

Ambient Air and Sound

Monthly Report

**STONEY TRAIL AGGREGATE RESOURCE**

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**BURNCO**

**LAFARGE**



**Volker Stevin**  
Contracting Ltd.

**Heidelberg**  
Materials

February 2024

# Glossary

- L<sub>eq</sub>** - Equivalent Continuous Sound Pressure Level. The total sound energy logged over the course of a measurement. (Uses logarithmic averaging).
- L<sub>eq24</sub>** - Measured over the entire 24-period (00:00 – 23:59)
- L<sub>eqDay</sub>** - Measured over the daytime period (07:00 – 22:00)
- L<sub>eqNight</sub>** - Measured over the nighttime period (22:00 – 07:00)
- SPL (dBA)** - Sound Pressure Level in dBA (A-weighted, which is corrected for human hearing)
- TSP** - Total Suspended Particulate Matter. Includes particulates with a diameter of greater than 10 micrometers and smaller.
- PM<sub>2.5</sub>** - Particulate Matter with a diameter of 2.5 micrometers and smaller.

## 1.0 SOUND LEVEL MEASUREMENT RESULTS

The results of the sound monitoring at the STAR Pit can be found in Table 1. Table 1 provides the daily averaged  $L_{eq24}$ ,  $L_{eqDay}$  and  $L_{eqNight}$  sound levels in addition to the minimum and maximum  $L_{eq24}$  values.

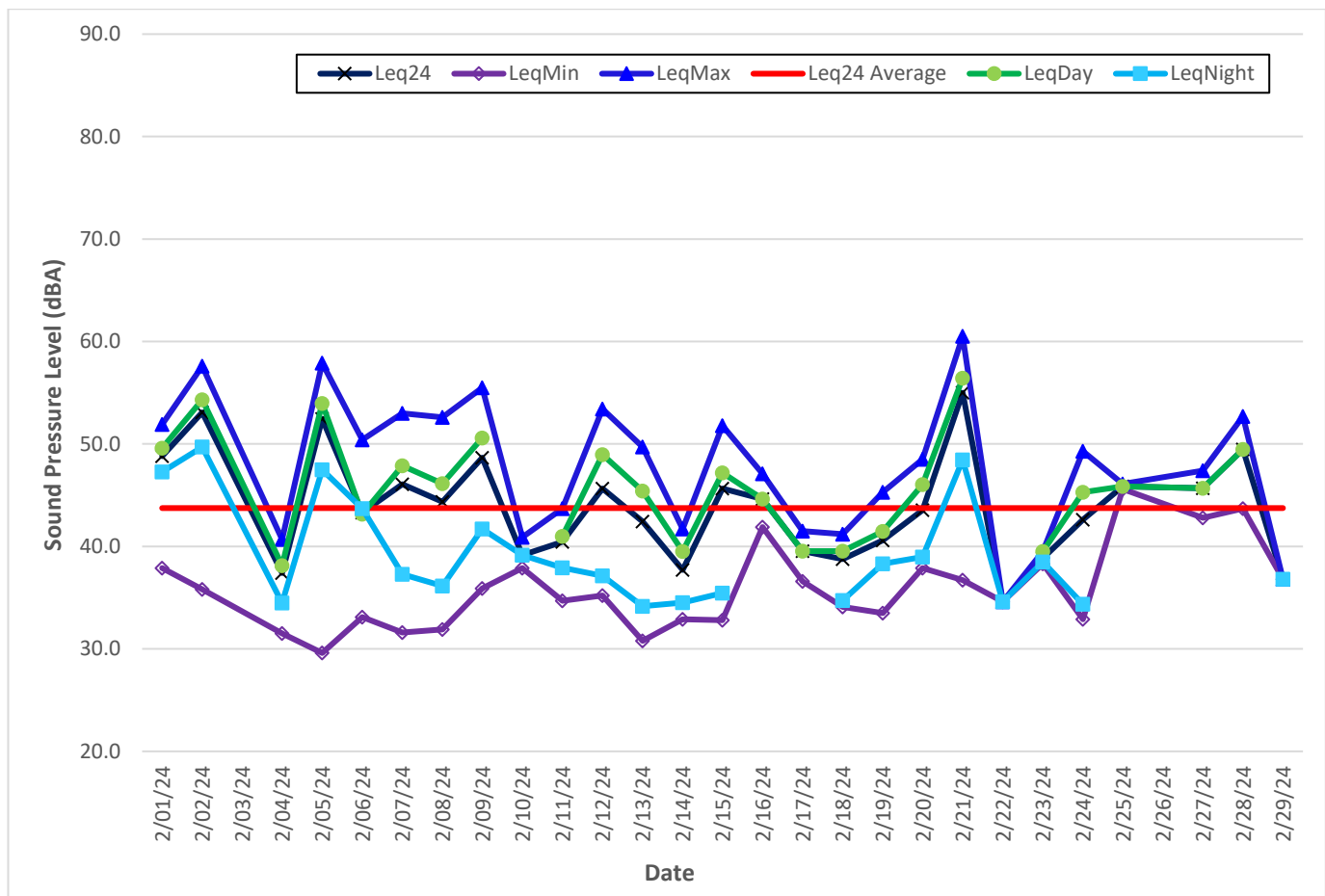
**Table 1. February 2024 – STAR PIT – Sound Monitoring Results<sup>1</sup>**

