

Northern Bus Garage

Noise, Vibration, and Dust Monitoring Report (July 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 July 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. Mic 1 recorded the highest noise levels of any location after work hours. In addition, Mic 1, Mic 2, and Mic 3 all recorded their loudest exceedances outside of working hours, respectively. Mic 5 recorded approximately 60% of its exceedance noise readings 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 five (5) vibration exceedances in the month of July.

- VM1 exhibited a vibration exceedance of 0.25 in/sec on July 30 at 08:06. Clark notes that a subcontractor was saw cutting for a utility line near the monitoring unit at that time.
- VM2 exhibited a vibration exceedance of 0.31 in/sec on July 10 at 07:17. Clark noted that the instrument was bumped by a subcontractor employee.
- VM2 exhibited a vibration exceedance of 0.41 in/sec on July 24 at 07:11. Clark noted that the instrument was bumped by a subcontractor employee.
- VM2 exhibited a vibration exceedance of 0.20 in/sec on July 29 at 09:54. Clark notes that a subcontractor was saw cutting for a utility line near the monitoring unit at that time.
- VM2 exhibited a vibration exceedance of 0.21 in/sec on July 31 at 07:08. Clark notes that a subcontractor was saw cutting and excavating for a utility line near the monitoring unit at that time

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 $\mu\text{g}/\text{m}^3$
Particulates (PM10)	50 $\mu\text{g}/\text{m}^3$

DM3 did experience power interruptions from 7/3 20:30 to 7/4 11:20 and again from 7/4 15:50 to 7/5 09:15.

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

There were three (3) Air Quality exceedances in the month of July. All exceedances happened on July 4th after 8:00pm, no work took place that day.

- DM1 – Exceedance of the PM2.5 limit on 7/4 from about 21:00 to 01:30 with readings up to 62 $\mu\text{g}/\text{m}^3$.
- DM1 – Exceedance of the PM10 limit on 7/4 from about 20:00 to 01:00 with readings up to 62 $\mu\text{g}/\text{m}^3$.
- DM2 – Exceedance of the PM2.5 limit on 7/4 from about 22:30 to 01:00 with readings up to 42 $\mu\text{g}/\text{m}^3$

