

Northern Bus Garage

Noise, Vibration, and Dust Monitoring Report (March 2024)

Noise, Vibration, and Dust levels were monitored as part of the reconstruction of Northern Bus Garage, 4615 14th Street, NW, Washington, DC, for the month of March 2024.

The following memorandum identifies the monitoring points and instruments, presents the data, and provides a brief analysis of the results per monthly monitoring report attached by Geo Instruments for Clark Construction. The report is organized by medium: noise, vibration, and dust. Figures and graphs are attached. The red dashed line on each of the graphs represents the monitoring thresholds, which are summarized below for each instrument.

Noise Monitoring

Five noise monitors are positioned around the perimeter of the project site. (See Figure 1) Under DC regulations, the regulatory standard is 80 dBA, measured 25 ft from the property line (20 DCMR 2802.1). Because the noise monitoring devices are placed on the property line (rather than a 25 ft offset), the monitoring threshold for site activities is adjusted to 85 dBA (assuming the noise level will dissipate). Noise levels and vibration levels were measured automatically with Micromate and Geophone Instrument.

No operating issue with the monitoring instruments was identified.

Numerous noise level exceedances at all hours of the day and all days of the week. Mic2 recorded the highest noise levels of any location after work hours and on weekends. In addition, Mic1 and Mic5 were similar to one another with 56% of the exceedances coming outside of working hours. Mic2 and Mic3 recorded 52% of its exceedances during nights and weekends. Mic4 had 29% of its exceedances outside of working hours. Please see table 1 (The “Work Hours” category includes all weekend shifts and evening shifts that were worked during the month).

Vibration Monitoring

Five vibration monitors are positioned around the perimeter of the project site. (See Figure 1) Vibration thresholds are based the WMATA Design Criteria. Monitors VM-1 and VM-2 are set at a lower vibration threshold due to their proximity to the historic façade, which is more sensitive to any movement. Noise levels and vibration levels were measured automatically with Micromate and Geophone Instrument.

Table 2

Instrument Type	Monitoring Threshold
Vibration Monitor (VM-1)	0.2 in/sec
Vibration Monitor (VM-2)	0.2 in/sec
Vibration Monitor (VM-3)	2.0 in/sec
Vibration Monitor (VM-4)	2.0 in/sec
Vibration Monitor (VM-5)	2.0 in/sec

No operating issue with the monitoring instruments was identified.

Graphs showing monitoring results are presented in Graphs 1 to 5.

There were no vibration exceedances in the month of March 2024.

Dust Monitoring Threshold Values and Exceedances:

Three dust monitors are positioned at the project site. (See Figure 2) EPA regulatory thresholds are based on a 24-hour monitoring period; the project has adopted thresholds to monitor site levels and provide an indication of when EPA standards might be exceeded. (See Table 3) Dust measurements were monitored using Aeroqual Dust Sentry Pro.

Table 3

Dust Monitoring Measurement	Monitoring Threshold
Particulates (PM2.5)	40 µg/m ³
Particulates (PM10)	50 µg/m ³

The QuickView data management system experienced errors ingesting data from the beginning of the month through March 4th at 10am. Not all data is available for DM3 during this period. There were no air quality sensor power interruptions for the month of March 2024. All three of the units have been fitted with hardware that allows tracking and alarming upon low voltage. It is not possible to plug the DM1 unit into mains power and the structure wall left in place shades the solar panel much of the day. Continued battery swaps will be the interim solution until site conditions change.

Graphs showing monitoring results are presented in Graphs 6-11.

All three air quality monitors recorded an exceedance on the evening of March 22, 2024, at 9:05pm. There was no work onsite at this time but the spike are likely due to the windy weather reported that evening.

DM 1 recorded PM2.5 and PM10 values of 70 and 80 $\mu\text{g}/\text{m}^3$.

DM 2 recorded PM2.5 and PM10 values of 47 and 50 $\mu\text{g}/\text{m}^3$.

DM 3 recorded PM2.5 and PM10 values of 61 and 70 $\mu\text{g}/\text{m}^3$.



