

LAFARGE CANADA INC.

AMBIENT AIR QUALITY MONTHLY REPORT NOVEMBER 2018

DECEMBER 18, 2018





AMBIENT AIR QUALITY MONTHLY REPORT

NOVEMBER 2018

LAFARGE CANADA INC.

PROJECT NO.: 171-00556-00
DATE: DECEMBER 18, 2018

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December 18, 2018

LAFARGE CANADA INC.
Highway 1A
Exshaw, AB T0L 2C0

Attention: Janet Brygger

Dear Ms. Brygger

Subject: Ambient Air Quality Monthly Report - November 2018

The operational uptime for the meteorological systems and all analyzers at the Lagoon station was over 99% in November. There was one exceedance of the 24-hour TSP Alberta Ambient Air Quality Objectives (AAAQOs) and zero exceedances of the PM_{2.5} AAAQOs in November at the Lagoon monitoring location.

All analyzers at the Windridge station had over 99% operational uptime in November. There were 7 exceedances of the 24-hour TSP AAAQO and zero exceedances of the 24-hour PM_{2.5} AAAQO and 1-hour PM_{2.5} AAAQG. TSP exceedances occurred on days with high wind speeds.

Data collected at all of the GRIMM monitors are considered Industrial Ambient Monitors and are meant for assessing the performance of Lafarge Exshaw's Fugitive Dust Control Best Management Practices – Program, the GRIMM monitors are not Air Monitoring Directive (AMD) compliant. The operational uptime at the 3 monitors was as follows: 99.9% at the West monitor station due to one hour of machine malfunction; 100% at both the Berm and Entrance monitor stations. The Entrance GRIMM monitor exceeded the 24-hour TSP AAAQO for 16 days, with zero exceedances of the 24-hour PM_{2.5} AAAQO, while the Berm GRIMM had 18 exceedances of the TSP Objective and 3 exceedances of the PM_{2.5} Objective. The West GRIMM monitor recorded zero exceedances of the 24-hour PM_{2.5} Objective and the 24-hour TSP Objective.

I certify that I have reviewed and verified this report and that the information is complete, accurate and representative of the monitoring results, reporting timeframe and the specified analysis, summarization and reporting requirements.

Sincerely,

Tyler Abel, M.Sc.
Group Manager, Air Quality
Environment

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December 18, 2018

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APPROVED¹ BY *(must be reviewed for technical accuracy prior to approval)*



December 18, 2018

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Date

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A DATA & CALIBRATION REPORTS

1 INTRODUCTION

This report summarizes the ambient air quality and meteorological data collected at the Lagoon, Windridge, and the GRIMM monitors in Exshaw, AB. The station is operated by WSP on behalf of Lafarge Canada Inc. (Lafarge) and is a requirement of Lafarge's Approval 1702-02-04. This report contains data collected between November 1, 2018 and November 30, 2018.

This monthly report was prepared by Rowena Seto, Junior Air Quality Specialist with WSP, on behalf of Lafarge and was reviewed by Tyler Abel, Manager of Air Quality and Air Quality Specialist at WSP.

2 NOVEMBER 2018 REPORT SUMMARY

This summary section provides the pertinent details on data collected and maintenance/calibration activities at each of the monitoring locations. The monitoring results for the stations are described in further detail in their corresponding sections. Maximum hourly concentrations are shown for all particulate matter size fractions, but there are no Alberta Ambient Air Quality Objectives (AAAQO) for 1-hour PM concentrations. The exceedances reported for 1-hour PM_{2.5} are those above the 1-hour PM_{2.5} Alberta Ambient Air Quality Guidelines (AAAQG).

2.1 LAGOON STATION

Table 2-1 Lagoon station data summary

Parameter	Data Completeness (%)	1-Hour Average		24-hour Average	
		Maximum Concentration	Exceedances of AAAQO or AAAQG	Maximum Concentration	Exceedances of AAAQO
NO ₂ (ppb)	100.0	23.5	0	11.5	-
SO ₂ (ppb)	100.0	17.8	0	6.6	0
PM _{2.5} (µg/m ³)	99.4	18.7	0	10.2	0
PM ₁₀ (µg/m ³)	99.4	194.2	-	75.4	-
TSP (µg/m ³)	99.4	306.2	-	118.1	1
Temperature (°C)	99.4	9.6	-	7.3	-
Wind Speed (km/hr) /Direction (Degrees)	99.9	49.0/W	-	40.0/WSW	-
Precipitation (mm)	99.4	0.0	-	0*	-

¹ Any exceedances reported for 1-hour PM_{2.5} are over the guideline level (AAAQG) of 80 µg/m³.

² Maximum Daily Total Accumulation of Precipitation (mm)

³ Monthly Total Accumulation of Precipitation (mm)

Data Quality Notes:

- There were no exceedances of the 24-hour PM_{2.5} AAAQO.
- There were no exceedances of the 1-hour PM_{2.5} AAAQG.
- There was one day exceeding the 24-hour TSP AAAQO.

Calibration/Maintenance Notes:

- The NO_x and SO₂ analyzers had 100% uptime for the month of November.

- All PM analyzers had 99.4% uptime for the month of November due to 4 hours of machine malfunction.
- The wind speed and wind direction analyzers had 99.9% uptime for the month of November due to 1 hour of machine malfunction.
- The rest of the meteorological analyzers had 99.4% uptime for the month of November due to 1 hour of machine malfunction and 3 hours of maintenance.

2.2 WINDRIDGE STATION

Table 2-2 Windridge station data summary

Parameter	Data Completeness (%)	1-Hour Average		24-hour Average	
		Maximum Concentration	Exceedances of AAAQO or AAAQG	Maximum Concentration	Exceedances of AAAQO
PM _{2.5} (µg/m ³)	99.9	22.4	0*	11.8	0
PM ₁₀ (µg/m ³)	99.9	361.8	-	119.4	-
TSP (µg/m ³)	99.9	466.3	-	139.3	7

* Any exceedances reported for 1-hour PM_{2.5} are over the guideline level (AAAQG) of 80 µg/m³.

Data Quality Notes:

- There were no exceedances of the 24-hour PM_{2.5} AAAQO.
- There were no exceedances of the 1-hour PM_{2.5} AAAQG.
- There were 7 days exceeding the 24-hour TSP AAAQO.

Calibration/Maintenance Notes:

- All PM analyzers had 99.9% uptime for the month of November due to 1 hour of machine malfunction.

2.3 WEST GRIMM

The GRIMM monitors are Industrial Ambient Monitors meant to aid Lafarge in assessing the performance of their Fugitive Dust Control Best Management Practices – Program (FDCBMP-P). The AAAQO are used as Guidelines to evaluate the performance of the FDCBMP-P; however, these Industrial monitors are not Alberta Air Monitoring Directive (AMD) compliant and not required to show compliance with the AAAQO.

Table 2-3 West station data summary

Parameter	Data Completeness (%)	1-Hour Average		24-hour Average	
		Maximum Concentration	Exceedances of Guidelines	Maximum Concentration	Exceedances of Guidelines
PM _{2.5} (µg/m ³)	99.9	24.7	0*	10.9	0
PM ₁₀ (µg/m ³)	99.9	72.2	-	13.1	-

TSP ($\mu\text{g}/\text{m}^3$)	99.9	156.2	-	18.8	0
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* Any exceedances reported for 1-hour $\text{PM}_{2.5}$ are over the guideline level (AAQG) of $80 \mu\text{g}/\text{m}^3$.

Data Quality Notes:

- There were no exceedances of the 24-hour $\text{PM}_{2.5}$ AAQG.
- There were no exceedances of the 1-hour $\text{PM}_{2.5}$ AAQG.
- There were no exceedances of the 24-hour TSP AAQG.

Calibration/Maintenance Notes:

- All PM analyzers had 99.9% uptime for the month of November due to 1 hour of machine malfunction.

2.4 BERM GRIMM

The GRIMM monitors are Industrial Ambient Monitors meant to aid Lafarge in assessing the performance of their FDCBMP-P. The AAQO are used as Guidelines to evaluate the performance of the FDCBMP-P; however, these Industrial monitors are not Alberta Air Monitoring Directive (AMD) compliant and not required to show compliance with the AAQO.

Table 2-4 Berm station data summary

Parameter	Data Completeness (%)	1-Hour Average		24-hour Average	
		Maximum Concentration	Exceedances of Guidelines	Maximum Concentration	Exceedances of Guidelines
$\text{PM}_{2.5}$ ($\mu\text{g}/\text{m}^3$)	100.0	116.1	8*	34.2	3
PM_{10} ($\mu\text{g}/\text{m}^3$)	100.0	804.3	-	229.1	-
TSP ($\mu\text{g}/\text{m}^3$)	100.0	2183.1	-	696.9	18

* Any exceedances reported for 1-hour $\text{PM}_{2.5}$ are over the guideline level (AAQG) of $80 \mu\text{g}/\text{m}^3$.

Data Quality Notes:

- There were 3 days exceeding the 24-hour $\text{PM}_{2.5}$ AAQG.
- There were 8 hours exceeding the 1-hour $\text{PM}_{2.5}$ AAQG.
- There were 18 days exceeding the 24-hour TSP AAQG.

Calibration/Maintenance Notes:

- All analyzers had 100% uptime for the month of November.

2.5 ENTRANCE GRIMM

The GRIMM monitors are Industrial Ambient Monitors meant to aid Lafarge in assessing the performance of their FDCBMP-P. The AAAQO are used as Guidelines to evaluate the performance of the FDCBMP-P; however, these Industrial monitors are not Alberta Air Monitoring Directive (AMD) compliant and not required to show compliance with the AAAQO.

Table 2-5 Entrance station data summary

Parameter	Data Completeness (%)	1-Hour Average		24-hour Average	
		Maximum Concentration	Exceedances of Guidelines	Maximum Concentration	Exceedances of Guidelines
PM _{2.5} (µg/m ³)	100.0	47.2	0*	21.6	0
PM ₁₀ (µg/m ³)	100.0	382.0	-	161.3	-
TSP (µg/m ³)	100.0	1321.3	-	470.7	16

* Any exceedances reported for 1-hour PM_{2.5} are over the guideline level (AAAQG) of 80 µg/m³.

Data Quality Notes:

- There were no exceedances of the 24-hour PM_{2.5} AAAQG.
- There were no exceedances of the 1-hour PM_{2.5} AAAQG.
- There were 16 days exceeding the 24-hour TSP AAAQG.

Calibration/Maintenance Notes:

- All analyzers had 100% uptime for the month of November.

3 LAGOON STATION

The Lagoon trailer contains NO_x, SO₂, TSP, PM₁₀, and PM_{2.5} analyzers as well as meteorological sensors, and is shown in Figure 3-1. An ambient air quality station has been at this location since 2002, providing a long-term data record for air quality in the Exshaw area.

This section provides a summary of the monitoring activities for the Lagoon ambient air quality station, including: a table of instrumentation (Table 3-1), a data summary table (Table 3-2), site visit notes, a wind rose (Figure 3-2) and tables and graphs illustrating the monitoring results for November 2018.

All of the monitors comply with Alberta Environment and Parks Air Monitoring Directive (2016).

3.1 OPERATIONAL SUMMARY

A summary of the station operation for the month is provided in Table 3-1.

Table 3-1 Instrumentation List at the Lagoon Station

Parameter Measured	Equipment Description	Notes
PM_{2.5} Concentrations	MetOne BAM-1020 FRM Continuous Particulate Monitor	An equipment failure on November 15 th led to 4 hours of lost operational time from 05:00 to 09:00. These hours were flagged as X for machine malfunction. Operational time and valid data was well above 90% for the month of November, at 99.4%. The PM _{2.5} and PM ₁₀ monitors were calibrated on November 14 th , while the TSP monitor was calibrated on November 15 th .
PM₁₀ Concentrations	MetOne BAM-1020 Continuous Particulate Monitor	
TSP Concentrations	MetOne BAM-1020 Continuous Particulate Monitor	
Oxides of Nitrogen	TEI 42C	No operational issues observed. The NO _x monitor was calibrated on November 15 th . The monitor had 100% uptime in November.
Sulphur Dioxide	Teledyne API 102A	No operational issues observed. The SO ₂ monitor was calibrated on November 15 th . The monitor had 100% uptime in November.
Precipitation	MetOne 130 Rain/Snow Gauge	An equipment failure on November 15 th led to 1 hour of lost operational time from 14:00 to 15:00. This hour was flagged as X for machine malfunction. Machine maintenance occurred for 3 hours on November 29 th from 11:00 to 14:00. These hours were flagged as Y for maintenance. Operational time and valid data was well above 90% for the month of November, at 99.4%.
Wind Speed	MetOne Wind Sensor	An equipment failure on November 15 th led to 1 hour of lost operational time from 14:00 to 15:00. This hour was flagged as X for machine malfunction. Operational time and valid data was well above 90% for the month of November, at 99.9%.
Wind Direction		

		The wind speed and wind direction monitors were calibrated on November 29 th .
Ambient Temperature	MetOne Ambient Temperature Sensor	An equipment failure on November 15 th led to 1 hour of lost operational time from 14:00 to 15:00. This hour was flagged as X for machine malfunction. Maintenance occurred for 3 hours on November 29 th from 11:00 to 14:00. These hours were flagged as Y for maintenance. Operational time and valid data was well above 90% for the month of November, at 99.4%.



Figure 3-1 Inlets on the top of WSP's Lagoon monitor

3.2 MONITORING RESULTS AND TRENDS

The following wind rose (Figure 3-2) illustrates the frequency of wind speed by wind direction for the month of November 2018. Table 3-2 summarizes the hourly and daily concentrations recorded in November 2018.

Figure 3-3 graphically illustrates the time series for hourly concentrations as well as wind speed and direction, while Figure 3- shows daily average concentrations recorded during November 2018 for the pollutants listed in Table 3-2. Additionally, Figure 3-4 to Figure 3-8 show the histograms of the hourly concentrations of NO₂, SO₂, PM_{2.5}, PM₁₀, and TSP measured at the Lagoon station.

There was one exceedance of the 24-hour TSP (100 µg/m³) AAAQO and zero exceedances of the 24-hour PM_{2.5} (30 µg/m³) AAAQO. Historically in November, the average number of 24-hour TSP AAQO exceedances and 24-hour PM_{2.5} AAAQO exceedances are both zero. The maximum number of 24-hour TSP exceedances was 2 in 2010. The station has not recorded an exceedance of the PM_{2.5} AAQO in November since monitoring began in 2010.

The wind rose (Figure 3-2) indicates that the winds predominantly came from the westerly directions. These directions follow the general orientation of the valley. The second wind rose (Figure 3-10) shows the one day (November 12, 2018) exceeding the 24-hour TSP objective. During this day, the winds were predominantly from the west and west-northwest directions and over 20 km/hr.

Table 3-2 Summary of November 2018 data at Lagoon

Parameter	Guideline / Objectives		Station	Exceedances		Monthly		1-hour					24-hour		Operational Time (Percent)
	1-hr	24-hr		1-hr	24-hr	Minimum	Average	Maximum Concentration/ Meteorological Variable	Day	Hour	Wind Speed (km/hr)	Wind Direction (degrees)	Maximum Concentration/ Meteorological Variable	Day	
NO ₂ (ppb)	159	-	Lagoon	0	-	0.0	5.7	23.5	7	18	2.8	229.6	11.5	30	100.0
SO ₂ (ppb)	172	48	Lagoon	0	0	0.0	1.5	17.8	12	10	33.3	284.2	6.6	12	100.0
PM _{2.5} (µg/m ³)	80	30	Lagoon	0	0	0.0	5.7	18.7	17	13	26.6	282.0	10.2	7	99.4
PM ₁₀ (µg/m ³)	-	-	Lagoon	-	-	0.0	25.2	194.2	9	10	24.3	272.7	75.4	12	99.4
TSP (µg/m ³)	-	100	Lagoon	-	1	0.0	36.1	306.2	9	10	24.3	272.7	118.1	12	99.4
Temperature (°C)	-	-	Lagoon	-	-	-14.7	-0.1	9.6	4	13	28.5	257.5	7.3	27	99.4
Wind Speed (km/hr)/Direction (degrees)	-	-	Lagoon	-	-	1.3	20.8	49.0/W	27	2	49.0	249.4	40.0/WSW	26	99.9
Precipitation (mm)	-	-	Lagoon	-	-	0.0	0.0	0.0	1	24	13.0	49.4	0.0		99.4

Table 3-3 Days exceeding the TSP AAAQO or PM_{2.5} AAAQO at the Lagoon Station

Date	TSP (ug/m ³)	PM _{2.5} (ug/m ³)	Average Wind Direction (degrees)	Average Wind Speed (km/hr)	Average RH (%)	Root Cause (Provided by Lafarge)
Lagoon						
11/12/2018	118.1	-	279.8	29.1	51.5	High wind event
Total # of Exceedances	1	0				
Maximum # of Exceedances (November)	2 (2010)	0 (2010 ~ 2017)				
Average # of Exceedances (November)	0	0				
Minimum # of Exceedances (November)	0 (2011 ~ 2014, 2016, 2017)	0 (2010 ~ 2017)				

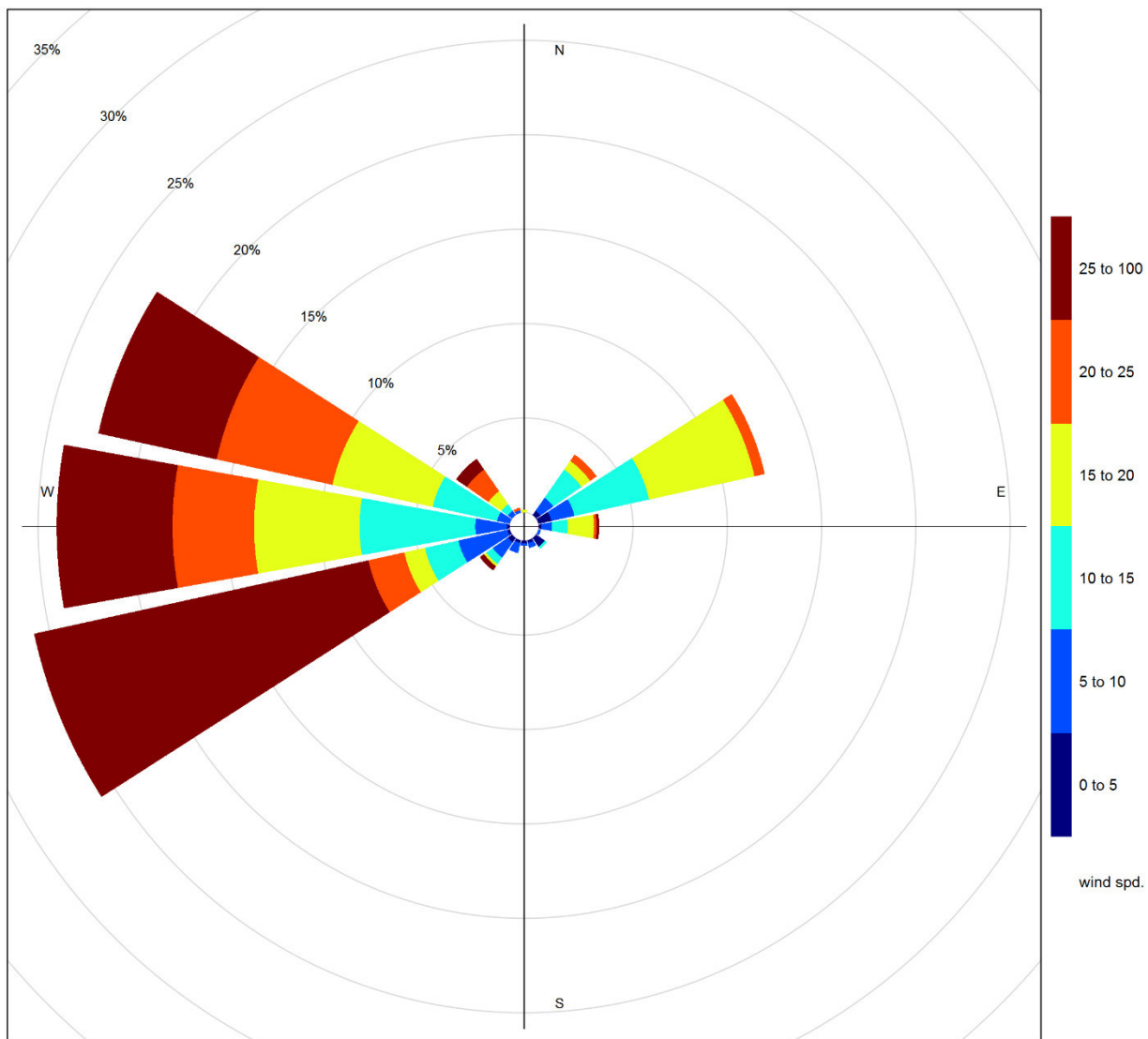


Figure 3-2 November 2018 wind rose from the Lagoon Station

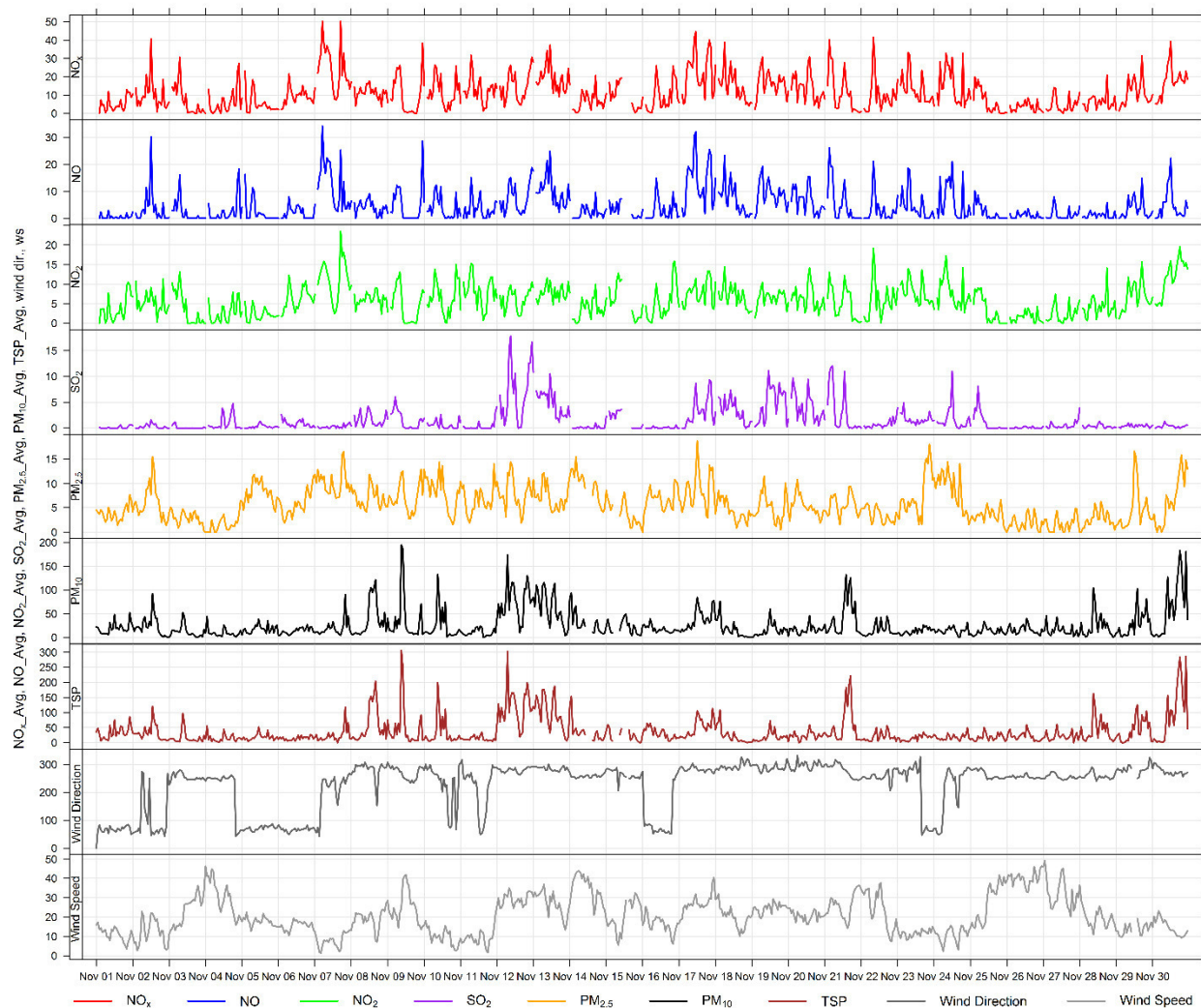


Figure 3-3 1-hour concentrations of NO_x, SO₂, particulate matter, wind direction and wind speed at the Lagoon station

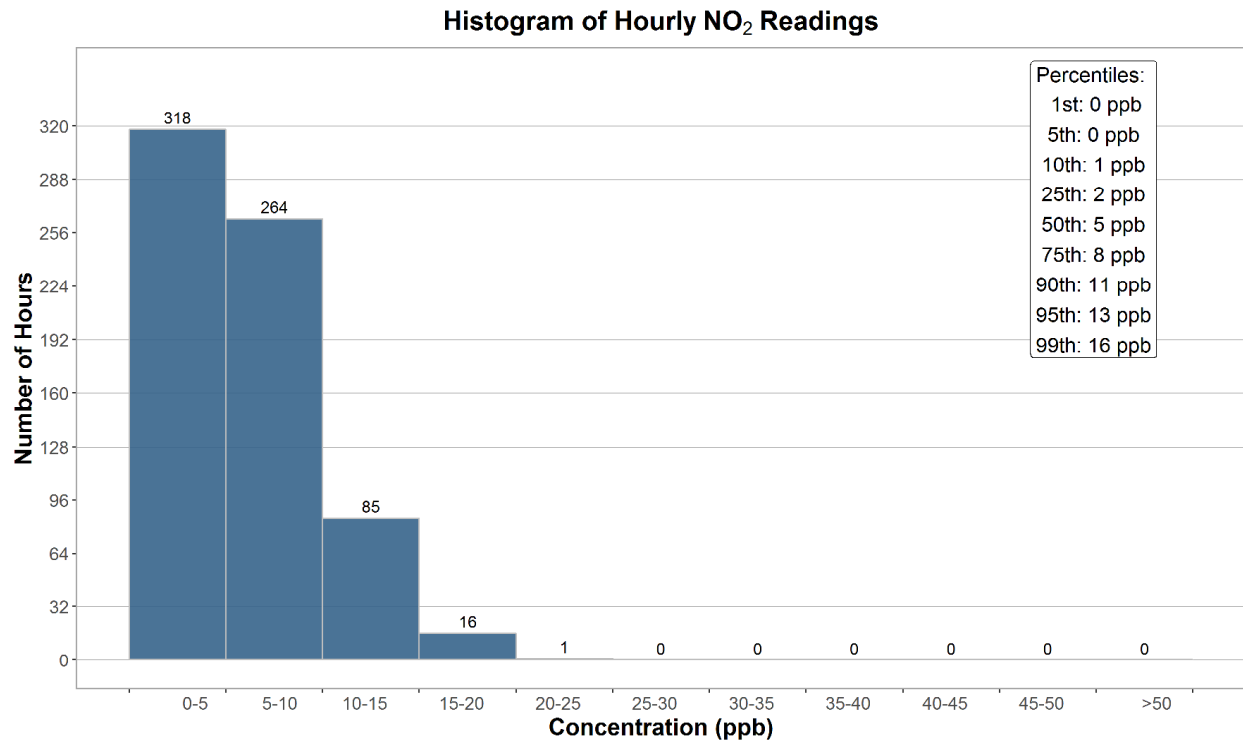


Figure 3-4 Histogram of hourly NO₂ concentrations at the Lagoon station

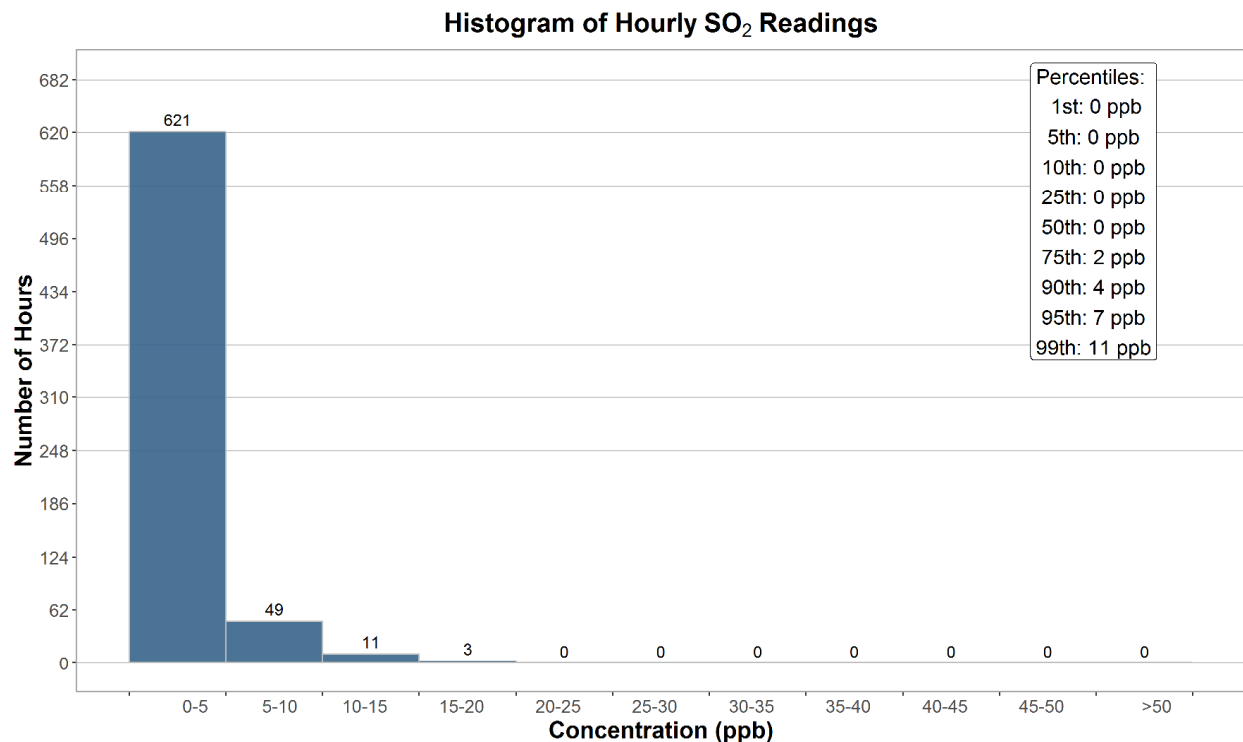


Figure 3-5 Histogram of hourly SO₂ concentrations at the Lagoon station

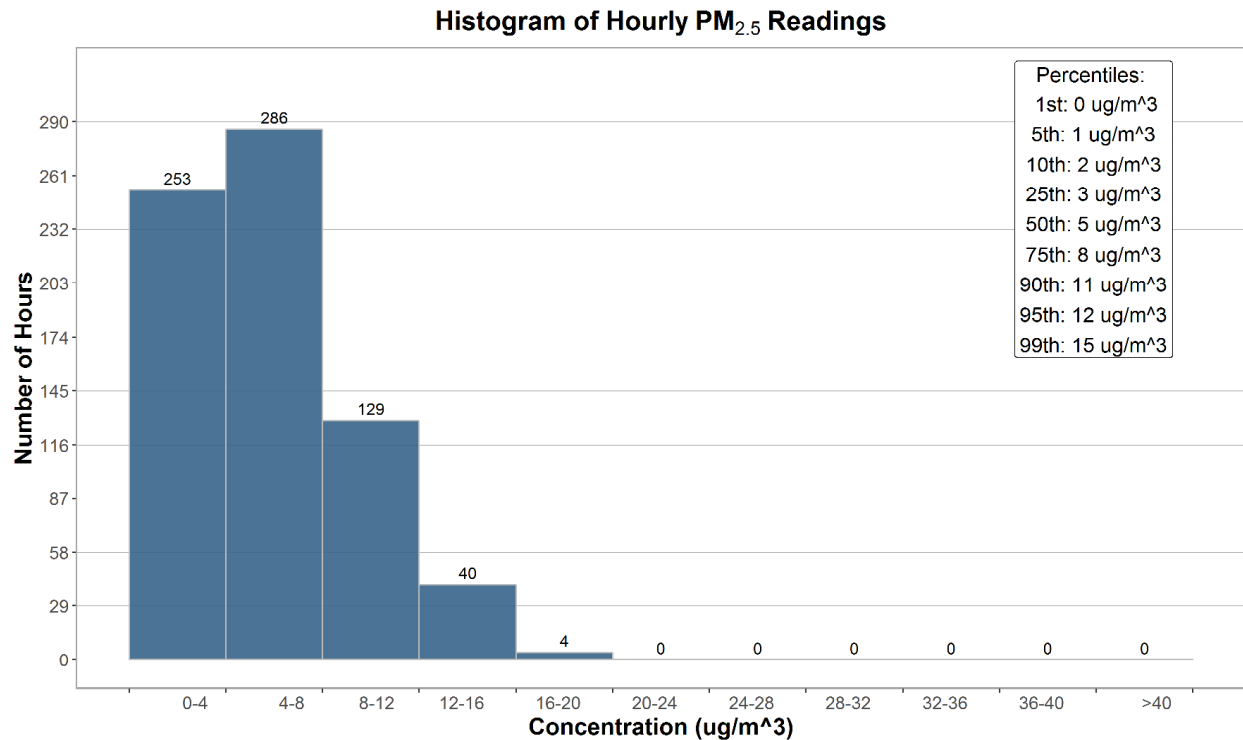


Figure 3-6 Histogram of hourly PM_{2.5} concentrations at the Lagoon station

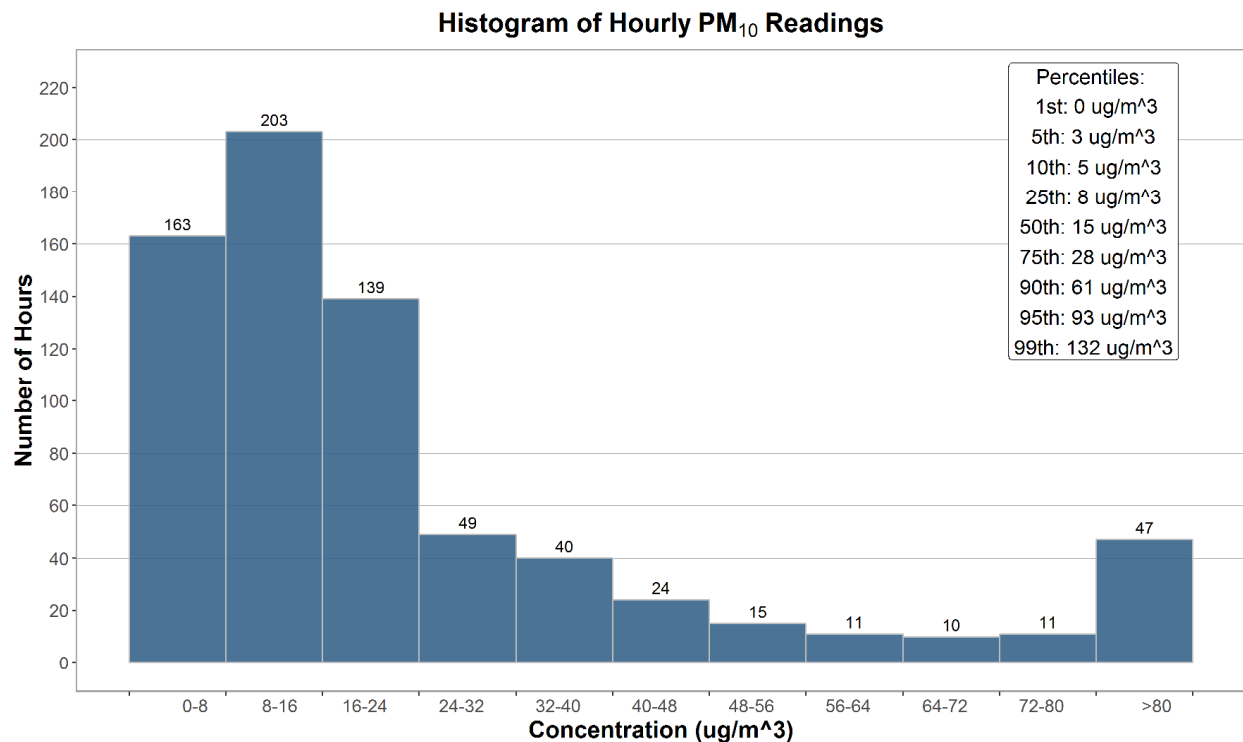


Figure 3-7 Histogram of hourly PM₁₀ concentrations at the Lagoon station

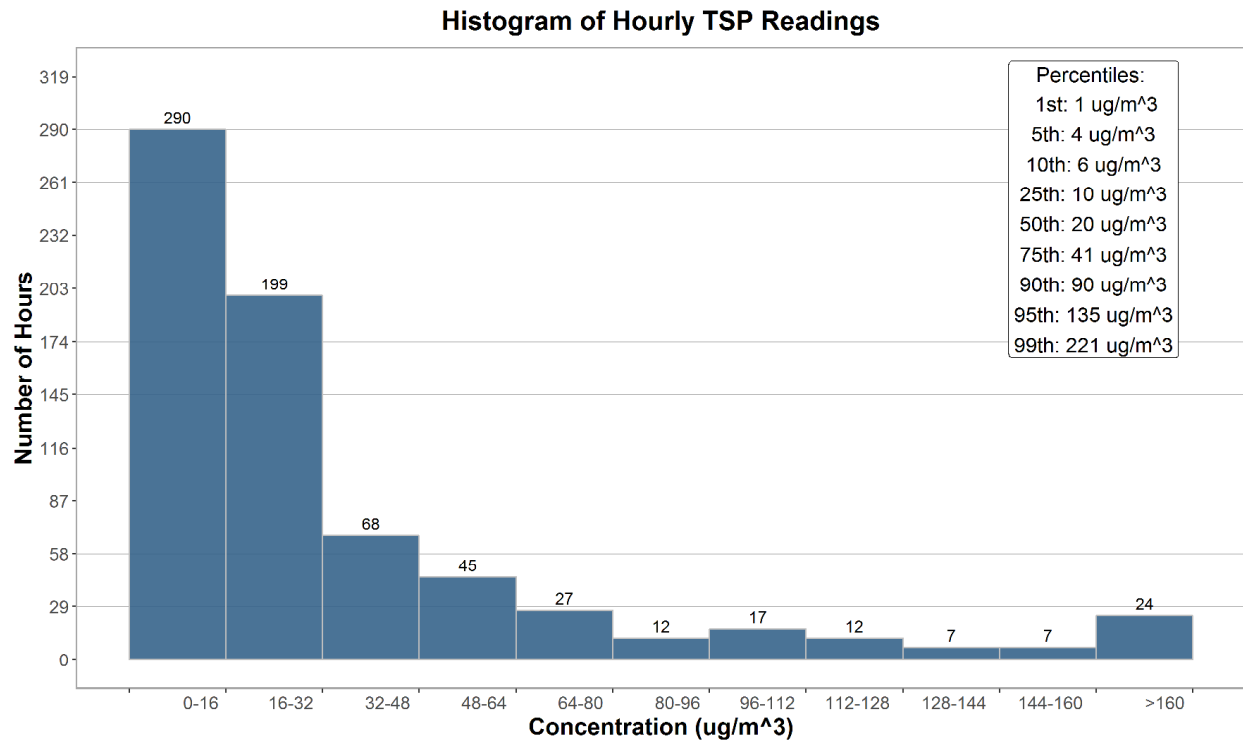


Figure 3-8 Histogram of hourly TSP concentrations at the Lagoon station

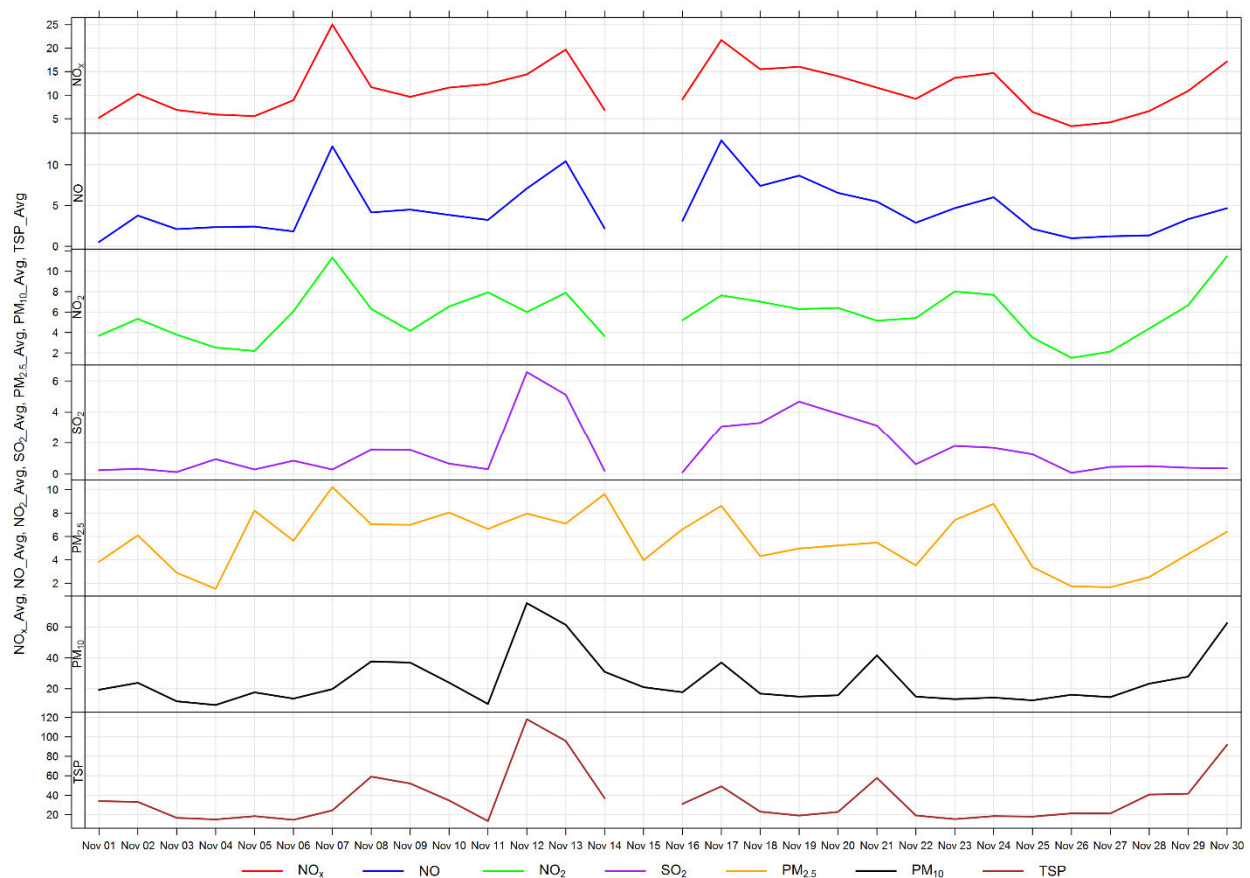


Figure 3-9 24-hour concentrations of NO_x, SO₂, and particulate matter at the Lagoon monitor

Figure 3- through Figure 3- show the variation in concentrations over various time averaging periods for PM, SO₂ and NO_x. The particulate matter plot in Figure 3- shows that PM₁₀ and TSP concentrations show less of a diurnal pattern associated with Lafarge operations, and daytime emissions from traffic and other activities in Exshaw than is typical at this station. This might suggest that the occurrences of high wind speeds in November dictated the release of fugitive dust and PM.

Figure 3- shows the variation of SO₂ over various time periods. SO₂ concentrations patterns are dependent on the timing of the highest SO₂ concentrations recorded in the month because in general SO₂ concentrations are very low. Figure 3- shows the variation of NO_x, NO and NO₂, with the peak of all three pollutants occurring in the early morning. This may be indicative of a peak in traffic.

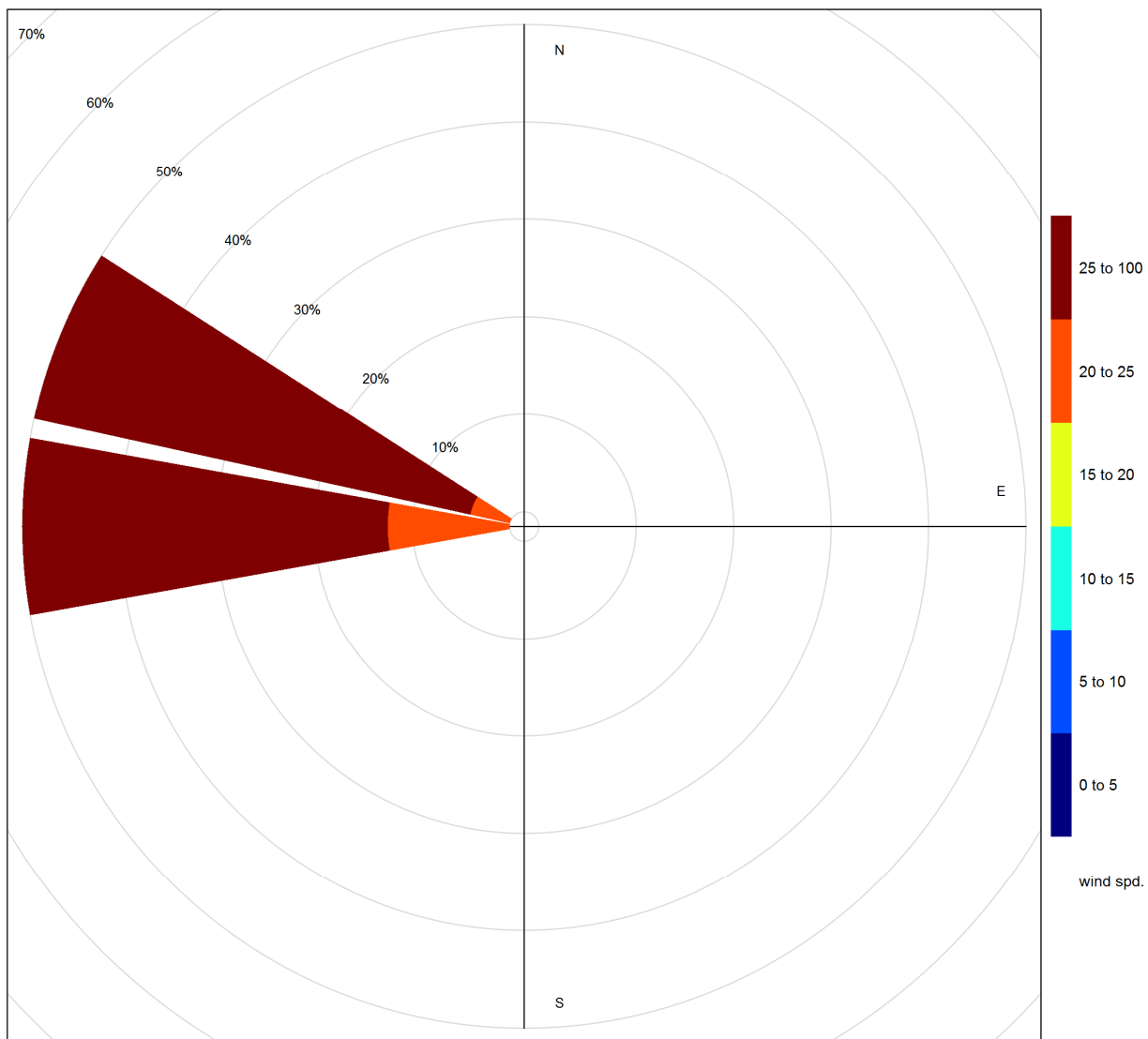


Figure 3-10 Wind rose for TSP exceedance days recorded at the Lagoon station

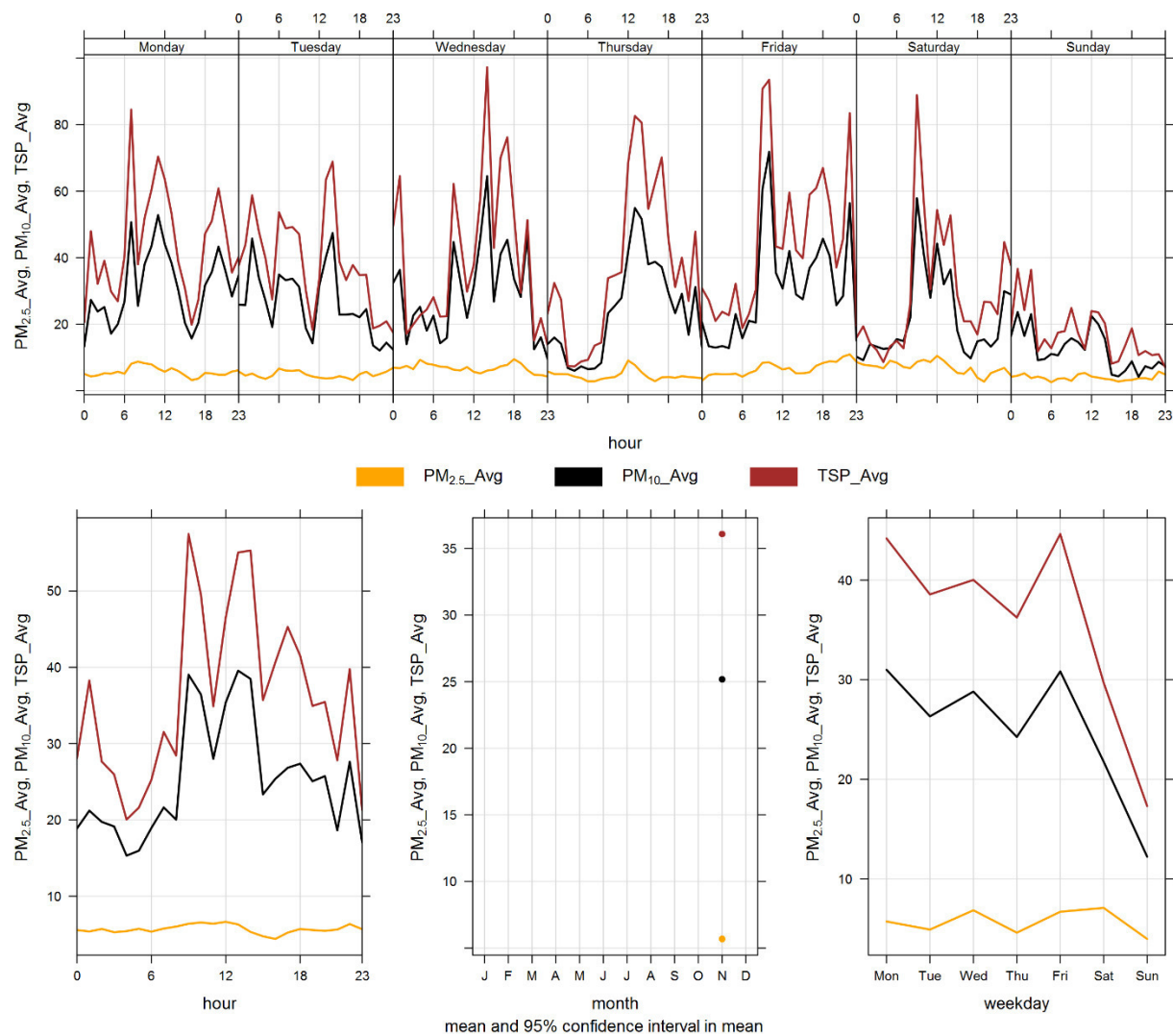


Figure 3-11 Lagoon monitor particulate matter time variation

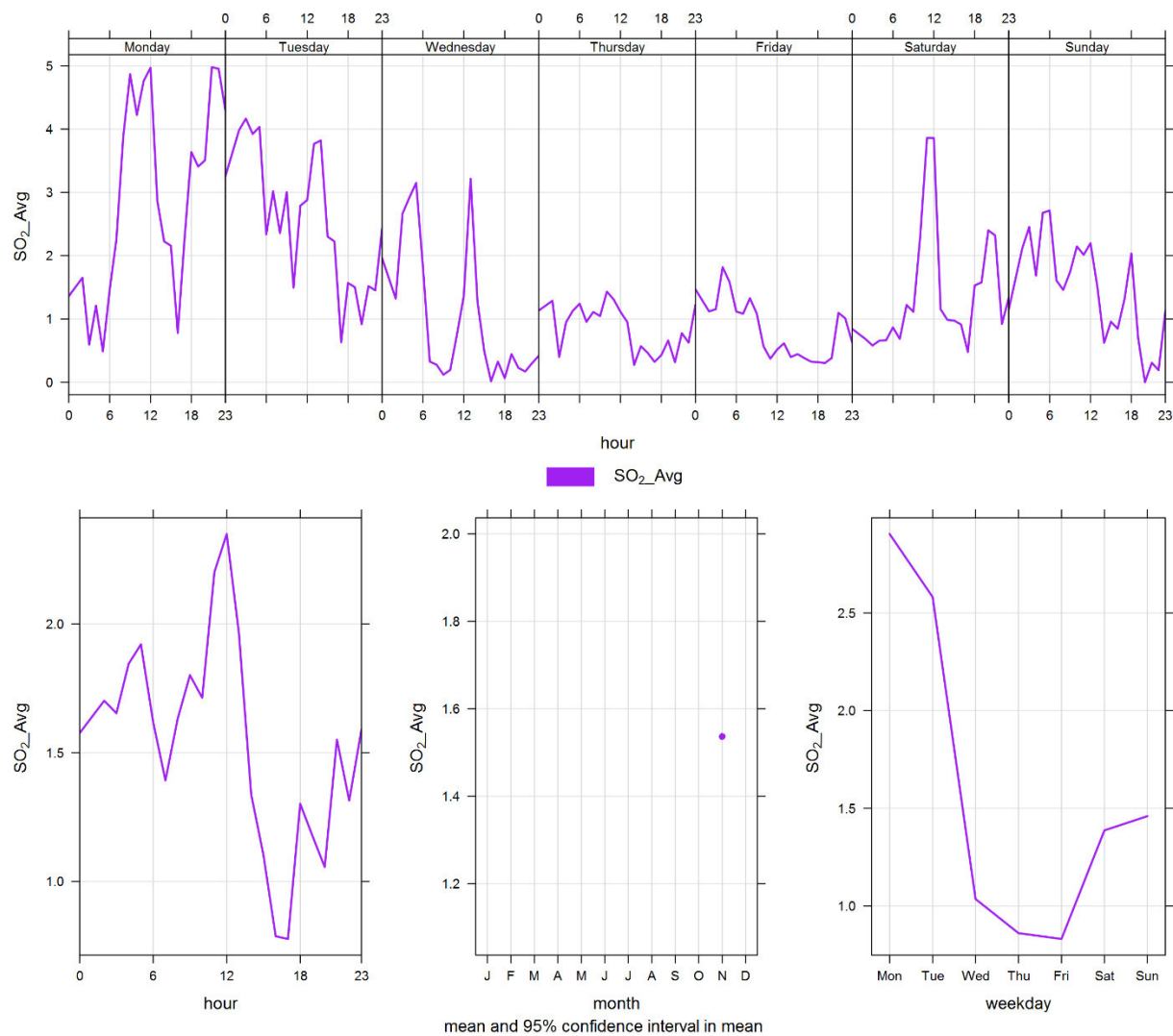


Figure 3-12 Lagoon monitor SO₂ time variation

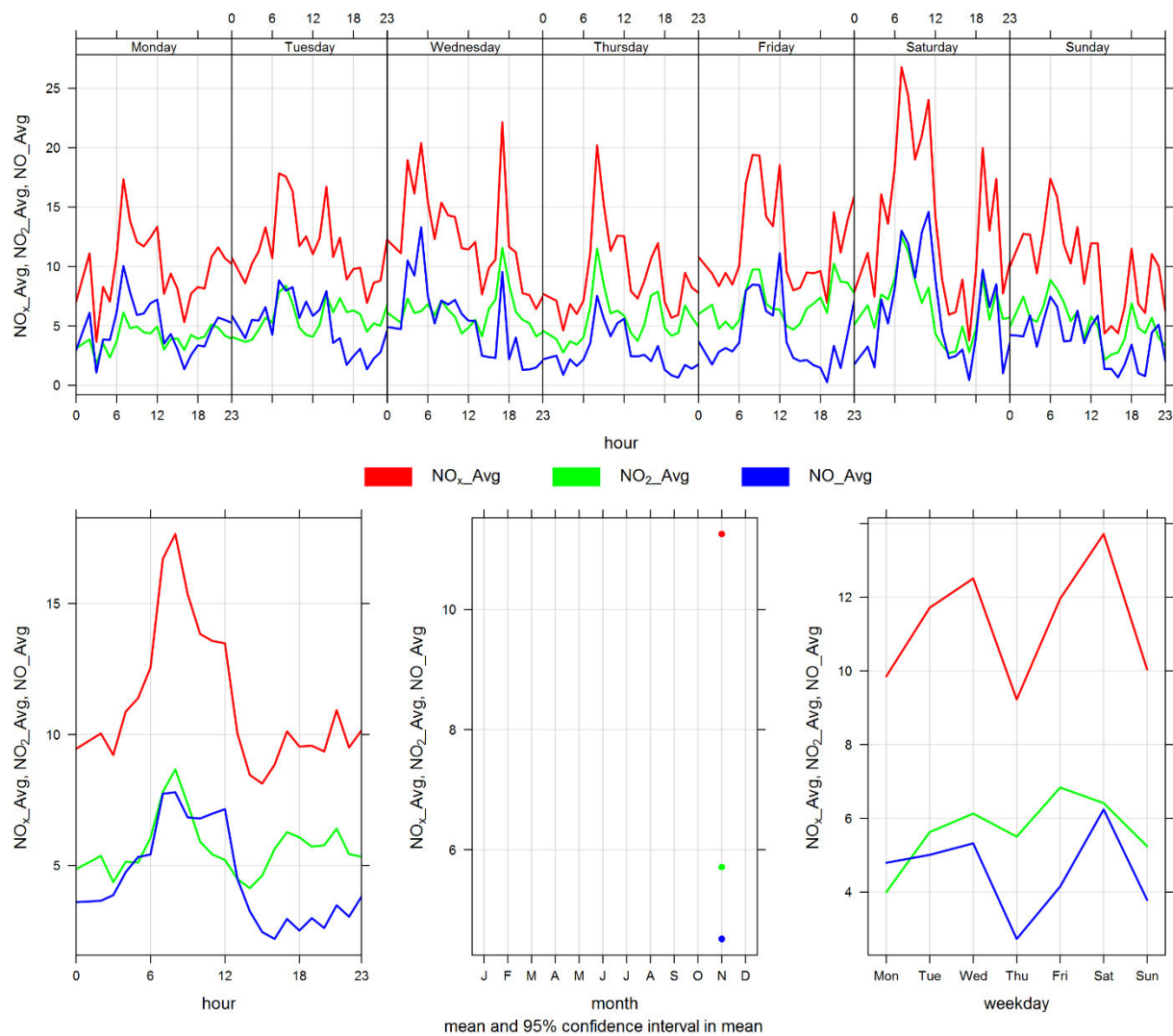


Figure 3-13 Lagoon monitor NO_x time variation

4 WINDRIDGE STATION

The Windridge station contains TSP, PM₁₀, and PM_{2.5} analyzers only. This section provides a summary of the monitoring activities for the Windridge ambient air quality station, including: a table of instrumentation (**Error! Reference source not found.**), a data summary table (Table 4-2), a table of recorded exceedances (Table 4-3), site visit notes, and graphs illustrating the monitoring results for November 2018.