Figure 1: Vibration and Noise Monitor Location Plan

16/06/2023, 13:43:04

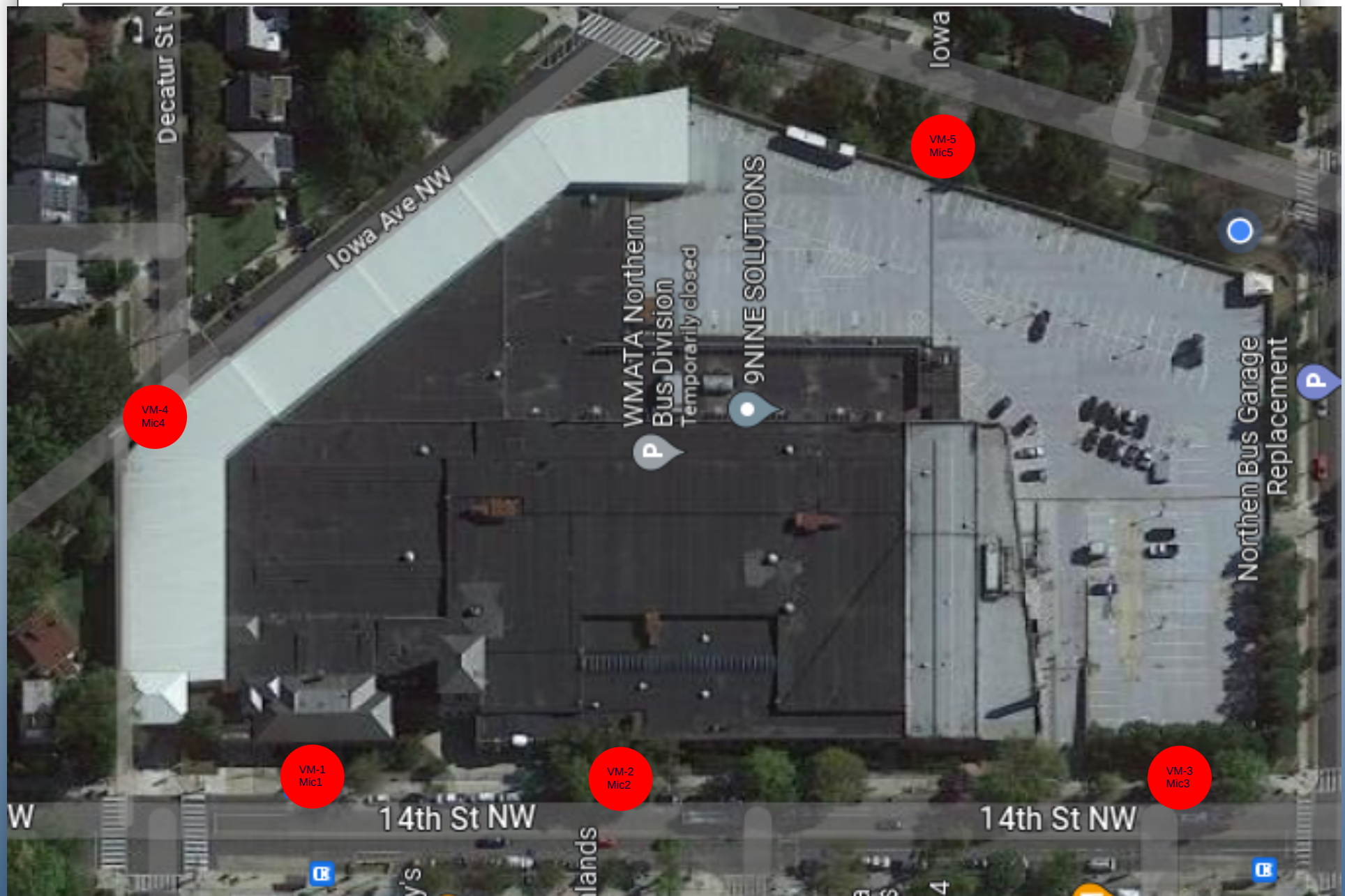


Figure 2: Dust Monitor Location Plan

16/06/2023, 13:43:04

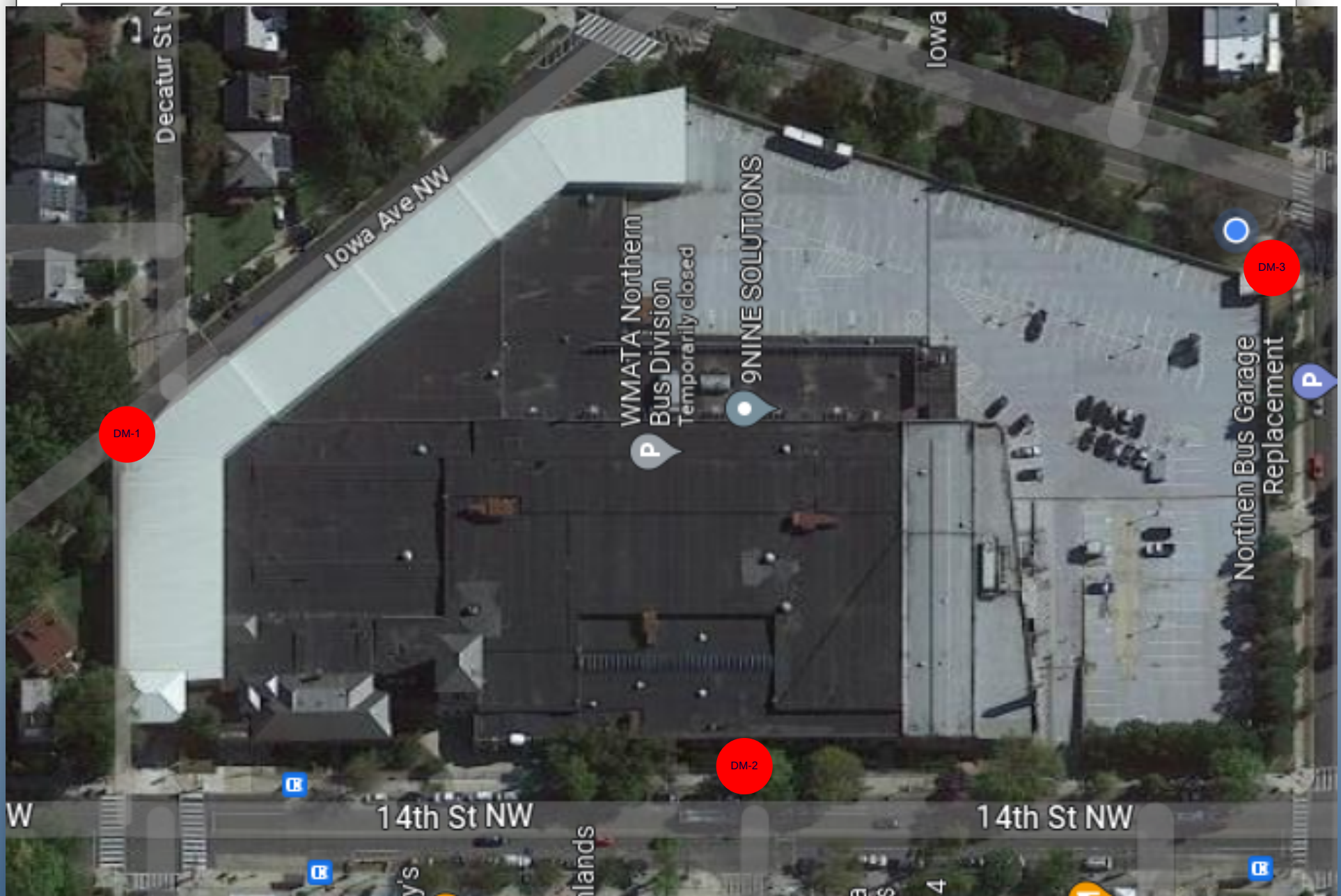


Table 1: Noise Summaries

VM1-MIC		
	Exceedance	Percentage
Work hours	776	45.70%
After hours	490	28.86%
Weekends	432	25.44%
Total	1698	100%

VM1-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	116.1	119.1	113.3
Lmin (dBA)	78.7	60.9	57.5
L10 (dBA)	86	88	77
L90 (dBA)	82	67	66
Leq (dBA)	85.4	87.5	81.8

VM2-MIC		
	Exceedance	Percentage
Work hours	456	55.01%
After hours	206	24.85%
Weekends	167	20.14%
Total	829	100%

VM2-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	112.7	113	112
Lmin (dBA)	85.1	60.2	57.6
L10 (dBA)	91	85	70
L90 (dBA)	86	66	59
Leq (dBA)	88.2	82	80.5

VM3-MIC		
	Exceedance	Percentage
Work hours	551	43.11%
After hours	404	31.61%
Weekends	323	25.27%
Total	1278	100%

VM3-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	111.3	114	116.1
Lmin (dBA)	63.5	65.2	55.3
L10 (dBA)	81	88	71
L90 (dBA)	66	68	61
Leq (dBA)	83.5	83.5	83.2

VM4-MIC		
	Exceedance	Percentage
Work hours	152	71.36%
After hours	42	19.72%
Weekends	19	8.92%
Total	213	100%

VM4-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	110.3	108	99.5
Lmin (dBA)	64.9	55.8	51.2
L10 (dBA)	83	89	64
L90 (dBA)	68	65	55
Leq (dBA)	82.1	85.4	71.7

