



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley

Monthly Report 3

22.09.2022 - 21.10.2022

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Attention To	Hazell Bros

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# 1 INTRODUCTION

Acoustic Logic has been engaged to carry out noise, dust and vibration monitoring for the impacts associated with the upgrade the existing road infrastructure of Tweed Coast Road/Cudgen Road intersection to service increased demand following the completion of the Tweed Valley Hospital.

This report provides the results of the following monitoring items:

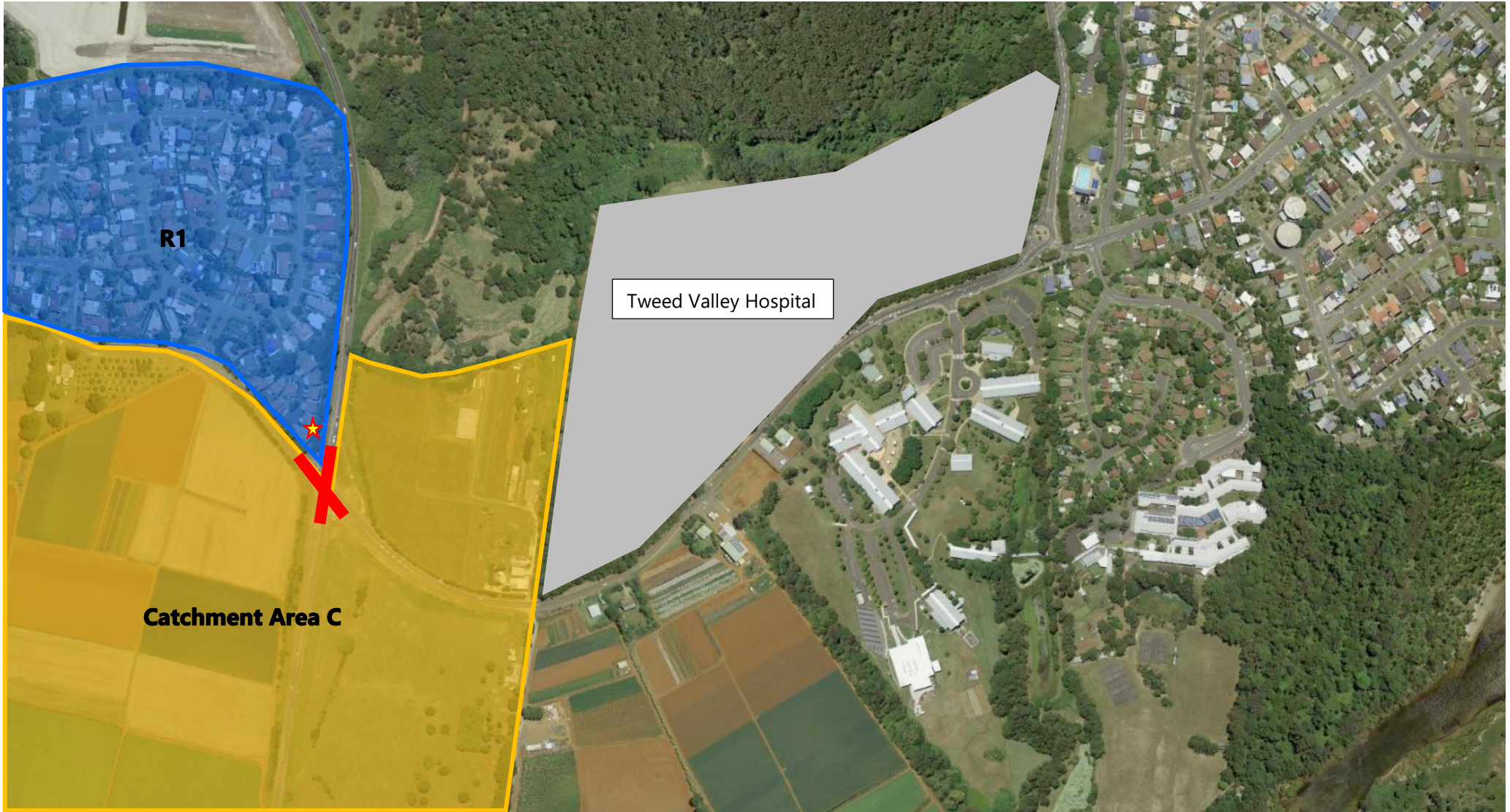
- Vibration Monitoring: 22<sup>nd</sup> of September to 21<sup>st</sup> of October 2022
- Noise Monitoring: 22<sup>nd</sup> of September to 21<sup>st</sup> of October 2022, and
- Dust Monitoring: 22<sup>nd</sup> of September to 21<sup>st</sup> of October 2022.

Unattended noise, dust and vibration monitoring has been carried out with reference to the management levels identified in the *Construction Noise, Dust & Vibration Management Plan* (CNVMP) for Tweed Valley Hospital Carpark the site prepared by AL (ref: 20211491.1/2911A/R2/OB, dated 29/11/2021). The criteria set up in the above management plan will be adopted to the proposed intersection upgrade site.

## 1.1 SITE DESCRIPTION AND SENSITIVE RECEIVERS

The subject site is located at Tweed Coast Road/Cudgen Road intersection, Kingscliff as indicated in Figure 1-1. The land uses surrounding the intersection are existing residential and agricultural receivers. The nearest potentially most affected receivers are:

- **Residential Receiver R1:** Residential receivers at 6-30 John Robb Way to the north of the proposed construction site
- **Industrial/Agricultural Receiver 1:** Catchment Area C to the south of the proposed construction site



- Industrial/Agricultural
- Proposed road upgrade location
- Monitoring Location

**Figure 1-1 – Project Site and Sensitive Receiver Locations**

- Tweed Valley Hospital
- Residential Receiver

## 2 CONSTRUCTION NOISE, DUST & VIBRATION MANAGEMENT LEVELS

Noise, dust and vibration management levels which are presented below have been adopted from the following documents:

- Tweed Valley Hospital Carpark *Construction Noise, Dust and Vibration Management Plan* (CNVMP), Acoustic Logic (ref: 20211491.1/2911A/R2/OB, dated 29/11/2021)
- For structural damage vibration, German Standard DIN 4150-3 *Structural Vibration: Effects of Vibration on Structures*, and
- For human exposure to vibration, the NSW EPA document *Assessing Vibration: A Technical Guideline*.

### 2.1 VIBRATION MONITORING OBJECTIVES

German Standard DIN 4150-3 provides vibration velocity guideline levels for use in evaluating the effects of vibration on structures. The criteria presented in DIN 4150-3 are presented in Table 2-1.

It is noted that the peak velocity is the absolute value of the maximum of any of the three orthogonal component particle velocities as measured at the foundation, and the maximum levels measured in the x- and y-horizontal directions in the plane of the floor of the uppermost storey.

**Table 2-1 – DIN4150-3 Safe Limits for Building Vibration**

TYPE OF STRUCTURE		PEAK PARTICLE VELOCITY (mms <sup>-1</sup> )			
		At Foundation at a Frequency of			Plane of Floor of Uppermost Storey
		< 10Hz	10Hz to 50Hz	50Hz to 100Hz	All Frequencies
1	Buildings used in commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use <b>Receivers R1</b>	5	5 to 15	15 to 20	15
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

The surrounding residential properties are considered type 2 structures and are the most sensitive receivers as such vibration will be assessed to the Type 2 criteria.

## 2.2 NOISE MONITORING OBJECTIVES

Project specific noise construction noise management levels are outlined in the approved CNVMP and summarised in Table 2-2 below:

**Table 2-2 – Summarised Construction Noise Requirements During Proposed Hours**

“Noise Affected” Level - dB(A) <sub>Leq(15min)</sub> Standard Hours	“Highly Noise Affected” Level - dB(A) <sub>Leq(15min)</sub>
55 externally at façade	75

## 2.3 DUST MONITORING OBJECTIVES

Dust monitoring has been conducted to measure mechanically generated respirable PM<sub>2.5</sub> dust particles (< 2.5µm) and PM<sub>10</sub> dust particles (< 10µm), which are generally understood to be the main health concern in airborne dust. The air quality limits are based on the standards outlined in Department of the Environment’s *National Environment Protection (Ambient Air Quality) Measure* and NSW EPA’s air quality categories.

It should be noted that the dust monitoring results can be influenced by events such as fires and dust storms, thus the PM<sub>10</sub> limit has an allowance of 5 days per year to account for the effects of such events.

The PM<sub>2.5</sub> and PM<sub>10</sub> goals are summarised below.

**Table 3 – PM<sub>2.5</sub> and PM<sub>10</sub> Goals (24-Hour Average)**

Pollutant	Averaging Time	Maximum Concentration
PM <sub>2.5</sub>	24 hours	25 µg/m <sup>3</sup>
PM <sub>10</sub>	24 hours	50 µg/m <sup>3</sup>

The EPA has air quality categories based on particle concentration over a one hour average. As per the Construction Noise, Dust and Vibration management Plan, this project has targeted the ‘Poor’ category as a reference, **however, the assessment level is the 24-hour average.**

**Table 4 – PM<sub>2.5</sub> and PM<sub>10</sub> Goals (1-Hour Average)**

Pollutant	Air Quality Category	Maximum Concentration
PM <sub>2.5</sub>	Poor	62-97 µg/m <sup>3</sup>
PM <sub>10</sub>		80-120 µg/m <sup>3</sup>

### 3 MONITOR/MEASUREMENT EQUIPMENT AND LOCATIONS

#### 3.1 VIBRATION MONITOR

##### 3.1.1 Measurement Equipment

Vibration monitoring was conducted using Texcel ETM vibration monitors with external Tri-axial Geophones. The monitors are programmed to store statistical vibration data every 5-minute intervals, along with any 'triggered' events that occur throughout the monitoring period.

##### 3.1.2 Measurement Locations & Installation Dates

A vibration monitor (M7394) has been installed, representative of the potential impact for vibration transmission to surrounding residential houses, at the northern boundary of the construction site (at the ground level, also see Figure 3-1). The monitor was installed on Friday 22<sup>nd</sup> July 2022.

#### 3.2 NOISE AND DUST MONITORS

##### 3.2.1 Measurement Equipment

Unattended noise monitoring was conducted using a *SiteHive Hexanode 134* noise and dust monitor. The monitor was programmed to store 15-minute statistical noise levels throughout the monitoring period. Measurements were taken on A-frequency weighting and fast time weighting.

##### 3.2.2 Measurement Locations & Installation Dates

A noise monitor has been installed, representative of the potential impact for noise transmission to surrounding residential houses, at the northern boundary of the construction site (at the ground level, also see Figure below). The monitor was installed on Friday 22<sup>nd</sup> July 2022.



**Figure 3-1 Noise, dust and vibration monitor installation locations**



## 4 NOISE, DUST & VIBRATION MEASUREMENTS

### 4.1 MONITORING PERIOD

This report provides the available results of noise, dust and vibration monitoring between the 22<sup>nd</sup> of September to 21<sup>st</sup> of October 2022.

### 4.2 VIBRATION MONITORING RESULTS

The highest axial (transverse / radial / vertical) vibration level, Peak Particle Velocity (PPV), during the monitoring period have been presented below. Graphs of the results are presented in Appendix A.

**Table 5 – Vibration Monitoring Results-M7394**

<b>Date</b>	<b>Maximum Measured Vibration Level mm/s</b>	<b>Structural Damage Criteria for Type 2 (DIN4150-3)</b>	<b>Comments</b>
Thursday 2022-09-22	<3mm/s		Vibration levels satisfy DIN4150-3 Type 2 criteria
Friday 2022-09-23	<3mm/s		
Saturday 2022-09-24	<3mm/s		
Sunday 2022-09-25	No work		
Monday 2022-09-26	<3mm/s	5 mm/s (<10Hz)	
Tuesday 2022-09-27	<3mm/s		
Wednesday 2022-09-28	<3mm/s	5-15 mm/s (10-50Hz)	
Thursday 2022-09-29	<3mm/s	15-20mm/s (50-100Hz)	
Friday 2022-09-30	<3mm/s		
Saturday 2022-10-01	<3mm/s		
Sunday 2022-10-02	No work		
Monday 2022-10-03	<3mm/s		
Tuesday 2022-10-04	<3mm/s		

<b>Date</b>	<b>Maximum Measured Vibration Level mm/s</b>	<b>Structural Damage Criteria for Type 2 (DIN4150-3)</b>	<b>Comments</b>	
Wednesday 2022-10-05	<3mm/s		Vibration levels satisfy DIN4150-3 Type 2 criteria	
Thursday 2022-10-06	<3mm/s			
Friday 2022-10-07	<3mm/s			
Saturday 2022-10-08	<3mm/s			
Sunday 2022-10-09	No work			
Monday 2022-10-10	<3mm/s			
Tuesday 2022-10-11	<3mm/s	5 mm/s (<10Hz)		
Wednesday 2022-10-12	<3mm/s			
Thursday 2022-10-13	<3mm/s	5-15 mm/s (10-50Hz)		
Friday 2022-10-14	<3mm/s	15-20mm/s (50-100Hz)		
Saturday 2022-10-15	<3mm/s			
Sunday 2022-10-16	No work			
Monday 2022-10-17	<3mm/s			
Tuesday 2022-10-18	<3mm/s			
Wednesday 2022-10-19	6mm/s @80Hz			Event due to monitor service
Thursday 2022-10-20	<3mm/s			Vibration levels satisfy DIN4150-3 Type 2 criteria
Friday 2022-10-21	<3mm/s			

Vibration levels for monitor M7394 to the north of the construction site were within the nominated criteria for the whole monitoring period between 22<sup>nd</sup> September to 21<sup>st</sup> October 2022.

### 4.3 NOISE MONITORING RESULTS

The available measured noise levels have been analysed by this office and the graphed noise data presented in Appendix 1. Summarised results are also in Table 6 below.

**Table 6 – Measured Construction Noise Levels @ R1**

Date	Time Period	Percentage of Time that Measured Noise Level dB(A) <sub>Leq(15min)</sub> Exceeds			
		0-5 above Noise affected level 55 dB(A) <sub>Leq(15min)</sub>	5-10 above Noise affected level 55 dB(A) <sub>Leq(15min)</sub>	10-15 above Noise affected level 55 dB(A) <sub>Leq(15min)</sub>	Above Highly Noise affected level 75 dB(A) <sub>Leq(15min)</sub>
Thursday 2022-09-22	7am – 6pm	23.91%	73.91%	0.00%	0.00%
Friday 2022-09-23		13.64%	86.36%	0.00%	0.00%
Saturday 2022-09-24	8am – 1pm	90.48%	9.52%	0.00%	0.00%
Sunday 2022-09-25	No Works				
Monday 2022-09-26	7am – 6pm	27.27%	72.73%	0.00%	0.00%
Tuesday 2022-09-27		27.27%	72.73%	0.00%	0.00%
Wednesday 2022-09-28		34.09%	65.91%	0.00%	0.00%
Thursday 2022-09-29		47.73%	50.00%	2.27%	0.00%
Friday 2022-09-30		50.00%	50.00%	0.00%	0.00%
Saturday 2022-10-01	8am – 1pm	47.62%	52.38%	0.00%	0.00%
Sunday 2022-10-02	No Works				
Monday 2022-10-03	7am – 6pm	84.09%	4.55%	0.00%	0.00%
Tuesday 2022-10-04		79.55%	20.45%	0.00%	0.00%
Wednesday 2022-10-05		63.64%	36.36%	0.00%	0.00%
Thursday 2022-10-06		54.55%	45.45%	0.00%	0.00%

Date	Time Period	Percentage of Time that Measured Noise Level dB(A) <sub>Leq(15min)</sub> Exceeds			
		0-5 above Noise affected level 55 dB(A) <sub>Leq(15min)</sub>	5-10 above Noise affected level 55 dB(A) <sub>Leq(15min)</sub>	10-15 above Noise affected level 55 dB(A) <sub>Leq(15min)</sub>	Above Highly Noise affected level 75 dB(A) <sub>Leq(15min)</sub>
Friday 2022-10-07	7am – 6pm	72.73%	27.27%	0.00%	0.00%
Saturday 2022-10-08	8am – 1pm	100.00%	0.00%	0.00%	0.00%
Sunday 2022-10-09	No Works				
Monday 2022-10-10	7am – 6pm	45.45%	54.55%	0.00%	0.00%
Tuesday 2022-10-11		72.73%	27.27%	0.00%	0.00%
Wednesday 2022-10-12		54.55%	45.45%	0.00%	0.00%
Thursday 2022-10-13		50.00%	50.00%	0.00%	0.00%
Friday 2022-10-14		47.73%	52.27%	0.00%	0.00%
Saturday 2022-10-15	8am – 1pm	100.00%	0.00%	0.00%	0.00%
Sunday 2022-10-16	No Works				
Monday 2022-10-17	7am – 6pm	40.91%	59.09%	0.00%	0.00%
Tuesday 2022-10-18		25.00%	75.00%	0.00%	0.00%
Wednesday 2022-10-19		22.73%	77.27%	0.00%	0.00%
Thursday 2022-10-20		20.45%	77.27%	2.27%	0.00%
Friday 2022-10-21		14.10%	55.13%	0.00%	0.00%

Noise levels were below the highly noise affected level (75dB(A)) during the whole monitoring period. Noise levels were normally between 5-10 dB higher than the noise affected level. This is expected to lower at the residential façade due to distance attenuation.

#### 4.4 DUST MONITORING RESULTS

The daily average PM<sub>2.5</sub> and PM<sub>10</sub> concentration levels are presented below.

**Table 7 – 24hr Average PM<sub>2.5</sub> and PM<sub>10</sub> Concentration**

Date	24hr Average PM <sub>2.5</sub> and PM <sub>10</sub> Concentration					
	PM <sub>2.5</sub> Level (µg/m <sup>3</sup> )	PM <sub>2.5</sub> Limit (µg/m <sup>3</sup> )	Complies	PM <sub>10</sub> Level (µg/m <sup>3</sup> )	PM <sub>10</sub> Limit (µg/m <sup>3</sup> )	Complies
Thursday 2022-09-22	6	25	Yes	12	50	Yes
Friday 2022-09-23	6		Yes	14		Yes
Saturday 2022-09-24	6		Yes	21		Yes
Sunday 2022-09-25	5		Yes	20		Yes
Monday 2022-09-26	6		Yes	25		Yes
Tuesday 2022-09-27	5		Yes	19		Yes
Wednesday 2022-09-28	5		Yes	15		Yes
Thursday 2022-09-29	4		Yes	25		Yes
Friday 2022-09-30	6		Yes	21		Yes
Saturday 2022-10-01	4		Yes	10		Yes
Sunday 2022-10-02	5		Yes	16		Yes
Monday 2022-10-03	4		Yes	13		Yes
Tuesday 2022-10-04	3		Yes	20		Yes
Wednesday 2022-10-05	2		Yes	12		Yes
Thursday 2022-10-06	3		Yes	13		Yes
Friday 2022-10-07	5	Yes	52	Occurred at midnight – Non construction related		

Date	24hr Average PM <sub>2.5</sub> and PM <sub>10</sub> Concentration					
	PM <sub>2.5</sub> Level (µg/m <sup>3</sup> )	PM <sub>2.5</sub> Limit (µg/m <sup>3</sup> )	Complies	PM <sub>10</sub> Level (µg/m <sup>3</sup> )	PM <sub>10</sub> Limit (µg/m <sup>3</sup> )	Complies
Saturday 2022-10-08	8	25	Yes	26	50	Yes
Sunday 2022-10-09	13		Yes	35		Yes
Monday 2022-10-10	13		Yes	39		Yes
Tuesday 2022-10-11	8		Yes	28		Yes
Wednesday 2022-10-12	8		Yes	26		Yes
Thursday 2022-10-13	9		Yes	36		Yes
Friday 2022-10-14	15		Yes	46		Yes
Saturday 2022-10-15	8		Yes	31		Yes
Sunday 2022-10-16	9		Yes	34		Yes
Monday 2022-10-17	4		Yes	16		Yes
Tuesday 2022-10-18	9		Yes	40		Yes
Wednesday 2022-10-19	11		Yes	36		Yes
Thursday 2022-10-20	12		Yes	34		Yes
Friday 2022-10-21	19		Yes	40		Yes

Hourly averaged dust monitoring results comply with the criteria during the whole monitoring period.

The **daily maximum 1hour** PM<sub>2.5</sub> and PM<sub>10</sub> concentration levels are presented below.

**Table 8 – 1Hr Maximum PM<sub>2.5</sub> and PM<sub>10</sub> Concentration**

Date	Maximum 1hr Average PM <sub>2.5</sub> and PM <sub>10</sub> Concentration					
	PM <sub>2.5</sub> Level (µg/m <sup>3</sup> )	PM <sub>2.5</sub> Limit (µg/m <sup>3</sup> )	Complies	PM <sub>10</sub> Level (µg/m <sup>3</sup> )	PM <sub>10</sub> Limit (µg/m <sup>3</sup> )	Complies
Thursday 2022-09-22	18	62-97	Yes	37	80-120	Yes
Friday 2022-09-23	17		Yes	34		Yes
Saturday 2022-09-24	13		Yes	55		Yes
Sunday 2022-09-25	10		Yes	42		Yes
Monday 2022-09-26	16		Yes	83		Non construction works related
Tuesday 2022-09-27	9		Yes	28		Yes
Wednesday 2022-09-28	15		Yes	35		Yes
Thursday 2022-09-29	10		Yes	72		Yes
Friday 2022-09-30	20		Yes	78		Yes
Saturday 2022-10-01	14		Yes	39		Yes
Sunday 2022-10-02	10		Yes	48		Yes
Monday 2022-10-03	5		Yes	22		Yes
Tuesday 2022-10-04	10		Yes	88		Non construction works related
Wednesday 2022-10-05	4		Yes	21		Yes
Thursday 2022-10-06	4		Yes	29		Yes
Friday 2022-10-07	15		Yes	805		Non construction works related

Date	Maximum 1hr Average PM <sub>2.5</sub> and PM <sub>10</sub> Concentration					
	PM <sub>2.5</sub> Level (µg/m <sup>3</sup> )	PM <sub>2.5</sub> Limit (µg/m <sup>3</sup> )	Complies	PM <sub>10</sub> Level (µg/m <sup>3</sup> )	PM <sub>10</sub> Limit (µg/m <sup>3</sup> )	Complies
Saturday 2022-10-08	13	62-97	Yes	49	80-120	Yes
Sunday 2022-10-09	29		Yes	78		Yes
Monday 2022-10-10	25		Yes	73		Yes
Tuesday 2022-10-11	11		Yes	46		Yes
Wednesday 2022-10-12	10		Yes	34		Yes
Thursday 2022-10-13	17		Yes	172		Non construction works related
Friday 2022-10-14	35		Yes	129		Non construction works related
Saturday 2022-10-15	20		Yes	100		Yes
Sunday 2022-10-16	15		Yes	69		Yes
Monday 2022-10-17	10		Yes	100		Non construction works related
Tuesday 2022-10-18	21		Yes	109		Weather affected
Wednesday 2022-10-19	17		Yes	61		Yes
Thursday 2022-10-20	19		Yes	66		Yes
Friday 2022-10-21	30		Yes	67		Yes

Maximum hourly averaged PM<sub>10</sub> exceedances on 18<sup>th</sup> October were resulted from severe weather conditions. Exceedances on 26<sup>th</sup> September and 4<sup>th</sup>, 7<sup>th</sup>, 13<sup>th</sup>, 14<sup>th</sup>, 17<sup>th</sup> October were recorded outside construction hours and unrelated to construction activities.



## 5 CONCLUSION

Acoustic Logic Consultancy has carried out noise, dust and vibration monitoring for the proposed intersection upgrade at Tweed Coast Road/Cudgen Road intersection, Tweed Valley.

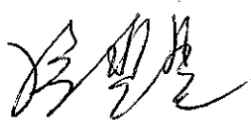
This monitoring report presents the noise and vibration monitoring for the periods as follows:

- Vibration Monitoring: 22<sup>nd</sup> of September to 21<sup>st</sup> of October 2022
- Noise Monitoring: 22<sup>nd</sup> of September to 21<sup>st</sup> of October 2022, and
- Dust Monitoring: 22<sup>nd</sup> of September to 21<sup>st</sup> of October 2022.

Vibration levels were below the criteria during the whole monitoring period. Noise levels were normally below 10dB(A) exceedance of noise affected level (55dB(A)). This is believed to be lower at the closest residential receiver due to distance attenuation. Several dust measurements exceedances were recorded during the above monitoring period and as found due to extreme weather conditions or events that unrelated to the construction works as per the results notes in this report.

Please contact us should you have any further queries.

Yours faithfully,

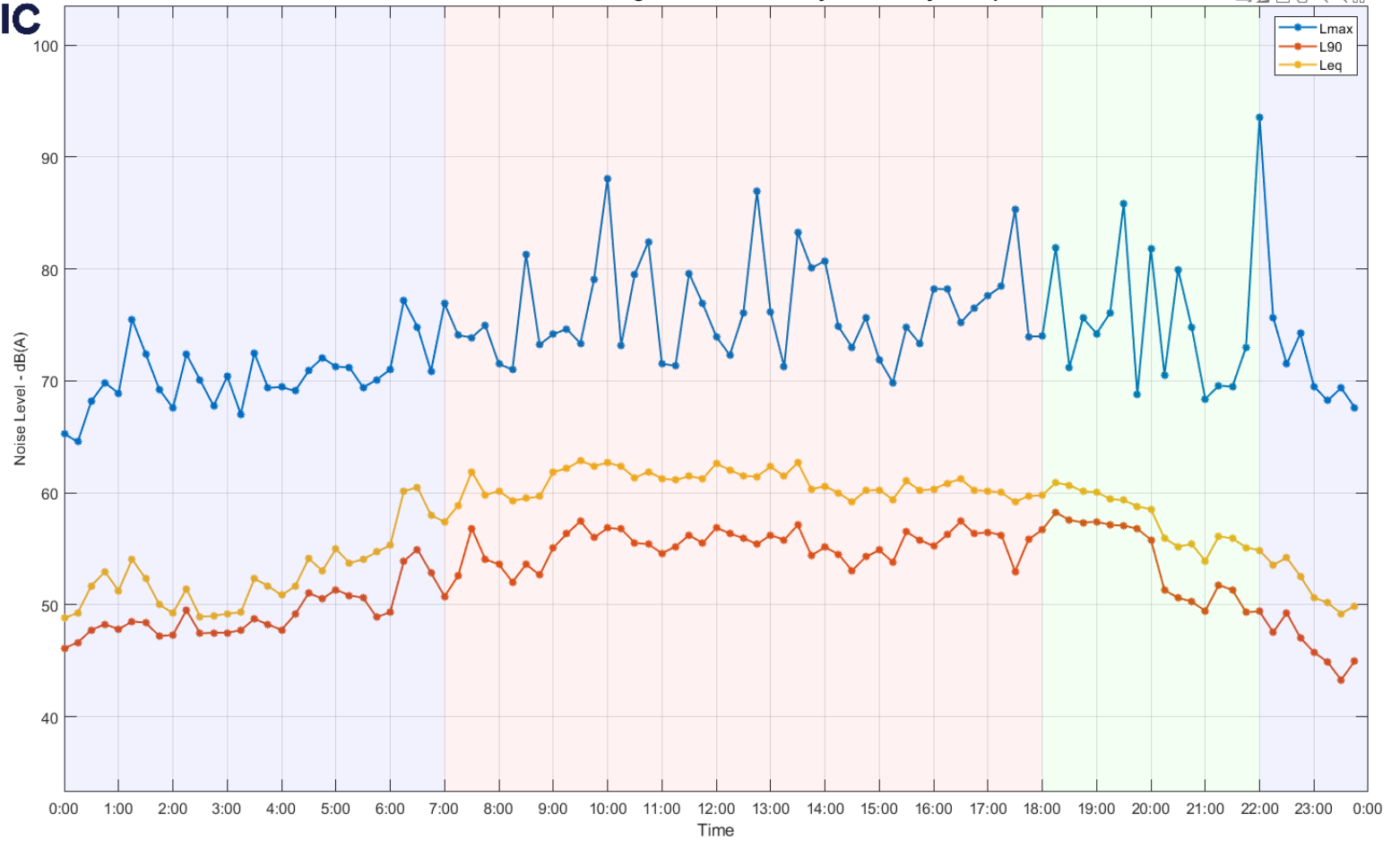
A handwritten signature in black ink, appearing to be 'J. Smith', written in a cursive style.