Day	Leq24	L <sub>eq</sub> Min	L <sub>eq</sub> Max	LeqDay	LeqNight
Thursday 01-Feb-24	48.8	37.9	51.9	49.6	47.3
Friday 02-Feb-24	53.1	35.8	57.6	54.3	49.7
Saturday 03-Feb-24	No Data				
Sunday 04-Feb-24	37.4	31.5	40.7	38.1	34.5
Monday 05-Feb-24	52.5	29.6	57.9	54.0	47.5
Tuesday 06-Feb-24	43.3	33.1	50.4	43.1	43.7
Wednesday 07-Feb-24	46.1	31.6	53.0	47.9	37.3
Thursday 08-Feb-24	44.3	31.9	52.6	46.1	36.2
Friday 09-Feb-24	48.7	35.9	55.5	50.6	41.7
Saturday 10-Feb-24	39.2	37.9	40.9	N/A	39.2
Sunday 11-Feb-24	40.4	34.7	43.7	41.0	37.9
Monday 12-Feb-24	45.7	35.2	53.4	49.0	37.1
Tuesday 13-Feb-24	42.4	30.8	49.7	45.4	34.2
Wednesday 14-Feb-24	37.7	32.9	41.7	39.5	34.5
Thursday 15-Feb-24	45.6	32.8	51.8	47.2	35.5
Friday 16-Feb-24	44.6	41.9	47.1	44.6	N/A
Saturday 17-Feb-24	39.5	36.6	41.5	39.5	N/A
Sunday 18-Feb-24	38.8	34.1	41.2	39.6	34.7
Monday 19-Feb-24	40.6	33.5	45.3	41.5	38.3
Tuesday 20-Feb-24	43.5	37.9	48.5	46.0	39.0
Wednesday 21-Feb-24	55.0	36.7	60.5	56.4	48.5
Thursday 22-Feb-24	34.6	34.6	34.6	N/A	34.6
Friday 23-Feb-24	38.9	38.3	39.5	39.5	38.5
Saturday 24-Feb-24	42.6	32.9	49.3	45.3	34.4
Sunday 25-Feb-24	45.9	45.6	46.1	45.9	N/A
Monday 26-Feb-24	No Data				
Tuesday 27-Feb-24	45.7	42.8	47.4	45.7	N/A
Wednesday 28-Feb-24	49.5	43.7	52.7	49.5	N/A
Thursday 29-Feb-24	36.8	36.8	36.8	N/A	36.8
Monthly Average	43.7	35.8	47.8	45.8	39.1
Monthly Maximum	55.0	45.6	60.5	56.4	49.7
Monthly Minimum	34.6	29.6	34.6	38.1	34.2

<sup>1</sup> It should be noted that all measured sound levels provided in Table 1 are for instances in which the wind speeds were below 11 km/hr and rainfall was below 3mm/hr, as both conditions will impact the validity of the measured results. As such, it is possible that there will time periods/days in which there is no valid data.