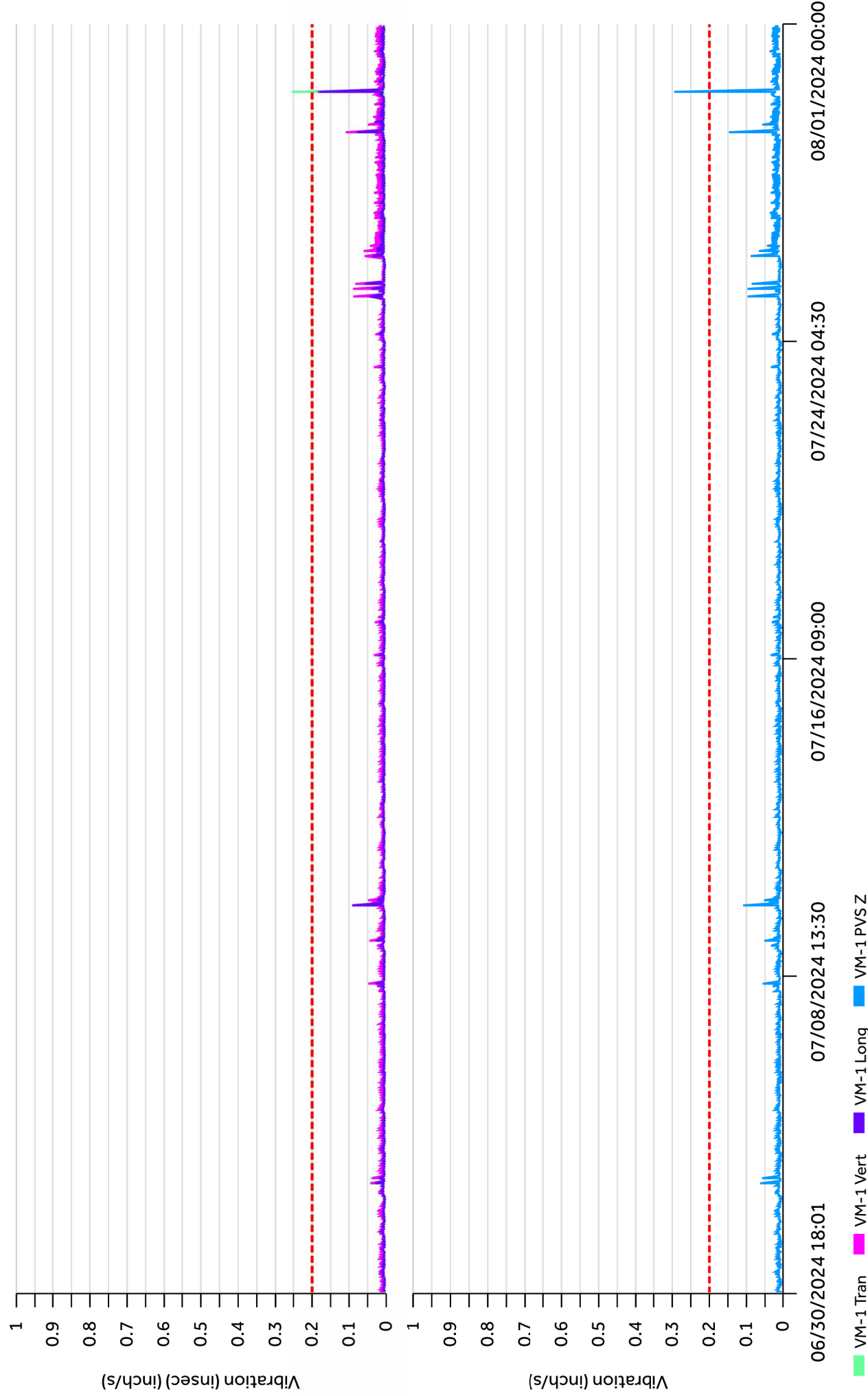
VM5-MIC		
	Exceedance	Percentage
Work hours	108	40.45%
After hours	91	34.08%
Weekends	68	25.47%
Total	267	100%

VM5-MIC			
	Work hours	After hours	Weekends
Lmax (dBA)	108	105	104.1
Lmin (dBA)	60.9	54.5	53.8
L10 (dBA)	72	75	71
L90 (dBA)	63	58	56
Leq (dBA)	74.8	73.8	72.3

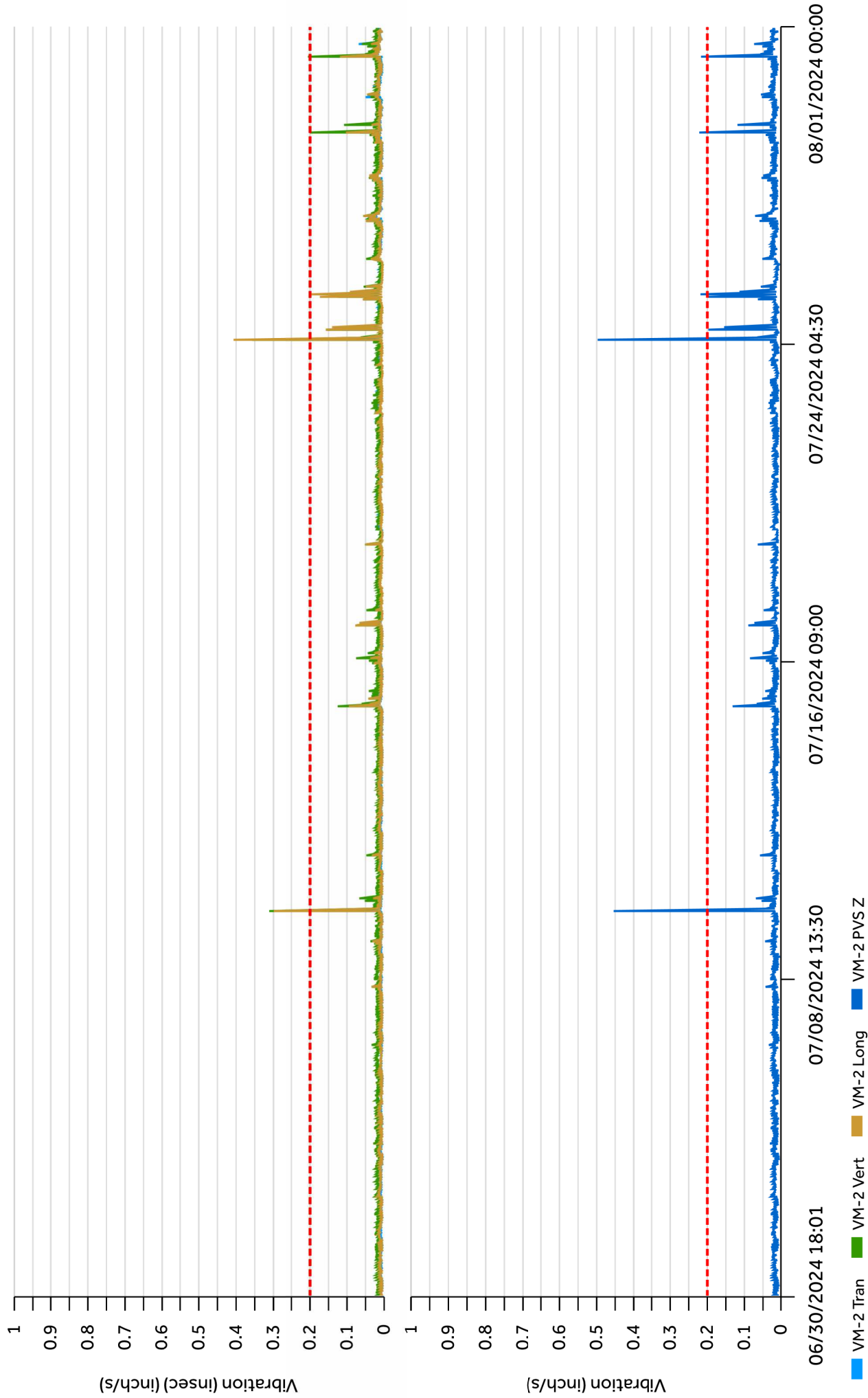
Summary tables contain values for working hours, after hours, and weekend time periods:

- 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.