Acoustic Logic Pty Ltd

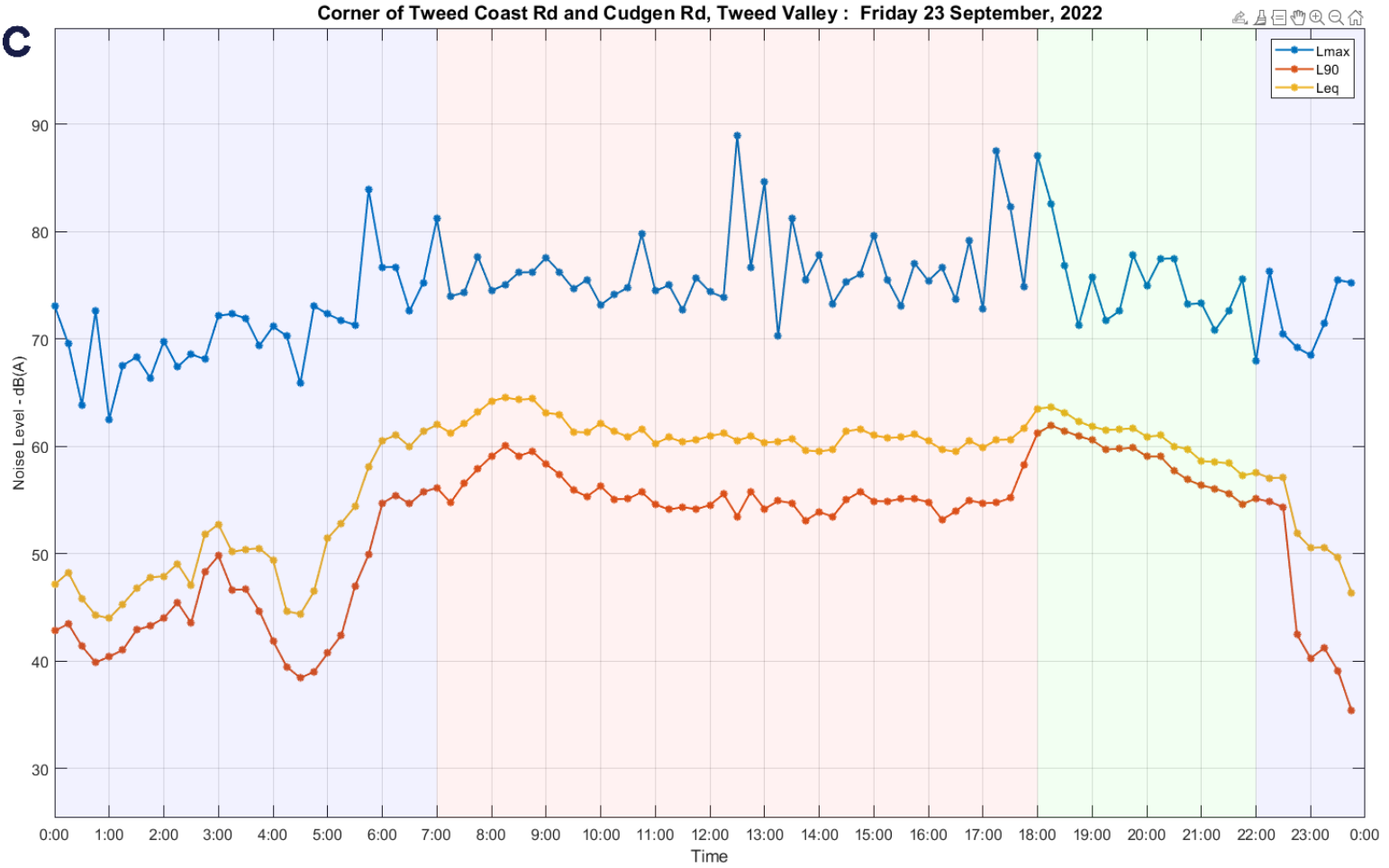


## **APPENDIX 1 – NOISE MONITORING RESULTS**

Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 22 September, 2022

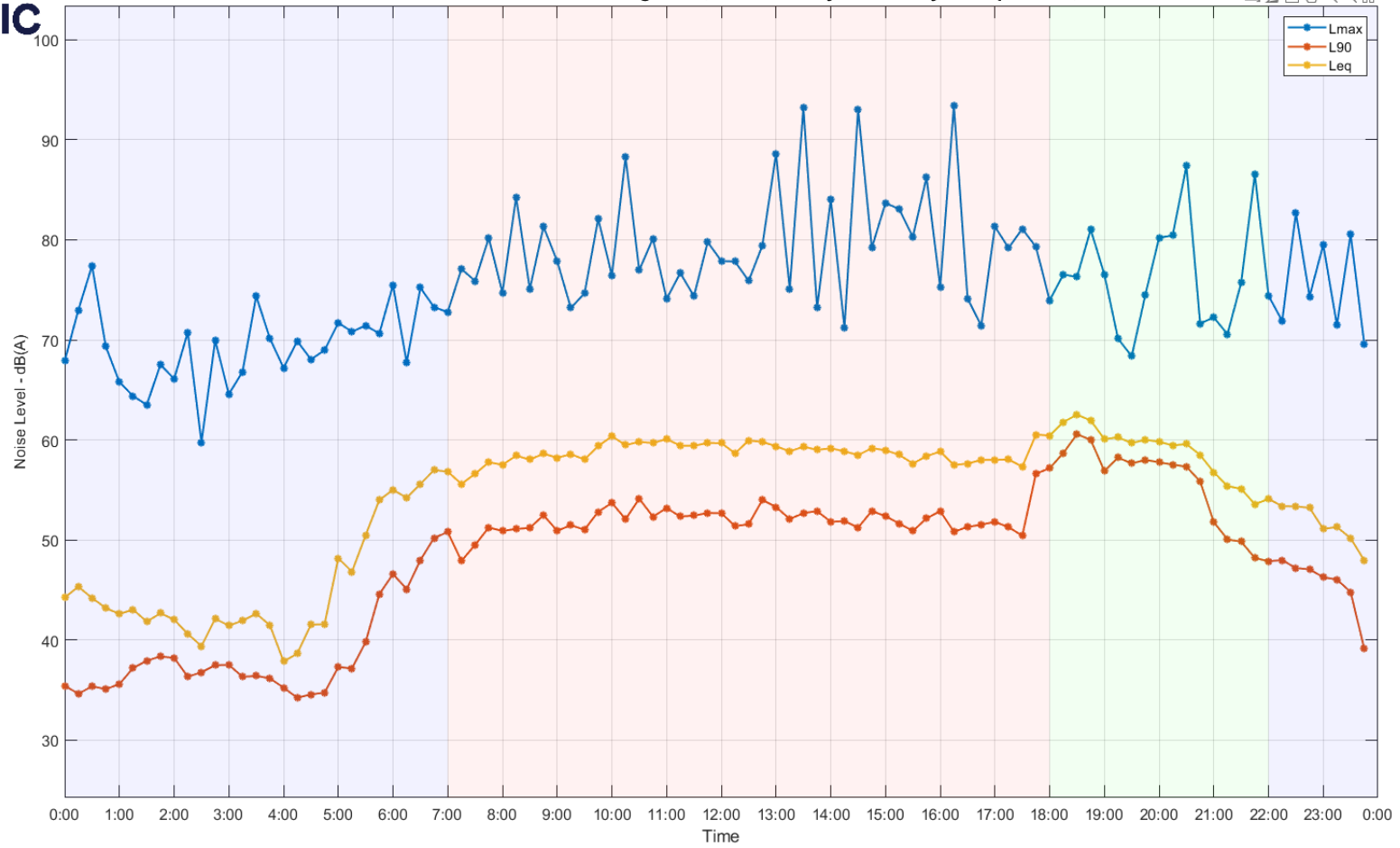


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 23 September, 2022



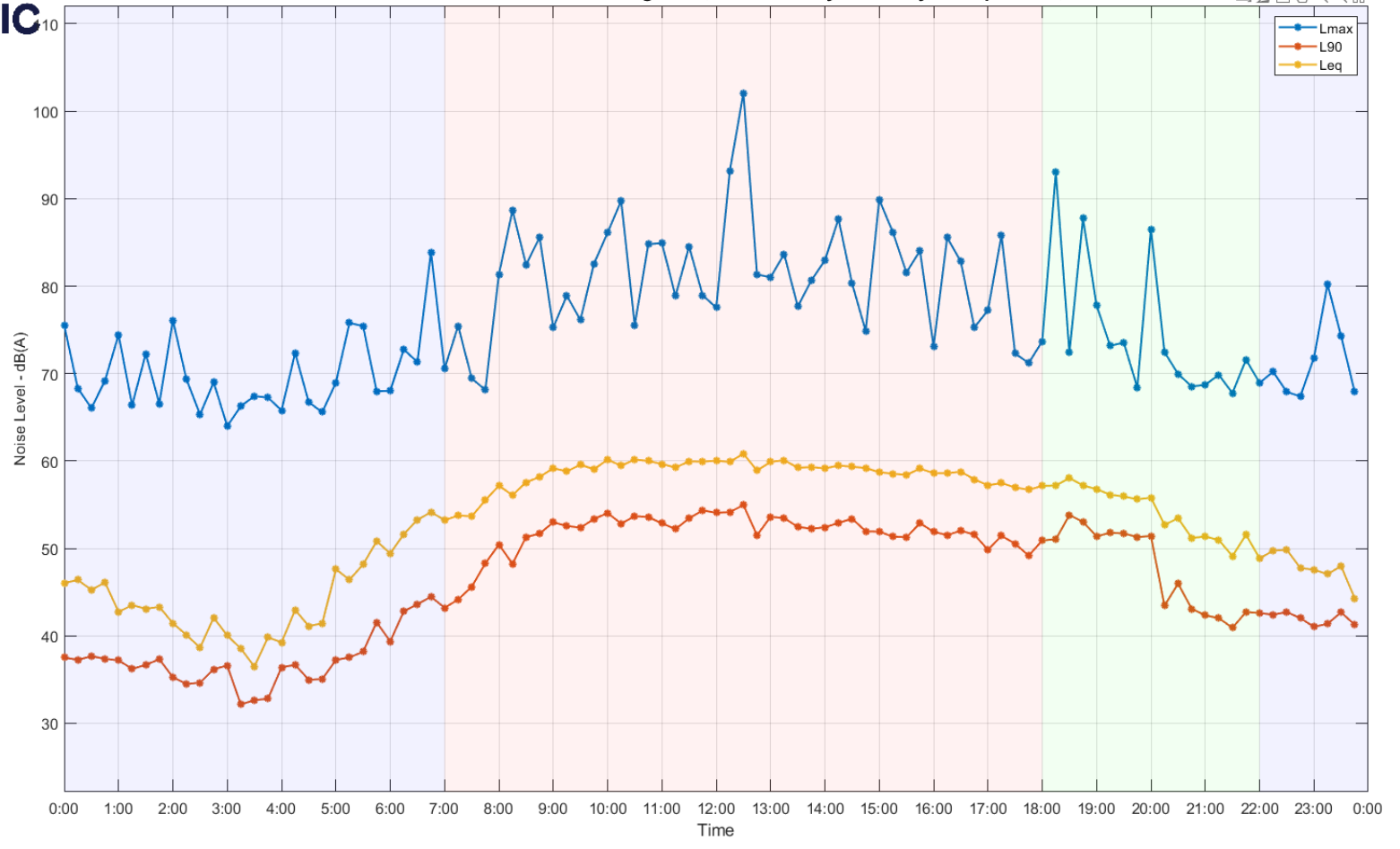


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 24 September, 2022



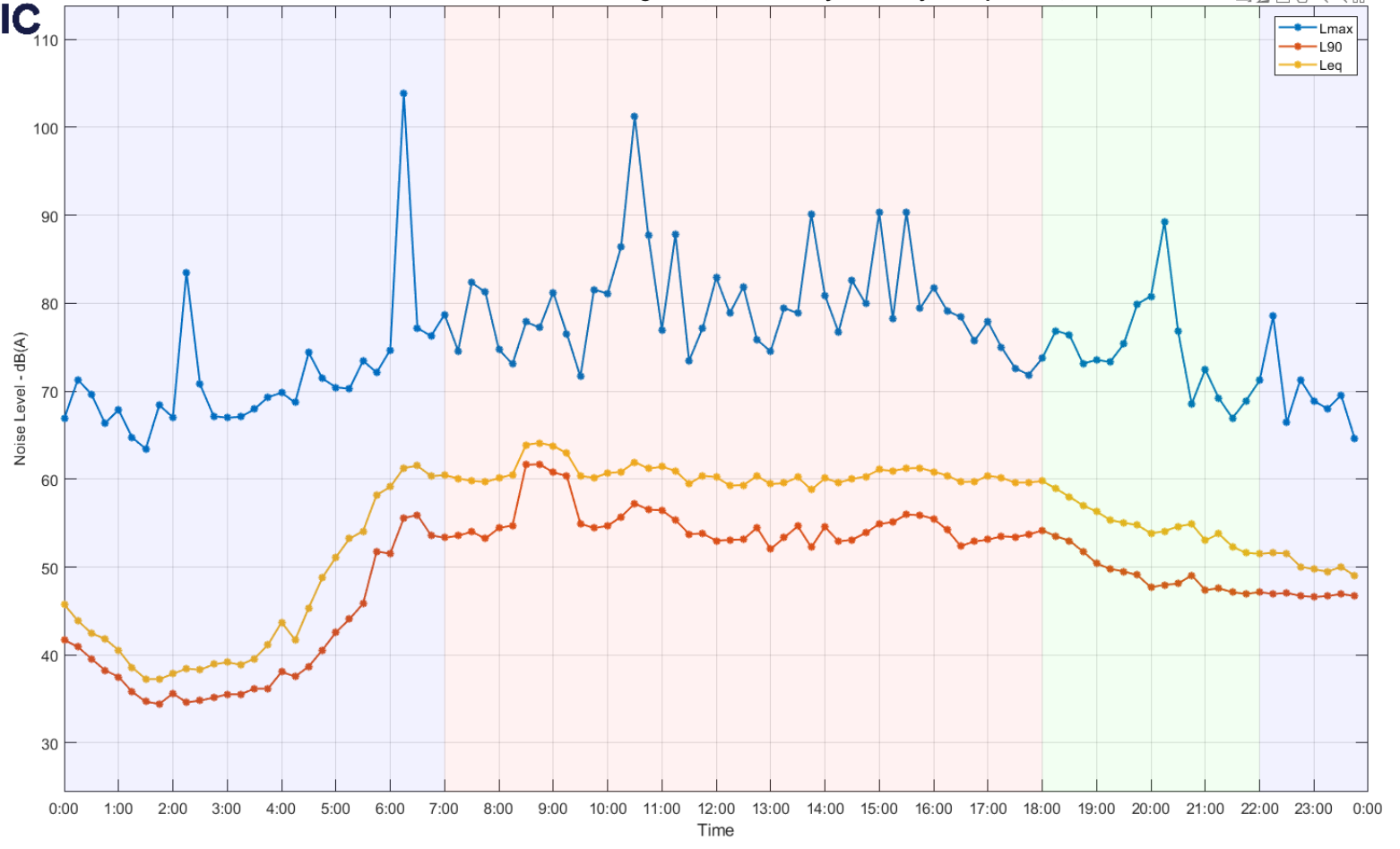


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 25 September, 2022



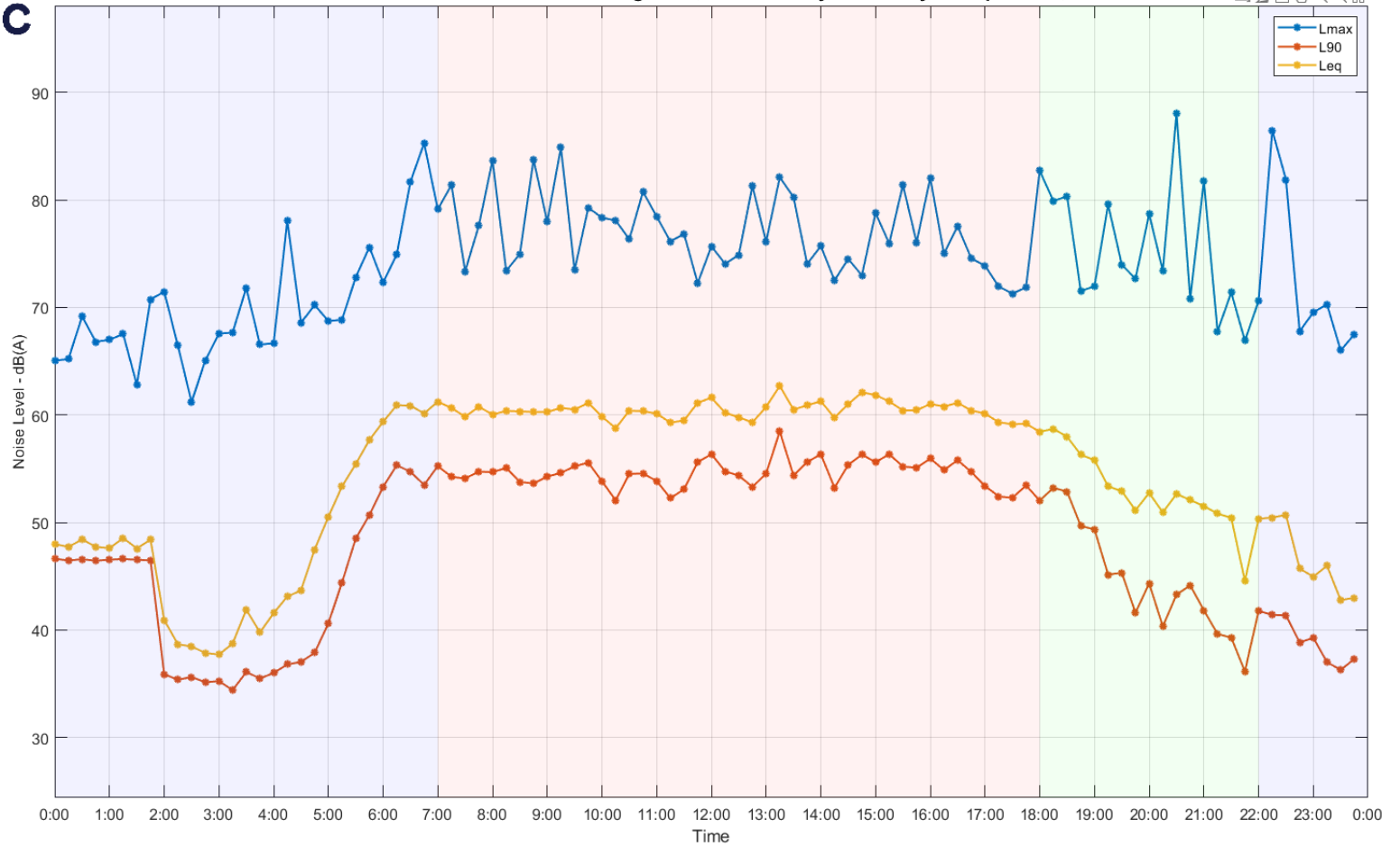


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 26 September, 2022





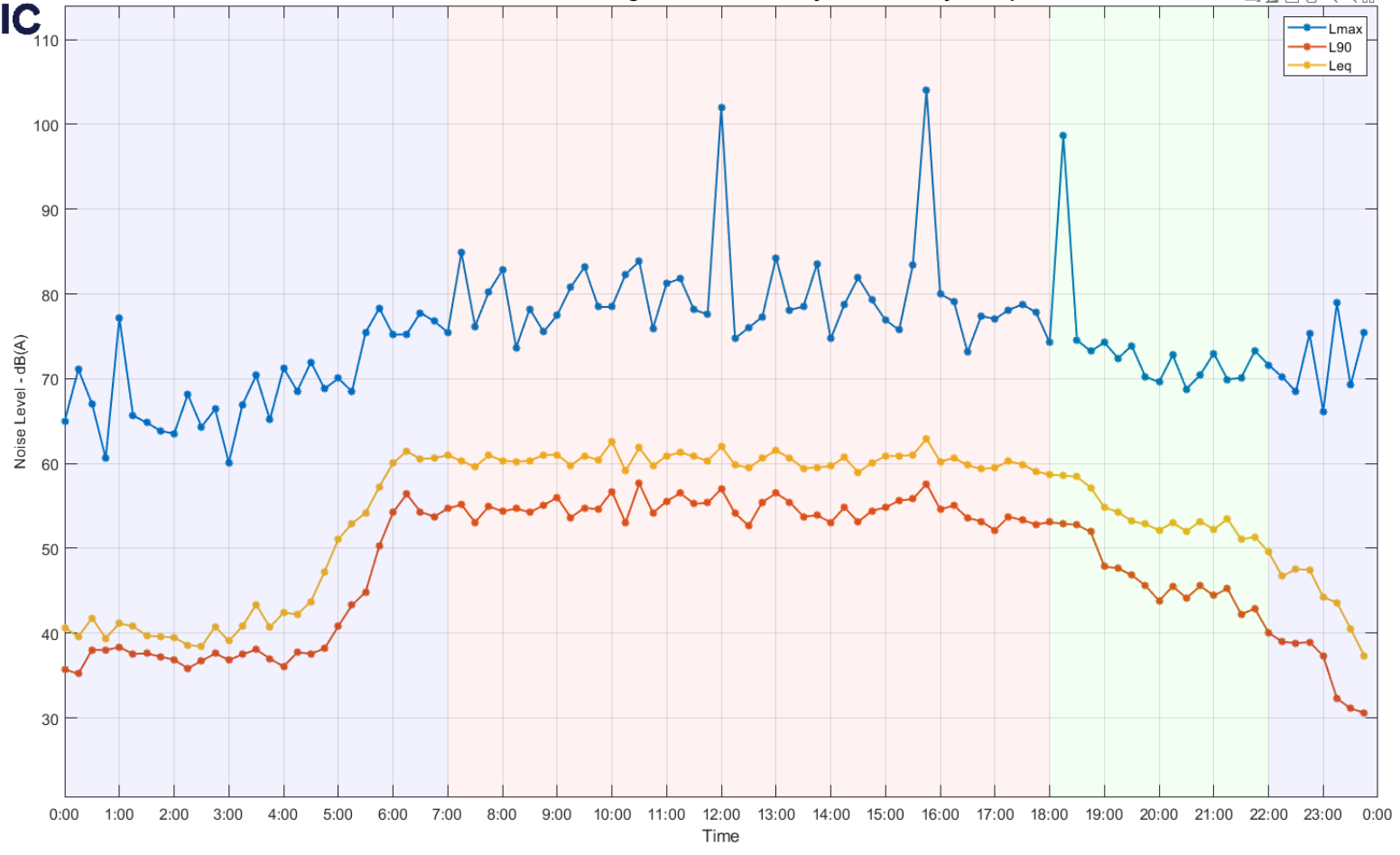
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 27 September, 2022