All of the monitors comply with Alberta Environment and Parks Air Monitoring Directive (2016).

4.1 OPERATIONAL SUMMARY

A summary of the station operation for the month is provided in Table 4-1.

Table 4-1 Instrumentation List at the Windridge monitoring location

Parameter Measured	Equipment Description	Notes
PM _{2.5} Concentrations	MetOne BAM-1020 FRM Continuous Particulate Monitor	An equipment failure on November 17 th led to 1 hour of lost operational time from 23:00 to 24:00. This hour was flagged as X for machine malfunction. Operational time and valid data was well above 90% for the month of November, at 99.9%. All BAM monitors were calibrated on November 15 th .
PM ₁₀ Concentrations	MetOne BAM-1020 Continuous Particulate Monitor	
TSP Concentrations	MetOne BAM-1020 Continuous Particulate Monitor	

4.2 MONITORING RESULTS AND TRENDS

Table 4-2 summarizes the hourly and daily concentrations recorded in November 2018 and Table 4-2 summarizes the recorded exceedances. Figure 4-1 illustrates the time series for hourly PM, Figures 4-2 to 4-4 illustrate the histograms for hourly PM, Figure 4-5 illustrates the time series for daily PM, and Figure 4-7 illustrates the time series for hourly PM over different time periods.

There were zero exceedances of the 24-hour PM_{2.5} AAAQO, zero exceedances of the 1-hour PM_{2.5} AAAQG, and 7 exceedances of the 24-hour TSP AAAQO. TSP exceedances occurred on days with high wind speeds.

Table 4-2 Summary of November 2018 data at the Windridge Station

Parameter	Guideline		Station	Exceedances		Monthly		Maximum 1-hour					Maximum 24-hour		Operational Time (Percent)
	1-hr	24-hr		1-hr	24-hr	Minimum	Average	Maximum Concentration	Day	Hour	Wind Speed (km/hr)	Wind Direction (degrees)	Maximum Concentration	Day	
PM _{2.5} (µg/m ³)	80	30	Windridge	0	0	0.0	5.7	22.4	30	20	9.4	273.4	11.8	14	99.9
PM ₁₀ (µg/m ³)	-	-	Windridge	-	-	0.0	45.9	361.8	9	11	39.3	256.0	119.4	12	99.9
TSP (µg/m ³)	-	100	Windridge	-	7	0.0	62.4	466.3	3	24	33.9	247.7	139.3	12	99.9

Table 4-3 Days exceeding the TSP AAAQO or PM_{2.5} AAAQO at the Windridge Station

Date	TSP (ug/m ³)	PM _{2.5} (ug/m ³)	Average Wind Direction (degrees)	Average Wind Speed (km/hr)	Average RH (%)	Root Cause (Provided by Lafarge)
Windridge						
11/4/2018	105.7	-	252.3	30.7	46.8	High wind event
11/12/2018	139.3	-	279.8	29.1	51.5	High wind event
11/14/2018	132.3	-	257.0	34.9	58.5	High wind event
11/26/2018	103.5	-	254.7	40.0	54.8	High wind event
11/27/2018	100.2	-	254.2	32.4	47.6	High wind event
11/28/2018	119.0	-	256.9	20.0	41.3	
11/30/2018	113.9	-	277.3	14.7	68.0	
Total # of Exceedances	7	0				

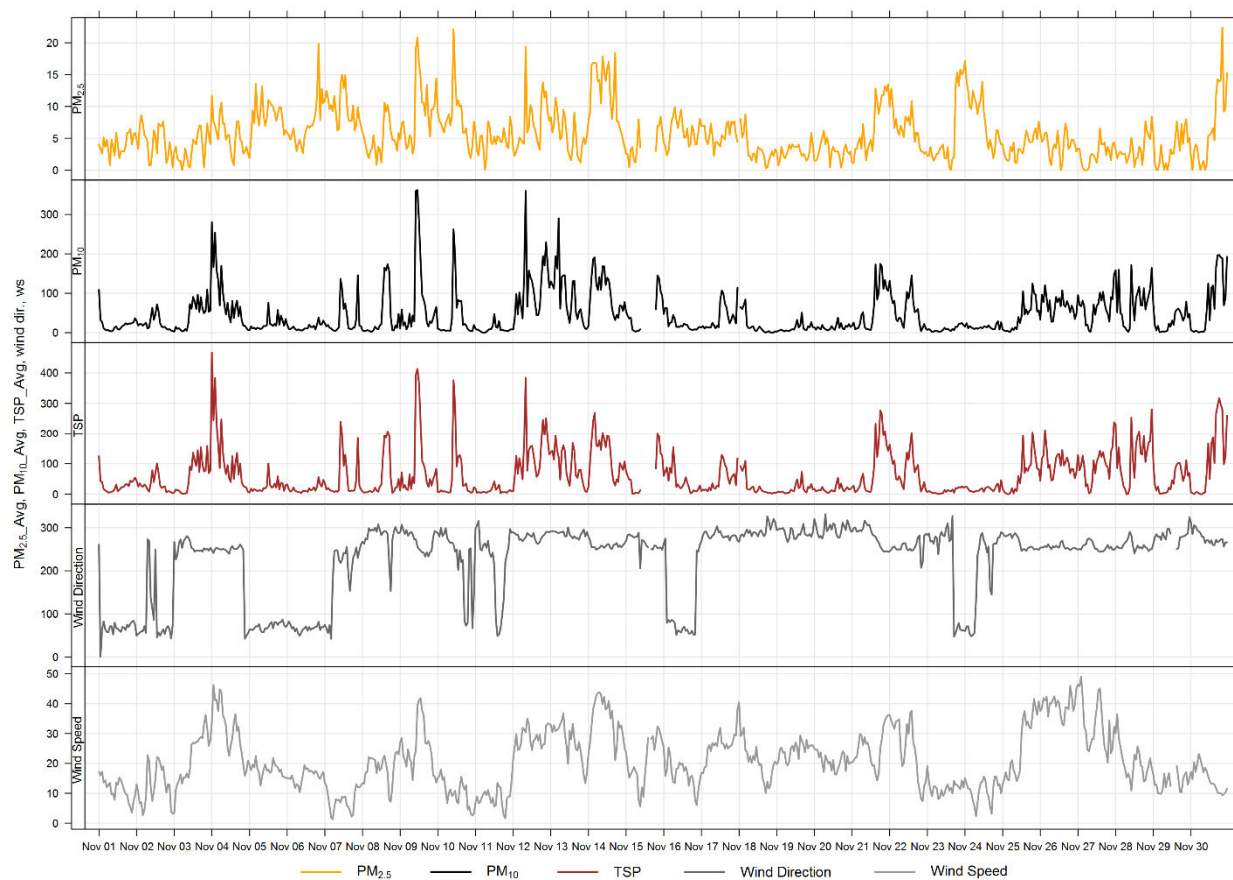


Figure 4-1 1-hour particulate matter concentrations recorded at the Windridge monitor

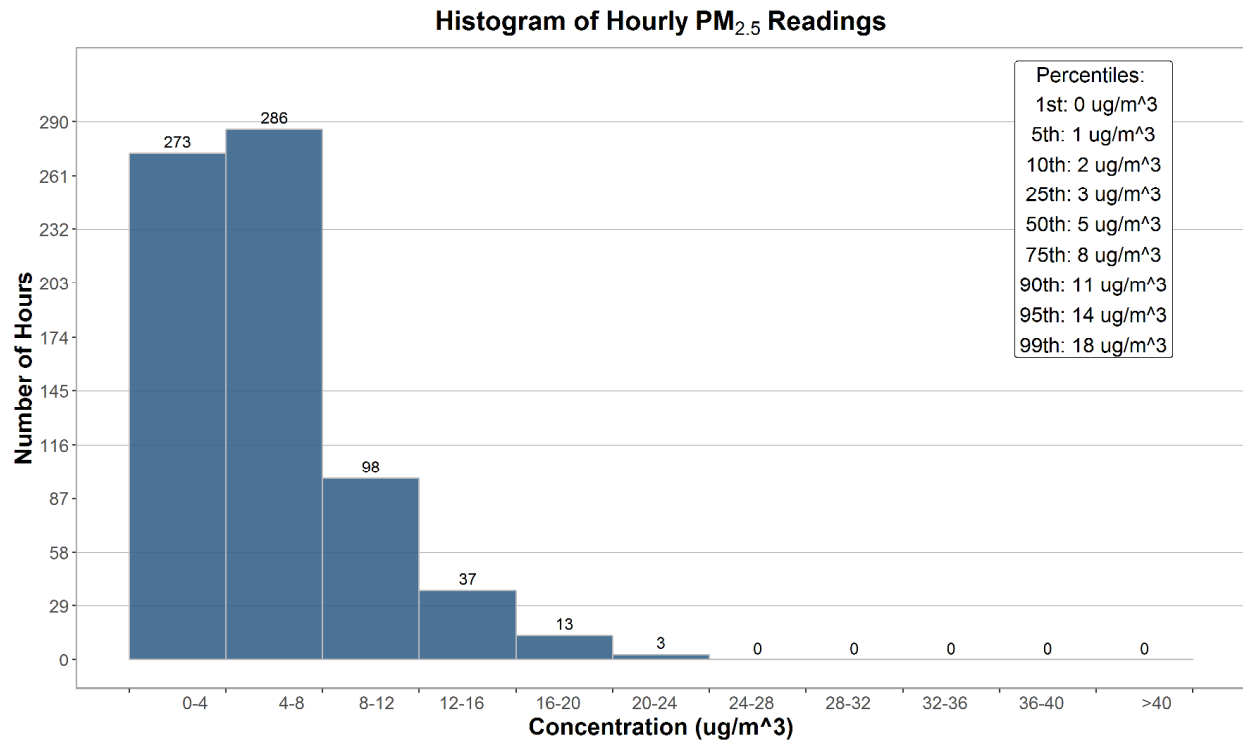


Figure 4-2 Histogram of hourly PM_{2.5} concentrations at the Windridge station

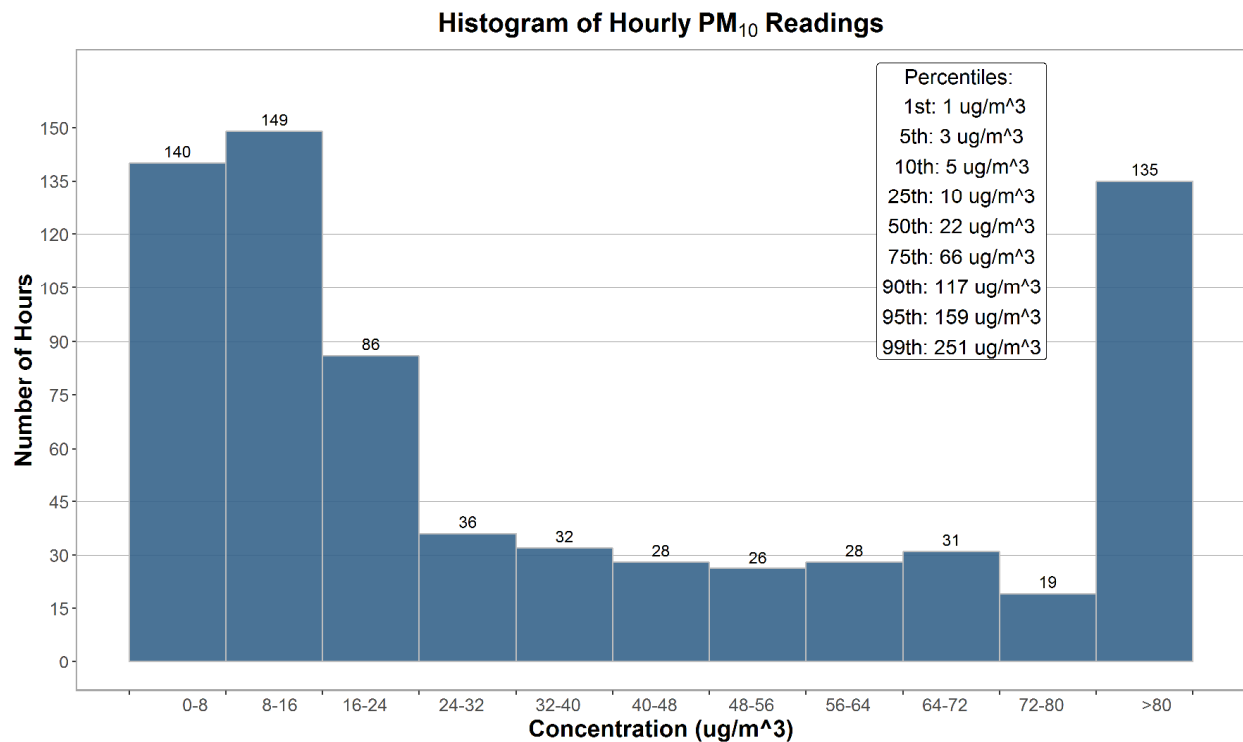


Figure 4-3 Histogram of hourly PM₁₀ concentrations at the Windridge station

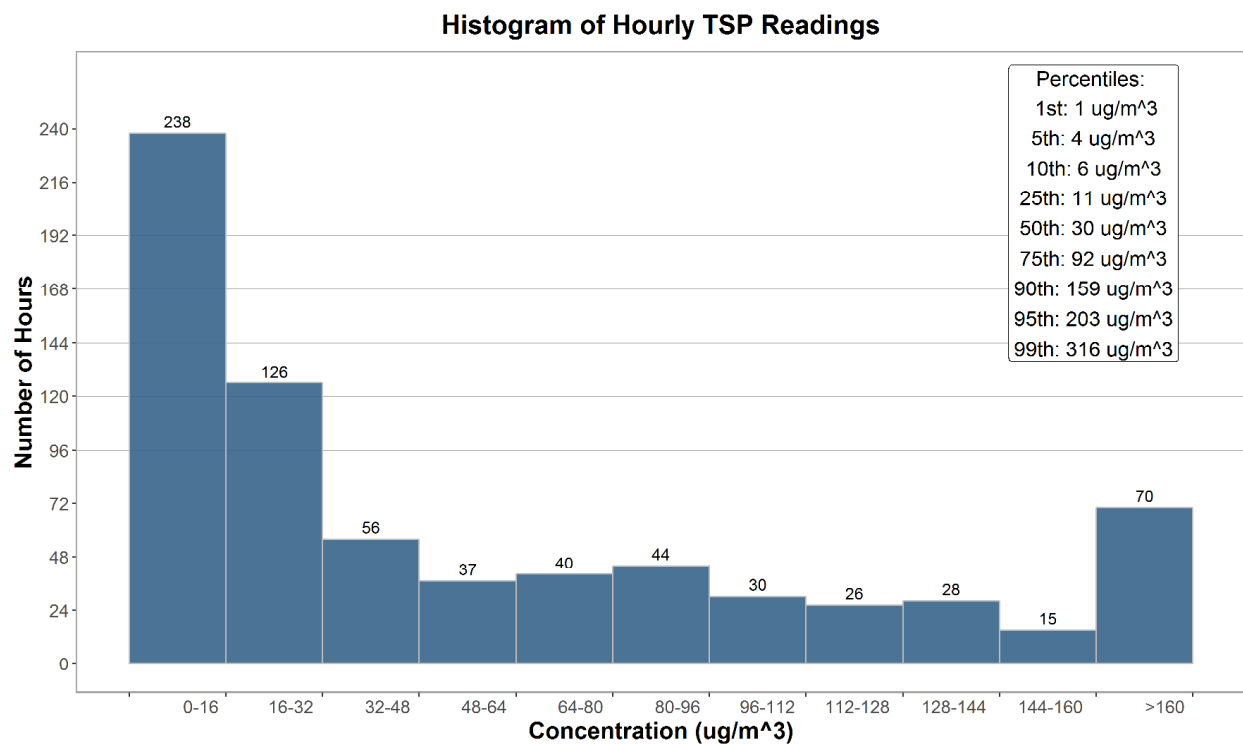


Figure 4-4 **Histogram of hourly TSP concentrations at the Windridge station**

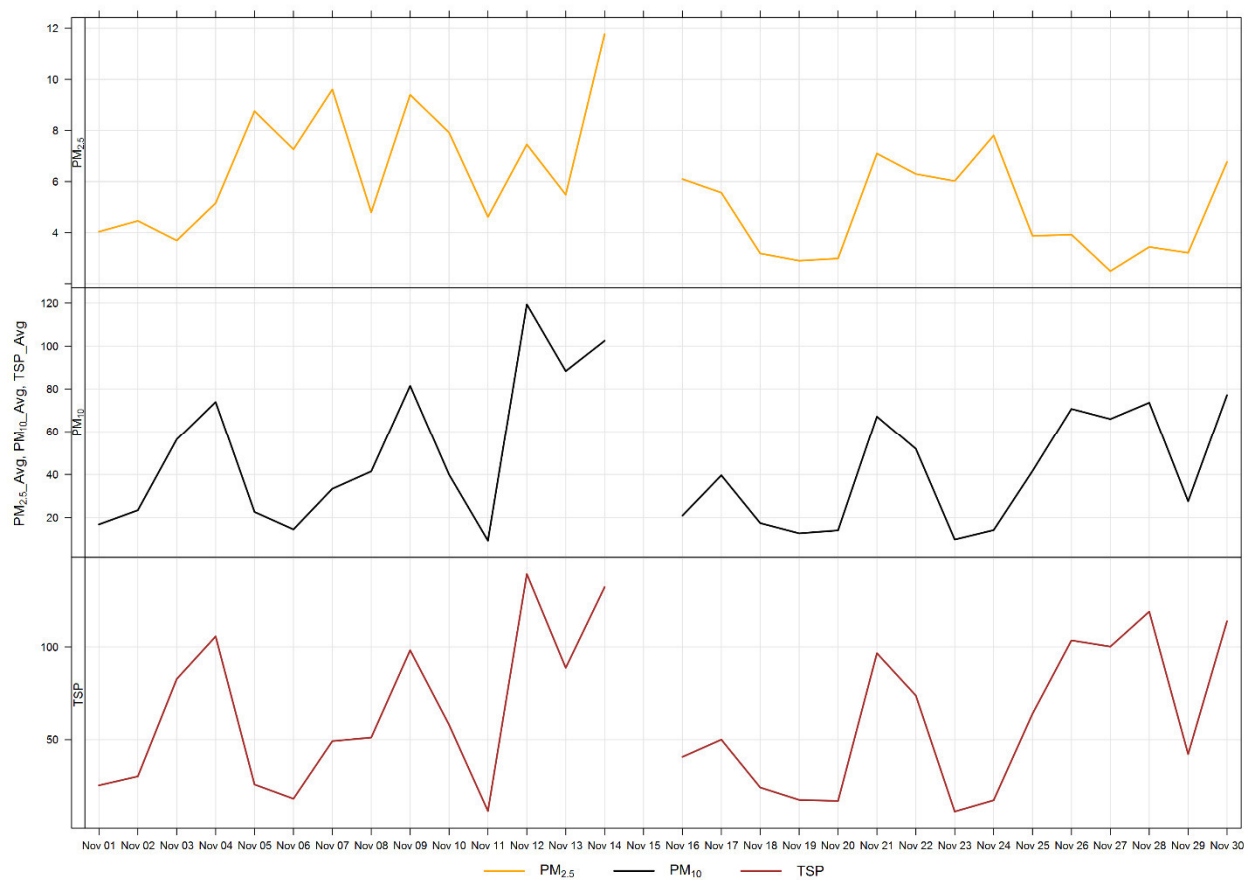


Figure 4-5 24-hour particulate matter concentrations at the Windridge monitor

Figure 4- shows the wind rose for the 7 days of TSP exceedances. The wind rose shows that the winds predominantly come from the west and west-southwest directions, and were over 20 km/hr.

Figure 4- illustrates the hourly PM concentrations recorded at the Windridge monitor, averaged over different time periods. The plot across the top shows the variation of PM over the course of a week, while the bottom three plots show the changes in PM over the course of a day, month and weekday, respectively. Figure 4- is based on data collected during November 2018 and similar to the Lagoon station shows less of a diurnal pattern associated with Lafarge operations, and daytime emissions from traffic and other activities in Exshaw than is typical at this station. This might suggest that the occurrences of high wind speeds in November dictated the release of fugitive dust and PM.

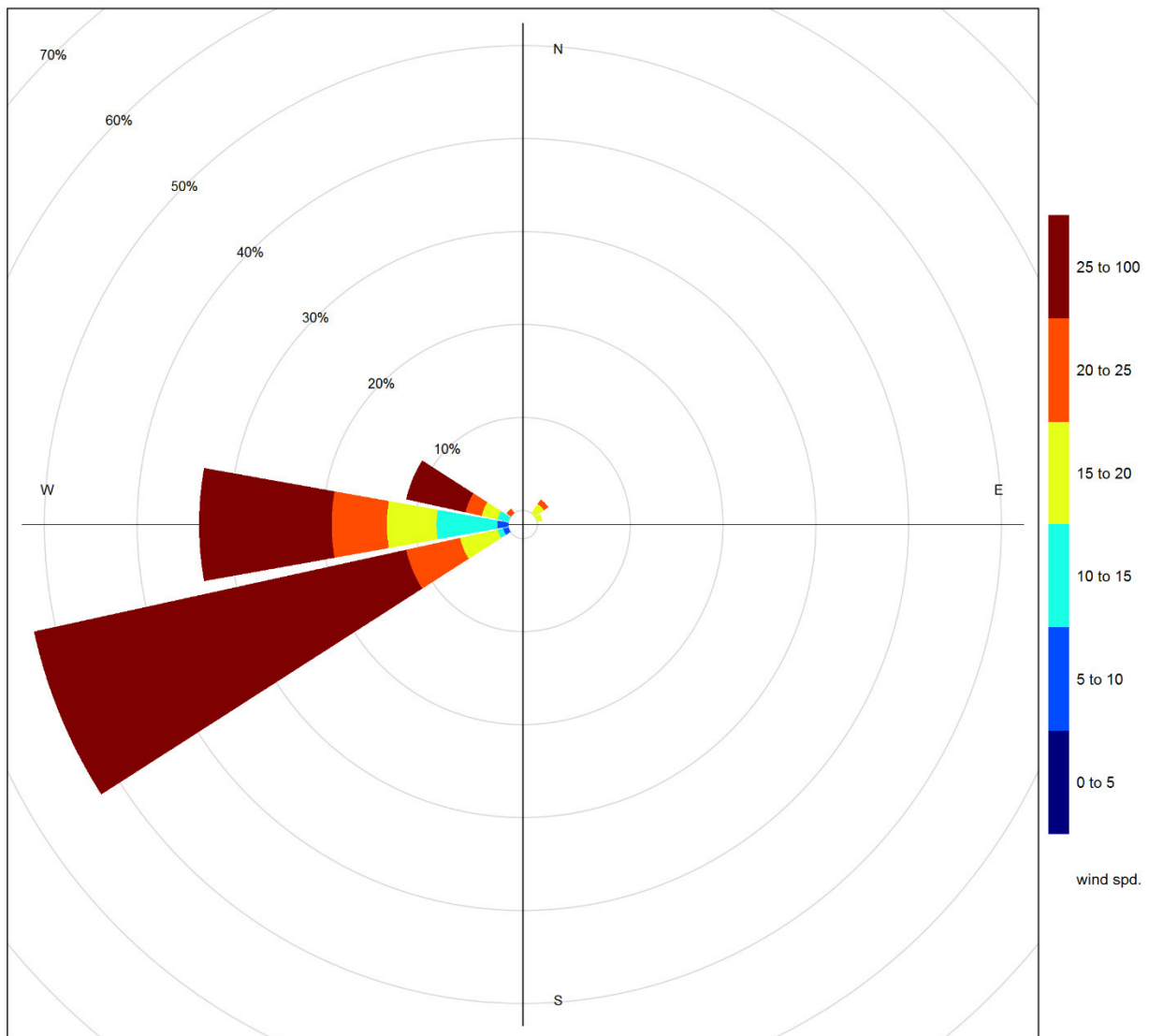


Figure 4-6 Wind rose for TSP exceedance day recorded at the Windridge Station

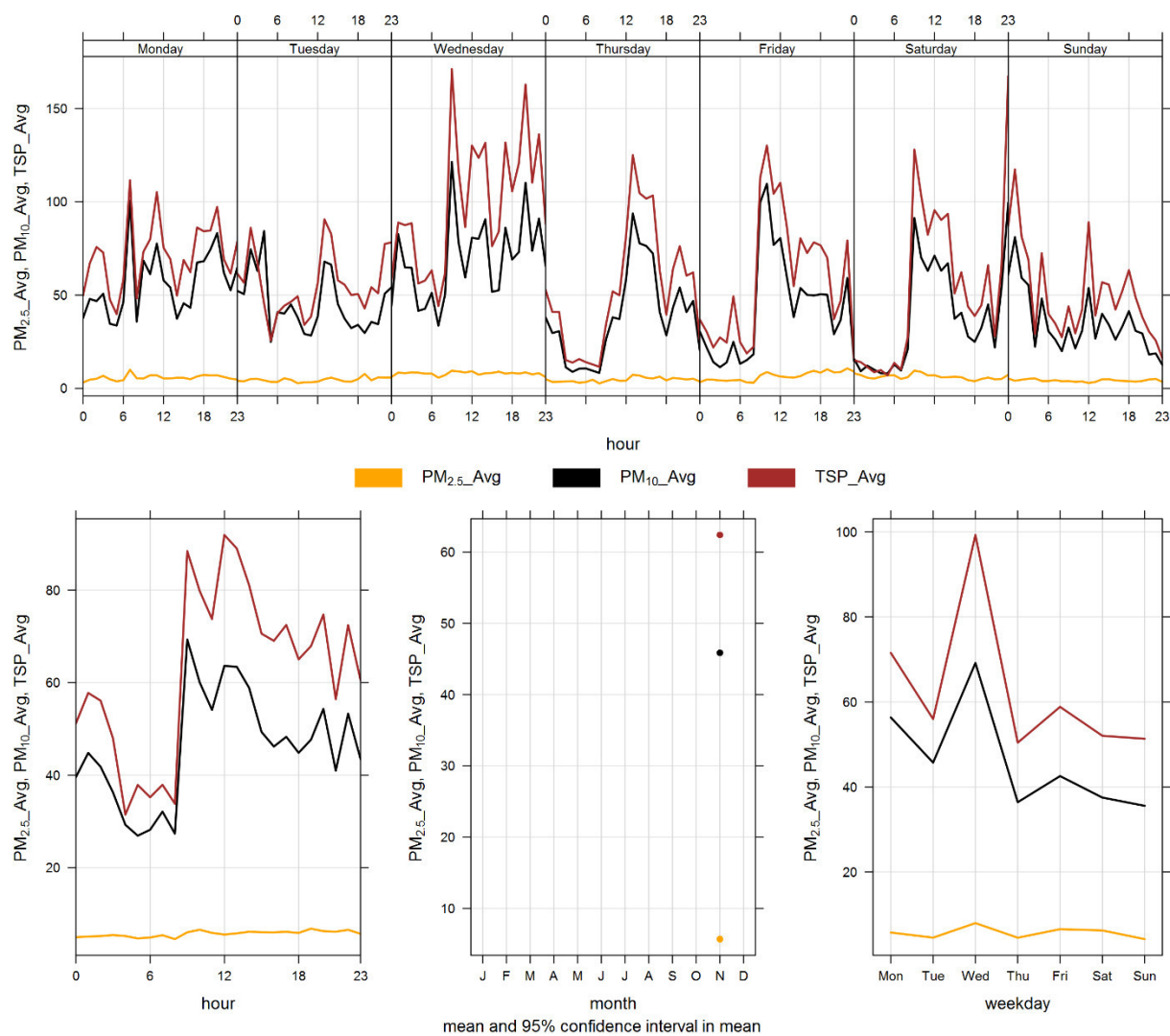


Figure 4-7 Windridge particulate matter time variation

5 WEST INDUSTRIAL GRIMM

5.1 OPERATIONAL SUMMARY

A summary of the station operation for the month is provided in Table 5-1.

Table 5-1 Instrumentation List at the West monitoring location

Parameter Measured	Equipment Description	Notes
PM _{2.5} , PM ₁₀ , TSP Concentrations	GRIMM 365 Continuous Particulate Monitor	An equipment failure on November 15 th led to 1 hour of lost operational time from 16:00 to 17:00. This hour was flagged as X for machine malfunction. Operational time and valid data was well above 90% for the month of November, at 99.9%.

5.2 MONITORING RESULTS AND TRENDS

The West GRIMM was installed in its current location in order to monitor “background” PM concentrations since the predominant wind pattern is from west to east in the valley. Table 5-2 summarizes the maximum 1-hour and 24-hour concentrations recorded over the course of the month. This is an industrial monitor that is not Alberta Air Monitoring Directive (AMD) compliant and is not required to show compliance with the AAAQO.

Figure 5-1 and Figure 5- show the hourly and daily PM_{2.5}, PM₁₀ and TSP concentrations recorded over the month.. There were no exceedances of the 24-hour TSP guideline (100 µg/m³) nor the PM_{2.5} (30 µg/m³) guideline. Historically in November, the average number of 24-hour TSP AAQO exceedances and 24-hour PM_{2.5} AAAQO exceedances are one and zero, respectively. The maximum number of 24-hour TSP AAQO exceedances was 5 in 2012, while the maximum number of 24-hour PM_{2.5} AAQO exceedances was one in 2012.

Table 5-2 Summary of November 2018 data at the West GRIMM

Parameter	Guideline		Station	Exceedances		Monthly		Maximum 1-hour					Maximum 24-hour		Operational Time (Percent)
	1-hr	24-hr		1-hr	24-hr	Minimum	Average	Maximum Concentration	Day	Hour	Wind Speed (km/hr)	Wind Direction (degrees)	Maximum Concentration	Day	
PM_{2.5} (µg/m ³)	80	30	West	0	0	0.1	5.0	24.7	23	22	14.3	62.1	10.9	7	99.9
PM₁₀ (µg/m ³)	-	-	West	-	-	0.2	6.3	72.2	2	13	22.2	45.7	13.1	7	99.9
TSP (µg/m ³)	-	100	West	-	0	0.1	5.6	156.2	2	13	22.2	45.7	18.8	2	99.9

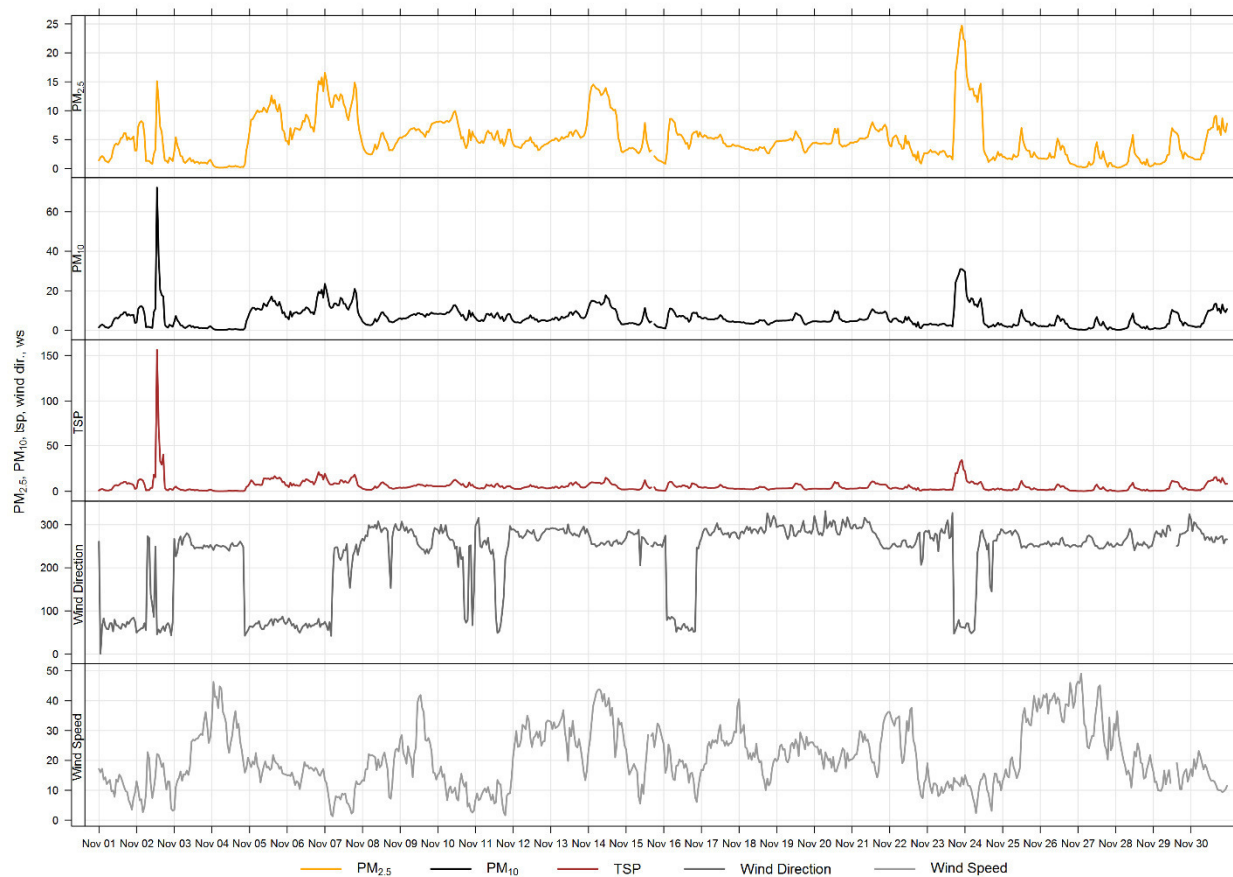


Figure 5-1 1-hour particulate matter concentrations at the West monitor

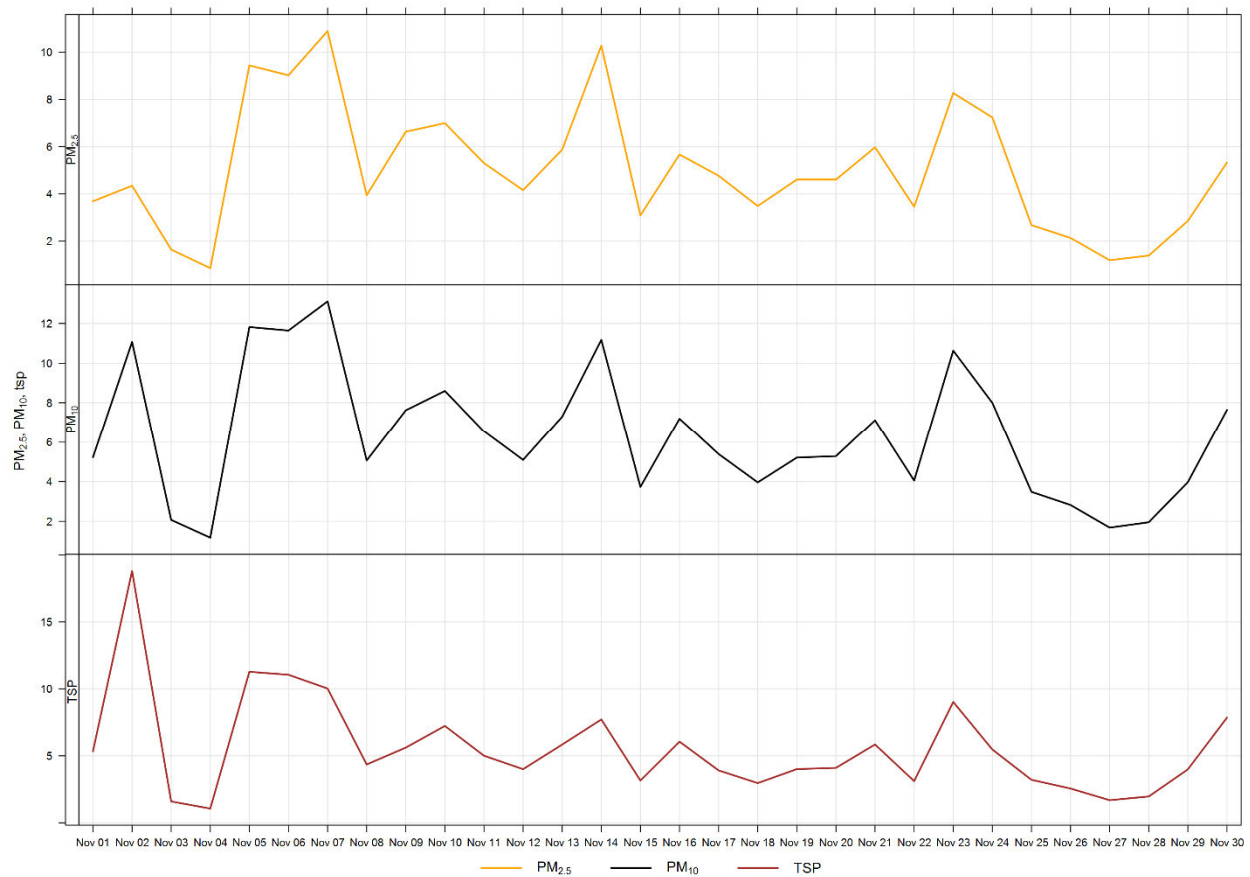


Figure 5-2 24-hour particulate matter concentrations at the West monitor

Figure 5- illustrates the hourly PM concentrations recorded at the West monitor, averaged over different time periods. The plot across the top shows the variation of PM over the course of a week, while the bottom three plots show the changes in PM over the course of a day, month and weekday, respectively. Figure 5- is based on data collected during November 2018 and indicates a strong relationship between TSP and hours which Lafarge is typically operational. Due to the proximity of the West monitor to the highway, the daily variations in PM may also be a result of higher traffic volume during daylight hours.

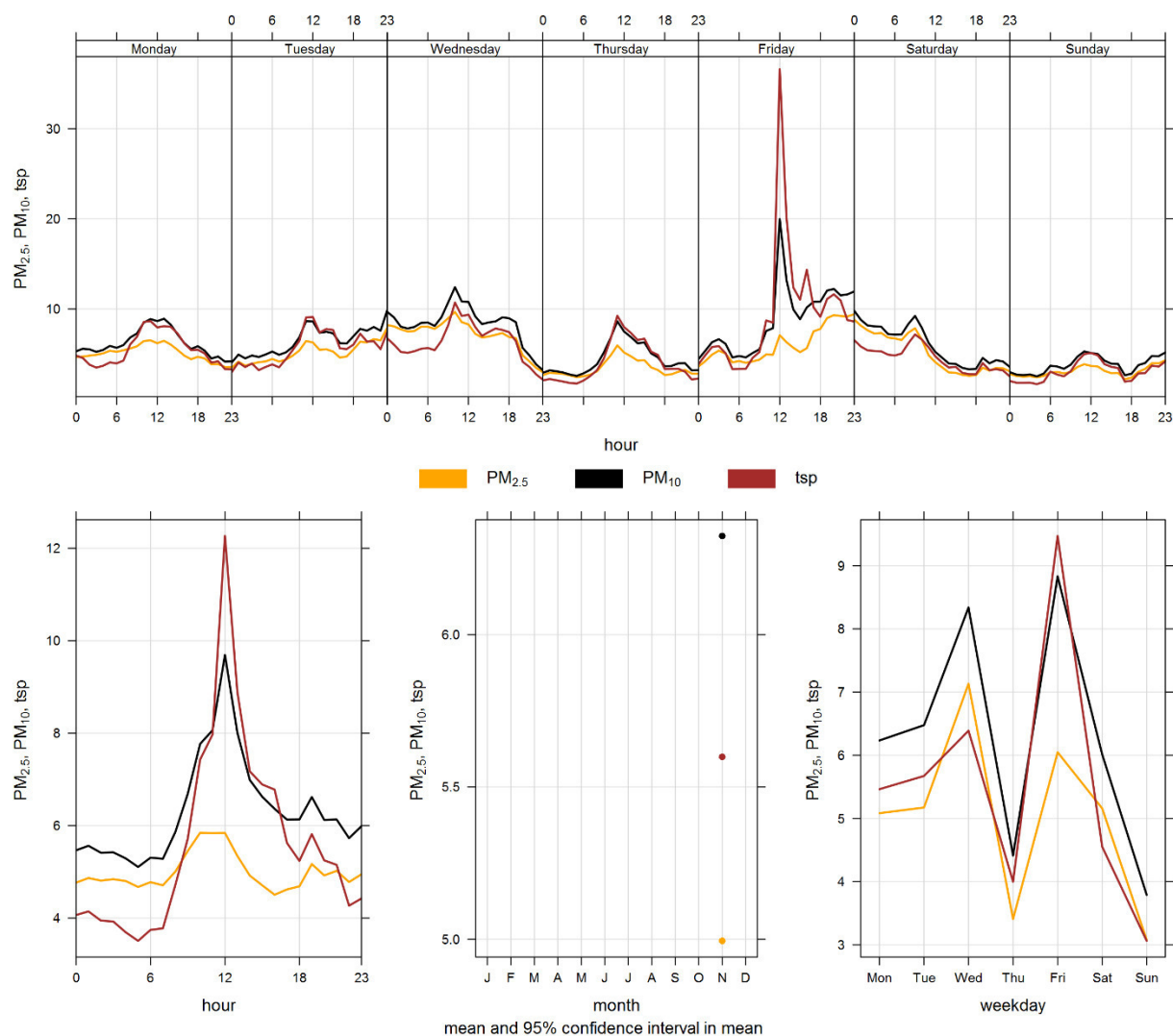


Figure 5-3 West particulate matter time variation

6 BERM INDUSTRIAL GRIMM

6.1 OPERATIONAL SUMMARY

A summary of the station operation for the month is provided in Table 6-1.

Table 6-1 Instrumentation List at the Berm monitoring location

Parameter Measured	Equipment Description	Notes
PM _{2.5} , PM ₁₀ , TSP Concentrations	GRIMM 365 Continuous Particulate Monitor	No operational issues observed. The monitor had 100% uptime in the month of November.

6.2 MONITORING RESULTS AND TRENDS

The Berm monitor was placed at its current location as a result of the dispersion modelling conducted for the facility in 2009. Figure 6-1 and Figure 6- show the hourly and daily PM_{2.5}, PM₁₀ and TSP concentrations recorded over the month. Table 6-2 summarizes the maximum 1-hour and 24-hour PM concentrations recorded during the month, and Table 6-3 summarizes the recorded exceedances. This is an industrial monitor that is not Alberta Air Monitoring Directive (AMD) compliant and is not required to show compliance with the AAAQO.

In November, there were 18 and 3 exceedances of the 24-hour TSP (30 µg/m³) and PM_{2.5} (100 µg/m³) guidelines, respectively. There were 8 hours exceeding the 1-hour PM_{2.5} guideline (80 µg/m³). Historically during the month of November, the Berm monitor records an average of 16 and zero exceedances of the 24-hour TSP and PM_{2.5} guidelines respectively. The maximum number of TSP exceedances recorded during November occurred in 2011 where there were 23 days that exceeded the guideline. The minimum number of TSP exceedances was recorded during November 2015, which had 12 days that exceeded the guideline. The maximum number of PM_{2.5} exceedances occurred in November 2017 where 3 days of exceedances were also observed.

It should also be noted that the GRIMM monitors become more conservative in the reported PM concentrations as the size fraction increases. The PM_{2.5} size fraction has been shown to match other regulatory approved PM_{2.5} monitors, but the TSP concentrations recorded by the GRIMM tend to be higher than regulatory approved monitors (Levelton, 2015).

The Berm monitor is located along a ridge at the edge of the Lafarge property and is in an area where on-site trucks drive through site, which can create fugitive dust. Quarry blasting also has the potential to impact short term PM immediately following a blast.

Table 6-2 Summary of November 2018 data at the Berm GRIMM

Parameter	Guideline		Station	Exceedances		Monthly		Maximum 1-hour					Maximum 24-hour		Operational Time (Percent)
	1-hr	24-hr		1-hr	24-hr	Minimum	Average	Maximum Concentration	Day	Hour	Wind Speed (km/hr)	Wind Direction (degrees)	Maximum Concentration	Day	
PM_{2.5} (µg/m ³)	80	30	Berm	8	3	0.6	14.0	116.1	4	1	46.3	241.2	34.2	14	100.0
PM₁₀ (µg/m ³)	-	-	Berm	-	-	1.3	79.7	804.3	9	10	24.3	272.7	229.1	12	100.0
TSP (µg/m ³)	-	100	Berm	-	18	1.0	215.0	2183.1	9	10	24.3	272.7	696.9	12	100.0

Table 6-3 Days exceeding the Guideline for TSP or PM_{2.5} at the Berm Monitor

Date	TSP (ug/m ³)	PM _{2.5} (ug/m ³)	Average Wind Direction (degrees)	Average Wind Speed (km/hr)	Average RH (%)	Root Cause (Provided by Lafarge)
Berm						
11/3/2018	238.5	-	252.8	23.2	54.8	High wind event
11/4/2018	195.5	-	252.3	30.7	46.8	High wind event
11/8/2018	156.4	-	288.5	18.9	56.7	
11/9/2018	487.0	31.1	264.0	25.2	56.5	High wind event
11/10/2018	124.3	-	264.8	9.8	63.4	
11/12/2018	696.9	31.5	279.8	29.1	51.5	High wind event
11/13/2018	462.8	-	285.0	27.0	50.1	High wind event
11/14/2018	559.0	34.2	257.0	34.9	58.5	High wind event
11/15/2018	263.5	-	262.0	20.7	61.7	High wind event
11/17/2018	275.0	-	281.5	26.8	65.8	High wind event
11/21/2018	397.2	-	277.3	25.8	51.7	High wind event
11/22/2018	214.3	-	255.1	24.5	53.9	High wind event
11/25/2018	327.7	-	258.9	27.0	52.2	High wind event
11/26/2018	430.3	-	254.7	40.0	54.8	High wind event
11/27/2018	386.9	-	254.2	32.4	47.6	High wind event

11/28/2018	461.7	-	256.9	20.0	41.3	
11/29/2018	106.2	-	283.1	13.7	55.9	
11/30/2018	219.8	-	277.3	14.7	68.0	
Total # of Exceedances	18	3				
Maximum # of Exceedances (November)	23 (2011)	3 (2017)				
Average # of Exceedances (November)	16	0				
Minimum # of Exceedances (November)	12 (2015)	0 (2010, 2013, 2016)				

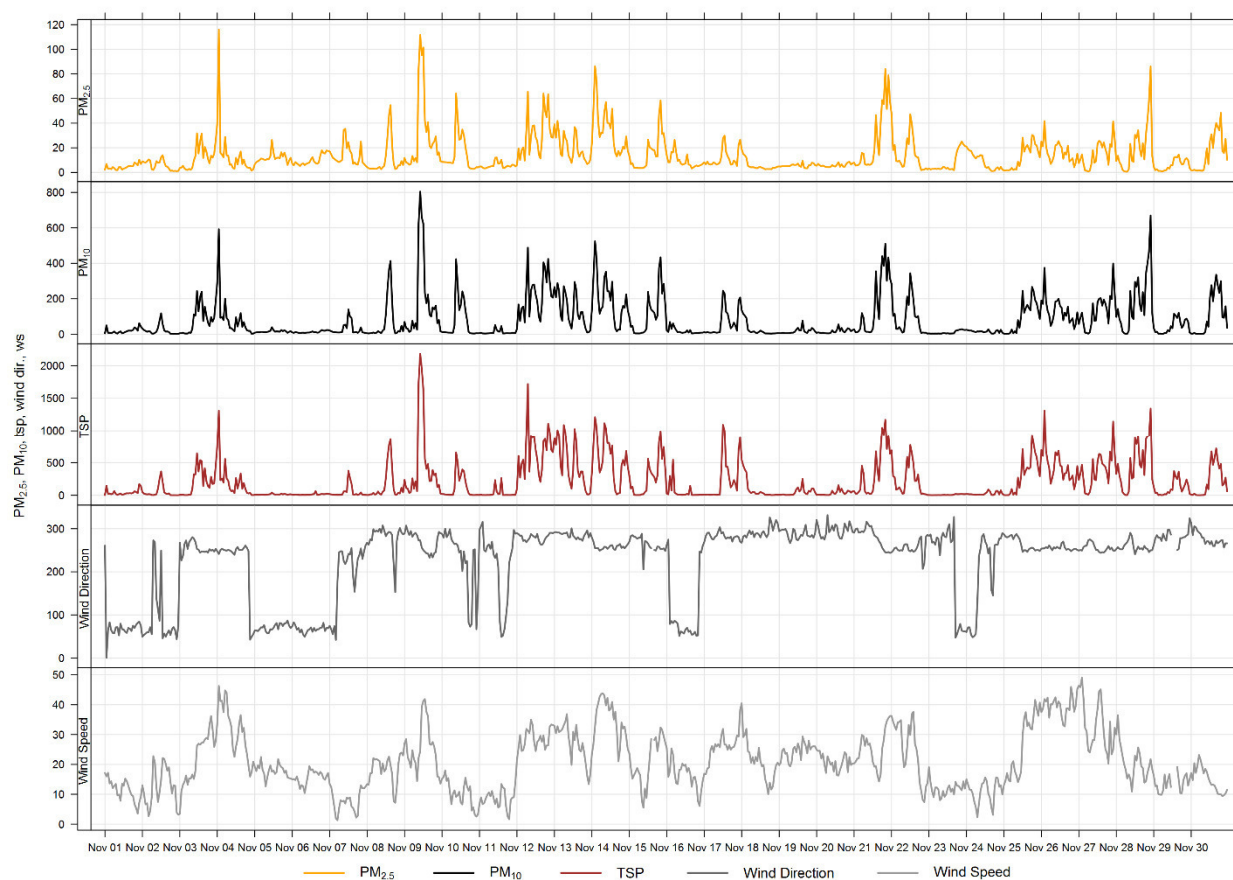


Figure 6-1 1-hour particulate matter concentrations recorded at the Berm monitor

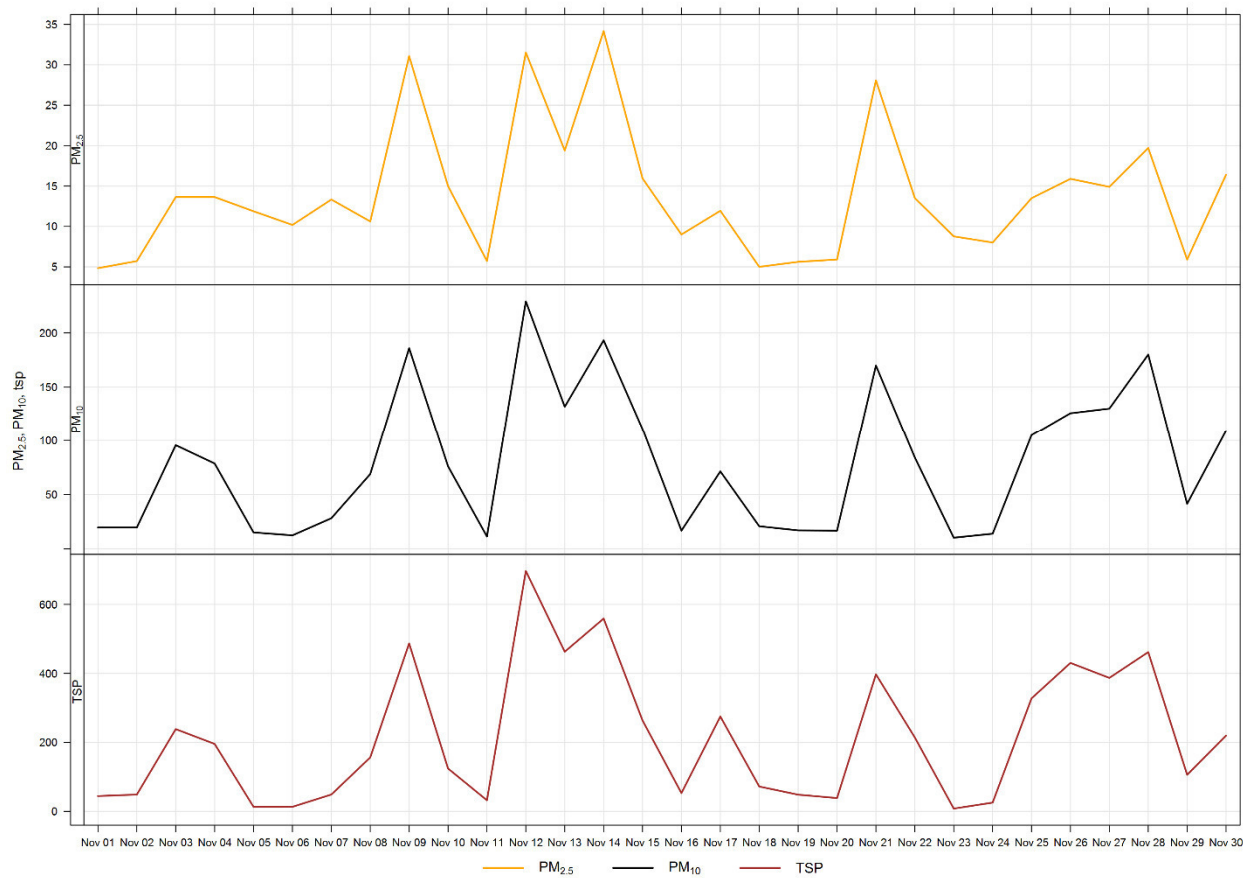


Figure 6-2 24-hour particulate matter concentrations recorded at the Berm monitor

Figure 6- shows the wind rose for the 18 days of TSP exceedances, while Figure 6-4 shows the wind rose for the 3 days of $PM_{2.5}$ exceedances. Both wind roses show that the winds predominantly came from westerly directions.