Monitoring Report

WMATA Bus Garage Monthly Report

March 2024

Figure 1: Vibration and Noise Monitor Location Plan

16/06/2023, 13:43:04

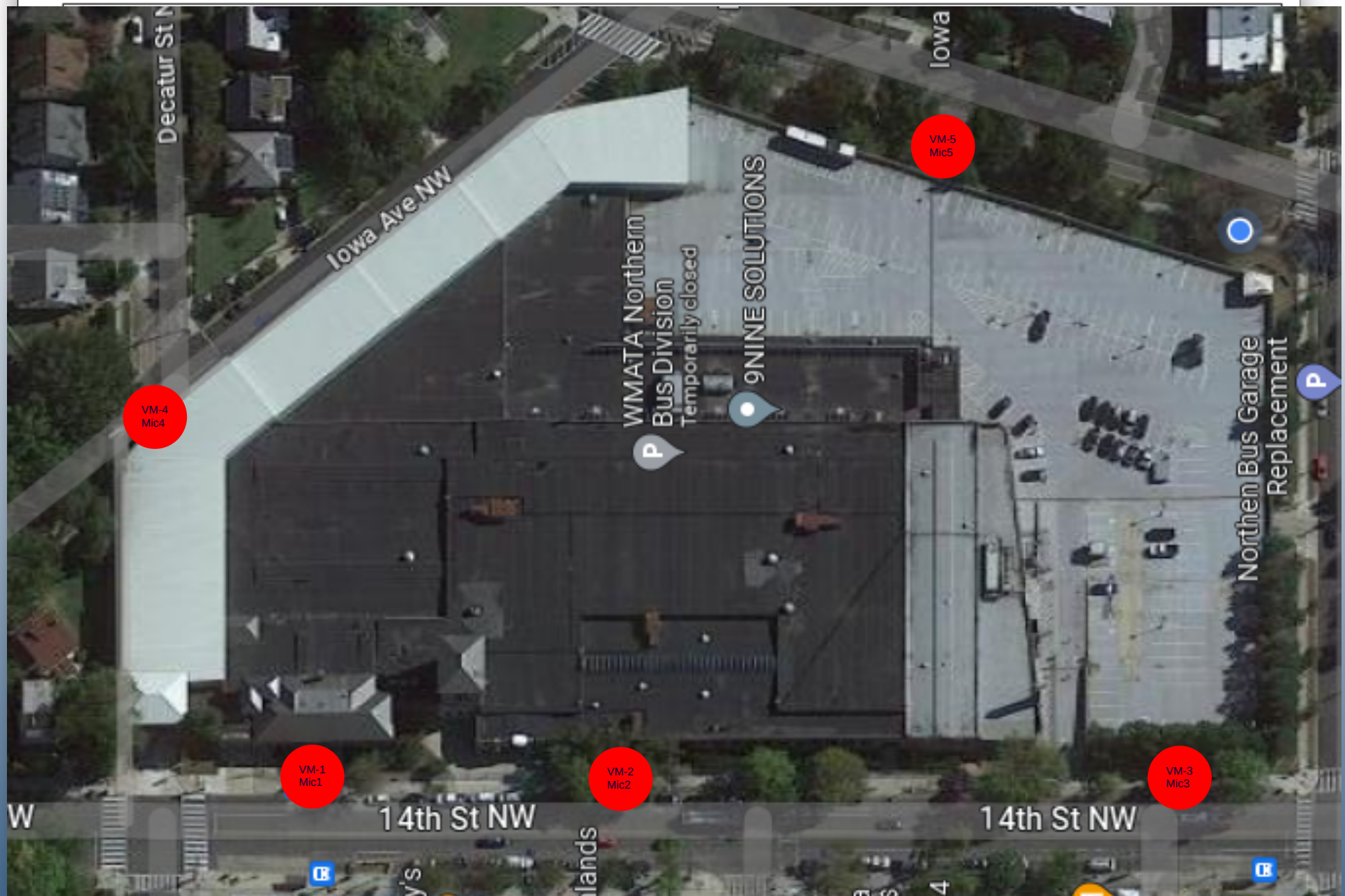


Figure 2: Dust Monitor Location Plan

16/06/2023, 13:43:04

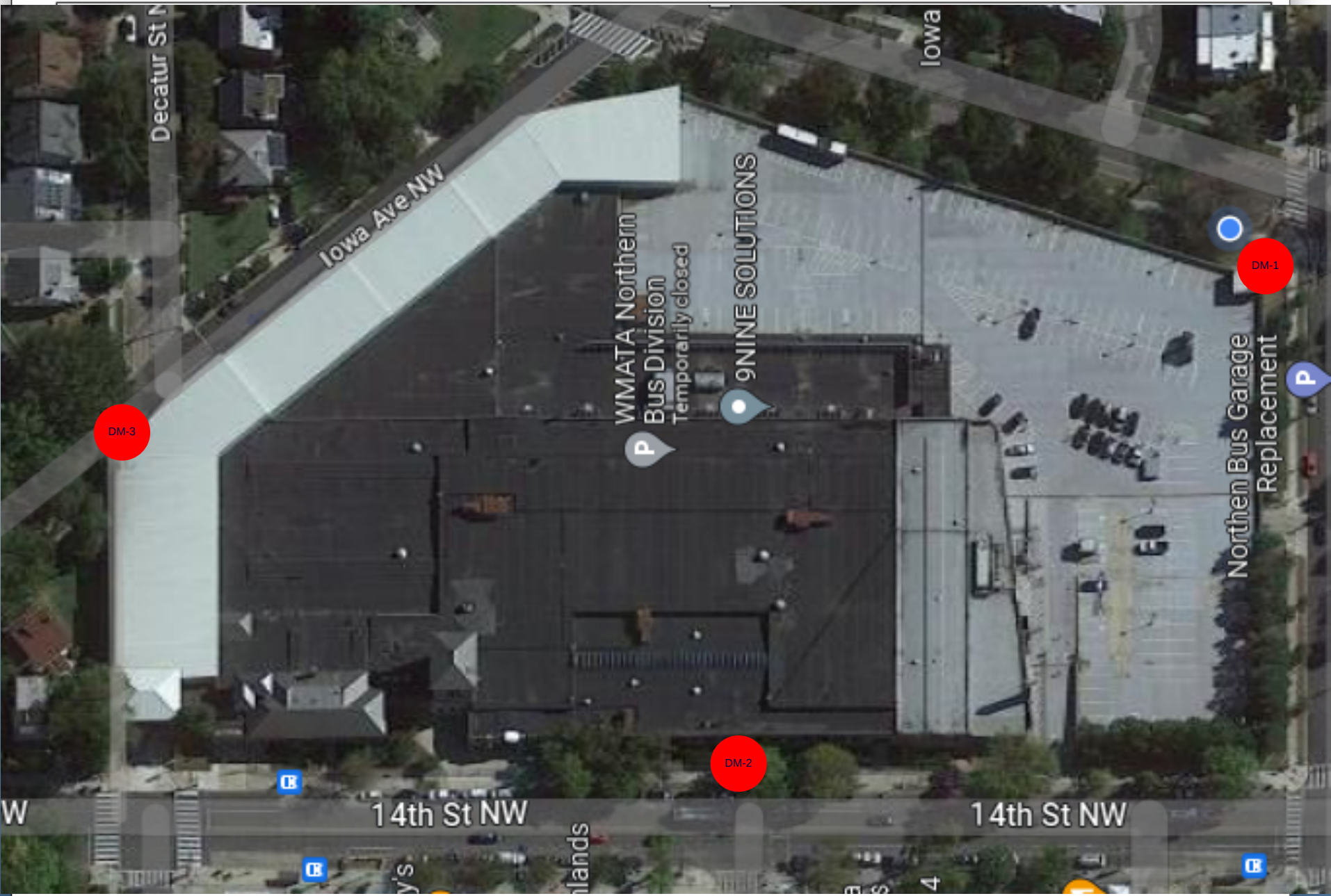


Table 1: Noise Summaries

VM1-MIC		
	Exceedance	Percentage
Work hours	369	44.84%
After hours	191	23.21%
Weekends	263	31.96%
Total	823	100%

VM1-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	111.7	111.7	110
Lmin (dBA)	65	53.2	60.8
L10 (dBA)	78	74	82
L90 (dBA)	66	57	74
Leq (dBA)	82.2	80.1	82.1

VM2-MIC		
	Exceedance	Percentage
Work hours	102	48.80%
After hours	47	22.49%
Weekends	60	28.71%
Total	209	100%

VM2-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	113.1	114.7	113.7
Lmin (dBA)	54.8	44	50.4
L10 (dBA)	75	67	69
L90 (dBA)	62	50	53
Leq (dBA)	79.8	75.8	76.4

VM3-MIC		
	Exceedance	Percentage
Work hours	439	47.61%
After hours	212	22.99%
Weekends	271	29.39%
Total	922	100%

VM3-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	106.4	110.8	111.3
Lmin (dBA)	60.5	54.8	55.1
L10 (dBA)	84	73	73
L90 (dBA)	65	60	62
Leq (dBA)	78.5	77.8	79.2

VM4-MIC		
	Exceedance	Percentage
Work hours	54	71.05%
After hours	8	10.53%
Weekends	14	18.42%
Total	76	100%