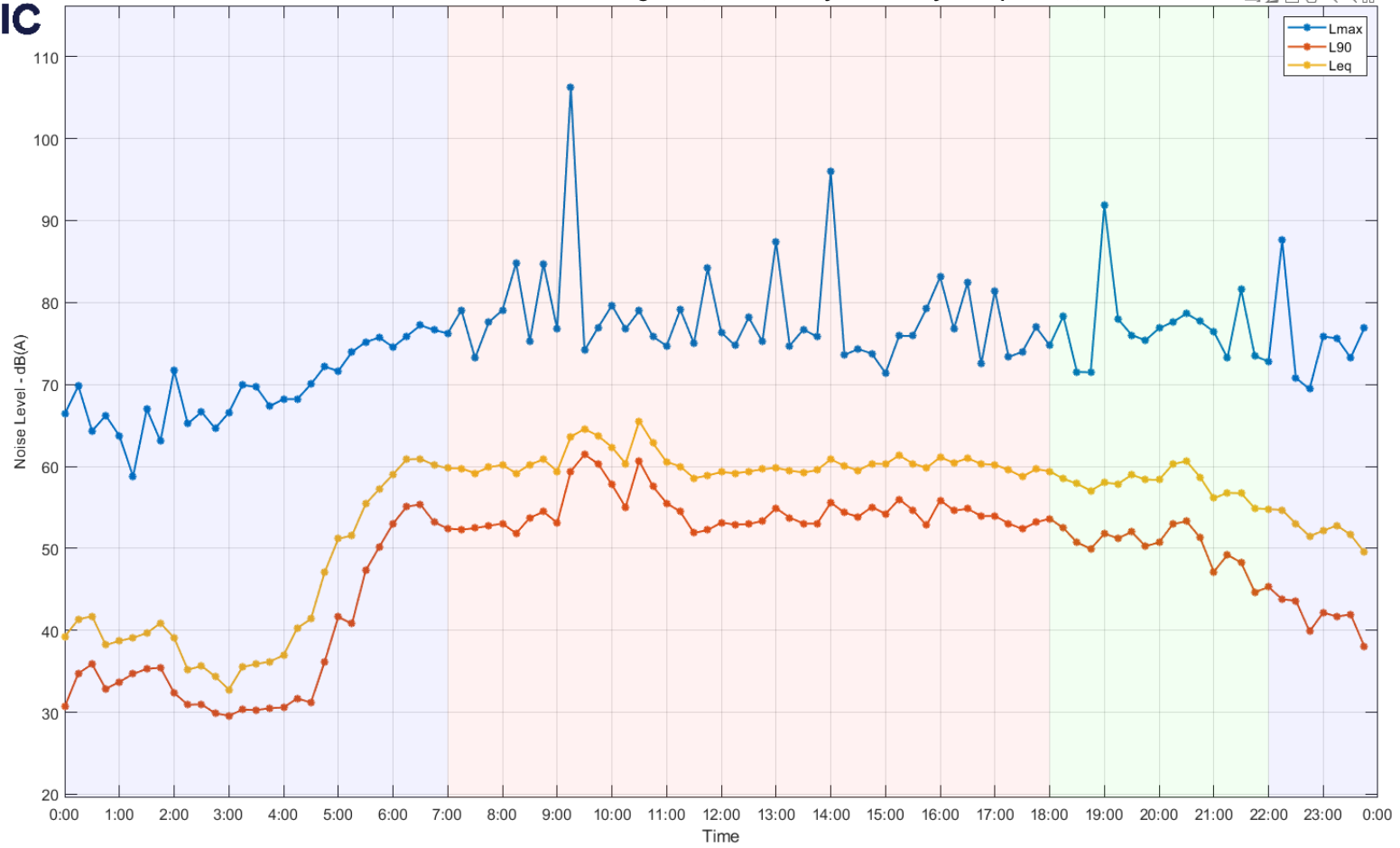


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 28 September, 2022



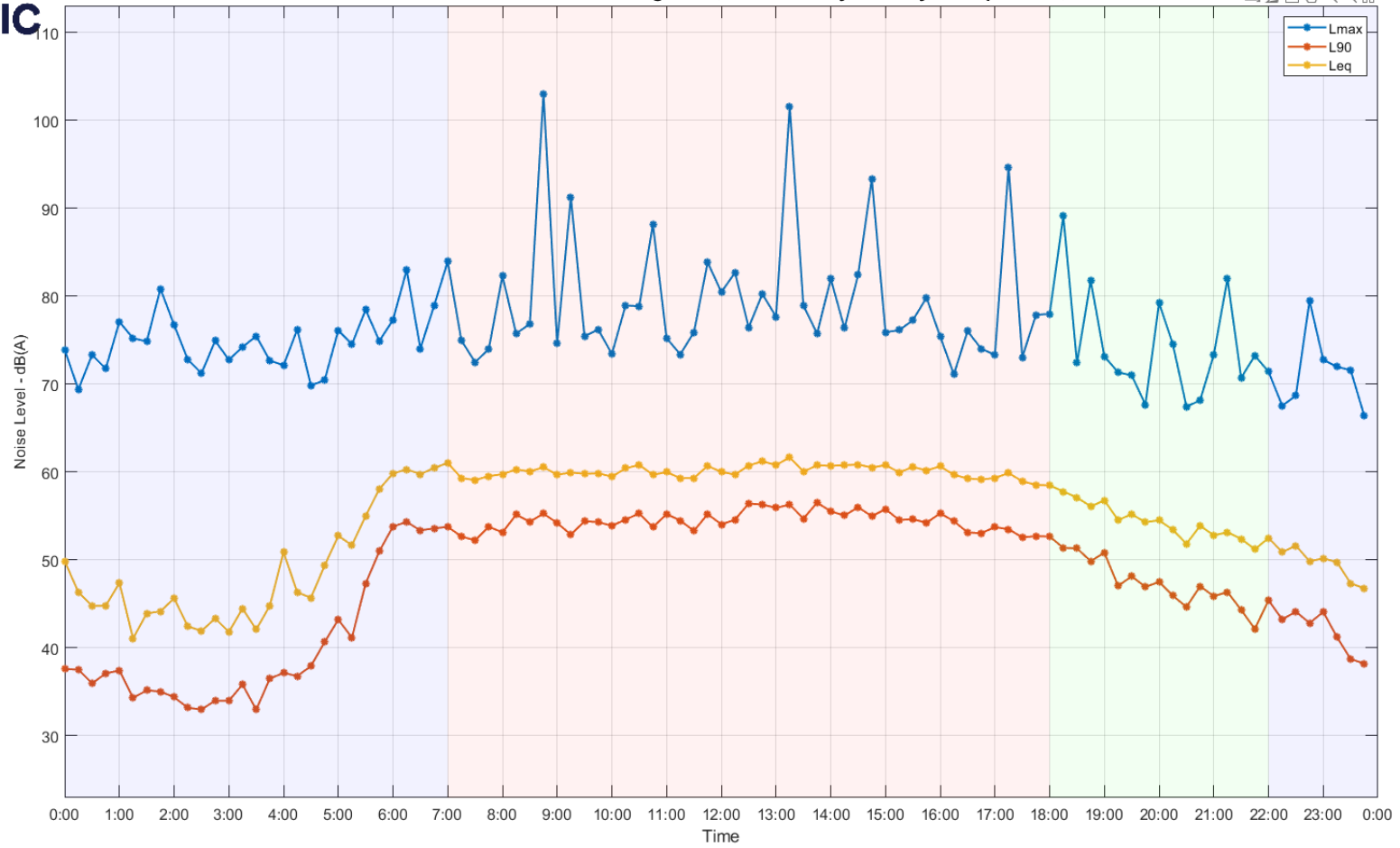


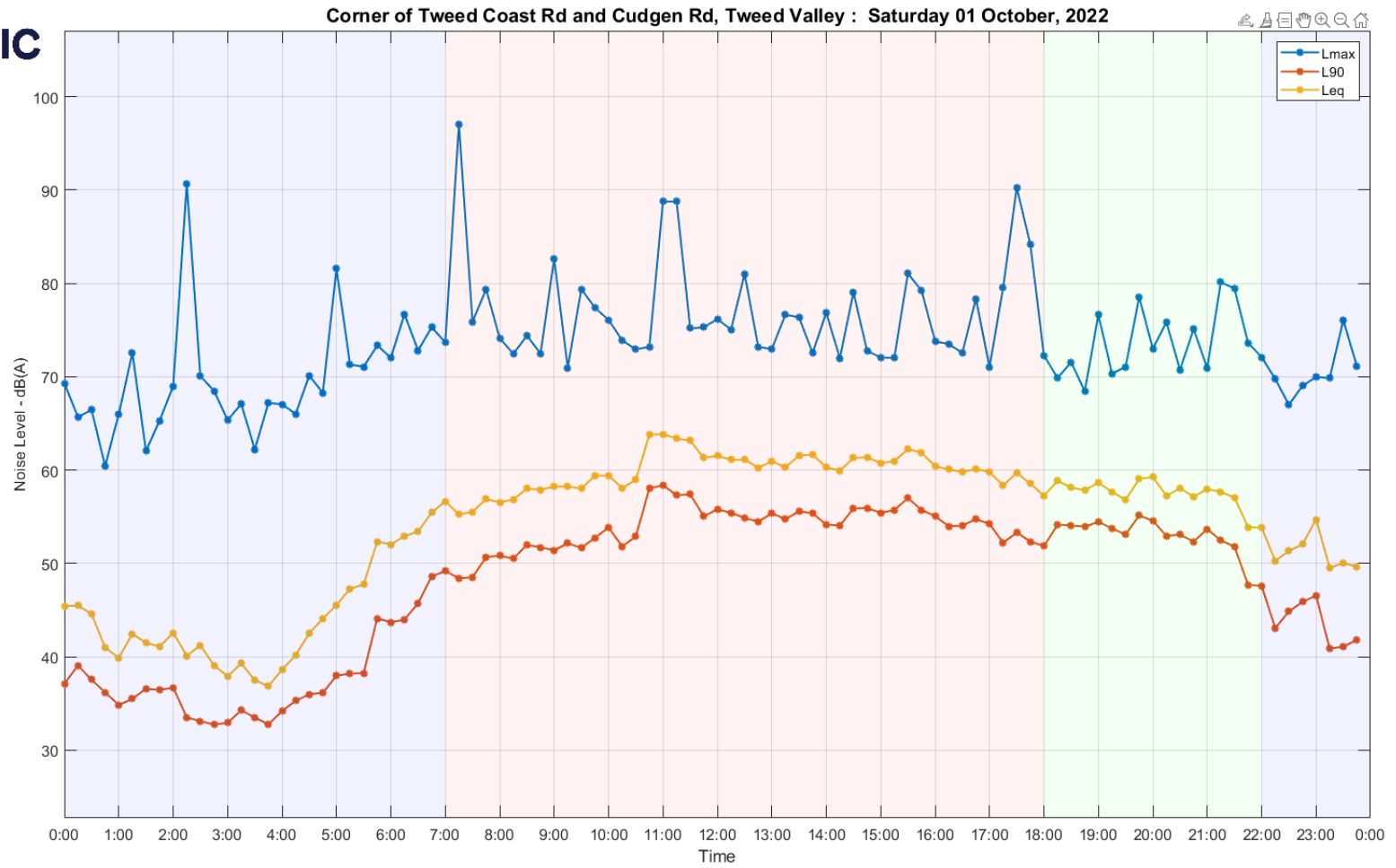
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 29 September, 2022





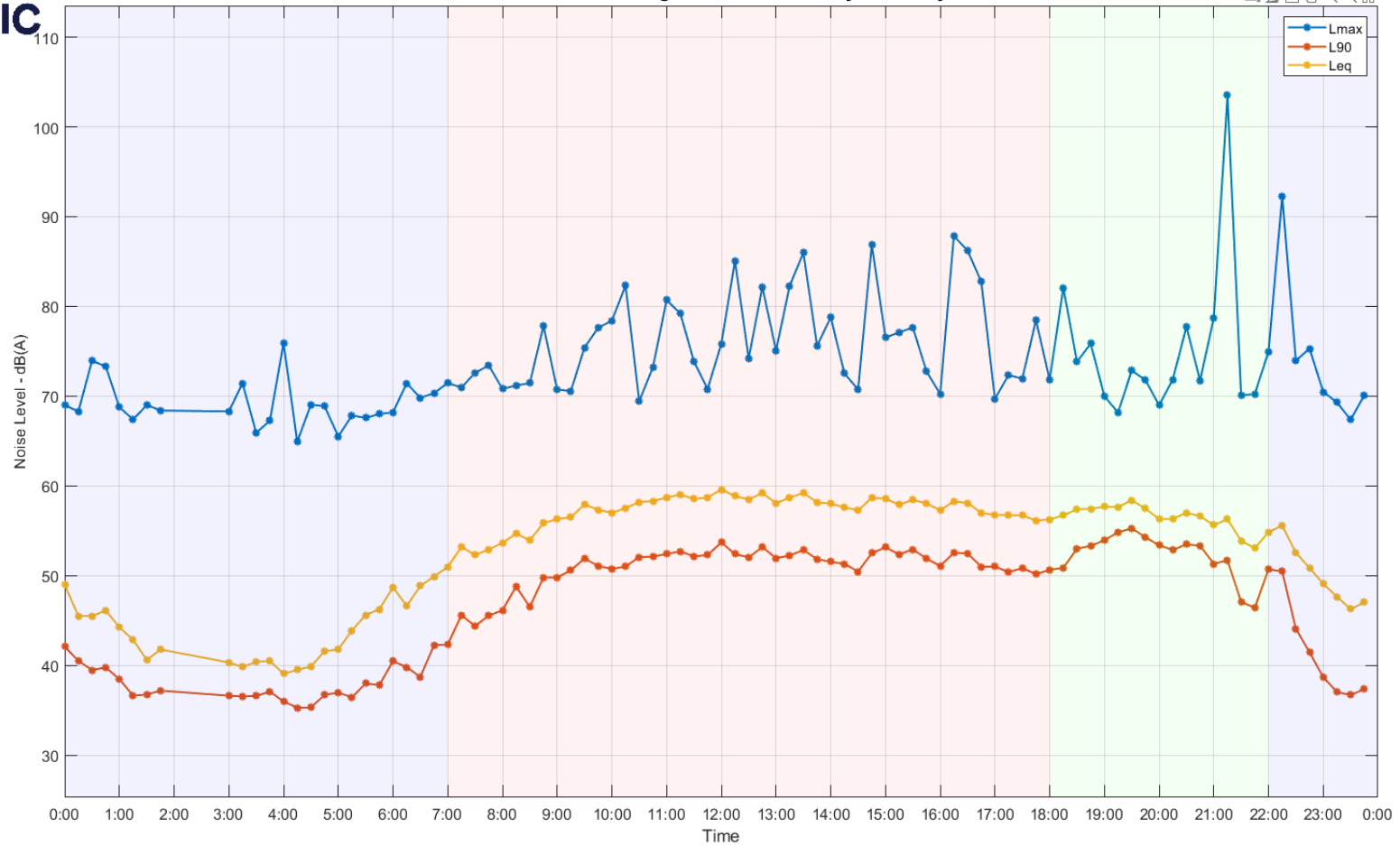
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 30 September, 2022



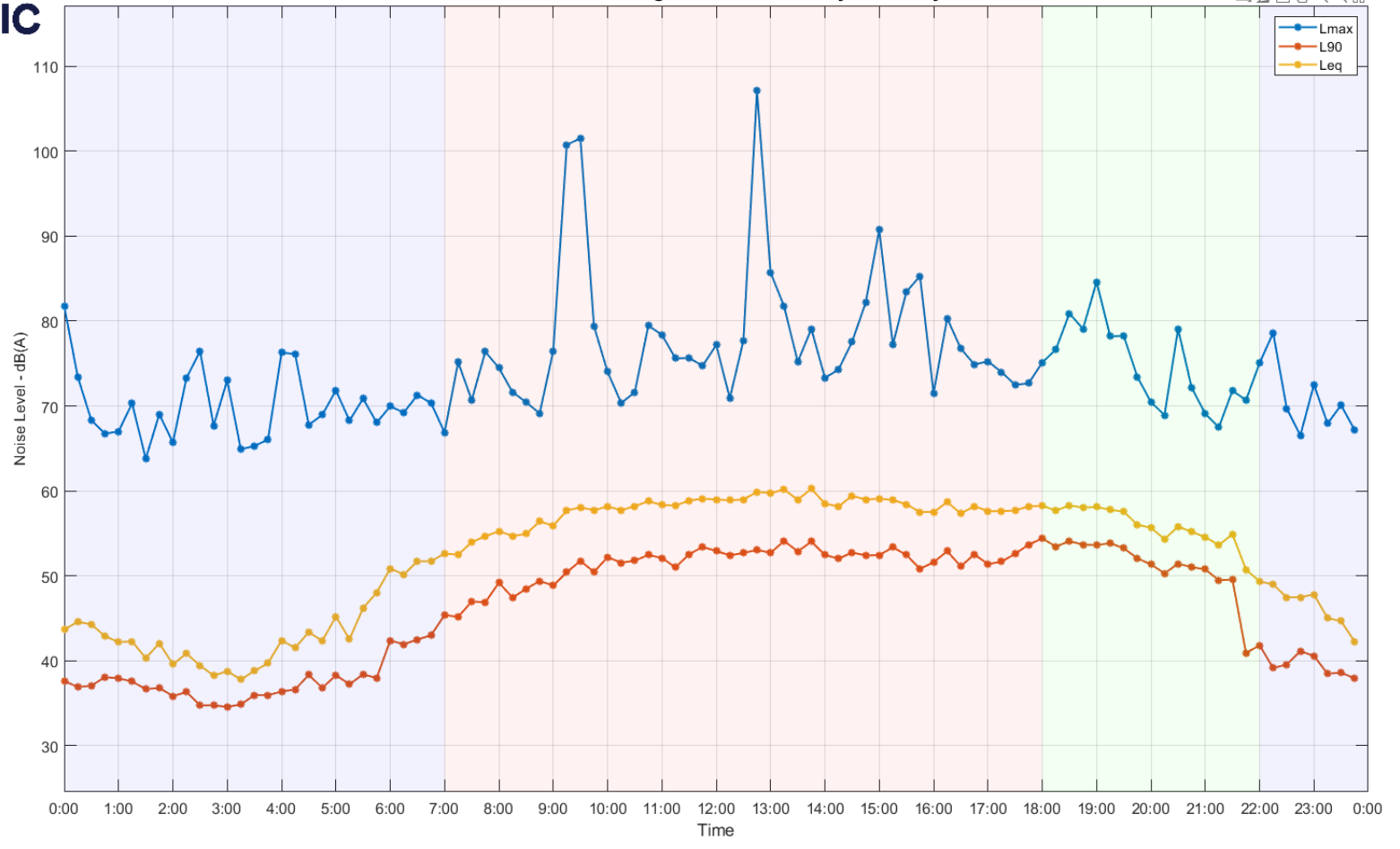




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 02 October, 2022

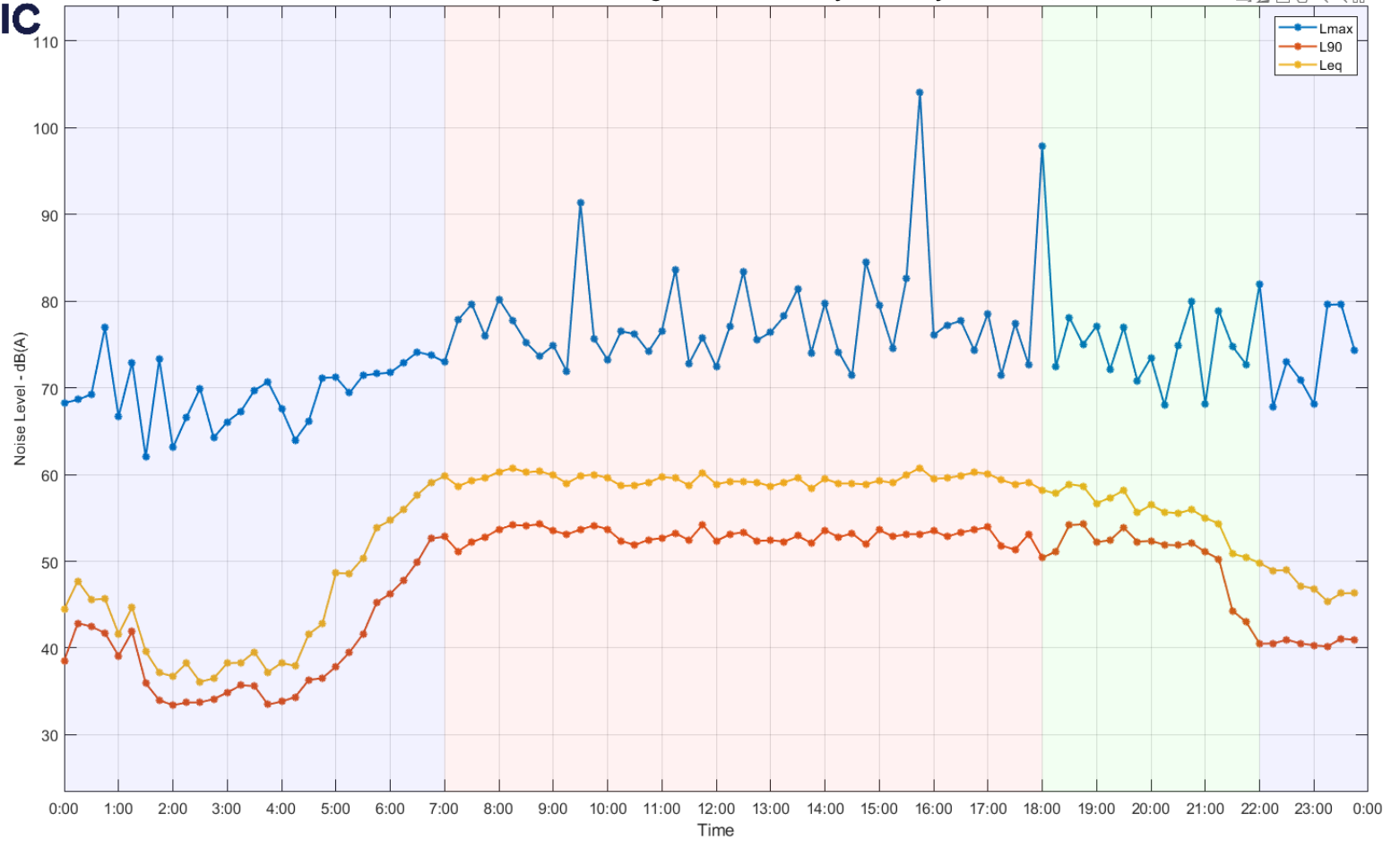


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 03 October, 2022



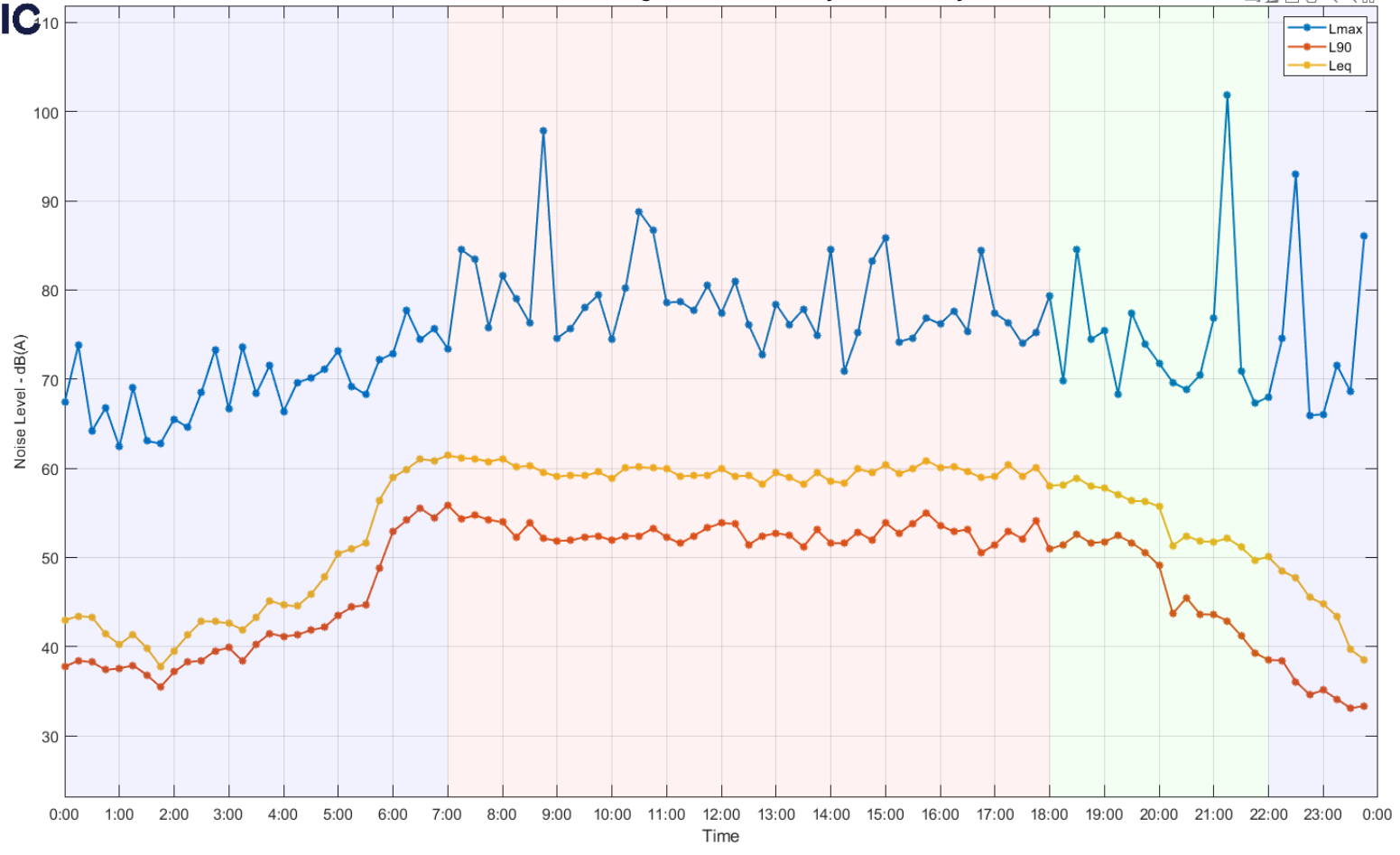


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 04 October, 2022





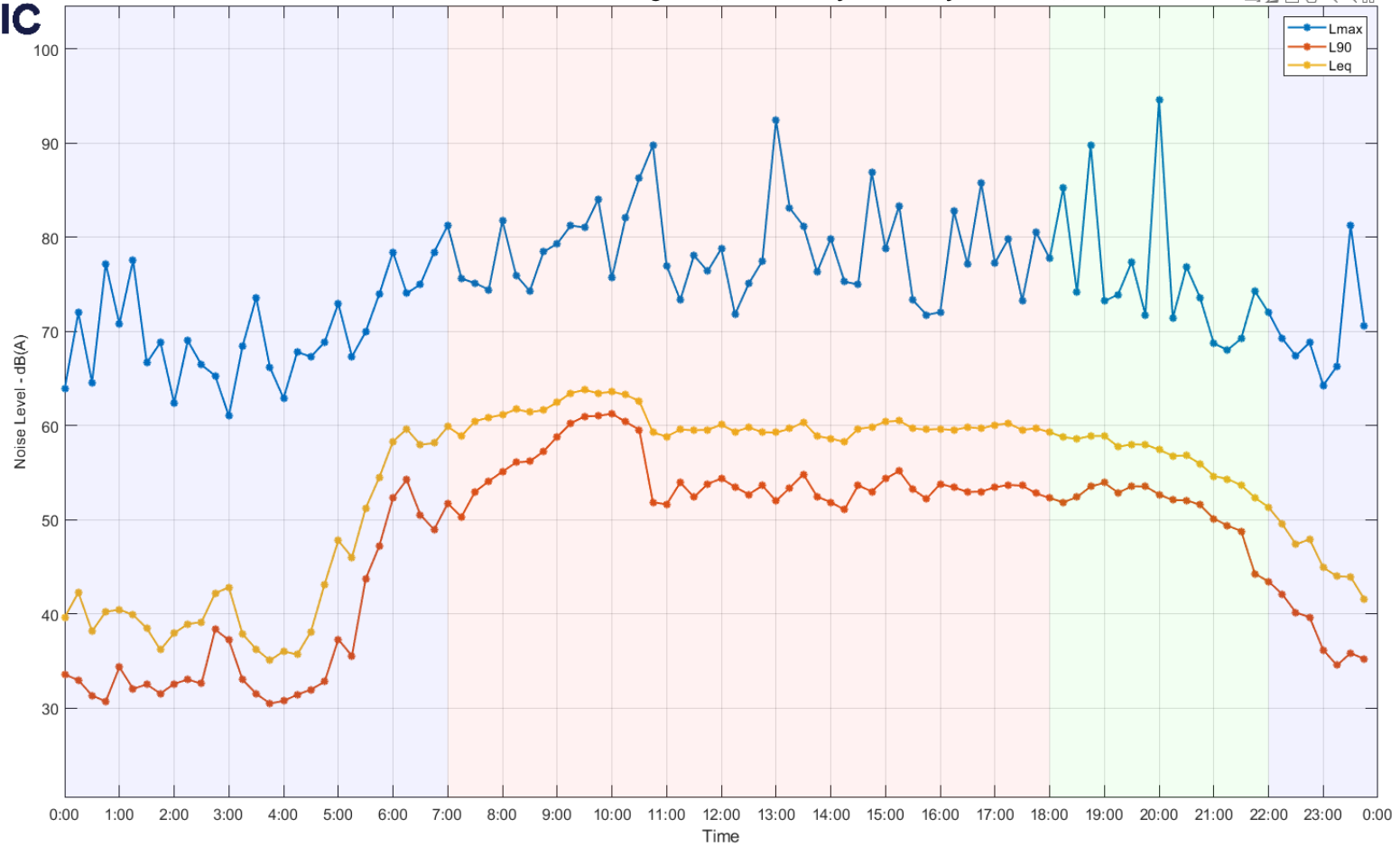
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 05 October, 2022