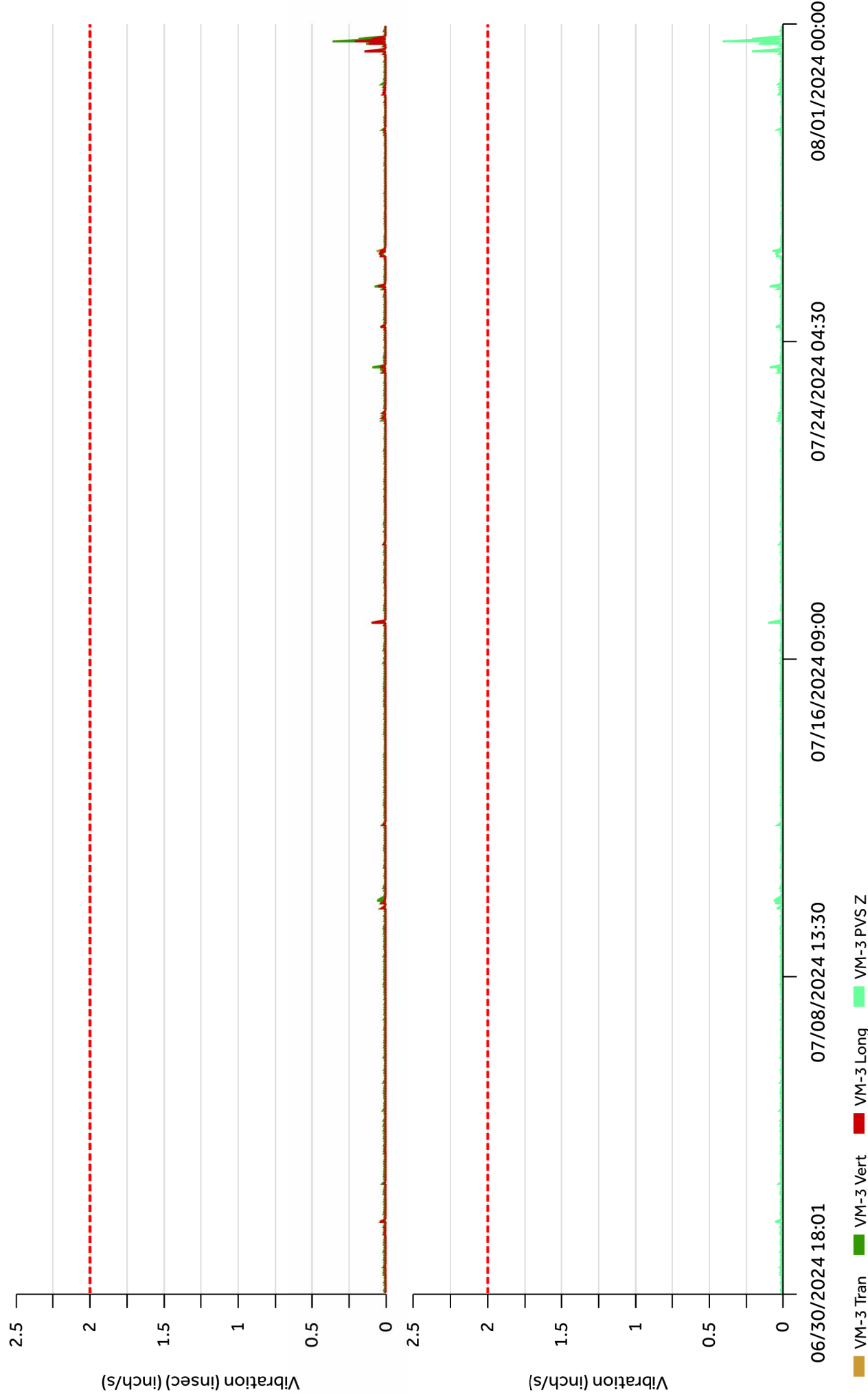
Graph 1
VM-1 - Vibration Monitor



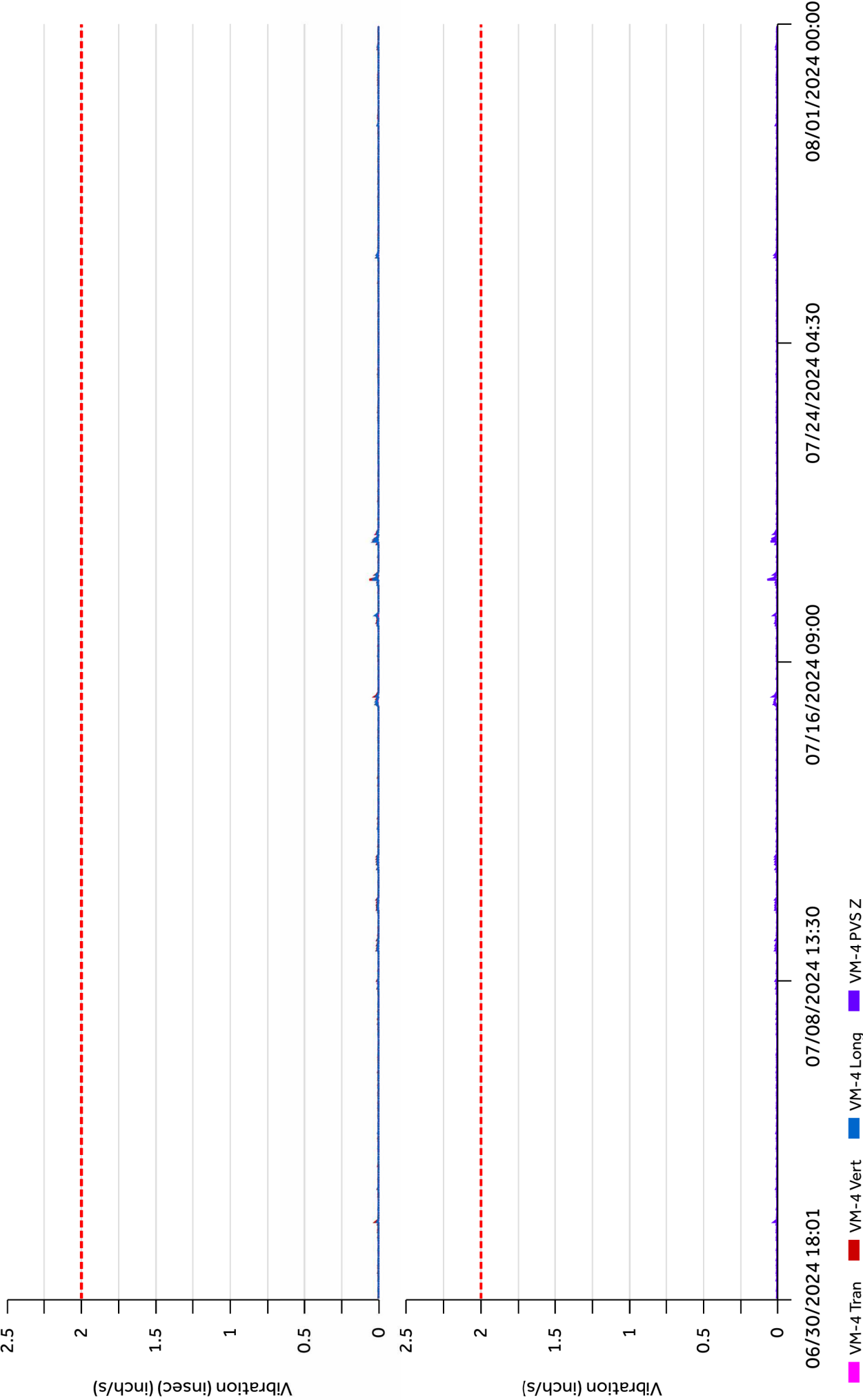
Graph 2