Figure 6- shows the variation of PM recorded at the Berm monitor over various time averaging periods. The Berm monitor diurnal pattern is similar to the Windridge and Lagoon stations, is associated with Lafarge operations, but also daytime emissions from traffic and other activities in Exshaw.

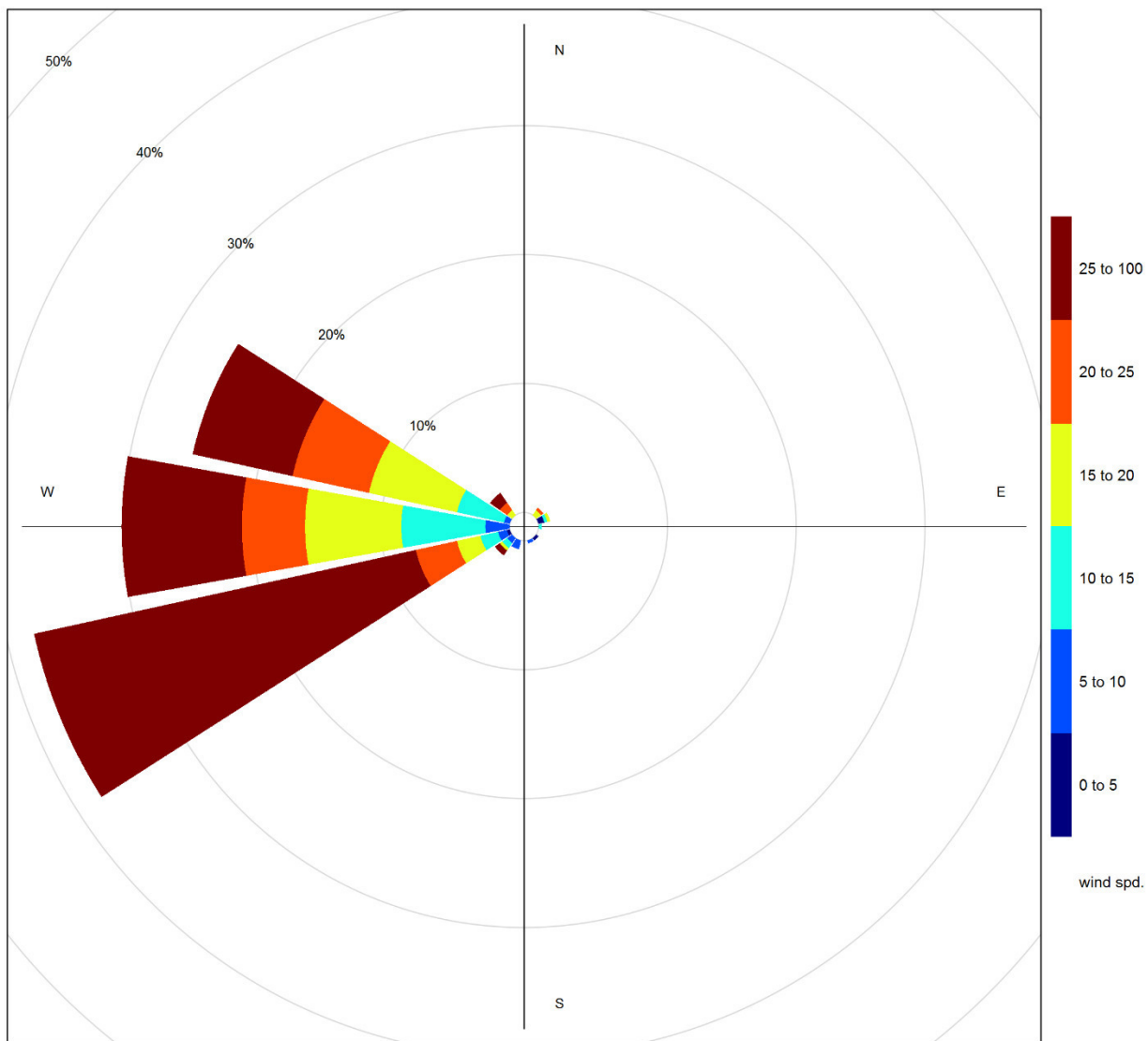


Figure 6-3 Wind rose for TSP exceedance days recorded at the Berm GRIMM

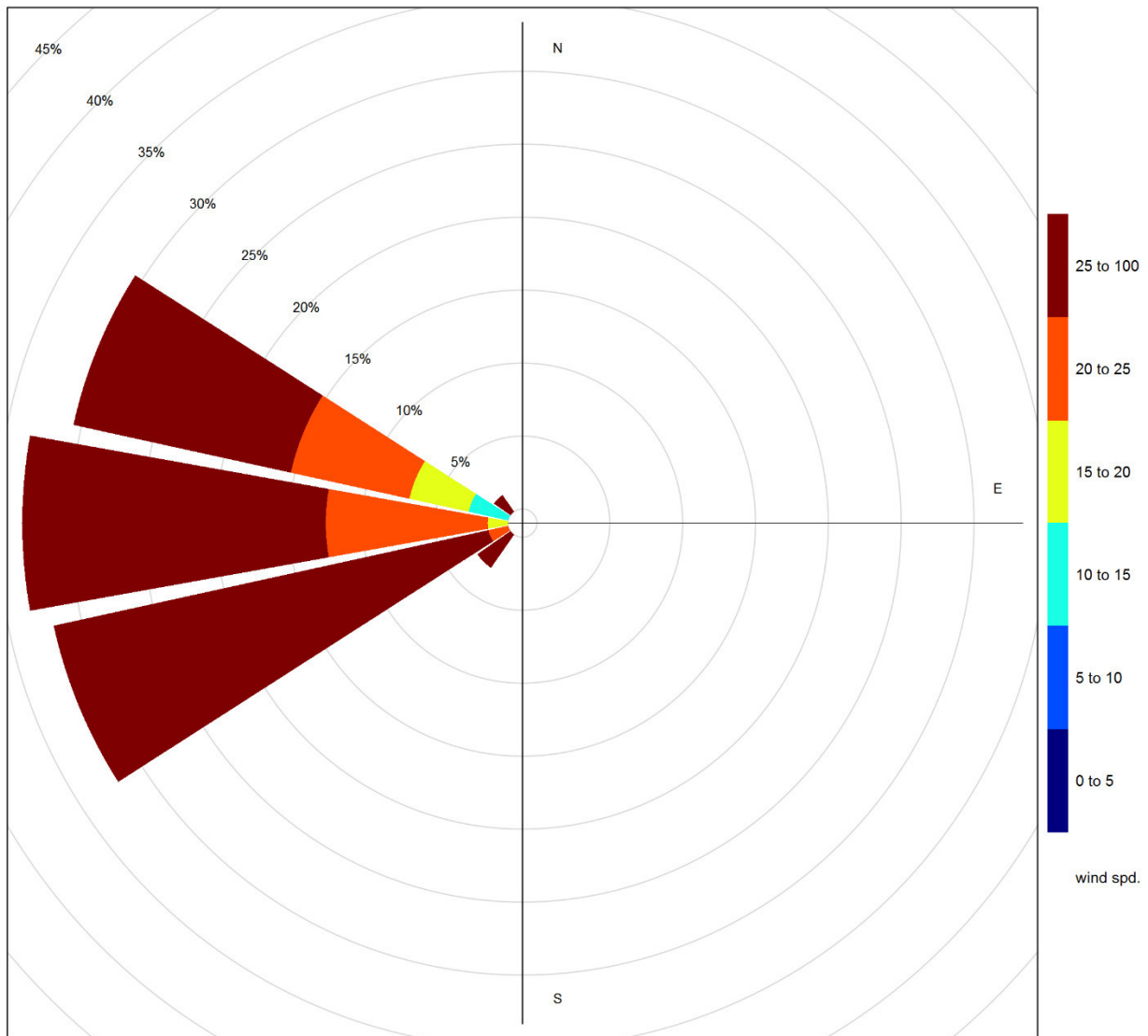


Figure 6-4 Wind rose for PM_{2.5} exceedance days recorded at the Berm GRIMM

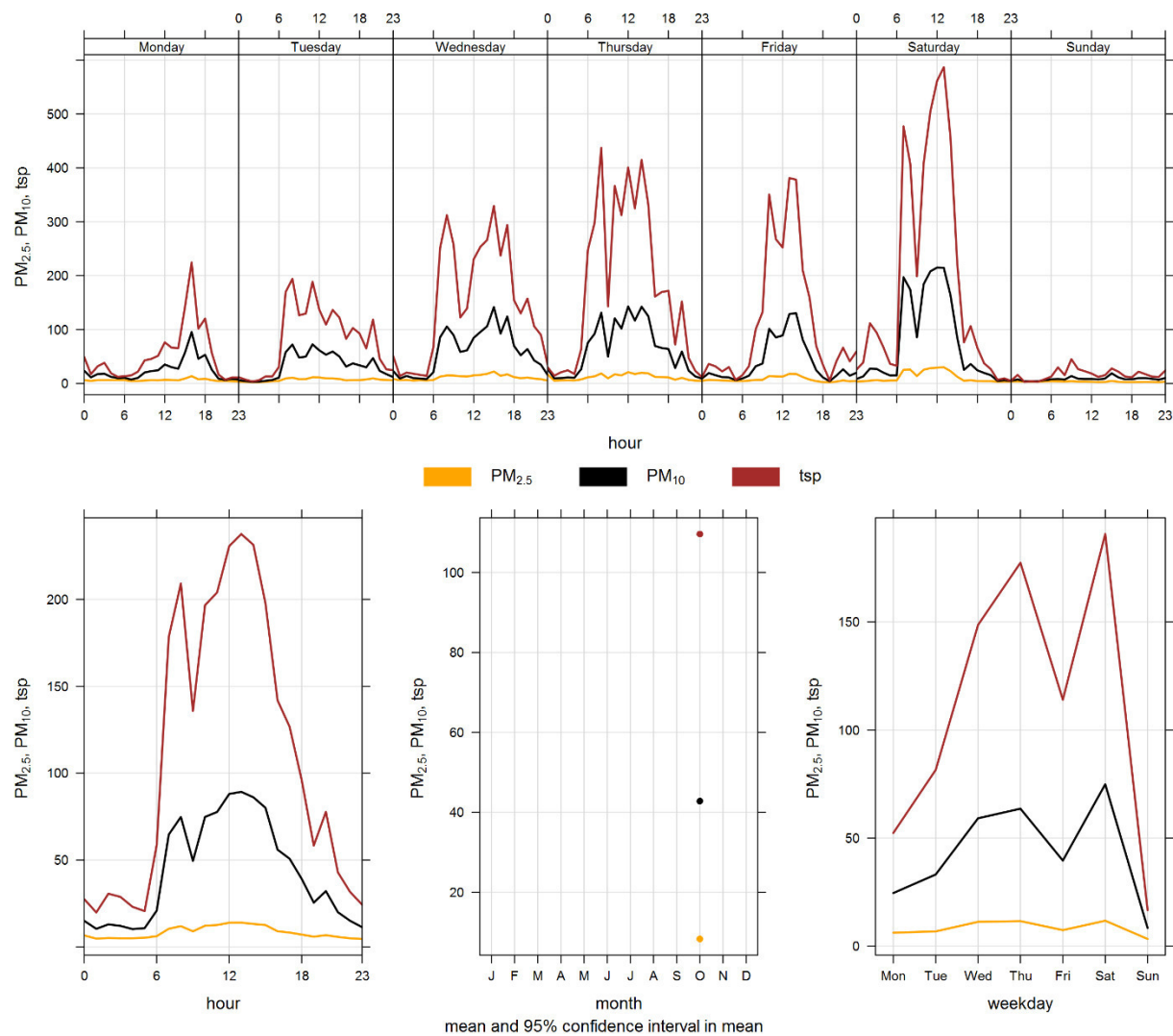


Figure 6-5 Berm particulate matter time variation

7 ENTRANCE INDUSTRIAL GRIMM

7.1 OPERATIONAL SUMMARY

A summary of the station operation for the month is provided in Table 7-1.

Table 7-1 Instrumentation List at the Entrance monitoring location

Parameter Measured	Equipment Description	Notes
PM _{2.5} , PM ₁₀ , TSP Concentrations	GRIMM 365 Continuous Particulate Monitor	No operational issues observed. The monitor had 100% uptime in the month of November.

7.2 MONITORING RESULTS AND TRENDS

The Entrance monitor was placed at its current location as a result of dispersion modelling conducted in 2009. This area was indicated as being the area where the maximum PM concentrations were expected. Figure 7-1 and Figure 7- show the hourly and daily PM_{2.5}, PM₁₀ and TSP concentrations recorded over the month. Table 7-2 summarizes the maximum 1-hour and 24-hour PM concentrations recorded during the month. Table 7-3 summarizes the recorded exceedances. This is an industrial monitor that is not Alberta Air Monitoring Directive (AMD) compliant and is not required to show compliance with the AAAQO.

During November, there were 16 and zero exceedances of the 24-hour TSP (100 µg/m³) and PM_{2.5} (30 µg/m³) guidelines, respectively. Historically, the Entrance monitor records an average of 15 and zero exceedances of the 24-hour TSP and PM_{2.5} guidelines respectively, during the month of November. The maximum number of TSP exceedances recorded during November occurred in 2014, which had 25 days that exceeded the guideline. The minimum number of TSP exceedances recorded during November occurred in 2012, which had one day that exceeded the guideline. On the other hand, the maximum number of PM_{2.5} exceedances recorded during the month of November was 2 days of exceedances in 2013 and 2014. The fewest number of PM_{2.5} exceedances for November was zero days of exceedances occurring in 2010, 2011, and 2015 to 2017.

It should also be noted that the GRIMM monitors become more conservative in the reported PM concentrations as the size fraction increases. The PM_{2.5} size fraction has been shown to match other regulatory approved PM_{2.5} monitors, but the TSP concentrations recorded by the GRIMM tend to be higher than regulatory approved monitors (Levelton, 2015).

The Entrance monitor is impacted by fugitive dust from plant activities, and high wind events. Trucks also pass near to the Entrance monitor as they enter and exit the Lafarge facility for loading and deliveries. Additionally, the monitor is closely located to Highway 1A. Traffic, particularly large trucks, can create dust while crossing over the railway tracks. This can all lead to the monitor recording high TSP concentrations, which are typically associated with fugitive dust sources. The CPR rail crossing is in disrepair and may be contributing to PM concentrations at the Entrance monitor. Lafarge has been informed the crossing is scheduled to be repaired in the spring of 2019.

Figure 7- shows the wind rose for the 16 days that exceeded the TSP Guideline at the Entrance GRIMM. The wind rose indicates that the winds predominantly came from the westerly directions. High wind speeds were a primary factor in TSP exceedances in November at the Entrance station. On those days without high wind speeds other sources, such as industry, traffic and rail may have contributed to the exceedances.

Table 7-2 Summary of November 2018 data at the Entrance GRIMM

Parameter	Guideline		Station	Exceedances		Monthly		Maximum 1-hour					Maximum 24-hour		Operational Time (Percent)
	1-hr	24-hr		1-hr	24-hr	Minimum	Average	Maximum Concentration	Day	Hour	Wind Speed (km/hr)	Wind Direction (degrees)	Maximum Concentration	Day	
PM_{2.5} (µg/m ³)	80	30	Entrance	0	0	0.5	11.7	47.2	8	20	20.0	291.6	21.6	8	100.0
PM₁₀ (µg/m ³)	-	-	Entrance	-	-	1.3	55.0	382.0	21	12	20.8	294.7	161.3	8	100.0
TSP (µg/m ³)	-	100	Entrance	-	16	0.9	163.8	1321.3	9	11	39.3	256.0	470.7	8	100.0

Table 7-3 Days exceeding the Guideline for TSP or PM_{2.5} at the Entrance Monitor

Date	TSP (ug/m ³)	PM _{2.5} (ug/m ³)	Average Wind Direction (degrees)	Average Wind Speed (km/hr)	Average RH (%)	Root Cause (Provided by Lafarge)
Entrance						
11/1/2018	189.9	-	63.4	11.3	58.4	
11/8/2018	470.7	-	288.5	18.9	56.7	
11/9/2018	336.4	-	264.0	25.2	56.5	High wind event
11/12/2018	267.1	-	279.8	29.1	51.5	High wind event
11/13/2018	400.4	-	285.0	27.0	50.1	High wind event
11/14/2018	140.0	-	257.0	34.9	58.5	High wind event
11/17/2018	211.0	-	281.5	26.8	65.8	High wind event
11/18/2018	179.8	-	292.0	20.2	60.1	High wind event
11/19/2018	233.1	-	288.5	24.6	66.8	High wind event
11/20/2018	423.7	-	296.1	20.6	63.2	High wind event
11/21/2018	387.2	-	277.3	25.8	51.7	High wind event
11/22/2018	107.4	-	255.1	24.5	53.9	High wind event
11/25/2018	200.8	-	258.9	27.0	52.2	High wind event
11/26/2018	249.6	-	254.7	40.0	54.8	High wind event

11/27/2018	123.8	-	254.2	32.4	47.6	High wind event
11/29/2018	229.6	-	283.1	13.7	55.9	
Total # of Exceedances	16	0				
Maximum # of Exceedances (November)	25 (2014)	2 (2013, 2014)				
Average # of Exceedances (November)	15	0				
Minimum # of Exceedances (November)	1 (2012)	0 (2010, 2011, 2015 ~ 2017)				

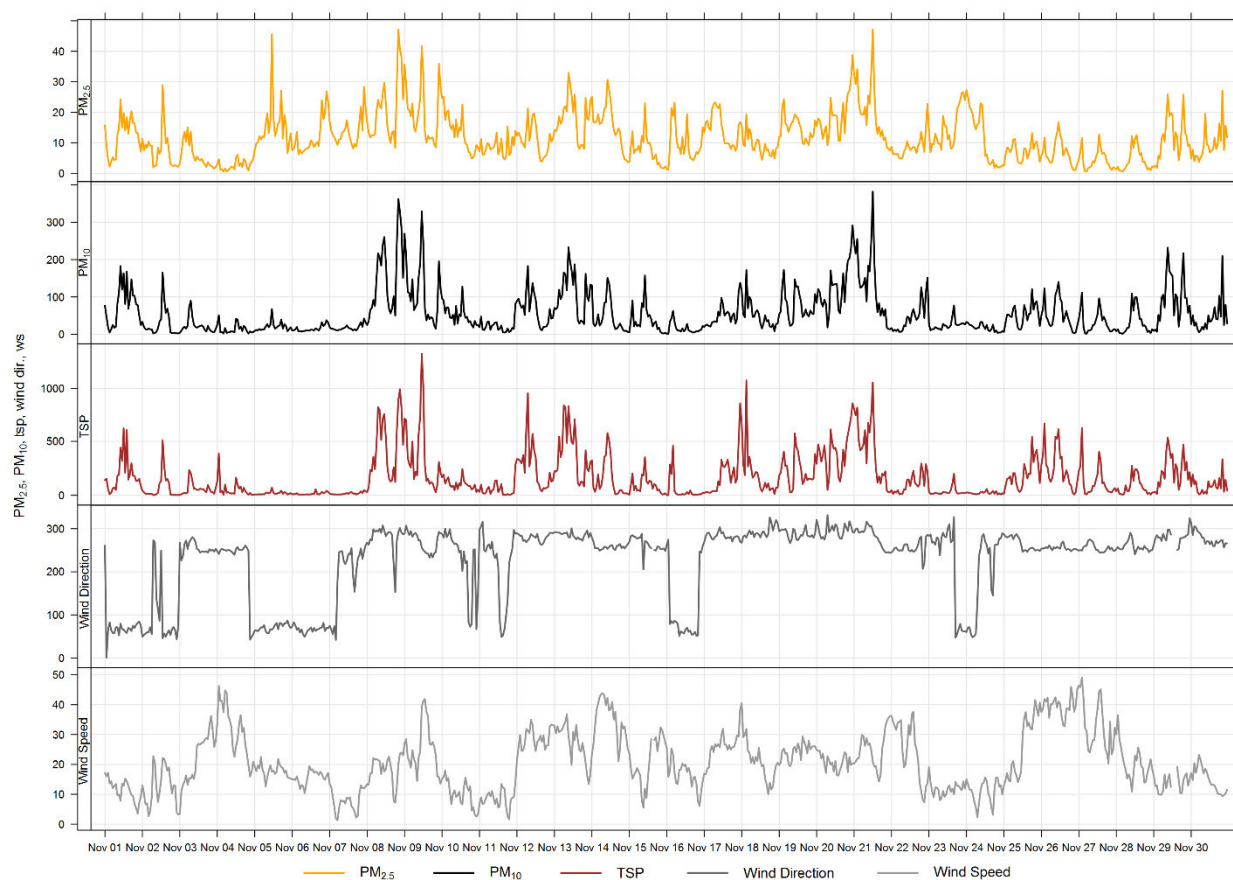


Figure 7-1 1-hour particulate matter concentrations recorded at the Entrance monitor

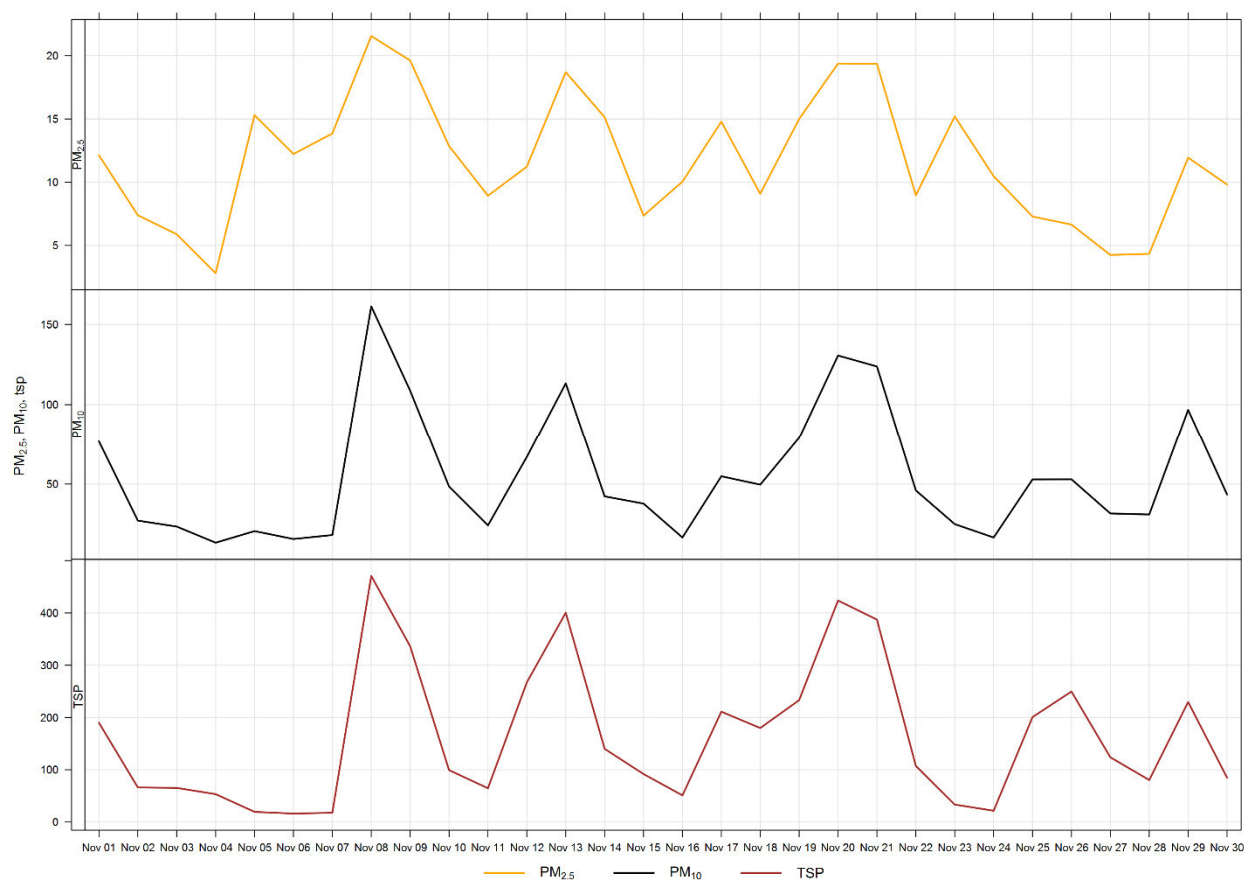


Figure 7-2 24-hour particulate matter concentrations at the Entrance monitor

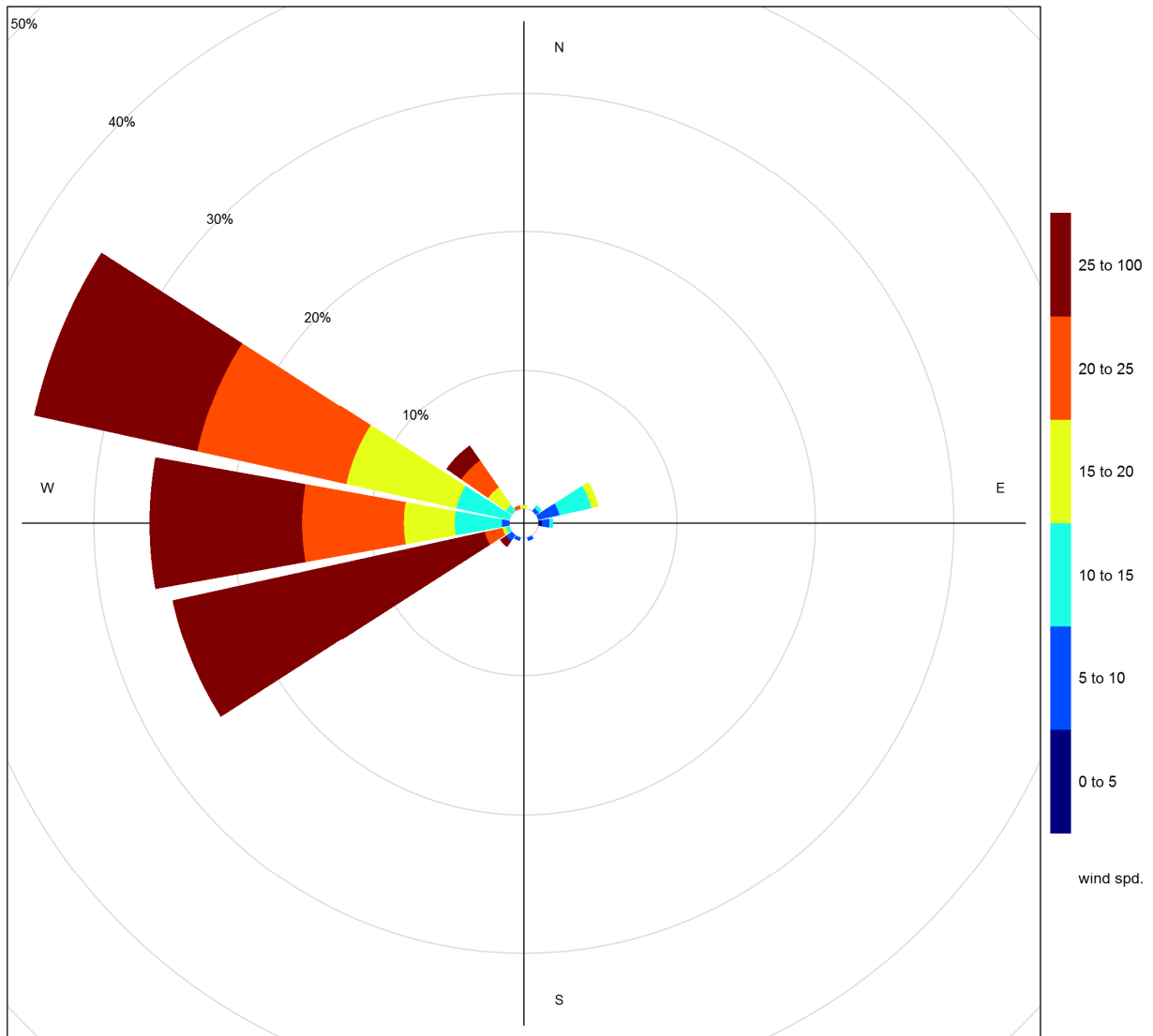


Figure 7-3 Wind rose for TSP exceedance days recorded at the Entrance GRIMM

Figure 7- illustrates the hourly PM concentrations recorded at the Entrance monitor, averaged over different time periods. The plot across the top shows the variation of PM over the course of a week, while the bottom three plots show the changes in PM over the course of a day, month and weekday, respectively. Figure 7- is based on data collected during November 2018 and shows a peak in the morning hours when traffic emissions likely influence the PM concentrations at the Entrance monitor which is located near Highway 1 and the entrance to Lafarge.

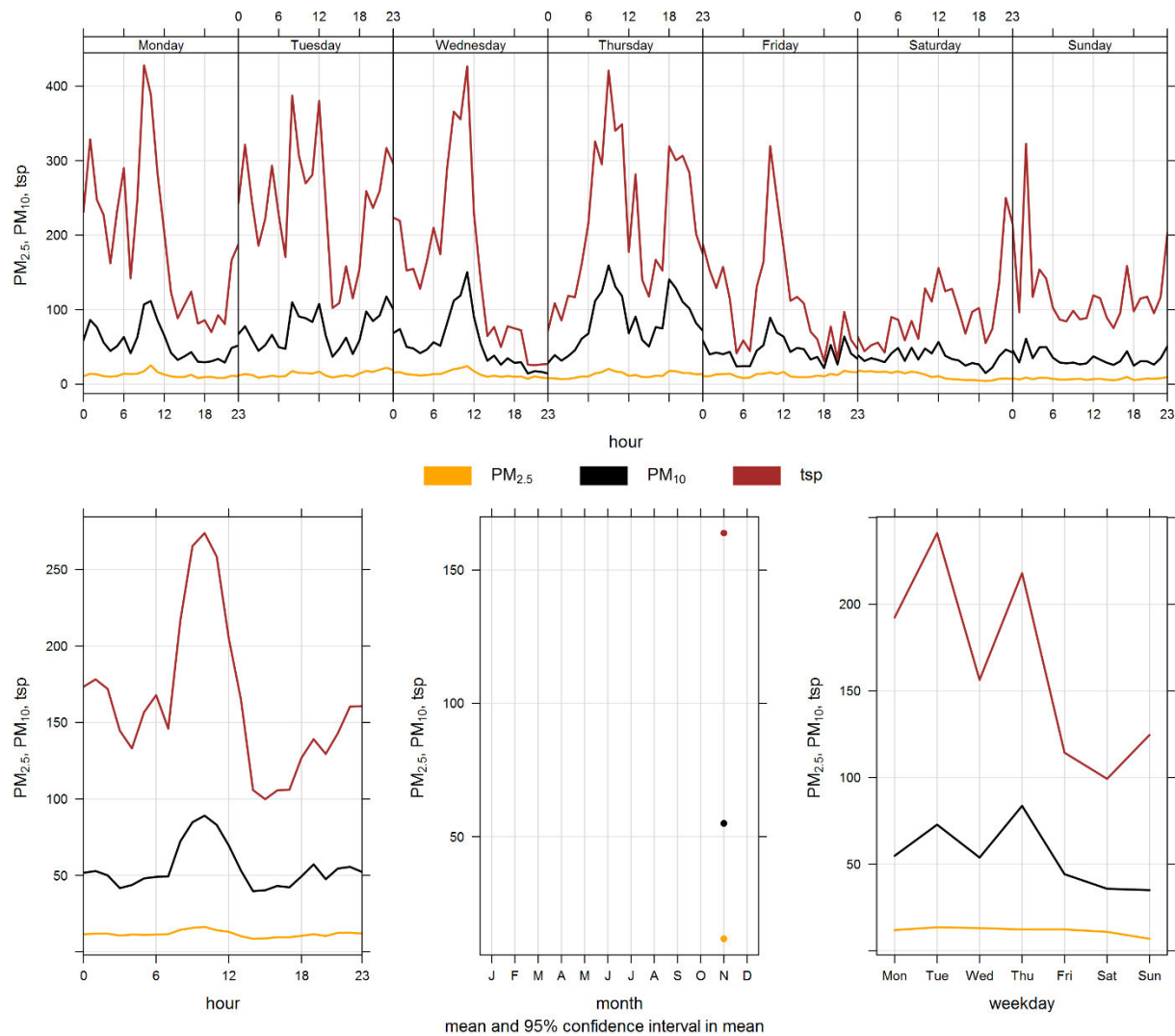


Figure 7-4 Entrance particulate matter time variation

BIBLIOGRAPHY

- Alberta Environment and Parks. (2016, June). Alberta Ambient Air Quality Objectives and Guidelines Summary. Alberta, Canada.
- Alberta Environment and Parks. (2016, April). Air Monitoring Directive. Alberta, Canada.
- Carslaw, D.C. and K. Ropkins, (2012). Openair — an R package for air quality data analysis. Environmental Modelling & Software. Volume 27–28, 52–61.
- Levelton Consultants Ltd. (2015, June 15). Comparison of GRIMM and E-BAM Data. Alberta, Can

APPENDIX

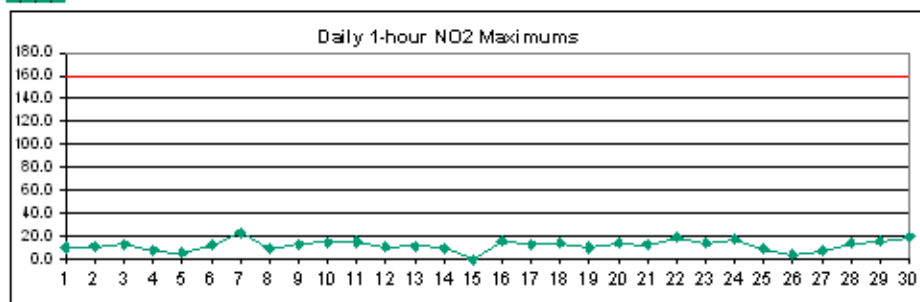
A DATA & CALIBRATION REPORTS

APPENDIX



Lagoon NO₂ (ppb) – November 2018

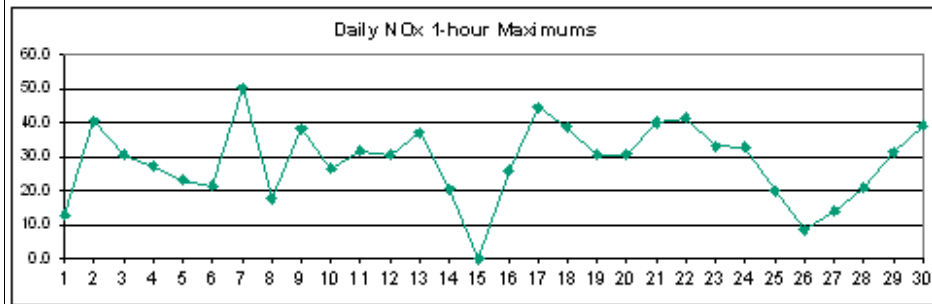
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	5.3	\$	0.0	3.6	3.7	3.7	0.0	1.0	7.7	2.7	1.0	0.1	0.8	2.0	2.6	2.4	5.2	2.2	0.9	3.2	9.6	10.4	9.8	7.0	3.7	10.4
2	6.8	\$	10.7	3.6	5.8	3.0	4.2	4.8	5.6	8.4	5.5	5.5	9.1	6.8	4.4	6.9	0.2	3.2	3.9	3.4	11.3	3.3	2.4	3.7	5.3	11.3
3	4.6	\$	10.2	8.2	8.7	6.1	9.5	13.2	8.3	5.2	2.8	6.1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	2.8	0.3	0.0	0.9	0.0	3.8	13.2
4	0.0	\$	6.3	1.2	0.0	0.0	0.2	1.0	2.3	0.7	0.0	4.4	4.3	1.0	0.1	0.0	2.9	4.2	7.9	2.3	2.2	7.5	7.8	1.6	2.5	7.9
5	2.9	\$	5.5	0.4	0.1	0.0	2.1	5.7	4.2	1.5	0.9	1.0	0.8	1.4	2.7	4.3	3.4	2.3	2.4	1.7	1.9	1.6	1.7	1.8	2.2	5.7
6	1.9	\$	1.7	2.1	4.3	4.1	6.9	12.2	9.4	6.4	4.4	2.6	4.3	3.8	5.6	6.7	10.1	9.4	10.8	7.6	7.3	7.0	6.1	5.2	6.1	12.2
7	7.4	\$	9.9	11.8	13.4	14.7	15.8	15.0	13.1	11.6	9.5	6.4	3.8	2.5	3.2	5.5	10.5	23.5	17.0	18.0	16.1	13.0	10.9	8.5	11.3	23.5
8	9.6	\$	7.4	2.9	5.4	4.8	6.1	5.5	6.2	5.5	8.0	7.3	7.3	5.3	5.5	6.8	9.1	8.9	5.5	5.9	2.3	7.2	6.0	6.5	6.3	9.6
9	2.9	\$	4.1	3.6	7.7	8.2	11.3	11.4	13.1	8.0	1.2	0.0	0.0	0.0	0.1	0.2	0.4	0.3	0.0	0.0	3.0	5.0	6.7	8.5	4.2	13.1
10	7.9	\$	4.7	4.1	6.8	5.5	6.8	13.8	11.6	9.5	5.7	8.6	3.2	2.0	0.2	0.1	4.1	1.3	4.8	5.9	5.8	14.9	11.4	11.6	6.5	14.9
11	3.4	\$	10.5	6.6	7.5	8.5	12.2	15.3	14.8	7.7	8.1	3.4	9.4	8.3	4.1	0.7	2.1	2.5	9.0	10.5	11.7	11.8	5.6	8.7	7.9	15.3
12	6.4	\$	7.1	3.8	7.0	1.7	3.2	6.3	8.7	9.7	7.3	7.5	8.6	3.4	2.0	1.8	2.2	5.5	4.7	6.9	6.9	8.6	8.3	10.5	6.0	10.5
13	9.1	\$	6.3	4.8	6.4	8.4	7.2	7.5	9.6	11.5	7.9	11.0	8.0	4.7	9.2	6.4	8.3	5.5	9.3	10.0	6.7	6.0	7.0	10.6	7.9	11.5
14	7.8	\$	1.0	1.0	0.0	0.0	0.5	2.8	6.6	4.7	3.7	5.9	5.2	2.9	1.0	6.7	6.4	9.9	2.4	4.0	2.5	3.4	1.7	3.5	3.6	9.9
15	6.4	\$	9.2	4.4	5.6	5.1	6.1	11.0	12.8	10.7	11.1	C	C	C	C	C	C	3.2	1.6	0.0	0.4	1.4	1.4	1.4	-	-
16	4.8	\$	4.4	1.3	0.6	0.3	0.1	2.5	6.0	10.2	6.6	4.4	1.4	1.3	3.8	1.9	3.2	3.2	7.5	5.3	15.1	15.8	13.0	7.0	5.2	15.8
17	4.2	\$	5.6	3.6	3.7	7.5	8.3	8.9	7.8	8.8	9.6	11.4	5.6	5.5	6.5	7.6	9.9	4.6	10.9	13.2	13.3	11.5	3.9	3.6	7.6	13.3
18	10.5	\$	8.2	6.1	5.9	9.3	14.4	6.9	4.8	7.4	10.5	7.6	8.3	10.3	4.3	8.3	5.2	5.8	8.5	6.5	3.6	3.5	2.6	3.0	7.0	14.4
19	3.0	\$	1.3	3.0	6.1	6.9	9.3	10.4	4.5	6.7	7.8	7.6	6.6	5.1	7.1	6.7	4.9	6.6	8.5	7.7	7.4	8.3	6.2	3.0	6.3	10.4
20	5.2	\$	5.8	7.8	7.1	9.3	3.3	6.5	7.2	6.5	6.6	2.7	4.0	11.7	14.1	10.6	9.5	3.1	3.6	5.7	1.9	4.1	4.5	6.6	6.4	14.1
21	3.4	\$	6.3	13.0	9.8	9.6	6.2	1.8	2.0	2.0	4.1	4.2	7.1	12.1	9.4	7.9	8.1	7.8	0.5	1.0	1.2	0.7	0.3	0.2	5.2	13.0
22	0.4	\$	1.7	0.5	0.4	0.5	5.2	9.4	19.1	14.3	3.3	8.4	4.6	0.1	2.5	5.1	5.1	9.4	6.2	4.3	3.5	9.1	6.7	4.6	5.4	19.1
23	8.9	\$	9.8	10.8	7.6	6.9	7.2	13.9	12.9	10.1	8.6	7.7	5.5	6.8	4.4	4.8	13.6	10.6	6.0	5.9	5.9	4.9	5.7	5.6	8.0	13.9
24	3.6	\$	6.5	3.4	11.4	9.7	11.2	14.2	17.2	11.7	9.6	6.7	8.5	5.9	4.1	3.6	5.6	5.3	3.3	14.1	2.7	4.9	6.1	7.5	7.7	17.2
25	5.6	\$	4.8	8.7	8.0	9.0	8.6	9.0	5.9	5.7	6.3	0.1	1.1	0.2	0.0	1.3	0.9	3.0	2.2	0.0	0.0	0.0	0.0	0.0	3.5	9.0
26	0.0	\$	1.5	0.0	0.9	0.8	0.1	2.1	1.8	1.8	1.9	1.4	3.7	2.1	3.9	2.9	1.4	2.5	0.0	0.0	4.2	0.9	0.6	0.4	1.5	4.2
27	0.0	\$	0.8	0.6	0.9	1.0	3.6	5.0	7.4	3.0	0.5	0.7	0.0	0.0	1.4	0.9	1.5	6.6	1.4	0.6	2.0	3.8	2.4	4.7	2.1	7.4
28	5.9	\$	3.8	3.4	1.2	0.7	4.8	4.0	6.8	7.2	5.8	0.9	3.3	4.6	2.9	5.6	3.9	4.9	14.1	1.7	2.3	3.8	3.5	5.7	4.4	14.1
29	1.3	\$	1.1	2.3	3.5	2.9	2.8	6.0	11.7	9.0	6.7	9.4	10.8	10.2	4.3	6.1	10.9	15.6	10.0	7.4	6.1	5.3	4.8	5.1	6.7	15.6
30	6.6	\$	4.9	4.4	5.1	5.2	4.4	7.3	11.1	12.1	12.4	14.4	15.9	10.2	10.7	12.0	14.8	17.0	19.5	15.9	15.9	14.5	15.4	13.9	11.5	19.5
NO	30	-	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	30	30	30	30	30	30	30	684	100%
MEAN	4.9	-	5.4	4.4	5.1	5.1	6.1	7.8	8.7	7.3	5.9	5.4	5.2	4.5	4.1	4.6	5.6	6.3	6.1	5.7	5.8	6.4	5.4	5.3		
MAX	10.5	-	10.7	13.0	13.4	14.7	15.8	15.3	19.1	14.3	12.4	14.4	15.9	12.1	14.1	12.0	14.8	23.5	19.5	18.0	16.1	15.8	15.4	13.9		



Number of 1HR Exceedences	0
Number of Non-Zero Readings	650
Maximum 1-HR Average	23.5 PPB
Maximum 24-HR Average	11.5 PPB
Monthly Calibration	6
Standard Deviation	4.1
Operational Time	720 HRS
Operational Uptime	100.0 %
Monthly Average	5.7 PPB

Lagoon NOx (ppb) – November 2018

Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	7.7	\$	0.2	7.3	4.6	4.5	0.5	1.7	11.9	3.9	3.2	1.3	2.2	3.8	4.0	3.6	7.5	2.7	1.3	3.5	12.9	11.6	11.5	8.8	5.2	12.9
2	10.5	\$	13.9	3.9	7.0	4.0	8.1	9.5	8.6	21.2	11.2	11.9	40.7	16.1	8.0	13.4	0.8	6.4	5.8	4.5	18.5	3.9	2.9	4.7	10.2	40.7
3	6.2	\$	14.4	12.2	17.1	10.1	18.6	30.7	13.0	6.9	4.7	10.8	0.4	0.7	0.7	0.8	0.7	0.0	0.0	5.1	1.0	0.6	2.3	0.8	6.9	30.7
4	0.0	\$	13.2	2.4	0.5	0.0	1.1	2.3	4.9	1.8	0.0	8.5	8.4	2.4	0.9	1.6	5.4	8.0	13.4	4.2	4.2	22.7	27.3	2.2	5.9	27.3
5	8.4	\$	23.1	0.7	0.5	0.2	8.5	18.3	15.4	3.7	2.8	4.4	3.9	4.1	5.6	6.3	4.2	2.7	3.6	2.1	2.3	2.4	2.3	2.6	5.6	23.1
6	2.2	\$	2.2	2.6	7.4	4.7	10.6	21.5	14.1	10.6	7.5	5.8	10.3	10.2	11.0	9.9	15.2	10.1	12.3	7.8	8.4	8.4	6.8	5.5	8.9	21.5
7	13.8	\$	22.0	28.5	32.7	50.2	37.9	33.0	37.0	34.2	31.8	22.8	13.2	7.8	7.5	9.3	18.3	50.3	20.8	33.0	20.9	17.7	18.2	13.3	25.0	50.3
8	17.3	\$	14.5	4.0	10.6	10.9	14.2	11.1	10.9	10.5	16.1	16.1	17.7	11.0	13.2	10.4	14.0	9.3	7.1	10.4	3.5	12.9	10.7	12.6	11.7	17.7
9	6.0	\$	7.7	6.9	18.2	16.6	24.9	24.2	26.2	16.1	2.7	1.0	0.8	0.5	0.7	0.8	1.3	0.7	0.0	0.0	4.1	8.5	15.7	38.4	9.7	38.4
10	15.3	\$	8.6	8.0	13.0	7.9	12.4	26.4	25.2	17.8	12.0	21.7	7.1	4.5	1.2	0.7	6.0	1.7	6.7	7.2	7.9	26.0	12.8	16.6	11.6	26.4
11	5.5	\$	11.8	12.2	8.3	12.2	15.1	31.7	24.3	9.2	13.1	7.7	16.8	19.8	7.6	1.4	2.7	3.0	13.6	12.1	15.1	15.6	8.6	16.3	12.3	31.7
12	13.8	\$	14.7	7.5	14.7	3.4	7.1	14.3	24.4	26.1	17.8	17.3	22.8	7.9	6.3	4.8	4.8	9.8	8.0	13.0	15.4	22.0	24.9	30.7	14.4	30.7
13	28.0	\$	17.0	15.4	17.1	23.1	18.8	20.3	26.2	34.3	22.1	37.2	20.9	11.1	22.4	12.2	15.4	9.1	18.7	21.0	12.4	10.9	13.9	24.6	19.7	37.2
14	15.7	\$	2.1	2.0	0.3	0.5	1.3	5.0	12.9	10.6	6.5	12.5	9.7	5.4	1.8	10.8	8.4	20.6	3.9	7.1	5.2	6.1	2.6	6.7	6.9	20.6
15	10.9	\$	16.8	6.9	11.9	8.5	9.5	18.1	15.4	18.8	19.3	C	C	C	C	C	C	5.6	2.4	0.4	1.0	3.4	2.8	2.5	-	-
16	8.9	\$	4.7	1.8	0.9	0.5	0.4	3.9	12.2	26.1	17.3	10.8	3.0	3.6	9.7	3.4	5.0	3.6	13.2	5.7	26.0	20.9	19.6	8.3	9.1	26.1
17	5.8	\$	10.3	5.2	6.2	23.1	28.7	28.0	26.3	25.0	41.3	44.6	19.1	15.3	15.1	17.9	22.3	7.4	27.5	35.0	40.0	36.1	8.1	10.3	21.7	44.6
18	26.4	\$	18.9	16.2	14.9	21.2	38.8	14.1	10.2	20.3	28.5	16.9	19.5	24.5	8.6	14.1	7.6	9.5	14.6	10.7	5.0	5.8	4.1	5.9	15.5	38.8
19	5.7	\$	2.3	6.0	16.1	22.7	27.3	30.7	11.0	15.1	21.7	23.9	19.0	14.8	17.2	15.9	10.0	13.8	21.0	17.1	17.7	19.9	13.4	6.3	16.0	30.7
20	12.2	\$	13.0	21.6	18.8	23.1	5.9	15.4	16.2	15.7	15.6	4.9	12.1	28.2	30.8	19.6	16.8	4.3	6.2	9.4	2.9	8.0	10.1	11.8	14.0	30.8
21	7.9	\$	15.0	40.2	29.9	29.8	14.8	3.3	2.7	2.9	9.3	9.1	17.1	27.6	16.6	10.9	9.3	12.0	0.9	2.4	2.0	1.5	0.8	0.5	11.6	40.2
22	1.0	\$	2.6	1.1	0.9	1.1	8.0	16.4	41.4	28.5	5.6	15.0	9.2	1.1	5.5	10.6	6.1	10.7	7.9	4.8	3.9	13.3	9.9	7.4	9.2	41.4
23	18.4	\$	15.4	23.9	14.4	11.6	11.1	33.2	31.8	14.1	12.6	12.8	8.9	10.5	6.5	6.4	23.5	16.8	6.4	6.3	6.4	6.1	8.0	9.4	13.7	33.2
24	4.0	\$	11.1	4.3	28.1	13.2	13.6	21.9	32.8	26.3	26.0	18.9	30.6	15.0	6.7	5.2	6.5	5.9	4.1	32.7	3.2	6.8	7.7	13.4	14.7	32.8
25	8.0	\$	7.1	19.9	13.9	18.6	14.6	15.3	8.0	9.6	11.8	1.0	3.0	1.1	0.3	2.8	1.8	6.1	4.3	0.4	0.0	0.0	0.0	0.6	6.4	19.9
26	0.2	\$	4.3	0.5	1.8	1.9	0.7	6.1	4.3	3.4	4.4	4.2	7.5	4.0	8.5	5.4	2.3	4.6	0.4	0.4	7.8	2.2	2.2	1.3	3.4	8.5
27	0.5	\$	2.2	1.3	1.8	2.3	7.5	14.1	13.8	4.8	1.7	2.1	0.8	0.0	2.7	1.6	2.3	12.1	1.9	1.2	4.1	7.1	4.4	7.4	4.2	14.1
28	11.5	\$	5.3	5.1	1.7	1.0	7.6	7.9	8.8	9.5	9.0	1.8	5.8	7.4	4.7	8.5	6.3	5.6	20.9	2.2	2.9	5.0	4.2	9.5	6.6	20.9
29	1.7	\$	1.5	3.8	6.2	5.0	3.5	8.4	21.3	14.1	12.3	18.0	21.2	15.9	6.5	10.5	15.2	31.5	16.4	9.3	8.3	6.1	6.3	7.5	10.9	31.5
30	10.2	\$	5.3	5.2	6.8	9.8	5.5	14.3	18.1	19.3	27.1	30.4	39.3	17.3	15.1	17.1	17.0	19.5	22.7	18.2	17.8	16.4	23.0	18.6	17.1	39.3
NO.	30	-	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	30	30	30	30	30	30	30	684	100%
MEAN	9.5	-	10.0	9.2	10.9	11.4	12.6	16.7	17.7	15.3	13.8	13.6	13.5	10.1	8.5	8.1	8.8	10.1	9.5	9.6	9.4	10.9	9.5	10.2		
MAX	28.0	-	23.1	40.2	32.7	50.2	38.8	33.2	41.4	34.3	41.3	44.6	40.7	28.2	30.8	19.6	23.5	50.3	27.5	35.0	40.0	36.1	27.3	38.4		