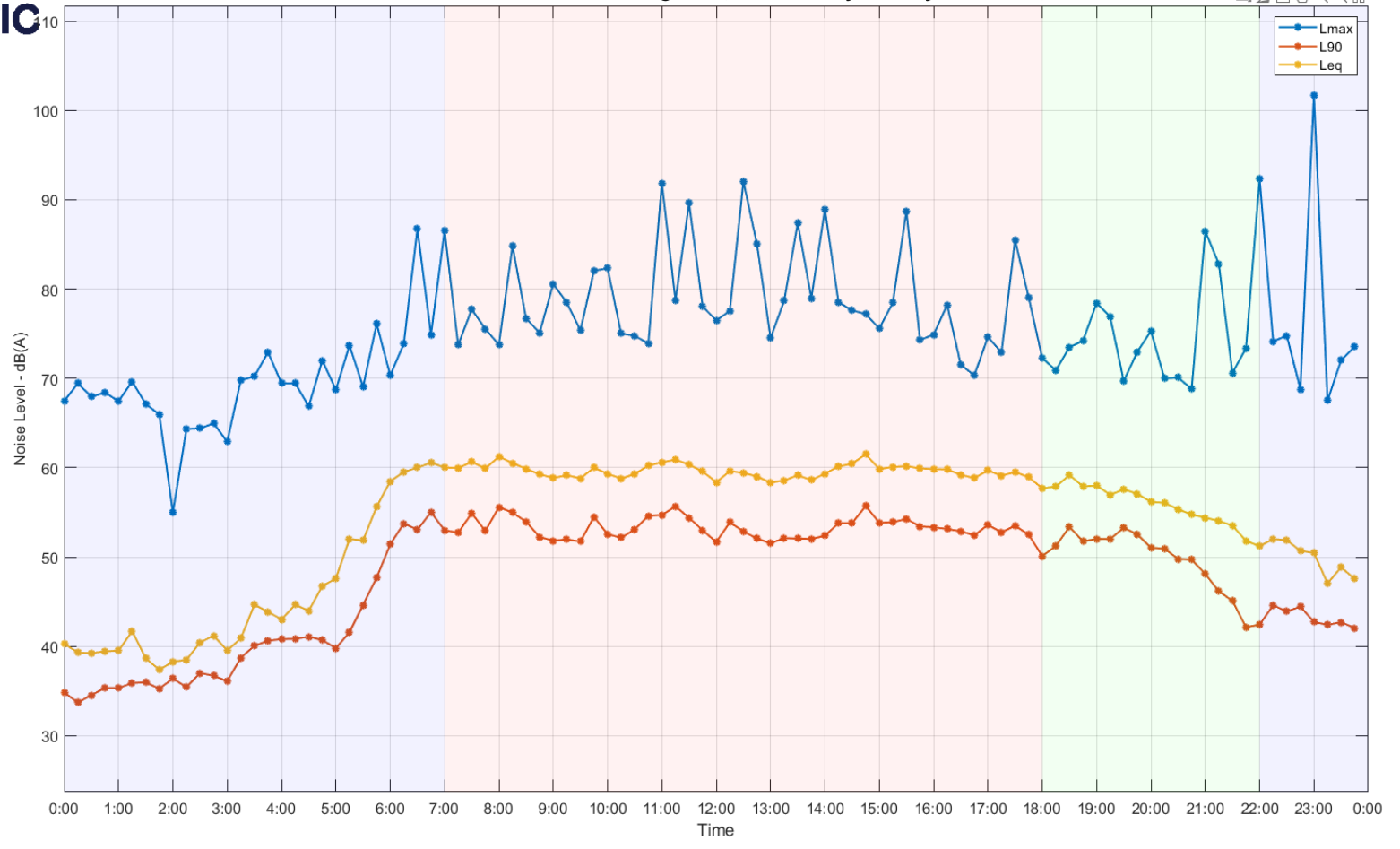


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 06 October, 2022



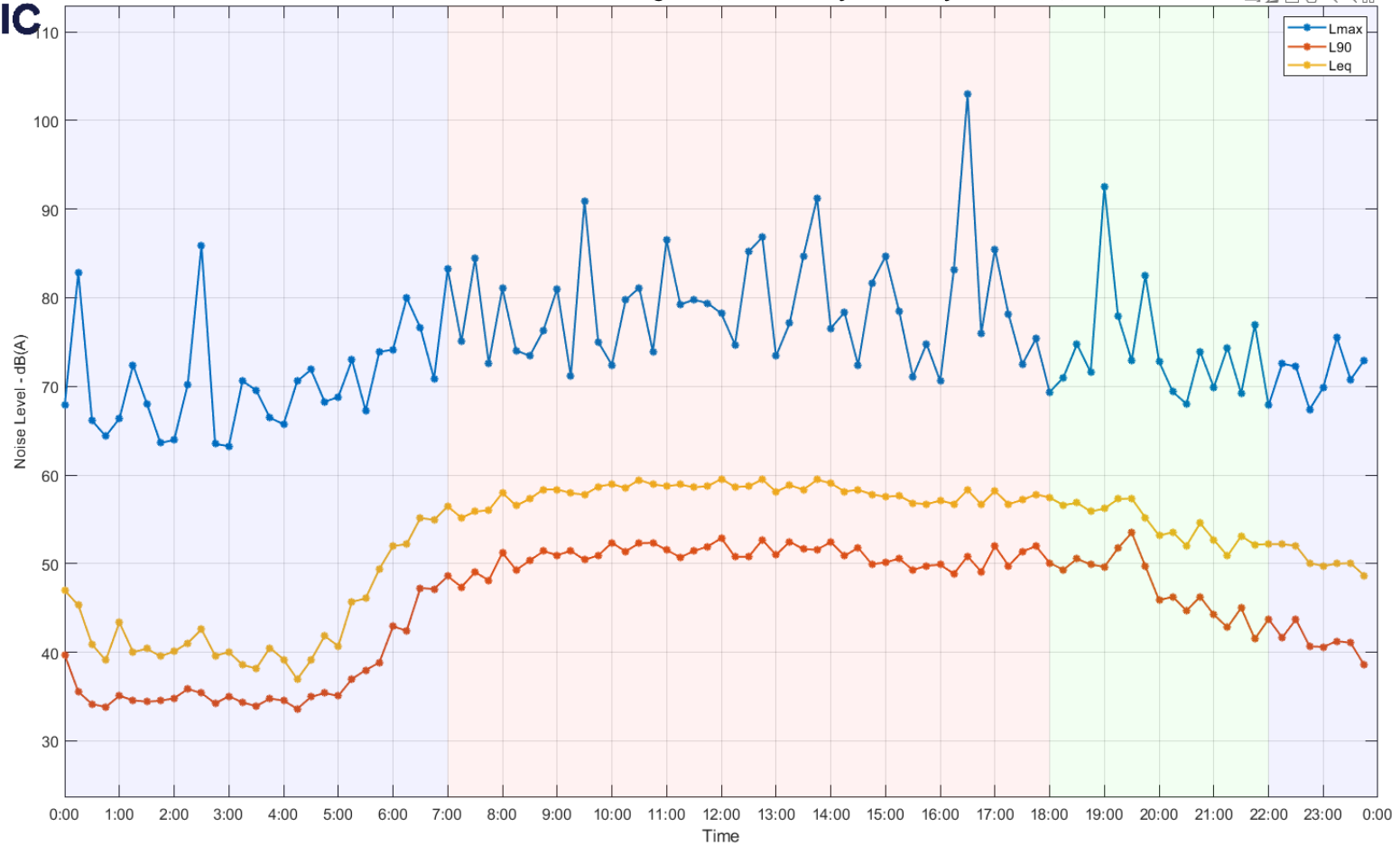


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 07 October, 2022

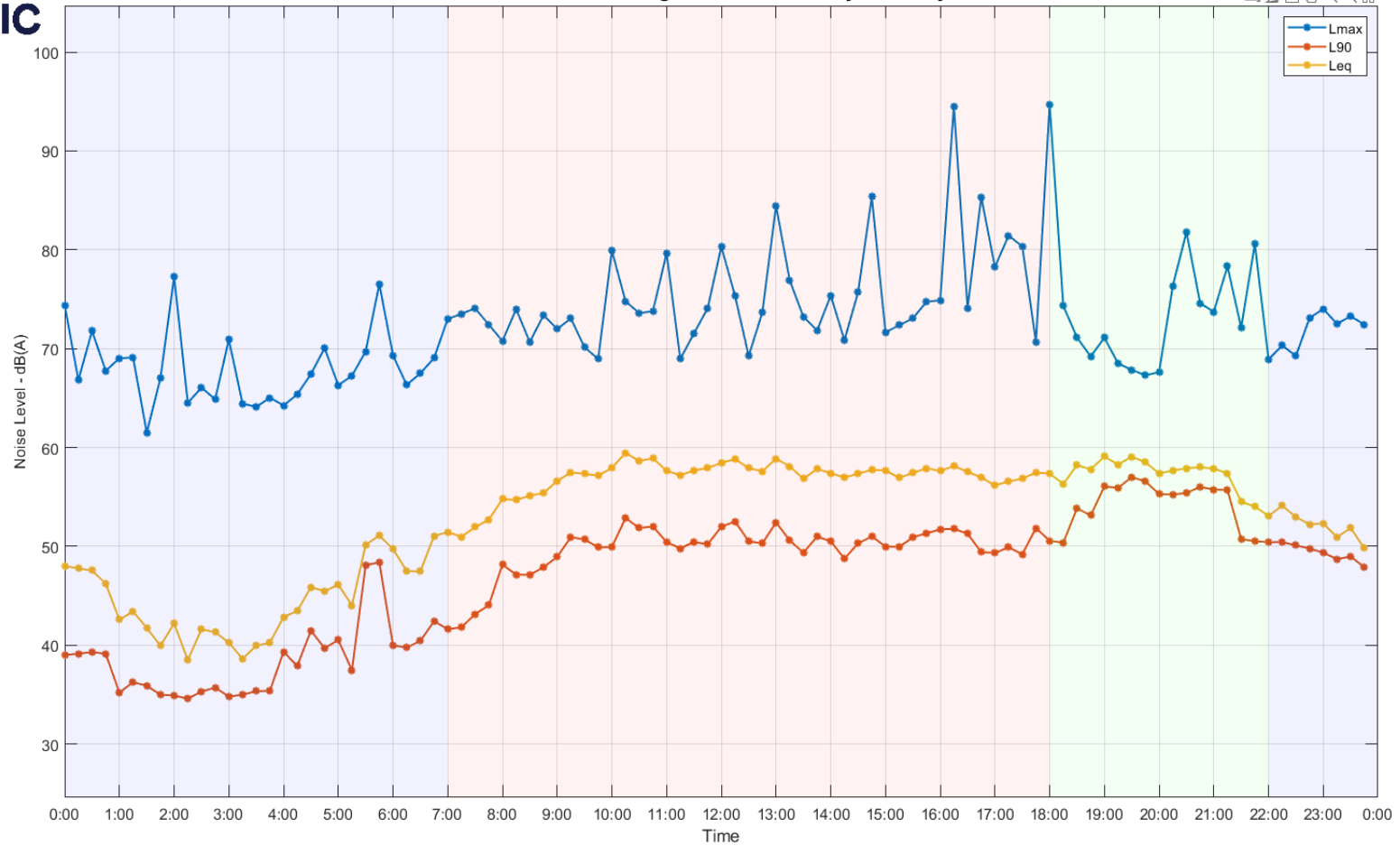




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 08 October, 2022

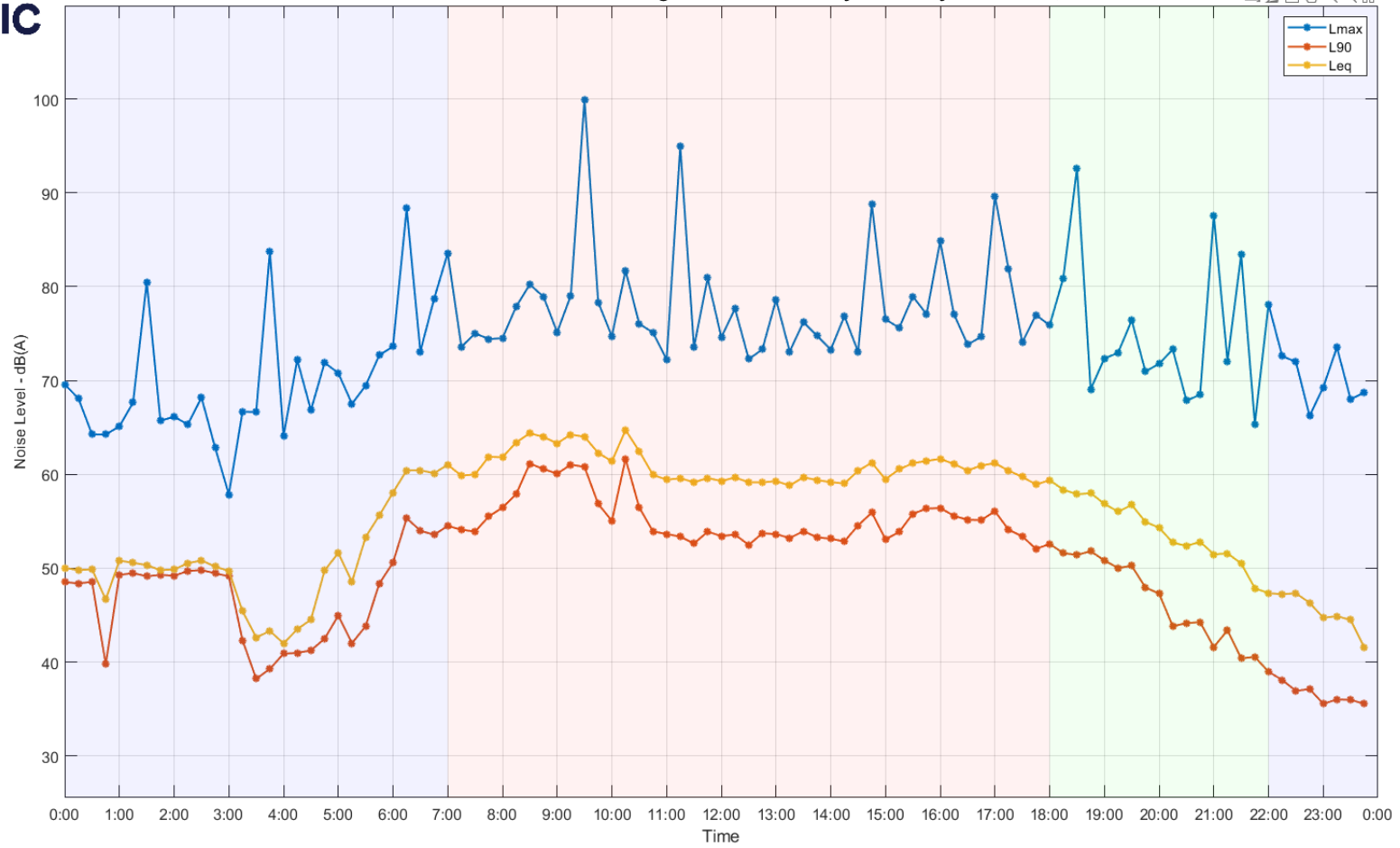


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 09 October, 2022

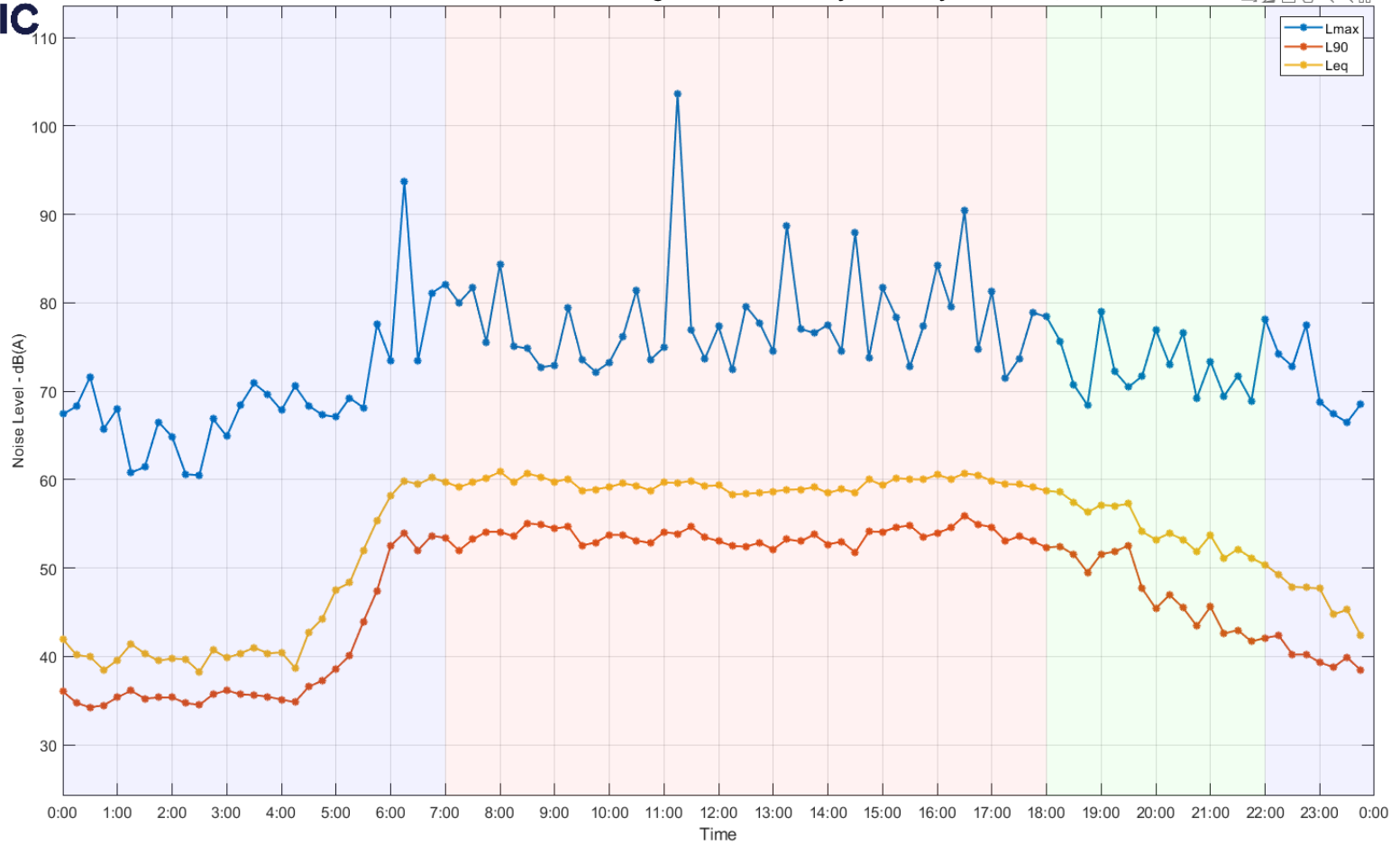




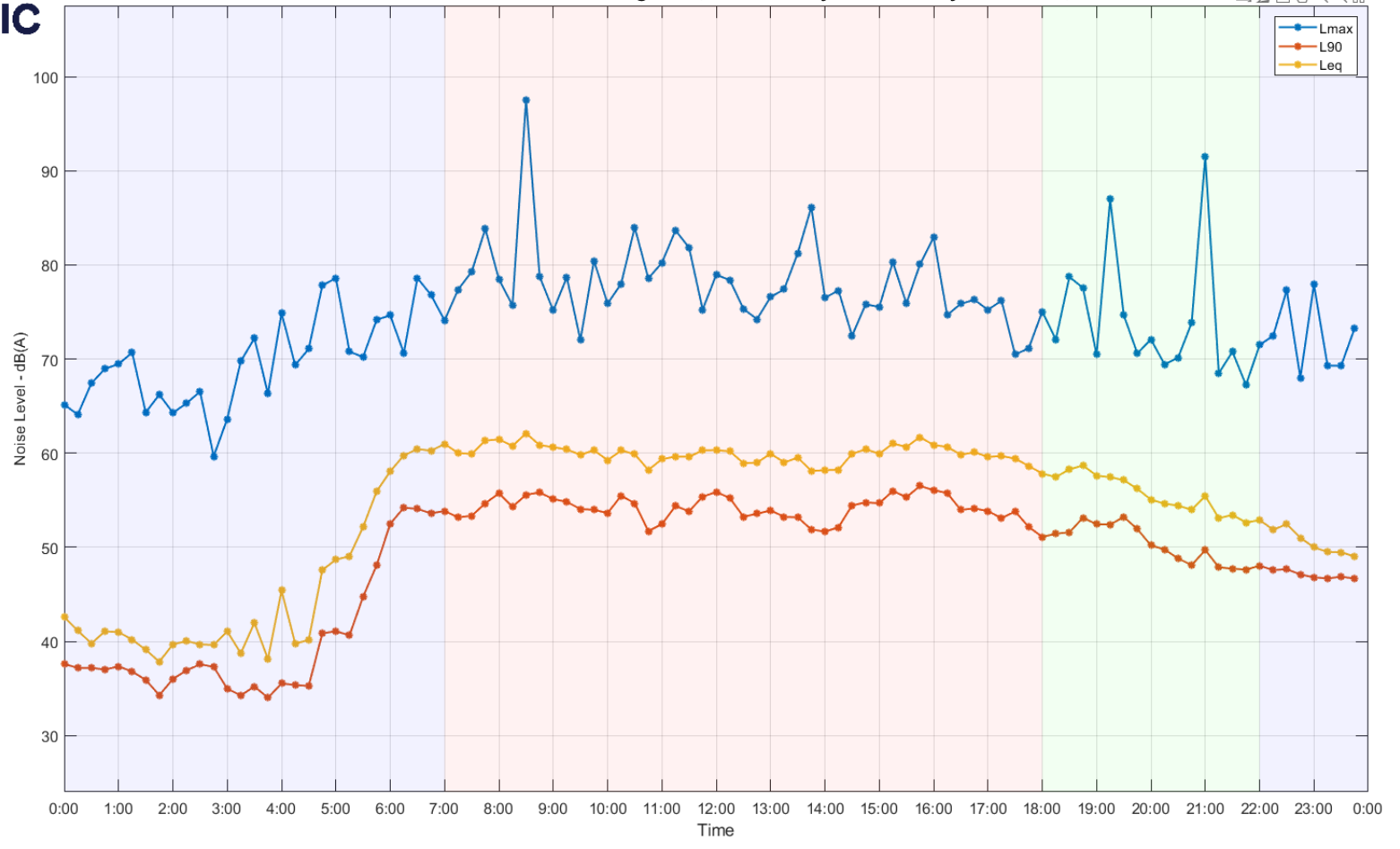
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 10 October, 2022



Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 11 October, 2022

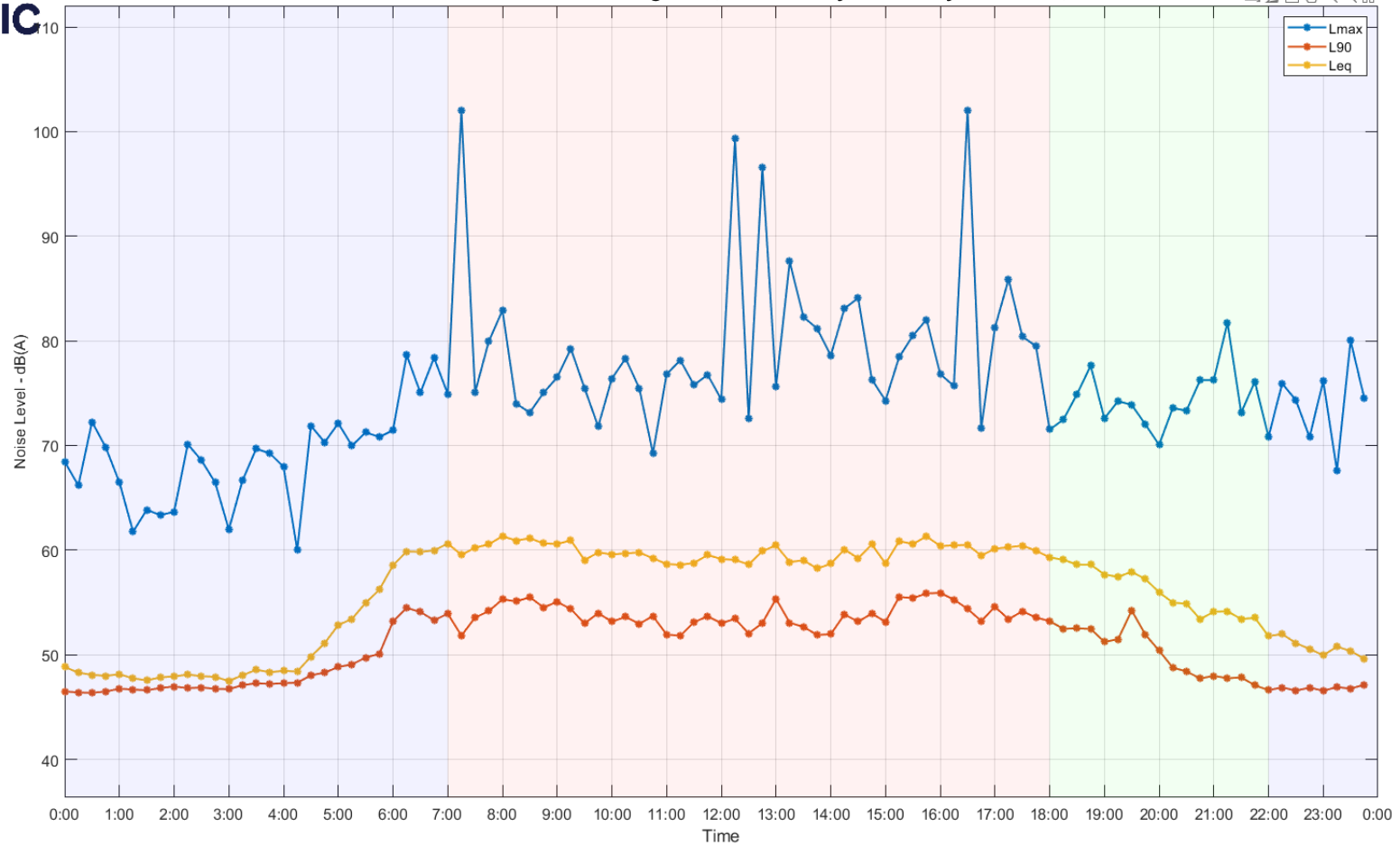


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 12 October, 2022



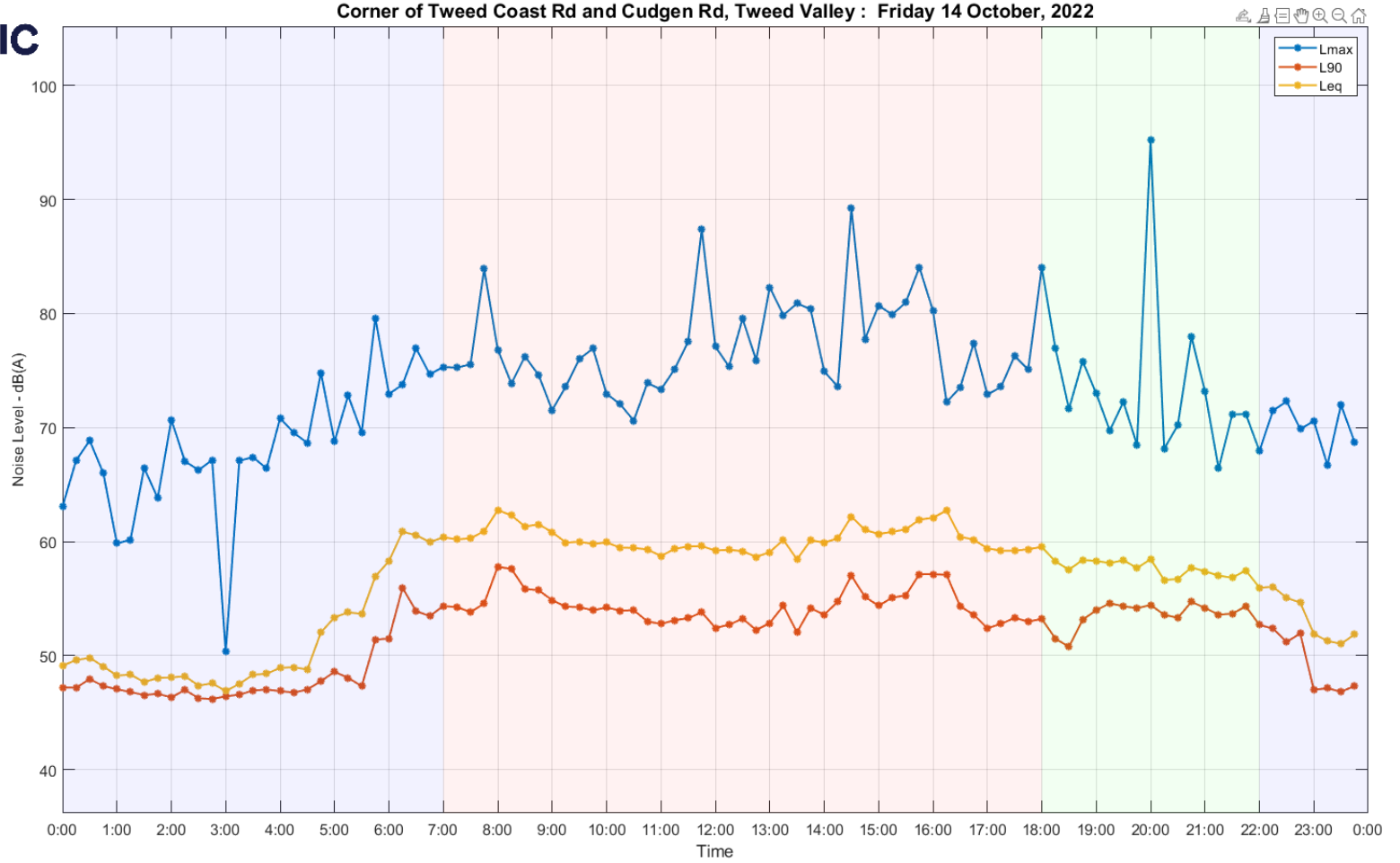


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 13 October, 2022

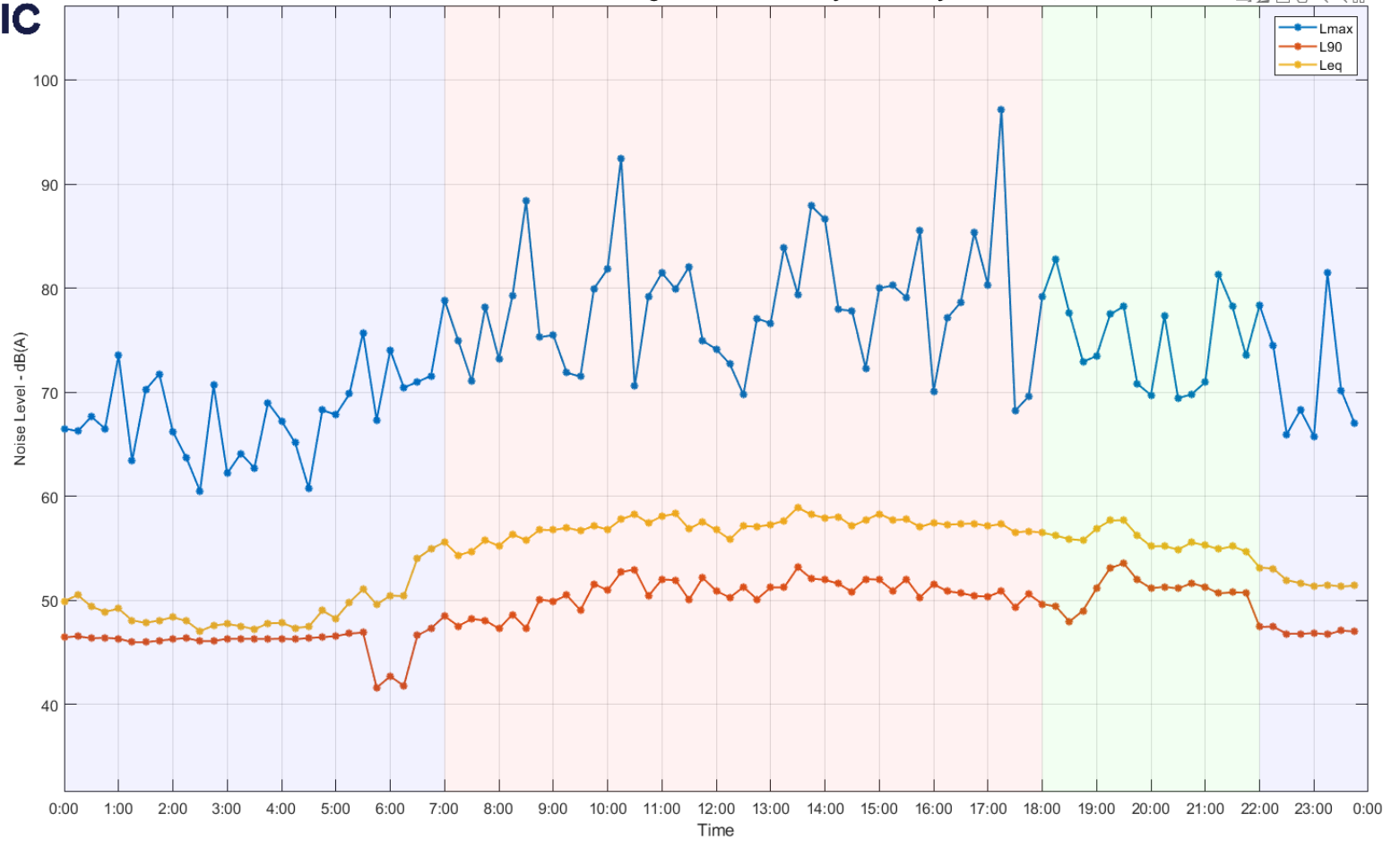




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 14 October, 2022

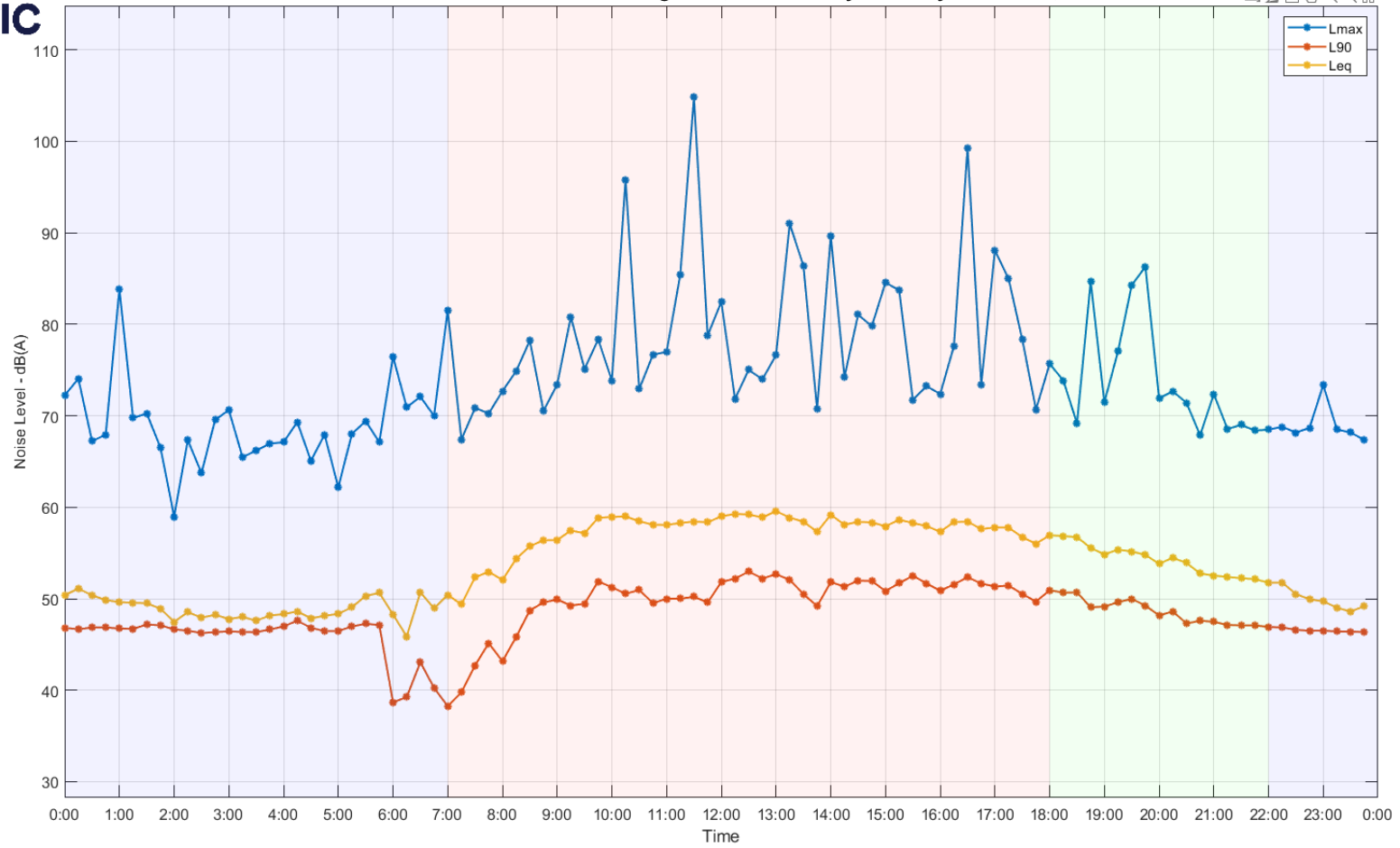


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Saturday 15 October, 2022

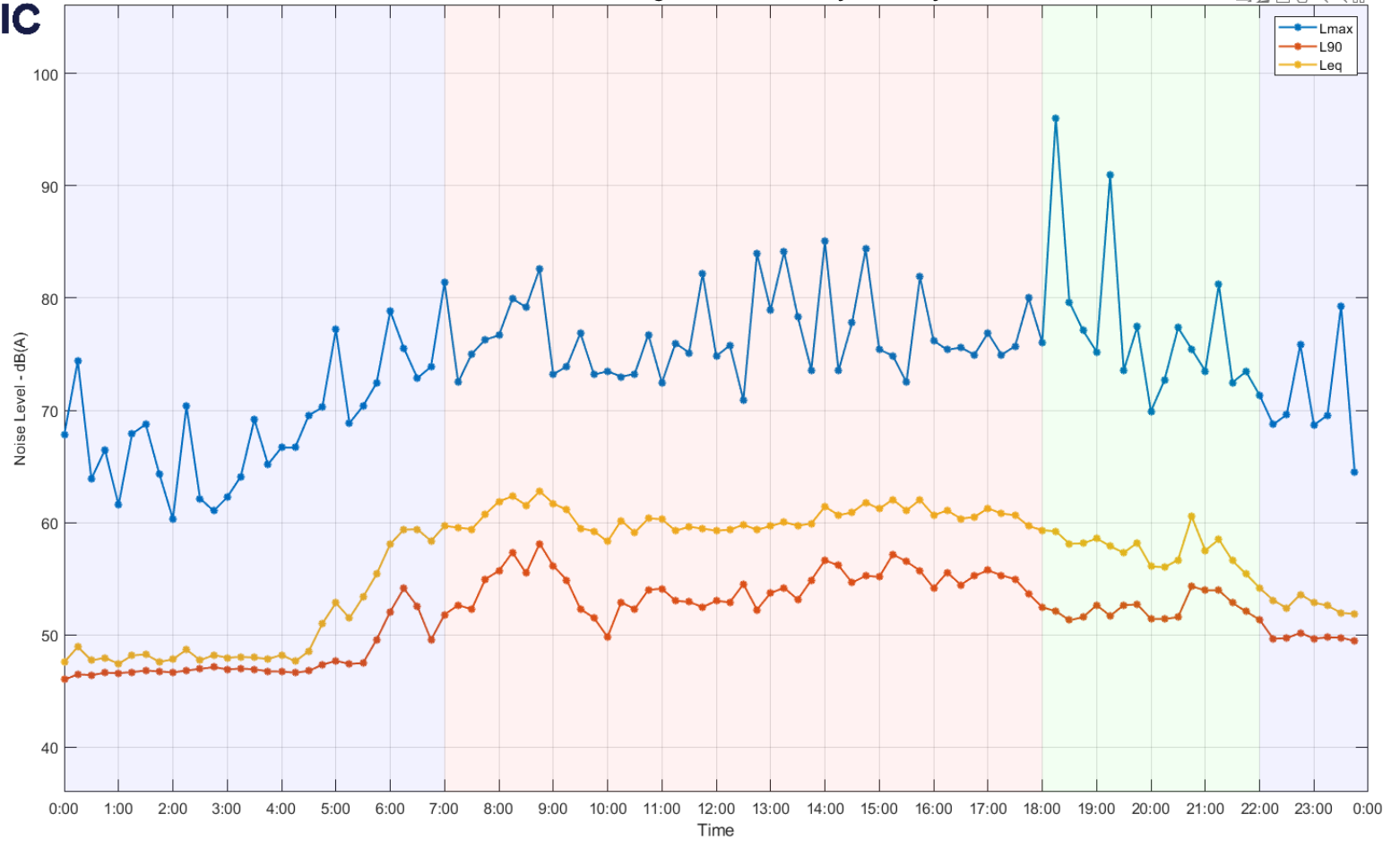




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Sunday 16 October, 2022

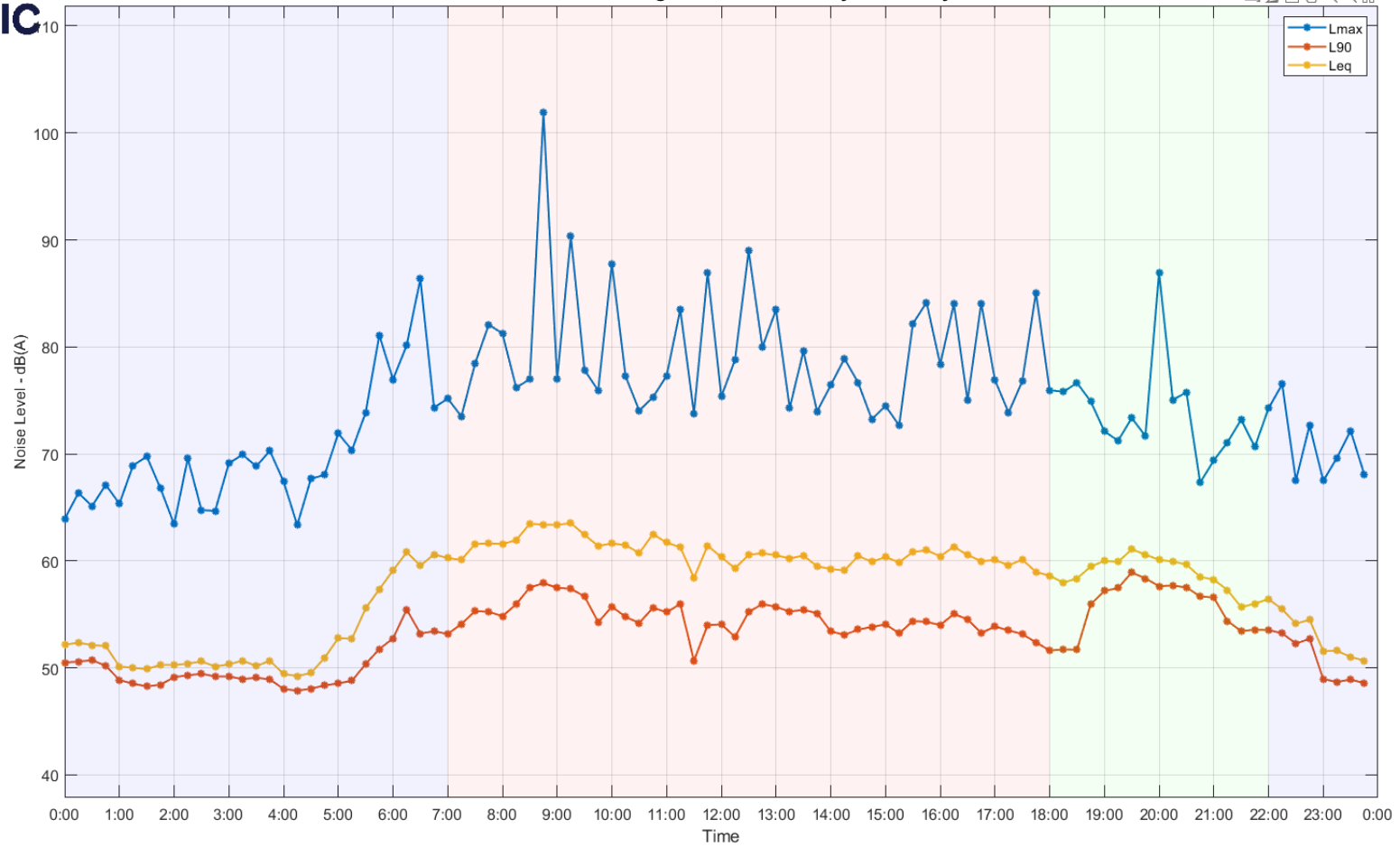


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Monday 17 October, 2022



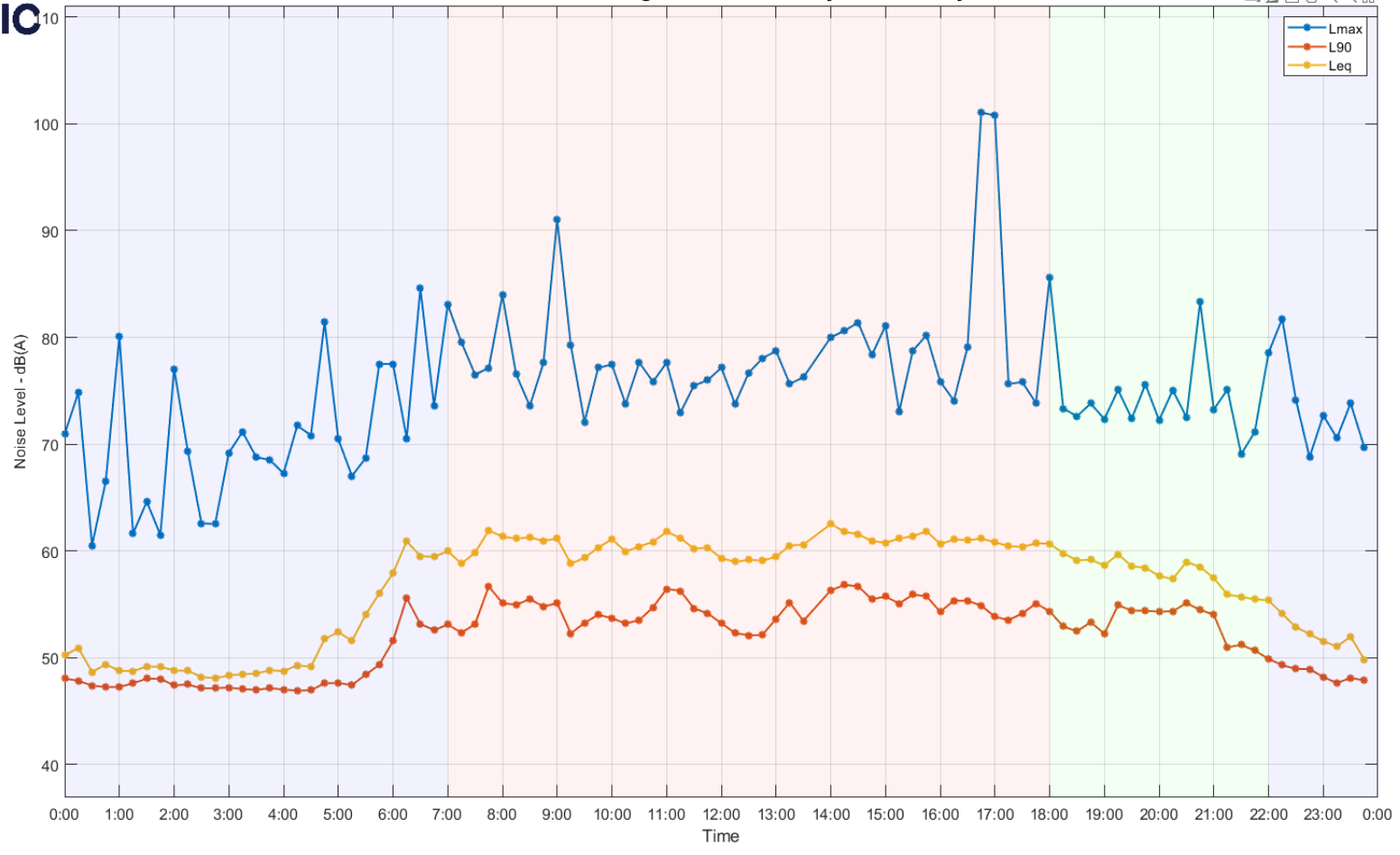


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Tuesday 18 October, 2022



