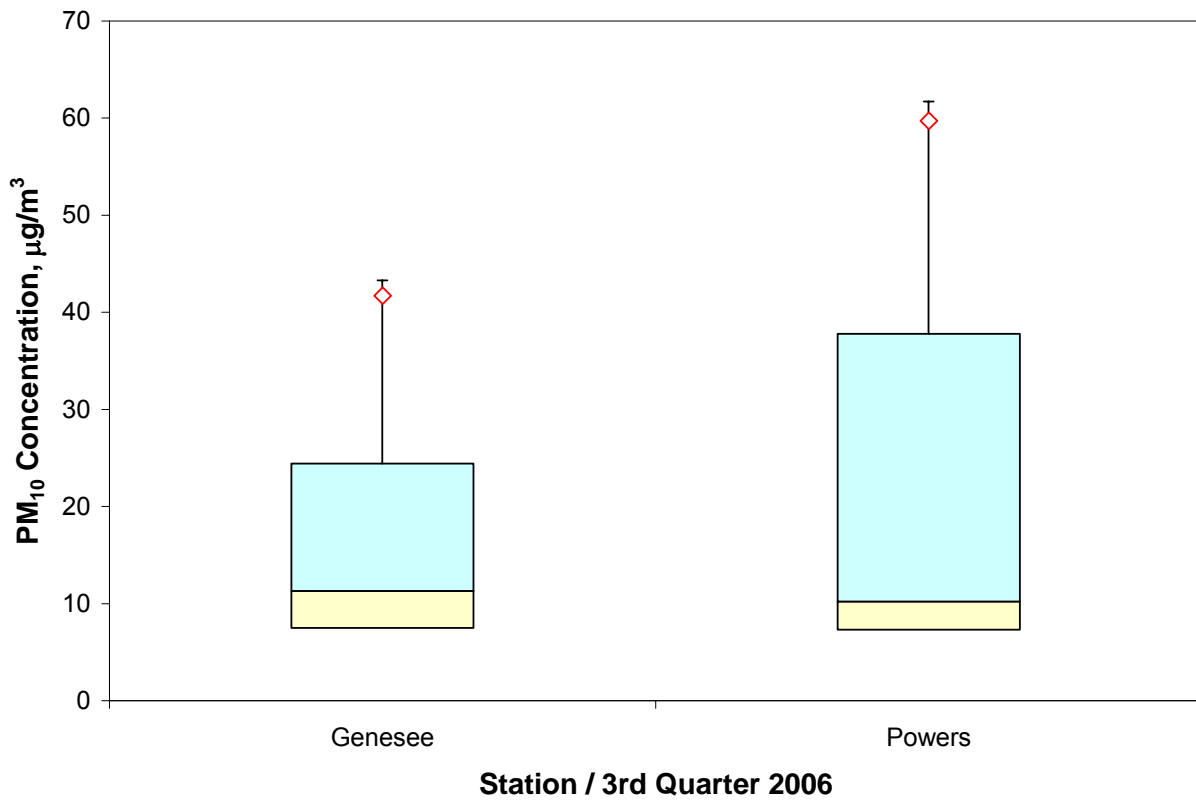
**Figure 8** Box-and-Whisker plot of 8-hour average  $\text{O}_3$  concentrations from continuous monitoring at Genesee station in central Alberta (Q3 2006).

Note: 7 = July; 8 = August; 9 = September; 25th %ile (bottom of box);  
 50th %ile (horizontal line within box); 75th %ile (top of box);  
 98th percentile (diamond); maximum (top T)