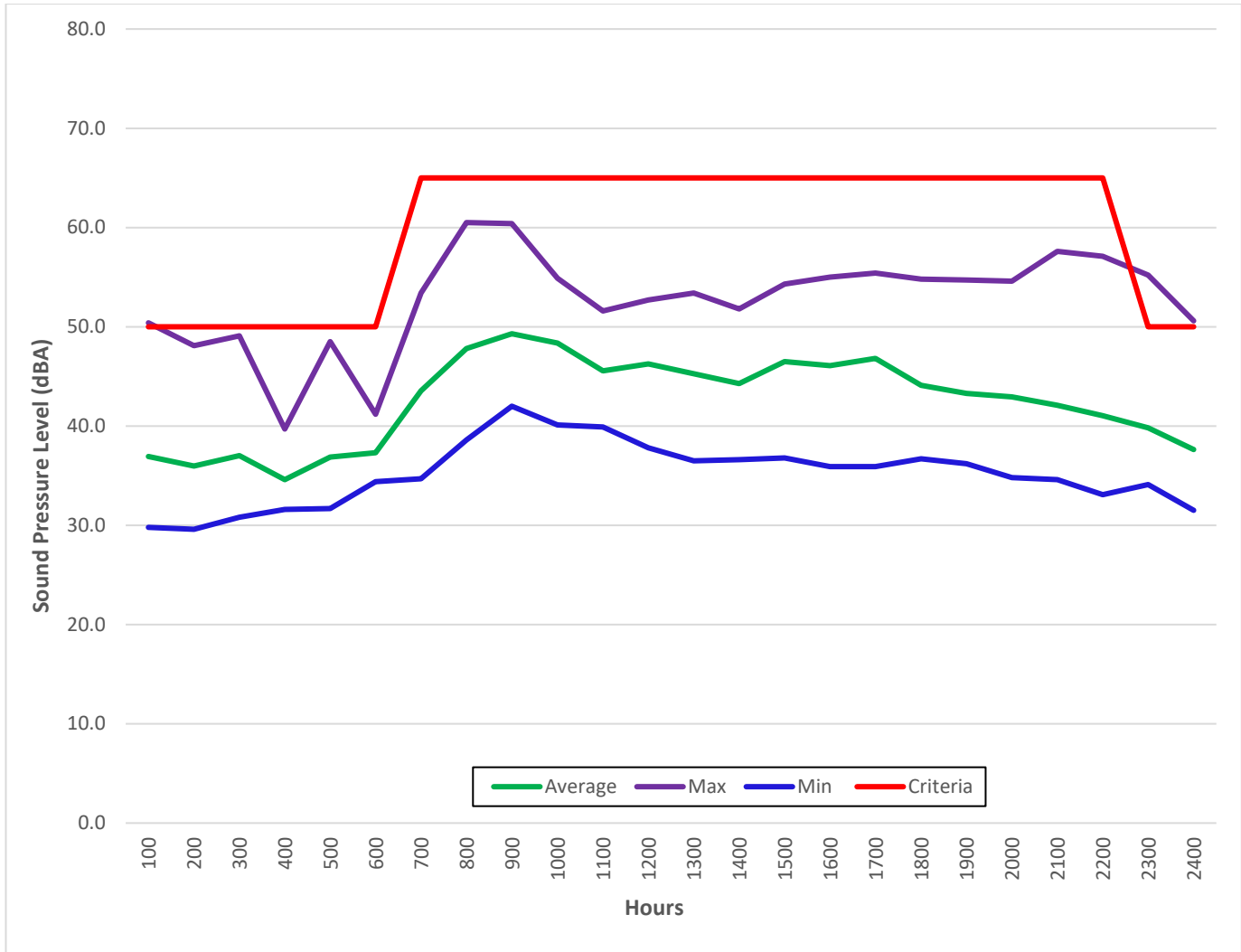
Figure 1 provides the graphical representation of the results found in Table 1. Figure 2 illustrates the hourly average, maximum and minimum Leq dBA values for the entire month. In addition, the City of Calgary’s Community Standards Bylaw values have been included.

Lastly, it is important to note that the monitoring stations are located inside the perimeter berms, adjacent to operations and not beyond the site boundaries. Measurements are intended to help monitor and measure the internal operations performance and are not representative of the lower offsite levels.



**Figure 1. STAR PIT – February 2024 – Daily Sound Monitoring Results<sup>2</sup>**

<sup>2</sup> Values of 30 were given to dates in which there was no data. This was to allow for the creation of the graph. The values within Table 1 are correctly calculated ignoring the dates of no data (due to wind or rain).