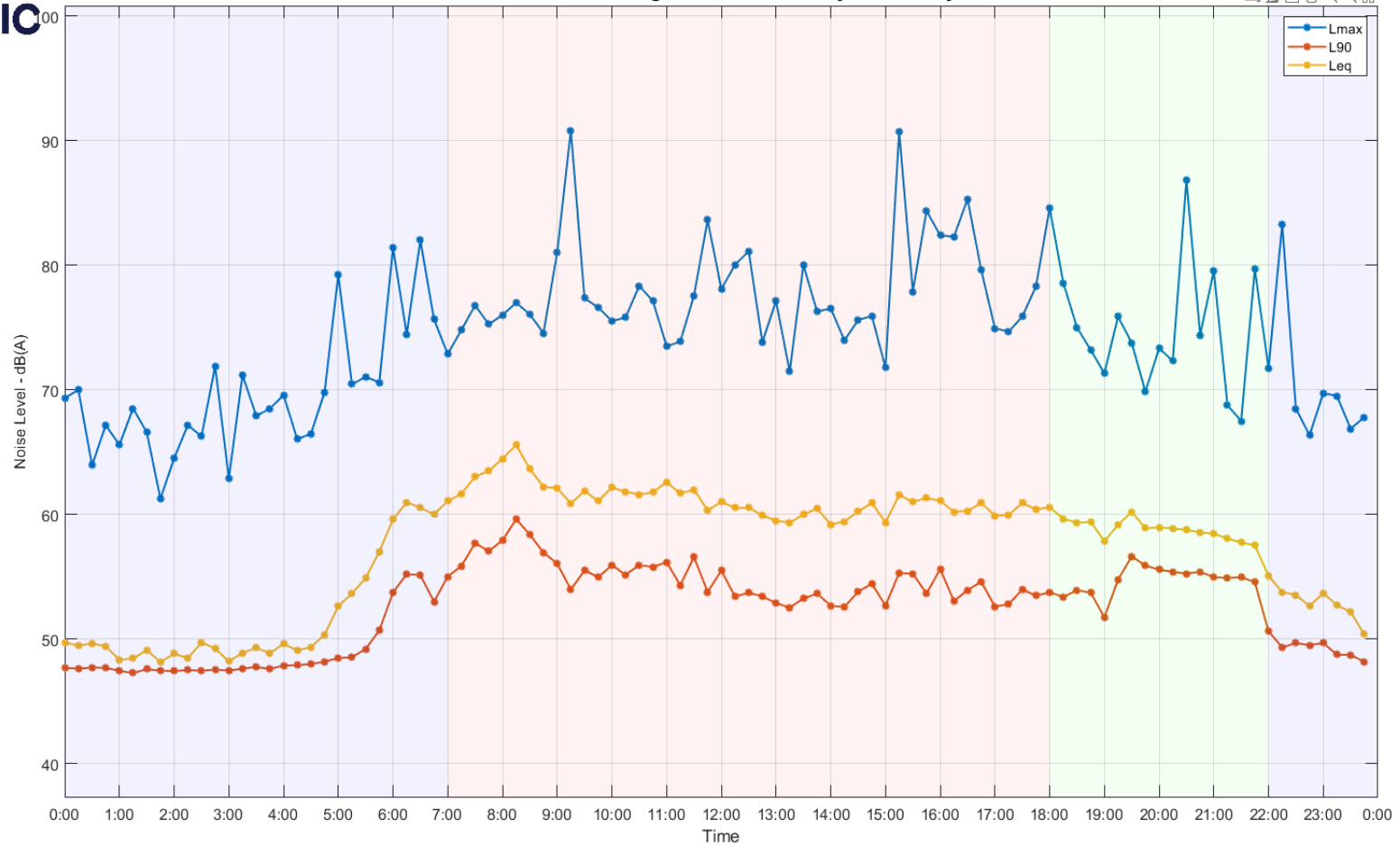


Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Wednesday 19 October, 2022

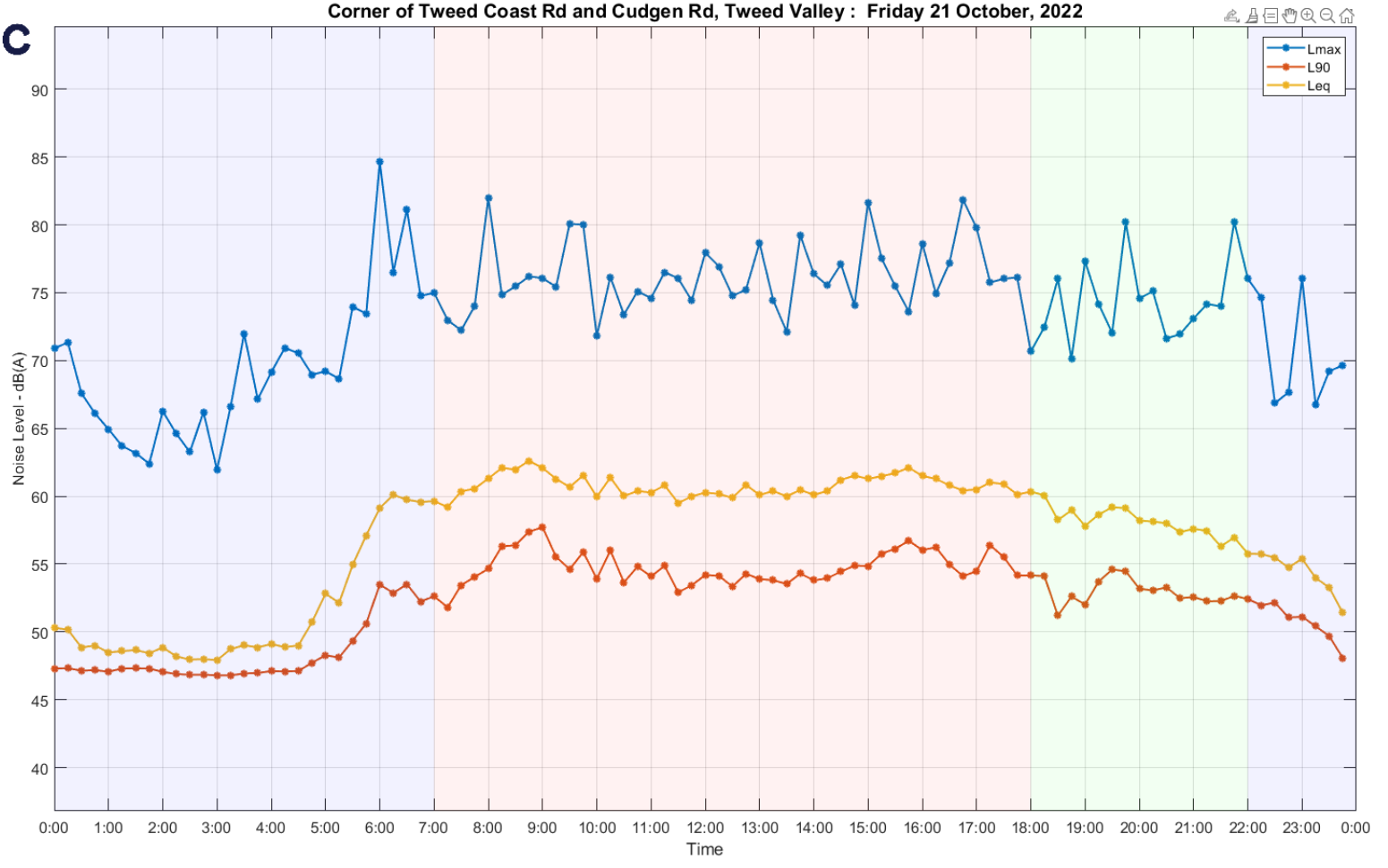




Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Thursday 20 October, 2022



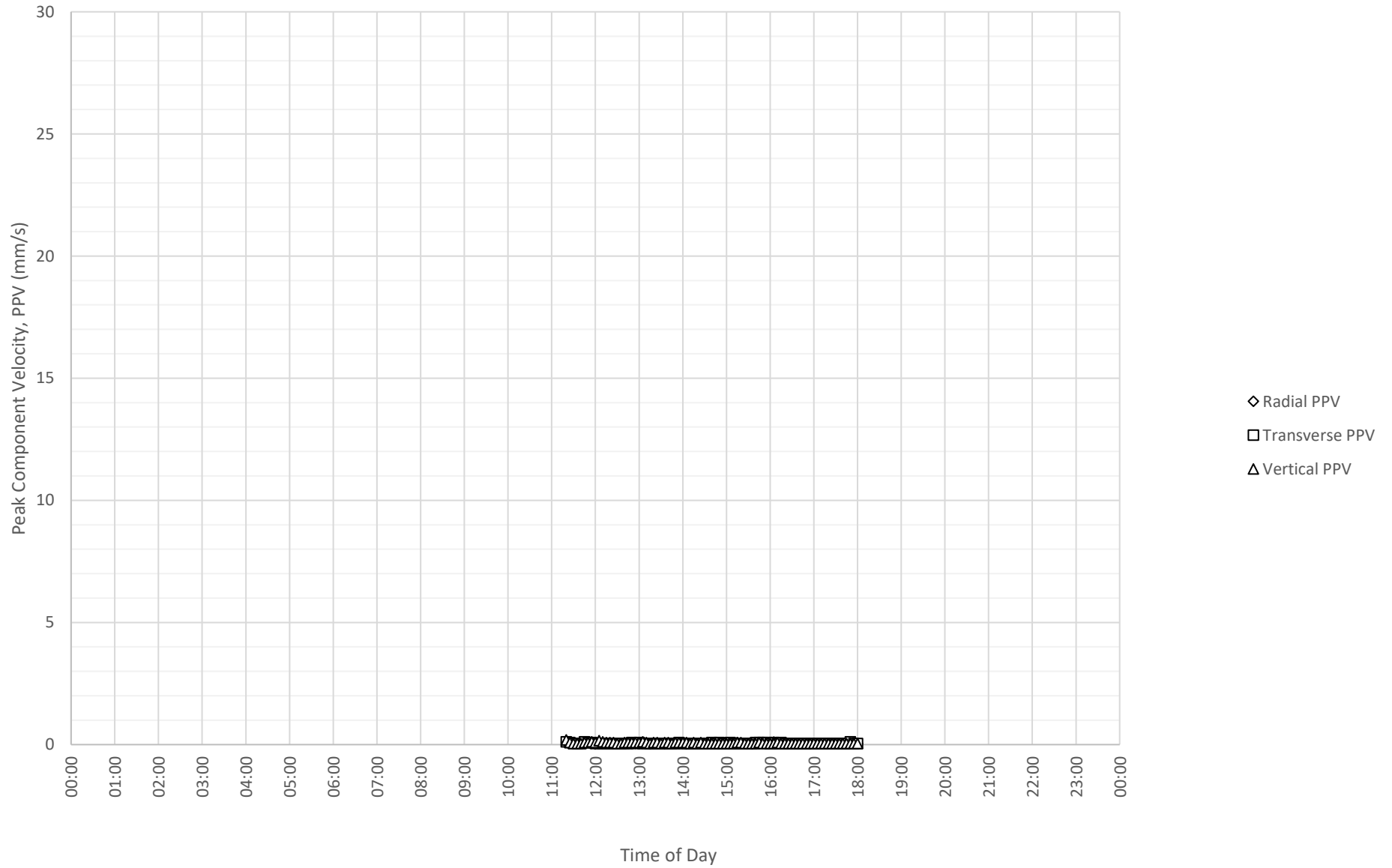
Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley : Friday 21 October, 2022



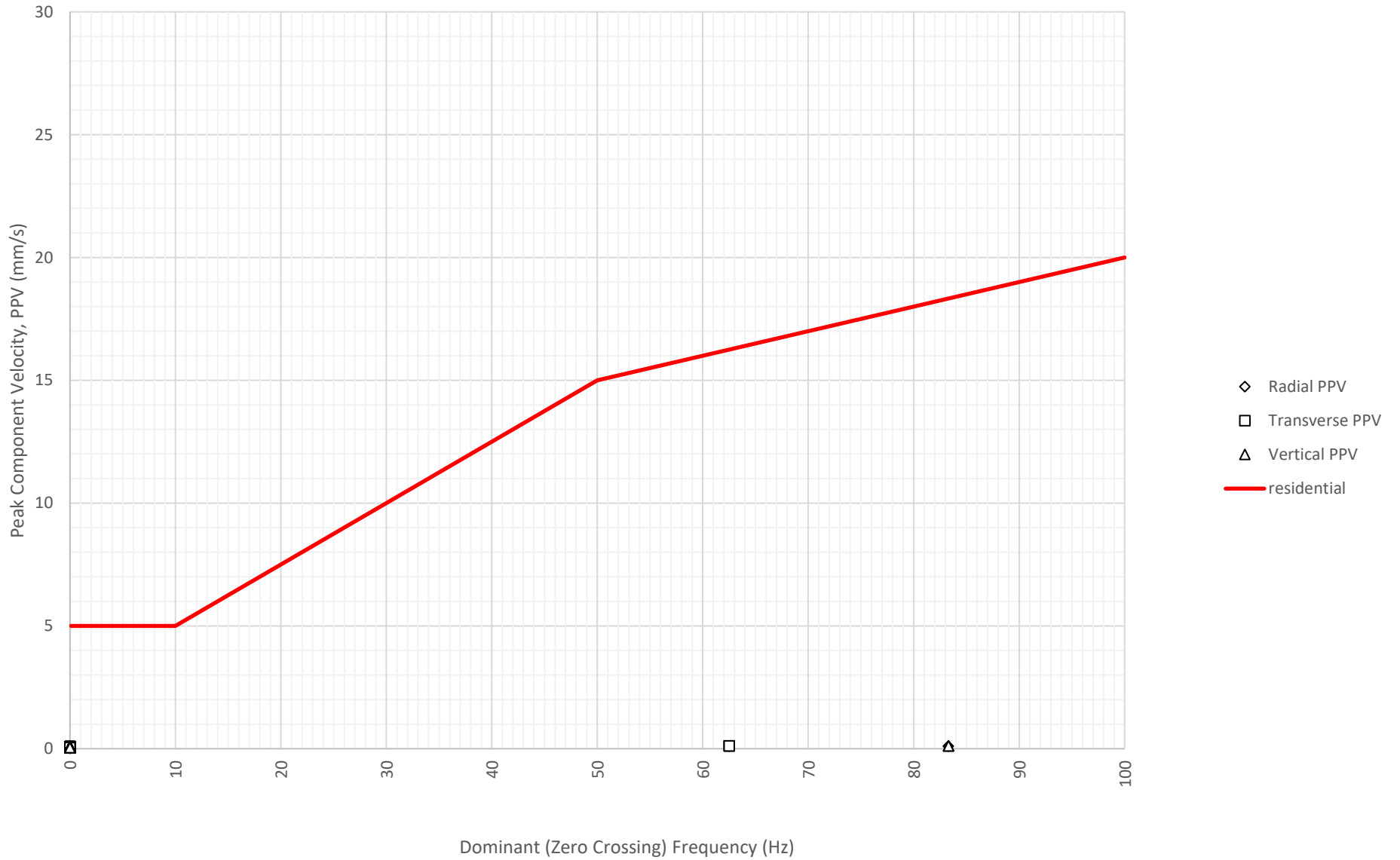


## **APPENDIX 2 – VIBRATION MONITORING RESULTS**

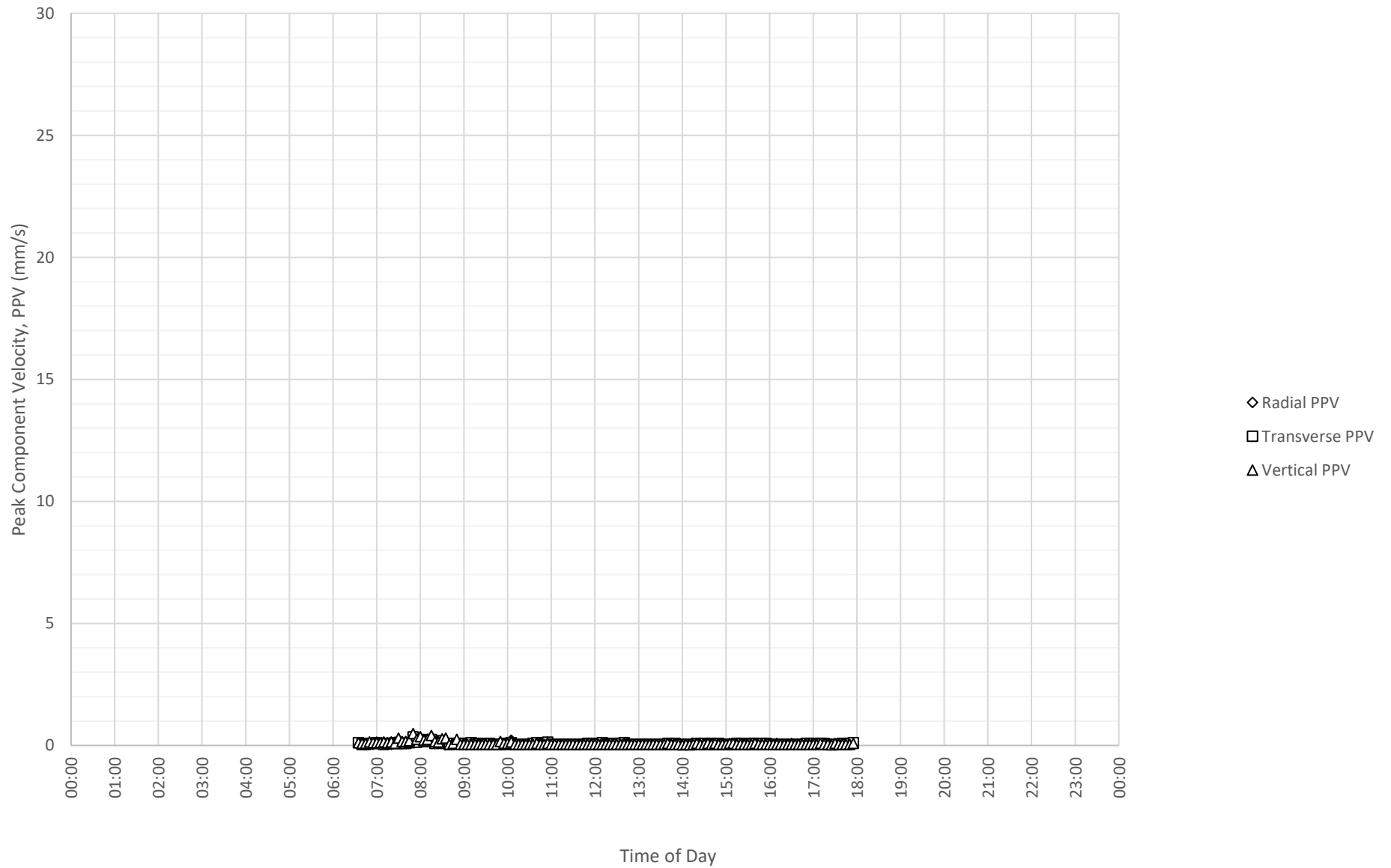
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 22-09-2022



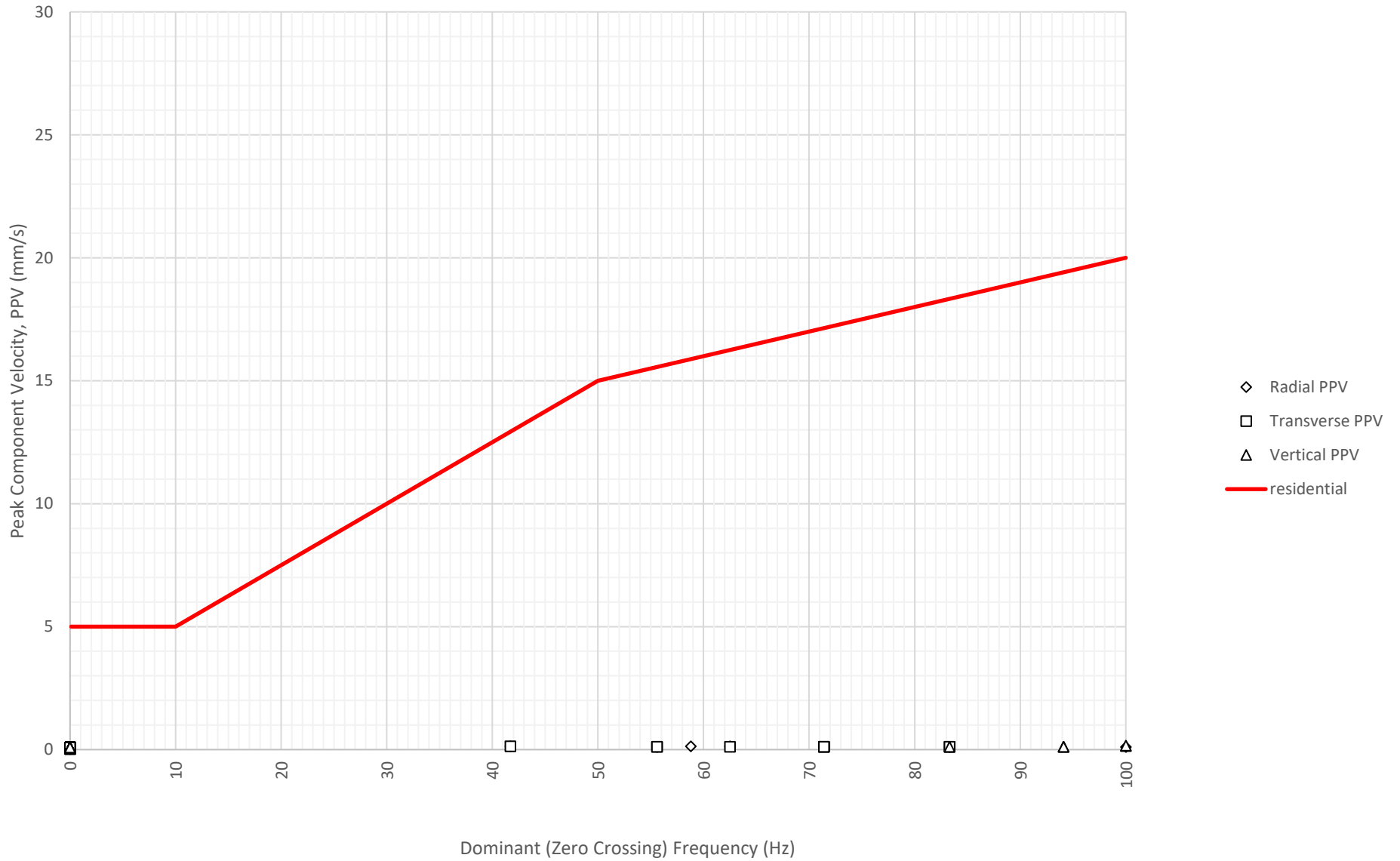
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 22-09-2022



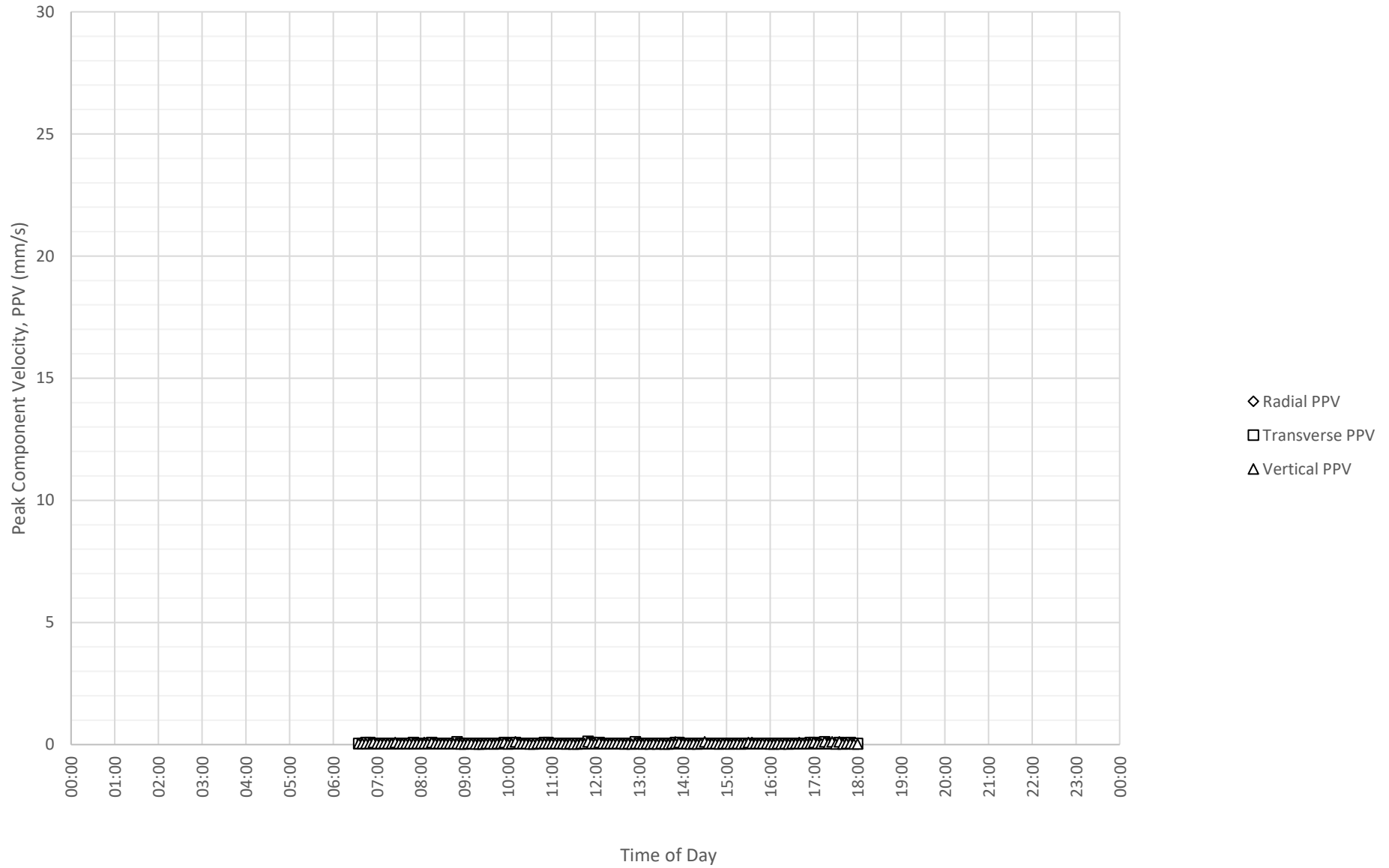
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 23-09-2022



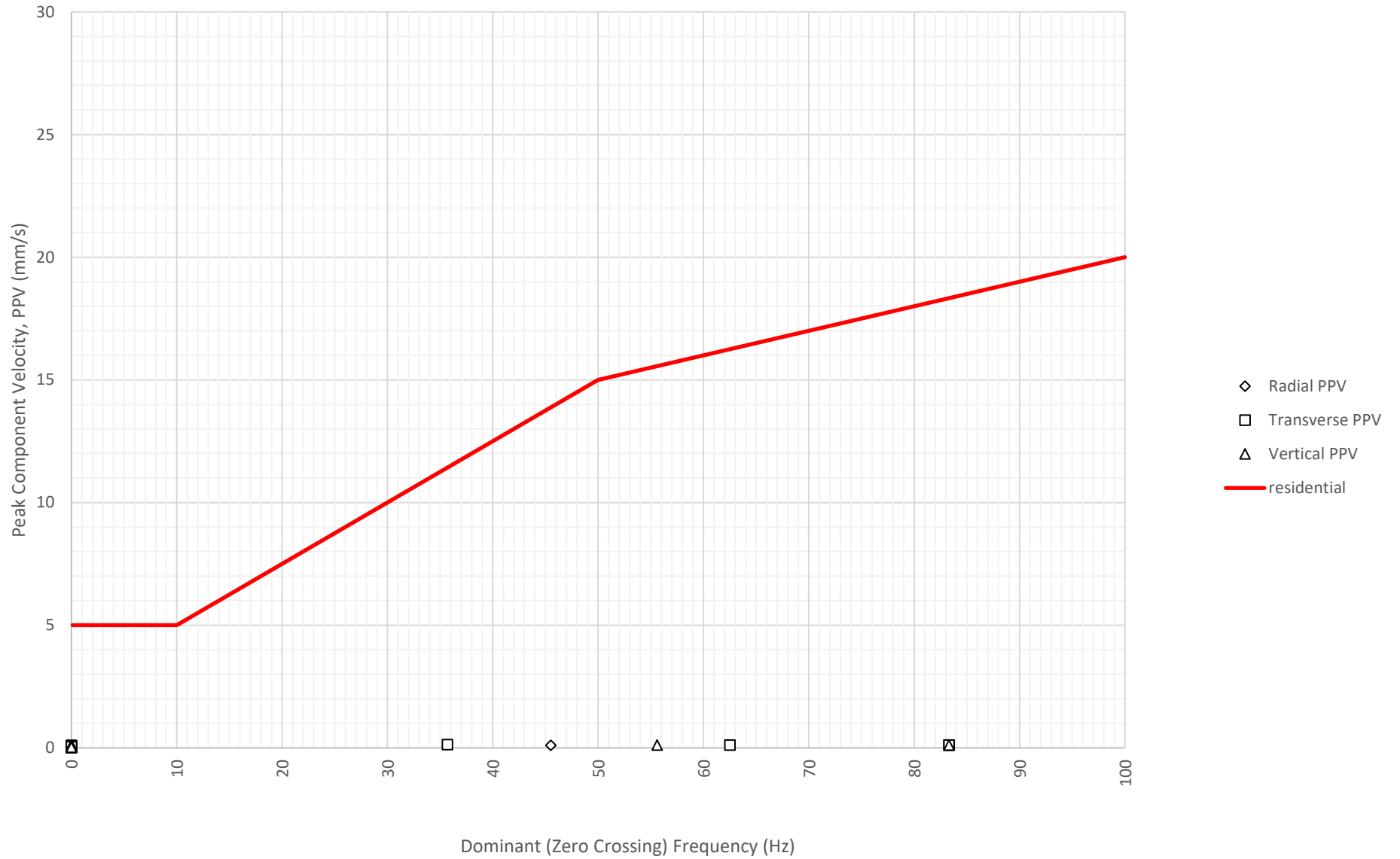
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on  
23-09-2022