VM4-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	109.1	95.3	99.2
Lmin (dBA)	53.6	49.4	49.8
L10 (dBA)	80	79	64
L90 (dBA)	56	53	53
Leq (dBA)	81.5	76.1	69

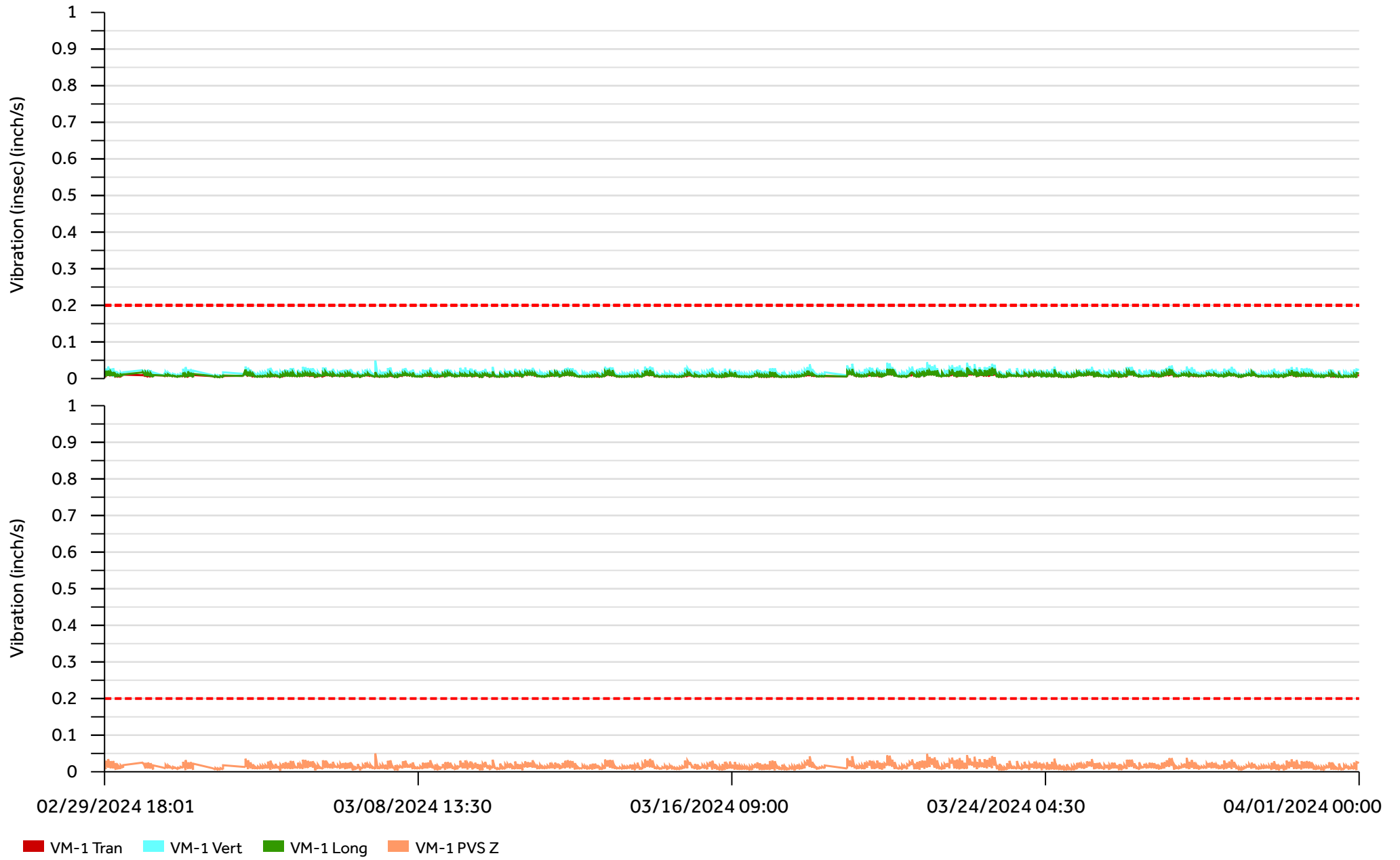
VM5-MIC		
	Exceedance	Percentage
Work hours	91	43.96%
After hours	49	23.67%
Weekends	67	32.37%
Total	207	100%

VM5-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	110.8	112.3	112
Lmin (dBA)	57.5	46.1	49.8
L10 (dBA)	72	69	73
L90 (dBA)	60	54	55
Leq (dBA)	78.4	82.1	79.8

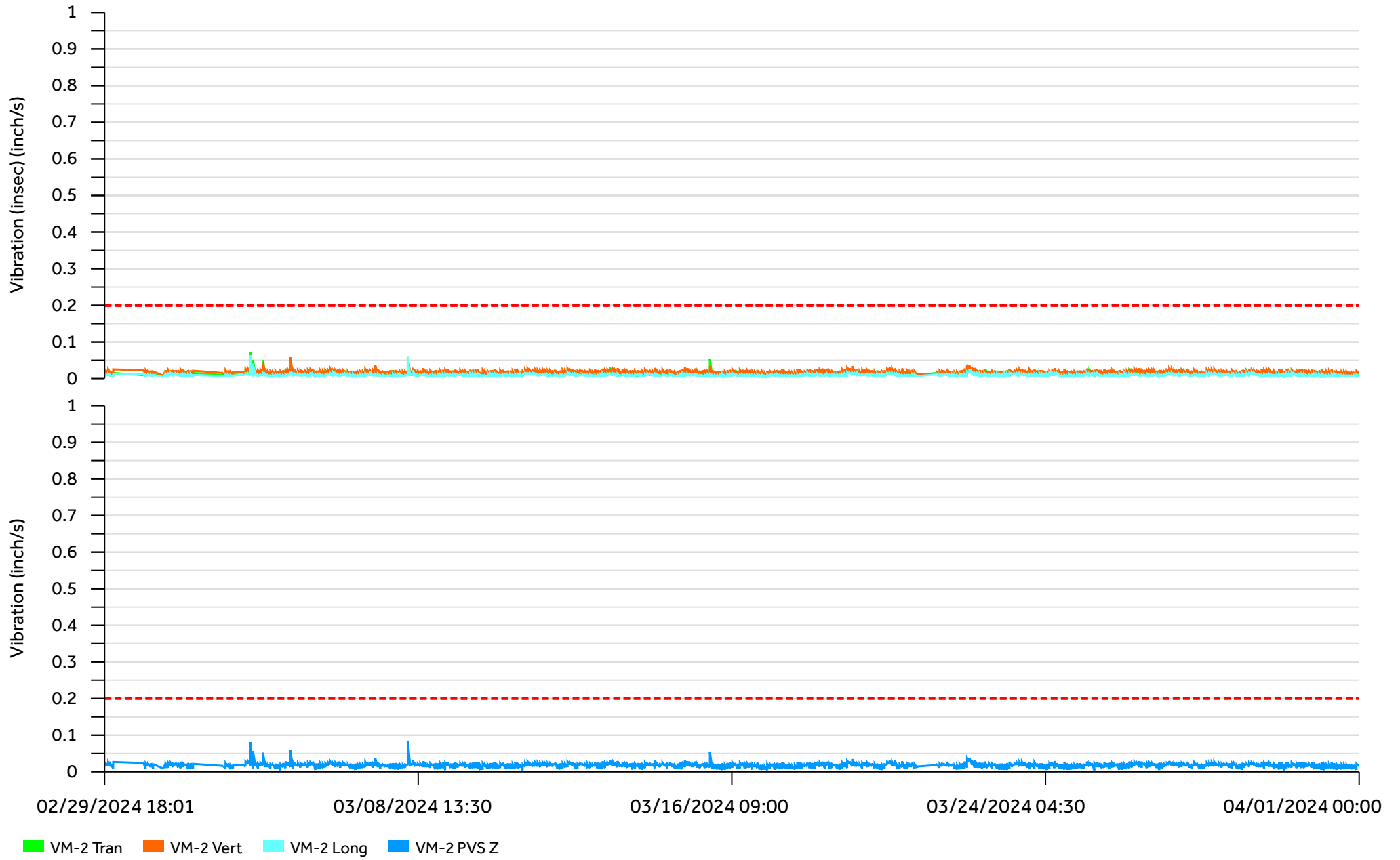
Summary tables contain values for working hours, after hours, and weekend time periods:

- Lmax: Highest Maximum Noise Level recorded for the month, in dBA.
- Lmin: Highest Minimum Noise Level recorded for the month, in dBA.
- L10: Highest noise level that was exceeded 10% of the time of all recording periods this month, in dBA.
- L90: Highest noise level that was exceeded 90% of the time of all recording periods this month, in dBA.
- Leq: Highest Equivalent Continuous Sound Level, or 'average' of all recording periods this month, in dBA.

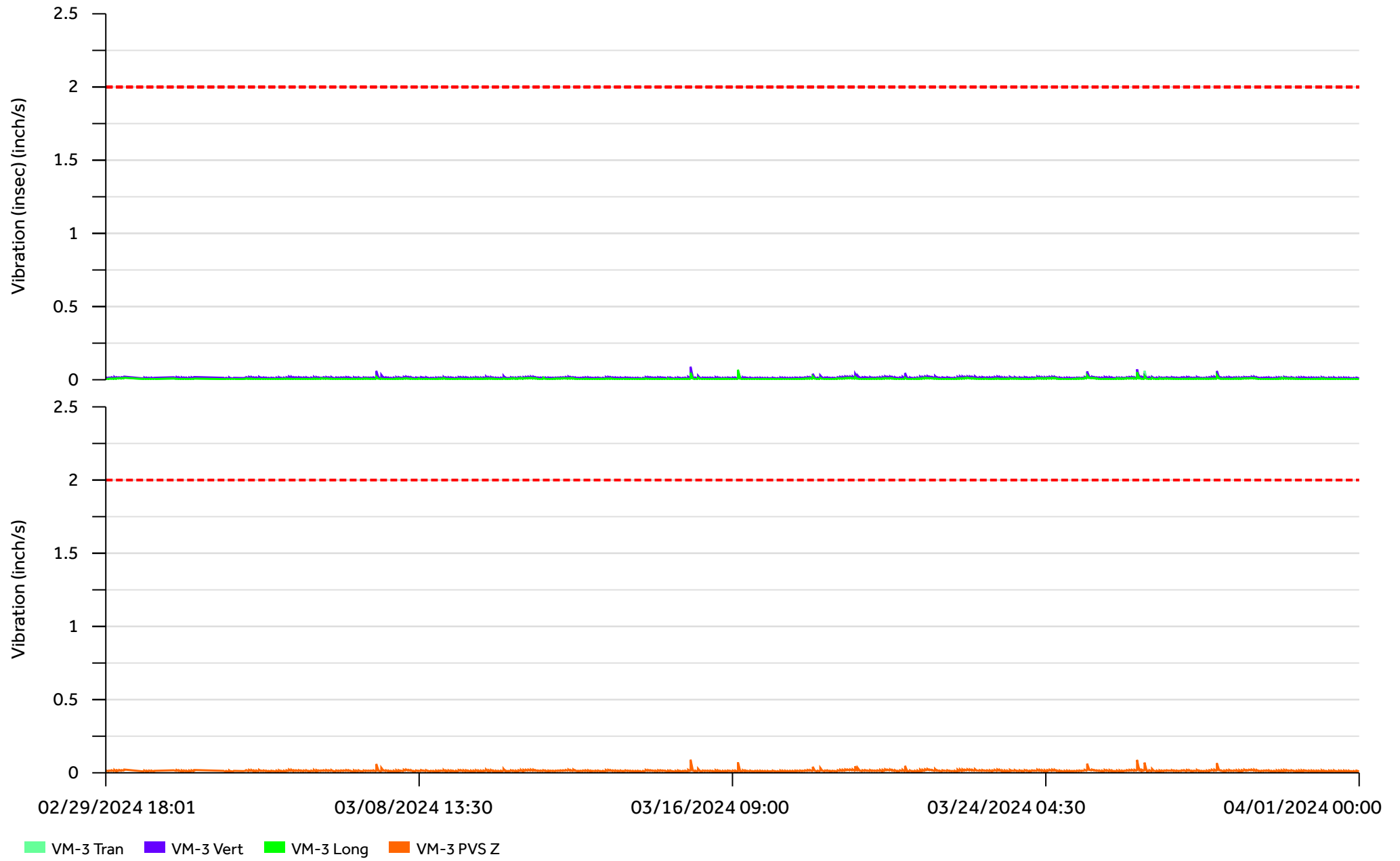
Graph 1:
VM-1- Vibration Monitor



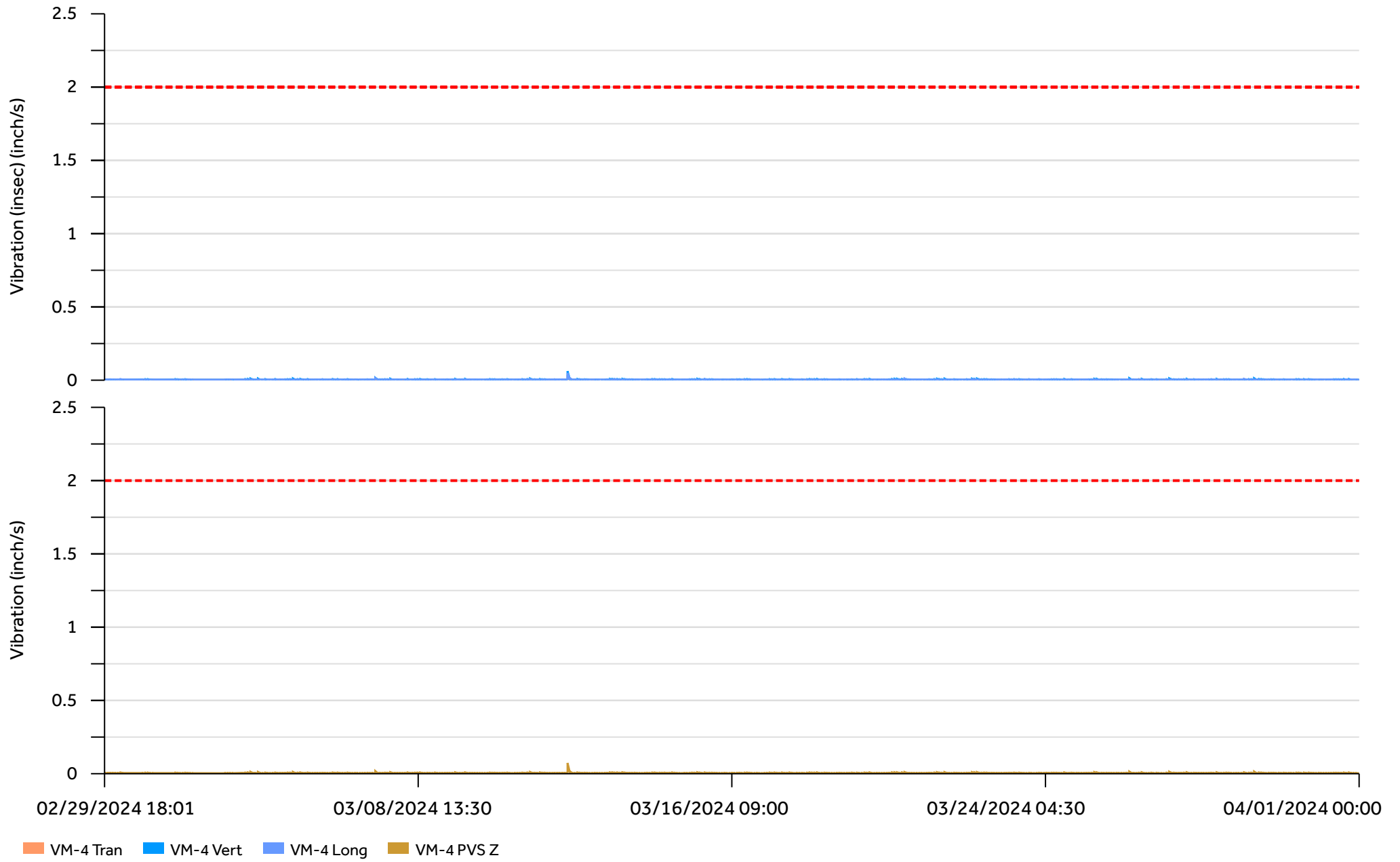
Graph 2:
VM-2- Vibration Monitor



Graph 3:
VM-3- Vibration Monitor

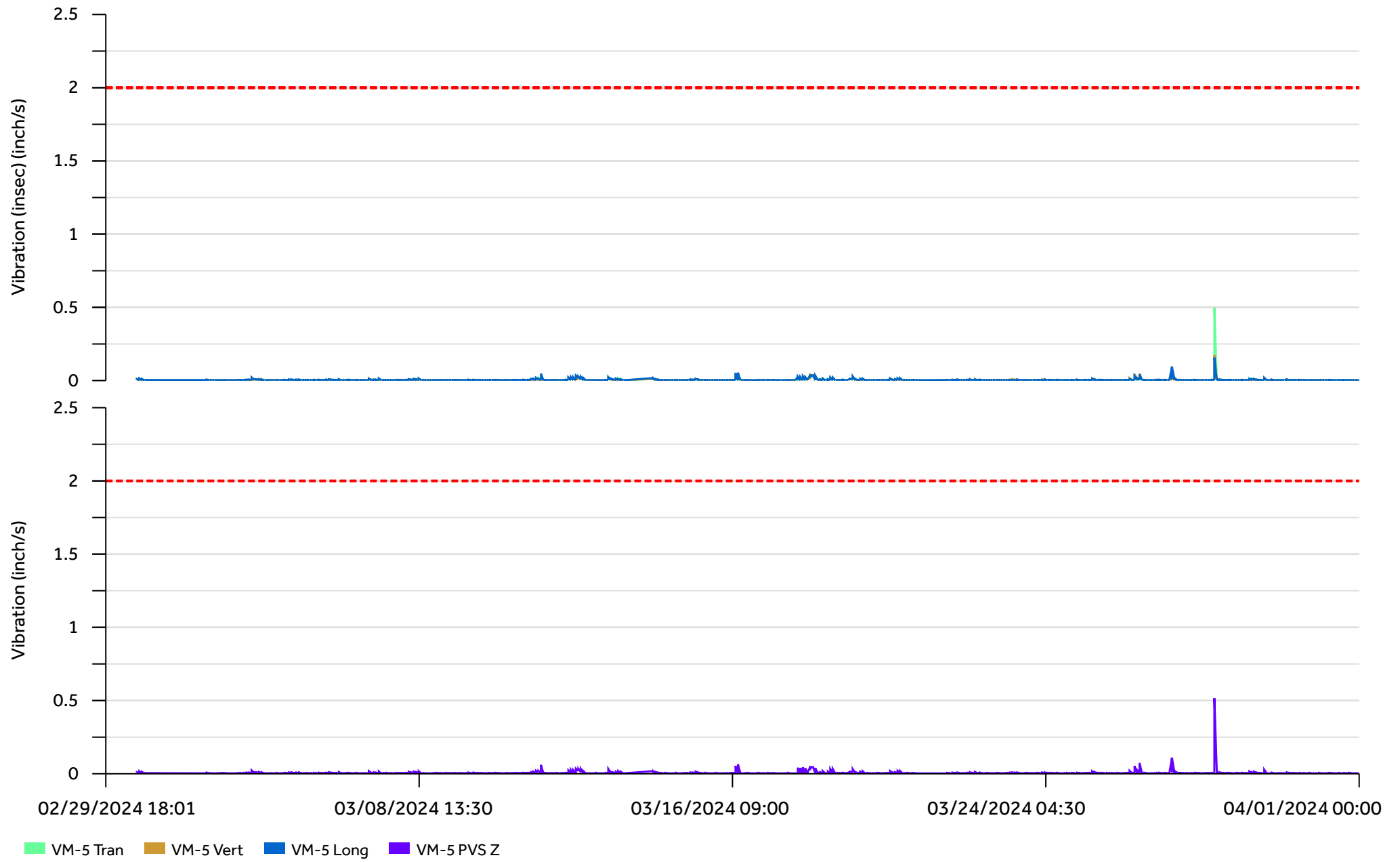


Graph 4:
VM-4- Vibration Monitor

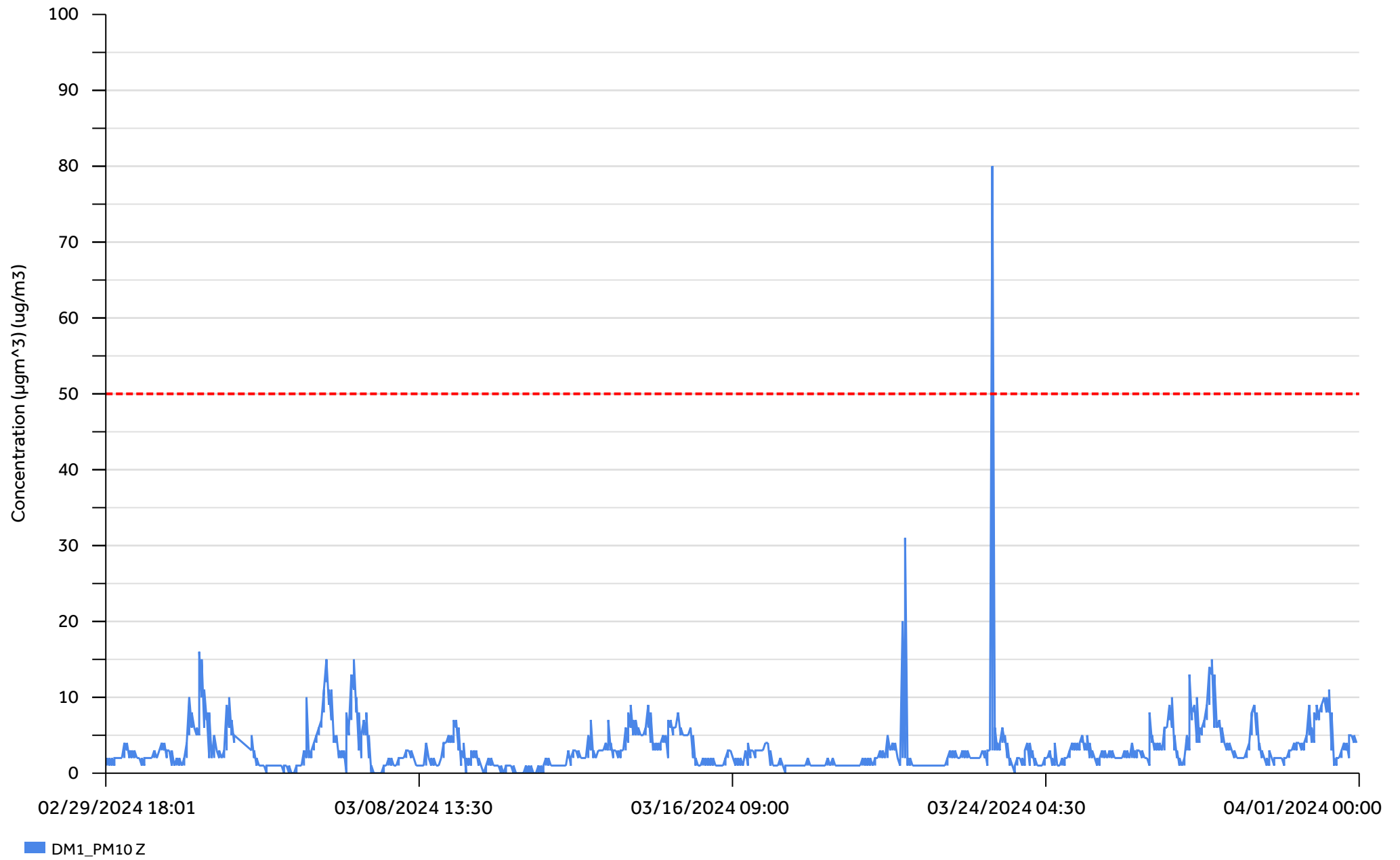


Graph 5:

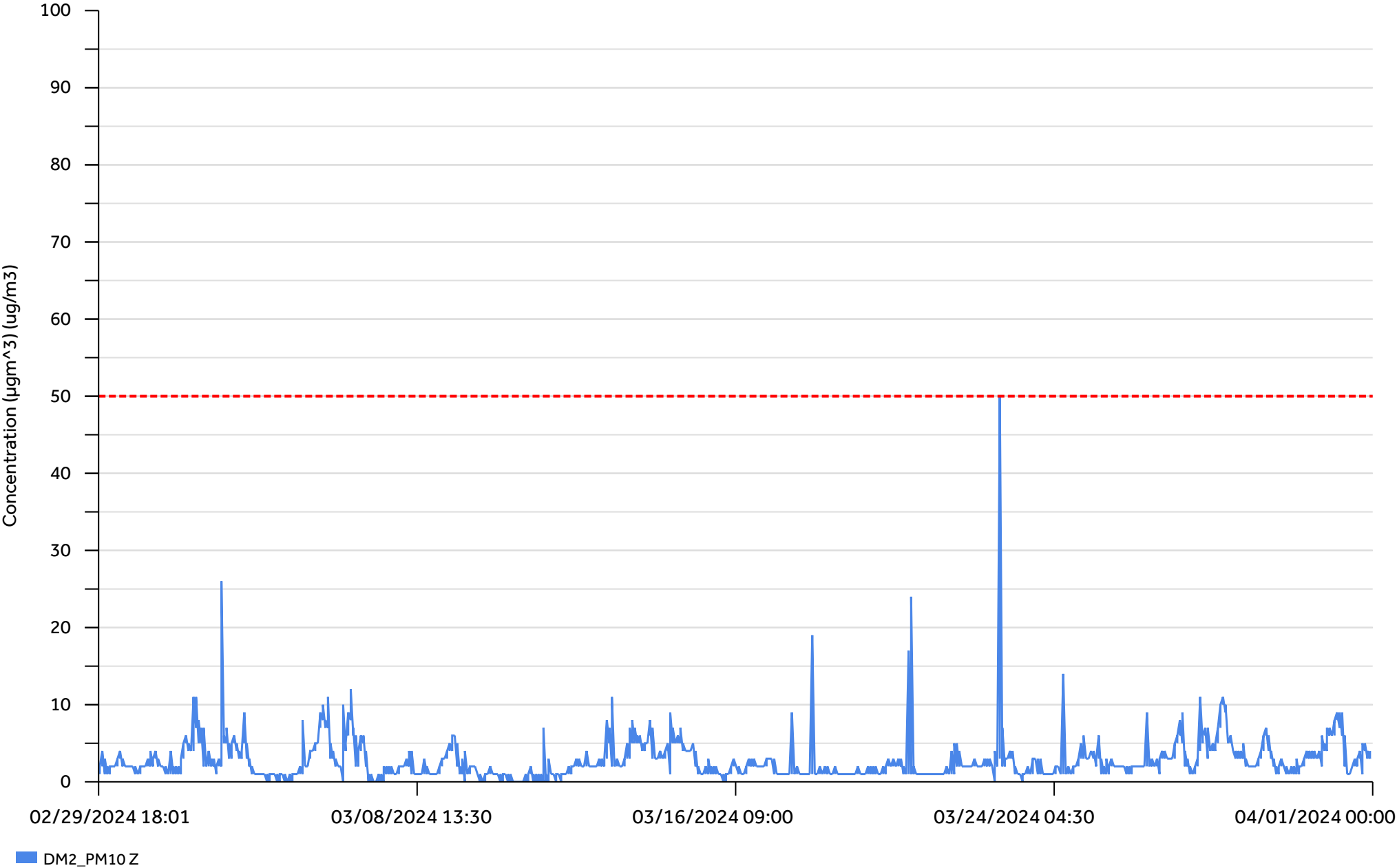
VM-5- Vibration Monitor



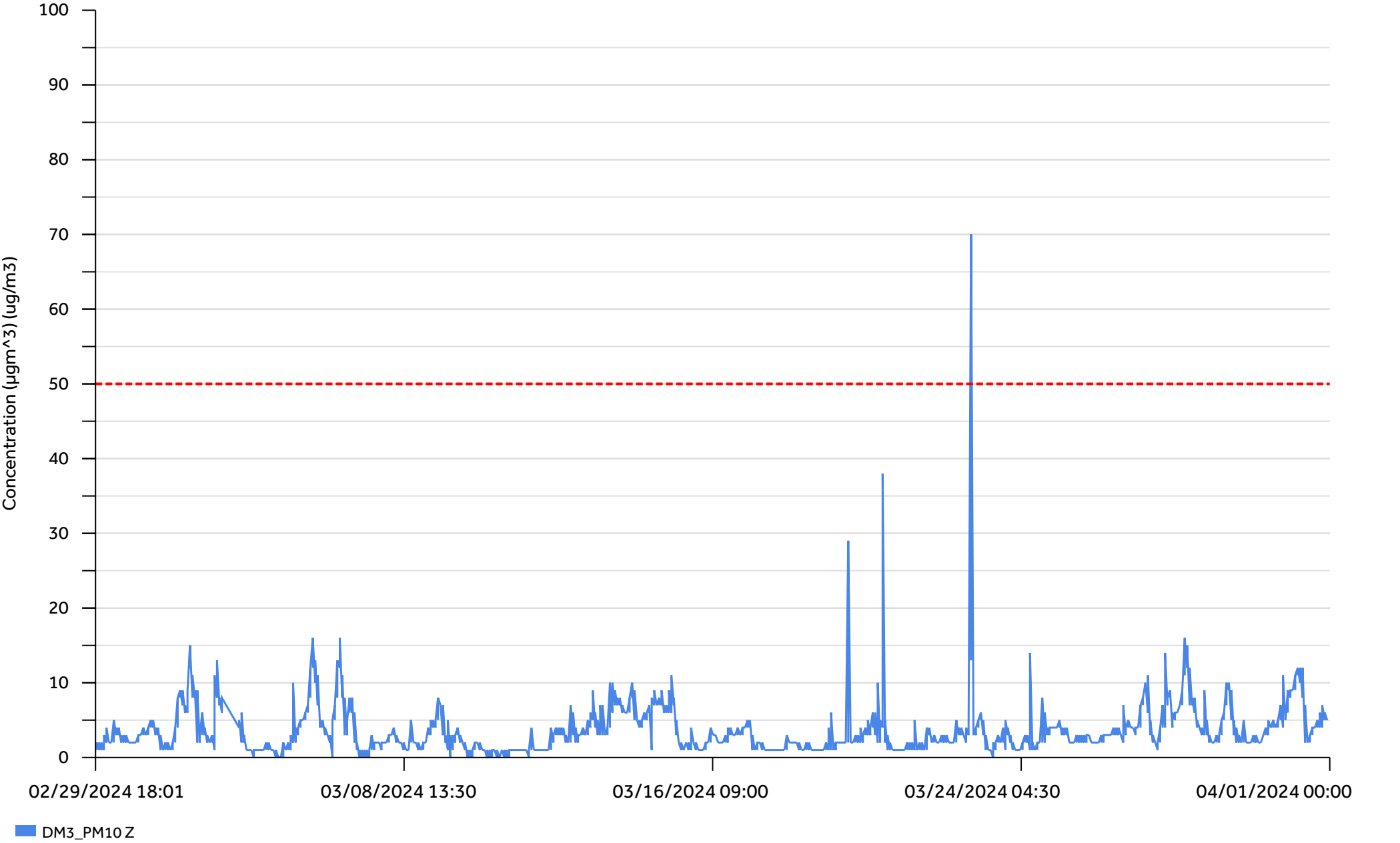
Graph 6:
DM1 - PM10



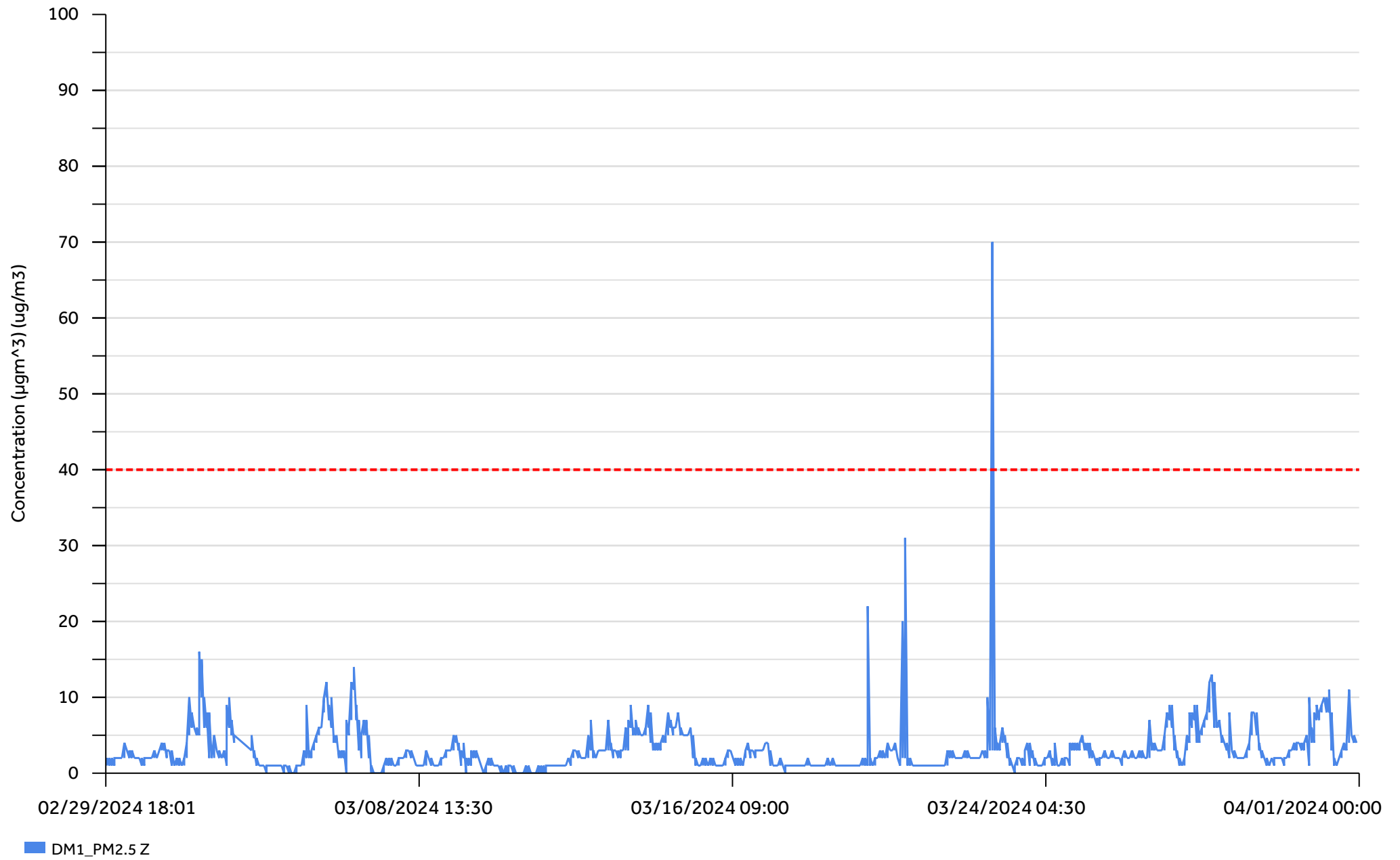