VM-2- Vibration Monitor



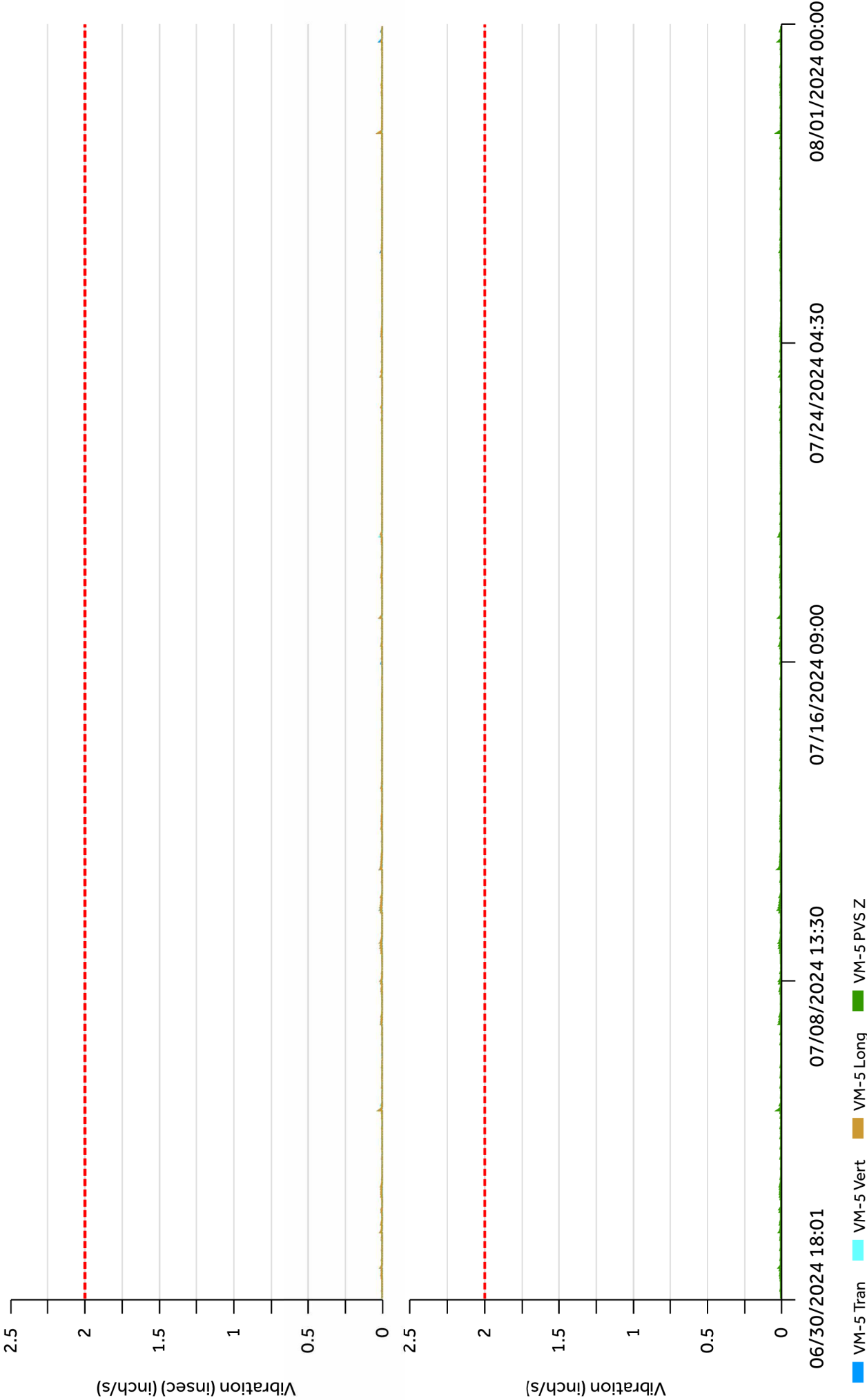
Graph 3
VM-3- Vibration Monitor



Graph 4
VM-4- Vibration Monitor