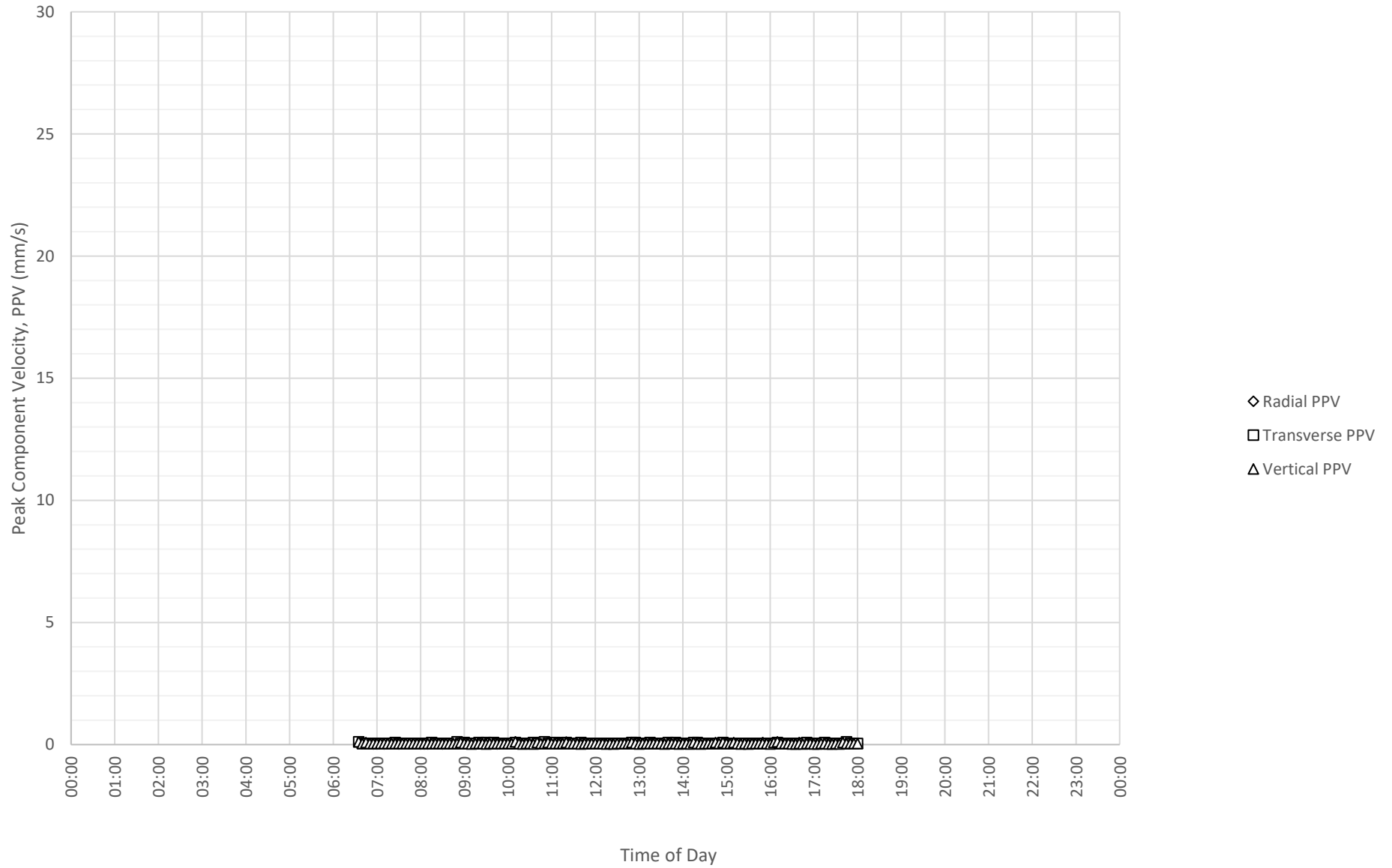
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 24-09-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 24-09-2022

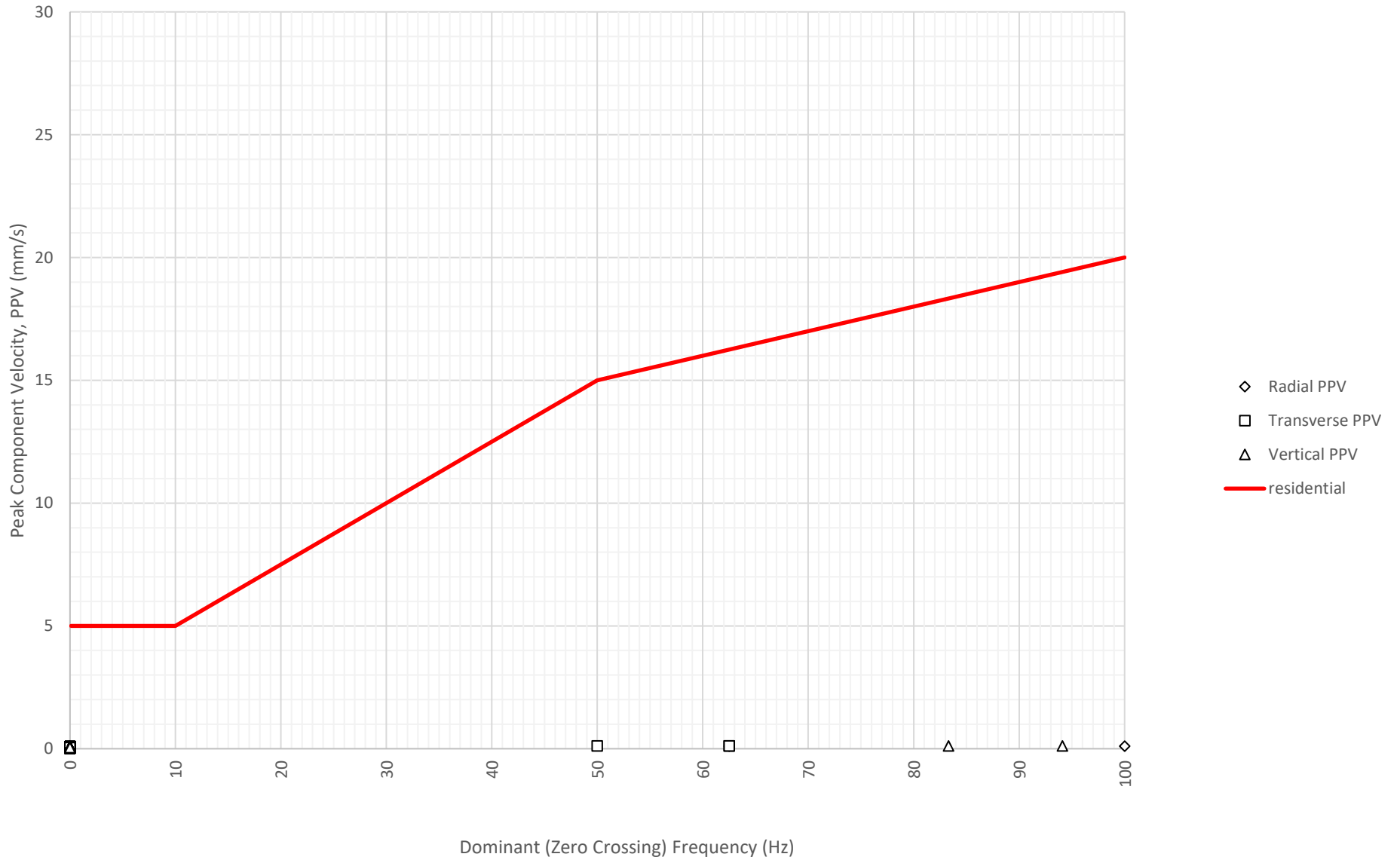


# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 25-09-2022

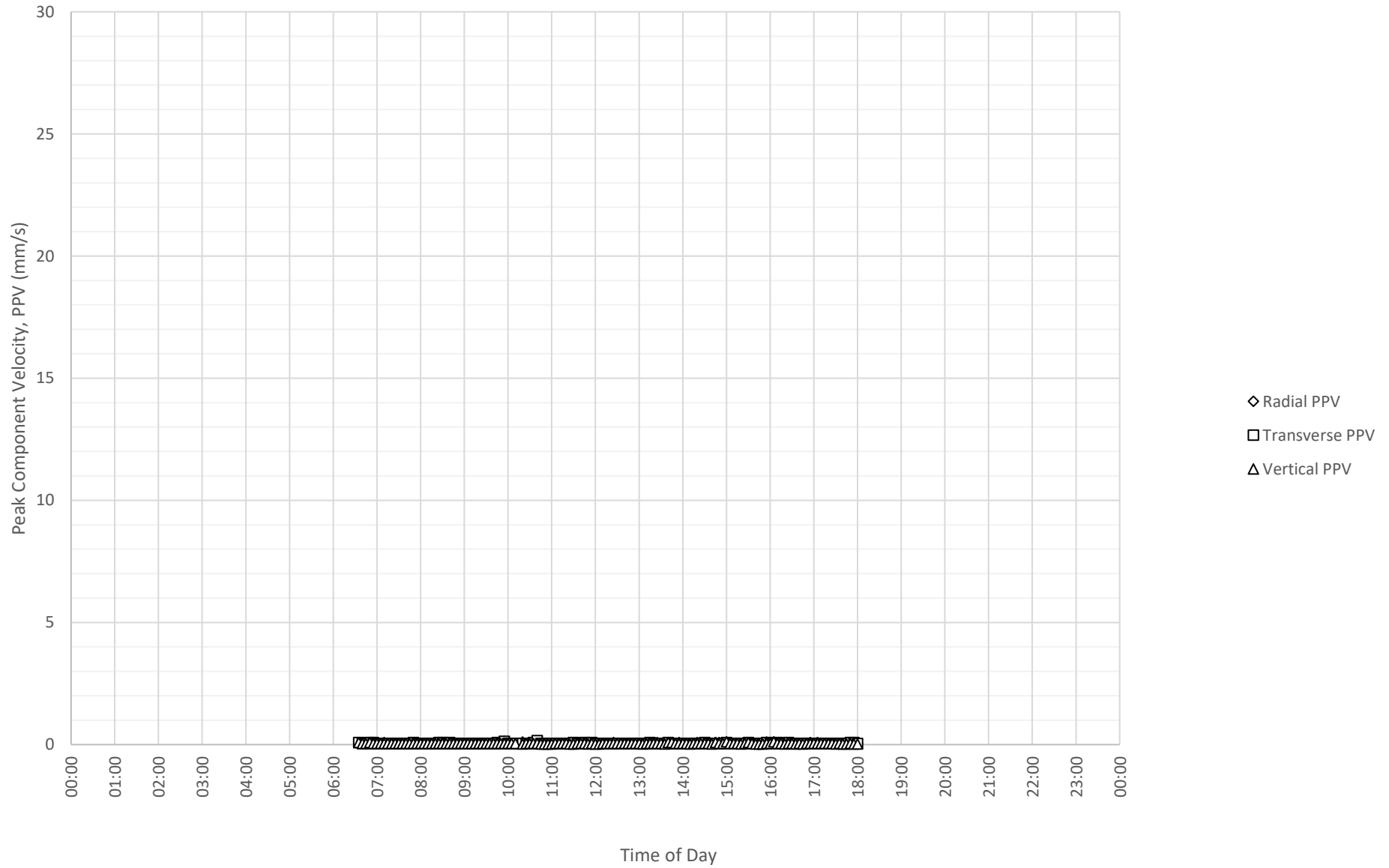




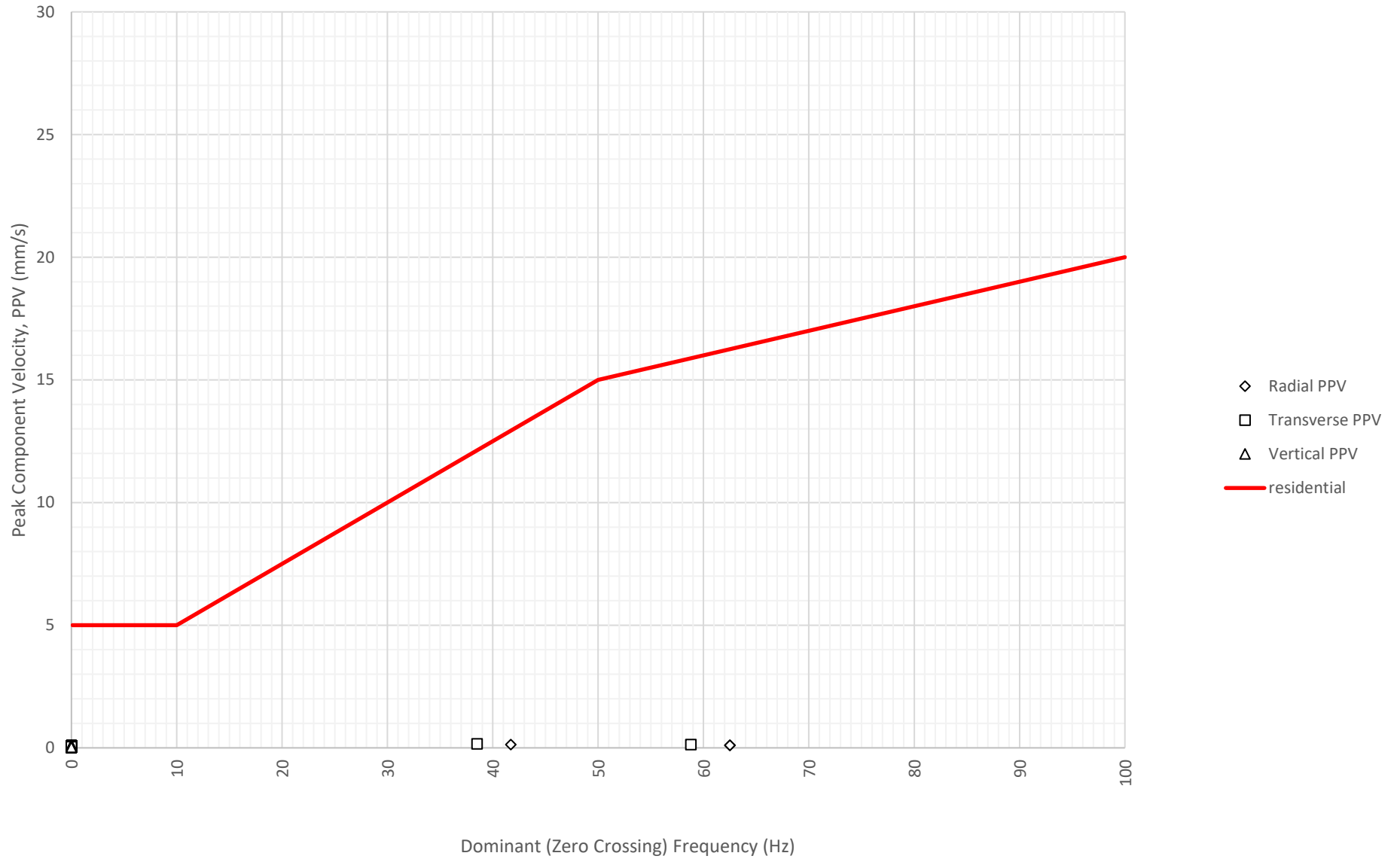
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 25-09-2022



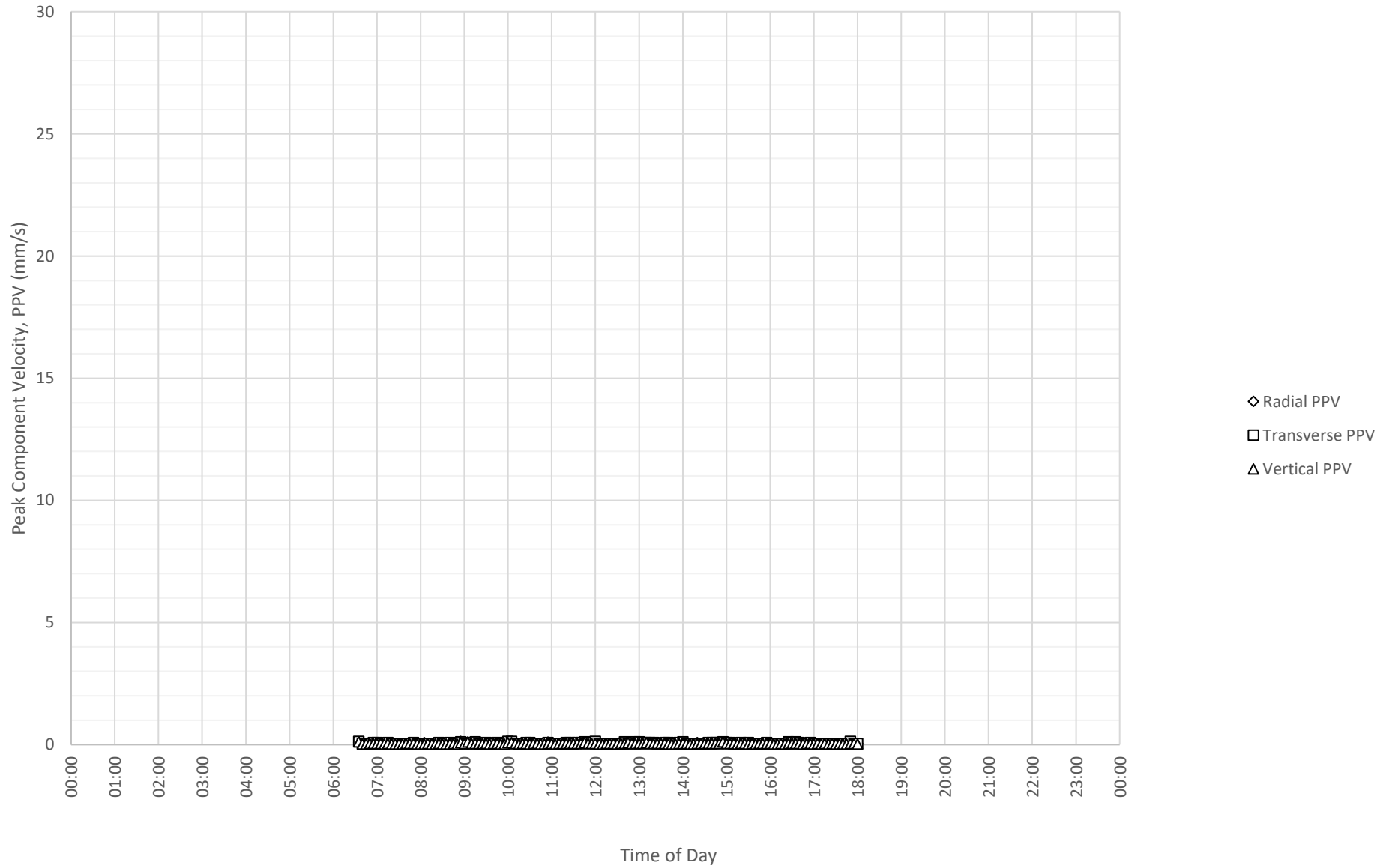
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 26-09-2022



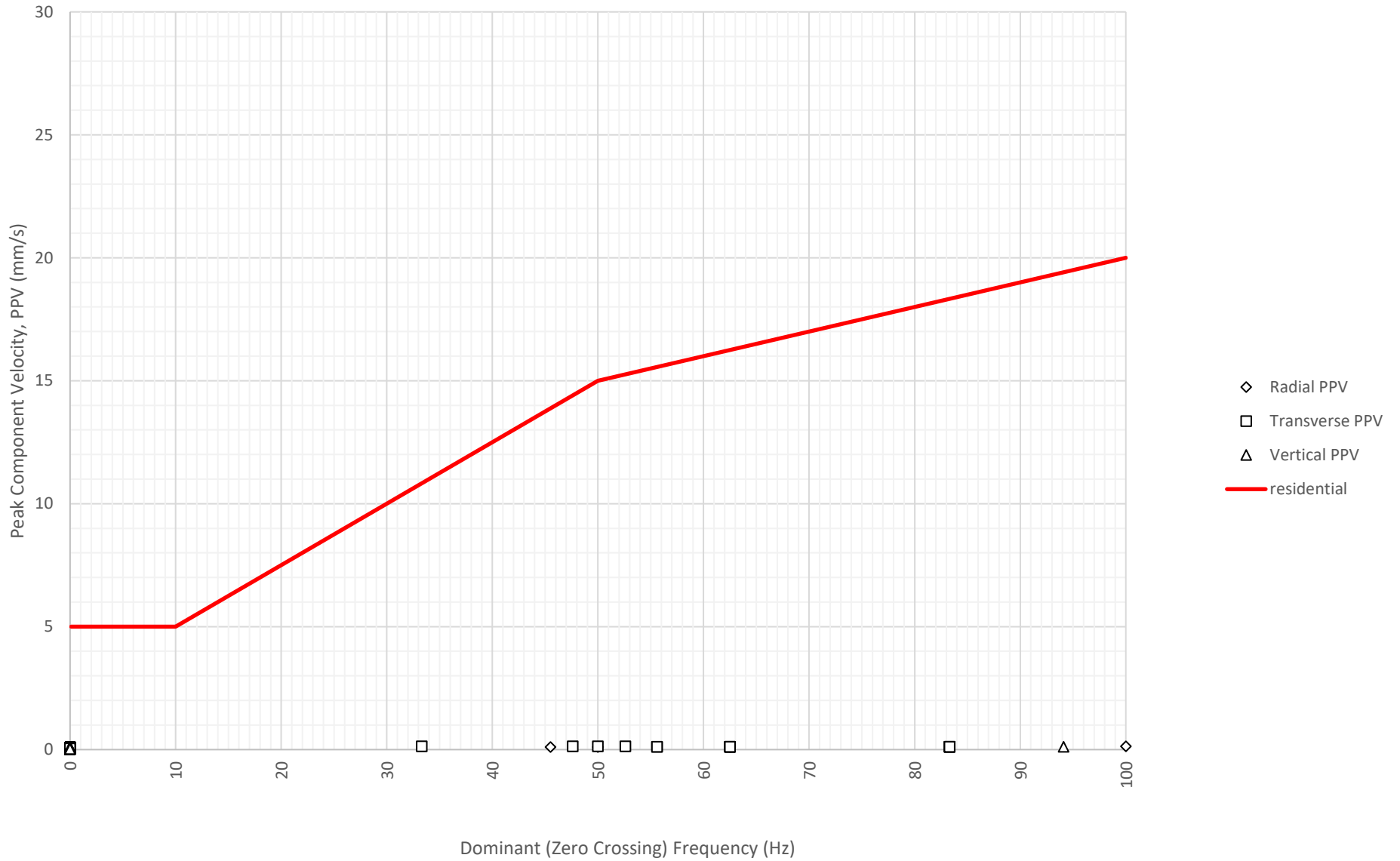
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 26-09-2022



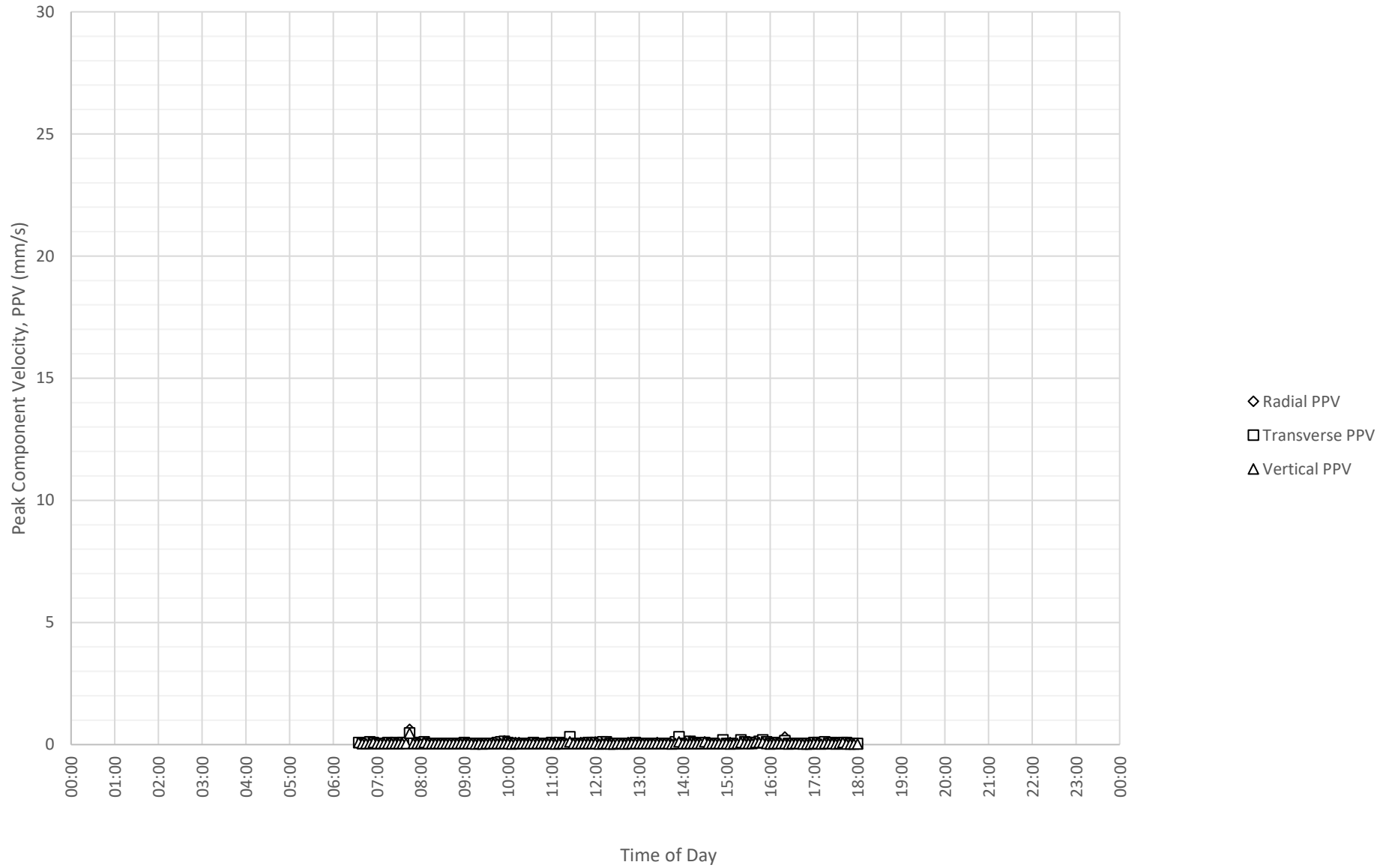
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 27-09-2022