Number of Non-Zero Readings 675

Maximum 1-HR Average 50.3 PPB

Maximum 24-HR Average 25.0 PPB

Monthly Calibration 6

Standard Deviation 9.195

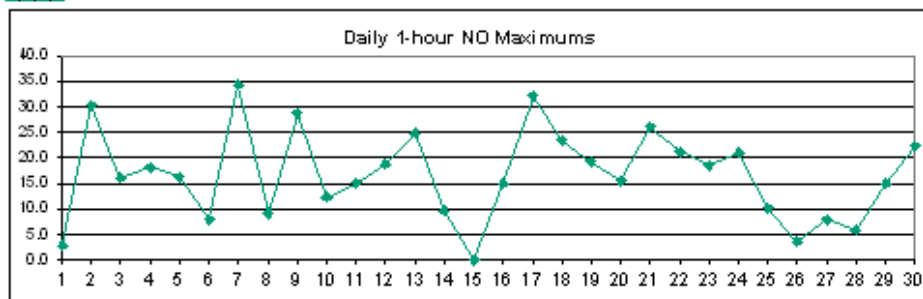
Operational Time 720 HRS

Operational Uptime 100.0 %

Monthly Average 11.3 PPB

Lagoon NO (ppb) – November 2018

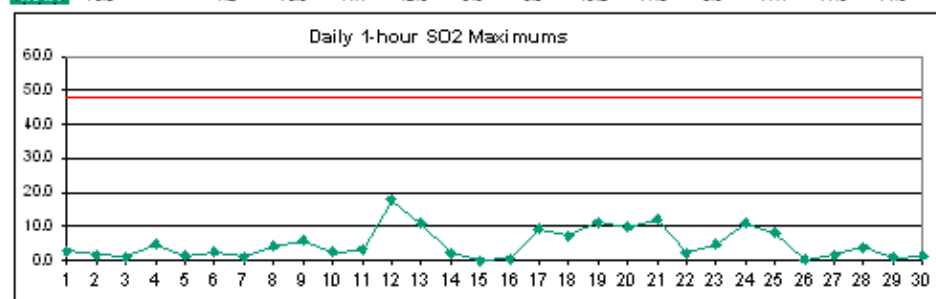
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	1.1	\$	0.0	2.3	0.0	0.0	0.0	0.0	2.9	0.0	0.9	0.0	0.1	0.5	0.1	0.0	1.0	0.0	0.0	0.0	2.0	0.0	0.5	0.6	0.5	2.9
2	2.4	\$	1.9	0.0	0.0	0.0	2.7	3.3	1.7	11.4	4.5	5.1	30.2	7.9	2.3	5.1	0.0	1.8	0.5	0.0	5.8	0.0	0.0	0.0	3.8	30.2
3	0.3	\$	2.9	2.8	7.1	2.7	7.8	16.1	3.5	0.4	0.5	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.1	0.0	2.1	16.1
4	0.0	\$	5.5	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	2.8	2.8	0.1	0.0	0.4	1.3	2.5	4.2	0.6	0.6	13.8	18.2	0.0	2.4	18.2
5	4.1	\$	16.2	0.0	0.0	0.0	5.0	11.3	9.9	0.8	0.6	2.1	1.9	1.4	1.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	16.2
6	0.0	\$	0.0	0.0	1.7	0.0	2.4	8.0	3.4	2.9	1.8	1.9	4.7	5.0	4.1	1.9	3.8	0.0	0.2	0.0	0.0	0.2	0.0	0.0	1.8	8.0
7	5.1	\$	10.9	15.3	17.9	34.1	20.7	16.6	22.4	21.2	20.9	15.0	8.1	4.1	3.0	2.6	6.5	25.3	2.5	13.6	3.5	3.4	6.0	3.5	12.3	34.1
8	6.4	\$	5.8	0.0	3.9	4.8	6.8	4.3	3.4	3.7	6.8	7.5	9.1	4.4	6.3	2.4	3.7	0.0	0.4	3.2	0.0	4.4	3.4	4.9	4.2	9.1
9	1.8	\$	2.3	2.1	9.3	7.1	12.2	11.5	11.8	6.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	7.8	28.6	4.5	28.6
10	6.1	\$	2.7	2.6	4.8	1.1	4.3	11.3	12.3	7.0	5.0	11.8	2.5	1.3	0.0	0.0	0.7	0.0	0.7	0.1	0.8	9.7	0.1	3.7	3.9	12.3
11	0.8	\$	0.0	4.3	0.0	2.5	1.5	15.0	8.1	0.3	3.8	3.1	6.1	10.2	2.2	0.0	0.0	0.0	3.4	0.3	2.1	2.6	1.7	6.4	3.2	15.0
12	6.1	\$	6.4	2.4	6.5	0.5	2.6	6.7	14.3	15.1	9.2	8.5	12.9	3.1	3.0	1.7	1.4	3.0	2.0	4.8	7.1	12.0	15.2	18.7	7.1	18.7
13	17.5	\$	9.4	9.3	9.4	13.4	10.3	11.5	15.3	21.4	12.8	24.8	11.6	5.1	11.9	4.5	5.8	2.2	8.0	9.6	4.3	3.6	5.5	12.7	10.4	24.8
14	6.6	\$	0.0	0.0	0.0	0.0	0.0	0.9	5.0	4.6	1.5	5.2	3.2	1.5	0.0	3.1	1.0	9.6	0.5	2.1	1.7	1.7	0.0	2.1	2.2	9.6
15	3.4	\$	6.6	1.6	5.3	2.4	2.4	6.2	1.6	7.1	7.2	C	C	C	C	C	C	1.3	0.0	0.0	0.0	1.0	0.3	0.2	-	-
16	3.2	\$	0.0	0.0	0.0	0.0	0.0	0.5	5.2	14.8	9.7	5.3	0.8	1.4	4.9	0.4	0.8	0.0	4.7	0.0	9.9	4.1	5.5	0.4	3.1	14.8
17	0.7	\$	3.8	0.6	1.6	14.6	19.3	18.1	17.4	15.1	30.6	32.0	12.4	8.8	7.7	9.3	11.3	1.8	15.5	20.6	25.5	23.4	3.3	5.7	13.0	32.0
18	14.8	\$	9.7	9.0	8.0	10.9	23.3	6.1	4.3	11.8	16.9	8.3	10.1	13.1	3.2	4.8	1.4	2.6	5.0	3.2	0.3	1.3	0.4	1.8	7.4	23.3
19	1.6	\$	0.0	1.9	8.9	14.7	17.0	19.2	5.5	7.2	12.9	15.3	11.4	8.7	9.1	8.1	4.1	6.1	11.4	8.3	9.2	10.5	6.2	2.3	8.7	19.2
20	5.9	\$	6.2	12.7	10.7	12.7	1.5	7.8	7.9	8.0	8.0	1.1	7.1	15.4	15.5	7.9	6.2	0.2	1.6	2.7	0.0	2.9	4.5	4.2	6.6	15.5
21	3.4	\$	7.6	26.0	19.0	19.1	7.5	0.4	0.0	0.0	4.1	3.8	8.9	14.3	6.1	1.9	0.3	3.2	0.0	0.3	0.0	0.0	0.0	0.0	5.5	26.0
22	0.0	\$	0.0	0.0	0.0	0.0	1.7	5.9	21.2	13.2	1.2	5.5	3.4	0.0	2.0	4.4	0.0	0.3	0.7	0.0	0.0	3.2	2.1	1.8	2.9	21.2
23	8.4	\$	4.5	12.0	5.7	3.6	2.8	18.6	17.7	2.9	3.0	4.0	2.3	2.7	1.0	0.5	8.7	5.2	0.0	0.0	0.0	0.1	1.2	2.7	4.7	18.6
24	0.0	\$	3.6	0.0	15.4	2.4	1.3	6.6	14.4	13.6	15.4	11.2	21.0	8.0	1.5	0.5	0.0	0.0	0.0	17.4	0.0	0.9	0.5	4.8	6.0	21.0
25	1.3	\$	1.3	10.2	5.0	8.6	5.0	5.3	1.1	2.9	4.4	0.0	0.8	0.0	0.0	0.4	0.0	1.9	1.1	0.0	0.0	0.0	0.0	0.0	2.1	10.2
26	0.0	\$	1.8	0.0	0.0	0.0	0.0	3.0	1.4	0.5	1.4	1.7	2.7	0.7	3.5	1.5	0.0	1.1	0.0	0.0	2.5	0.2	0.6	0.0	1.0	3.5
27	0.0	\$	0.3	0.0	0.0	0.2	2.8	8.0	5.3	0.7	0.1	0.3	0.0	0.0	0.2	0.0	0.0	4.4	0.0	0.0	1.1	2.2	1.0	1.6	1.2	8.0
28	4.5	\$	0.4	0.7	0.0	0.0	1.8	2.9	1.1	1.4	2.1	0.0	1.4	1.7	0.8	1.9	1.3	0.0	5.8	0.0	0.0	0.2	0.0	2.7	1.3	5.8
29	0.0	\$	0.0	0.5	1.6	1.0	0.0	1.4	8.5	4.0	4.6	7.9	9.7	4.9	1.4	3.5	3.4	14.9	5.4	0.9	1.2	0.0	0.6	1.4	3.3	14.9
30	2.7	\$	0.0	0.0	0.7	3.5	0.1	6.0	6.0	6.2	13.7	14.9	22.2	6.1	3.4	4.1	1.1	1.4	2.1	1.3	0.9	0.9	6.5	3.7	4.7	22.2
NO.	30	-	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	30	30	30	30	30	30	30	684	100%
MEAN	3.6	-	3.7	3.9	4.7	5.3	5.4	7.7	7.8	6.8	6.8	7.0	7.2	4.5	3.3	2.5	2.2	3.0	2.5	3.0	2.6	3.5	3.0	3.8		
MAX	17.5	-	16.2	26.0	19.0	34.1	23.3	19.2	22.4	21.4	30.6	32.0	30.2	15.4	15.5	9.3	11.3	25.3	15.5	20.6	25.5	23.4	18.2	28.6		



Number of Non-Zero Readings	521		
Maximum 1-HR Average	34.1 PPB		
Maximum 24-HR Average	13.0 PPB		
Monthly Calibration	6	Operational Time	720 HRS
Standard Deviation	5.823	Operational Uptime	100.0 %
		Monthly Average	4.5 PPB

Lagoon SO₂ (ppb) – November 2018

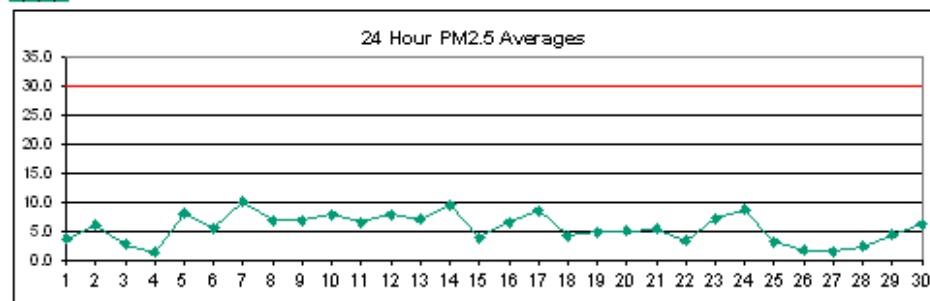
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	2.8	\$	0.1	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.6	0.0	0.0	0.0	0.0	0.3	0.7	0.6	0.2	2.8
2	0.5	\$	0.0	0.0	0.0	0.3	0.2	0.0	0.4	0.9	0.7	0.2	1.6	0.9	0.7	0.9	0.2	0.0	0.0	0.0	0.0	0.4	0.1	0.0	0.3	1.6
3	0.0	\$	0.5	0.9	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	1.2
4	0.0	\$	0.5	0.3	0.3	0.0	0.1	0.1	0.2	0.3	0.0	3.8	3.1	0.0	0.3	0.7	1.7	3.3	4.7	2.2	0.0	0.1	0.2	0.0	1.0	4.7
5	0.0	\$	0.0	0.0	0.0	0.2	0.0	0.2	0.0	0.3	0.2	0.9	1.3	0.8	0.6	0.5	0.3	0.1	0.3	0.2	0.0	0.2	0.3	0.3	0.3	1.3
6	0.2	\$	2.6	1.0	2.0	1.1	0.6	0.7	0.2	0.6	0.4	0.0	0.9	1.3	1.6	1.1	1.9	0.4	0.4	0.8	0.7	0.1	0.2	0.5	0.9	2.6
7	0.1	\$	0.3	0.0	0.0	0.1	0.1	0.1	0.3	0.0	0.0	0.4	0.5	0.5	0.0	0.4	0.0	0.2	0.0	1.0	0.1	0.6	0.8	1.1	0.3	1.1
8	0.4	\$	2.5	0.3	1.2	2.2	3.8	0.9	0.1	1.0	2.2	4.2	3.6	2.7	0.8	0.8	0.4	0.4	0.9	1.1	0.3	0.9	1.6	3.5	1.6	4.2
9	1.8	\$	2.7	2.9	3.9	6.0	4.0	3.3	3.1	2.6	0.4	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	1.6	1.8	1.2	1.5	6.0
10	1.9	\$	1.0	0.5	0.5	0.6	0.6	1.1	2.0	0.6	0.0	2.6	0.4	0.0	0.0	0.0	0.0	0.5	0.6	0.0	0.0	0.0	0.0	2.3	0.7	2.6
11	1.1	\$	0.3	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.3	3.2	0.3	3.2
12	4.1	\$	6.4	1.8	4.0	0.5	1.7	4.7	15.2	17.8	9.5	6.7	10.5	2.7	0.0	0.1	0.1	3.6	5.4	6.6	7.6	12.5	12.7	16.6	6.6	17.8
13	10.8	\$	7.2	5.9	5.8	7.2	6.5	6.9	6.3	6.6	3.9	10.5	6.4	4.1	7.0	1.8	2.0	1.2	4.0	2.4	2.3	2.5	2.0	4.2	5.1	10.8
14	2.2	\$	0.0	0.0	0.0	0.1	0.0	0.3	0.1	0.0	0.1	0.0	0.4	0.1	0.0	0.0	0.0	1.0	0.0	0.4	0.0	0.0	0.0	0.0	0.2	2.2
15	2.3	\$	3.2	1.7	2.9	2.8	1.8	3.4	3.5	3.3	3.6	C	C	C	C	C	C	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-
16	0.6	\$	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.3	0.0	0.0	0.0	0.0	0.6	0.0	0.1	0.6
17	0.0	\$	0.0	0.0	0.0	1.2	1.9	1.2	1.3	1.1	5.1	8.7	4.1	2.7	2.9	3.7	3.6	1.4	4.9	6.1	9.3	8.9	2.2	0.6	3.1	9.3
18	3.1	\$	6.0	5.7	3.1	2.6	6.5	3.4	3.6	5.4	7.4	4.2	4.4	6.0	2.2	3.2	1.7	1.9	3.4	0.5	0.0	0.3	0.3	1.3	3.3	7.4
19	1.3	\$	0.2	0.5	0.8	1.2	3.9	4.1	0.4	1.3	7.1	11.1	7.6	7.7	8.3	7.8	2.7	5.0	8.8	6.9	6.4	7.2	6.9	0.2	4.7	11.1
20	1.7	\$	5.8	9.7	7.9	6.6	1.4	4.2	2.7	4.8	1.4	0.5	4.0	9.4	5.9	5.5	5.1	0.8	1.6	2.4	0.4	1.8	2.6	3.4	3.9	9.7
21	1.6	\$	4.5	10.6	11.7	12.0	6.5	0.6	0.3	0.1	0.4	2.7	3.8	11.0	4.3	0.7	0.0	0.1	0.0	0.1	0.5	0.0	0.4	0.3	3.1	12.0
22	0.0	\$	0.4	0.0	0.3	0.4	0.1	0.0	0.8	0.6	0.4	0.7	0.6	0.5	0.0	0.5	0.4	0.5	1.0	1.9	0.4	2.3	0.9	1.8	0.6	2.3
23	3.9	\$	2.9	2.7	4.8	1.4	1.4	1.2	1.8	1.0	1.2	1.2	0.5	1.7	0.8	1.0	1.5	1.1	1.6	1.4	1.6	3.2	2.0	1.4	1.8	4.8
24	1.5	\$	1.2	0.9	0.9	0.9	0.9	0.4	1.5	2.8	4.1	4.1	11.0	1.9	1.1	0.2	0.0	0.0	0.6	0.2	0.3	0.4	1.5	2.2	1.7	11.0
25	0.4	\$	1.7	3.8	3.3	8.1	4.2	2.8	2.1	1.2	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	1.3	8.1
26	0.0	\$	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.3	0.4	0.3	0.0	0.2	0.0	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.4
27	0.3	\$	0.3	0.0	0.0	1.3	0.8	0.2	0.2	0.0	0.3	0.1	0.2	0.2	0.7	0.8	0.0	0.1	0.2	0.3	0.3	1.6	1.0	1.6	0.5	1.6
28	3.9	\$	0.4	0.0	0.0	0.3	0.6	0.4	0.4	0.3	0.3	0.0	0.8	1.3	0.7	0.8	0.0	0.0	0.3	0.3	0.4	0.0	0.0	0.2	0.5	3.9
29	0.2	\$	0.2	0.0	0.4	0.3	0.5	0.4	1.0	0.3	0.9	0.3	0.2	0.6	0.3	0.7	0.5	0.7	0.2	0.3	0.8	0.4	0.0	0.2	0.4	1.0
30	0.5	\$	0.0	0.2	0.3	0.2	0.0	0.5	1.3	0.7	0.6	0.4	0.5	0.5	0.3	0.0	0.1	0.3	0.0	0.1	0.3	0.3	0.6	0.6	0.4	1.3
NO.	30	-	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	30	30	30	30	30	30	30	684	100%
MEAN	1.6	-	1.7	1.7	1.8	1.9	1.6	1.4	1.6	1.8	1.7	2.2	2.3	2.0	1.3	1.1	0.8	0.8	1.3	1.2	1.1	1.6	1.3	1.6		
MAX	10.8	-	7.2	10.6	11.7	12.0	6.5	6.9	15.2	17.8	9.5	11.1	11.0	11.0	8.3	7.8	5.1	5.0	8.8	6.9	9.3	12.5	12.7	16.6		



Number of 1HR Exceedences	0
Number of Non-Zero Readings	516
Maximum 1-HR Average	17.8 PPB
Maximum 24-HR Average	6.6 PPB
Monthly Calibration	6
Standard Deviation	2.529
Operational Time	720 HRS
Operational Uptime	100.0 %
Monthly Average	1.5 PPB

Lagoon PM_{2.5} (µg/m³) – November 2018

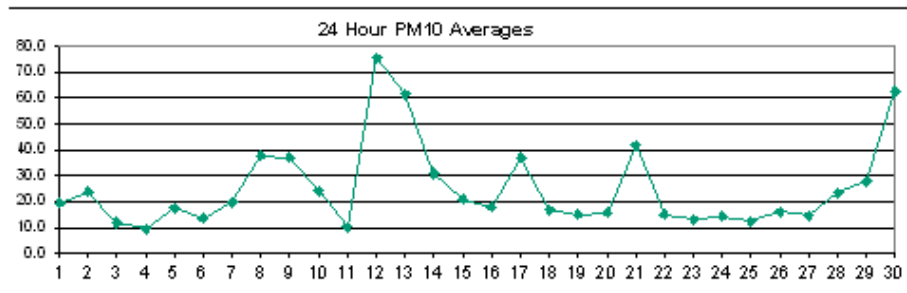
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	4.4	4.0	3.7	4.5	4.1	3.0	2.0	2.6	5.0	4.1	2.3	2.9	4.3	3.3	1.4	2.2	2.6	2.2	4.0	5.1	5.8	4.1	7.8	6.6	3.8	7.8
2	4.1	5.7	6.1	4.8	3.4	4.3	4.1	4.4	5.4	8.9	9.1	11.1	7.8	15.5	13.5	8.2	7.3	6.6	4.1	2.0	3.9	2.3	1.4	2.2	6.1	15.5
3	4.0	5.1	4.4	2.7	2.9	2.3	0.9	1.5	3.6	4.7	4.1	3.0	2.7	1.9	3.9	2.3	3.9	4.4	2.7	3.3	1.6	1.9	1.9	0.2	2.9	5.1
4	0.0	0.0	0.0	0.0	2.5	1.2	0.0	0.0	0.7	1.8	2.6	2.9	3.6	1.6	0.5	0.4	0.8	1.5	1.2	1.2	2.2	1.9	3.6	6.4	1.5	6.4
5	6.2	4.5	6.8	9.0	6.0	7.9	7.0	11.4	11.9	10.2	11.2	9.8	10.5	11.5	8.5	9.0	9.0	7.3	8.3	8.7	6.5	4.7	4.1	7.3	8.2	11.9
6	6.9	6.2	5.1	2.6	1.9	2.6	4.0	4.4	4.4	2.6	4.1	6.2	5.1	6.3	5.8	4.8	4.7	4.0	8.0	9.7	8.0	6.9	9.4	11.6	5.6	11.6
7	11.9	10.2	12.9	10.5	11.9	10.9	11.5	8.7	8.3	8.0	8.0	11.9	9.4	8.3	6.9	7.3	7.3	9.1	15.9	16.5	12.2	9.1	10.1	8.4	10.2	16.5
8	9.8	8.0	8.7	7.9	5.3	6.2	4.8	6.1	5.5	4.4	4.1	6.6	11.9	10.8	9.7	7.3	7.6	9.7	5.8	4.4	5.5	8.0	5.8	5.1	7.0	11.9
9	5.1	7.6	6.9	5.8	5.5	6.2	5.9	8.4	10.5	12.3	12.6	7.2	5.5	4.6	2.7	2.8	4.4	3.3	4.0	6.6	8.7	10.9	12.9	7.7	7.0	12.9
10	12.9	11.2	11.4	9.7	7.3	10.8	9.8	8.3	7.3	10.5	14.4	8.8	13.7	8.7	7.6	5.8	3.3	2.9	2.2	1.5	2.6	5.5	8.7	8.0	8.0	14.4
11	10.5	9.1	9.7	6.9	3.7	2.6	1.9	3.0	4.7	4.6	8.7	8.3	5.2	9.1	8.3	6.5	5.1	4.8	6.2	5.8	4.7	6.7	14.0	9.4	6.6	14.0
12	10.5	8.7	6.9	7.3	7.6	5.8	3.1	12.3	11.6	14.4	13.7	10.1	6.5	5.5	6.6	5.1	1.9	2.6	5.9	8.4	9.1	11.2	9.0	7.3	8.0	14.4
13	10.8	7.3	7.3	8.0	6.3	6.3	11.9	12.3	8.4	11.2	8.3	5.5	4.0	4.0	4.4	5.8	4.6	4.1	6.9	6.2	4.4	6.5	6.2	9.8	7.1	12.3
14	11.6	13.0	13.0	11.3	15.5	12.3	10.5	10.9	11.9	11.2	9.1	C	C	C	C	7.7	10.1	10.5	9.4	6.2	5.3	4.4	4.0	4.8	9.6	15.5
15	8.7	6.9	5.8	4.4	5.5	X	X	X	X	3.3	4.4	6.9	8.3	5.8	3.3	2.6	0.8	0.8	3.3	2.6	1.5	2.1	1.9	0.8	4.0	8.7
16	0.0	4.0	5.1	7.3	8.4	9.7	7.3	6.9	7.7	7.0	7.3	8.7	6.5	4.4	4.0	4.8	5.8	7.0	6.2	4.7	4.5	10.8	10.5	10.1	6.6	10.8
17	6.5	6.2	4.0	5.1	6.9	10.1	10.5	9.0	5.5	5.1	7.3	12.4	18.7	13.3	9.4	7.7	8.0	6.5	3.3	2.9	13.7	12.7	13.3	8.7	8.6	18.7
18	3.7	5.9	8.7	6.2	7.6	7.6	5.1	7.6	6.2	3.7	4.4	4.4	4.0	2.2	0.8	2.1	2.2	3.7	3.7	3.3	1.9	1.2	4.4	3.3	4.3	8.7
19	3.7	3.3	3.3	3.7	4.0	5.9	8.7	8.0	11.5	7.6	5.1	5.5	5.5	6.2	4.0	1.5	1.2	3.3	2.6	0.5	3.0	3.4	10.1	7.9	5.0	11.5
20	4.0	2.3	5.8	5.3	6.2	9.1	10.8	7.6	8.3	6.5	5.5	5.1	4.7	4.4	5.1	5.5	4.4	4.7	3.7	4.4	3.3	1.9	2.6	4.4	5.2	10.8
21	4.4	4.0	3.3	3.5	7.6	6.9	7.8	8.0	5.4	3.3	1.5	4.7	5.1	4.7	5.1	5.5	9.4	9.4	8.3	6.9	5.8	4.0	3.0	3.7	5.5	9.4
22	4.7	4.7	4.8	5.5	5.8	5.4	3.3	1.5	2.3	5.1	5.8	4.8	4.4	3.3	1.5	1.4	1.9	3.7	2.9	2.2	1.9	2.2	1.5	4.0	3.5	5.8
23	3.3	2.6	6.2	6.9	6.5	4.4	4.0	6.2	5.1	6.2	6.9	5.8	6.2	4.0	1.5	3.3	1.6	9.4	14.1	15.2	14.1	18.0	15.1	10.9	7.4	18.0
24	11.2	9.0	10.5	11.9	9.8	13.0	12.6	9.8	10.9	14.4	11.6	10.5	6.9	12.3	7.6	5.8	5.2	14.0	7.6	3.3	3.3	4.4	3.7	1.5	8.8	14.4
25	2.6	3.3	2.6	2.2	3.3	3.7	3.3	4.0	3.4	1.9	4.4	5.8	4.4	3.0	4.7	4.4	3.0	2.6	2.1	4.8	6.5	3.7	1.2	0.4	3.4	6.5
26	0.0	0.8	1.5	1.2	3.0	3.5	1.9	0.8	0.1	0.8	1.9	1.2	0.5	4.0	4.7	2.9	0.8	1.5	4.8	3.3	0.7	0.0	0.0	2.2	1.7	4.8
27	1.5	2.6	2.6	0.8	0.0	0.0	0.0	0.0	3.0	4.4	1.9	0.4	1.9	0.1	0.0	1.5	2.1	0.1	1.4	2.6	1.9	4.7	4.7	1.9	1.7	4.7
28	0.0	0.0	0.8	0.8	2.2	2.6	1.5	1.5	3.0	3.0	5.8	4.7	2.6	2.6	6.2	5.1	2.6	2.1	4.4	3.7	1.5	1.9	1.9	0.4	2.5	6.2
29	1.4	1.5	2.2	2.6	0.8	0.8	1.2	1.2	1.5	2.6	4.0	5.5	16.6	15.5	11.9	6.2	1.5	3.7	4.8	5.3	7.2	4.4	2.9	2.6	4.5	16.6
30	2.6	3.7	1.1	0.0	1.2	1.2	0.0	0.8	1.5	7.7	6.9	4.8	6.2	5.8	4.4	7.3	8.7	11.2	13.4	15.9	12.3	9.4	14.8	13.0	6.4	15.9
NO.	30	30	30	30	30	29	29	29	29	30	30	29	29	29	29	30	30	30	30	30	30	30	30	30	712	99%
MEAN	5.6	5.4	5.7	5.3	5.4	5.7	5.4	5.8	6.0	6.4	6.6	6.4	6.6	6.3	5.3	4.8	4.4	5.2	5.7	5.6	5.5	5.6	6.4	5.7		
MAX	12.9	13.0	13.0	11.9	15.5	13.0	12.6	12.3	11.9	14.4	14.4	12.4	18.7	15.5	13.5	9.0	10.1	14.0	15.9	16.5	14.1	18.0	15.1	13.0		



Number of 24HR Exceedences	0
Number of Non-Zero Readings	693
Maximum 1-HR Average	18.7 UG/M3
Maximum 24-HR Average	10.2 UG/M3
Monthly Calibration	4
Standard Deviation	3.648
Operational Time	716 HRS
Operational Uptime	99.4 %
Monthly Average	5.7 UG/M3

Lagoon PM₁₀ (µg/m³) – November 2018

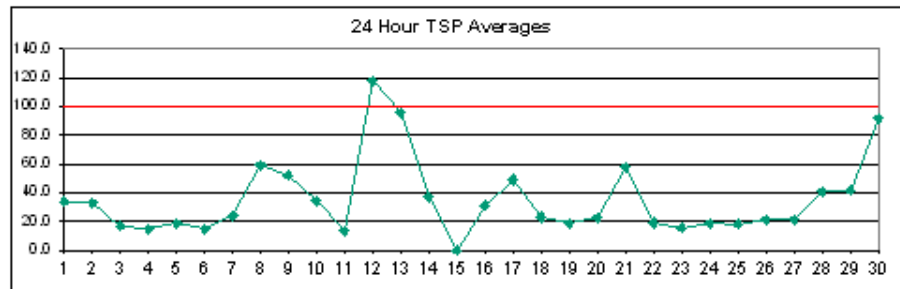
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	21.7	20.9	14.4	9.0	7.4	8.6	7.4	8.0	5.4	31.2	15.6	18.7	48.0	19.0	20.1	17.0	27.8	21.9	13.8	15.4	12.3	16.0	51.7	32.7	19.3	51.7
2	23.3	13.2	20.5	22.2	22.1	17.7	11.6	37.3	43.0	21.9	19.6	33.8	24.9	92.2	57.3	40.6	39.9	12.1	7.5	3.5	1.4	3.8	2.0	0.0	23.8	92.2
3	0.0	4.4	15.6	14.9	12.9	12.8	12.1	10.8	23.7	52.1	43.7	16.8	9.0	5.5	5.6	7.9	6.7	3.2	0.0	0.5	3.2	4.6	1.4	16.8	11.8	52.1
4	9.1	44.2	9.7	7.4	6.7	9.3	9.4	4.2	3.1	4.6	3.4	2.0	25.8	20.5	7.3	8.0	6.1	6.6	8.0	3.5	1.4	4.5	7.9	14.5	9.5	44.2
5	5.1	16.3	18.2	9.8	8.7	6.8	8.0	17.1	18.2	26.6	23.1	38.4	23.1	18.4	18.8	16.1	8.4	35.5	9.5	15.5	24.8	9.5	22.2	25.4	17.6	38.4
6	4.0	4.0	8.8	13.4	10.7	10.1	7.3	4.0	6.0	9.4	12.8	13.5	19.5	14.2	20.2	20.9	21.5	13.5	17.6	26.8	12.9	22.3	21.5	11.4	13.6	26.8
7	10.1	11.4	11.4	6.7	9.4	12.1	10.8	15.5	17.6	28.9	18.9	20.4	32.9	18.8	11.3	11.2	6.0	4.8	15.6	28.4	89.9	21.2	45.0	16.1	19.8	89.9
8	8.0	5.4	8.0	9.4	8.0	7.3	6.0	10.1	12.8	12.8	19.7	35.1	94.8	104.8	94.2	105.1	121.0	63.9	31.6	22.4	35.7	22.6	52.3	12.4	37.6	121.0
9	40.3	15.5	14.1	12.8	11.8	43.0	19.1	38.4	27.4	194.2	185.7	77.2	20.8	13.4	10.1	8.7	10.0	6.7	7.3	8.0	6.3	38.2	70.4	6.7	36.9	194.2
10	9.4	11.6	10.7	8.7	7.4	10.2	13.5	20.0	30.1	132.3	75.2	17.3	63.3	30.8	74.4	1.3	4.7	7.3	4.0	4.7	5.3	5.4	10.8	16.8	24.0	132.3
11	12.1	10.0	6.7	4.7	4.0	7.4	8.7	6.8	14.8	11.4	20.3	22.9	14.2	23.6	21.4	0.0	1.3	4.0	4.0	3.3	4.7	8.9	18.3	9.6	10.1	23.6
12	38.8	70.1	41.5	71.5	47.3	46.3	87.4	173.0	57.2	99.0	115.7	114.8	80.4	70.5	47.0	10.2	22.9	22.3	102.2	101.1	129.8	109.4	72.4	78.5	75.4	173.0
13	84.4	64.6	110.2	99.2	68.1	44.5	108.4	115.7	101.1	57.6	35.7	19.4	80.6	98.2	113.8	49.3	36.6	50.7	54.6	32.3	20.1	4.0	6.1	17.4	61.4	115.7
14	84.0	93.5	27.3	59.6	65.9	19.6	19.6	20.3	26.4	37.7	23.8	C	C	C	C	10.7	8.9	31.8	37.0	14.8	11.6	9.4	7.4	9.5	30.9	93.5
15	23.7	38.4	23.5	10.7	9.4	X	X	X	X	14.9	29.5	38.6	46.0	49.2	25.0	29.6	8.7	3.5	25.6	20.8	7.3	5.7	4.6	4.8	21.0	49.2
16	25.6	27.0	21.0	23.6	21.0	39.1	28.2	12.8	19.5	10.1	12.1	17.0	14.8	17.6	22.2	14.0	13.4	11.4	8.7	9.4	11.5	16.2	15.6	14.1	17.7	39.1
17	14.1	10.8	17.5	12.8	16.2	16.2	28.5	20.9	16.9	30.5	23.2	61.7	83.8	65.5	51.7	54.0	33.7	28.4	39.9	41.2	31.1	35.4	75.9	76.9	36.9	83.8
18	37.2	35.9	47.5	76.1	19.5	6.7	16.9	23.6	21.5	13.4	9.4	7.5	33.0	16.2	20.8	2.6	3.3	4.7	4.0	1.3	1.9	1.2	0.0	0.0	16.8	76.1
19	0.0	1.3	6.7	6.7	3.3	6.0	6.0	5.4	16.1	6.7	10.2	31.2	59.3	25.0	23.7	37.1	16.8	10.0	6.1	17.5	8.1	20.9	15.5	17.4	14.9	59.3
20	2.7	18.9	18.8	12.8	23.5	18.8	7.3	3.3	4.7	15.5	11.4	11.4	10.1	25.1	45.8	13.5	24.9	20.2	8.8	11.4	19.5	16.2	14.8	18.9	15.8	45.8
21	27.6	9.4	10.8	18.2	24.3	37.4	43.8	12.1	9.4	8.0	9.4	8.2	50.2	80.7	131.7	66.5	111.8	124.9	51.4	50.8	76.2	13.4	12.1	10.1	41.6	131.7
22	7.3	4.6	4.0	2.6	4.0	8.0	7.3	5.3	10.1	28.6	42.0	10.1	14.9	42.5	16.8	13.5	14.9	44.6	34.4	10.1	9.4	7.4	8.0	7.4	14.9	44.6
23	8.8	9.4	4.0	3.3	8.0	12.1	12.8	8.7	4.7	6.7	15.4	9.4	20.7	8.1	18.9	16.1	9.4	26.3	22.3	24.3	16.2	21.6	14.1	16.8	13.3	26.3
24	17.5	10.1	12.1	16.8	13.9	12.1	8.0	8.1	16.8	16.9	23.6	16.2	20.9	26.3	14.1	9.4	1.2	0.0	15.5	15.5	13.5	16.8	31.7	5.3	14.3	31.7
25	7.3	4.6	2.1	4.0	6.7	14.8	9.4	8.1	16.9	33.7	25.6	16.8	16.8	19.9	12.8	8.8	6.7	8.7	19.5	8.7	21.6	12.1	8.6	5.3	12.5	33.7
26	9.4	21.6	29.0	12.8	9.4	21.0	6.0	7.4	10.8	20.2	24.6	26.9	13.5	39.9	31.7	18.4	14.8	14.1	9.4	8.7	10.7	5.3	3.3	17.5	16.1	39.9
27	12.5	15.5	45.2	10.7	6.0	3.3	16.8	10.1	23.0	42.5	15.5	12.8	16.2	23.6	10.0	8.0	8.7	8.0	7.4	27.6	2.1	6.0	15.5	1.9	14.5	45.2
28	8.1	31.0	6.7	6.0	1.3	3.3	16.2	9.4	10.2	104.2	80.5	37.1	10.8	39.2	50.7	18.9	37.8	20.2	30.5	18.9	9.4	6.0	0.0	2.6	23.3	104.2
29	9.4	10.7	20.9	2.6	1.3	5.3	5.3	3.3	5.3	29.0	20.9	37.2	5.4	59.5	102.2	25.0	21.6	52.1	41.9	48.0	81.2	32.4	39.2	8.0	27.8	102.2
30	4.6	1.9	5.3	5.3	1.3	3.3	7.4	8.0	8.0	70.4	126.6	39.8	72.4	79.2	36.5	58.2	111.7	143.5	182.9	157.8	93.4	62.9	180.1	37.8	62.4	182.9
NO.	30	30	30	30	30	29	29	29	29	30	30	29	29	29	29	30	30	30	30	30	30	30	30	30	712	99%
MEAN	18.9	21.2	19.7	19.1	15.3	16.0	18.9	21.6	20.0	39.0	36.4	28.0	35.4	39.6	38.5	23.3	25.4	26.8	27.4	25.1	25.7	18.6	27.6	17.1		
MAX	84.4	93.5	110.2	99.2	68.1	46.3	108.4	173.0	101.1	194.2	185.7	114.8	94.8	104.8	131.7	105.1	121.0	143.5	182.9	157.8	129.8	109.4	180.1	78.5		



Number of Non-Zero Readings	704		
Maximum 1-HR Average	194.2 UG/M3		
Maximum 24-HR Average	75.4 UG/M3		
Monthly Calibration	4	Operational Time	716 HRS
Standard Deviation	29.15	Operational Uptime	99.4 %
		Monthly Average	25.2 UG/M3

Lagoon TSP ($\mu\text{g}/\text{m}^3$) – November 2018

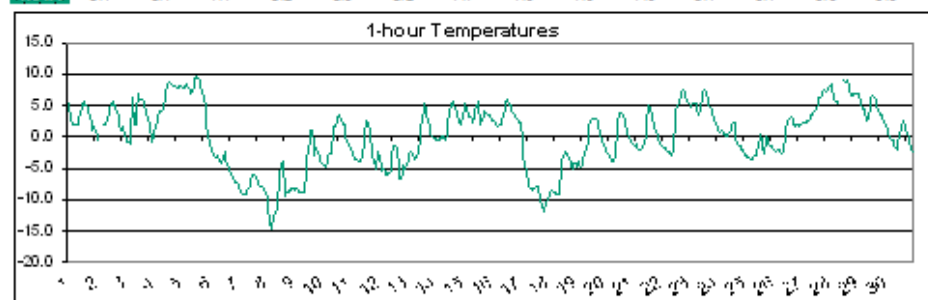
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	36.1	48.0	28.8	6.2	12.3	17.9	11.6	9.9	7.2	57.4	20.0	26.1	75.4	22.1	35.4	29.5	54.3	52.8	27.6	23.8	27.7	43.7	85.4	54.2	33.9	85.4
2	31.6	30.6	29.3	29.2	33.2	24.2	13.1	23.2	52.8	31.6	25.3	50.2	28.9	120.9	79.7	59.1	58.2	14.6	11.3	8.6	9.8	11.2	8.6	7.2	33.0	120.9
3	11.1	12.6	12.6	12.6	6.0	4.4	5.7	3.2	33.3	96.8	65.3	16.2	10.1	8.6	8.5	7.2	9.8	7.2	5.8	5.7	20.3	8.7	3.2	24.1	16.6	96.8
4	11.9	54.9	10.3	21.7	3.8	12.7	7.4	4.5	3.0	1.6	10.8	5.6	44.0	26.0	11.9	9.9	9.9	24.4	30.4	9.0	3.2	13.5	15.9	14.1	15.0	54.9
5	10.1	18.0	10.3	13.8	4.8	8.3	9.8	15.2	14.1	21.9	27.6	51.6	27.6	18.5	16.9	20.9	17.1	41.2	12.7	16.9	23.5	7.2	14.1	19.4	18.4	51.6
6	11.4	18.1	12.7	18.0	7.2	12.5	5.8	8.5	8.5	8.6	15.3	5.8	12.8	24.9	10.1	25.0	14.1	19.5	16.8	19.4	11.5	26.4	25.0	12.7	14.6	26.4
7	16.9	26.2	7.1	10.0	15.3	8.5	9.9	12.7	17.0	33.1	16.9	22.5	33.1	10.4	13.8	0.0	15.4	15.6	30.7	38.5	117.9	32.5	65.8	14.0	24.3	117.9
8	12.7	19.5	14.0	9.9	8.5	11.4	19.7	31.9	22.3	21.2	40.4	49.9	141.4	153.3	135.9	161.1	203.8	134.5	53.7	26.7	41.4	25.7	65.8	12.1	59.0	203.8
9	74.3	32.0	26.3	15.4	14.7	64.6	27.0	63.7	34.3	306.2	248.1	79.6	18.3	24.8	5.2	3.1	14.0	9.8	7.1	7.1	6.5	65.5	91.7	8.5	52.0	306.2
10	10.5	22.2	12.5	5.7	5.8	11.2	9.9	13.0	39.7	199.5	115.1	23.5	86.7	45.3	110.8	11.3	11.4	23.5	5.8	8.5	12.6	8.6	13.0	23.6	34.6	199.5
11	12.7	14.0	9.8	11.2	9.9	10.3	8.6	19.6	19.7	27.6	11.4	20.4	10.1	25.2	34.4	10.3	7.1	9.8	5.8	8.5	8.4	4.5	12.6	7.8	13.3	34.4
12	59.1	127.9	68.5	116.0	89.8	71.5	133.7	301.7	99.0	152.4	166.0	164.3	136.6	103.4	70.1	19.7	27.7	34.9	161.9	158.3	198.8	162.6	103.9	106.8	118.1	301.7
13	120.4	112.6	157.6	139.4	108.9	67.9	175.7	175.4	154.3	96.4	57.9	32.7	88.3	167.7	186.9	85.7	70.3	84.5	86.9	58.0	34.5	11.2	5.9	19.5	95.8	186.9
14	125.0	153.4	28.0	39.0	48.3	26.4	24.0	33.5	40.3	42.8	26.8	C	C	C	C	8.5	6.0	30.7	39.5	11.3	15.9	8.5	8.6	21.2	36.9	153.4
15	40.5	59.6	52.2	11.2	5.8	X	X	X	X	26.7	45.9	C	C	C	C	42.5	8.6	14.3	30.5	22.1	9.8	4.3	0.0	0.7	-	-
16	29.5	45.7	40.7	64.0	51.6	63.5	46.8	24.2	51.0	29.1	19.6	21.1	33.5	44.4	42.6	15.6	26.1	5.7	5.8	12.7	14.2	27.6	14.0	15.4	31.0	64.0
17	16.0	20.6	18.2	16.8	14.2	23.9	36.0	23.7	22.4	27.4	25.8	72.6	105.0	93.9	74.9	78.6	52.7	48.4	37.9	63.7	55.4	48.2	113.1	88.0	49.0	113.1
18	42.7	63.9	69.9	108.2	27.7	16.8	21.0	28.0	35.9	19.4	9.8	6.2	35.9	20.8	13.9	5.3	5.8	7.1	4.3	4.3	1.5	0.0	1.6	1.6	23.0	108.2
19	1.7	11.2	5.8	7.1	5.2	5.8	7.2	10.0	19.4	8.6	17.0	32.6	72.8	31.9	26.8	52.2	18.2	11.2	10.0	20.9	15.5	22.7	18.4	23.4	19.0	72.8
20	3.4	26.4	23.6	18.5	38.7	20.9	22.0	0.0	3.2	22.8	22.8	18.1	10.9	33.7	59.3	33.4	36.0	28.9	8.6	15.6	29.1	20.9	19.7	29.3	22.7	59.3
21	33.3	26.4	19.6	22.3	22.6	45.9	55.0	23.5	11.2	9.9	12.6	9.3	65.7	105.0	183.1	120.1	191.4	222.1	77.1	40.5	58.9	9.9	9.9	9.9	57.7	222.1
22	8.5	9.9	12.6	7.1	9.8	5.7	4.3	4.6	22.4	29.5	50.7	5.8	13.5	45.6	26.3	12.7	20.0	56.7	44.0	12.7	16.7	14.1	20.7	4.5	19.1	56.7
23	15.4	15.2	1.7	8.5	8.5	5.7	4.3	3.0	5.9	14.1	18.1	12.8	24.8	3.3	26.4	24.9	15.7	34.6	26.4	23.6	16.9	22.2	16.8	19.6	15.4	34.6
24	26.4	22.2	14.0	13.9	8.6	13.9	8.5	11.2	8.8	31.9	23.5	9.9	15.6	27.7	16.8	18.1	9.8	4.5	18.3	29.1	18.3	26.8	49.5	15.3	18.4	49.5
25	9.9	13.9	7.1	4.4	5.9	22.2	14.1	18.1	13.1	50.9	37.2	18.0	5.9	22.3	20.8	7.2	12.6	12.9	34.6	21.1	34.6	24.9	13.9	4.4	17.9	50.9
26	11.5	34.8	44.1	19.6	19.6	22.2	11.3	11.4	19.6	25.1	30.6	33.2	17.3	59.4	41.5	30.4	16.4	22.1	4.4	8.1	5.7	4.4	5.8	11.3	21.2	59.4
27	15.4	18.5	41.4	16.2	4.4	8.5	11.3	11.5	31.0	60.6	25.0	16.9	22.4	27.9	19.5	11.3	12.7	18.3	26.7	46.6	0.0	19.7	33.1	8.7	21.1	60.6
28	22.7	52.3	14.0	8.4	4.5	16.9	23.6	19.6	21.2	162.9	126.5	57.7	14.6	60.0	95.0	43.3	67.5	36.5	64.7	27.7	12.6	9.8	3.0	10.0	40.6	162.9
29	18.3	25.1	29.9	2.9	0.0	0.2	1.7	8.0	6.1	34.5	16.6	60.8	43.8	109.6	124.9	27.6	25.8	92.6	72.0	70.6	104.6	47.4	67.2	5.7	41.5	124.9
30	3.2	12.6	7.1	1.6	5.7	3.0	3.0	1.6	7.8	73.0	156.6	53.3	108.0	104.7	57.3	96.5	180.8	239.8	284.3	228.6	138.0	101.8	286.4	46.9	91.7	286.4
NO.	30	30	30	30	30	29	29	29	29	30	30	28	28	28	28	30	30	30	30	30	30	30	30	30	708	99%
MEAN	28.1	38.3	27.6	26.0	20.0	21.6	25.2	31.5	28.4	57.5	49.5	34.9	46.5	55.0	55.3	35.7	40.6	45.3	41.5	34.9	35.5	27.8	39.8	21.3		
MAX	125.0	153.4	157.6	139.4	108.9	71.5	175.7	301.7	154.3	306.2	248.1	164.3	141.4	167.7	186.9	161.1	203.8	239.8	284.3	228.6	198.8	162.6	286.4	106.8		



Number of 24HR Exceedences	1
Number of Non-Zero Readings	702
Maximum 1-HR Average	306.2 UG/M3
Maximum 24-HR Average	118.1 UG/M3
Monthly Calibration	8
Standard Deviation	44.9
Operational Time	716 HRS
Operational Uptime	99.4 %
Monthly Average	36.1 UG/M3

Lagoon Temperature (°C) – November 2018

Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	5.3	2.8	2.7	2.2	2.0	1.9	2.0	1.8	1.8	2.9	4.0	4.4	5.2	5.6	5.2	5.0	4.8	4.0	3.4	2.4	1.1	1.4	1.6	0.9	3.1	5.6
2	0.5	-0.3	-1.0	-0.9	-1.0	0.2	5.9	6.1	1.9	1.9	4.0	6.9	5.8	5.9	5.8	5.9	5.6	3.9	3.5	3.3	3.0	2.0	-0.7	-1.3	2.8	6.9
3	-0.1	0.6	1.6	2.6	3.2	3.8	4.2	4.1	4.5	5.2	6.0	7.3	8.2	8.6	8.7	8.5	8.4	8.2	8.0	8.0	7.9	8.0	7.8	8.2	5.9	8.7
4	8.1	7.7	7.7	8.2	8.3	8.2	7.7	7.6	7.0	7.3	8.1	9.1	9.6	9.3	9.2	8.9	8.0	7.6	7.3	6.7	4.5	1.9	0.8	-0.2	7.0	9.6
5	-1.0	-1.7	-2.2	-2.8	-3.1	-3.3	-3.1	-3.0	-3.8	-4.0	-4.1	-3.7	-3.3	-2.4	-3.4	-4.2	-4.9	-5.2	-6.7	-6.3	-6.6	-6.9	-7.1	-7.3	-4.1	-1.0
6	-7.7	-7.9	-8.4	-8.7	-9.1	-9.1	-9.1	-9.1	-8.8	-8.3	-7.8	-7.0	-6.4	-5.9	-5.9	-6.2	-6.5	-6.9	-7.4	-7.8	-7.9	-7.9	-8.1	-8.5	-7.8	-5.9
7	-8.8	-9.5	-11.3	-13.4	-14.7	-14.6	-12.5	-12.4	-12.3	-11.5	-10.0	-7.6	-6.1	-4.5	-3.9	-6.4	-7.2	-9.4	-8.7	-8.5	-8.9	-8.4	-8.3	-8.4	-9.4	-3.9
8	-8.5	-8.1	-8.3	-8.6	-8.8	-8.7	-8.8	-8.9	-8.7	-8.1	-6.2	-4.0	-2.2	-0.5	0.9	0.9	-0.7	-3.1	-1.8	-1.9	-2.2	-2.9	-3.8	-4.0	-4.9	0.9
9	-4.1	-4.7	-4.7	-4.7	-4.1	-3.1	-2.6	-2.8	-1.8	0.0	1.5	1.7	2.4	3.1	3.4	3.1	2.8	2.2	1.9	1.9	0.1	-0.6	-1.0	-1.4	-0.5	3.4
10	-2.0	-2.4	-3.0	-3.4	-3.6	-3.7	-3.8	-3.9	-3.9	-3.8	-3.0	-1.0	0.4	2.4	2.5	2.2	1.0	-0.2	-1.9	-2.8	-3.8	-4.9	-5.2	-3.0	-2.1	2.5
11	-2.4	-3.2	-4.9	-5.3	-5.1	-5.5	-5.9	-6.1	-5.7	-5.8	-5.5	-3.3	-1.3	-1.7	-1.4	-1.7	-2.5	-4.3	-6.6	-6.7	-5.7	-4.6	-5.0	-4.8	-4.4	-1.3
12	-4.4	-3.7	-3.0	-2.3	-2.4	-2.5	-3.2	-3.7	-3.4	-2.7	-2.1	-0.6	1.1	2.9	4.5	5.2	4.5	3.6	2.7	1.6	0.9	0.3	-0.1	-0.1	-0.3	5.2
13	-0.2	-0.4	-0.6	-0.4	-0.1	0.0	-0.1	0.0	-0.4	-0.2	0.2	2.0	3.9	5.1	5.2	5.6	5.0	4.7	3.9	3.1	2.8	2.4	2.1	2.4	1.9	5.6
14	3.3	4.3	5.2	4.8	3.5	3.1	3.1	3.0	2.2	3.0	4.0	4.6	5.7	4.6	2.9	2.1	2.9	3.0	4.2	3.9	3.9	3.6	3.4	3.3	3.6	5.7
15	2.5	2.5	2.5	2.2	2.0	1.7	1.7	2.0	2.0	2.5	3.2	4.5	5.7	5.9	X	5.2	4.9	4.2	3.8	3.9	3.4	3.0	2.8	2.2	3.2	5.9
16	1.9	2.2	-0.4	-2.6	-4.6	-5.5	-5.8	-6.9	-8.0	-8.3	-8.3	-8.4	-8.2	-8.1	-7.9	-7.9	-8.2	-9.4	-10.1	-11.1	-12.0	-11.6	-11.1	-10.7	-7.1	2.2
17	-9.8	-9.5	-9.1	-8.6	-8.8	-8.7	-8.9	-9.2	-9.2	-9.1	-7.5	-5.9	-4.3	-3.1	-2.7	-2.5	-2.9	-2.7	-3.3	-4.3	-4.7	-5.1	-4.3	-3.8	-6.2	-2.5
18	-4.3	-4.8	-3.9	-4.4	-4.7	-4.4	-3.5	-2.8	-2.3	-2.0	-0.9	1.4	2.7	3.0	2.8	2.9	2.7	2.8	2.7	1.5	1.1	0.6	-0.2	-0.9	-0.6	3.0
19	-1.5	-1.7	-2.3	-2.8	-3.0	-3.3	-3.5	-3.8	-3.8	-3.2	-1.8	0.0	2.2	3.7	3.9	3.9	3.4	2.4	2.0	1.3	0.8	-0.1	-0.5	-0.8	-0.4	3.9
20	-1.2	-1.2	-1.3	-1.2	-1.7	-2.1	-2.0	-2.1	-1.7	-1.3	-1.2	0.1	2.7	4.7	5.1	4.6	3.7	2.8	2.3	1.7	1.1	0.4	-0.3	-0.7	0.5	5.1
21	-1.1	-1.3	-1.6	-1.8	-1.9	-2.0	-2.5	-2.4	-2.8	-3.0	-2.4	-0.4	1.7	4.0	4.8	5.3	5.5	6.3	7.1	7.5	7.2	6.6	5.9	5.4	1.8	7.5
22	5.4	4.9	4.7	5.4	5.3	5.4	5.3	4.1	3.7	3.4	4.4	6.2	7.0	7.4	7.3	6.8	6.2	5.5	4.7	4.4	3.6	3.0	2.5	1.9	4.9	7.4
23	1.7	0.9	0.6	0.6	0.9	0.8	0.5	0.5	0.2	0.2	0.6	0.9	1.1	1.5	2.1	2.2	0.2	-1.0	-1.2	-1.3	-1.5	-2.0	-2.2	-2.5	0.2	2.2
24	-3.0	-3.0	-3.2	-3.3	-3.5	-3.6	-3.7	-3.6	-3.1	-3.0	-2.8	-1.3	-0.2	0.3	-0.1	-1.4	-2.6	-0.6	0.1	-0.3	-0.8	-1.3	-1.6	-1.7	-2.0	0.3
25	-2.1	-2.2	-2.2	-2.0	-2.1	-2.0	-2.5	-2.7	-2.2	-1.8	-0.6	1.3	2.3	2.9	2.9	3.1	2.9	2.1	1.9	1.7	1.9	1.9	1.7	2.0	0.3	3.1
26	1.9	2.3	2.3	2.3	2.4	2.3	2.7	3.0	3.1	3.7	3.6	4.1	4.3	4.5	5.2	6.3	6.3	6.4	7.1	7.4	7.0	7.2	7.6	8.0	4.6	8.0
27	8.0	8.4	7.4	6.9	6.0	5.8	5.3	5.8	6.0	6.6	8.0	8.8	8.9	8.7	8.9	8.6	8.6	7.6	6.7	6.4	6.8	6.9	6.8	6.7	7.3	8.9
28	6.8	6.1	5.9	5.5	4.5	4.3	3.6	3.3	2.6	2.9	4.9	5.9	6.4	6.6	6.3	5.9	5.4	4.2	3.8	3.7	3.5	3.1	2.5	2.2	4.6	6.8
29	1.7	1.2	0.6	0.1	-0.4	-0.5	-0.5	-1.4	-1.7	-1.9	-1.2	Y	Y	Y	2.7	2.7	1.8	1.0	0.7	0.0	-0.9	-1.8	-2.5	-3.4	-0.2	2.7
30	-4.2	-5.0	-6.8	-6.3	-6.5	-6.6	-6.5	-7.4	-7.5	-7.9	-7.2	-5.8	-4.2	-2.9	-2.3	-2.1	-2.2	-2.4	-2.8	-3.2	-3.7	-4.3	-5.0	-5.6	-4.9	-2.1
NO.	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	30	30	30	30	30	30	30	30	30	716	99%
MEAN	-0.6	-0.9	-1.2	-1.4	-1.7	-1.7	-1.6	-1.7	-1.9	-1.5	-0.7	0.7	1.8	2.5	2.5	2.5	1.9	1.2	0.9	0.5	0.1	-0.3	-0.7	-0.9		
MAX	8.1	8.4	7.7	8.2	8.3	8.2	7.7	7.6	7.0	7.3	8.1	9.1	9.6	9.3	9.2	8.9	8.6	8.2	8.0	8.0	7.9	8.0	7.8	8.2		