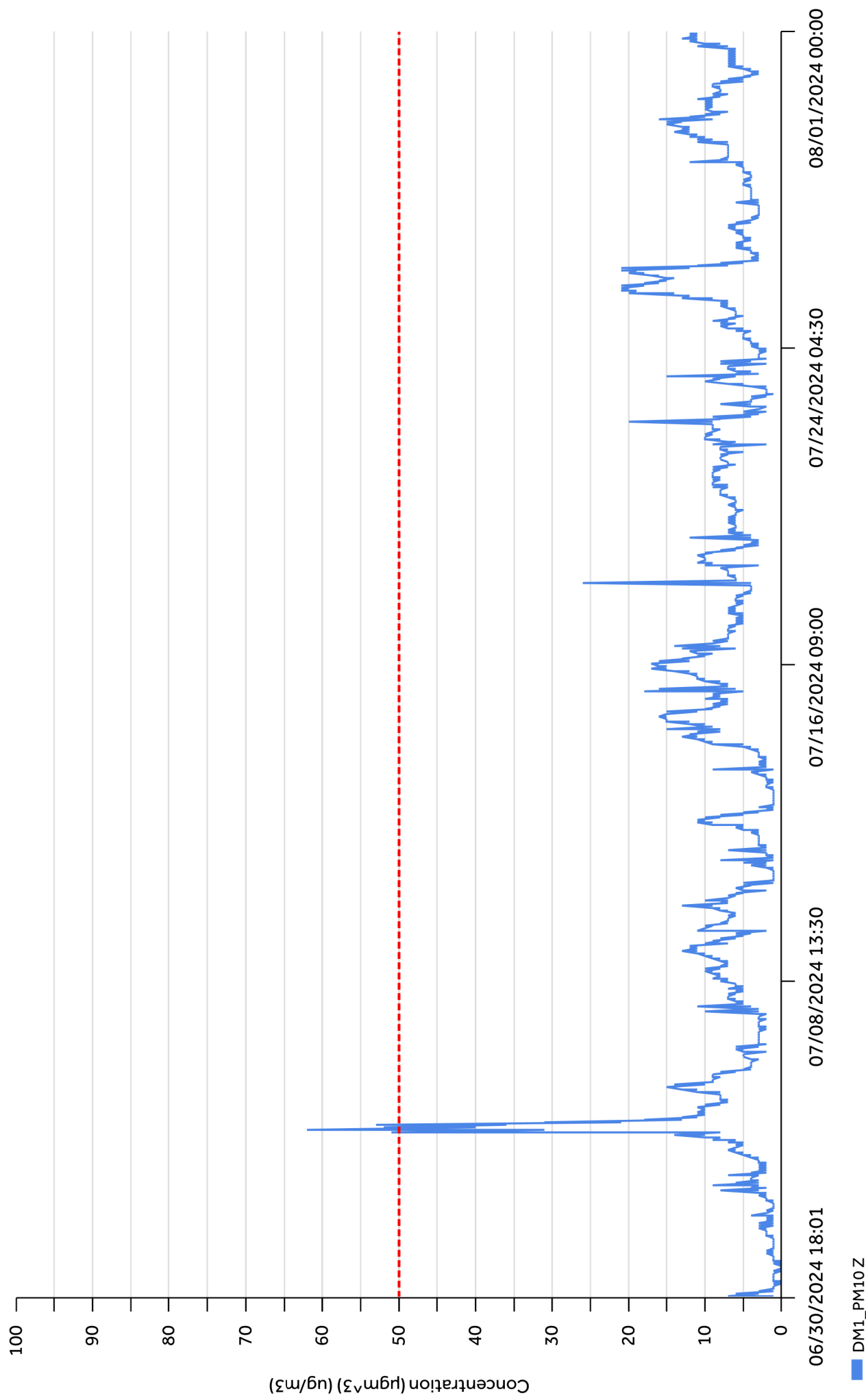


Graph 5
VM-5- Vibration Monitor



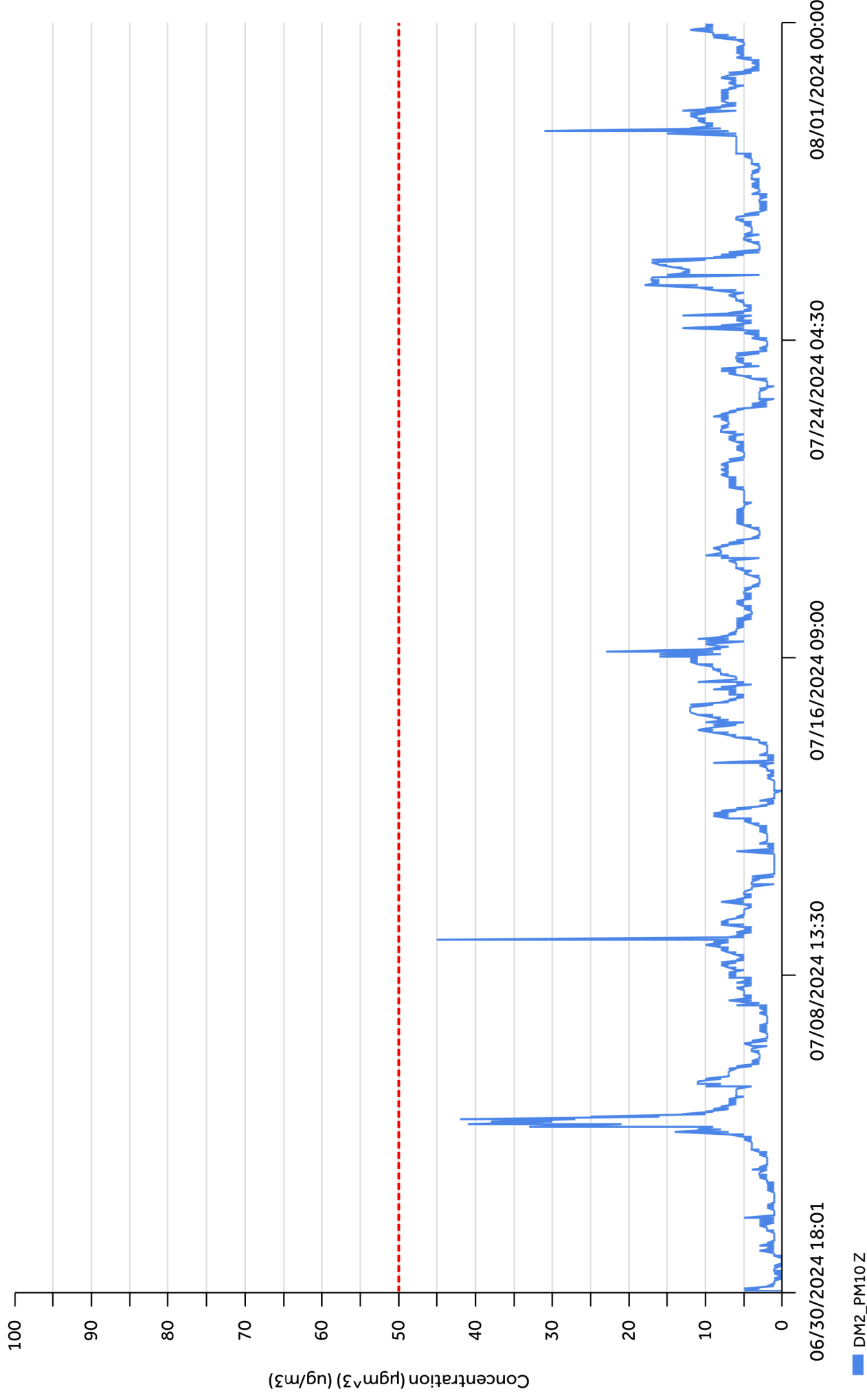
Graph 6