**Figure 2. STAR PIT – February 2024 – Hourly Sound Monitoring Summary**

## 2.0 SOUND LEVEL EXCEEDANCES

As per the development permit, the permissible sound level for this site is 50 dBA  $L_{eq}$ -1Hour for the nighttime and 65 dBA  $L_{eq}$ -1Hour for the daytime hours. As shown in Table 2, from February 1 to 29, 2024 there were 5 exceedances.

**Table 2. STAR PIT – February 2024 – Sound Level Exceedances**

Date	$L_{eq}$ -1-hour (dBA)	Wind Speed (Km/hr)	Temperature (°C)	Wind Direction	Hourly Rainfall (mm)	Day/Night
Feb-02-2024 23:00	55.2	10.7	7.2	North-West	0.00	Night
Feb-05-2024 23:00	51.7	7.6	-7.5	North-East	0.00	Night
Feb-06-2024 00:00	50.6	8.1	-7.8	North	0.00	Night
Feb-06-2024 01:00	50.4	10.3	-7.9	North	0.00	Night

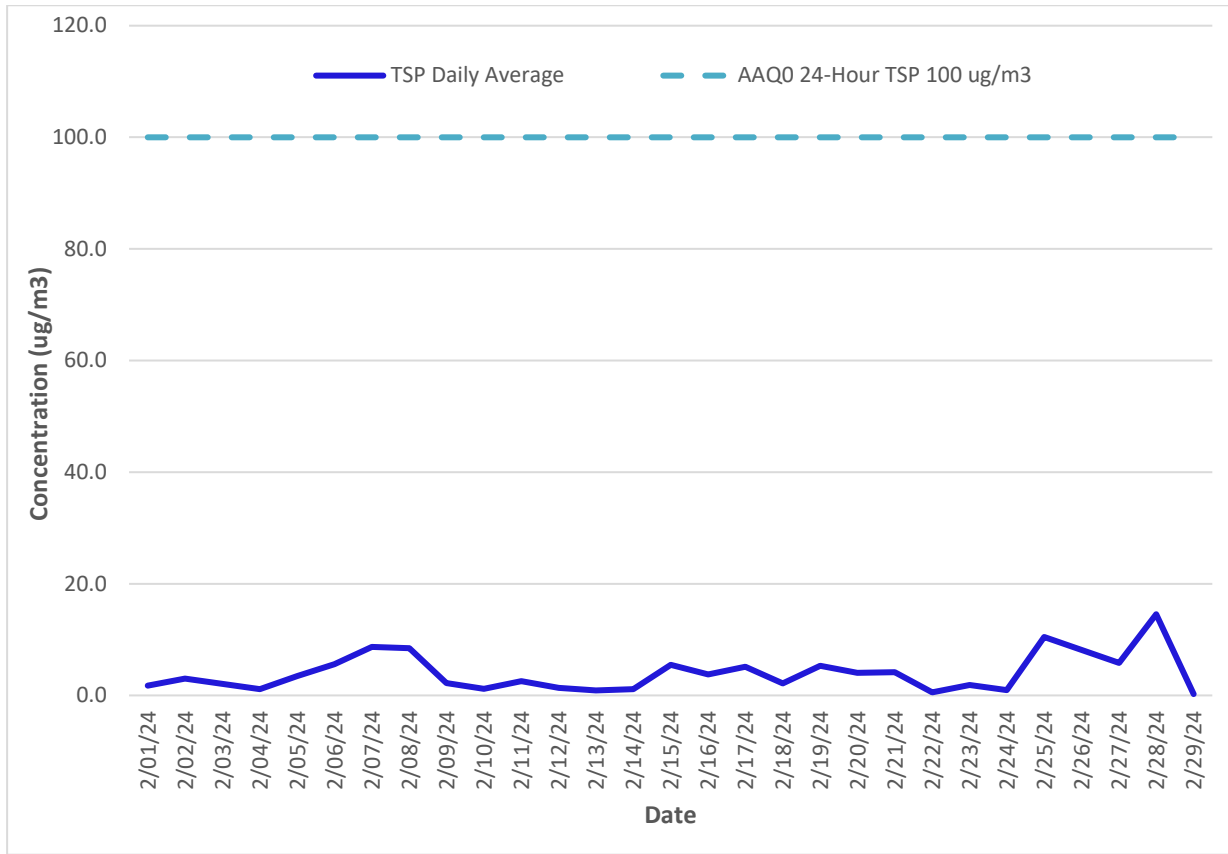
### 3.0 PARTICULATE RESULTS

As per development permit the air quality threshold values of particulate matter for this site are of 100 µg/m<sup>3</sup> for TSP Daily, 29 µg/m<sup>3</sup> for the PM2.5 Daily and 80 µg/m<sup>3</sup> for the PM2.5 Hourly. As shown in Table 3, there were exceedances from the CRAZ data. This was consistent with higher values from the Site.

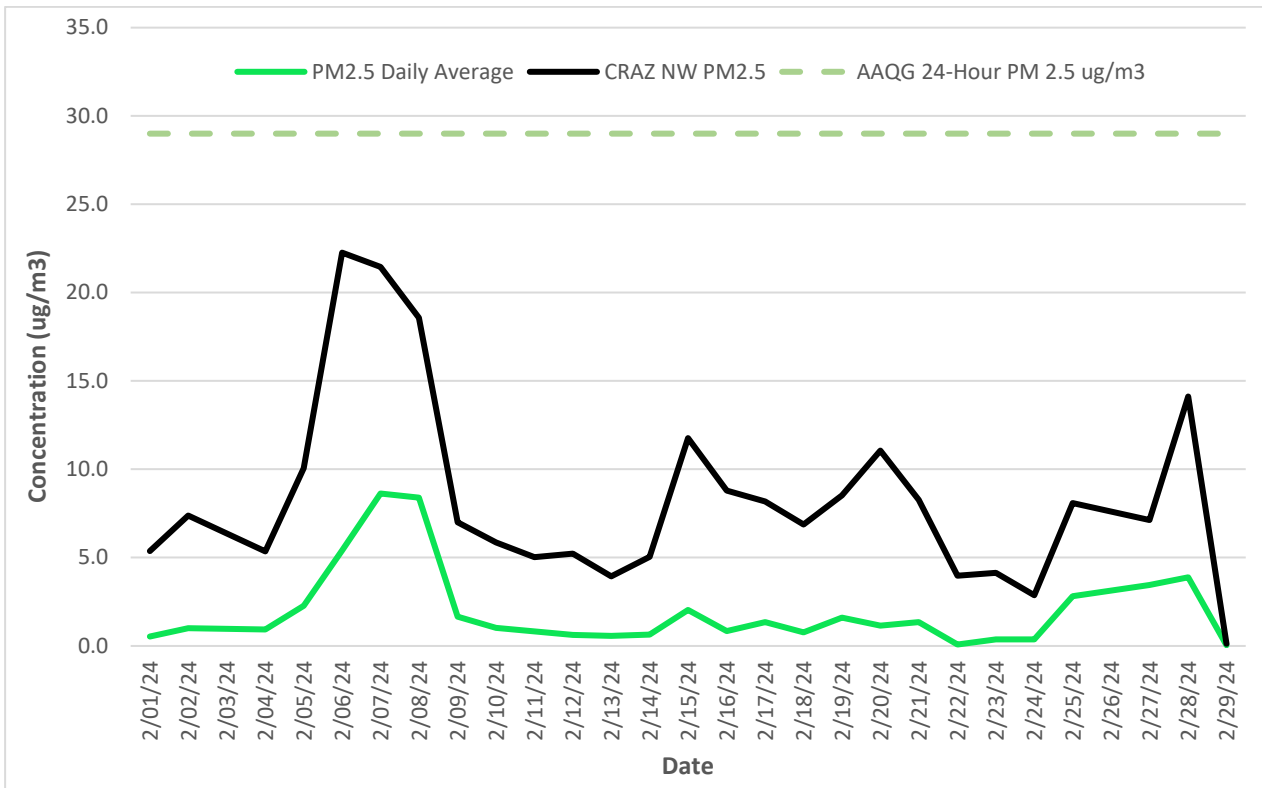
**Table 3. STAR PIT – February 2024 – Particulate Results**

