

Stephen Parry  
Chief Executive  
Gore District Council  
PO Box 8  
Gore, 9740

3<sup>rd</sup> May 2021

Dear Stephen

**RE: NH<sub>3</sub> Monitoring Report 1<sup>st</sup> April to 30<sup>th</sup> April 2021**

**Background**

Gore District Council (GDC) engaged Land and Water Science to conduct continuous monitoring of ammonia (NH<sub>3</sub>) gas emissions from the Mataura Mill dross storage site (121 Kana Street, Mataura) from May 2018. GDC require emission values to comply with consent conditions that specify a limit of 5 ppm NH<sub>3</sub> discharged to air.

In May 2017, Photonic Innovations (PI) installed two NH<sub>3</sub> sensors for comparison of the indoor and outdoor ammonia levels. Measurements were recorded continuously and reported as a 5-minute average for both the outdoor and indoor sensors. A dashboard to access this data is available in real time at <http://35.213.230.53/d/CPQFoUvGz/gore-district-council?orgId=1&refresh=1m>.

**April Summary**

Due to technical issues with the outdoor sensor, the data from this sensor has not been used to generate this report. The indoor sensor can provide an indication of likely discharge from the site as concentrations measured indoors are not diluted by air outside or influenced by wind direction. Consequently, indoor measurements constitute a maximum value and can be used as a reasonable proxy of the likely outdoor concentrations.

The weekly indoor emissions are reported as normal from 1 April and 30 April 2021. The maximum mean, and median NH<sub>3</sub> concentrations during April were 2.85 ppm, and 2.70 ppm, respectively. There was an anomalous indoor concentration recorded at 43.10 ppm (22 April 15:30 pm) in this monitoring period. High readings can occur when the material is disturbed and is likely the cause of this increase in concentration.

Daily (diurnal) variation in NH<sub>3</sub> concentration shows a consistent pattern in the data. Specifically, NH<sub>3</sub> concentration is strongly correlated with air temperature, reaching maximum values as air temperatures peak during the day and minimum values at night when air temperatures are at their lowest. Although diurnal variation is evident in the data, average air temperature is a greater control over the absolute concentration with maximum concentrations recorded during the warmest months of the year and minimum concentrations recorded during the coolest months of the year. Calm days also impact the maximum NH<sub>3</sub> concentrations due to the absence of air movement near the area being monitored.

Table 1. Summary statistics for the Indoor NH<sub>3</sub> sensor, 1 April – 30 April 2021. NH<sub>3</sub> measured in parts per million (ppm).

Date	1-4 April	5-11 April	12-18 April	19-25 April	26-30 April
Mean	2.28	2.39	2.63	2.85	1.90
Std Dev	0.62	0.91	0.84	1.84	0.84
Median	2.20	2.30	2.70	2.70	1.70
Minimum	0.70	0.40	0.60	0.50	0.00
Maximum	5.20	5.70	5.20	<b>43.10</b>	5.60

#### **1 – 4 April 2021**

Indoor NH<sub>3</sub> concentration levels recorded a mean of 2.28 ppm and a median of 2.20 ppm. The maximum indoor concentration was 5.20 ppm for this period.

#### **5 – 11 April 2021**

Indoor NH<sub>3</sub> concentration levels recorded a mean of 2.39 ppm and a median of 2.30 ppm. The maximum indoor concentration was 5.70 ppm for this week.

#### **12 – 18 April 2021**

Indoor NH<sub>3</sub> concentration levels recorded a mean of 2.63 ppm and a median of 2.70 ppm. The maximum indoor concentration was 5.20 ppm for this period.

#### **19 – 25 April 2021**

Indoor NH<sub>3</sub> concentration levels recorded a mean of 2.85 ppm and a median of 2.70 ppm. There was an anomalous indoor concentration recorded at 43.10 ppm (22 April 15:30 pm) in this period.

#### **26 – 30 April 2021**

Indoor NH<sub>3</sub> concentration levels recorded a mean of 1.90 ppm and a median of 1.70 ppm. The maximum indoor concentration was 5.60 ppm for this period after air temperatures climbed during the week.

#### **Summary**

Due to technical issues with the outdoor sensor, the data from this sensor has not been used to generate this report. The indoor sensor can provide an indication of likely discharge from the site as concentrations measured indoors are not diluted by air outside. In short, the indoor sensor suggests little anomalous NH<sub>3</sub> over the monitoring period. Both sensors are due to be serviced and recalibrated.