DM1 - PM10



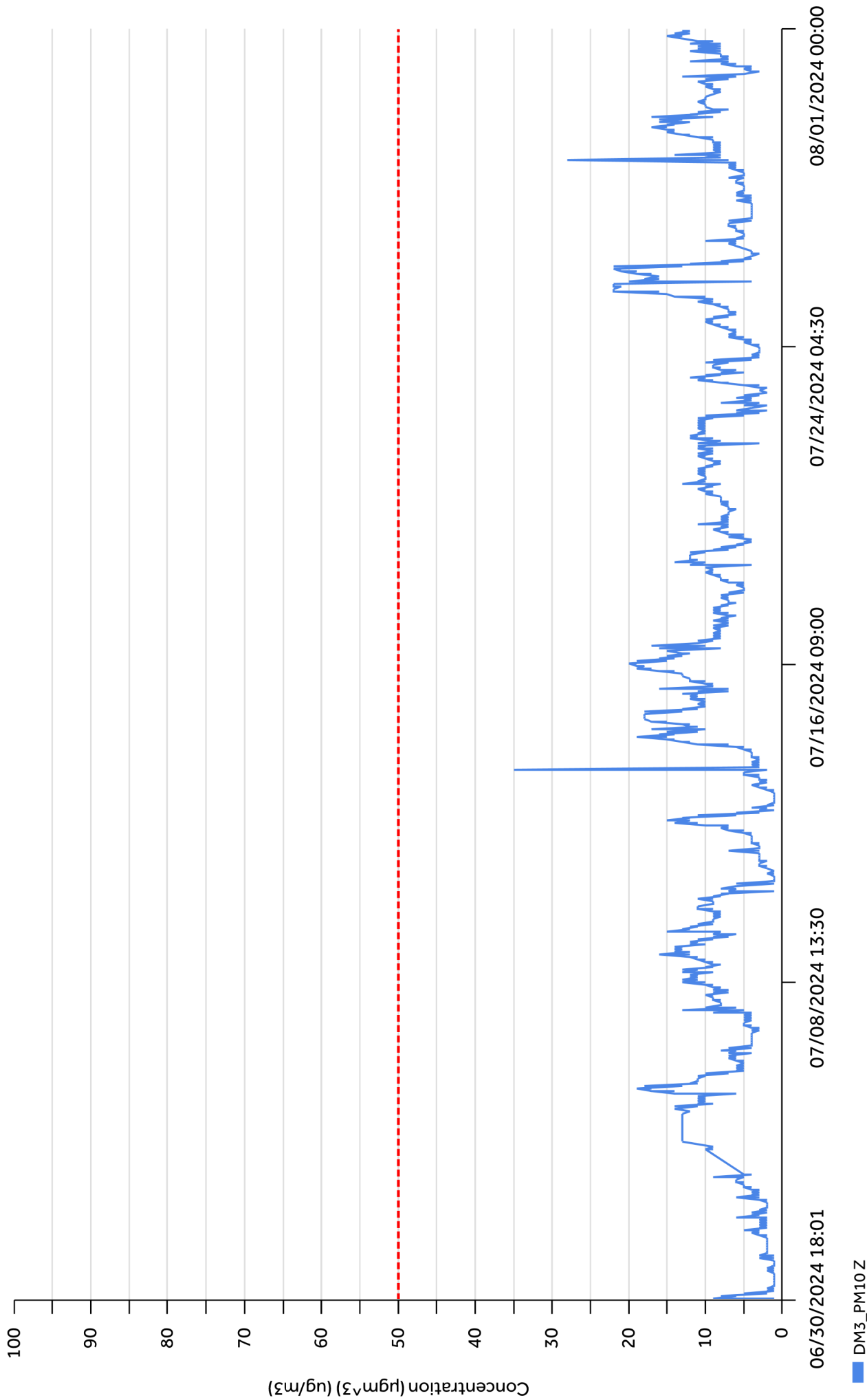
Graph 7

DM2-PM10



Graph 8

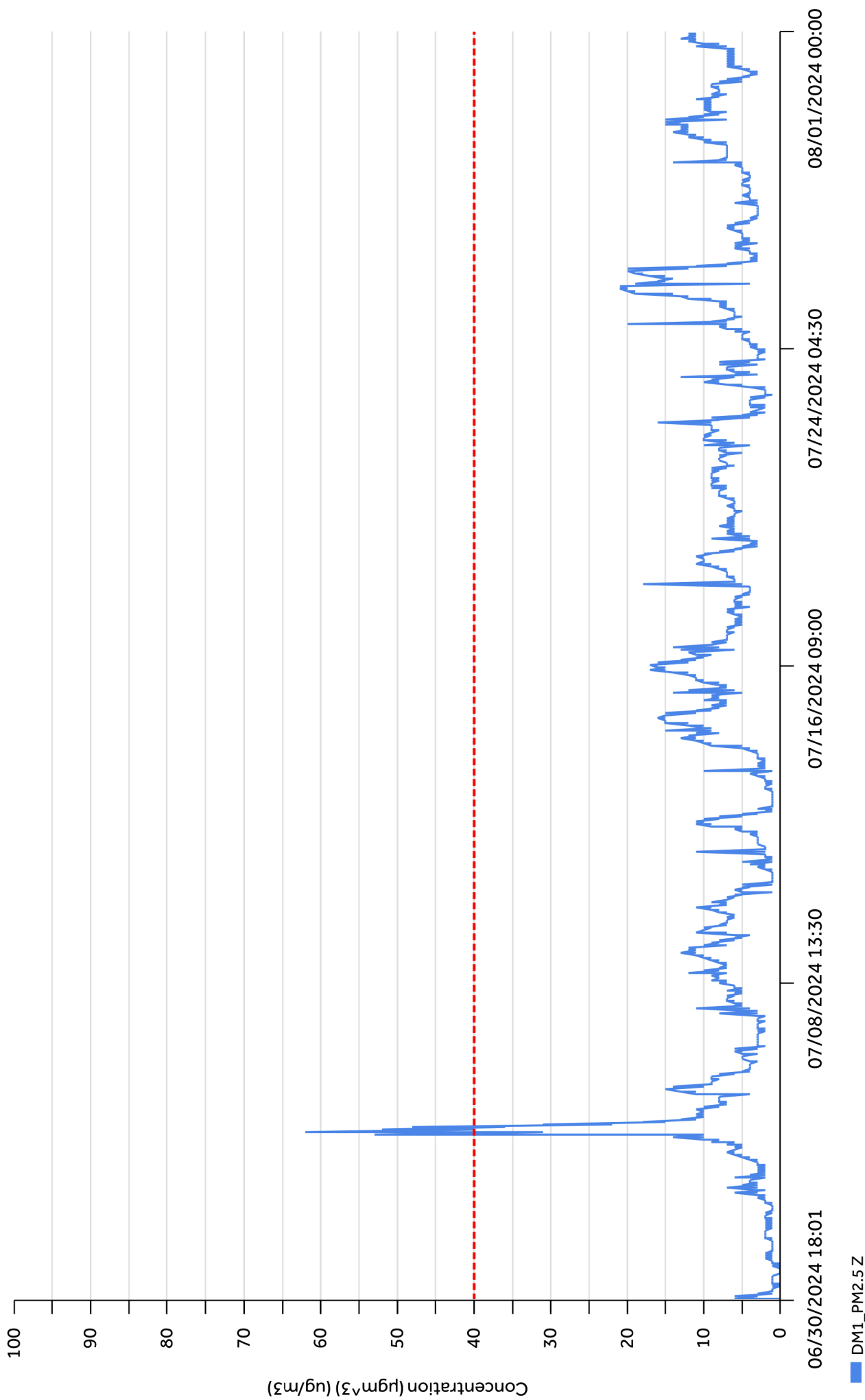