Date	TSP Daily Average	PM2.5 Daily Average	CRAZ NW PM2.5	PM2.5 Hourly Max
Thursday 01-Feb-24	1.8	0.5	5.4	0.9
Friday 02-Feb-24	3.0	1.0	7.4	3.8
Saturday 03-Feb-24	No Data			
Sunday 04-Feb-24	1.1	0.9	5.4	2.4
Monday 05-Feb-24	3.5	2.3	10.1	6.0
Tuesday 06-Feb-24	5.6	5.4	22.3	9.9
Wednesday 07-Feb-24	8.7	8.6	21.5	11.7
Thursday 08-Feb-24	8.5	8.4	18.6	15.5
Friday 09-Feb-24	2.2	1.7	7.0	3.6
Saturday 10-Feb-24	1.2	1.0	5.9	1.3
Sunday 11-Feb-24	2.5	0.8	5.0	1.4
Monday 12-Feb-24	1.3	0.6	5.2	0.8
Tuesday 13-Feb-24	0.9	0.6	3.9	0.8
Wednesday 14-Feb-24	1.1	0.7	5.0	0.9
Thursday 15-Feb-24	5.5	2.0	11.8	6.2
Friday 16-Feb-24	3.7	0.9	8.8	1.6
Saturday 17-Feb-24	5.1	1.3	8.2	2.0
Sunday 18-Feb-24	2.1	0.8	6.9	0.9
Monday 19-Feb-24	5.3	1.6	8.5	4.0
Tuesday 20-Feb-24	4.1	1.1	11.1	3.1
Wednesday 21-Feb-24	4.2	1.4	8.3	2.0
Thursday 22-Feb-24	0.6	0.1	4.0	0.1
Friday 23-Feb-24	1.9	0.4	4.1	0.4
Saturday 24-Feb-24	0.9	0.4	2.9	0.7
Sunday 25-Feb-24	10.5	2.8	8.1	3.0
Monday 26-Feb-24	No Data			
Tuesday 27-Feb-24	5.8	3.5	7.1	3.5
Wednesday 28-Feb-24	14.5	3.9	14.1	8.0
Thursday 29-Feb-24	0.2	0.0	0.1	0.0
Monthly Average	3.9	1.9	8.4	3.5

Figure 3 & Figure 4 illustrate the values in Table 3 and compares the TSP & PM 2.5 values to the AAAQO & AAAQG criteria, respectively.



**Figure 3. STAR PIT – February 2024 – TSP Daily Particulate Monitoring Results**



**Figure 4. STAR PIT – February 2024 – PM 2.5 Daily Particulate Monitoring Results**



As previously discussed, there were no exceedances of the particulate limits in the month of February 2024.

**Table 4. STAR PIT – February 2024 – Particulate Exceedances**

Date	PM2.5	Wind Speed (Km/hr)	Temperature (°C)	Wind Direction	Hourly Rainfall (mm)	Day/Night
No Exceedances						