Kind regards



Mary Dang  
Land and Water Science Ltd



Dr Lisa Pearson  
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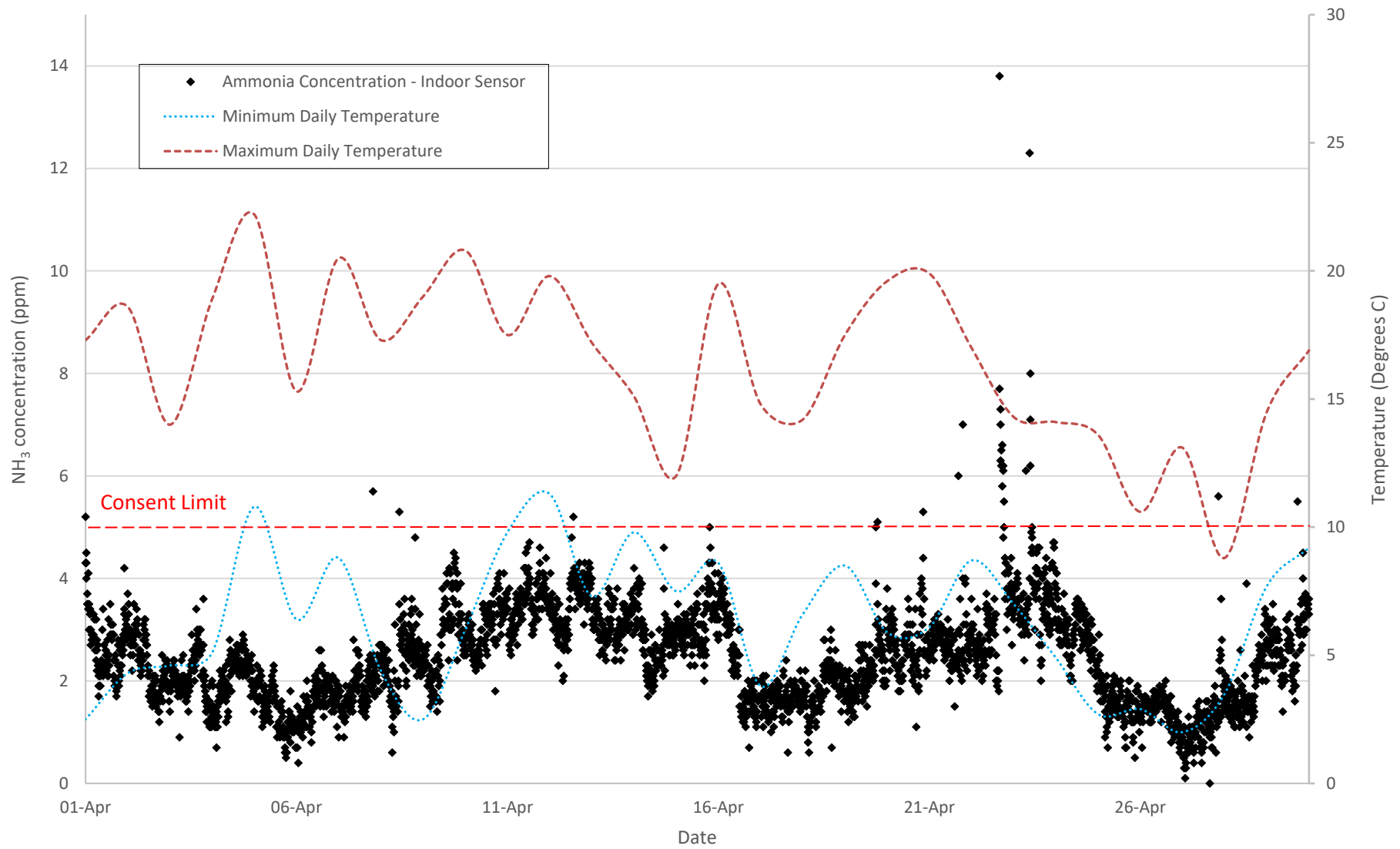


Figure 1: Continuous indoor NH<sub>3</sub> concentration, minimum and maximum daily temperature. Temperature data is sourced from NIWA climate station AWS Gore 5778.