DM3-PM10



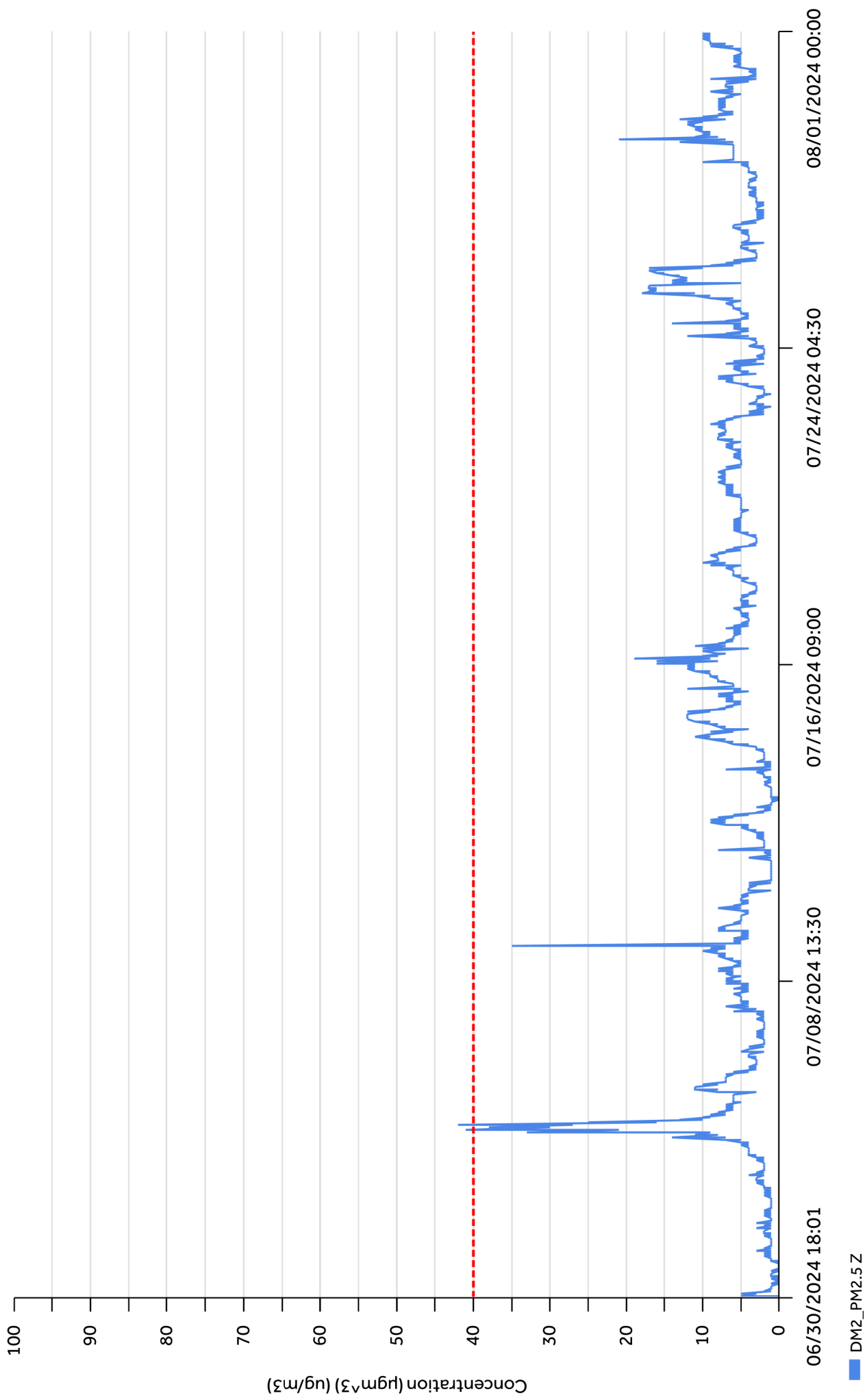
DM3-PM10 Z

Graph 9

DM1-PM2.5



Graph 10
DM2-PM2.5



Graph 11
DM3-PM2.5