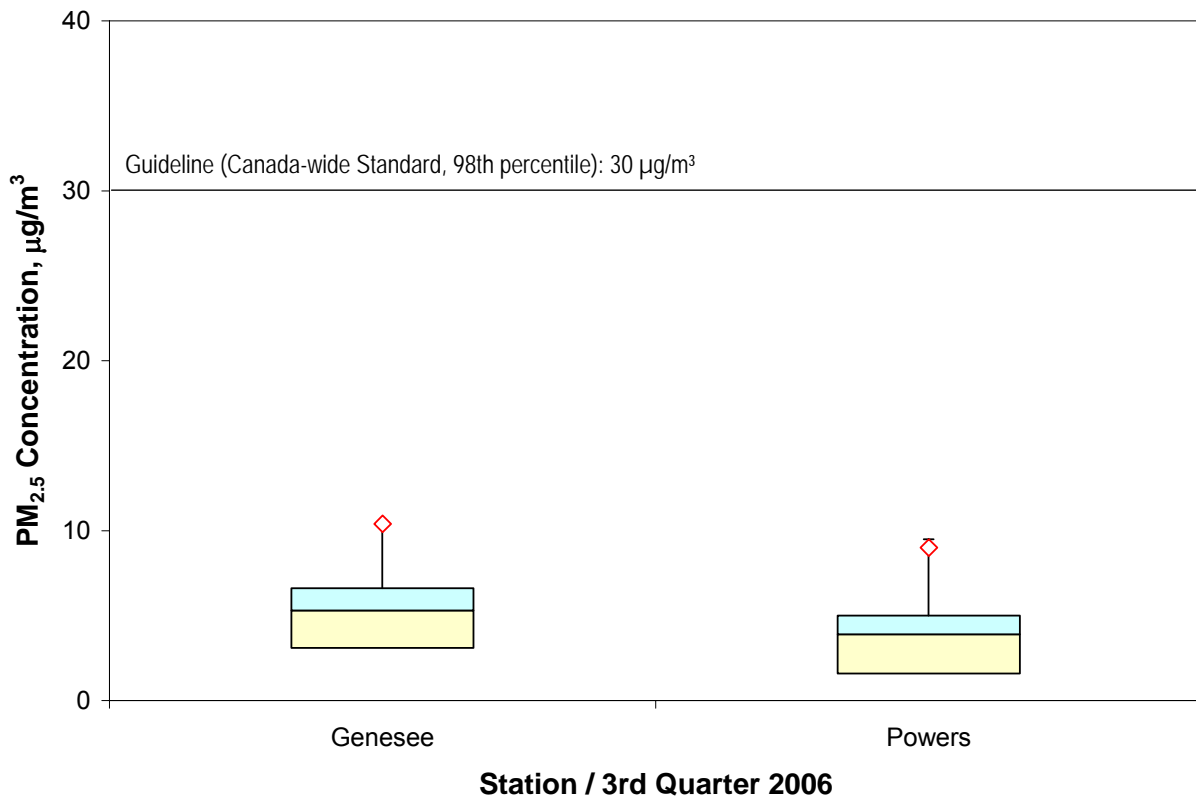
**Figure 9** Box-and-Whisker plot of 24-hour average  $PM_{2.5}$  concentrations from continuous monitoring at Genesee and Powers stations in central Alberta (Q3 2006).

Note: 7 = July; 8 = August; 9 = September; 25th %ile (bottom of box);  
 50th %ile (horizontal line within box); 75th %ile (top of box);  
 98th percentile (diamond); maximum (top T)



**Figure 10** Box-and-Whisker plot of 24-hour average  $PM_{10}$  concentrations from intermittent monitoring at Genesee and Powers stations in central Alberta (Q3 2006).

Note: 25th %ile (bottom of box); 50th %ile (horizontal line within box); 75th %ile (top of box); 98th percentile (diamond); maximum (top T)



**Figure 11** Box-and-Whisker plot of 24-hour average  $\text{PM}_{2.5}$  concentrations from intermittent monitoring at Genesee and Powers stations in central Alberta (Q3 2006).

Note: 25th %ile (bottom of box);  
 50th %ile (horizontal line within box);  
 98th percentile (diamond);

75th %ile (top of box);  
 maximum (top T)

The Alberta ambient air quality (1-hour average) objective of 160  $\mu\text{g}/\text{m}^3$  was exceeded in September at the Genesee air monitoring station for  $\text{O}_3$  (Figure 7). The maximum  $\text{O}_3$  concentration in July and September was greater than the Canada Wide Standard (8-hour average) of 125  $\mu\text{g}/\text{m}^3$  at the Genesee air monitoring station (Figure 8).

The 98<sup>th</sup> percentile  $\text{PM}_{2.5}$  concentration for the quarter was greater than the Canada Wide Standard (24-hour average) of 30  $\mu\text{g}/\text{m}^3$  at the Genesee and Powers air monitoring station for  $\text{PM}_{2.5}$  (Figure 9). This was likely caused by forest fires that occurred to the west and northwest of the air monitoring area resulting in smoky conditions and elevated fine particulate matter concentrations in the atmosphere at the time. Whereas, integrated (every 6<sup>th</sup> day)  $\text{PM}_{2.5}$  sample results in Figure 11 show maximum and 98<sup>th</sup> percentile  $\text{PM}_{2.5}$  concentrations for the quarter well below the Canada Wide Standard (24-hour average) of 30  $\mu\text{g}/\text{m}^3$  at both the Genesee and Powers air monitoring stations.

## 2.2 Acid Deposition Assessment Program

### 2.2.1 Data Completeness

There were two incidents of invalid or missing data in the third quarter of 2006 for the acid deposition program integrated samples. These incidents are summarized in Table 6. The corresponding data capture rates are presented in Table 7.

**Table 6 Incidences of invalid or missing data for the acid deposition assessment program (Q3 2006).**

Date	Station	Parameter	Cause	Corrective Action
July 22	Violet Grove	TSP	Sampler malfunction – sample filter spoiled	Sampler checked and put back into service
August 2	Violet Grove	TSP	Sampler out of service for repairs	Sampler repairs completed successfully.