Graph 7:
DM2-PM10



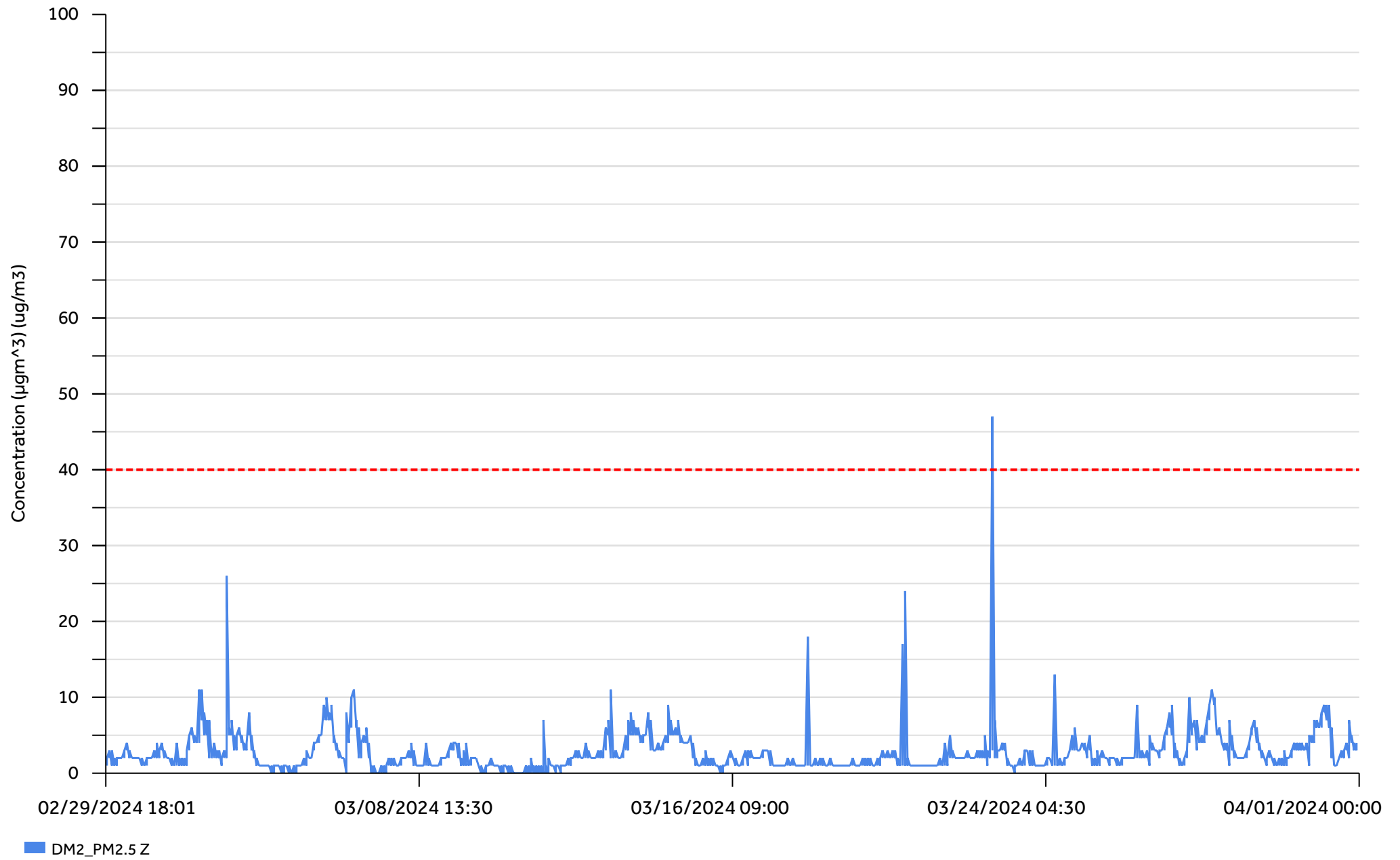
Graph 8:
DM3-PM10



Graph 9:
DM1-PM2.5



Graph 10:
DM2-PM2.5



Graph 11:
DM3-PM2.5