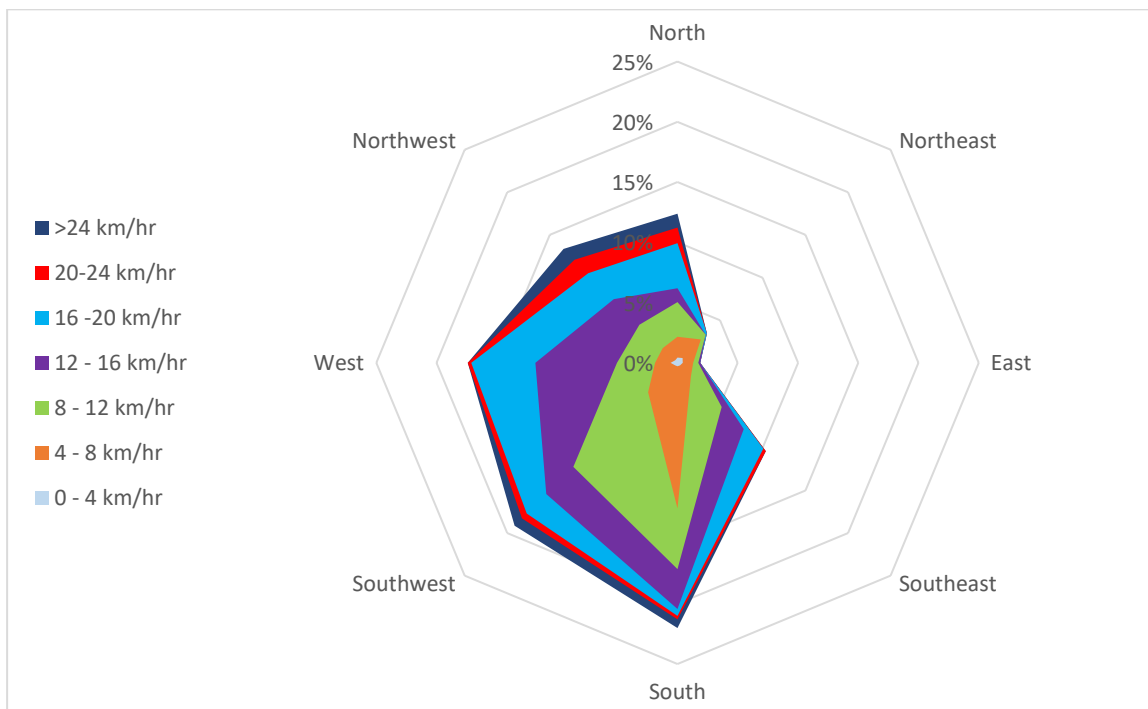
## 4.0 METEOROLOGICAL DATA

### 4.1 TRAILER

As indicated in Table 5 & Figure 5, the primary wind direction for February 2024 was from the west and southwest with moderate to high windspeeds (between 4 – 20 km/hr). The monthly values for the temperature and precipitation can be found in Table 6.

**Table 5. STAR PIT Trailer – February 2024 – Wind Data Results**

Count of Direction	Column Labels								Grand Total
Row Labels	East	North	Northeast	Northwest	South	Southeast	Southwest	West	Grand Total
0-4	0.43%	0.43%	0.58%	0.29%	0.29%	0.29%	0.29%	0.58%	3.17%
4-8	0.86%	1.73%	2.16%	1.44%	11.80%	1.29%	3.17%	1.29%	23.74%
8-12	0.43%	2.88%	0.58%	2.73%	5.04%	3.60%	8.78%	3.17%	27.19%
12-16	0.14%	1.15%	0.00%	3.02%	3.31%	2.59%	3.17%	6.76%	20.14%
16-20	0.00%	3.74%	0.14%	3.02%	0.58%	2.30%	2.30%	5.32%	17.41%
20-24	0.00%	1.29%	0.00%	1.58%	0.29%	0.29%	0.58%	0.29%	4.32%
>24	0.00%	1.15%	0.00%	1.29%	0.72%	0.00%	0.86%	0.00%	4.03%
<b>Grand Total</b>	<b>1.87%</b>	<b>12.37%</b>	<b>3.45%</b>	<b>13.38%</b>	<b>22.01%</b>	<b>10.36%</b>	<b>19.14%</b>	<b>17.41%</b>	<b>100.00%</b>