**Table 7 Capture rates for integrated data for the acid deposition assessment program (Q3 2006).**

Station	Violet Grove AMS				Genesee MAS			
	7	8	9	Q3	7	8	9	Q3
TSP	5/5	4/5	4/5	13/15	5/5	5/5	5/5	15/15
$\text{HNO}_3$	1/1	1/1	1/1	3/3	1/1	1/1	1/1	3/3
$\text{HNO}_2$	1/1	1/1	1/1	3/3	1/1	1/1	1/1	3/3

Note: 7 = July; 8 = August; 9 = September.

Data capture rates expressed as: valid samples/total samples scheduled.

Table 8 shows data capture rates for continuous data collected at the Violet Grove and Genesee air monitoring stations for the acid deposition assessment program. All data capture

rates were above 90% for the continuous monitoring program in the third quarter of 2006. Capture rates for continuous monitoring parameters at the Violet Grove AMS in July were below 94% due to data acquisition failure.

**Table 8 Capture rates (%) for continuous data for the acid deposition assessment program (Q3 2006).**

Station	Violet Grove AMS				Genesee AMS			
	7	8	9	Q3	7	8	9	Q3
NO <sub>2</sub>	93.3	100	100	97.8	100	100	100	100
SO <sub>2</sub>	93.3	100	100	97.8	100	100	100	100
WSP	93.3	100	100	97.8	100	100	100	100
WDR	93.3	100	100	97.8	100	100	100	100
T <sub>2</sub>	93.3	100	100	97.8	100	100	99.2	99.7
T <sub>10</sub>	92.1	100	100	97.4	100	100	99.2	99.7
RH	93.3	100	100	97.8	100	100	99.2	99.7

Note: 7 = July; 8 = August; 9 = September.  
WSP = wind speed.  
WDR = wind direction.  
T<sub>2</sub> = temperature at 2 metre height above ground.  
T<sub>10</sub> = temperature at 10 metres height above ground.  
RH = relative humidity.  
n/a = not applicable.  
Bolded values indicate <90% uptime.

## 2.3 Mercury Assessment Program

### 2.3.1 Data Completeness

There were 14 wet deposition sample collection periods (weeks) in the third quarter of 2006. From these 14 collection periods, 12 samples contained precipitation and one dry sample (i.e., no precipitation occurred this collection period) were submitted. One sample was not collected in July during the switchover from MDN site designation AB99 to AB14. No precipitation was recorded from rain gauge during this collection period. Frontier Geosciences Inc. rated all 12 precipitation samples as valid. Data capture rates for integrated sample data relevant to the mercury assessment (wet deposition) program are presented in Table 9.

**Table 9 Capture rates for precipitation samples in the mercury assessment (wet deposition) sampling program (Q3 2006).**

Station	Genesee AMS			
	7	8	9	Q3
Hg wet deposition sample	3/4	5/5	5/5	13/14

Note: 7 = July; 8 = August; 9 = September.

## **2.4 *Contraventions of Special Environmental Monitoring Programs***

One contravention of approval terms and applicable air quality monitoring objectives were reported for the July to September 2006 period. The NO/NO<sub>2</sub>/NO<sub>x</sub> sensor at the Wagner air monitoring station was removed from service near the end of July due to damage caused by static on the telephone line. This was reported to Alberta Environment on August 17, 2006 under reference #175470. The sensor was not returned to service until August 29, resulting in 8.3% uptime during August. The sensor has been functioning properly since.

## **3 Summary**

### **3.1 *Regional Ambient Air Program***

There were no instances of invalid or missing data for intermittent PM<sub>10</sub> and PM<sub>2.5</sub> samples. There were three instances of invalid or missing passive results for the third quarter of 2006. Data capture rates for continuous monitoring parameters at all air monitoring stations were well above the 90% criterion on a monthly basis as stipulated in the Air Monitoring Directive (1989). High uptimes indicate that equipment in the continuous air monitoring network was generally well-maintained.

One contravention of approval terms and applicable air quality monitoring objectives were reported for the July to September 2006 period. The NO/NO<sub>2</sub>/NO<sub>x</sub> sensor at the Wagner air monitoring station was removed from service near the end of July due to damage caused by static on the telephone line. This was reported to Alberta Environment on August 17, 2006 under reference #175470. The sensor was not returned to service until August 29, resulting in 8.3% uptime during August. The sensor has been functioning properly since.

### **3.2 *Acid Deposition Assessment Program***

There were two incidents of invalid or missing data in the third quarter of 2006 for the acid deposition program integrated TSP samples. All data capture rates were above 90% for the continuous monitoring program in the third quarter of 2006. Capture rates for continuous monitoring parameters at the Violet Grove AMS in July were below 94% due to data acquisition failure.

### **3.3 *Mercury Assessment Program***

There were no notable issues with the mercury assessment program in the third quarter of 2006. Conversion of this site to the National Acid Deposition Program's Mercury Deposition Program (MDN) was completed in July 2006.