Number of Non-Zero Readings 716

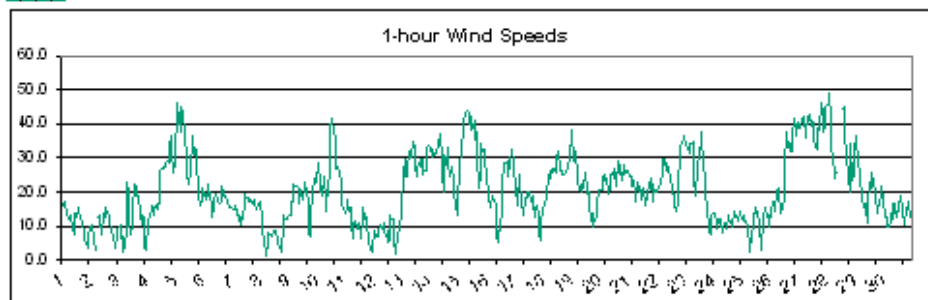
Maximum 1-HR Average 9.6 C

Maximum 24-HR Average 7.3 C

Monthly Calibration	0	Operational Time	716 HRS
Standard Deviation	4.997	Operational Uptime	99.4 %
		Monthly Average	-0.1 C

Lagoon Wind Speed (km/hr) – November 2018

Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	16.0	17.2	13.6	14.4	12.1	12.8	13.4	9.6	9.9	7.8	13.5	12.8	15.2	14.4	12.9	11.1	9.8	9.4	6.6	5.4	3.5	7.2	9.2	13.0	11.3	17.2
2	10.3	6.6	7.0	2.7	4.4	9.0	22.8	20.7	12.2	7.4	10.6	14.9	22.2	21.8	20.1	17.8	19.0	14.1	10.2	13.0	12.8	3.9	3.2	3.4	12.1	22.8
3	11.1	13.2	14.2	16.3	13.1	15.4	15.3	16.6	15.1	17.9	26.3	26.9	26.6	27.2	27.3	28.3	28.9	28.5	33.2	36.2	31.8	25.9	27.8	33.9	23.2	36.2
4	46.3	41.2	41.3	37.5	44.8	44.0	36.3	34.8	32.6	25.2	22.5	26.0	28.5	33.6	36.5	30.9	32.2	26.4	23.5	19.6	15.9	17.4	20.9	19.3	30.7	46.3
5	17.8	19.6	18.7	22.5	18.2	16.9	12.7	15.6	17.9	19.7	17.6	17.9	16.8	17.4	21.8	19.9	19.1	18.7	17.2	17.9	15.7	15.4	15.3	15.0	17.7	22.5
6	15.1	14.8	16.0	14.2	11.8	13.1	12.6	10.4	13.4	16.2	19.4	18.1	18.4	17.2	17.6	17.2	16.5	17.5	16.9	15.3	14.9	16.2	17.2	13.4	15.5	19.4
7	12.5	9.3	5.6	1.9	1.3	5.3	8.0	7.6	7.8	6.9	8.9	8.6	8.9	5.9	5.4	4.1	2.2	2.8	10.2	13.0	12.1	12.0	12.5	13.4	7.8	13.4
8	13.2	17.0	17.1	22.1	21.6	21.8	21.5	21.1	16.8	20.3	17.7	18.4	21.4	22.6	19.8	16.9	7.7	7.2	12.2	20.0	23.6	23.9	23.0	27.1	18.9	27.1
9	28.5	22.4	21.1	18.9	24.8	21.7	20.5	14.4	22.3	24.3	39.3	41.2	41.9	37.6	36.2	26.9	26.6	27.5	25.9	23.0	16.0	15.7	13.6	15.2	25.2	41.9
10	15.7	18.0	14.5	15.4	10.8	6.7	10.2	11.3	9.1	9.6	10.8	7.3	6.6	12.4	15.5	12.6	11.2	12.7	4.5	5.6	3.2	2.5	3.2	6.8	9.8	18.0
11	8.9	6.7	7.1	8.6	9.8	10.6	9.3	11.1	8.8	6.7	8.5	5.6	6.0	13.4	12.3	11.9	5.9	2.6	1.6	8.2	8.9	9.0	14.2	21.5	9.0	21.5
12	25.6	29.8	24.5	24.8	26.7	31.9	31.3	30.4	35.0	33.3	27.5	24.5	27.5	28.1	29.6	27.6	29.7	24.9	26.3	26.4	32.6	33.4	33.2	32.9	29.1	35.0
13	30.5	32.8	30.8	31.2	31.8	33.1	34.3	36.8	29.6	25.9	19.8	30.9	28.2	33.3	28.2	24.8	24.3	27.2	24.2	20.4	16.2	13.4	16.7	23.3	27.0	36.8
14	26.9	32.7	38.3	40.4	42.7	43.6	43.8	43.1	39.8	42.2	38.0	38.6	40.9	35.0	37.6	31.3	21.0	24.9	34.0	32.0	32.6	29.3	25.1	23.7	34.9	43.8
15	18.7	15.2	16.4	17.5	18.8	17.4	16.4	7.8	5.5	11.9	8.8	16.1	21.8	28.6	X	28.2	29.1	24.5	27.8	32.4	31.6	29.5	27.3	25.4	20.7	32.4
16	15.9	17.7	25.3	23.4	17.1	13.7	13.4	18.2	18.3	20.3	19.5	19.9	17.5	18.8	17.0	12.5	15.6	15.8	13.4	7.6	6.1	10.9	14.4	16.9	16.2	25.3
17	16.7	18.6	19.0	24.8	26.1	24.1	26.8	26.0	26.8	25.7	29.8	31.9	26.6	26.6	24.9	26.5	25.0	25.7	25.9	27.3	29.7	29.4	38.3	40.5	26.8	40.5
18	29.2	30.0	31.9	24.4	24.0	20.6	22.4	20.1	22.6	21.1	25.6	21.0	19.3	19.8	15.1	13.3	10.1	13.9	11.6	12.7	17.2	19.7	20.6	19.8	20.2	31.9
19	20.6	24.7	25.3	23.6	23.9	20.1	19.4	20.8	25.2	25.9	24.1	27.0	25.4	21.5	29.4	27.6	26.2	23.7	27.9	25.0	25.9	26.1	26.0	24.9	24.6	29.4
20	24.5	24.6	22.0	23.7	20.1	17.1	22.7	21.3	19.9	20.6	17.5	21.1	16.4	16.3	18.2	19.7	21.8	24.1	23.4	17.4	22.5	19.8	20.2	20.3	20.6	24.6
21	20.9	21.9	22.1	25.5	29.9	29.4	26.2	28.7	26.6	27.0	24.8	20.8	19.3	19.4	16.3	14.3	16.5	25.3	28.1	32.7	34.5	35.5	36.2	36.3	25.8	36.3
22	34.3	32.8	31.6	34.1	34.2	34.8	24.6	19.1	20.1	25.8	33.2	29.9	36.8	37.6	26.9	25.1	21.3	14.0	11.2	8.1	7.4	12.5	13.7	19.1	24.5	37.6
23	14.0	10.9	9.0	12.3	12.3	11.6	8.0	8.6	11.1	9.2	10.0	12.0	13.0	10.8	11.9	10.0	14.2	12.9	12.8	12.1	11.3	14.3	11.9	15.1	11.6	15.1
24	13.3	11.6	11.5	10.2	7.5	5.7	2.3	6.9	11.2	13.5	13.9	15.6	14.4	10.2	8.9	5.5	3.1	12.1	15.6	15.4	12.5	13.0	10.0	13.0	10.7	15.6
25	14.6	17.1	14.8	14.3	20.1	21.1	17.7	16.3	14.0	15.5	17.5	29.8	35.5	37.5	32.8	34.0	32.1	31.7	36.3	41.6	38.8	36.3	40.7	37.5	27.0	41.6
26	38.6	41.9	41.0	42.3	35.7	40.1	40.1	41.3	42.5	39.1	41.0	40.2	35.9	33.1	32.7	38.7	38.8	38.2	46.0	43.0	37.7	39.5	45.3	46.4	40.0	46.4
27	45.9	49.0	42.0	32.2	31.1	24.6	24.0	26.3	28.2	28.1	34.7	38.7	44.5	45.1	37.9	30.5	25.1	23.8	20.2	34.3	23.4	25.0	32.3	30.1	32.4	49.0
28	36.5	28.5	25.8	22.8	20.1	18.2	15.3	16.6	15.1	10.9	16.7	22.9	21.3	25.7	23.7	19.4	18.8	13.9	14.3	17.3	19.2	21.8	18.4	16.3	20.0	36.5
29	12.7	12.9	10.0	9.9	9.8	11.3	16.6	12.0	14.7	16.7	12.4	C	C	C	19.2	14.9	10.4	10.4	14.7	16.2	17.0	12.9	15.1	17.2	13.7	19.2
30	14.7	20.4	17.2	19.6	23.1	21.5	19.3	17.0	18.5	17.5	15.5	14.1	13.1	13.2	12.9	11.7	10.2	10.0	10.0	9.4	9.7	10.3	11.5	12.8	14.7	23.1
NO.	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	30	30	30	30	30	30	30	30	30	716	100%
MEAN	21.6	22.0	21.2	21.0	20.9	20.6	20.2	19.7	19.7	19.7	20.9	22.5	23.1	23.6	22.4	20.4	19.1	18.8	19.5	20.3	19.5	19.4	20.6	21.8		
MAX	46.3	49.0	42.0	42.3	44.8	44.0	43.8	43.1	42.5	42.2	41.0	41.2	44.5	45.1	37.9	38.7	38.8	38.2	46.0	43.0	38.8	39.5	45.3	46.4		



Number of Non-Zero Readings 716

Maximum 1-HR Average 49.0 KM/HR

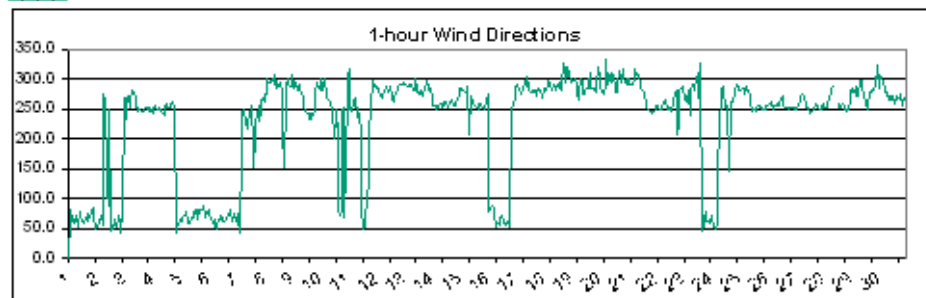
Maximum 24-HR Average 40.0 KM/HR

Monthly Calibration 3
Standard Deviation 9.926

Operational Time 719 HRS
Operational Uptime 99.9 %
Monthly Average 20.8 KM/HR

Lagoon Wind Direction (°) – November 2018

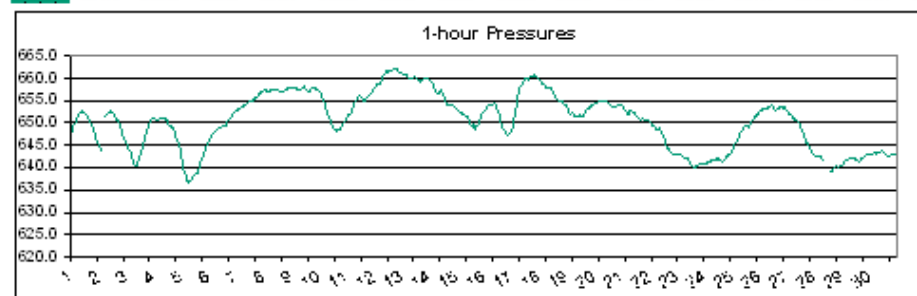
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	0.8	63.9	82.8	64.9	58.3	57.5	71.1	71.6	52.7	79.7	66.9	66.1	61.2	58.4	69.8	68.0	62.6	75.0	69.8	77.3	81.5	84.3	75.3	49.4	63.4	84.3
2	53.6	56.5	59.7	60.0	71.3	55.4	272.9	268.9	138.0	113.1	86.4	249.1	45.7	56.9	49.5	57.8	64.1	53.3	67.3	71.7	64.2	43.5	73.6	267.1	55.7	272.9
3	226.5	236.8	264.3	272.6	253.1	269.0	274.3	280.4	277.0	269.0	252.9	251.3	244.5	247.4	247.0	245.9	247.6	244.6	252.4	249.3	251.0	247.0	253.0	247.7	252.8	280.4
4	241.2	250.3	253.6	251.2	250.0	249.2	250.9	249.6	247.4	243.5	239.5	252.7	257.5	250.4	250.5	250.5	255.4	260.6	255.6	247.9	42.5	49.4	55.0	63.6	252.3	260.6
5	63.8	62.4	66.6	71.1	70.9	76.5	62.4	57.5	58.0	66.8	65.6	69.7	77.0	81.2	66.6	81.2	80.4	74.3	80.2	80.9	86.9	75.0	69.6	73.4	71.6	86.9
6	82.9	76.0	66.1	69.6	59.2	66.2	54.3	49.4	57.2	64.4	66.5	70.9	60.8	69.6	62.9	66.6	66.8	70.5	70.5	81.7	62.7	69.6	69.2	74.7	67.4	82.9
7	66.5	55.3	74.0	42.1	177.9	244.9	247.7	247.5	225.1	218.0	226.1	241.7	240.4	255.1	189.7	153.7	198.4	229.6	238.9	254.1	229.7	246.9	261.4	267.4	239.0	267.4
8	262.8	275.3	272.9	298.8	292.9	295.6	293.3	299.9	290.3	307.5	295.3	282.5	289.0	292.6	291.4	285.3	216.5	152.9	271.0	291.6	301.4	291.1	286.9	288.8	288.5	307.5
9	307.0	294.7	285.4	294.5	281.5	287.1	290.2	284.7	272.9	272.7	256.0	250.3	246.6	243.0	242.0	232.8	243.0	233.3	243.1	245.4	277.4	292.6	289.3	288.0	264.0	307.0
10	279.4	299.8	280.4	286.2	298.8	275.7	269.0	264.2	265.5	261.5	244.7	249.0	201.7	247.4	219.9	224.8	82.6	72.8	78.7	250.3	252.2	66.8	145.2	297.6	264.8	299.8
11	305.9	315.7	250.1	247.1	259.6	263.5	253.4	269.7	240.4	232.1	242.0	211.0	86.1	49.1	52.1	66.8	97.1	133.3	220.2	237.9	253.1	296.9	288.4	289.5	274.3	315.7
12	287.4	283.5	284.1	271.6	273.6	268.5	273.2	277.6	287.3	284.2	281.3	279.0	287.8	272.7	263.9	262.7	266.9	276.1	281.1	284.2	290.3	290.4	289.8	291.2	279.8	291.2
13	292.4	290.8	291.0	288.7	287.4	289.3	289.2	291.3	280.1	279.9	300.7	283.9	279.9	275.3	280.1	275.6	276.1	271.9	283.3	289.4	295.8	279.6	289.8	279.5	285.0	300.7
14	270.1	254.8	254.8	254.6	249.0	251.6	252.7	258.1	257.4	253.2	256.8	261.0	261.8	252.2	250.9	260.0	260.9	264.4	255.5	258.5	254.6	259.4	263.8	269.9	257.0	270.1
15	283.1	284.9	281.6	280.5	276.7	278.9	279.0	288.2	205.6	271.5	269.8	265.3	258.0	254.6	X	250.6	249.4	258.5	258.0	252.6	252.8	254.1	248.3	262.8	262.0	288.2
16	274.5	78.9	85.6	81.1	86.3	83.7	79.5	51.3	61.6	59.6	56.9	66.2	70.4	60.8	63.3	54.3	54.9	60.8	51.4	52.8	246.6	244.3	259.9	269.0	63.8	274.5
17	283.1	290.3	290.8	282.8	276.0	275.6	281.5	283.8	294.3	303.3	288.8	292.2	282.0	276.6	279.9	277.9	281.2	270.0	279.7	281.5	282.8	280.4	270.0	267.4	281.5	303.3
18	281.7	284.6	279.4	288.5	295.9	287.4	293.3	280.3	288.6	289.7	286.6	279.7	290.1	294.2	286.3	280.1	287.3	326.2	315.2	295.4	308.6	320.0	313.0	294.2	292.0	326.2
19	296.2	297.6	297.3	299.3	292.3	276.7	266.6	275.0	299.5	296.3	275.2	273.1	279.0	285.4	283.7	295.4	308.9	284.4	282.6	281.4	285.2	278.8	289.2	320.2	288.5	320.2
20	305.6	287.2	276.8	280.8	274.7	287.6	331.4	291.8	297.6	306.9	295.1	309.9	306.7	284.9	277.2	276.5	288.8	311.8	303.2	294.4	317.2	307.0	292.6	290.5	296.1	331.4
21	298.9	300.5	290.8	291.3	294.2	292.0	297.8	316.1	310.9	304.9	306.6	294.7	284.1	281.5	278.9	270.7	265.5	256.0	250.2	245.3	244.8	245.9	243.7	245.2	277.3	316.1
22	249.1	255.0	256.1	251.1	248.7	250.1	249.4	262.0	264.2	263.7	249.8	247.5	250.8	246.5	248.3	253.7	262.7	277.5	281.9	206.9	219.0	281.1	285.7	283.2	255.1	285.7
23	286.5	267.8	269.7	263.0	279.7	276.5	238.2	279.5	290.5	281.9	280.2	299.6	310.3	268.4	272.4	327.1	47.2	55.8	67.2	79.0	63.5	62.1	61.9	60.3	319.1	327.1
24	71.0	71.1	53.4	48.2	51.0	56.1	128.1	236.2	253.7	282.2	287.4	270.1	262.2	242.6	256.0	157.6	145.2	261.5	263.3	262.5	277.1	277.4	289.5	287.2	277.6	289.5
25	281.6	279.8	281.4	284.0	285.7	275.8	283.1	287.4	282.0	276.2	263.3	246.1	250.0	249.8	246.1	252.3	254.5	255.9	254.1	249.5	250.5	250.4	248.3	253.8	258.9	287.4
26	254.0	254.3	257.2	254.9	261.4	255.4	249.9	257.0	254.3	257.9	255.4	253.6	266.9	270.0	256.4	251.2	252.8	251.8	247.8	250.6	253.2	253.3	250.5	249.3	254.7	270.0
27	250.5	249.4	257.4	260.1	260.5	272.8	274.9	272.7	269.5	259.3	251.0	250.9	245.9	243.9	245.6	245.0	248.4	253.7	259.9	251.9	255.9	249.4	248.6	252.7	254.2	274.9
28	257.1	253.3	252.0	252.3	260.6	264.8	268.8	276.4	290.3	283.0	258.0	240.6	250.4	258.5	252.9	254.4	251.4	260.0	254.4	252.8	245.5	249.8	250.1	262.3	256.9	290.3
29	277.6	285.0	279.0	279.5	271.6	288.2	278.6	272.3	297.3	297.5	286.2	C	C	C	250.3	252.9	278.2	277.9	280.1	280.7	284.1	286.7	324.0	312.8	283.1	324.0
30	284.8	305.5	303.1	294.8	291.1	287.9	279.2	278.7	264.3	270.7	270.8	263.9	270.9	259.8	259.7	272.2	266.2	268.8	272.5	273.4	256.3	266.0	266.1	271.7	277.3	305.5
NO.	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	30	30	30	30	30	30	30	30	30	716	100%
MEAN	232.5	228.7	226.6	225.5	229.7	232.0	241.1	246.0	239.1	241.7	235.4	237.0	224.7	221.7	217.0	216.8	205.4	211.4	219.6	224.4	226.2	223.3	228.4	241.0		
MAX	307.0	315.7	303.1	299.3	298.8	295.6	331.4	316.1	310.9	307.5	306.6	309.9	310.3	294.2	291.4	327.1	308.9	326.2	315.2	295.4	317.2	320.0	324.0	320.2		



Number of Non-Zero Readings	716
Maximum 1-HR Average	331 degrees
Maximum 24-HR Average	319 degrees
Monthly Calibration	3
Standard Deviation	83.9
Operational Time	719 HRS
Operational Uptime	99.9 %
Monthly Average	228.1 degrees

Lagoon Pressure (mmHg) – November 2018

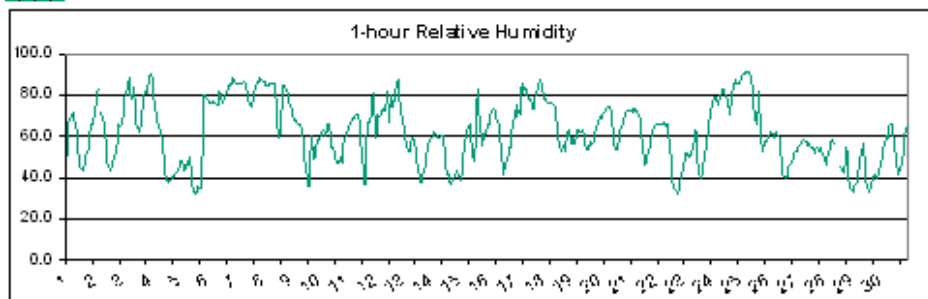
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	647.9	648.8	649.6	650.3	650.9	651.5	652.0	652.3	652.5	652.7	652.5	652.4	651.8	651.4	651.1	650.8	650.5	649.9	649.1	648.6	647.8	646.8	646.0	645.4	650.1	652.7
2	644.9	644.3	643.9	643.2	642.2	641.5	640.7	640.5	640.7	641.1	641.5	642.3	643.4	644.4	645.1	646.0	647.0	648.1	648.9	649.6	650.1	650.7	650.9	651.2	645.1	651.2
3	651.1	650.8	650.8	650.5	651.2	651.1	651.1	650.9	651.0	650.9	650.6	650.5	649.9	649.6	649.4	649.0	648.9	648.2	647.3	646.5	646.2	645.0	643.6	642.3	649.0	651.2
4	640.5	639.8	639.0	638.3	637.1	636.8	636.9	637.1	637.4	637.9	638.3	638.5	638.7	638.7	639.3	640.3	641.1	641.9	642.5	643.2	643.9	644.5	644.9	645.5	640.1	645.5
5	646.0	646.6	647.2	647.7	648.0	648.3	648.5	648.5	648.7	648.9	649.0	649.2	649.3	649.5	650.0	650.5	650.7	651.2	651.6	652.0	652.3	652.5	652.5	652.7	649.5	652.7
6	652.9	653.1	653.4	653.5	653.5	653.7	653.9	654.0	654.3	654.5	654.8	655.0	654.9	655.0	655.2	655.5	655.6	655.9	656.2	656.5	656.7	657.0	657.0	657.1	655.0	657.1
7	657.3	657.3	657.1	657.1	657.2	657.3	657.2	657.4	657.5	657.6	657.5	657.4	657.1	656.9	656.8	656.9	657.1	657.3	657.5	657.7	657.6	657.7	657.8	657.9	657.3	657.9
8	657.8	657.7	657.9	657.7	657.6	657.5	657.4	657.5	658.0	658.1	658.1	657.9	657.5	657.2	657.1	657.1	657.5	657.7	657.8	657.8	657.8	657.6	657.4	657.1	657.6	658.1
9	656.9	656.7	655.9	655.4	654.4	653.7	652.8	652.2	651.0	650.5	649.6	649.2	648.6	648.3	648.1	648.4	648.5	648.6	648.9	649.3	649.8	650.2	650.6	650.9	651.2	656.9
10	651.4	651.7	652.1	652.4	653.0	653.7	654.2	654.7	655.3	655.8	656.1	656.0	655.6	655.1	654.8	655.0	655.5	655.9	656.2	656.3	656.4	656.8	657.1	657.5	655.0	657.5
11	657.9	658.2	658.6	658.8	658.9	659.1	659.4	660.2	660.7	661.3	661.6	661.4	661.6	661.7	661.7	661.9	662.1	662.0	661.9	662.0	661.9	661.5	661.2	661.0	660.7	662.1
12	661.0	660.8	660.8	660.7	660.3	659.9	659.9	660.2	660.0	660.1	660.4	660.6	660.0	659.7	659.5	659.2	659.5	659.8	659.9	659.8	659.8	660.1	660.2	660.0	660.0	660.1
13	659.4	659.2	658.5	658.2	657.6	656.9	656.4	656.5	657.0	657.1	657.6	656.7	655.5	654.7	654.5	654.2	654.1	654.0	653.9	654.1	653.9	653.8	653.4	653.1	655.8	659.4
14	652.9	652.7	652.2	652.2	651.8	651.7	651.9	651.3	651.5	651.0	650.5	650.4	649.6	649.6	649.0	648.7	649.2	649.5	649.8	650.4	651.1	651.6	652.2	652.5	651.0	652.9
15	652.6	653.2	653.8	654.2	654.2	654.1	654.1	654.3	654.3	654.0	653.6	652.7	651.7	650.9	X	649.4	648.6	647.9	647.5	647.3	647.3	647.6	648.2	648.2	651.3	654.3
16	648.9	650.4	652.3	654.1	655.7	656.9	657.7	658.3	658.8	659.1	659.4	659.9	659.9	659.7	660.1	660.3	660.3	660.5	660.6	660.7	660.5	660.3	660.1	659.9	658.1	660.7
17	659.6	659.1	658.9	658.6	658.1	658.0	657.9	657.7	658.0	657.8	657.5	657.2	656.8	656.1	655.4	655.1	654.9	654.8	654.8	654.8	654.4	654.1	653.9	653.6	656.5	659.6
18	653.4	652.7	652.1	652.2	652.2	651.9	651.5	651.6	651.3	651.7	651.7	651.8	651.7	651.7	652.0	652.3	652.7	653.0	653.3	653.5	653.8	654.0	654.1	654.1	652.5	654.1
19	654.3	654.3	654.5	654.7	654.8	654.8	654.7	654.8	654.9	654.9	654.8	654.7	654.3	654.0	653.7	653.5	653.5	653.5	653.6	653.9	654.0	654.0	653.9	653.8	654.2	654.9
20	653.4	653.0	652.7	652.3	651.9	652.0	652.6	652.8	652.4	652.5	652.5	652.3	651.7	651.2	650.9	650.8	650.8	651.0	650.8	650.7	650.6	650.6	650.6	650.4	651.7	653.4
21	650.3	650.0	649.5	649.3	648.9	648.6	648.6	648.8	648.6	648.3	648.0	647.3	646.4	645.3	644.7	644.5	644.0	643.5	643.2	642.9	642.8	642.9	643.1	643.0	646.4	650.3
22	643.0	642.9	642.9	642.7	642.5	642.3	642.2	642.2	642.0	641.9	641.5	641.2	640.4	640.1	640.1	640.2	640.2	640.6	640.7	640.7	641.0	641.0	641.0	640.8	641.4	643.0
23	640.9	641.0	641.2	641.1	641.2	641.5	641.7	641.9	641.9	642.0	641.9	641.8	641.5	641.5	641.4	641.4	641.7	642.1	642.4	642.6	642.8	643.1	643.4	643.7	641.9	643.7
24	644.3	644.8	645.5	646.0	646.5	647.0	647.5	648.0	648.4	648.9	649.4	649.5	649.3	649.2	649.3	649.7	650.2	650.8	651.0	651.3	651.5	651.8	652.1	652.4	648.9	652.4
25	652.8	652.8	653.1	653.2	653.1	653.1	653.2	653.5	653.8	653.9	653.9	653.5	653.1	653.0	653.0	653.2	653.4	653.4	653.4	653.2	653.5	653.6	653.2	653.0	653.3	653.9
26	652.5	652.0	651.8	651.4	651.1	650.9	650.8	650.6	650.4	650.2	649.8	649.4	648.4	647.7	647.1	646.3	645.7	645.5	644.4	644.1	643.6	643.2	642.8	642.8	648.0	652.5
27	642.7	642.4	642.5	642.6	642.5	642.2	641.8	641.3	640.9	640.8	640.3	639.6	639.2	639.0	639.2	639.4	639.8	640.3	640.6	640.0	640.2	640.5	640.6	640.8	640.8	642.7
28	640.9	641.2	641.5	641.7	641.9	642.1	642.2	642.0	642.0	642.2	642.1	641.9	641.6	641.5	641.5	641.7	642.0	642.3	642.5	642.7	642.8	642.9	643.0	643.0	642.0	643.0
29	643.1	642.9	643.2	643.3	643.2	643.3	643.2	643.3	643.4	643.6	643.7	Y	Y	Y	642.7	642.7	642.7	642.8	642.8	642.8	642.8	643.0	643.3	643.5	643.1	643.7
30	643.5	643.7	643.7	643.8	643.8	643.9	643.9	644.2	644.4	644.6	644.7	644.6	644.5	644.5	644.4	644.6	644.9	645.0	645.2	645.4	645.6	645.9	646.1	646.4	644.6	646.4
NO.	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	30	30	30	30	30	30	30	30	30	716	99%
MEAN	650.5	650.5	650.5	650.6	650.5	650.5	650.5	650.6	650.7	650.8	650.8	650.9	650.5	650.2	649.9	649.9	650.1	650.2	650.3	650.3	650.4	650.5	650.5	650.5		
MAX	661.0	660.8	660.8	660.7	660.3	659.9	659.9	660.2	660.7	661.3	661.6	661.4	661.6	661.7	661.7	661.9	662.1	662.0	661.9	662.0	661.9	661.5	661.2	661.0		



Number of Non-Zero Readings	716
Maximum 1-HR Average	662 MMHg
Maximum 24-HR Average	661 MMHg
Monthly Calibration	0
Standard Deviation	6.239
Operational Time	716 HRS
Operational Uptime	99.4 %
Monthly Average	650.4 MMHg

Lagoon Relative Humidity (%) – November 2018

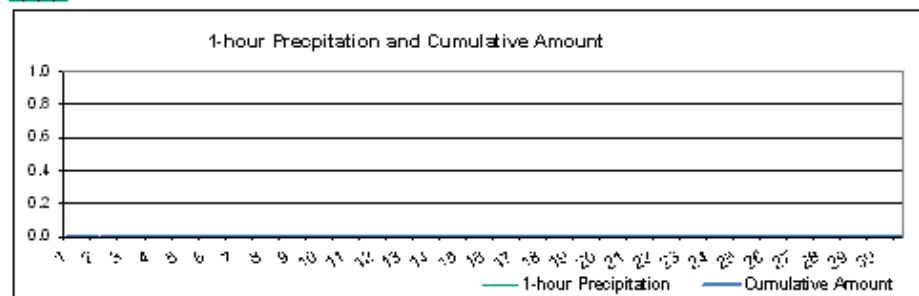
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	50.7	65.0	68.2	69.8	70.7	71.6	69.2	65.9	62.2	55.9	47.2	46.5	44.3	43.3	45.3	46.2	51.0	51.7	53.8	58.2	65.8	65.1	65.7	67.5	58.4	71.6
2	72.4	77.2	80.9	83.4	86.0	88.1	81.6	78.3	81.5	83.8	74.5	65.9	64.7	62.2	64.2	64.6	66.5	78.7	80.7	81.4	80.7	82.1	88.4	91.0	77.4	91.0
3	89.8	87.6	81.9	73.9	70.5	67.9	65.3	65.2	62.0	57.9	54.5	48.4	43.3	39.7	37.9	38.6	39.0	39.5	40.9	40.6	41.6	42.2	43.4	43.3	54.8	89.8
4	44.8	48.0	48.2	45.0	43.7	44.1	46.1	45.7	49.9	49.1	43.6	37.7	33.3	33.0	32.2	33.0	35.5	35.1	35.3	39.0	62.5	79.9	79.7	78.3	46.8	79.9
5	78.2	76.9	76.5	76.2	77.1	76.3	76.0	75.9	75.4	75.5	81.8	81.1	79.3	76.4	79.3	78.1	81.8	81.0	84.1	85.5	84.6	85.9	87.9	87.2	79.9	87.9
6	85.7	85.8	85.8	85.9	85.6	85.8	85.7	86.2	85.5	83.8	82.1	78.2	75.7	74.0	73.9	77.7	80.0	83.8	86.3	86.5	86.1	88.1	87.2	86.2	83.4	88.1
7	86.6	86.4	85.0	84.5	84.7	85.3	85.6	85.6	85.3	85.1	82.7	75.2	67.3	58.9	61.7	67.5	77.8	84.9	84.9	82.3	83.1	80.2	76.5	74.6	79.7	86.6
8	73.3	69.6	68.9	67.8	67.7	66.3	65.7	65.5	64.4	62.2	57.8	50.6	44.9	40.1	35.7	35.9	45.2	60.7	49.5	49.1	49.8	52.8	58.2	58.3	56.7	73.3
9	58.4	61.6	62.5	62.7	61.9	60.0	62.6	66.3	65.5	60.1	55.0	54.4	52.3	49.7	47.7	47.4	47.3	49.9	49.2	47.0	55.3	58.5	60.2	61.7	56.5	66.3
10	63.7	64.5	66.3	67.5	68.2	68.9	69.9	70.5	70.3	70.6	66.5	58.3	51.9	42.0	36.6	37.1	55.1	65.4	69.0	67.2	70.3	76.9	80.5	63.9	63.4	80.5
11	59.1	62.0	70.3	69.8	70.3	71.6	73.5	72.7	72.8	78.0	81.4	69.3	67.0	79.5	75.3	74.5	77.6	80.3	86.0	87.2	81.5	71.6	68.2	65.2	73.5	87.2
12	62.9	60.3	56.6	52.5	52.3	52.8	56.7	59.2	58.3	55.5	54.2	49.6	44.6	40.6	38.1	37.9	39.7	43.0	46.2	50.6	53.4	56.0	57.8	58.4	51.5	62.9
13	59.4	60.5	61.8	61.1	60.0	59.3	59.7	58.9	60.7	60.1	58.5	52.3	45.9	42.0	41.3	37.7	37.7	36.9	38.7	41.0	40.9	42.6	43.5	41.7	50.1	61.8
14	39.0	39.9	42.3	48.1	56.7	61.3	63.2	64.1	65.6	59.2	54.2	51.9	47.7	60.1	74.6	82.6	72.6	67.5	55.9	57.6	58.5	60.8	60.8	60.9	58.5	82.6
15	65.7	66.1	68.5	72.0	73.6	73.4	72.2	68.9	67.8	65.7	62.0	52.0	43.1	41.6	X	46.4	47.9	51.7	54.3	55.0	60.8	65.6	70.1	75.8	61.7	75.8
16	75.3	69.4	72.1	70.4	82.7	85.3	81.0	84.0	82.8	80.3	78.8	78.4	78.4	75.8	73.7	73.7	77.5	81.4	83.0	84.5	86.3	87.4	84.6	81.8	79.5	87.4
17	78.2	78.4	77.2	75.9	76.4	76.2	75.8	76.0	75.0	74.8	70.3	65.3	60.2	55.3	53.7	52.7	55.1	53.2	55.2	60.2	61.7	63.2	56.9	52.8	65.8	78.4
18	56.1	59.3	56.3	60.3	62.8	63.4	62.3	62.3	62.3	63.0	61.5	57.0	53.8	53.9	55.4	55.9	57.1	56.8	57.6	62.1	63.3	64.6	66.3	68.1	60.1	68.1
19	69.5	68.9	70.4	72.0	72.6	73.6	74.5	74.6	74.0	71.8	68.0	62.3	57.0	53.5	54.0	55.3	57.7	62.4	64.3	66.6	67.9	70.7	71.2	71.5	66.8	74.6
20	72.7	72.7	72.6	71.8	73.1	73.6	72.7	72.6	70.9	69.2	68.8	63.9	55.0	47.8	45.9	46.8	50.1	53.0	55.0	58.1	59.9	61.9	64.1	65.4	63.2	73.6
21	66.1	66.1	66.3	66.2	66.0	65.4	66.6	65.0	65.7	65.4	63.1	55.5	48.5	39.1	36.7	34.5	33.7	32.8	32.5	34.2	37.4	40.7	45.4	48.3	51.7	66.6
22	49.5	51.4	52.1	50.3	50.9	50.7	50.6	55.8	58.5	63.5	61.9	50.7	43.3	40.1	39.5	42.5	45.7	49.7	56.4	58.6	60.9	64.5	71.2	75.9	53.9	75.9
23	76.3	78.4	79.0	78.9	75.6	76.4	78.2	78.3	82.9	82.7	80.4	79.5	79.4	77.0	72.0	70.7	78.9	84.5	85.2	86.0	87.2	85.8	85.2	87.4	80.2	87.4
24	88.1	88.9	90.1	90.4	90.9	91.1	91.2	91.1	88.6	87.0	84.0	76.3	69.3	66.4	68.1	75.4	81.5	59.9	52.7	53.5	55.2	57.1	57.6	57.5	75.5	91.2
25	60.3	61.3	62.0	61.2	60.8	59.7	61.5	62.3	60.5	58.9	54.3	46.4	42.3	40.3	40.9	39.9	40.8	44.9	46.3	47.6	47.6	49.5	51.6	51.8	52.2	62.3
26	53.1	53.4	55.2	56.8	57.6	58.6	58.4	57.2	57.3	55.7	56.2	55.1	54.7	54.8	54.3	52.2	53.2	54.3	54.0	53.1	54.6	53.9	51.8	49.4	54.8	58.6
27	48.8	46.5	49.5	51.2	55.2	56.1	58.0	55.8	54.8	52.5	47.7	44.8	44.8	45.6	44.1	44.5	42.8	48.6	55.0	51.9	41.1	36.0	34.2	33.1	47.6	58.0
28	33.0	35.6	36.5	38.0	43.3	44.6	48.9	51.5	56.2	56.0	45.5	39.9	36.2	33.5	33.5	35.2	35.3	40.6	41.3	40.5	39.4	39.9	42.7	44.2	41.3	56.2
29	47.1	49.6	53.3	56.3	59.7	60.4	59.4	64.3	66.0	66.0	62.7	Y	Y	Y	41.9	41.2	43.6	46.9	48.3	52.1	59.0	63.2	65.7	67.8	55.9	67.8
30	69.4	70.5	72.5	73.2	73.2	72.7	72.1	74.6	74.4	74.9	71.6	67.8	62.7	59.9	57.7	57.5	58.0	59.1	61.1	62.7	67.3	70.7	73.3	75.6	68.0	75.6
NO.	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	30	30	30	30	30	30	30	30	30	716	99%
MEAN	64.4	65.4	66.3	66.4	67.7	68.0	68.1	68.5	68.6	67.5	64.4	59.1	54.9	52.6	52.2	52.8	55.5	57.9	58.7	60.0	62.1	63.9	65.0	64.8		
MAX	89.8	88.9	90.1	90.4	90.9	91.1	91.2	91.1	88.6	87.0	84.0	81.1	79.4	79.5	79.3	82.6	81.8	84.9	86.3	87.2	87.2	88.1	88.4	91.0		



Number of Non-Zero Readings	716
Maximum 1-HR Average	91.2 %
Maximum 24-HR Average	83.4 %
Monthly Calibration	0
Standard Deviation	14.67
Operational Time	716 HRS
Operational Uptime	99.4 %
Monthly Average	62.3 %

Lagoon Precipitation (mm) – November 2018

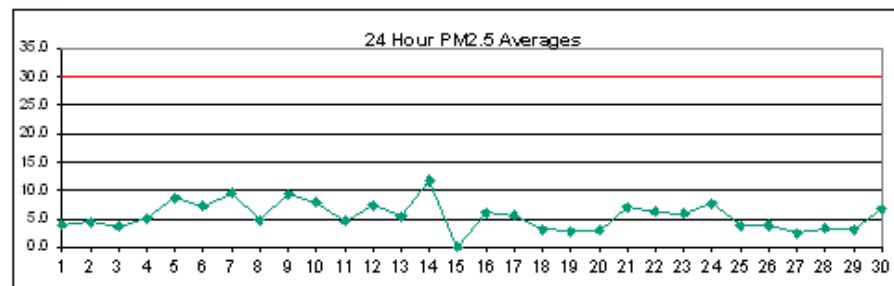
HOUR																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	MAX
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	X	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Y	Y	Y	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
NO.	30	30	30	30	30	30	30	30	30	30	30	29	29	29	29	30	30	30	30	30	30	30	30	30	716	99%
MEAN	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0



Number of Non-Zero Readings	0		
Maximum 1-HR Average	0.0 MM		
Maximum 24-HR Average	0.0 MM		
Monthly Calibration	0	Operational Time	716 HRS
Standard Deviation	0	Operational Uptime	99.4 %
		Monthly Average	0.00 MM

Windridge PM_{2.5} (µg/m³) – November 2018

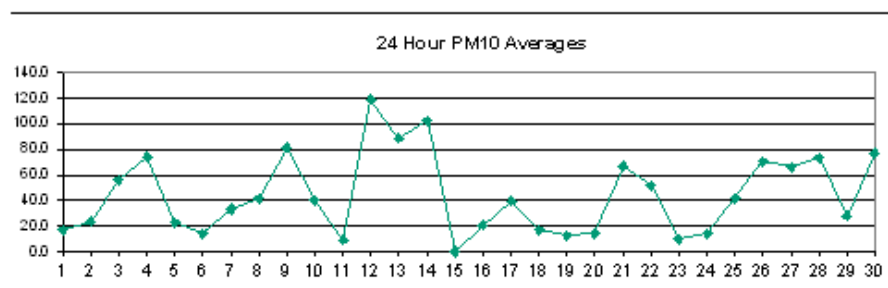
Day	HOUR																								MEAN	MAX
1	3.3	2.6	5.1	3.7	4.8	3.3	0.8	4.8	3.7	2.2	5.9	4.0	1.8	2.9	3.0	2.9	3.7	5.9	5.9	6.5	4.1	5.5	5.9	4.8	4.0	6.5
2	3.3	7.0	8.7	7.3	5.5	5.1	4.4	0.7	0.8	3.0	6.2	5.4	2.6	7.3	7.0	7.0	7.7	4.5	1.1	1.9	4.4	2.9	0.4	2.9	4.5	8.7
3	3.7	1.8	1.5	1.5	0.0	1.1	3.4	2.2	0.7	0.4	2.8	4.8	4.4	4.0	5.9	7.0	6.9	3.6	0.4	4.1	7.3	5.5	4.1	11.7	3.7	11.7
4	7.7	7.0	5.9	4.8	8.8	10.6	7.3	7.3	4.8	5.5	5.5	3.0	1.5	0.8	5.2	7.7	7.7	4.8	4.5	2.6	2.9	3.7	2.6	1.9	5.2	10.6
5	5.2	9.4	7.4	13.5	8.8	7.0	9.6	13.2	8.4	7.0	8.1	11.0	10.6	10.3	9.9	9.1	7.7	8.7	9.9	9.8	7.9	5.5	6.2	5.9	8.8	13.5
6	5.5	4.8	5.5	6.6	4.7	3.0	4.1	4.7	3.6	2.6	5.2	6.3	7.0	6.6	7.0	7.0	7.7	8.9	11.6	19.8	7.8	12.8	10.6	10.9	7.3	19.8
7	12.4	11.3	9.8	10.2	9.2	11.7	9.1	6.2	6.4	13.6	15.0	12.9	14.9	10.5	7.9	7.7	7.8	10.2	6.3	7.1	9.9	8.0	6.9	5.9	9.6	15.0
8	5.1	4.0	2.6	1.9	3.0	3.4	5.4	3.2	0.8	3.7	3.3	1.2	4.9	10.6	9.2	10.2	8.7	6.2	4.8	4.8	4.4	3.0	5.8	4.8	4.8	10.6
9	7.3	7.6	5.4	3.3	3.7	5.5	5.1	2.6	3.8	19.1	20.8	16.8	14.5	10.6	10.6	8.6	13.4	8.3	5.3	9.5	9.6	10.4	14.4	9.1	9.4	20.8
10	7.7	7.3	6.6	5.9	7.4	8.1	8.7	7.0	8.5	22.1	14.9	10.2	11.0	9.9	10.1	5.9	5.9	6.8	4.4	2.6	1.9	3.8	7.6	6.1	7.9	22.1
11	2.9	2.3	5.3	5.5	3.6	0.1	2.0	7.7	6.9	4.4	4.1	5.3	4.1	5.3	5.1	4.4	4.5	6.6	5.1	3.7	3.5	8.4	6.9	3.3	4.6	8.4
12	2.2	3.0	3.7	5.1	4.8	4.4	4.2	19.4	5.9	6.7	10.2	9.5	7.0	6.4	5.1	4.0	3.2	11.4	13.8	11.4	12.4	9.1	7.7	8.4	7.5	19.4
13	5.9	7.1	11.3	9.8	7.3	4.8	5.3	9.5	8.4	5.8	2.9	2.2	1.5	3.8	9.1	5.8	2.2	1.6	1.2	4.1	5.1	4.1	5.2	7.7	5.5	11.3
14	9.0	16.5	16.9	16.9	16.8	13.9	14.2	10.5	17.9	15.7	14.0	16.0	17.0	10.9	8.0	11.2	18.4	7.7	7.7	6.6	5.8	4.7	3.6	2.6	11.8	18.4
15	2.5	0.5	3.3	3.6	1.5	1.2	3.8	7.9	3.6	C	C	C	C	C	C	C	C	C	C	3.0	7.0	7.0	8.4	6.2	4.4	
16	3.7	2.3	3.0	5.4	7.7	8.5	9.9	7.9	6.7	8.1	9.5	6.9	5.1	5.2	6.6	3.7	4.1	7.0	6.2	4.0	4.0	5.9	8.1	7.0	6.1	9.9
17	7.0	6.9	4.8	4.1	5.2	7.3	5.5	2.2	4.4	4.4	4.0	3.7	5.5	5.1	4.8	7.3	7.7	5.5	7.6	7.3	7.7	5.5	4.4	X	5.6	7.7
18	8.0	5.2	5.9	8.7	5.3	2.2	2.2	1.5	2.6	2.6	1.2	3.7	3.3	3.3	2.9	2.2	0.3	0.4	1.5	2.2	2.9	2.2	3.3	2.9	3.2	8.7
19	0.8	1.5	3.7	2.6	1.9	2.3	3.0	4.0	3.3	4.0	3.7	3.7	3.7	4.0	2.9	2.2	2.6	2.2	1.5	1.9	3.0	5.8	4.0	1.5	2.9	5.8
20	1.5	1.9	3.0	4.1	5.2	6.2	4.1	5.1	4.0	0.4	3.0	3.7	3.0	2.9	2.9	2.2	0.4	1.5	3.3	4.0	2.9	2.6	2.9	1.1	3.0	6.2
21	1.2	3.3	3.3	4.4	5.1	3.4	7.3	4.4	1.5	3.3	4.1	4.7	3.0	6.0	12.8	10.9	8.8	10.3	11.7	11.8	13.2	12.4	13.5	10.0	7.1	13.5
22	12.8	10.2	6.6	8.0	6.2	5.5	7.0	6.2	5.2	8.4	7.7	8.4	7.0	10.9	7.6	4.4	5.9	5.8	3.7	2.9	2.9	2.6	2.9	2.2	6.3	12.8
23	2.2	3.6	2.2	1.5	1.9	2.6	2.6	3.4	3.7	4.0	1.8	1.9	3.6	0.4	0.0	1.8	2.1	13.2	15.3	13.3	15.7	15.0	15.4	17.2	6.0	17.2
24	13.9	12.4	9.9	9.6	12.5	11.4	10.6	8.8	10.3	11.1	13.8	9.1	7.3	4.7	3.3	4.7	3.6	1.9	3.0	6.2	6.2	4.8	4.1	4.0	7.8	13.9
25	2.6	1.8	1.5	1.5	3.7	3.0	4.3	1.1	1.2	3.3	3.3	2.9	2.6	4.4	6.2	5.5	4.4	4.4	4.4	5.9	6.6	4.8	7.6	5.8	3.9	7.6
26	4.5	4.8	5.9	5.8	4.0	1.5	0.8	3.4	4.0	3.4	6.2	3.9	0.0	0.8	4.8	7.3	6.2	3.3	3.7	4.8	4.8	4.0	2.9	3.4	3.9	7.3
27	3.3	1.5	0.4	0.0	0.0	0.0	0.4	2.3	2.6	2.3	1.8	1.2	3.0	6.5	4.1	4.0	4.4	2.3	3.7	2.9	1.5	4.0	4.4	3.3	2.5	6.5
28	1.9	2.6	2.9	2.6	2.6	2.5	1.1	1.9	2.6	5.1	3.2	0.5	1.8	1.9	3.7	3.2	0.8	3.4	7.7	6.2	5.4	4.9	8.4	5.8	3.4	8.4
29	1.1	0.0	0.0	1.2	4.0	1.4	0.0	1.1	0.0	1.2	3.3	2.6	2.6	4.8	7.6	5.1	3.0	7.3	4.1	7.0	8.0	4.4	5.1	2.2	3.2	8.0
30	0.0	3.0	4.0	3.6	1.4	0.0	0.8	1.4	0.0	0.9	5.4	5.5	5.9	6.6	4.7	11.8	14.3	14.0	14.1	22.4	9.2	9.7	15.2	8.7	6.8	22.4
NO.	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	30	30	30	30	30	29	710	100%
MEAN	4.9	5.1	5.2	5.4	5.2	4.7	4.9	5.4	4.5	6.0	6.6	5.9	5.5	5.8	6.1	6.0	6.0	6.1	5.9	6.8	6.3	6.2	6.5	5.7		
MAX	13.9	16.5	16.9	16.9	16.8	13.9	14.2	19.4	17.9	22.1	20.8	16.8	17.0	10.9	12.8	11.8	18.4	14.0	15.3	22.4	15.7	15.0	15.4	17.2		



Number of 24HR Exceedences	0	Proposed Guideline
Number of Non-Zero Readings	700	
Maximum 1-HR Average	22.4 UG/M3	
Maximum 24-HR Average	11.8 UG/M3	
Monthly Calibration	9	Operational Time
Standard Deviation	3.9	Operational Uptime
		Monthly Average
		719 HRS
		99.9 %
		5.7 UG/M3