**Figure 5. STAR PIT Trailer – February 2024 - Wind Rose**

**Table 6. STAR PIT Trailer – February 2024 – Wind Data Results**

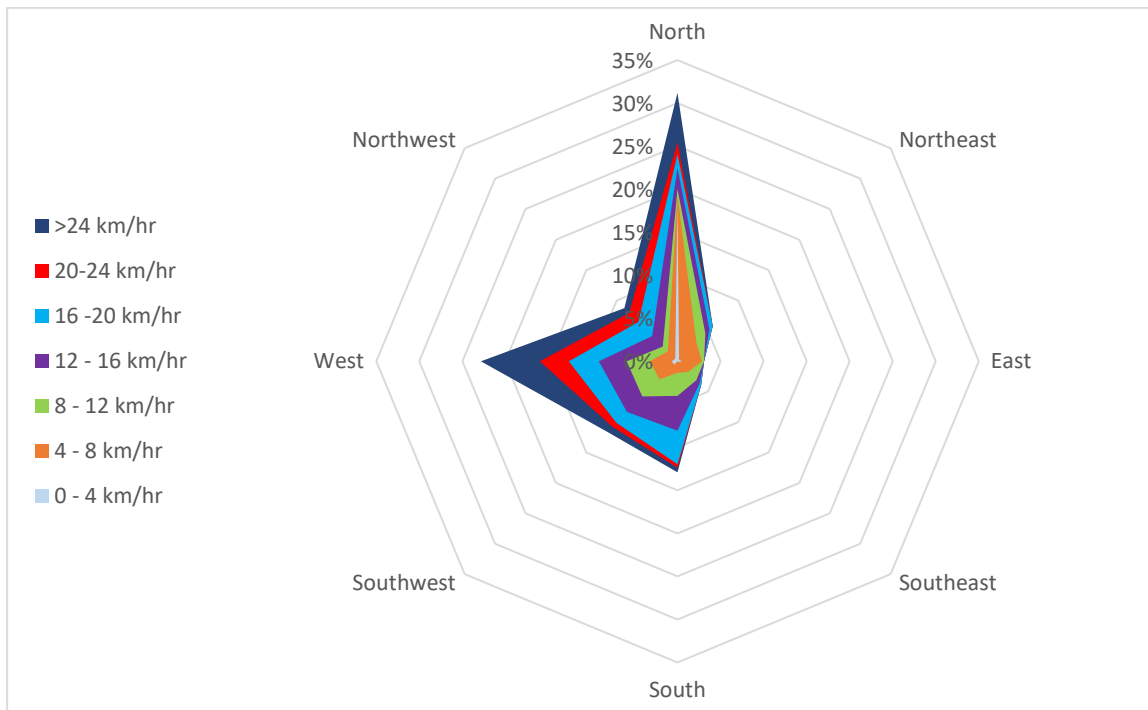
Parameter	Monthly Average	1-Hour	
		Maximum	Minimum
Temperature (°C)	-3.7	11.8	-23.4
Precipitation (mm)	0.0	1.1	0.0
Total Monthly Precipitation (mm)		2.9	

## 4.2 OFFICE

As indicated in Table 7 & Figure 6, the primary wind direction for February 2024 was from the west and north with moderate to high windspeeds (between 0 and +20 km/hr). The monthly values for the temperature and precipitation can be found in Table 8.

**Table 7. STAR PIT Office – February 2024 – Wind Data Results**

Count of Direction	Column Labels								Grand Total
Row Labels	East	North	Northeast	Northwest	South	Southeast	Southwest	West	Grand Total
0-4	0.54%	18.28%	0.27%	0.40%	0.00%	0.13%	0.54%	0.67%	20.83%
4-8	2.28%	0.94%	2.82%	1.21%	1.34%	1.61%	2.42%	2.55%	15.19%
8-12	0.27%	0.81%	1.48%	0.81%	2.69%	1.34%	2.82%	2.69%	12.90%
12-16	0.00%	2.42%	0.67%	1.75%	4.03%	0.54%	2.55%	3.23%	15.19%
16-20	0.00%	1.61%	0.54%	2.28%	3.90%	0.27%	1.75%	3.49%	13.84%
20-24	0.00%	1.34%	0.00%	1.48%	0.40%	0.00%	0.67%	3.36%	7.26%
>24	0.00%	5.78%	0.00%	0.81%	0.54%	0.00%	0.81%	6.85%	14.78%
<b>Grand Total</b>	<b>3.09%</b>	<b>31.18%</b>	<b>5.78%</b>	<b>8.74%</b>	<b>12.90%</b>	<b>3.90%</b>	<b>11.56%</b>	<b>22.85%</b>	<b>100.00%</b>



**Figure 6. STAR PIT Office – February 2024 - Wind Rose**

**Table 8. STAR PIT Office – February 2024 – Wind Data Results**

Parameter	Monthly Average	1-Hour	
		Maximum	Minimum
Temperature (°C)	-3.8	11.7	-23.3
Precipitation (mm)	0.0	0.9	0.0
Total Monthly Precipitation (mm)		0.9	

## 5.0 CALIBRATION RECORDS

### Record of Calibration Results

Description	Location	Date	Time	Pre / Post	Calibration Level	Calibrator Model	Serial Number
Pre-Measurement Calibration	STAR PIT	November 24, 2023	09:00	Post	93.9 dBA	B&K 4231	2575493
Post-Measurement Calibration	STAR PIT	March 7, 2024	09:00	Pre	93.7 dBA	B&K 4231	2575493