Windridge PM₁₀ (µg/m³) – November 2018

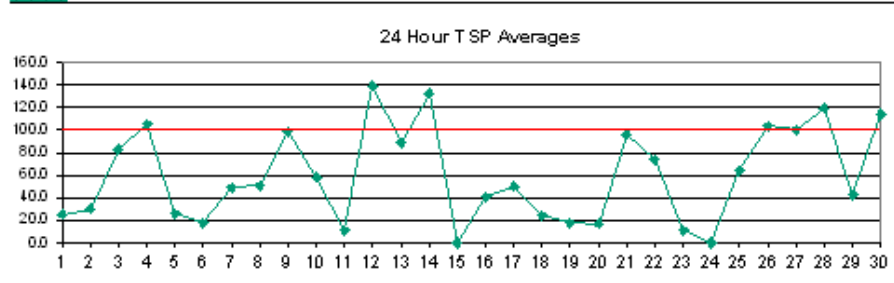
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	32.2	27.2	11.1	7.8	6.2	6.1	4.0	3.4	5.5	13.4	15.3	9.0	7.6	12.5	16.7	18.9	23.8	21.0	23.1	23.1	23.8	26.0	36.4	29.8	16.8	36.4
2	18.2	21.7	21.6	17.8	21.7	25.1	10.4	13.4	37.0	63.0	32.4	46.5	71.6	54.6	23.7	15.3	13.9	14.6	10.4	7.6	9.0	5.4	4.0	2.7	23.4	71.6
3	14.8	9.7	11.1	6.8	3.3	4.1	8.9	4.9	24.2	72.3	60.7	90.7	79.3	59.9	98.0	52.3	89.9	60.8	49.2	55.3	109.3	52.7	56.0	280.2	56.3	280.2
4	166.3	253.6	158.3	133.9	69.1	169.9	101.8	70.1	45.9	75.7	40.6	25.7	80.5	37.4	65.5	81.2	41.6	65.8	31.4	18.1	17.4	11.8	6.9	6.2	73.9	253.6
5	16.0	10.4	12.5	8.4	12.5	11.1	9.2	11.1	16.7	16.7	18.3	75.5	22.4	20.2	16.9	22.2	17.8	57.3	20.2	43.2	31.4	17.3	34.7	20.0	22.6	75.5
6	9.7	9.1	11.9	15.2	9.6	6.2	8.2	6.6	5.5	6.3	10.4	10.4	10.7	19.9	14.6	14.0	17.5	7.9	20.8	38.0	20.3	21.2	30.7	23.6	14.5	38.0
7	16.1	19.4	12.5	10.8	6.8	4.7	4.9	9.0	13.8	136.6	109.3	60.2	73.9	48.3	11.1	9.6	8.4	12.5	13.0	35.0	145.7	17.4	16.4	5.4	33.4	145.7
8	4.1	4.8	6.1	5.3	2.7	2.7	6.4	15.2	10.3	8.8	18.2	22.1	96.3	164.6	158.2	173.6	155.9	39.1	6.1	5.8	18.6	12.1	47.4	10.4	41.4	173.6
9	58.6	18.4	26.1	8.5	16.3	48.2	15.5	43.5	28.5	359.6	361.8	281.9	184.8	95.4	83.5	67.0	25.6	15.7	28.6	24.8	36.2	52.4	65.2	10.3	81.5	361.8
10	8.2	5.5	6.2	6.8	4.8	5.5	5.4	4.8	35.5	262.4	195.4	63.2	82.9	79.6	80.5	19.6	22.3	18.6	9.6	5.4	4.0	3.8	19.3	10.3	40.0	262.4
11	7.5	6.8	3.9	1.2	0.0	0.0	2.0	6.2	9.0	9.2	17.0	46.8	14.6	12.3	29.4	6.2	7.5	5.4	5.3	4.0	4.1	7.6	8.3	8.3	9.3	46.8
12	34.3	97.7	46.7	101.8	68.5	36.1	142.8	359.6	66.1	157.8	141.3	131.1	109.5	75.7	44.2	44.1	64.0	135.6	194.4	170.3	229.3	169.5	114.3	130.0	119.4	359.6
13	121.4	111.7	193.4	162.7	290.2	60.9	141.7	145.2	145.4	66.1	44.3	24.2	62.6	130.4	131.3	51.4	34.5	53.5	59.7	35.2	17.4	9.8	9.9	17.4	88.3	290.2
14	83.5	143.0	186.9	190.8	122.0	108.1	141.2	108.9	168.4	168.3	121.0	139.4	133.5	102.2	62.0	43.8	32.0	44.7	37.5	68.8	67.8	54.9	77.3	53.1	102.5	190.8
15	42.6	35.9	38.3	7.5	4.7	2.7	4.1	4.6	8.3	C	C	C	C	C	C	C	C	C	59.1	144.9	137.5	105.4	92.8	47.3		
16	62.6	61.8	16.2	25.2	25.8	44.8	34.7	14.8	14.6	14.6	17.4	16.1	23.0	20.2	19.4	11.0	8.2	6.9	7.6	8.3	7.7	12.5	14.6	13.3	20.9	62.6
17	16.6	10.5	14.6	13.2	13.2	13.4	25.1	18.7	11.2	17.4	13.7	82.7	106.9	99.5	63.3	39.7	23.3	32.5	46.2	37.6	23.3	113.9		X	39.6	113.9
18	64.6	60.0	69.9	84.0	17.5	11.8	11.9	14.6	15.9	6.0	4.1	9.8	15.2	11.0	6.1	1.9	0.4	2.0	4.0	0.5	0.0	0.6	3.3	2.7	17.4	84.0
19	4.8	6.1	7.5	4.7	3.4	5.7	4.7	4.1	6.9	9.0	7.7	16.3	32.6	13.3	18.1	50.5	11.0	7.5	6.3	16.0	13.8	26.4	13.9	13.8	12.7	50.5
20	7.7	14.3	11.7	8.3	19.4	11.7	8.9	6.2	6.2	9.1	16.6	10.3	7.1	19.9	37.9	12.0	24.2	11.0	8.4	17.4	14.8	21.5	14.5	17.6	14.0	37.9
21	25.6	9.0	10.4	12.0	21.5	44.4	52.0	14.5	9.7	9.0	7.6	7.2	27.2	68.6	172.9	84.0	100.7	174.6	167.1	111.3	133.4	111.8	106.3	131.6	67.2	174.6
22	91.9	74.7	80.7	34.9	28.9	37.9	36.2	20.8	12.0	59.9	103.2	87.0	110.6	145.1	77.5	52.0	54.9	59.7	23.4	3.5	12.0	22.1	10.3	6.9	51.9	145.1
23	8.9	6.1	1.9	2.0	5.4	4.7	2.6	2.0	4.1	7.0	12.4	8.3	9.8	6.6	4.2	9.4	6.3	14.6	14.8	21.7	23.1	24.4	19.5	15.5	9.8	24.4
24	23.9	11.2	16.7	13.2	11.1	9.3	11.8	9.7	11.6	13.2	11.0	15.3	15.3	13.3	18.7	13.1	10.3	8.4	8.6	23.2	29.0	8.0	26.2	8.0	14.2	29.0
25	5.4	4.1	4.7	2.6	2.8	11.0	6.8	13.8	9.0	39.7	24.1	40.7	105.0	45.9	58.8	47.2	54.9	59.1	124.8	100.6	96.1	52.8	56.4	33.0	41.6	124.8
26	96.0	77.6	120.4	87.9	54.0	81.8	28.0	27.9	53.5	90.5	77.6	87.5	67.0	107.3	70.2	65.6	80.0	69.5	51.7	68.5	58.5	34.6	47.4	95.1	70.8	120.4
27	70.2	67.1	81.3	65.7	18.2	20.6	4.4	2.4	22.8	70.9	45.5	68.3	73.8	101.6	81.4	103.5	73.5	56.7	47.3	28.0	90.0	85.2	148.2	158.1	66.0	158.1
28	51.7	159.4	49.8	45.0	16.0	13.5	6.7	2.0	10.0	171.8	75.6	30.8	88.3	101.8	116.6	69.6	69.3	112.8	58.8	77.1	94.0	111.1	164.1	71.9	73.6	171.8
29	19.2	5.7	17.1	1.2	1.7	3.3	2.6	3.4	5.2	23.0	15.7	30.6	19.6	52.8	58.4	61.0	54.6	44.6	30.3	39.8	78.5	38.8	47.5	6.8	27.6	78.5
30	4.0	2.0	4.7	3.3	0.5	1.9	2.6	2.0	7.3	53.8	124.5	31.4	113.6	119.6	60.2	166.3	196.6	197.1	190.9	188.8	69.3	88.6	192.6	31.6	77.2	197.1
NO.	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	30	30	30	30	30	29	710	100%
MEAN	39.5	44.8	41.8	36.3	29.3	26.9	28.2	32.1	27.3	69.3	60.1	54.1	63.6	63.4	58.9	49.3	46.2	48.3	44.8	47.7	54.3	41.0	53.3	43.5		
MAX	166.3	253.6	193.4	190.8	290.2	169.9	142.8	359.6	168.4	359.6	361.8	281.9	184.8	164.6	172.9	173.6	196.6	197.1	194.4	188.6	229.3	169.5	192.6	280.2		



Number of Non-Zero Readings	707
Maximum 1-HR Average	361.8 UG/M3
Maximum 24-HR Average	119.4 UG/M3
Monthly Calibration	9
Standard Deviation	54
Operational Time	719 HRS
Operational Uptime	99.9 %
Monthly Average	45.9 UG/M3

Windridge TSP ($\mu\text{g}/\text{m}^3$) – November 2018

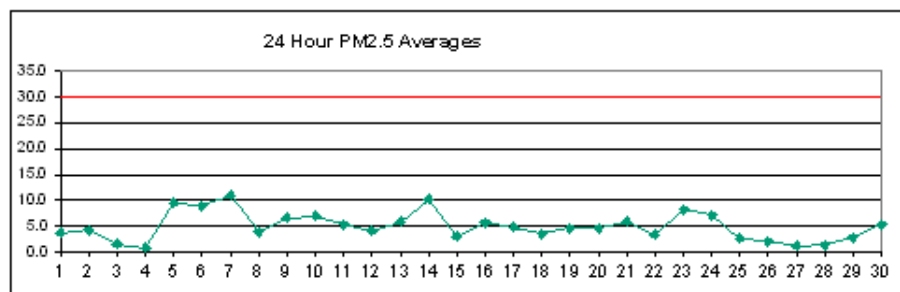
Day	HOUR																								MEAN	MAX
1	42.8	39.9	16.7	12.5	9.0	5.5	6.2	7.6	9.7	16.6	31.4	9.7	14.0	21.0	23.1	25.2	32.2	32.2	26.0	44.2	40.0	45.0	54.1	43.9	25.4	54.1
2	25.3	35.7	26.6	24.5	31.5	25.8	14.6	8.4	35.3	77.9	39.5	71.2	100.4	69.4	28.7	20.3	23.8	25.2	6.2	9.7	9.0	6.1	3.4	6.2	30.2	100.4
3	15.1	12.5	11.8	6.1	1.9	1.2	2.6	3.5	33.3	90.7	79.8	135.8	110.4	92.4	143.3	72.2	153.2	97.1	74.8	77.8	158.0	68.9	76.7	466.3	82.7	466.3
4	244.6	383.3	232.8	162.3	85.3	248.1	137.7	91.3	65.6	94.7	51.7	39.8	124.2	50.2	102.2	134.7	64.2	100.2	38.5	27.3	23.8	20.9	6.9	5.5	105.7	383.3
5	18.1	9.7	16.5	13.2	10.4	12.5	11.8	10.5	20.3	18.9	25.7	100.3	30.8	22.4	23.4	34.7	21.2	58.0	15.9	37.3	35.9	10.8	29.5	31.9	25.8	100.3
6	16.5	8.3	11.4	22.1	11.0	8.9	6.8	6.1	4.6	10.4	9.7	10.3	7.9	19.4	13.2	14.8	22.8	11.4	24.6	55.6	31.4	25.0	46.8	36.0	18.1	55.6
7	15.4	20.1	14.5	11.1	11.0	6.3	10.3	7.6	13.8	239.9	194.1	92.4	129.0	75.1	11.7	9.7	11.8	11.1	13.2	47.0	184.3	27.1	15.8	8.2	49.2	239.9
8	5.5	6.2	6.2	9.0	11.0	6.2	10.0	21.4	11.7	8.0	24.4	31.6	122.8	192.2	185.8	207.6	195.9	53.5	4.8	7.9	21.0	23.1	49.6	11.9	51.1	207.6
9	71.2	20.5	29.4	15.9	13.8	64.2	17.0	56.2	35.6	394.0	412.7	367.5	236.7	108.8	96.6	77.1	36.8	23.7	49.3	27.8	48.8	63.1	83.2	6.8	98.2	412.7
10	6.3	12.4	8.3	9.8	8.2	6.1	5.5	6.2	45.6	375.8	291.5	90.9	123.3	127.8	111.2	27.3	28.9	35.2	11.1	9.6	5.5	5.9	22.5	18.5	58.0	375.8
11	4.1	6.8	5.5	5.5	7.6	6.8	4.8	8.3	9.1	14.2	25.6	41.4	14.1	20.5	30.8	3.4	7.2	6.2	6.8	4.9	9.8	13.8	8.9	9.5	11.5	41.4
12	56.7	125.9	66.8	117.6	89.6	48.7	172.0	383.8	77.0	144.0	155.1	158.5	128.9	91.3	57.1	64.6	90.1	173.8	246.7	196.0	251.8	180.5	130.5	136.8	139.3	383.8
13	142.2	113.4	193.2	143.9	121.2	47.4	142.1	159.5	141.1	67.6	45.1	26.8	88.7	167.3	142.2	60.9	53.4	78.8	80.1	48.7	24.8	8.9	7.9	23.8	88.7	193.2
14	104.7	176.5	242.5	269.1	160.5	156.2	175.9	145.3	203.0	181.0	153.7	191.7	189.0	141.2	73.9	41.1	28.6	48.2	40.3	101.8	89.8	79.6	106.8	74.2	132.3	269.1
15	59.4	47.8	47.9	1.9	1.3	4.7	4.0	3.6	12.5	C	C	C	C	C	C	C	C	C	84.3	201.5	188.6	133.9	125.6	60.0		
16	74.1	87.9	43.6	86.0	69.7	154.0	92.4	23.2	32.0	22.3	19.2	26.1	38.1	55.2	37.6	22.8	3.4	4.9	12.5	9.7	9.1	16.2	28.4	10.5	40.7	154.0
17	14.6	14.0	15.2	9.2	21.5	13.0	35.5	20.2	18.3	27.9	25.0	94.9	128.7	117.9	96.2	85.2	51.7	34.0	52.9	61.3	66.1	29.6	117.3	X	50.0	128.7
18	91.9	76.1	86.3	108.9	18.1	15.2	14.8	22.4	24.9	7.5	5.6	12.7	25.7	15.9	9.7	8.2	6.8	5.4	4.0	4.0	2.0	4.1	4.8	5.5	24.2	108.9
19	8.9	6.2	8.3	7.5	3.3	2.7	4.7	4.9	14.6	11.7	9.3	30.5	48.8	19.8	24.0	72.9	18.0	8.9	5.8	23.7	19.8	33.3	15.4	17.6	17.5	72.9
20	9.0	11.8	13.8	12.7	23.6	13.9	9.6	5.4	4.1	9.1	13.1	9.7	9.4	34.0	53.5	18.4	34.7	16.4	9.1	16.9	22.5	16.0	16.8	22.5	16.9	53.5
21	26.9	6.2	10.5	17.6	27.1	51.6	66.7	22.2	11.1	10.3	7.8	8.1	38.0	85.8	233.2	121.2	166.2	276.7	263.6	193.3	209.0	161.0	141.9	162.1	96.6	276.7
22	125.3	99.0	109.4	50.5	46.6	58.8	46.7	27.1	16.7	91.0	136.1	112.7	157.3	202.6	112.5	71.3	84.6	95.3	39.4	8.5	20.6	39.5	12.4	6.9	73.8	202.6
23	10.3	7.5	4.7	3.4	4.3	2.6	0.0	1.9	2.6	3.5	13.8	7.3	13.2	11.0	9.0	15.1	5.0	20.2	18.9	23.0	21.1	25.8	21.0	23.8	11.2	25.8
24	24.4	17.3	10.4	9.8	7.6	7.6	11.1	10.4	11.9	17.5	18.6	7.8	19.6	23.1	23.7	18.8	15.2	9.1	16.8	29.7	34.5	7.6	45.8	17.3	N/A	43.6
25	8.2	3.3	0.5	0.0	5.7	19.9	2.3	17.3	10.0	59.4	35.1	74.1	192.5	69.5	84.9	76.3	90.9	96.5	204.1	159.1	117.6	83.0	82.2	43.6	64.0	204.1
26	116.0	126.4	211.6	152.9	86.8	95.4	45.0	47.0	81.0	118.5	129.8	131.6	93.2	144.1	94.5	103.2	120.1	104.2	68.5	81.6	81.7	52.1	70.8	128.5	103.5	211.6
27	78.4	92.9	126.0	91.5	25.4	32.3	2.9	6.0	35.9	110.3	68.3	107.3	120.2	141.8	122.1	137.5	111.5	93.5	88.6	50.1	138.3	153.9	238.1	230.8	100.2	238.1
28	85.2	152.7	82.5	56.3	26.4	17.1	0.0	1.5	20.3	253.5	112.8	53.6	164.7	192.0	207.6	133.0	129.5	191.2	105.4	140.7	168.4	173.5	280.4	108.2	119.0	280.4
29	30.4	12.1	24.7	1.9	1.3	3.3	3.4	4.5	7.2	21.6	16.0	45.4	34.0	84.7	97.2	102.8	100.8	73.2	43.1	58.5	110.9	60.7	69.0	6.1	42.2	110.9
30	3.3	0.6	5.5	6.8	3.2	0.0	0.0	4.1	6.0	66.9	165.8	49.5	164.6	185.5	102.1	267.0	293.7	317.4	296.4	280.0	97.6	123.5	260.6	33.2	113.9	317.4
NO.	30	30	30	30	30	30	30	30	30	29	29	29	29	29	29	29	29	29	30	30	30	30	30	29	710	100%
MEAN	51.2	57.8	56.1	48.0	31.5	37.9	35.2	37.9	33.8	88.4	79.9	73.8	91.9	89.0	81.1	70.6	69.0	72.5	65.0	67.9	74.7	56.4	72.4	60.6		
MAX	244.6	383.3	242.5	269.1	160.5	248.1	175.9	383.8	203.0	394.0	412.7	367.5	236.7	202.6	233.2	267.0	293.7	317.4	296.4	280.0	251.8	180.5	280.4	466.3		



Number of 24HR Exceedences	7	Proposed Guideline
Number of Non-Zero Readings	705	
Maximum 1-HR Average	466.3 UG/M3	
Maximum 24-HR Average	139.3 UG/M3	
IZS Calibration Time		Operational Time
Down Time	0	Operational Uptime
Standard Deviation	72.3	Monthly Average
		719 HRS
		99.9 %
		62.4 UG/M3

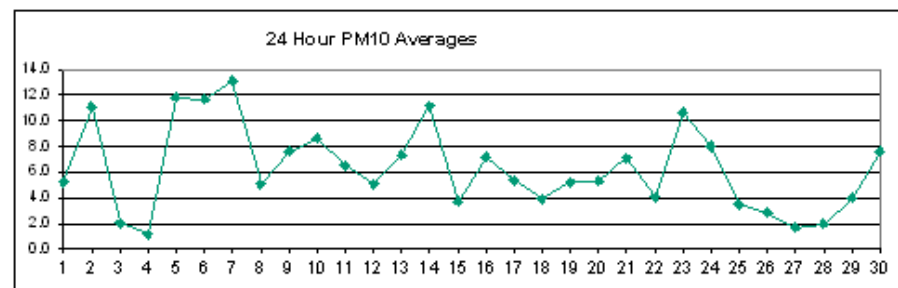
West PM_{2.5} (µg/m³) – November 2018

HOUR																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	MAX
1	1.9	2.2	1.9	1.4	1.2	1.0	1.5	1.9	3.2	4.1	4.3	4.1	4.5	5.3	5.4	6.1	6.1	4.9	5.4	5.0	5.2	5.5	3.1	3.1	3.7	6.1
2	7.2	7.9	8.2	7.9	5.9	1.3	1.4	1.3	1.0	0.8	2.5	3.3	15.1	11.7	7.2	6.4	3.6	1.4	1.3	1.0	1.9	1.6	1.3	2.9	4.3	15.1
3	5.4	3.9	3.3	2.2	2.1	1.2	1.0	1.2	1.6	1.8	1.2	1.5	1.0	1.2	1.2	0.9	1.1	1.0	1.0	1.0	0.8	1.3	1.5	1.0	1.6	5.4
4	0.5	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.3	0.5	0.3	0.3	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.7	3.1	4.5	6.4	0.9	6.4
5	8.4	8.5	9.1	9.6	10.1	9.8	9.9	9.8	10.6	10.1	9.7	10.5	11.1	12.6	11.3	11.9	10.4	9.9	11.1	9.6	6.7	6.4	4.8	4.8	9.4	12.6
6	4.1	7.0	5.0	6.1	7.0	6.9	6.8	6.6	7.1	8.3	8.1	9.3	9.0	8.3	7.1	7.1	6.4	8.4	12.5	15.1	14.5	15.7	13.4	16.5	9.0	16.5
7	15.3	13.3	11.6	10.6	10.6	12.5	12.7	12.1	11.7	12.9	12.5	11.1	10.5	9.1	8.4	10.0	11.2	12.4	14.9	13.7	8.3	6.5	5.3	4.1	10.9	15.3
8	3.3	2.9	2.6	2.5	2.4	2.5	3.1	4.2	3.3	4.0	5.0	6.0	6.2	5.3	4.8	4.3	3.2	3.2	3.6	4.2	4.6	5.1	5.4	3.9	6.2	
9	5.3	5.6	5.6	5.9	6.2	6.6	6.9	6.9	7.0	6.6	6.8	6.8	6.4	6.2	5.9	5.5	6.4	6.3	6.9	7.7	7.8	7.9	8.0	8.0	6.6	8.0
10	8.1	8.1	8.0	7.9	8.2	8.2	8.1	8.3	8.8	9.6	10.0	8.9	7.6	6.5	5.2	5.5	4.3	3.5	4.2	6.7	4.9	6.4	5.6	5.4	7.0	10.0
11	4.8	4.5	4.4	4.8	4.4	5.1	6.2	6.5	6.1	6.2	5.3	5.0	5.8	6.5	5.2	4.4	5.1	3.9	4.5	5.7	6.8	6.7	5.1	4.2	5.3	6.8
12	3.8	3.8	3.8	3.6	3.5	4.2	4.3	4.7	4.8	4.8	5.4	4.6	4.5	3.9	4.0	3.2	3.3	3.7	3.9	4.1	4.2	4.3	4.6	4.8	4.2	5.4
13	4.9	4.9	5.3	5.1	4.7	5.0	5.5	5.2	5.4	5.5	5.5	6.3	6.3	5.6	6.3	6.6	6.3	5.8	5.3	5.5	5.6	6.3	7.7	10.4	5.9	10.4
14	12.9	14.1	14.5	14.2	13.8	13.7	13.5	12.7	12.9	13.3	13.9	12.9	12.3	10.6	10.4	10.1	10.2	8.9	5.3	4.4	3.0	2.8	3.0	3.2	10.3	14.5
15	3.3	3.6	3.5	3.6	3.4	3.3	2.8	2.6	3.0	3.7	5.3	7.9	5.0	3.9	2.9	3.2	X	2.1	1.8	1.5	1.4	1.3	1.1	1.0	3.1	7.9
16	0.8	2.7	6.5	8.6	8.6	8.2	7.9	6.3	5.8	5.9	5.8	5.4	4.9	4.3	4.4	3.4	4.2	5.8	6.2	6.3	6.5	6.5	6.3	5.6	5.7	8.6
17	5.4	5.8	5.6	5.3	5.3	5.3	5.2	5.1	5.4	5.3	5.5	5.9	5.3	4.4	4.3	3.9	3.8	3.8	3.9	4.2	4.0	3.9	3.9	3.9	4.8	5.9
18	3.8	3.6	3.6	3.4	3.4	3.4	3.2	3.2	3.1	3.2	3.5	3.1	3.7	3.6	3.5	3.7	3.1	2.7	2.6	3.3	3.6	4.0	4.5	4.7	3.5	4.7
19	4.7	4.8	4.8	4.8	4.8	4.8	4.9	5.0	5.2	4.8	5.4	6.5	6.0	5.4	5.2	4.3	3.2	2.7	2.9	3.5	3.8	4.1	4.4	4.4	4.6	6.5
20	4.5	4.4	4.3	4.2	4.3	4.4	4.4	4.2	4.2	4.3	4.4	5.6	6.9	6.1	6.9	4.3	4.0	3.8	4.0	3.9	4.1	4.2	4.5	4.5	4.6	6.9
21	4.5	4.6	4.6	4.8	5.2	5.2	5.2	5.1	5.4	5.4	6.4	7.3	8.0	7.3	6.8	6.6	6.4	6.8	6.7	7.3	7.6	7.0	5.0	4.0	6.0	8.0
22	3.8	5.2	5.5	5.7	5.2	4.3	4.1	3.4	3.5	5.7	4.3	4.7	3.6	3.0	2.1	2.4	1.4	2.9	1.2	0.9	1.8	2.7	2.7	2.6	3.5	5.7
23	2.9	3.2	2.8	2.9	2.9	2.7	2.4	2.9	2.9	3.1	2.9	2.3	2.0	2.2	2.1	1.6	7.2	16.7	18.7	21.3	23.6	24.7	22.5	22.0	8.3	24.7
24	16.3	14.7	13.6	13.7	13.8	12.5	12.6	11.5	13.7	14.7	9.7	3.2	2.5	2.0	1.1	1.5	1.6	2.0	1.4	2.0	2.9	2.2	2.5	2.0	7.2	16.3
25	2.0	1.8	1.6	1.8	1.7	1.6	2.4	2.1	2.0	2.3	5.0	7.0	4.8	3.9	3.3	3.1	3.1	2.0	2.0	2.8	2.3	2.0	1.7	1.8	2.7	7.0
26	1.7	1.7	1.7	1.6	1.8	2.7	1.9	2.1	1.9	3.6	5.2	4.5	3.2	4.0	3.7	2.4	2.3	1.4	0.9	0.8	0.7	0.6	0.4	0.3	2.1	5.2
27	0.3	0.3	0.2	0.2	0.3	0.4	1.1	0.6	0.7	1.1	3.5	4.6	2.9	1.8	1.7	3.0	1.7	0.9	0.3	1.0	1.0	0.4	0.4	0.2	1.2	4.6
28	0.2	0.2	0.2	0.3	0.5	0.6	0.7	1.2	3.2	4.3	5.8	2.8	2.3	2.0	1.7	1.1	0.8	1.2	0.6	1.6	0.5	0.4	0.5	0.6	1.4	5.8
29	0.9	0.7	0.8	0.7	0.8	1.0	1.1	1.4	2.3	2.4	5.3	7.0	6.5	6.3	6.1	5.6	3.3	2.9	1.7	2.8	2.5	2.1	2.0	1.9	2.9	7.0
30	1.9	1.7	1.5	1.6	1.6	1.5	2.5	2.6	4.2	5.4	6.7	6.7	7.0	7.1	8.9	9.1	6.7	7.3	5.8	8.7	6.7	6.3	7.7	8.4	5.3	9.1
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	719	100%
MEAN	4.8	4.9	4.8	4.8	4.8	4.7	4.8	4.7	5.0	5.5	5.8	5.8	5.8	5.3	4.9	4.7	4.5	4.6	4.7	5.2	4.9	5.0	4.8	4.9		
MAX	16.3	14.7	14.5	14.2	13.8	13.7	13.5	12.7	13.7	14.7	13.9	12.9	15.1	12.6	11.3	11.9	11.2	16.7	18.7	21.3	23.6	24.7	22.5	22.0		



West PM₁₀ (µg/m³) – November 2018

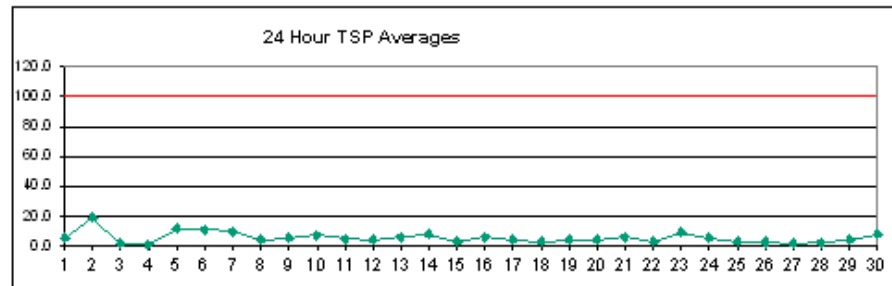
HOUR																										
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	MAX
1	2.4	2.9	2.4	1.6	1.4	1.2	1.8	2.3	4.4	5.9	6.3	6.0	6.6	7.9	8.0	9.1	9.1	7.4	8.1	7.5	7.7	7.8	3.7	4.0	5.2	9.1
2	10.7	11.9	12.2	11.4	8.5	1.6	1.8	1.7	1.4	1.2	9.2	10.9	72.2	38.6	20.5	17.9	17.1	2.8	1.8	1.3	2.8	2.4	1.8	4.2	11.1	72.2
3	7.2	5.1	4.0	2.6	2.4	1.5	1.1	1.6	2.2	2.5	1.6	2.0	1.3	1.6	1.5	1.0	1.2	1.1	1.2	1.1	0.9	1.6	2.1	1.4	2.1	7.2
4	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.4	0.6	0.5	0.4	0.5	0.6	0.5	0.4	0.3	0.4	0.3	0.9	4.6	6.6	8.8	1.2	8.8
5	10.3	11.4	11.3	10.4	11.0	10.8	10.4	10.6	13.6	12.7	12.1	14.1	15.3	17.1	14.6	15.0	13.0	12.4	14.3	11.9	8.6	9.2	6.7	6.7	11.8	17.1
6	5.5	9.5	6.9	8.6	8.9	9.2	8.4	8.4	8.9	10.1	10.2	11.5	11.3	10.4	8.8	9.1	8.0	10.8	16.3	19.5	18.7	20.4	16.5	23.5	11.6	23.5
7	20.3	16.4	12.3	11.3	11.6	13.6	13.6	12.6	12.6	16.4	15.8	13.3	13.3	11.3	10.4	12.6	14.0	16.6	20.9	18.7	9.4	7.3	6.1	4.4	13.1	20.9
8	3.6	3.0	2.7	2.7	2.5	2.8	3.8	5.8	4.3	5.4	7.1	8.8	9.1	7.7	7.1	6.2	4.4	4.4	4.0	4.2	4.8	5.2	5.8	6.1	5.1	9.1
9	5.6	6.0	5.9	6.1	6.5	7.1	7.6	7.9	8.2	7.7	8.5	8.7	8.2	8.2	7.5	6.8	8.3	7.6	8.3	8.9	8.4	8.3	8.4	8.2	7.6	8.9
10	8.4	8.4	8.2	8.0	8.4	9.1	8.9	9.8	10.8	12.5	12.8	11.6	9.8	8.7	7.2	7.9	6.0	5.0	6.1	10.0	7.0	8.8	7.1	6.2	8.6	12.8
11	5.2	4.7	4.7	5.3	4.6	6.0	8.3	8.3	7.5	8.4	6.9	6.3	7.9	8.8	7.0	5.8	6.8	4.7	5.5	7.5	8.3	8.0	5.8	4.7	6.5	8.8
12	4.1	3.9	4.0	3.8	3.8	4.8	5.2	5.7	6.1	6.2	7.6	6.2	6.3	5.2	5.6	4.3	4.5	5.1	5.1	5.1	4.7	4.7	4.9	5.2	5.1	7.6
13	5.8	5.4	6.5	6.2	5.0	5.7	6.9	6.2	6.4	7.0	7.1	8.9	9.1	7.8	9.1	9.8	8.9	8.1	6.6	6.2	6.1	6.7	8.6	11.2	7.3	11.2
14	13.6	14.9	14.9	14.6	14.1	14.0	14.1	12.9	13.4	14.4	17.7	16.5	15.9	12.6	11.4	11.0	10.8	9.2	5.4	4.5	3.1	3.0	3.1	3.2	11.2	17.7
15	3.3	3.6	3.5	3.6	3.4	3.3	2.9	2.7	3.3	4.5	7.5	11.4	7.0	5.3	3.9	4.4	X	3.1	2.3	1.7	1.5	1.4	1.3	1.0	3.7	11.4
16	0.8	3.7	8.8	11.1	10.9	10.0	8.8	7.0	6.8	7.4	6.9	7.3	6.9	6.0	6.1	4.3	5.3	8.5	8.9	8.7	8.9	6.7	6.9	6.1	7.2	11.1
17	5.9	6.3	6.2	5.6	5.6	5.5	5.5	5.4	5.9	5.8	6.5	7.7	7.1	5.6	5.6	4.8	4.4	4.3	4.3	4.5	4.2	4.1	4.2	4.2	5.4	7.7
18	4.0	3.9	4.0	3.5	3.5	3.5	3.3	3.4	3.2	3.6	4.2	4.0	5.2	5.0	4.8	5.1	4.1	3.1	2.8	3.5	3.7	4.1	4.6	4.9	4.0	5.2
19	4.7	4.8	4.8	4.9	4.9	4.9	4.9	5.1	5.4	5.1	6.7	8.7	8.3	7.6	7.5	6.0	4.0	3.0	3.0	3.6	3.9	4.2	4.5	4.5	5.2	8.7
20	4.6	4.4	4.4	4.3	4.4	4.4	4.4	4.3	4.3	4.4	5.0	7.5	9.8	8.6	9.5	5.9	5.4	4.5	4.7	4.1	4.2	4.3	4.6	4.5	5.3	9.8
21	4.6	4.7	4.7	5.0	5.7	5.4	5.3	5.2	5.5	5.9	7.7	9.4	10.7	9.9	8.9	8.9	8.6	8.8	8.7	8.9	9.5	8.7	5.7	4.4	7.1	10.7
22	4.1	5.6	5.9	6.0	5.4	4.4	4.5	3.8	4.1	6.8	5.2	6.7	5.1	4.3	2.9	3.4	1.8	4.0	1.4	1.0	2.3	2.9	2.8	2.7	4.1	6.8
23	3.0	3.4	2.9	2.9	2.9	2.7	2.4	3.0	3.0	3.3	3.2	2.5	2.2	2.5	2.6	1.9	10.2	24.1	26.3	28.3	30.9	30.9	30.3	29.6	10.6	30.9
24	17.7	15.4	14.2	16.2	15.7	12.8	13.0	11.9	14.4	16.0	10.7	3.7	2.8	2.4	1.4	2.0	2.1	2.8	1.9	2.7	3.8	2.7	3.3	2.4	8.0	17.7
25	2.2	1.9	1.7	1.9	1.8	1.6	3.0	2.5	2.4	2.8	7.1	10.3	6.9	5.7	4.6	4.4	4.3	2.5	2.6	3.8	3.0	2.4	2.0	2.2	3.5	10.3
26	2.0	2.1	1.9	1.8	2.1	3.1	2.2	2.6	2.3	5.1	7.5	6.5	4.6	5.7	5.3	3.4	3.3	1.8	1.1	0.9	0.8	0.7	0.5	0.4	2.8	7.5
27	0.3	0.4	0.3	0.2	0.3	0.5	1.3	0.8	1.0	1.6	5.1	6.7	4.2	2.6	2.5	4.3	2.4	1.3	0.3	1.4	1.3	0.5	0.6	0.3	1.7	6.7
28	0.2	0.2	0.3	0.4	0.6	0.8	1.0	1.7	4.8	6.3	8.5	4.1	3.3	2.9	2.5	1.5	1.1	1.6	0.8	2.1	0.7	0.4	0.5	0.7	2.0	8.5
29	1.2	0.8	0.9	0.8	0.9	1.2	1.3	1.7	3.1	3.2	7.7	10.3	9.6	9.3	9.1	8.3	5.0	4.3	2.4	4.0	3.4	2.6	2.3	2.2	4.0	10.3
30	2.1	1.8	1.6	1.7	1.8	1.7	3.3	3.6	6.1	8.1	9.9	9.9	10.4	10.6	13.1	13.5	10.0	11.0	8.7	13.0	10.1	9.2	10.7	11.5	7.6	13.5
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	719	100%
MEAN	5.5	5.6	5.4	5.4	5.3	5.1	5.3	5.3	5.9	6.7	7.8	8.1	9.7	8.0	7.0	6.6	6.4	6.1	6.1	6.6	6.1	6.1	5.7	6.0		
MAX	20.3	16.4	14.9	16.2	15.7	14.0	14.1	12.9	14.4	16.4	17.7	16.5	72.2	38.6	20.5	17.9	17.1	24.1	26.3	28.3	30.9	30.9	30.3	29.6		



Number of Non-Zero Readings	719
Maximum 1-HR Average	72.2 UG/M3
Maximum 24-HR Average	13.1 UG/M3
IS Calibration Time	
Down Time	0
Standard Deviation	5.4
Operative Time	719 HRS
Operative Uptime	99.9 %
Monthly Average	6.3 UG/M3

West TSP ($\mu\text{g}/\text{m}^3$) – November 2018

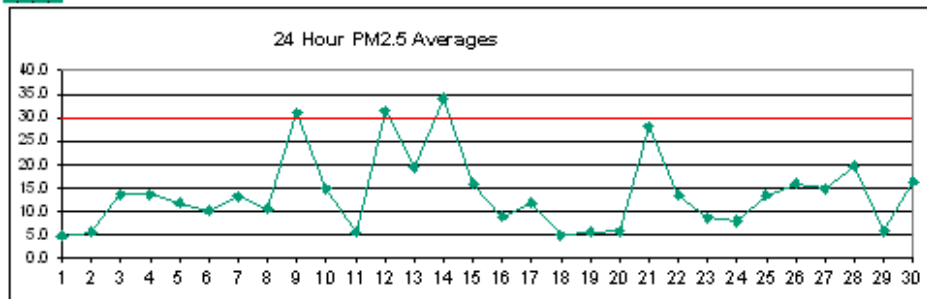
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	2.0	2.5	1.9	1.1	1.0	0.8	1.4	1.7	4.4	6.3	6.9	6.3	7.2	8.9	9.0	10.4	10.3	8.1	9.1	8.2	7.9	6.9	2.6	3.4	5.3	10.4
2	11.8	13.0	12.9	11.8	7.8	1.1	1.3	1.3	3.8	3.7	18.2	15.4	156.2	74.2	33.0	29.3	40.1	3.7	1.5	1.1	2.6	2.3	1.5	3.8	18.8	156.2
3	5.2	3.5	2.7	1.7	1.6	1.2	0.8	1.3	2.0	2.3	1.4	1.8	1.1	1.4	1.4	0.7	0.9	0.7	0.8	0.7	0.6	1.3	1.9	1.2	1.6	5.2
4	0.5	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.6	0.4	0.4	0.4	0.6	0.4	0.3	0.2	0.3	0.2	0.9	4.7	5.8	8.4	1.1	8.4
5	12.0	10.7	8.0	6.9	7.5	7.2	6.8	7.1	13.9	14.1	13.6	14.1	13.0	14.6	14.1	16.5	14.6	13.9	15.0	13.5	10.0	10.3	6.8	6.5	11.3	16.5
6	4.5	9.4	6.1	8.0	6.3	6.9	6.0	6.0	9.2	11.8	10.9	13.3	12.6	11.5	10.2	10.6	7.4	10.7	15.7	20.9	17.4	18.0	12.8	19.3	11.1	20.9
7	14.9	11.1	8.0	7.4	7.6	8.8	8.8	8.1	8.2	12.1	11.8	9.6	11.2	9.6	9.5	12.3	15.4	15.7	18.3	13.4	6.5	5.1	4.4	2.9	10.0	18.3
8	2.4	2.0	1.8	1.7	1.6	1.9	3.1	5.4	3.6	4.9	7.0	9.4	9.9	8.2	7.2	6.2	3.9	3.7	2.9	2.8	3.2	3.5	3.9	4.1	4.4	9.9
9	3.7	4.0	3.8	4.0	4.2	4.7	5.1	5.7	6.2	5.9	7.3	7.7	6.9	7.0	6.2	5.4	6.9	6.0	6.2	6.1	5.6	5.4	5.4	5.3	5.6	7.7
10	5.4	5.4	5.4	5.2	5.5	6.7	6.4	7.5	9.4	11.7	12.7	11.5	9.8	8.4	6.9	8.0	5.5	4.4	5.4	9.7	6.2	7.2	5.0	4.2	7.2	12.7
11	3.4	3.1	3.0	3.5	3.0	4.1	7.3	6.4	5.9	7.0	5.3	4.7	7.6	8.4	5.9	4.8	5.8	3.3	3.8	5.4	5.6	5.6	4.1	3.3	5.0	8.4
12	2.7	2.6	2.8	2.6	2.7	3.7	4.1	4.4	5.0	5.0	7.0	5.2	5.9	4.5	5.1	3.6	3.9	4.3	4.1	3.8	3.2	3.1	3.3	3.5	4.0	7.0
13	4.2	3.7	5.1	4.8	3.4	4.1	5.6	4.6	4.7	5.4	5.5	8.6	9.1	6.8	8.8	10.1	8.0	7.2	4.7	4.1	4.0	4.4	5.8	7.4	5.8	10.1
14	8.9	9.8	9.7	9.6	9.1	9.1	9.6	8.3	8.8	9.9	14.9	13.8	12.0	9.1	7.6	7.2	7.1	5.9	3.5	2.9	2.1	2.1	2.0	2.1	7.7	14.9
15	2.1	2.3	2.3	2.4	2.2	2.1	1.9	1.8	2.2	3.5	7.4	12.2	6.9	4.8	3.4	4.2	X	4.5	1.7	1.2	1.0	1.0	0.8	0.7	3.2	12.2
16	0.5	3.9	9.2	10.5	10.2	7.9	6.0	4.8	5.0	5.5	5.0	6.4	6.5	5.5	5.5	3.4	4.4	8.8	8.4	7.6	6.9	4.8	4.6	4.0	6.1	10.5
17	3.9	4.3	4.2	3.7	3.7	3.6	3.7	3.7	4.0	4.3	5.2	7.1	6.1	4.5	4.7	3.7	3.1	3.1	3.1	3.1	2.8	2.7	2.9	2.8	3.9	7.1
18	2.7	2.6	2.9	2.3	2.3	2.3	2.2	2.3	2.1	2.7	3.4	3.4	4.9	4.8	4.5	4.7	3.5	2.1	1.8	2.4	2.4	2.7	3.0	3.1	3.0	4.9
19	3.1	3.1	3.1	3.2	3.1	3.2	3.2	3.3	3.5	3.3	5.9	8.5	8.3	7.4	7.5	5.9	3.2	2.1	2.0	2.3	2.5	2.7	2.9	2.9	4.0	8.5
20	2.9	2.8	2.8	2.8	2.8	2.9	2.9	2.8	2.8	2.8	3.8	7.0	10.2	8.6	9.6	5.4	4.5	3.2	3.5	2.7	2.8	2.8	3.0	2.9	4.1	10.2
21	3.0	3.0	3.0	3.3	4.0	3.5	3.4	3.4	3.6	4.0	6.9	9.5	10.8	10.4	8.5	8.9	7.9	7.5	7.3	7.3	7.4	6.8	4.2	3.1	5.8	10.8
22	2.8	3.7	3.8	4.0	3.5	2.9	3.0	2.7	3.0	4.9	3.9	6.9	5.1	4.2	2.8	3.3	1.3	3.9	1.0	0.7	1.8	1.9	1.8	1.8	3.1	6.9
23	1.9	2.2	1.9	1.9	1.9	1.7	1.6	2.0	2.0	2.2	2.1	1.7	1.5	1.8	2.1	1.4	8.7	19.7	19.8	26.1	32.2	34.2	24.0	21.9	9.0	34.2
24	11.7	10.0	9.3	10.8	10.3	8.3	8.5	7.7	9.3	10.4	7.1	2.6	1.9	1.8	1.0	1.8	2.0	2.8	1.7	2.4	3.2	2.0	3.0	1.8	5.5	11.7
25	1.4	1.3	1.1	1.3	1.2	1.0	2.6	2.0	1.9	2.4	7.5	11.4	7.5	5.8	4.5	4.3	4.2	2.1	2.2	3.4	2.6	1.9	1.5	1.8	3.2	11.4
26	1.5	1.8	1.4	1.3	1.5	2.2	1.7	2.2	1.9	5.1	7.7	6.8	4.6	5.8	5.3	3.1	3.0	1.5	0.8	0.6	0.5	0.5	0.3	0.2	2.6	7.7
27	0.2	0.3	0.2	0.2	0.3	0.4	0.9	0.7	1.0	1.6	5.6	7.3	4.5	2.6	2.5	4.6	2.5	1.1	0.2	1.3	1.3	0.5	0.5	0.2	1.7	7.3
28	0.1	0.1	0.2	0.3	0.5	0.8	0.9	1.8	5.2	6.8	9.3	4.1	3.4	2.9	2.4	1.4	1.0	1.6	0.6	2.1	0.6	0.3	0.4	0.5	2.0	9.3
29	1.0	0.6	0.6	0.5	0.6	0.6	0.9	1.2	2.8	2.8	8.1	11.4	10.8	10.5	10.3	9.4	5.4	4.4	2.0	3.8	2.8	1.9	1.6	1.5	4.0	11.4
30	1.4	1.3	1.1	1.1	1.3	1.1	2.8	3.0	6.0	8.7	11.0	11.2	12.0	12.1	15.2	15.6	11.6	12.7	9.7	14.6	10.8	7.9	8.3	7.9	7.9	15.6
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	29	30	30	30	30	30	30	30	719	100%
MEAN	4.1	4.1	3.9	3.9	3.7	3.5	3.7	3.8	4.7	5.7	7.4	8.0	12.3	8.9	7.2	6.9	6.8	5.6	5.2	5.8	5.2	5.2	4.3	4.4		
MAX	14.9	13.0	12.9	11.8	10.3	9.1	9.6	8.3	13.9	14.1	18.2	15.4	156.2	74.2	33.0	29.3	40.1	19.7	19.8	26.1	32.2	34.2	24.0	21.9		



Number of 24HR Exceedences	0	Proposed Guideline
Number of Non-Zero Readings	719	
Maximum 1-HR Average	156.2 UG/M3	
Maximum 24-HR Average	18.8 UG/M3	
IZS Calibration Time		Operational Time
Down Time	0	Operational Uptime
Standard Deviation	7.769	Monthly Average
		719 HRS
		99.9 %
		5.6 UG/M3

Berm PM_{2.5} (µg/m³) – November 2018

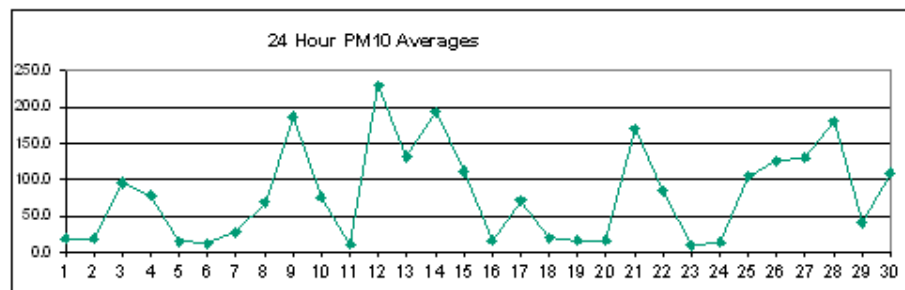
DAY	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	6.8	2.9	3.3	2.6	4.3	3.5	2.0	1.9	4.3	4.3	2.2	3.1	3.5	4.2	5.1	5.3	5.0	5.0	8.1	7.1	5.8	10.3	6.9	9.0	4.8	10.3
2	8.4	7.9	9.0	10.5	9.6	2.6	2.0	4.2	9.1	7.8	8.0	12.3	13.9	8.4	5.0	4.6	3.2	1.2	1.4	1.1	1.2	1.0	1.2	3.6	5.7	13.9
3	3.9	5.3	3.2	2.2	2.0	2.9	2.1	3.7	9.8	13.4	31.7	15.3	25.3	31.5	11.8	20.7	17.2	11.1	7.4	13.5	11.9	15.0	26.4	40.0	13.6	40.0
4	116.1	15.9	14.4	12.3	28.8	13.9	13.6	6.3	6.4	3.6	3.0	11.9	6.5	12.6	17.0	6.8	10.4	5.9	4.2	3.8	3.7	1.5	2.5	6.5	13.6	116.1
5	8.3	9.1	9.9	11.2	11.0	10.3	10.2	10.8	10.6	13.2	26.3	16.1	10.8	11.7	12.1	11.5	16.3	13.0	16.0	12.2	6.0	9.5	11.8	7.1	11.9	26.3
6	5.8	8.4	7.3	6.4	5.2	6.7	7.3	5.9	6.9	7.5	8.0	10.5	12.3	8.8	7.6	7.0	8.0	13.7	17.9	15.7	15.4	17.7	17.4	17.0	10.2	17.9
7	14.6	11.9	11.0	9.9	9.0	8.4	9.1	10.2	34.5	35.4	19.7	24.4	17.4	15.4	7.0	8.1	6.6	6.3	11.3	25.1	8.2	6.9	5.4	4.3	13.3	35.4
8	3.4	3.0	3.1	3.2	2.8	2.9	3.7	4.4	2.7	4.2	5.3	13.7	28.4	46.3	54.6	22.1	7.1	2.7	3.2	5.7	5.6	9.1	6.0	11.7	10.6	54.6
9	8.1	7.6	6.3	6.8	13.3	9.1	11.7	8.2	84.3	111.6	95.2	101.4	41.9	32.8	40.6	21.6	19.7	23.2	25.1	29.2	14.2	16.3	9.2	8.6	31.1	111.6
10	8.4	8.3	8.2	8.0	8.0	7.6	7.6	12.4	64.1	44.5	26.5	27.2	34.8	30.3	20.7	13.4	4.4	3.3	3.1	2.7	3.2	4.2	4.1	4.7	15.0	64.1
11	4.9	3.9	3.3	3.4	4.0	4.4	4.8	5.1	5.2	11.8	12.1	7.0	7.4	10.3	3.7	3.6	4.5	5.4	4.9	4.7	6.2	6.1	4.8	5.9	5.7	12.1
12	19.4	10.0	17.9	20.3	9.6	33.9	65.5	14.4	29.0	37.7	38.2	28.5	25.5	14.6	11.3	26.3	64.1	50.2	44.9	63.5	35.4	28.8	28.2	39.1	31.5	65.5
13	28.2	41.9	31.0	14.9	13.3	33.8	28.0	25.6	13.9	11.1	7.6	14.6	36.8	34.0	16.7	12.7	15.9	17.0	11.3	9.3	6.8	7.6	10.2	23.3	19.4	41.9
14	50.8	86.2	74.3	41.7	28.6	32.3	31.9	49.1	57.0	40.2	40.2	35.8	51.7	23.6	15.9	13.0	17.4	13.9	16.6	20.9	19.2	29.1	17.5	13.3	34.2	86.2
15	6.6	7.4	3.9	3.7	3.7	3.5	3.5	3.5	3.6	4.5	5.7	26.6	20.4	19.5	18.3	18.1	13.0	13.0	47.0	58.4	31.2	31.9	21.8	13.7	15.9	58.4
16	8.2	8.2	16.7	16.2	26.3	16.4	9.4	10.3	7.2	6.2	6.7	7.3	14.7	6.4	6.1	3.2	4.1	4.9	5.6	5.1	5.5	6.1	7.0	8.1	9.0	26.3
17	6.6	8.6	6.8	6.4	6.6	8.2	7.3	6.4	7.0	8.0	13.0	27.9	29.8	16.5	13.1	10.7	6.4	6.6	9.6	8.2	5.3	22.4	26.5	18.7	11.9	29.8
18	14.9	13.9	12.0	5.3	4.6	4.1	4.3	4.0	3.6	3.4	4.2	4.3	3.8	3.3	2.6	2.7	2.7	2.7	2.6	3.7	3.6	4.1	4.7	4.9	5.0	14.9
19	4.7	5.1	5.0	5.1	5.1	5.1	5.3	6.2	6.3	6.0	6.2	7.2	5.1	4.6	9.4	3.8	3.4	3.3	5.8	5.7	7.8	7.5	5.9	5.4	5.6	9.4
20	6.9	5.8	5.0	5.5	4.9	4.4	4.3	4.3	4.6	5.9	5.0	4.8	6.2	8.3	4.6	6.5	4.7	4.6	6.9	8.2	8.5	6.5	7.4	7.9	5.9	8.5
21	5.6	5.7	6.3	7.9	15.7	15.2	6.6	6.1	6.4	6.1	6.6	8.7	17.9	46.6	24.8	14.0	39.4	58.8	55.5	84.0	51.5	78.9	57.9	47.5	28.1	84.0
22	18.0	22.3	9.3	8.9	9.5	7.2	4.6	5.0	14.6	27.8	22.9	47.2	39.3	27.5	14.1	12.6	12.3	6.0	1.9	2.2	2.3	3.3	2.5	3.1	13.5	47.2
23	2.5	2.8	2.8	3.0	2.7	3.1	2.7	2.9	4.4	4.2	3.1	3.7	2.5	2.6	2.8	1.8	11.7	17.6	20.6	22.8	25.1	22.8	21.4	21.0	8.8	25.1
24	18.9	17.7	17.5	14.6	12.8	11.3	12.9	13.1	14.0	13.8	8.9	4.6	3.7	4.4	2.5	1.1	1.1	1.3	3.3	4.1	2.4	4.4	2.4	1.5	8.0	18.9
25	1.6	1.8	1.6	2.1	3.6	2.0	2.8	2.4	8.7	5.1	10.6	28.2	16.8	20.5	22.2	19.2	16.1	30.4	29.5	22.9	21.8	16.6	12.2	25.0	13.5	30.4
26	21.2	41.7	21.4	15.0	12.3	6.9	9.1	13.3	21.9	22.6	25.4	22.2	20.1	11.1	16.1	14.6	21.8	8.8	10.1	11.4	4.2	7.7	15.2	7.5	15.9	41.7
27	10.4	14.5	6.9	1.5	1.3	0.7	1.3	6.7	18.0	7.8	9.2	23.4	25.7	24.6	20.3	24.2	19.0	15.0	6.1	22.8	20.9	41.4	26.8	9.3	14.9	41.4
28	13.5	8.3	6.3	2.1	1.0	0.6	0.6	2.5	23.2	9.6	8.6	30.5	28.0	34.1	19.7	13.1	23.6	10.6	30.9	42.9	59.0	86.1	13.7	4.5	19.7	86.1
29	1.8	2.6	1.2	1.2	1.0	1.0	1.6	1.8	3.9	3.1	5.9	5.8	12.0	12.6	12.2	14.4	8.8	6.5	6.9	10.5	11.5	10.0	3.5	1.7	5.9	14.4
30	1.7	2.1	1.5	1.4	1.6	1.4	1.2	1.9	8.6	19.7	6.7	25.5	31.0	19.8	33.1	40.1	36.8	34.2	48.4	17.2	15.7	27.1	10.2	6.5	16.4	48.4
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	720	100%
MEAN	14.3	13.0	10.9	8.5	8.7	8.8	9.2	8.4	16.5	16.7	15.8	20.0	19.8	18.2	15.0	12.6	14.2	13.2	15.5	18.2	14.0	18.0	13.0	12.7		
MAX	116.1	86.2	74.3	41.7	28.8	33.9	65.5	49.1	84.3	111.6	95.2	101.4	51.7	46.6	54.6	40.1	64.1	58.8	55.5	84.0	59.0	86.1	57.9	47.5		



Number of 24HR Exceedences	3	Proposed Guideline	
Number of Non-Zero Readings	720		
Maximum 1-HR Average	116.1 UG/M3		
Maximum 24-HR Average	34.2 UG/M3		
		Operational Time	720 HRS
Monthly Calibration	0	Operational Uptime	100.0 %
Standard Deviation	15.2	Monthly Average	14.0 UG/M3

Berm PM₁₀ (µg/m³) – November 2018

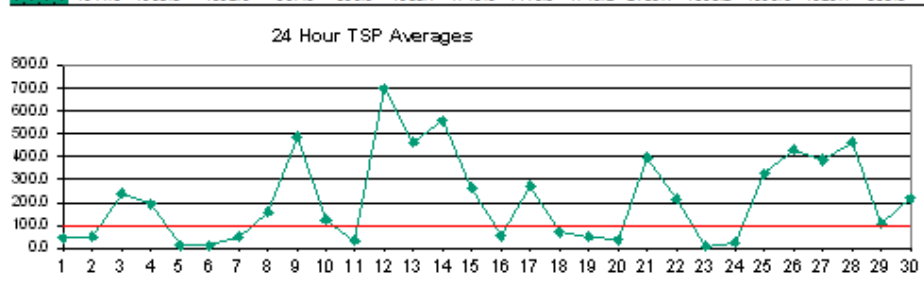
DAY	HOUR																								MEAN	MAX
1	49.1	7.6	7.6	5.1	9.1	14.5	6.3	3.3	10.9	15.1	4.4	7.2	12.0	15.5	19.5	19.4	18.9	23.6	37.6	31.6	19.3	61.9	42.6	31.8	19.7	61.9
2	23.2	18.4	13.4	15.8	14.4	3.7	2.6	6.3	13.6	35.4	76.7	117.2	56.2	21.7	14.1	14.7	12.2	2.0	1.9	1.5	1.7	1.3	1.5	5.0	19.8	117.2
3	5.6	7.5	3.8	3.3	3.5	9.7	6.7	29.1	111.8	105.4	243.3	128.6	209.5	238.9	73.6	155.5	106.0	66.3	45.2	96.1	70.7	91.2	188.4	295.2	95.6	295.2
4	591.8	92.4	96.3	79.1	199.7	90.2	79.5	34.5	33.5	25.2	16.5	95.1	42.9	75.3	118.6	41.4	67.3	38.4	21.8	18.4	18.0	2.1	2.8	7.9	78.7	591.8
5	9.8	10.4	10.2	12.7	12.3	11.3	10.8	12.5	14.7	19.0	38.7	22.7	13.7	15.2	14.6	13.5	23.0	16.7	21.5	16.3	7.4	13.1	16.1	9.8	15.2	38.7
6	7.3	11.2	9.8	7.6	5.6	7.4	8.3	6.5	8.1	8.8	8.9	11.8	15.0	10.7	11.4	8.2	9.1	17.2	23.3	19.6	18.9	22.9	23.0	20.2	12.5	23.3
7	16.5	12.4	11.2	10.0	9.3	9.0	9.9	11.6	51.1	52.8	33.6	139.1	99.7	91.4	9.1	10.1	12.6	7.0	15.7	37.5	9.9	8.2	6.4	5.0	28.3	139.1
8	3.9	5.4	6.3	9.1	5.5	7.8	16.5	11.0	5.2	20.1	27.5	111.0	249.2	363.4	413.1	185.2	41.1	4.5	5.9	17.6	14.0	47.0	15.7	68.9	68.9	413.1
9	33.7	30.9	12.5	17.6	74.9	33.2	60.9	24.6	625.4	804.3	659.9	622.3	232.7	174.8	222.8	110.4	99.2	150.5	140.0	160.7	61.8	79.8	15.9	12.1	185.9	804.3
10	11.0	10.6	9.4	8.5	8.3	7.8	8.0	50.3	423.3	281.8	135.6	163.2	240.9	209.4	132.1	81.1	13.6	5.4	4.2	3.4	3.7	5.3	4.9	5.5	76.1	423.3
11	7.2	4.1	3.6	3.5	4.2	4.7	5.8	6.4	7.1	51.4	24.9	15.0	14.4	45.1	4.0	4.1	5.3	5.6	5.0	5.0	7.1	6.8	6.0	28.9	11.5	51.4
12	167.3	73.7	145.2	155.1	66.4	268.8	487.8	98.7	247.2	277.1	279.7	223.0	185.1	99.5	70.4	170.4	404.8	377.4	292.5	424.4	297.2	213.7	206.2	266.0	229.1	487.8
13	208.3	288.1	241.4	105.0	75.4	270.3	237.3	191.5	88.8	57.0	31.1	110.2	294.3	248.5	109.5	84.2	124.0	124.5	67.9	30.2	9.0	10.0	21.6	134.9	131.8	294.3
14	319.7	523.9	425.9	214.8	115.1	143.5	154.3	321.5	351.9	242.0	241.4	189.1	295.7	106.6	32.4	15.4	25.8	24.7	126.6	159.1	149.7	224.1	133.6	97.9	193.1	523.9
15	41.0	46.2	6.4	4.2	4.2	3.9	4.4	7.8	8.6	15.9	30.6	238.1	168.1	138.5	130.0	120.5	81.7	103.6	374.1	433.1	229.0	284.5	168.9	20.5	111.0	433.1
16	12.3	68.3	29.8	60.3	38.0	22.6	11.1	13.3	9.0	7.4	8.8	9.8	21.3	8.8	22.9	4.0	4.5	5.7	6.4	5.9	7.6	8.3	8.5	10.8	16.9	68.3
17	8.5	11.8	8.7	8.1	8.7	11.5	9.6	8.0	9.3	10.8	95.7	244.4	229.0	125.2	115.8	72.4	32.6	43.1	64.8	46.0	19.0	189.7	206.4	135.2	71.4	244.4
18	114.0	104.3	91.2	24.4	15.7	10.4	13.7	14.5	7.6	6.5	12.5	19.8	14.9	10.3	4.1	3.9	3.7	3.5	3.0	3.9	4.0	4.9	5.7	5.6	20.9	114.0
19	5.2	6.8	6.7	5.4	5.6	5.6	6.4	8.2	8.2	13.2	25.0	35.7	20.6	21.8	75.5	16.4	9.5	6.8	23.5	20.2	34.7	27.4	15.3	6.9	17.1	75.5
20	9.7	7.6	6.1	7.2	6.0	4.9	4.5	4.5	7.4	21.2	10.6	9.4	23.6	54.7	17.6	34.6	15.9	9.3	22.3	33.3	28.8	16.4	22.8	27.0	16.9	54.7
21	9.9	10.6	16.9	30.8	118.6	93.3	17.3	12.7	13.4	9.9	12.5	29.3	112.0	354.3	175.9	83.7	307.3	439.9	385.8	510.1	301.4	432.4	314.7	282.9	169.8	510.1
22	102.6	114.4	29.8	29.2	39.6	24.4	8.4	13.7	103.4	212.3	164.3	343.8	270.3	194.4	99.6	94.9	101.7	37.6	5.8	9.0	8.1	7.8	3.0	3.9	84.2	343.8
23	2.7	2.9	2.9	3.2	2.9	3.6	3.0	3.2	5.8	5.5	3.8	5.1	3.2	3.5	3.8	4.5	18.5	21.5	23.3	26.2	28.3	24.3	23.3	24.3	10.4	28.3
24	22.3	19.5	20.2	16.3	13.8	11.6	15.0	14.3	15.5	15.5	10.4	12.3	14.5	27.1	13.5	3.5	2.6	5.1	19.4	22.6	7.1	24.6	8.3	2.3	14.1	27.1
25	1.8	2.3	1.8	6.5	25.8	4.7	15.5	5.5	79.0	36.8	98.9	244.0	120.8	147.3	165.2	147.1	134.8	266.6	242.5	191.9	174.2	131.0	85.7	189.9	105.0	266.6
26	170.5	374.2	183.8	132.1	107.3	46.3	67.2	109.7	183.8	186.7	199.1	158.9	148.5	77.7	121.0	102.7	155.1	63.7	77.4	89.3	28.3	55.7	122.7	57.3	125.8	374.2
27	91.6	121.2	58.1	7.9	7.2	2.6	9.8	55.6	173.1	75.0	77.0	181.4	199.9	202.8	160.9	194.3	173.5	136.0	59.6	215.5	197.4	398.3	225.1	97.2	130.1	398.3
28	142.1	85.4	61.3	15.0	5.3	1.5	1.5	18.7	243.7	98.7	85.5	294.8	266.8	320.4	171.1	129.9	236.8	106.7	341.5	400.6	468.8	669.4	119.4	34.3	180.0	669.4
29	11.6	13.7	2.0	2.9	1.4	1.8	6.3	6.0	22.5	15.4	45.0	33.9	114.9	105.0	91.3	120.7	67.6	35.4	49.4	81.6	87.2	70.3	9.3	2.7	41.6	120.7
30	2.7	7.0	2.0	1.6	1.8	1.7	1.9	2.6	12.7	71.2	41.8	205.8	275.9	185.2	270.2	335.1	276.5	233.1	299.4	95.3	92.4	157.1	35.8	9.5	109.1	335.1
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	720	100%
MEAN	73.4	69.7	50.8	33.4	33.5	37.7	43.0	36.9	96.5	93.2	91.5	134.1	132.2	123.1	96.1	79.4	86.2	79.4	93.6	106.9	80.2	109.6	68.6	63.3		
MAX	591.8	523.9	425.9	214.8	199.7	270.3	487.8	321.5	625.4	804.3	659.9	622.3	295.7	363.4	413.1	335.1	404.8	439.9	385.8	510.1	468.8	669.4	314.7	295.2		



Number of Non-Zero Readings	720
Maximum 1-HR Average	804.3 UG/M3
Maximum 24-HR Average	229.1 UG/M3
Monthly Calibration	0
Standard Deviation	113.3
Operational Time	720 HRS
Operational Uptime	100.0 %
Monthly Average	79.7 UG/M3

Berm TSP ($\mu\text{g}/\text{m}^3$) – November 2018

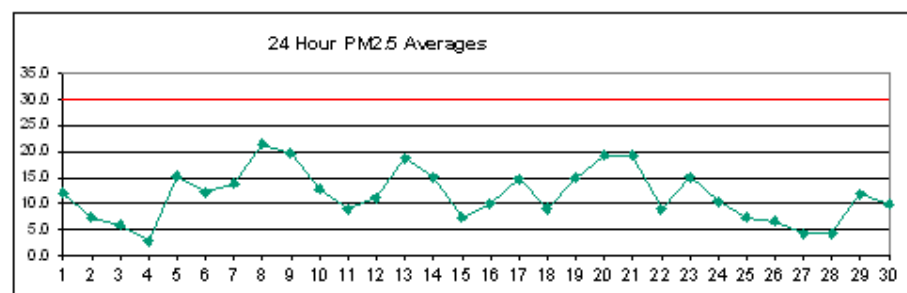
DAY	HOUR																								MEAN	MAX
1	144.5	20.3	25.6	15.5	22.9	64.1	18.8	6.0	16.2	26.1	7.5	13.3	22.7	31.0	28.4	32.5	28.2	36.6	60.3	49.6	32.5	171.2	144.3	47.7	44.4	171.2
2	25.8	17.8	13.0	16.8	14.4	3.5	2.4	7.0	15.4	100.4	253.6	363.7	205.1	44.0	27.1	20.0	27.9	1.9	1.5	1.4	1.5	1.0	1.0	5.0	48.8	363.7
3	5.3	6.8	2.6	2.6	2.5	9.1	8.2	94.6	321.5	319.4	641.1	364.3	537.1	522.6	141.1	413.6	218.5	142.3	114.0	281.9	172.6	180.8	457.4	763.8	238.5	763.8
4	1311.9	231.2	254.3	195.6	556.3	257.3	223.4	97.3	62.5	73.7	32.2	266.8	103.8	200.4	332.7	99.9	185.3	95.3	37.0	28.0	37.3	3.2	1.9	5.7	195.5	1311.9
5	6.8	7.3	6.6	8.9	8.5	7.6	7.2	9.1	12.6	18.0	41.1	20.1	10.0	11.7	11.8	10.5	24.6	13.4	21.4	15.4	5.8	13.2	15.1	9.1	13.2	41.1
6	6.2	11.0	8.8	6.1	3.7	5.2	5.6	4.4	5.7	6.3	6.1	8.4	15.0	17.2	63.9	6.3	6.6	14.3	20.9	16.2	17.3	23.7	23.0	17.2	13.3	63.9
7	13.3	8.3	7.3	6.5	6.1	5.9	6.5	8.2	57.8	60.2	49.2	375.5	266.6	176.4	11.5	9.4	18.2	4.7	15.5	42.7	7.6	6.3	4.6	3.7	48.8	375.5
8	2.8	13.6	14.0	36.7	9.9	20.5	56.7	22.6	9.6	53.8	73.9	261.8	565.2	768.2	858.6	420.1	89.4	9.6	8.2	38.8	27.2	114.4	43.8	234.9	156.4	858.6
9	112.3	101.5	35.2	48.0	258.8	101.2	214.6	62.1	1746.2	2183.1	1959.2	1635.6	557.0	404.3	477.7	216.7	218.8	385.8	308.2	330.7	123.8	160.7	26.8	18.6	487.0	2183.1
10	17.9	11.6	9.2	6.6	5.7	5.0	5.3	94.5	656.6	505.8	221.7	297.9	394.1	369.6	212.1	106.3	33.1	6.5	5.0	2.7	3.1	4.4	4.3	3.9	124.3	656.6
11	6.9	2.6	3.2	2.3	4.1	3.4	4.8	5.6	17.1	231.5	57.9	17.5	20.8	262.7	3.9	2.9	4.0	3.7	3.2	3.2	4.8	4.9	5.9	97.1	32.3	262.7
12	602.8	271.0	483.9	543.6	247.7	931.2	1719.0	361.8	918.0	886.6	906.8	693.1	553.1	315.2	203.4	387.2	833.0	864.6	688.8	1110.1	976.9	695.0	660.3	872.8	696.9	1719.0
13	773.7	1007.1	922.5	444.2	305.3	1088.7	971.7	716.0	314.1	191.0	100.4	386.6	1025.4	826.9	373.4	277.7	363.7	362.7	190.9	63.0	13.2	11.8	35.6	341.5	462.8	1088.7
14	772.8	1210.4	1052.6	667.5	347.1	409.1	533.5	1116.9	1038.7	800.8	803.2	634.6	759.7	262.7	65.3	12.5	28.4	35.6	456.4	541.8	457.1	677.7	432.8	297.4	559.0	1210.4
15	101.8	130.4	6.6	2.9	3.0	2.7	3.4	14.6	15.3	49.4	71.2	558.6	405.8	343.6	309.3	278.0	195.0	300.9	821.0	990.0	555.2	739.8	403.2	23.6	263.5	990.0
16	14.0	296.1	75.1	544.7	40.8	23.5	8.6	11.0	7.5	5.5	7.8	9.0	21.9	10.0	144.9	5.2	3.0	4.1	4.4	4.2	7.1	7.3	6.6	10.2	53.0	544.7
17	7.2	11.0	7.5	6.8	7.5	11.5	8.5	6.4	8.2	9.7	413.0	1091.1	1002.4	435.9	434.0	259.5	120.4	157.9	231.3	172.8	69.9	701.6	884.9	541.3	275.0	1091.1
18	454.9	394.5	352.8	96.3	56.3	33.0	48.4	51.7	21.9	23.0	26.8	52.4	38.4	28.4	6.5	5.4	5.0	6.9	2.3	2.7	3.8	7.0	4.8	6.9	72.1	454.9
19	5.9	11.9	12.3	3.7	4.0	3.9	4.9	7.0	7.1	31.4	92.2	118.9	58.0	86.4	249.9	48.0	25.3	16.6	67.5	54.8	104.4	99.9	43.3	5.7	48.5	249.9
20	9.0	6.9	5.0	6.7	4.9	3.5	3.1	3.0	14.5	69.2	28.7	21.4	53.7	153.2	51.4	99.2	45.4	18.1	36.0	70.4	63.3	40.1	58.6	61.3	38.6	153.2
21	26.3	26.0	51.6	86.7	451.1	341.4	55.6	25.7	41.5	20.0	21.4	62.4	247.1	672.2	385.5	215.8	695.2	1046.3	938.5	1170.7	709.5	918.1	636.8	688.1	397.2	1170.7
22	291.8	276.5	85.0	96.6	121.3	75.9	24.7	29.4	269.2	587.4	422.1	770.7	647.6	490.5	217.0	221.8	315.7	115.5	18.2	27.3	18.0	13.9	3.0	3.3	214.3	770.7
23	1.8	1.9	1.9	2.1	2.1	2.8	2.2	2.1	4.5	4.5	2.9	4.6	2.7	3.0	3.6	10.7	20.1	16.2	16.0	18.4	19.6	16.5	16.3	19.3	8.2	20.1
24	18.0	14.2	15.7	11.4	9.4	7.5	10.2	9.7	10.4	10.8	7.9	27.3	42.3	87.5	62.4	6.3	2.1	11.7	66.8	65.7	12.7	75.2	22.4	3.0	25.4	87.5
25	1.3	2.0	1.8	24.0	95.5	8.5	42.7	9.1	269.9	113.5	288.5	704.8	310.2	378.1	425.9	404.0	428.9	926.1	795.9	554.5	584.4	410.5	290.6	693.2	327.7	926.1
26	603.6	1308.8	676.2	522.7	416.5	175.6	267.7	381.4	658.1	612.0	681.1	457.6	439.8	236.8	334.7	340.3	460.3	230.4	257.8	301.4	91.3	191.8	445.5	236.3	430.3	1308.8
27	328.5	466.3	233.1	27.4	21.3	7.5	46.6	157.5	553.4	243.0	230.9	517.7	633.0	620.4	484.2	461.4	433.4	346.7	180.0	664.4	531.4	1142.3	629.6	326.9	386.9	1142.3
28	481.6	303.3	205.5	48.5	17.5	2.2	2.0	55.1	570.3	255.0	274.5	882.5	786.6	898.8	467.5	425.3	692.9	309.2	864.6	907.7	915.1	1343.0	245.8	127.0	461.7	1343.0
29	34.0	39.6	1.7	7.4	1.1	4.0	17.1	13.4	48.2	34.9	92.3	79.9	370.0	287.5	247.7	361.6	149.3	55.8	107.5	163.4	240.1	161.2	23.2	6.9	106.2	370.0
30	3.9	23.7	3.8	1.1	1.3	1.2	2.5	2.6	14.0	164.8	92.3	457.4	670.6	466.5	572.3	717.5	526.5	409.6	478.9	150.7	174.1	269.4	60.8	8.7	219.8	717.5
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	720	100%
MEAN	206.2	207.8	152.5	116.3	101.6	120.5	144.2	112.9	256.9	256.4	263.6	371.8	358.9	313.7	240.3	195.8	206.6	198.3	227.3	264.8	199.4	273.5	187.7	182.7		
MAX	1311.9	1308.8	1052.6	667.5	556.3	1088.7	1719.0	1116.9	1746.2	2183.1	1959.2	1635.6	1025.4	898.8	858.6	717.5	833.0	1046.3	938.5	1170.7	976.9	1343.0	884.9	872.8		



Number of 24HR Exceedences	18	Proposed Guideline
Number of Non-Zero Readings	720	
Maximum 1-HR Average	2183.1 UG/M3	
Maximum 24-HR Average	696.9 UG/M3	
IZS Calibration Time		Operational Time
Monthly Calibration	0	Operational Uptime
Standard Deviation	311.5	Monthly Average
		720 HRS
		100.0 %
		215.0 UG/M3

Entrance PM_{2.5} (µg/m³) – November 2018

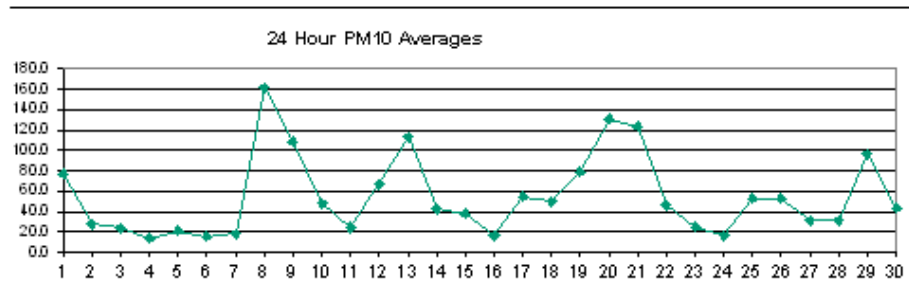
Day	HOUR																								MEAN	MAX
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1	8.9	4.7	2.2	3.9	5.2	4.3	4.6	12.6	14.8	24.3	15.0	19.7	14.1	18.3	13.0	17.4	20.3	16.6	16.4	13.3	13.1	10.0	7.1	11.3	12.1	24.3
2	7.6	9.4	8.4	10.3	9.1	9.0	1.9	2.5	2.5	8.4	6.4	7.6	28.9	18.1	9.8	11.7	7.4	3.0	2.6	2.4	2.7	2.3	2.1	3.1	7.4	28.9
3	6.5	11.3	13.6	10.4	15.1	9.1	13.6	7.2	5.3	4.0	5.5	4.6	4.2	4.8	3.6	2.8	2.1	3.7	2.8	2.3	2.1	1.5	2.0	3.0	5.9	15.1
4	4.6	1.1	1.2	0.6	1.6	0.6	0.9	1.6	2.2	2.0	1.4	5.1	6.1	2.4	3.3	2.0	4.7	3.9	1.9	0.9	2.9	3.8	4.7	7.7	2.8	7.7
5	9.8	10.1	12.2	11.1	12.1	11.8	16.1	19.6	13.2	17.5	45.6	18.1	12.2	13.9	16.4	17.0	27.1	11.4	19.1	15.9	6.6	9.8	13.1	7.5	15.3	45.6
6	8.1	9.9	13.5	6.3	7.7	6.5	7.1	7.6	8.1	8.2	8.8	10.8	10.0	8.7	9.5	10.2	9.0	14.6	24.0	17.8	19.9	26.9	23.5	17.0	12.2	26.9
7	13.9	12.6	11.8	10.7	9.4	11.0	11.3	13.3	13.7	14.7	17.4	14.0	11.5	9.7	8.1	9.6	8.8	11.5	16.9	21.8	14.0	28.3	21.5	16.8	13.8	28.3
8	13.4	11.7	12.5	12.4	12.8	20.3	24.0	22.2	21.3	26.0	29.7	22.8	15.2	12.1	9.9	13.4	13.8	8.4	29.3	47.2	40.7	38.2	24.3	35.6	21.6	47.2
9	29.1	21.2	20.6	18.7	22.8	15.1	13.7	16.9	20.6	24.5	41.7	32.3	13.4	10.1	12.3	11.2	11.6	11.7	9.4	8.5	16.4	36.0	28.4	24.6	19.6	41.7
10	25.1	17.5	20.2	20.6	15.7	14.5	15.9	11.8	17.6	12.0	15.1	14.0	22.5	12.2	9.8	9.3	7.0	6.6	4.9	5.1	6.4	9.2	8.6	7.2	12.9	25.1
11	11.2	6.1	6.2	7.7	9.9	9.5	7.8	8.1	8.5	10.0	13.3	6.2	7.7	11.4	5.3	4.5	5.5	15.4	6.0	6.8	12.0	9.1	13.9	12.3	8.9	15.4
12	13.3	12.2	10.1	9.5	8.5	13.9	21.2	10.6	14.4	19.2	19.6	16.4	11.7	7.4	4.1	3.9	5.0	5.5	6.1	8.1	13.0	10.4	11.1	14.2	11.2	21.2
13	13.8	15.0	18.6	16.2	17.3	21.4	21.9	20.3	32.9	29.6	25.9	20.0	25.8	17.5	9.1	8.0	9.2	9.3	8.0	24.7	17.9	17.6	23.9	25.1	18.7	32.9
14	16.7	16.8	16.9	19.4	16.2	16.4	17.8	21.1	21.8	30.6	27.5	23.9	18.2	14.4	12.5	13.2	14.7	13.6	9.1	6.1	4.6	4.3	3.7	3.7	15.1	30.6
15	8.6	13.7	6.6	7.7	7.7	9.0	6.9	12.3	10.3	23.0	11.9	9.7	10.0	8.2	4.6	5.0	6.2	2.9	3.5	2.1	1.7	1.7	2.3	1.3	7.4	23.0
16	1.1	8.7	21.4	18.8	23.2	12.4	8.7	8.3	6.3	11.8	6.3	9.6	19.4	7.5	5.0	4.7	4.2	5.3	7.0	6.4	7.6	9.0	15.1	13.3	10.0	23.2
17	16.7	17.2	14.7	14.1	21.0	22.6	23.2	22.0	21.4	22.7	16.0	13.5	9.8	9.7	9.9	9.5	8.0	9.2	9.1	7.3	8.7	15.7	16.8	15.8	14.8	23.2
18	9.5	8.9	19.4	11.1	14.5	12.7	7.8	7.5	9.6	11.1	10.6	6.8	4.4	6.7	9.6	7.6	7.8	5.8	5.6	7.6	4.9	8.0	8.7	11.9	9.1	19.4
19	12.1	21.7	24.3	16.5	15.7	13.5	15.2	16.5	17.2	19.4	18.6	17.9	16.1	14.7	9.9	9.6	11.4	10.3	9.3	13.2	11.7	12.4	17.3	15.5	15.0	24.3
20	17.9	17.3	14.7	11.3	13.6	15.4	9.2	12.8	24.7	19.1	19.0	19.0	18.7	10.7	10.6	17.4	23.1	13.1	22.0	26.3	27.0	30.8	38.7	32.4	19.4	38.7
21	29.3	34.1	23.4	19.9	19.2	19.3	21.8	15.8	25.5	22.8	33.1	47.1	26.9	16.4	13.0	15.3	12.1	14.0	11.0	11.8	8.5	8.1	7.5	8.6	19.4	47.1
22	6.2	6.4	6.1	6.3	4.9	4.8	5.1	7.1	8.1	10.5	8.8	7.6	8.1	8.8	8.2	6.6	9.1	9.9	13.7	10.2	7.0	15.0	22.7	13.7	9.0	22.7
23	6.9	9.6	9.5	12.9	11.4	9.7	9.7	7.8	18.8	15.7	15.6	11.1	12.5	8.0	8.4	10.1	15.5	21.0	22.2	24.0	26.4	26.5	24.0	27.3	15.2	27.3
24	25.0	21.7	20.9	19.2	16.0	14.4	16.0	16.5	23.0	22.4	14.5	5.7	6.2	3.6	2.8	3.3	4.4	1.8	2.8	1.9	1.9	2.2	2.7	2.4	10.5	25.0
25	5.9	8.4	8.2	6.9	7.9	10.9	11.4	7.0	3.7	3.4	3.1	4.1	8.3	7.9	4.9	6.2	8.5	13.2	8.0	9.7	10.4	7.6	3.7	5.7	7.3	13.2
26	7.0	11.7	5.6	5.2	4.0	3.4	3.8	6.8	11.1	13.2	16.7	12.7	11.1	5.8	7.1	8.3	6.5	5.4	3.0	1.5	1.0	1.2	3.1	4.5	6.6	16.7
27	7.0	11.6	2.4	0.6	0.5	1.7	1.9	2.3	4.0	3.4	5.3	6.7	12.7	8.4	6.3	6.7	5.9	3.4	3.0	1.8	1.1	1.9	1.7	1.3	4.2	12.7
28	2.1	0.8	0.8	0.5	1.2	1.9	2.9	3.4	6.0	12.2	8.3	11.3	12.5	9.0	6.1	6.6	3.7	3.9	2.6	1.3	1.7	1.0	2.3	2.0	4.3	12.5
29	2.5	1.7	5.7	4.8	11.4	12.9	10.4	17.7	25.9	18.8	19.7	19.2	7.6	13.4	12.0	4.2	7.6	16.5	25.8	13.5	12.3	8.9	9.4	4.8	11.9	25.9
30	7.7	4.0	5.7	5.6	3.7	5.2	6.1	8.7	19.5	9.6	9.0	6.8	7.4	8.0	11.6	8.0	9.3	16.3	10.7	27.1	7.6	15.6	11.8	10.8	9.8	27.1
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	720	100%
MEAN	11.6	11.9	11.9	10.6	11.3	11.1	11.3	11.6	14.4	15.7	16.3	14.2	13.1	10.3	8.6	8.8	9.6	9.6	10.5	11.6	10.4	12.4	12.5	12.0		
MAX	29.3	34.1	24.3	20.6	23.2	22.6	24.0	22.2	32.9	30.6	45.6	47.1	28.9	18.3	16.4	17.4	27.1	21.0	29.3	47.2	40.7	38.2	38.7	35.6		



Number of 24HR Exceedences	0	Proposed Guideline
Number of Non-Zero Readings	720	
Maximum 1-HR Average	47.2 UG/M3	
Maximum 24-HR Average	21.6 UG/M3	
Monthly Calibration	0	
Standard Deviation	7.703	
Operational Time	720 HRS	
Operational Uptime	100.0 %	
Monthly Average	11.7 UG/M3	

Entrance PM₁₀ (µg/m³) – November 2018

HOUR																											
Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	MEAN	MAX	
1	47.4	18.9	4.9	13.4	24.9	18.0	20.2	82.0	111.3	182.7	120.0	163.0	81.2	168.0	68.5	93.4	147.2	103.7	103.0	80.7	78.1	49.5	25.2	33.4	76.6	182.7	
2	19.9	14.1	12.6	15.5	13.7	13.4	2.6	3.3	6.9	16.3	34.5	40.5	165.6	96.0	57.6	68.7	46.9	5.3	3.5	3.2	3.7	3.0	2.6	4.3	27.2	165.6	
3	9.6	16.9	20.4	15.6	22.8	73.2	90.0	48.2	25.8	19.7	18.2	20.7	22.4	24.0	20.6	11.7	7.8	22.4	13.3	8.5	6.7	5.4	14.3	26.5	23.5	90.0	
4	51.2	5.4	6.7	2.3	16.8	4.1	5.4	5.9	8.3	7.2	5.7	41.6	39.6	14.7	20.7	8.9	22.8	17.8	8.1	2.4	8.1	4.9	6.1	9.3	13.5	51.2	
5	11.8	11.1	14.3	11.5	13.4	13.1	21.2	27.1	18.9	25.6	67.5	25.2	15.5	18.1	22.5	24.0	39.6	15.1	27.3	22.4	8.5	13.9	18.8	10.4	20.7	67.5	
6	10.9	13.3	19.6	8.0	9.0	7.4	8.5	9.3	10.5	10.2	10.0	12.5	12.2	10.4	15.9	13.6	10.5	17.5	32.4	22.3	26.2	37.8	31.3	19.6	15.8	37.8	
7	14.8	14.9	13.0	11.5	10.3	12.4	12.0	15.3	16.5	18.9	23.9	18.1	15.6	14.3	10.4	14.0	10.4	15.5	24.3	32.7	20.3	42.4	32.3	25.1	18.3	42.4	
8	34.8	65.7	70.5	92.2	75.7	148.2	216.6	205.7	184.2	238.7	260.2	193.9	102.0	68.7	56.0	69.4	101.8	50.5	238.5	362.3	329.2	285.3	151.1	269.4	161.3	362.3	
9	209.1	113.7	110.1	88.3	147.4	64.9	73.0	81.8	152.2	190.7	329.1	241.9	69.2	37.4	52.9	40.8	46.0	42.6	23.2	15.2	63.1	195.8	124.6	96.1	108.7	329.1	
10	90.8	56.2	72.4	71.7	45.9	43.2	52.2	25.9	76.0	29.1	53.9	48.7	127.9	61.1	44.5	46.7	32.5	35.5	25.3	18.4	35.8	25.7	24.5	19.1	48.5	127.9	
11	47.5	12.8	11.5	18.7	33.3	34.0	12.1	22.9	26.0	31.5	32.2	11.9	15.1	23.6	5.7	4.9	6.1	15.8	6.2	9.0	17.1	14.5	81.4	89.1	24.3	89.1	
12	95.3	80.9	70.6	77.3	51.7	125.5	182.7	61.2	94.4	137.0	111.2	93.2	52.9	29.8	13.9	11.0	20.0	20.6	21.6	30.6	67.9	42.0	44.1	70.7	66.9	182.7	
13	67.6	72.4	119.4	93.8	105.3	165.7	160.7	117.9	233.1	195.5	171.8	132.3	187.4	114.2	37.7	28.9	37.3	34.1	27.7	162.2	100.8	89.3	132.9	130.9	113.3	233.1	
14	28.6	21.7	29.3	53.7	23.5	29.6	44.3	84.0	86.2	151.0	137.3	102.3	54.3	27.1	14.2	15.2	21.1	28.9	21.0	11.6	9.0	9.5	6.4	5.4	42.3	151.0	
15	38.5	90.3	21.2	33.5	21.9	25.4	20.9	83.2	72.8	157.6	66.3	47.8	51.9	40.9	21.3	30.1	34.3	13.9	18.2	6.2	2.8	2.6	4.2	1.6	37.8	157.6	
16	1.3	34.6	42.5	62.8	32.7	16.0	10.0	10.3	7.5	16.1	8.2	13.2	28.2	10.8	8.6	6.6	4.8	6.2	8.5	7.7	10.9	12.1	22.4	19.8	16.7	62.8	
17	25.0	25.8	22.0	21.0	31.5	33.9	34.8	33.0	60.9	50.0	97.4	80.7	50.1	56.0	60.8	55.0	33.0	49.5	56.3	28.6	41.5	113.4	137.7	117.5	54.8	137.7	
18	53.4	45.9	172.6	69.8	100.4	91.1	47.0	47.1	59.8	64.5	54.3	28.3	15.8	29.8	51.0	35.1	38.2	21.4	18.9	27.8	8.4	27.6	28.9	53.5	49.6	172.6	
19	61.0	129.6	172.5	94.3	85.7	43.8	22.8	24.7	32.1	147.3	126.8	128.6	105.9	87.0	46.6	51.2	66.5	53.0	48.4	63.5	56.1	54.3	107.7	84.4	78.9	172.5	
20	121.2	112.9	85.0	74.4	92.9	81.3	18.6	49.8	171.0	131.2	133.1	134.8	134.4	64.3	56.2	100.6	163.7	86.2	157.8	196.8	203.7	228.9	291.4	244.6	130.6	291.4	
21	216.5	255.2	154.3	124.8	127.2	134.2	151.3	88.3	183.5	168.5	250.9	382.0	190.4	102.8	59.6	83.0	49.8	69.8	50.2	66.6	17.9	14.3	13.6	16.7	123.8	382.0	
22	8.5	12.3	9.1	13.5	6.4	7.0	9.6	23.9	21.9	47.2	45.3	29.4	55.4	67.6	51.2	38.6	44.3	57.4	126.0	96.1	43.6	112.6	151.3	26.2	46.0	151.3	
23	10.9	14.1	13.9	19.4	17.0	14.4	14.5	11.5	28.2	23.6	23.4	16.7	18.8	24.6	50.9	77.0	27.3	25.0	25.1	26.8	29.4	29.4	26.4	33.2	25.1	77.0	
24	30.7	25.5	24.3	21.7	17.4	14.7	17.0	18.0	32.7	33.2	21.5	14.5	25.4	10.7	8.6	13.7	26.0	5.7	10.7	3.8	5.1	4.9	8.8	6.7	16.7	33.2	
25	30.2	52.2	52.9	47.9	46.5	69.7	77.1	40.3	17.1	12.5	13.5	29.9	78.4	63.4	37.4	54.3	56.0	121.2	66.0	83.5	88.5	57.6	22.4	50.7	52.9	121.2	
26	68.0	122.9	47.8	39.9	27.3	21.5	26.0	52.6	106.1	118.0	140.2	96.0	86.7	33.0	46.8	62.3	45.4	31.9	19.5	5.8	2.6	5.4	23.5	41.3	52.9	140.2	
27	68.2	112.1	18.7	2.7	1.9	10.2	10.7	12.6	24.7	26.1	39.1	54.1	96.4	69.6	37.4	47.0	37.7	23.7	16.3	8.2	7.8	12.5	14.1	8.6	31.7	112.1	
28	13.7	3.7	3.1	1.4	5.0	9.2	16.9	18.3	39.3	109.1	63.5	98.7	99.9	72.6	41.5	40.7	22.8	24.3	19.2	6.4	9.6	3.1	13.8	9.5	31.0	109.1	
29	12.6	7.1	51.8	35.2	98.4	105.8	71.6	163.4	232.1	169.7	162.5	156.1	50.8	107.2	98.8	20.6	54.5	148.1	217.0	97.6	97.9	57.5	76.7	27.5	96.7	232.1	
30	51.2	23.2	32.4	14.6	5.6	9.9	20.0	13.0	29.2	14.3	50.5	33.4	36.4	47.0	72.9	41.2	40.0	103.3	47.3	209.6	24.7	78.9	29.4	16.1	43.5	209.6	
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	720	100%	
MEAN	51.7	52.8	50.0	41.7	43.7	48.0	49.0	49.4	72.3	84.8	89.1	83.0	69.5	53.2	39.7	40.3	43.1	42.2	49.4	57.2	47.5	54.5	55.6	52.2			
MAX	216.5	255.2	172.6	124.8	147.4	165.7	216.6	205.7	233.1	238.7	329.1	382.0	190.4	168.0	98.8	100.6	163.7	148.1	238.5	362.3	329.2	285.3	291.4	269.4			



Number of Non-Zero Readings 720

Maximum 1-HR Average 382.0 UG/M3

Maximum 24-HR Average 161.3 UG/M3

Monthly Calibration 0

Standard Deviation 58.16

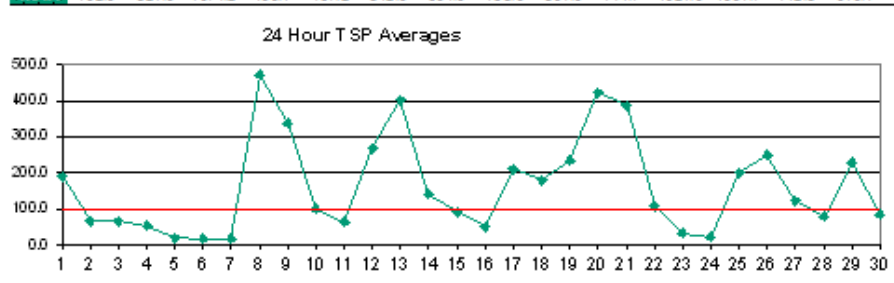
Operational Time 720 HRS

Operational Uptime 100.0 %

Monthly Average 55.0 UG/M3

Entrance TSP ($\mu\text{g}/\text{m}^3$) – November 2018

Day	HOUR																								MEAN	MAX
1	152.4	60.5	10.4	22.0	64.2	71.7	50.3	180.1	190.2	441.1	317.9	629.5	208.4	613.4	145.5	196.3	296.4	181.3	179.8	131.7	135.2	151.9	85.5	42.3	189.9	629.5
2	27.4	13.5	12.3	15.2	12.7	12.6	2.1	2.9	9.9	23.6	112.6	131.8	509.1	270.4	137.2	150.6	117.7	7.4	2.9	2.7	3.2	2.2	1.9	4.0	66.1	509.1
3	9.8	17.4	22.8	17.3	26.2	233.5	205.4	136.9	62.0	59.7	49.9	49.7	60.5	56.4	57.8	40.2	29.0	94.9	58.9	31.8	29.2	14.3	68.8	132.4	65.2	233.5
4	386.4	28.6	41.7	4.7	98.6	24.3	28.4	20.1	16.2	19.2	14.7	163.5	97.0	61.4	81.4	27.4	69.4	36.9	18.2	5.6	21.2	3.7	4.7	6.7	53.3	386.4
5	8.2	7.5	10.0	7.6	9.9	9.5	19.5	26.5	17.6	26.1	70.1	22.7	11.5	14.3	21.0	23.9	42.8	14.1	29.3	22.8	7.5	14.1	19.7	10.1	19.4	70.1
6	9.4	12.4	19.1	6.7	6.8	5.5	6.3	7.1	8.3	7.9	7.3	9.1	13.9	12.3	56.2	12.1	7.8	13.8	31.8	19.8	26.0	41.1	30.8	15.7	16.1	56.2
7	9.8	9.8	8.5	7.5	6.7	8.0	7.8	10.0	11.1	13.6	20.8	13.6	25.4	29.1	16.3	17.7	7.3	13.5	21.2	35.4	19.6	48.3	37.3	29.0	17.8	48.3
8	71.7	233.4	222.6	356.1	241.7	462.1	824.5	798.6	513.0	720.7	761.7	538.3	258.7	154.0	127.8	139.4	259.6	123.1	598.0	889.0	991.9	824.4	467.2	718.6	470.7	991.9
9	706.1	348.9	287.3	256.5	497.2	148.4	217.9	183.8	572.4	741.7	1321.3	1011.3	277.7	131.8	154.5	105.1	120.9	112.2	63.5	27.6	99.0	309.4	210.9	167.2	336.4	1321.3
10	190.6	108.6	142.0	166.8	95.1	77.7	88.8	48.0	117.5	56.9	111.4	90.3	243.3	135.7	110.7	98.7	86.0	84.6	54.6	63.8	98.3	30.2	50.9	32.1	99.3	243.3
11	98.3	21.5	16.0	20.6	59.7	76.8	13.4	42.5	53.7	134.3	137.8	30.2	54.5	103.3	3.8	3.2	4.1	10.4	4.0	7.2	16.4	20.3	281.3	336.2	64.6	336.2
12	332.5	320.7	294.6	371.8	207.8	652.7	954.6	265.8	371.2	577.7	415.0	355.3	126.6	104.8	51.6	36.7	66.4	64.0	68.6	77.8	209.4	128.4	133.7	223.7	267.1	954.6
13	219.2	235.4	552.6	354.0	411.9	842.3	824.7	486.1	834.5	647.1	492.9	475.9	712.8	472.2	114.0	88.7	124.6	123.9	81.7	416.2	244.6	221.9	308.1	323.4	400.4	842.3
14	69.5	32.6	81.4	192.2	58.0	87.2	178.6	355.2	373.0	585.2	508.4	399.2	155.7	69.7	10.4	10.7	20.4	49.3	47.2	21.0	17.0	19.2	13.3	4.8	140.0	585.2
15	93.1	201.4	46.7	88.4	42.2	47.5	37.8	190.8	183.1	352.7	130.4	107.0	137.0	125.3	61.1	104.7	91.8	44.5	54.8	23.9	8.8	9.0	18.9	1.2	91.8	352.7
16	0.9	284.7	197.9	460.1	35.7	14.1	6.7	7.0	5.1	12.0	6.7	11.4	28.9	11.2	44.9	14.1	3.3	4.3	6.0	5.6	10.2	9.4	22.3	21.0	51.0	460.1
17	28.8	29.6	24.6	23.8	36.3	39.1	40.1	37.8	130.0	93.1	329.5	270.4	260.8	287.9	330.3	234.4	116.0	192.8	257.7	116.9	151.4	489.2	860.9	683.2	211.0	860.9
18	289.9	186.2	1074.2	267.6	356.9	259.1	163.4	179.0	214.5	210.2	148.5	62.7	35.5	64.6	116.1	69.7	109.8	44.5	60.4	65.8	11.3	70.6	68.0	185.7	179.8	1074.2
19	208.0	311.1	403.0	271.1	274.7	144.3	26.1	28.6	57.1	583.6	449.8	412.1	318.8	247.8	104.5	132.9	199.0	140.2	153.8	153.2	145.8	153.7	383.3	292.0	233.1	583.6
20	470.2	405.9	310.9	371.1	461.2	296.3	49.3	150.7	619.0	486.4	430.9	440.0	390.6	168.2	126.7	214.5	422.4	270.5	470.2	568.1	649.1	726.5	861.5	807.9	423.7	861.5
21	752.3	821.6	507.9	415.2	434.6	472.4	611.6	295.3	681.2	591.8	758.8	1054.7	493.1	246.1	118.0	175.5	108.3	199.0	185.1	221.1	45.1	27.8	29.1	46.9	387.2	1054.7
22	11.8	34.9	24.9	47.3	9.4	14.7	13.7	54.3	53.8	145.0	146.1	84.1	166.8	227.1	115.7	96.5	80.2	104.4	294.2	226.9	85.4	288.0	221.6	30.2	107.4	294.2
23	12.2	15.4	15.1	22.0	19.4	16.1	16.0	12.3	31.7	26.8	26.8	18.9	21.6	49.4	109.2	199.6	50.0	17.7	17.1	18.3	20.0	21.2	18.5	25.8	33.4	199.6
24	26.0	20.8	19.4	14.8	11.9	9.6	11.2	11.9	29.7	33.3	22.5	32.6	58.4	18.8	12.7	24.3	39.8	15.3	37.3	8.0	17.4	8.1	18.8	14.1	21.5	58.4
25	84.5	149.6	158.1	175.1	100.2	205.4	204.3	104.9	52.5	30.2	46.6	98.3	289.2	232.1	155.3	200.3	199.2	542.6	308.1	380.6	420.1	285.9	113.9	281.4	200.8	542.6
26	375.7	674.4	281.7	256.9	156.4	123.7	159.0	247.3	542.8	523.5	621.4	340.9	356.7	125.9	176.2	230.8	187.8	106.5	91.4	25.3	7.2	26.9	127.9	224.1	249.6	674.4
27	270.8	631.4	104.8	11.2	8.9	28.6	30.3	37.9	86.9	85.9	146.3	198.6	403.1	319.9	112.2	119.8	78.6	52.3	33.4	31.8	26.1	47.6	66.7	37.8	123.8	631.4
28	62.6	12.5	11.9	3.9	12.5	91.7	40.9	36.9	89.9	272.0	133.6	238.4	240.9	212.3	113.5	102.9	63.2	48.7	45.8	11.5	23.0	6.1	26.0	26.8	80.3	272.0
29	30.6	12.4	122.8	79.0	225.7	209.3	152.4	404.5	535.1	443.5	344.1	384.1	115.9	287.7	249.2	50.1	106.1	308.1	468.0	229.7	310.9	145.4	213.5	81.5	229.6	535.1
30	191.1	102.6	132.3	32.7	8.1	15.4	50.2	14.8	33.9	15.8	129.9	77.4	76.2	95.9	139.4	73.2	59.6	158.9	64.3	332.0	31.9	142.5	44.0	15.7	84.9	332.0
NO.	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	720	100%
MEAN	173.3	178.2	171.9	144.6	133.0	156.7	167.8	145.9	216.6	265.3	273.8	258.4	204.9	165.0	105.8	99.8	105.6	106.0	126.9	139.0	129.4	142.9	160.3	160.7		
MAX	752.3	821.6	1074.2	460.1	497.2	842.3	954.6	798.6	834.5	741.7	1321.3	1054.7	712.8	613.4	330.3	234.4	422.4	542.6	598.0	889.0	991.9	824.4	861.5	807.9		



Number of 24HR Exceedences	16	Proposed Guideline	
Number of Non-Zero Readings	720		
Maximum 1-HR Average	1321.3 UG/M3		
Maximum 24-HR Average	470.7 UG/M3		
		Operational Time	720 HRS
Monthly Calibration	0	Operational Uptime	100.0 %
Standard Deviation	203.5	Monthly Average	163.8 UG/M3

MetOne BAM PM_{2.5} Calibration



STATION: Lafarge
LOCATION: Exshaw - Lagoon
START TIME (MST): 11:30

OPERATOR: Darrin Pike
DATE: November 14, 2018
END TIME (MST): 12:25

MONITOR INFO / PARAMETER VALUES:

Make/Model MetOne BAM
Configuration PM2.5
Serial Number T19087

Audit Device Model Delta Cal
Audit Device S/N 624
Certification Date 30-Nov-17

AUDIT / CALIBRATION RESULTS:

		Ambient Temp. (° C)	Ambient Pres. (mmHg)	Leak Check (L/min)	Flow Rate (lpm)	Time settings (hh:mm)
As Found Data	Audit values (I)	5.8	648	0.00	16.7	12:20
	MEASURED (AF)	5.4	648	0.50	16.50	12:20
	AF Difference (AF-I)	-0.4	0	0.50	-0.20	0:00
Adjusted Data	MEASURED (M)	5.8	648	0.50	16.67	12:20
	Adj Difference (M-I)	0.0	0	0.50	-0.03	0:00
	LIMITS	± 4.0 °C	5 mm Hg	1.0 L/min	± 1.0 L/min	±2 min

Sample Head Inspect/Cleaning: inspected and cleaned

Status of sampling tape: new roll

Nozzle Inspection / cleanliness: clean

COMMENTS:

MetOne BAM PM₁₀ Calibration



STATION: Lafarge
LOCATION: Exshaw - Lagoon
START TIME (MST): 11:40

OPERATOR: Darrin Pike
DATE: November 14, 2018
END TIME (MST): 12:35

MONITOR INFO / PARAMETER VALUES:

Make/Model MetOne BAM
Configuration PM10
Serial Number A3315

Audit Device Model Delta Cal
Audit Device S/N 624
Certification Date 30-Nov-17

AUDIT / CALIBRATION RESULTS:

		Ambient Temp. (° C)	Ambient Pres. (mmHg)	Leak Check (L/min)	Flow Rate (lpm)	Time settings (hh:mm)
As Found Data	Audit values (I)	5.3	648	0.00	16.7	12:23
	MEASURED (AF)	5.3	648	0.40	16.65	12:23
	AF Difference (AF-I)	0	0	0.40	-0.05	0:00
Adjusted Data	MEASURED (M)	5.3	648	0.40	16.67	12:23
	Adj Difference (M-I)	0.0	0	0.40	-0.03	0:00
	LIMITS	± 4.0 °C	5 mm Hg	1.0 L/min	± 1.0 L/min	±2 min

Sample Head Inspect/Cleaning: inspected and cleaned

Status of sampling tape: 3/4 roll

Nozzle Inspection / cleanliness: clean

COMMENTS:



Field Service Report

Air Monitoring Network / Client: Lafarge

Station Information

Visit Date: November 14, 2018
Station Location: Exshaw
Reason for Visit: Monthly calibrations
Arrival Time: 10:30
Weather Conditions: Windy, 6°C

Project Number: 171-00556-00
Station Name: Lagoon
Departure Time: 13:30

Record of Hours

Parts Used

Employee	Category	Hours	Qty	Parts Description
DP	TR	3		
DP	CAL	3		

Station Information

Time (MST) Comments

10:30 – arrived and checked in at Lafarge plant
11:30 - Flagged all PM channels at Lagoon site. Proceeded with Bam 1020 calibrations
12:25 - BAM PM2.5 calibration completed with no issues
12:35 - BAM PM10 calibration completed with no issues
13:30 - Left plant after signing out.

NOTES:

- All analyzers in sample mode → OK
- Confirmed operation of manifold intake fan → OK
- All sample lines connected properly → OK



Field Service Report

Technician: Darrin Pike

Ref #: 10923

MetOne BAM TSP Calibration



STATION: Lafarge
LOCATION: Exshaw - Lagoon
START TIME (MST): 11:45

OPERATOR: Darrin Pike
DATE: November 15, 2018
END TIME (MST): 12:40

MONITOR INFO / PARAMETER VALUES:

Make/Model MetOne BAM
Configuration TSP
Serial Number A3589

Audit Device Model Delta Cal
Audit Device S/N 624
Certification Date 30-Nov-17

AUDIT / CALIBRATION RESULTS:

		Ambient Temp. (° C)	Ambient Pres. (mmHg)	Leak Check (L/min)	Flow Rate (lpm)	Time settings (hh:mm)
As Found Data	Audit values (I)	5.1	650	0.00	16.7	12:36
	MEASURED (AF)	4.9	650	0.40	16.90	12:36
	AF Difference (AF-I)	-0.2	0	0.40	0.20	0:00
Adjusted Data	MEASURED (M)	5.1	650	0.40	16.72	12:36
	Adj Difference (M-I)	0.0	0	0.40	0.02	0:00
	LIMITS	± 4.0 °C	5 mm Hg	1.0 L/min	± 1.0 L/min	±2 min

Sample Head Inspect/Cleaning: inspected and cleaned

Status of sampling tape: new roll

Nozzle Inspection / cleanliness: clean

COMMENTS:

Calibration Report

Parameter **NO_x-NO-NO₂**
Air Monitoring Network **Lafarge - Exshaw**



Station Information

Calibration Date	November 15, 2018	Previous Calibration	October 24, 2018
Station Number	N/A	Station Location	Exshaw - Lagoon
Reason:	Routine Installation Removal Other:		
Start Time (MST)	11:30	End Time (MST)	16:30
Barometric Pressure	650 mmHg	Station Temperature	22.0 Deg C
Calibrator	SABIO 2010	Serial Number	9700712
NO Cal Gas Conc	51.4 ppm	Cal Gas Expiry Date	February 14, 2020
NOx Cal Gas Conc	51.5 ppm	Cal Gas Serial #	cc27839

DACS Information

DACS make **Campbell Scientific CR1000** DACS serial No. **67802**

	Parameter	NO2	NOx	NO
Before	Data Slope	1.000689	0.999509	0.995989
	Data Offset	1.650618	3.100097	2.888461
After	Data Slope	1.000160	0.996686	0.997865
	Data Offset	1.350819	2.143167	1.781147
Channel #		3	1	2
Voltage Range		0 - 5 VDC	0 - 5 VDC	0 - 5 VDC

Analyzer Information

Analyzer make/model **T200** Analyzer serial # **642**

Test Point	before		after	
Concentration range	0 - 500	ppb	0 - 500	ppb
NO Slope	0.962		0.959	
NO Offset	-0.6	mV	-0.6	mV
NOX Slope	0.962		0.962	
NOX Offset	0.6	mV	0.6	mV
HVPS	771.0	V	771	V
Moly Temp	314.2	degC	313.8	degC
O3 Flow	81.0	ccm	81	ccm
RxCell Press	4.4	inHg	4.4	inHg
Sample press	23.7	inHg	23.9	inHg
Sample flow	436	ccm	435	ccm

Notes: High point was adjusted

Calibration Report

Parameter **NO_x-NO-NO₂**
Air Monitoring Network **Lafarge - Exshaw**

Station Information

Calibration Date: November 15, 2018 Station Location: Exshaw - Lagoon

Calibration Data

	Dilution flow rate (ccm)	Source gas flow rate (ccm)	Calculated NO _x conc (ppb)	Calculated NO conc (ppb)	Calculated NO ₂ conc (ppb)	Indicated NO _x conc (ppb)	Indicated NO conc (ppb)	Indicated NO ₂ conc (ppb)	NO _x Correction factor	NO Correction factor
zero	5000	0.00	0.0	0.0	0.0	-1.2	-0.8	-1.4	N/A	N/A
1	5000	39.00	398.6	397.8	0.8	398.4	397.5	0.1	1.0006	1.0007
2	5000	20.00	205.2	204.8	0.4	202.9	202.5	-0.2	1.0113	1.0112
3	7000	14.00	102.8	102.6	0.2	100.3	100.3	-1.0	1.0251	1.0228
AFZ	5000	0	0.0	0.0	0.0	-1.2	-0.8	-1.4	0.0000	0.0000
AFS	5000	39	398.6	397.8	0.8	396.6	394.7	1.1	1.0051	1.0078
Average Correction Factor									1.0123	1.0116

As Found Concentrations: NO_x= 400.9 NO= 398.4 As Found Percent Change NO_x= 0.6% NO= 0.1%

GPT Calibration Data

Dilution Flow 5000 ccm Source Gas Flow 39.00 ccm

O ₃ Setpoint (V)	Indicated NO high point (ppb)	Indicated NO drop conc (ppb)	Calculated NO ₂ conc (ppb)	Indicated NO _x conc (ppb)	Indicated NO conc (ppb)	Indicated NO ₂ conc (ppb)	NO _x Correction factor	NO Correction factor	NO ₂ Correction factor	Converter Efficiency
0	-0.8	-0.8	0.0	-1.2	-0.8	-1.4	N/A	N/A	N/A	N/A
NO point	398.2	398.2	0.0	398.7	398.2	-0.2	0.9989	1.0000	N/A	N/A
0.70V	398.2	79.9	318.4	397.8	79.9	317.1	1.0012	1.0000	1.0040	99.6%
0.45V	398.2	223.4	174.8	397.2	223.4	172.9	1.0027	1.0000	1.0109	98.9%
0.35V	398.2	295.8	102.4	398.2	295.8	101.5	1.0001	1.0000	1.0092	99.1%
Average Correction Factor							1.0013	1.0000	1.0080	99.2%

AIC Data

	Previous calibration				Current calibration			
Parameter	NO _x	NO ₂	NO		NO _x	NO ₂	NO	
Auto zero	1.4	-1.5	1.5	ppb	1.1	0.1	1.1	ppb
Auto span	391.6	-1.4	391.9	ppb	392.0	0.9	392.0	ppb

Calibration Performed By: Darrin Pike

Calibration Summary

Parameter NO₂

Air Monitoring Network Lafarge - Exshaw



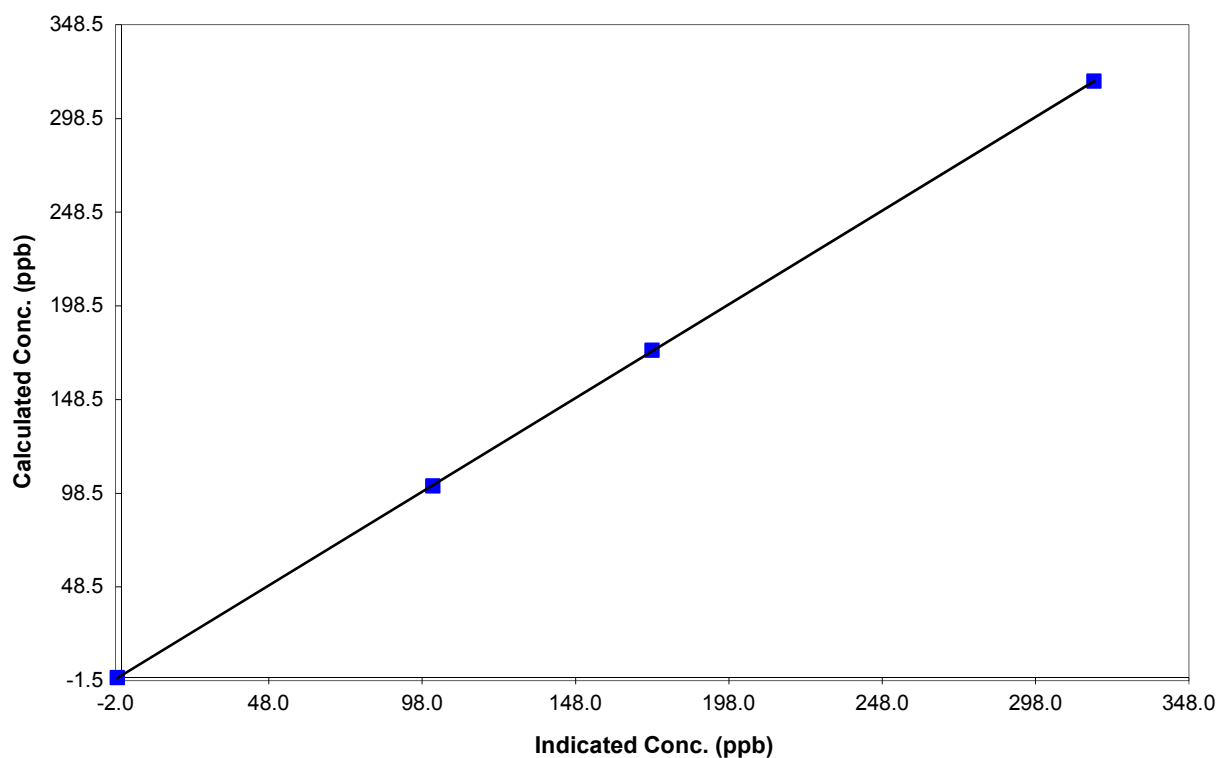
Station Information

Calibration Date	November 15, 2018	Previous Calibration	October 24, 2018
Station Number	N/A	Station Location	Exshaw - Lagoon
Start Time (MST)	11:30	End Time (MST)	16:30
Analyzer make	T200	Analyzer serial #	642

Calibration Data

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-1.4	N/A	Correlation Coefficient	0.999991
318.4	317.1	1.0040		
174.8	172.9	1.0109		
102.4	101.5	1.0092	Slope	1.000160
			Intercept	1.350819

NO₂ Calibration Curve



Calibration Summary

Parameter NO_x

Air Monitoring Network Lafarge - Exshaw



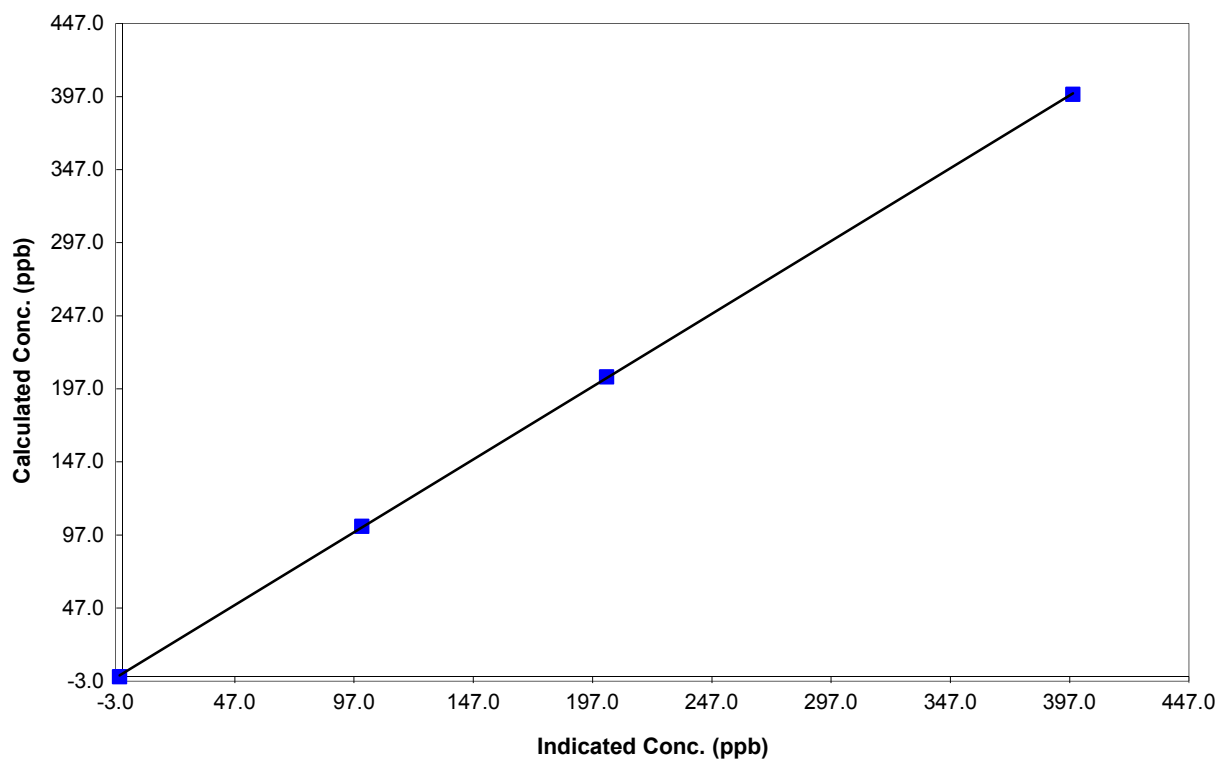
Station Information

Calibration Date	November 15, 2018	Previous Calibration	October 24, 2018
Station Number	N/A	Station Location	Exshaw - Lagoon
Start Time (MST)	11:30	End Time (MST)	16:30
Analyzer make	T200	Analyzer serial #	642

Calibration Data

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-1.2	N/A	Correlation Coefficient	0.999972
398.6	398.4	1.0006		
205.2	202.9	1.0113		
102.8	100.3	1.0251	Slope	0.996686
			Intercept	2.143167

NO_x Calibration Curve



Calibration Summary

Parameter NO
 Air Monitoring Network Lafarge - Exshaw



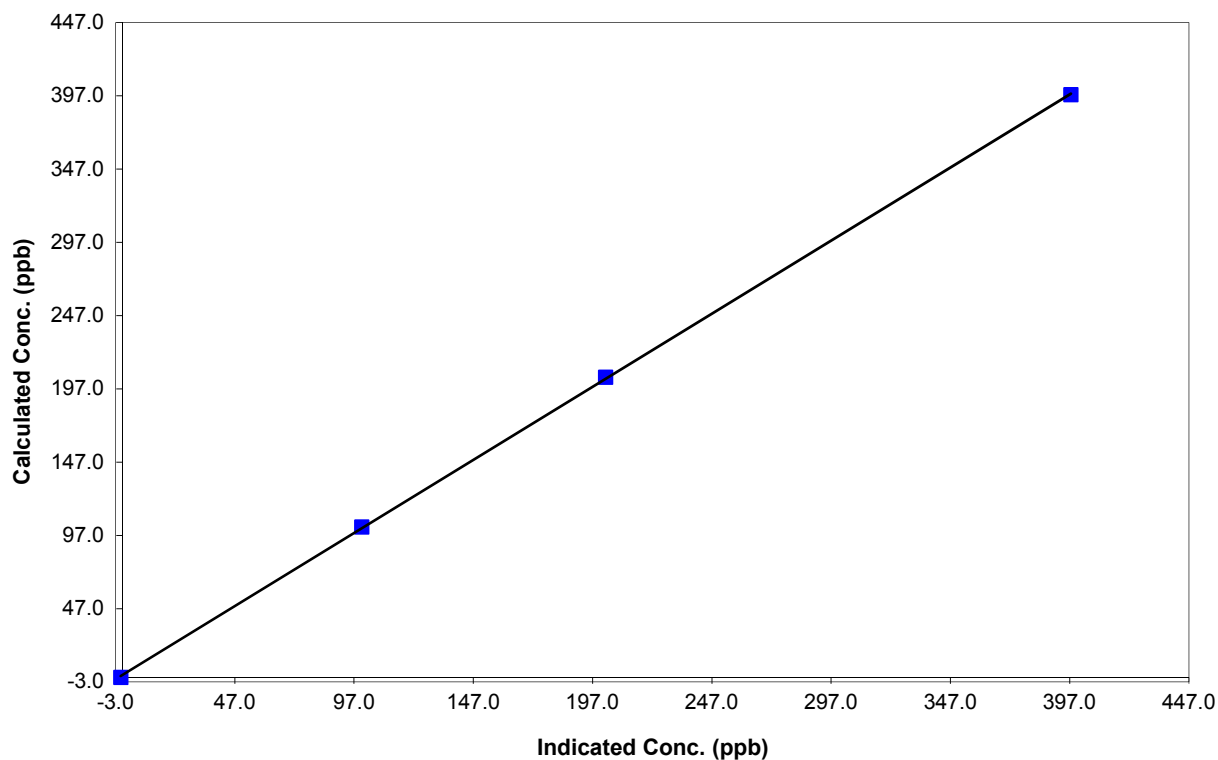
Station Information

Calibration Date	November 15, 2018	Previous Calibration	October 24, 2018
Station Number	N/A	Station Location	Exshaw - Lagoon
Start Time (MST)	11:30	End Time (MST)	16:30
Analyzer make	T200	Analyzer serial #	642

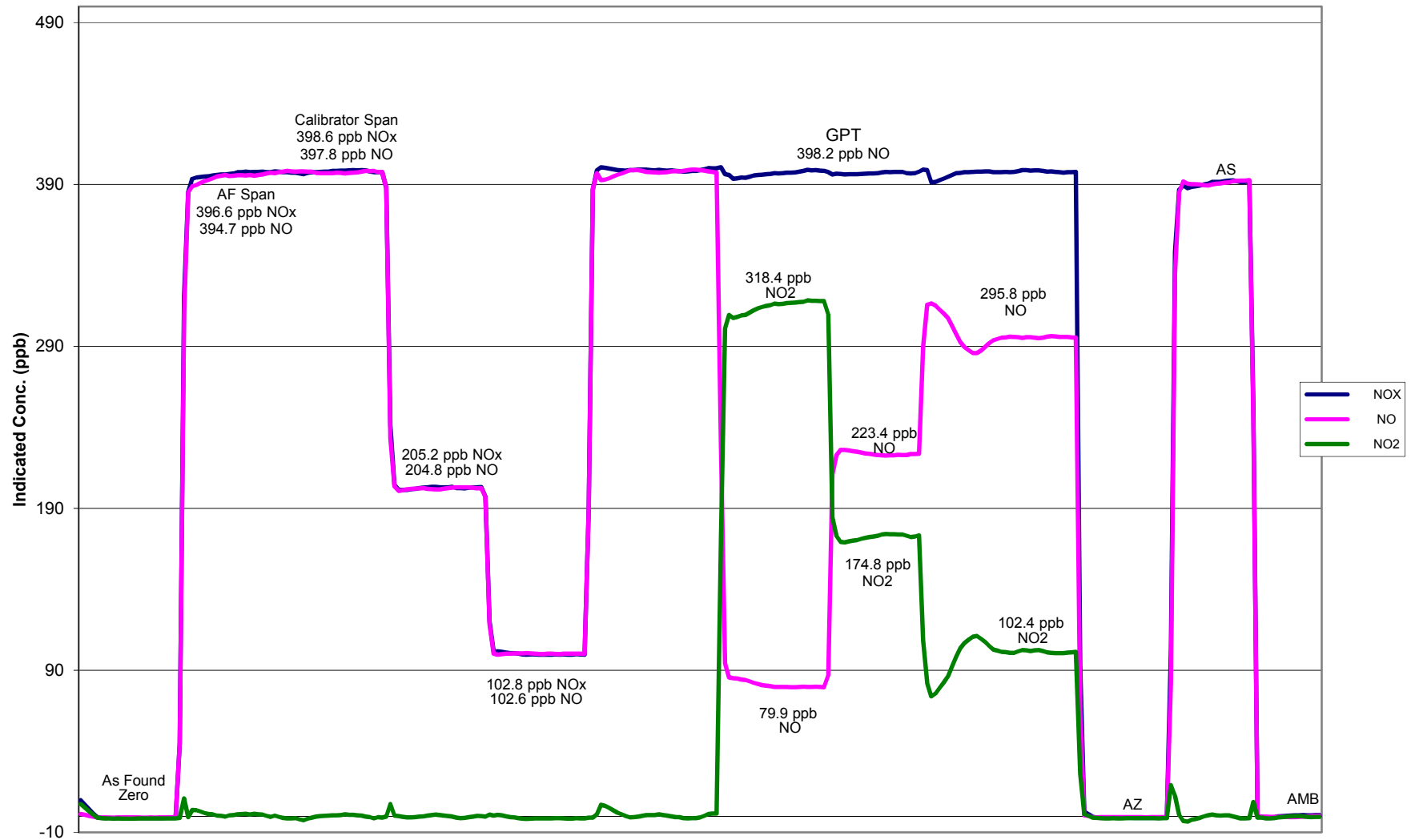
Calibration Data

Calculated conc (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	-0.8	N/A	Correlation Coefficient	0.999968
397.8	397.5	1.0007		
204.8	202.5	1.0112		
102.6	100.3	1.0228	Slope	0.997865
			Intercept	1.781147

NO Calibration Curve



NOX Calibration



November 15, 2018

Calibration Report



AIR QUALITY MONITORING

Parameter SO2

Air Monitoring Network Lafarge - Exshaw

Station Information

Calibration Date	November 15, 2018	Previous Calibration	October 24, 2018
Station Number	N/A	Station Location	Exshaw - Lagoon
Reason:	<input type="checkbox"/> Routine	<input type="checkbox"/> Install	<input type="checkbox"/> Removal
			Other: <input type="text"/>
Start Time (MST)	11:30	End Time (MST)	16:30
Barometric Pressure	650 mmHg	Station Temperature	22.0 Deg C
Calibrator	SABIO 2010	Serial Number	9700712
Cal Gas Concentration	50.8 ppm	Cal Gas Expiry Date	July 14, 2020
Gas Cert Reference	CC27839		
DACS make	Campbell Scientific CR1000	DACS serial No.	67802
DACS voltage range	0 - 5 VDC	DACS channel #	4
	<u>Before</u>		<u>After</u>
DACS Scale High	500	DACS slope	500
DACS Scale Low	0	DACS intercept	0
Calculated slope	0.992023	Calculated slope	0.999071
Calculated intercept	2.490198	Calculated intercept	1.177667
Analyzer make	API Model 102A	Analyzer serial #	393

	before		after	
Concentration range	0-500	ppb	0-500	ppb
Slope	1.203		1.201	
Offset	43.2	mV	43.2	mV
Pressure	23.8	in Hg	23.8	in Hg
Sample Flow	404	ccm	398	ccm
UV Lamp	3335	mV	3283	mV
HVPS	690	V	690	V
PMT Temp	7.4	degC	7.4	degC

Calibration Data

Dilution air flow rate (cc/min)	Source gas flow rate (cc/min)	Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)
5000	0.00	0.0	0.1	N/A
5000	39.00	393.2	393.0	1.0004
5000	20.00	202.4	200.7	1.0085
7000	14.00	101.4	99.1	1.0230
5000	0	0.0	0.1	As found zero
5000	39	393.2	392.0	As found span
Average Correction Factor				1.0106

Calculated value of As Found Response: 391.3 ppb Percent Change of As Found: 0.5%

	before calibration		after calibration	
Auto zero	-0.3	ppb	-0.4	ppb
Auto span	385.3	ppb	390.7	ppb

Notes: high point adjusted

Calibration Performed By: Darrin Pike

Calibration Summary

Parameter SO2

Air Monitoring Network Lafarge - Exshaw



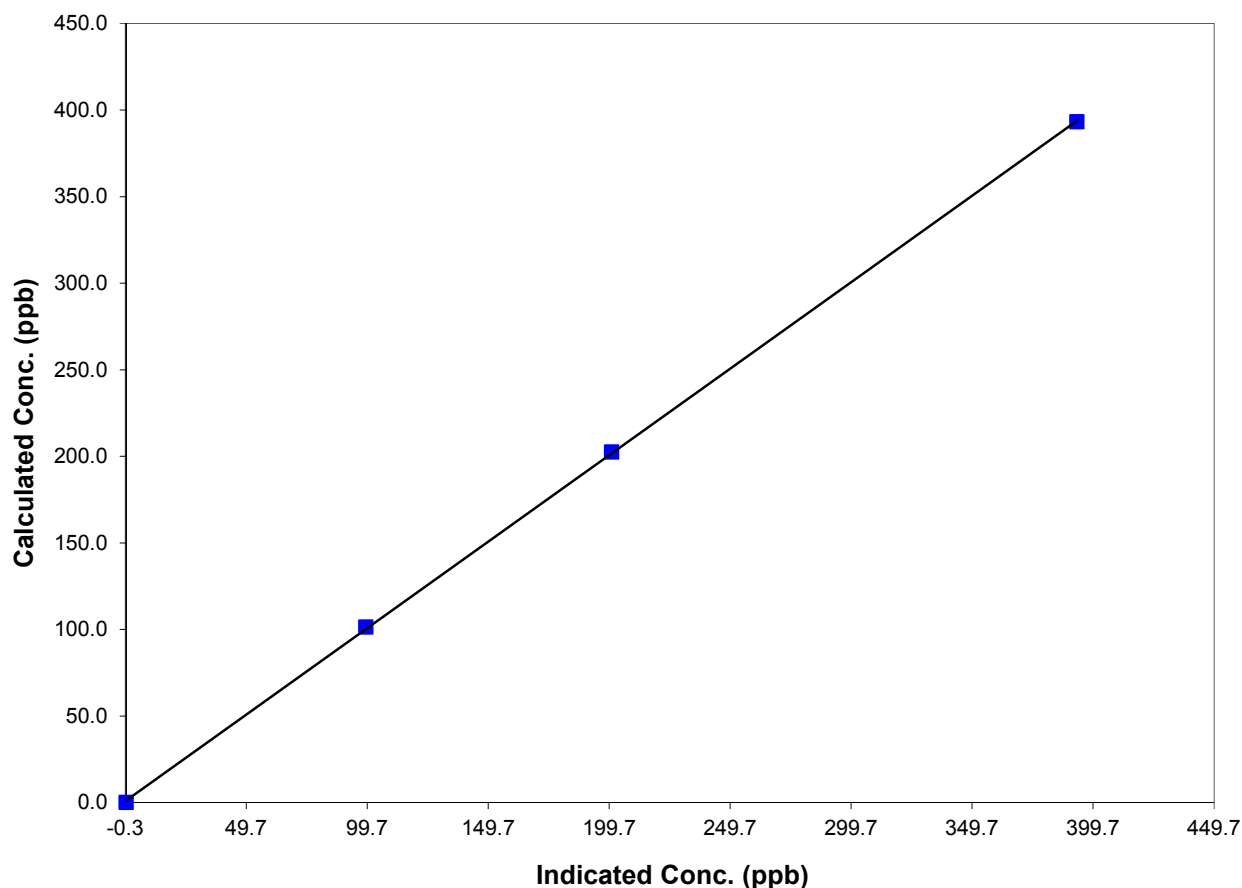
Station Information

Calibration Date	November 15, 2018	Previous Calibration	October 24, 2018
Station Number	N/A	Station Location	Exshaw - Lagoon
Start Time (MST)	11:30	End Time (MST)	16:30
Analyzer make/model	API Model 102A	Analyzer serial #	393

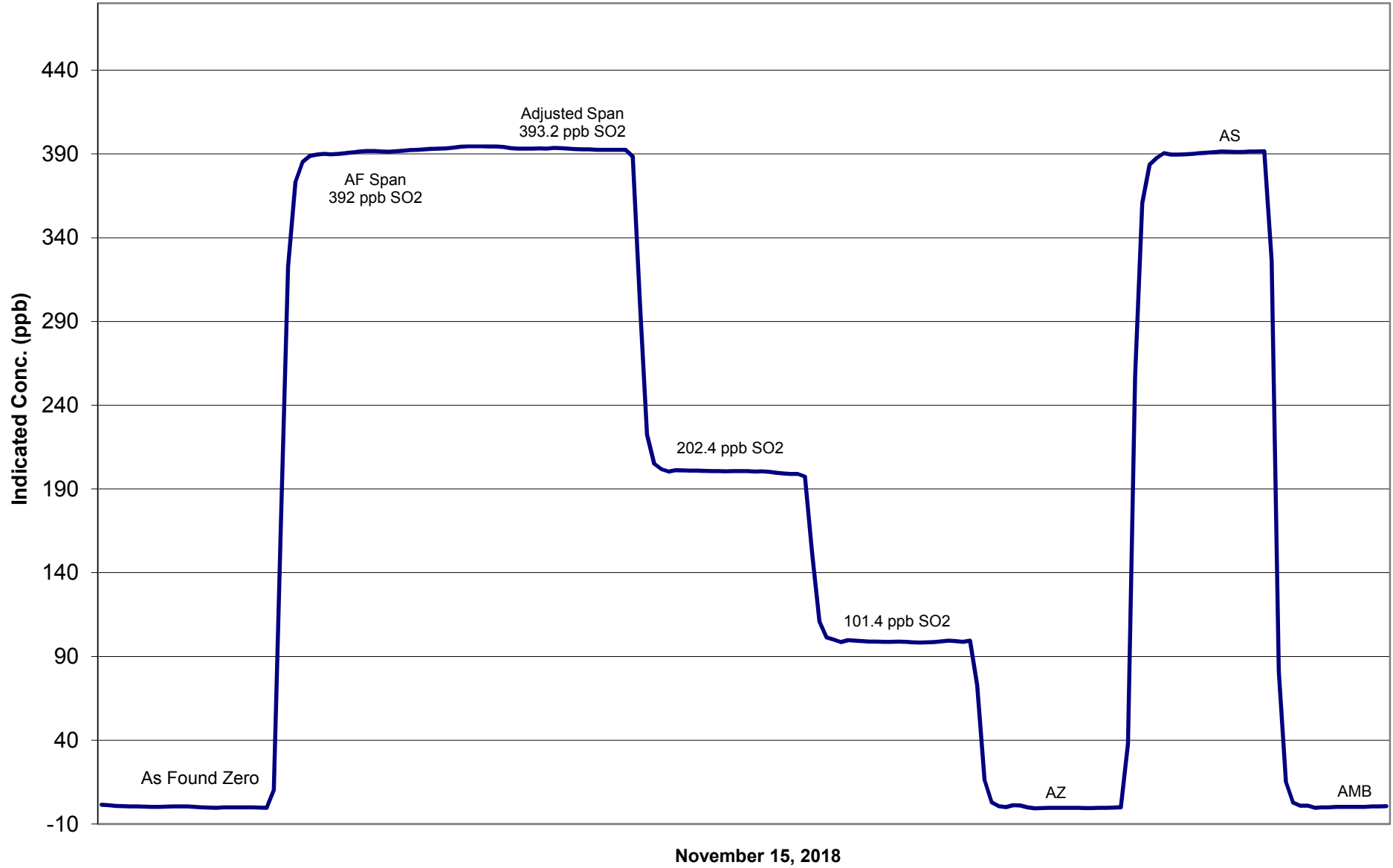
Calibration Data

Calculated concentration (ppb) (Cc)	Indicated concentration (ppb) (Ic)	Correction factor (Cc/Ic)	Statistical Evaluation	
0.0	0.1	N/A	Correlation Coefficient	0.999953
393.2	393.0	1.0004		
202.4	200.7	1.0085		
101.4	99.1	1.0230	Slope	0.999071
			Intercept	1.177667

SO2 Calibration Curve



SO2 Calibration





Field Service Report

Air Monitoring Network / Client: Lafarge

Station Information

Visit Date: November 15, 2018
Station Location: Exshaw
Reason for Visit: monthly calibrations
Arrival Time: 11:00
Weather Conditions: Clear, 5°C

Project Number: 171-00556-00
Station Name: Lagoon
Departure Time: 17:30

Record of Hours

Parts Used

Employee	Category	Hours	Qty	Parts Description
DP	CAL	6.5	2	47mm sample filter

Station Information

Time (MST) Comments

11:00 - Arrived at Lagoon station. Started unloading and setting for calibrations
11:30 - Started AF calibrator Zero on NOx and SO2.
11:45 - Flagged TSP for calibration.
11:55 - AF Zero was good. Started AF calibrator Span.
12:28 - NOx/SO2 spans adjusted
12:40 - BAM TSP calibration completed with no issues.
13:31 - SO2 calibration completed, no issues noted. NOx GPT reference point started, no issues noted in the first portion of the calibration.
14:05 - Started introducing O3 for GPT portion of calibration.
15:30 - GPT portion of calibration went well, no issues noted. Started AIC on NOx and SO2.
16:30 Left station & proceeded to the Grimm sites

West Sharp:
Measured Sample flow = 1.14 LPM
Sharp AmbT = 3.2 degC
Audit AmbT = 3.9 degC



Field Service Report

Berm Sharp:

Measured Sample flow = 1.1 LPM

Sharp AmbT = 3 degC

Audit AmbT = 3.5 degC

Entrance Sharp:

Measured Sample flow = 1.12 LPM

Sharp AmbT = 3.5 degC

Audit AmbT = 4 degC

17:30 Left plant after signing out.

NOTES:

- All analyzers in sample mode → OK
- Confirmed operation of manifold intake fan → OK
- All sample lines connected properly → OK

Technician: Darrin Pike

Ref #: 10922

Calibration Report

Parameter
Air Monitoring Network

Wind Speed & Direction

Lafarge - Exshaw

Station Information

Calibration Date	November 29, 2018	Previous Calibration	September 28, 2017
Station Number	NA	Station Location	Lagoon
Reason: Routine <input checked="" type="checkbox"/>	Installation <input type="checkbox"/>	Removal <input type="checkbox"/>	Other: <input type="checkbox"/>
Start Time (MST)	11:00	End Time (MST)	12:30
WS Calibrator	RM Young 053	Serial Number	H9383

WIND SPEED

Sensor make/model	MET One 010C	Sensor serial #	C2605
	<u>Before</u>		<u>After</u>
Calculated slope	1.004760	Calculated slope	1.005128
Calculated intercept	-0.360133	Calculated intercept	-0.362351

Wind Speed Calibration Data

Shaft RPM	Actual Speed (K/hr)	Indicated Speed (K/hr)	Correction factor
0	0.0	1.0	n/a
100	10.6	10.6	0.9957
200	20.2	20.2	0.9981
300	29.8	29.8	0.9987
400	39.4	39.4	0.9990
500	49.0	49.0	0.9991
600	58.6	58.6	0.9992
700	68.2	68.2	0.9993
800	77.8	77.8	0.9994
900	87.4	87.4	0.9994
Average Correction Factor			0.9990

WIND DIRECTION

Sensor make/model	Met One 020C	Sensor serial #	E3126
	<u>Before</u>		<u>After</u>
Calculated slope	1.000556	Calculated slope	1.000072
Calculated intercept	-0.700367	Calculated intercept	-0.013025

Wind Direction Calibration Data

Physical Direction (Degrees)	Indicated Direction (Degrees)	Correction factor
0	1.0	n/a
90	88.7	1.0147
180	179.7	1.0017
270	270.6	0.9978
360	360.0	1.0000
Average Correction Factor		1.0035

Notes: Removal calibration - no adjustments made

Calibration Performed By: Darrin Pike / Lenin Flores

Calibration Report

Parameter
Air Monitoring Network
Station Information

Wind Speed & Direction
Lafarge - Exshaw

Calibration Date	November 29, 2018	Previous Calibration	September 28, 2017
Station Number	NA	Station Location	Lagoon
Start Time (MST)	11:00	End Time (MST)	12:30

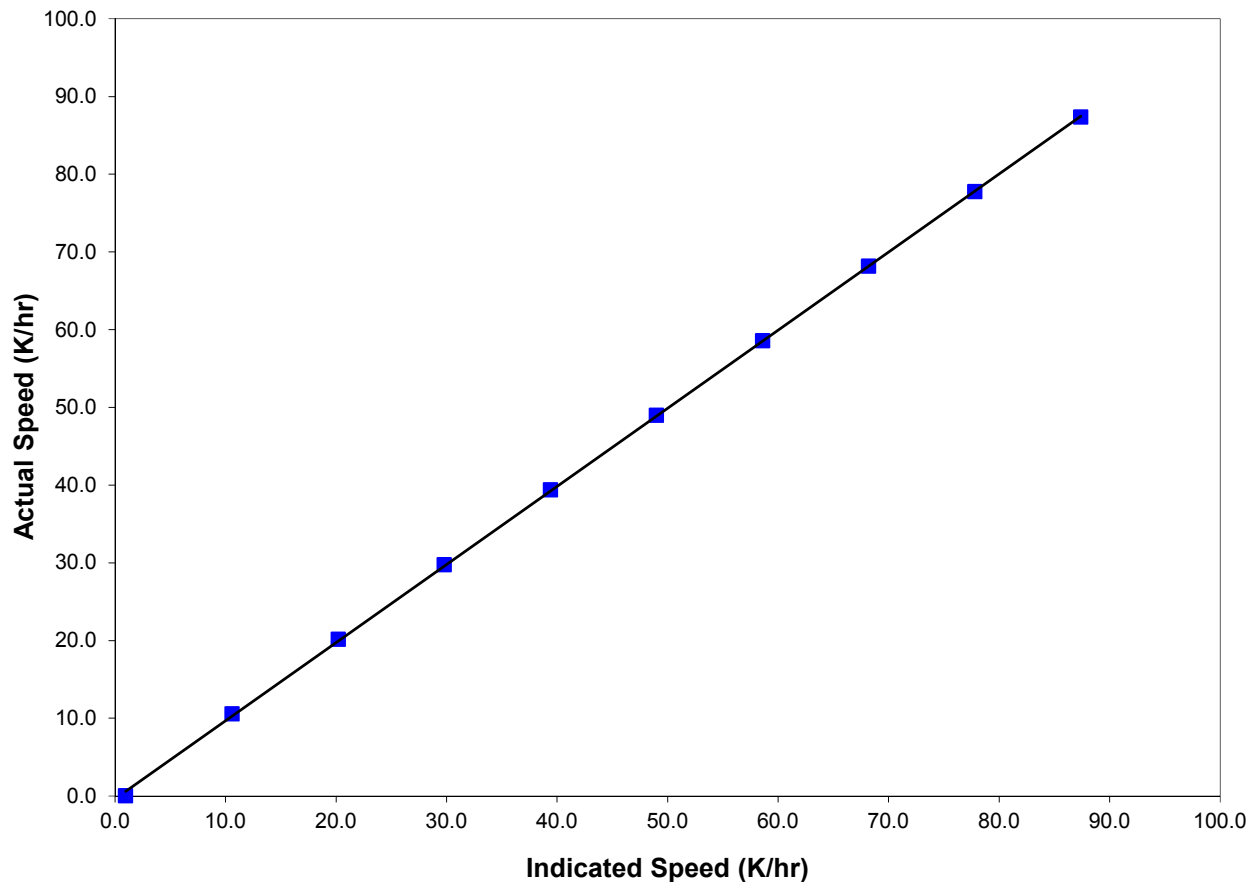
WIND SPEED

Sensor make/model	MET One 010C	Sensor serial #	C2605
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Calibration Data

Actual Speed (K/hr)	Indicated Speed (K/hr)	Correction factor	Statistical Evaluation	
0.0	1.0	N/A	Correlation Coefficient	
10.6	10.6	0.9957		
20.2	20.2	0.9981		
29.8	29.8	0.9987		
39.4	39.4	0.9990		
49.0	49.0	0.9991	Slope	1.005128
58.6	58.6	0.9992		
68.2	68.2	0.9993		
77.8	77.8	0.9994		
87.4	87.4	0.9994	Intercept	-0.362351

WS Calibration Curve



Calibration Report

Parameter
Air Monitoring Network

Wind Speed & Direction

Lafarge - Exshaw

Station Information

Calibration Date	November 29, 2018	Previous Calibration	September 28, 2017
Station Number	NA	Station Location	Lagoon
Start Time (MST)	11:00	End Time (MST)	12:30

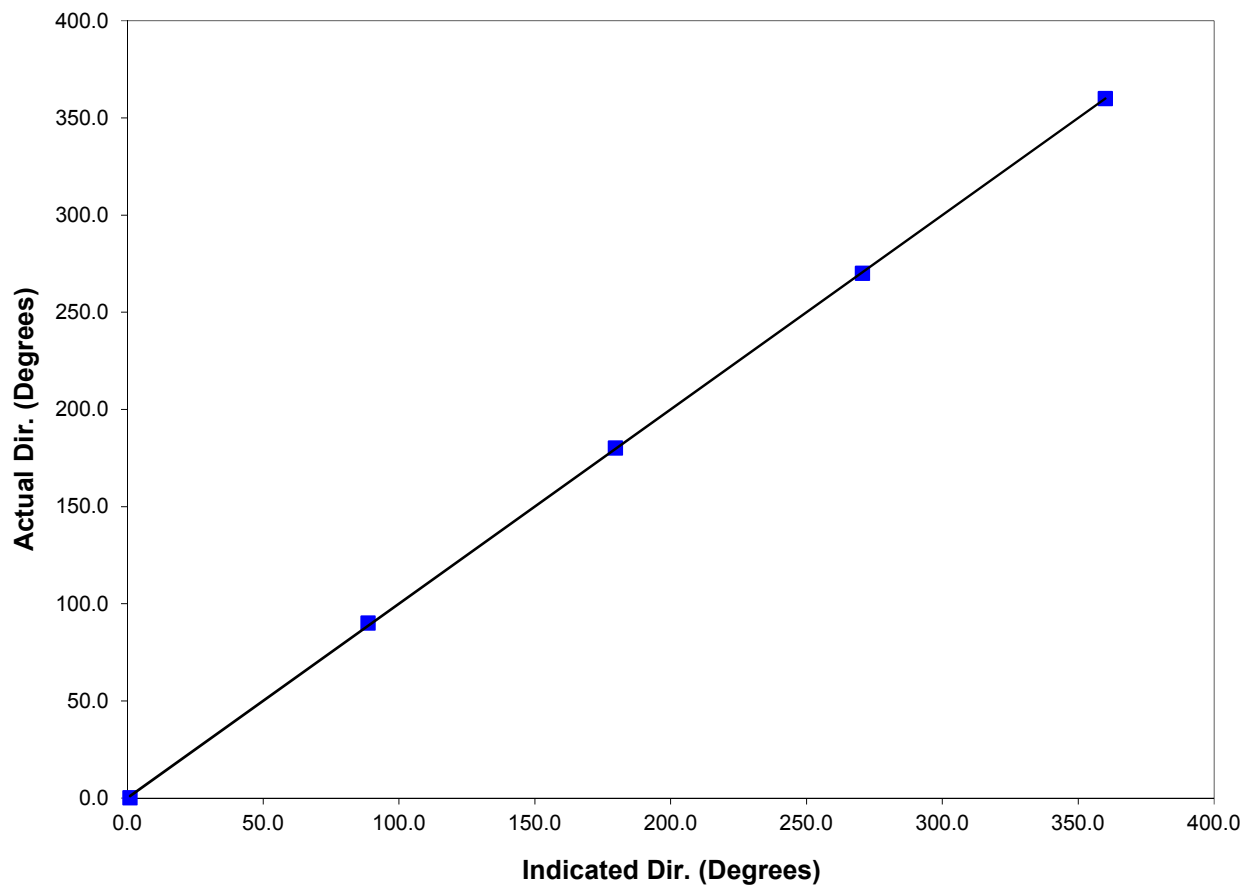
WIND DIRECTION

Sensor make/model	Met One 020C	Sensor serial #	E3126
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Calibration Data

Physical Direction (Degrees)	Indicated Direction (Degrees)	Correction factor	Statistical Evaluation	
0.0	1.0	N/A	Correlation Coefficient	0.999961
90.0	88.7	1.0147		
180.0	179.7	1.0017	Slope	1.000072
270.0	270.6	0.9978		
360.0	360.0	1.0000	Intercept	-0.013025

WD Calibration Curve



Calibration Report

Parameter
Air Monitoring Network

Wind Speed & Direction

Lafarge - Exshaw

Station Information

Calibration Date	November 29, 2018	Previous Calibration	N/A
Station Number	NA	Station Location	Lagoon
Reason: Routine <input type="checkbox"/>	Installation <input checked="" type="checkbox"/>	Removal <input type="checkbox"/>	Other: <input type="checkbox"/>
Start Time (MST)	11:00	End Time (MST)	12:30
WS Calibrator	RM Young 053	Serial Number	H9383

WIND SPEED

Sensor make/model	MET One 010C	Sensor serial #	C3632
	<u>Before</u>		<u>After</u>
Calculated slope	NA	Calculated slope	1.004715
Calculated intercept	NA	Calculated intercept	-0.357151

Wind Speed Calibration Data

Shaft RPM	Actual Speed (K/hr)	Indicated Speed (K/hr)	Correction factor
0	0.0	1.0	n/a
100	10.6	10.6	0.9966
200	20.2	20.2	0.9991
300	29.8	29.8	0.9977
400	39.4	39.4	0.9990
500	49.0	49.1	0.9981
600	58.6	58.6	0.9989
700	68.2	68.2	0.9993
800	77.8	77.8	0.9989
900	87.4	87.4	0.9992
Average Correction Factor			0.9988

WIND DIRECTION

Sensor make/model	Met One 020C	Sensor serial #	E1032
	<u>Before</u>		<u>After</u>
Calculated slope	NA	Calculated slope	1.005575
Calculated intercept	NA	Calculated intercept	-0.480636

Wind Direction Calibration Data

Physical Direction (Degrees)	Indicated Direction (Degrees)	Correction factor
0	1.0	n/a
90	89.6	1.0045
180	179.2	1.0045
270	268.6	1.0052
360	359.0	1.0028
Average Correction Factor		1.0042

Notes: New bearings installed, new potentiometer installed in 020C WD. Swapped sensors.

Calibration Performed By: Darrin Pike / Lenin Flores

Calibration Report

Parameter
Air Monitoring Network
Station Information

Wind Speed & Direction
Lafarge - Exshaw

Calibration Date	November 29, 2018	Previous Calibration	N/A
Station Number	NA	Station Location	Lagoon
Start Time (MST)	11:00	End Time (MST)	12:30

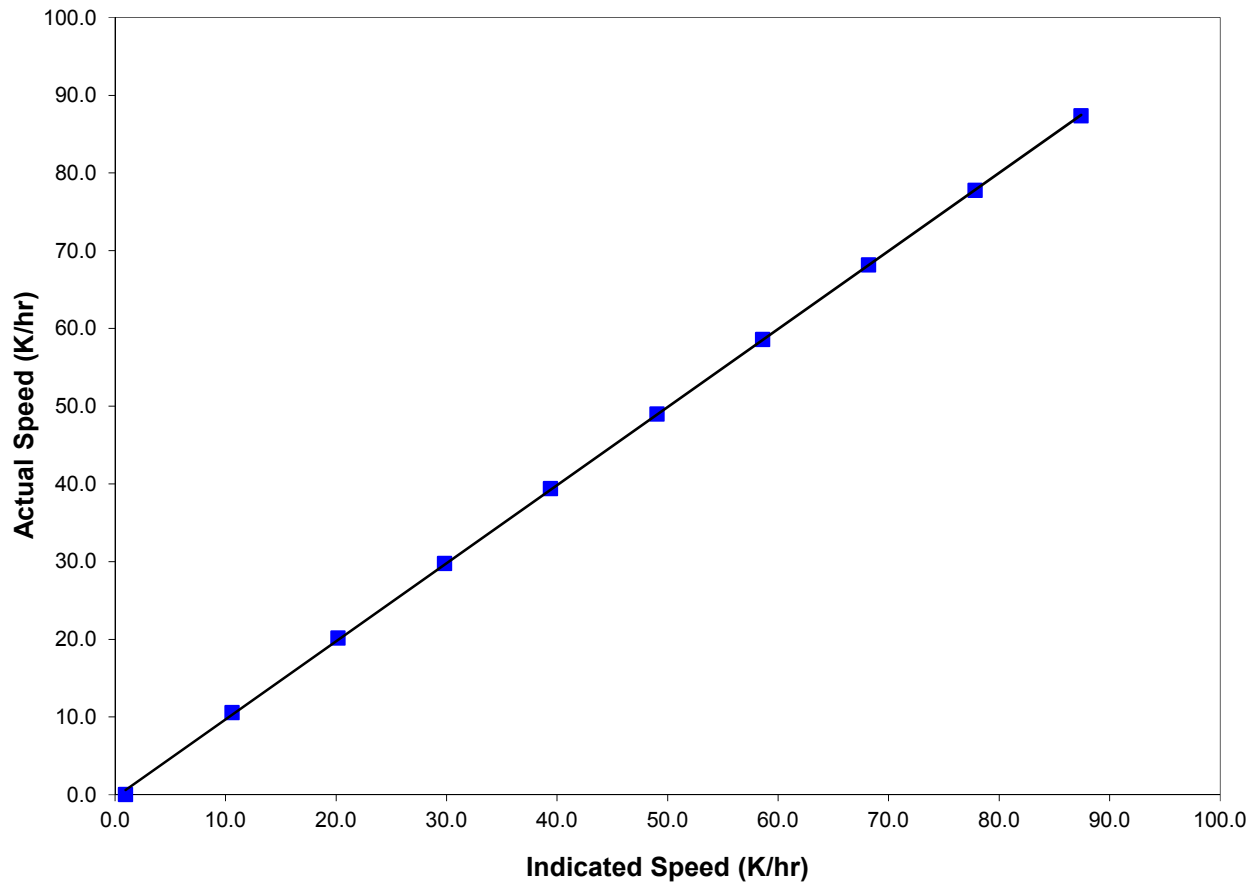
WIND SPEED

Sensor make/model	MET One 010C	Sensor serial #	C3632
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Calibration Data

Actual Speed (K/hr)	Indicated Speed (K/hr)	Correction factor	Statistical Evaluation	
0.0	1.0	N/A	Correlation Coefficient	
10.6	10.6	0.9966		
20.2	20.2	0.9991		
29.8	29.8	0.9977		
39.4	39.4	0.9990		
49.0	49.1	0.9981	Slope	1.004715
58.6	58.6	0.9989		
68.2	68.2	0.9993		
77.8	77.8	0.9989		
87.4	87.4	0.9992	Intercept	-0.357151

WS Calibration Curve



Calibration Report

Parameter
Air Monitoring Network

Wind Speed & Direction

Lafarge - Exshaw

Station Information

Calibration Date	November 29, 2018	Previous Calibration	N/A
Station Number	NA	Station Location	Lagoon
Start Time (MST)	11:00	End Time (MST)	12:30

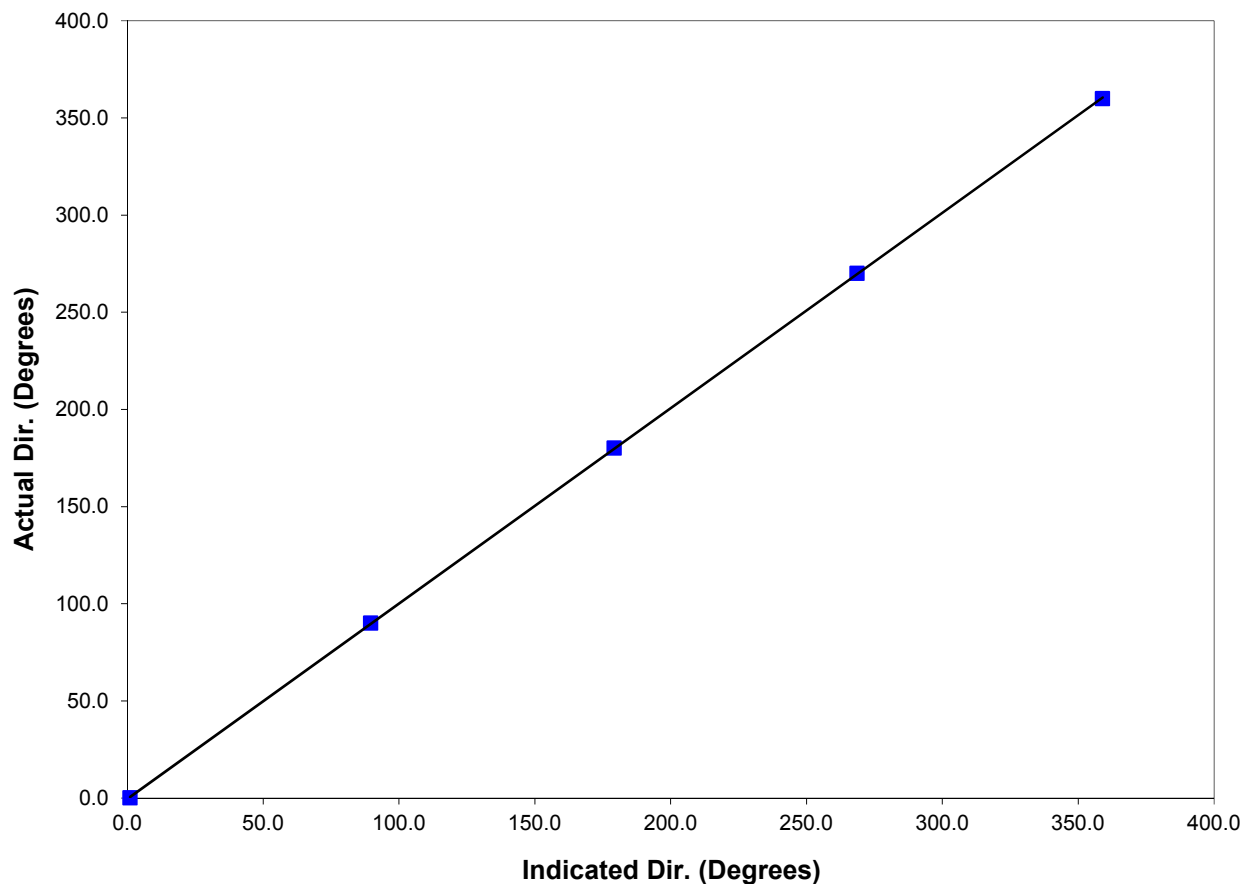
WIND DIRECTION

Sensor make/model	Met One 020C	Sensor serial #	E1032
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Calibration Data

Physical Direction (Degrees)	Indicated Direction (Degrees)	Correction factor	Statistical Evaluation	
0.0	1.0	N/A	Correlation Coefficient	0.999989
90.0	89.6	1.0045		
180.0	179.2	1.0045	Slope	1.005575
270.0	268.6	1.0052		
360.0	359.0	1.0028	Intercept	-0.480636

WD Calibration Curve





Field Service Report

Air Monitoring Network / Client: Lafarge

Station Information

Visit Date: November 29, 2018
Station Location: Exshaw
Reason for Visit: yearly wind calibrations
Arrival Time: 11:00
Weather Conditions: 5 deg C, sunny

Project Number: 171-00556-00
Station Name: Lagoon
Departure Time: 14:00

Record of Hours

Parts Used

Employee	Category	Hours	Qty	Parts Description
DP	TR	3		
DP	CAL	3		

Station Information

Time (MST) Comments

11:00 – Arrived on site for calibrations
11:10 – Flagged wind system for calibrations
11:20 – Removed wind system from the tower
12:30 – Completed a removal calibration of wind speed and direction units.
12:45 – Started install calibration after maintenance was completed.
13:30 – Install calibration was completed with no issues to note.
13:50 – Wind system was deployed on the tower with no issues.
14:00 – signed out at Lafarge plant and left site

Technician: Darrin Pike

Ref #: 10998

MetOne BAM PM_{2.5} Calibration



STATION: Lafarge
LOCATION: Exshaw - Windridge
START TIME (MST): 9:45

OPERATOR: Darrin Pike
DATE: November 15, 2018
END TIME (MST): 10:38

MONITOR INFO / PARAMETER VALUES:

Make/Model MetOne BAM
Configuration PM2.5
Serial Number U21074

Audit Device Model Delta Cal
Audit Device S/N 624
Certification Date 30-Nov-17

AUDIT / CALIBRATION RESULTS:

		Ambient Temp. (° C)	Ambient Pres. (mmHg)	Leak Check (L/min)	Flow Rate (lpm)	Time settings (hh:mm)
As Found Data	Audit values (I)	2.6	651	0.00	16.7	10:34
	MEASURED (AF)	2.5	651	0.40	16.26	10:35
	AF Difference (AF-I)	-0.1	0	0.40	-0.44	0:01
Adjusted Data	MEASURED (M)	2.6	651	0.40	16.69	10:34
	Adj Difference (M-I)	0.0	0	0.40	-0.01	0:00
	LIMITS	± 2.0 °C	5 mm Hg	1.0 L/min	± 1.0 L/min	±2 min

Sample Head Inspect/Cleaning: inspected and cleaned

Status of sampling tape: 1/3 roll

Nozzle Inspection / cleanliness: clean

COMMENTS:

MetOne BAM PM₁₀ Calibration



STATION: Lafarge
LOCATION: Exshaw - Windridge
START TIME (MST): 9:55

OPERATOR: Darrin Pike
DATE: November 15, 2018
END TIME (MST): 10:51

MONITOR INFO / PARAMETER VALUES:

Make/Model MetOne BAM
PM10
Serial Number U21075

Audit Device Model Delta Cal
Audit Device S/N 624
Certification Date 30-Nov-17

AUDIT / CALIBRATION RESULTS:

		Ambient Temp. (° C)	Ambient Pres. (mmHg)	Leak Check (L/min)	Flow Rate (lpm)	Time settings (hh:mm)
As Found Data	Audit values (I)	2.3	651	0.00	16.7	10:47
	MEASURED (AF)	1.6	651	0.30	16.30	10:48
	AF Difference (AF-I)	-0.7	0	0.30	-0.40	0:01
Adjusted Data	MEASURED (M)	2.3	651	0.30	16.70	10:47
	Adj Difference (M-I)	0.0	0	0.30	0.00	0:00
	LIMITS	± 2.0 °C	5 mm Hg	1.0 L/min	± 1.0 L/min	±2 min

Sample Head Inspect/Cleaning: inspected and cleaned

Status of sampling tape: 1/3 roll

Nozzle Inspection / cleanliness: clean

COMMENTS:

MetOne BAM TSP Calibration



STATION: Lafarge
LOCATION: Exshaw - Windridge
START TIME (MST): 10:10

OPERATOR: Darrin Pike
DATE: November 15, 2018
END TIME (MST): 11:05

MONITOR INFO / PARAMETER VALUES:

Make/Model MetOne BAM
Configuration TSP
Serial Number U21073

Audit Device Model Delta Cal
Audit Device S/N 624
Certification Date 30-Nov-17

AUDIT / CALIBRATION RESULTS:

		Ambient Temp. (°C)	Ambient Pres. (mmHg)	Leak Check (L/min)	Flow Rate (lpm)	Time settings (hh:mm)
As Found Data	Audit values (I)	2.3	651	0.00	16.7	11:01
	MEASURED (AF)	2.3	651	0.40	16.50	11:02
	AF Difference (AF-I)	0.0	0	0.40	-0.20	0:01
Adjusted Data	MEASURED (M)	2.3	651	0.40	16.71	11:01
	Adj Difference (M-I)	0.0	0	0.40	0.01	0:00
	LIMITS	± 2.0 °C	5 mm Hg	1.0 L/min	± 1.0 L/min	±2 min

Sample Head Inspect/Cleaning: inspected and cleaned

Status of sampling tape: 1/3 roll

Nozzle Inspection / cleanliness: clean

COMMENTS:



Field Service Report

Air Monitoring Network / Client: Lafarge

Station Information

Visit Date: November 15, 2018
Station Location: Exshaw
Reason for Visit: monthly calibrations
Arrival Time: 09:00
Weather Conditions: Clear, 3°C

Project Number: 171-00556-00
Station Name: Windridge
Departure Time: 11:00

Record of Hours

Parts Used

Employee	Category	Hours	Qty	Parts Description
DP	TR	3		
DP	CAL	2		

Station Information

Time (MST) Comments

9:00 – Arrived at LaFarge plant and signed in
9:30 - Flagged all PM channels at Windridge site for BAM 1020 calibrations.
10:38 - BAM PM2.5 calibration completed with no issues.
10:51 - BAM PM10 calibration completed with no issues.
11:00 - BAM TSP calibration unable to complete due to rain.
11:00 – Left site and proceeded to the lagoon site

NOTES:

- All analyzers in sample mode → OK
- Confirmed operation of manifold intake fan → OK
- All sample lines connected properly → OK

Technician: Darrin Pike

Ref #: 10924