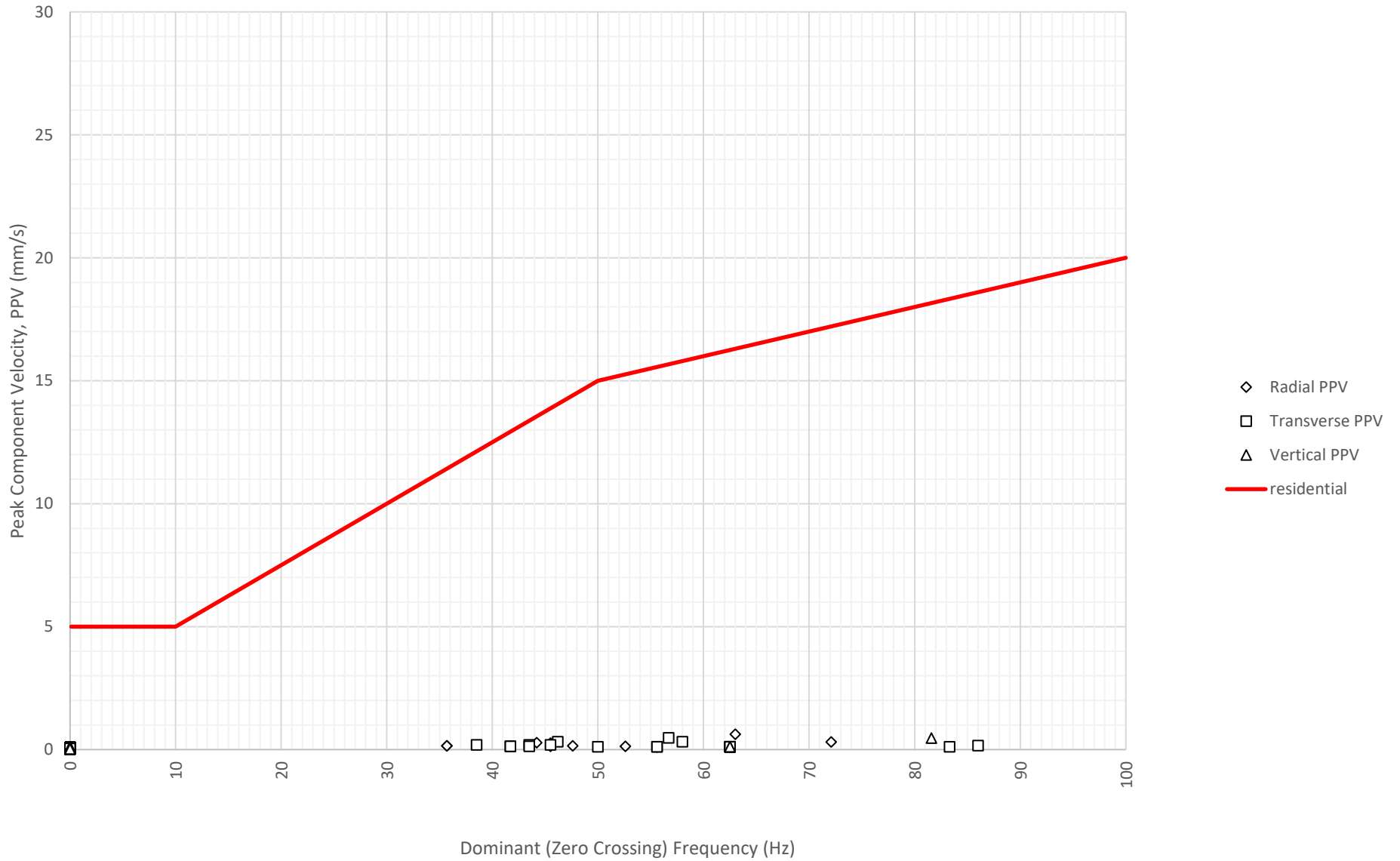
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 27-09-2022



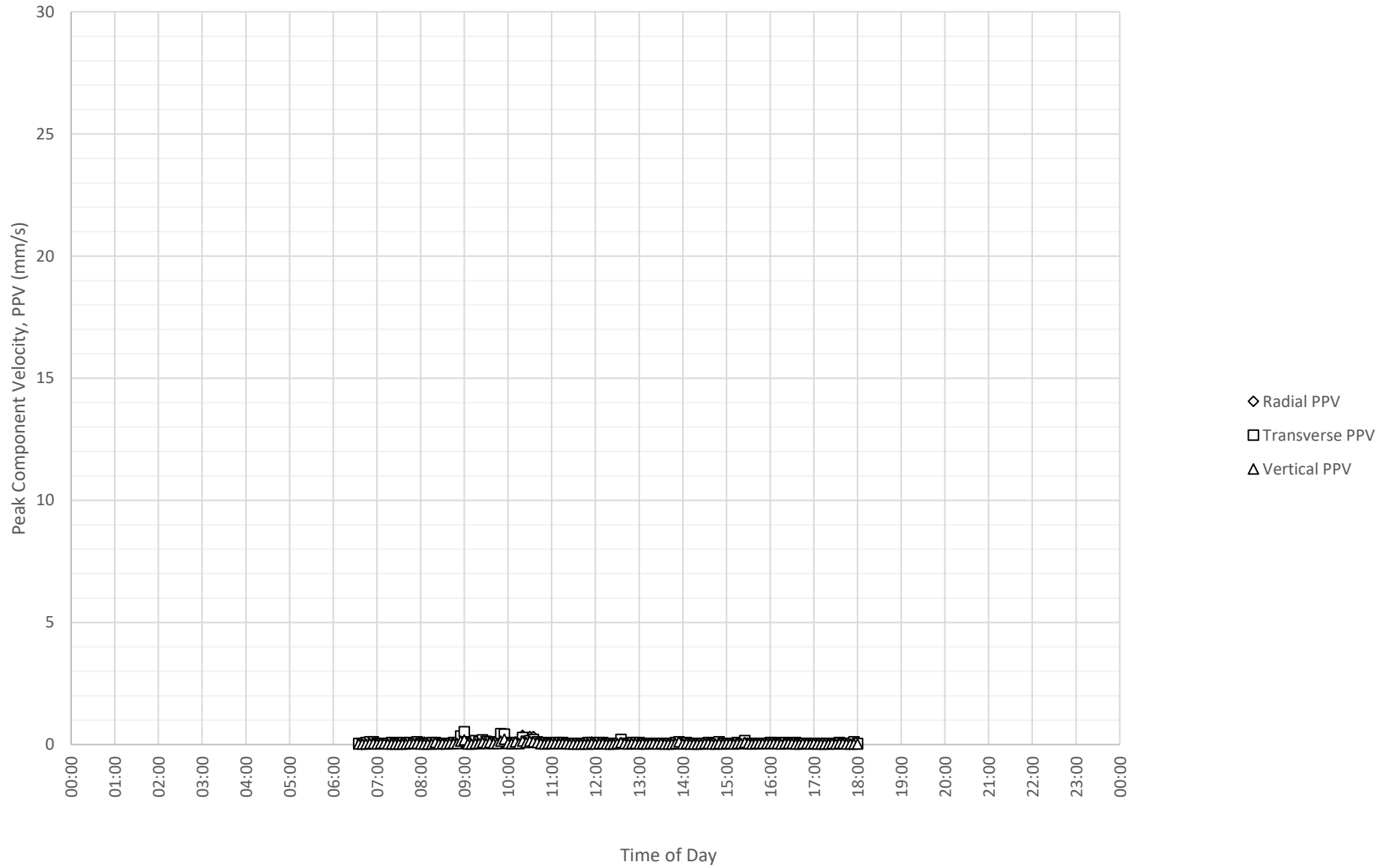
Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 28-09-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 28-09-2022

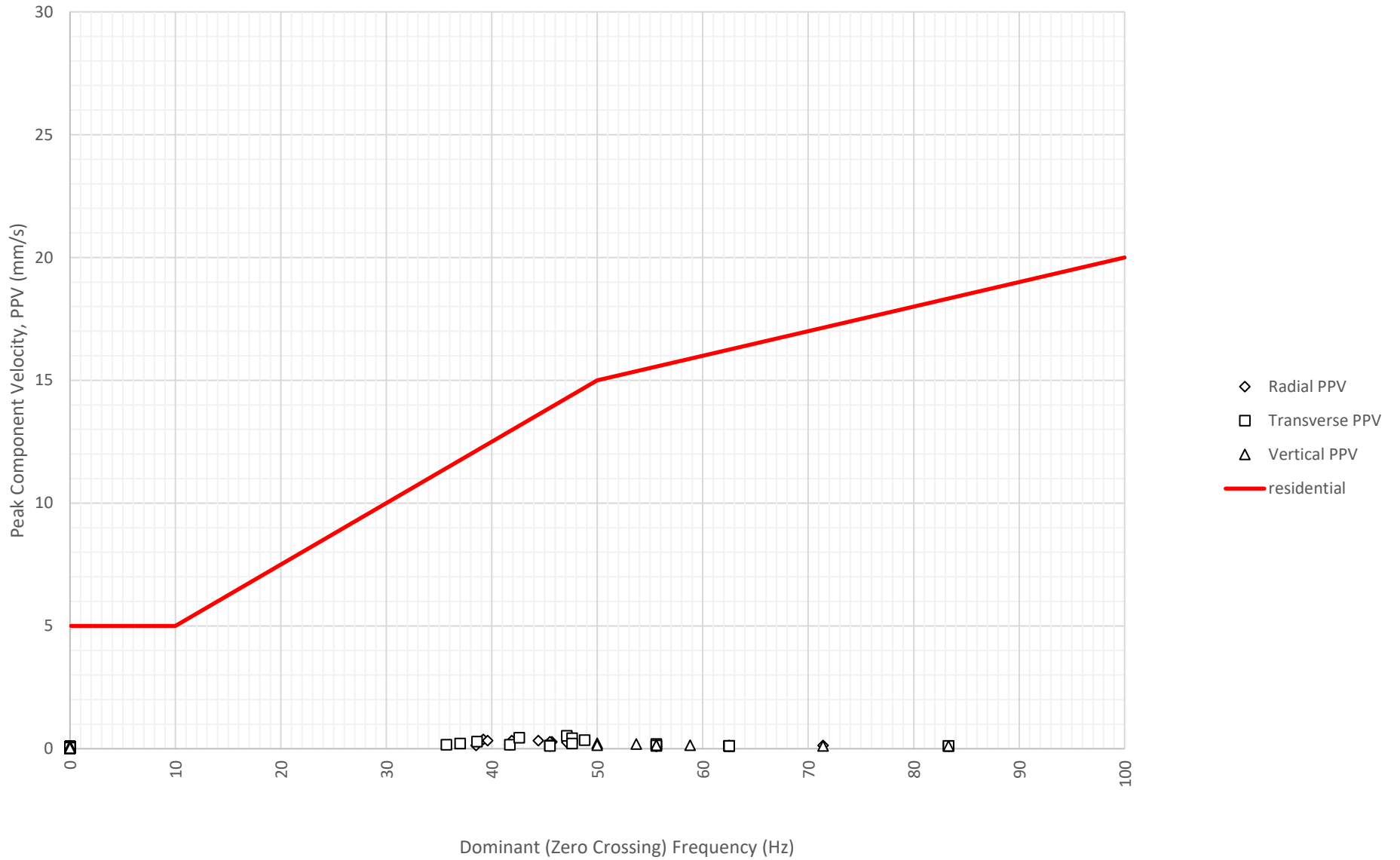


Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 29-09-2022

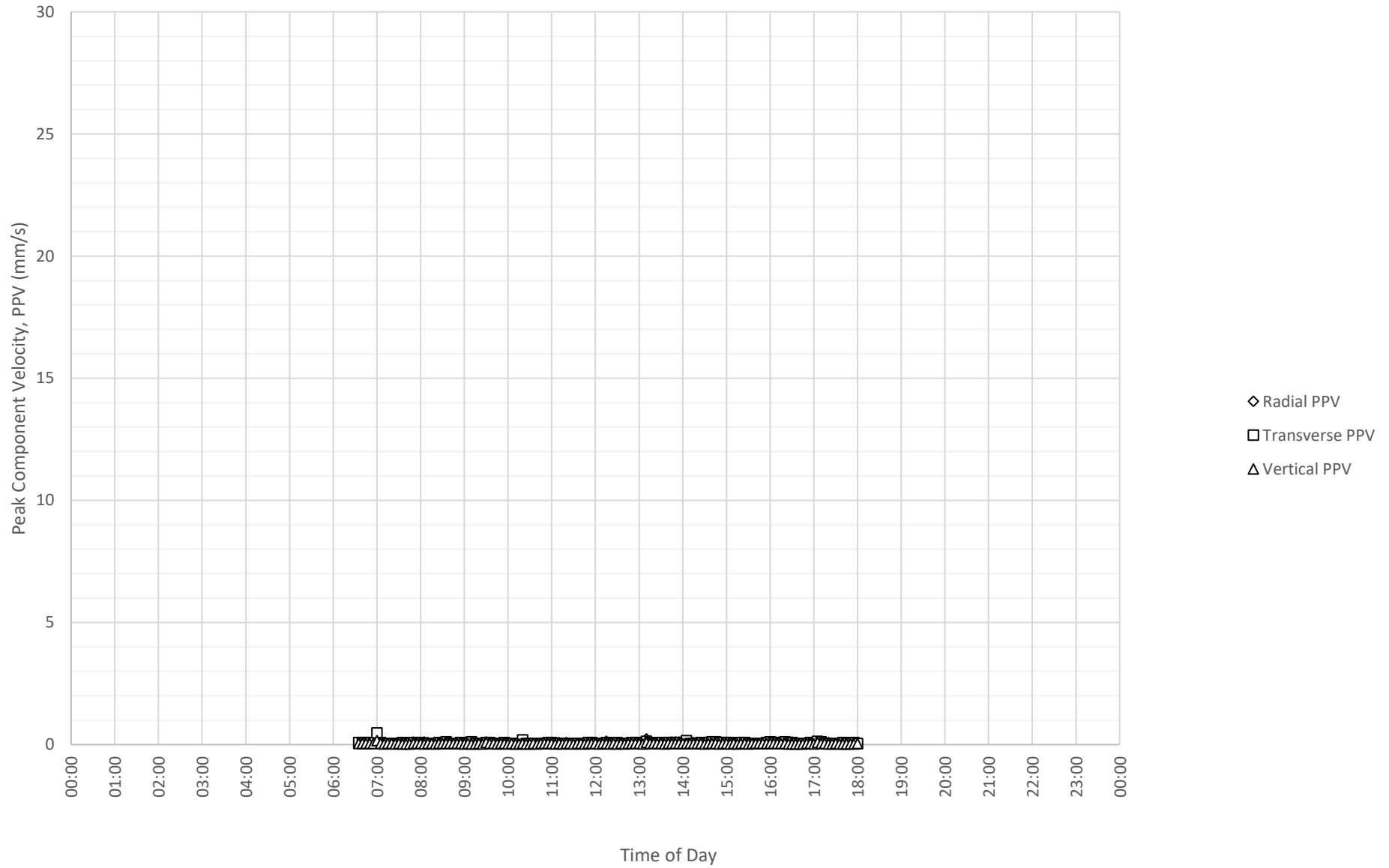




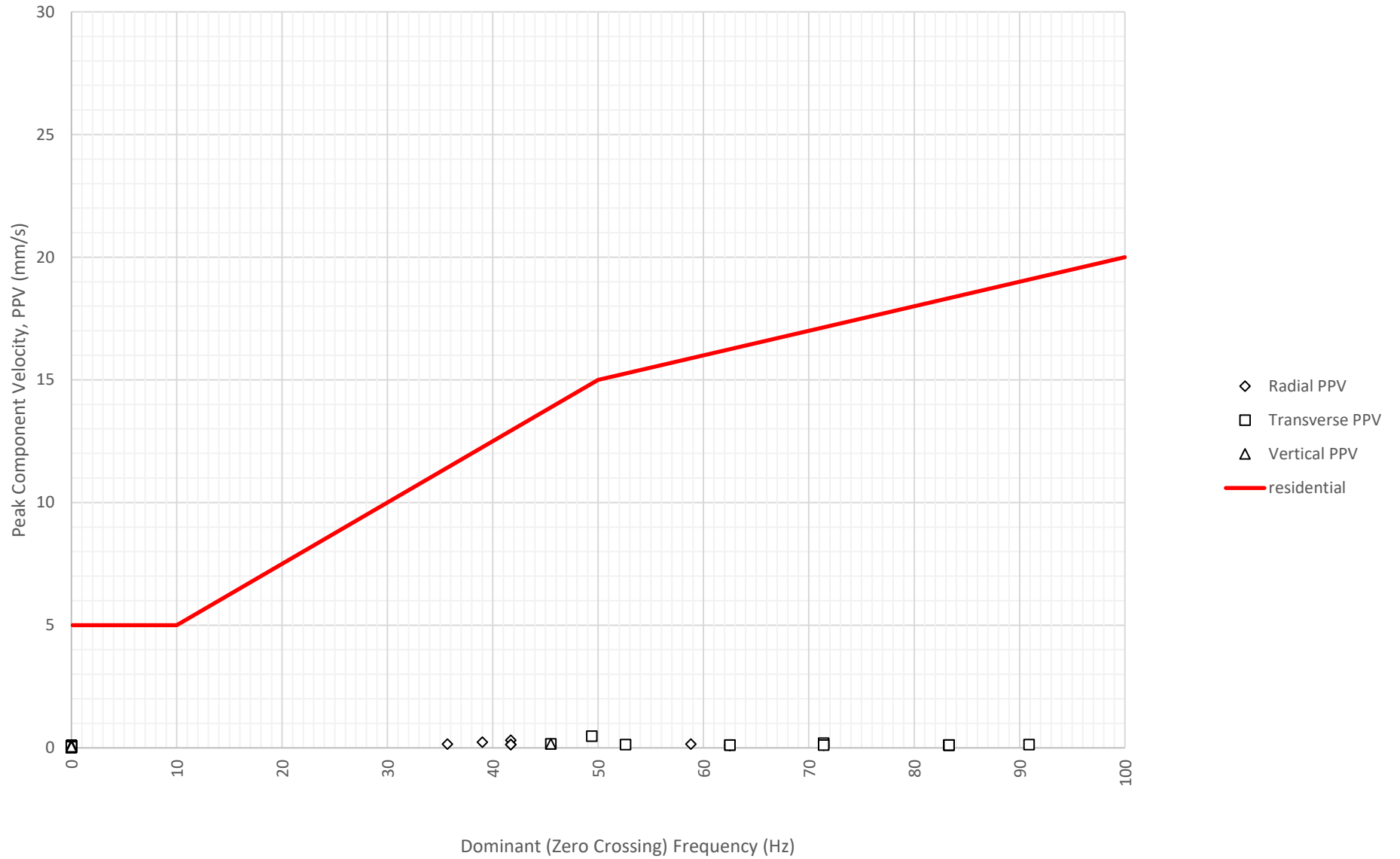
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 29-09-2022



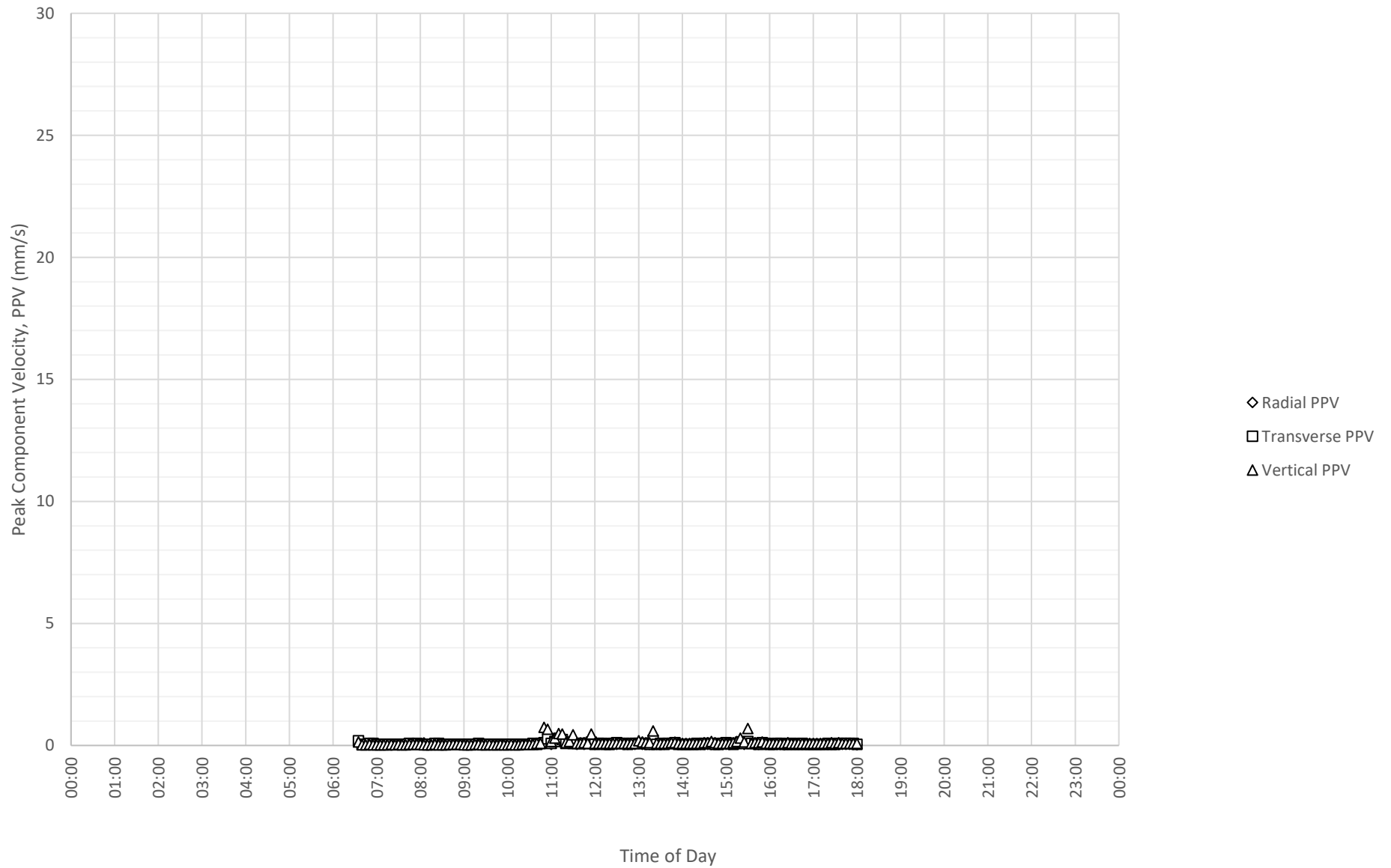
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 30-09-2022



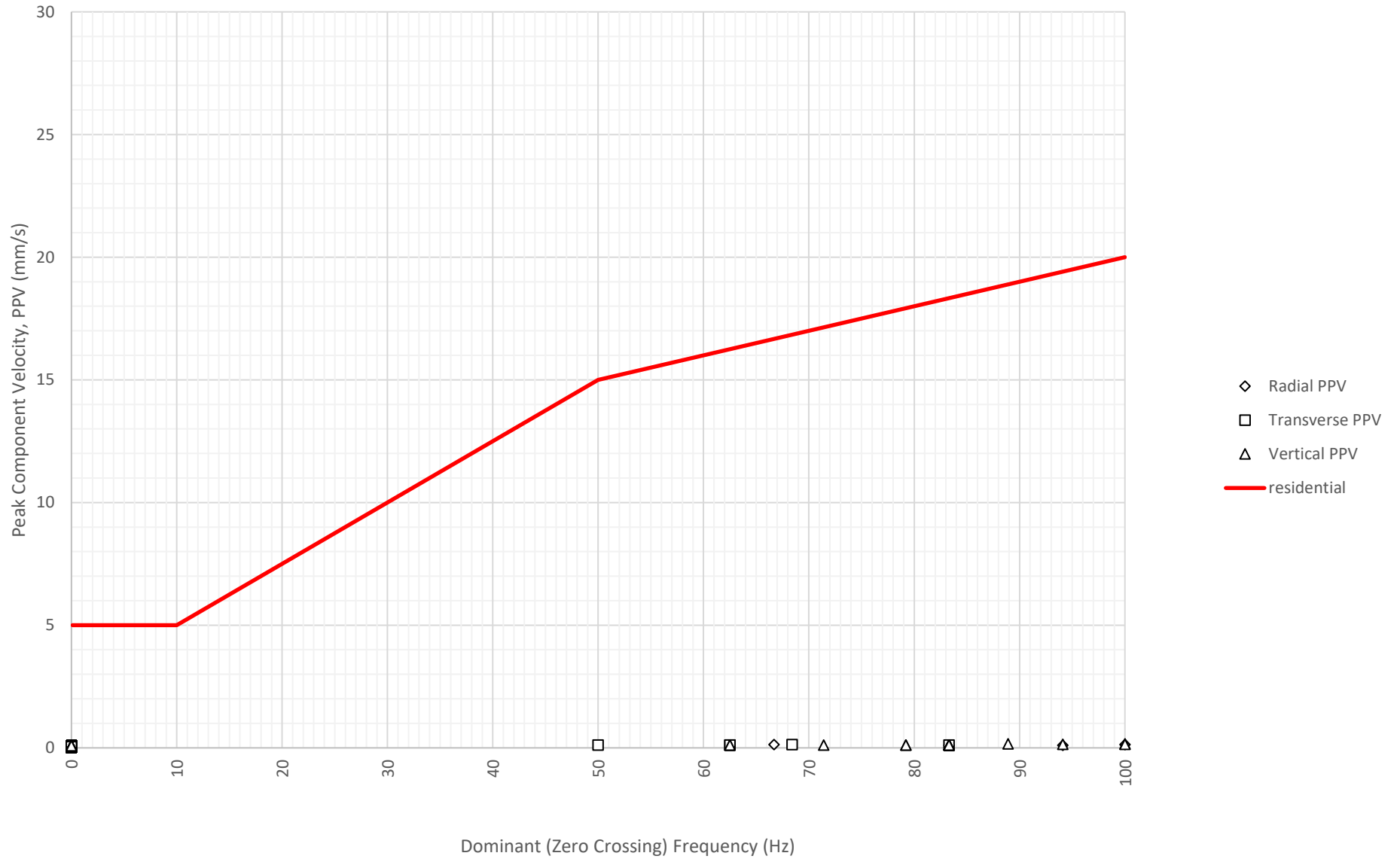
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 30-09-2022



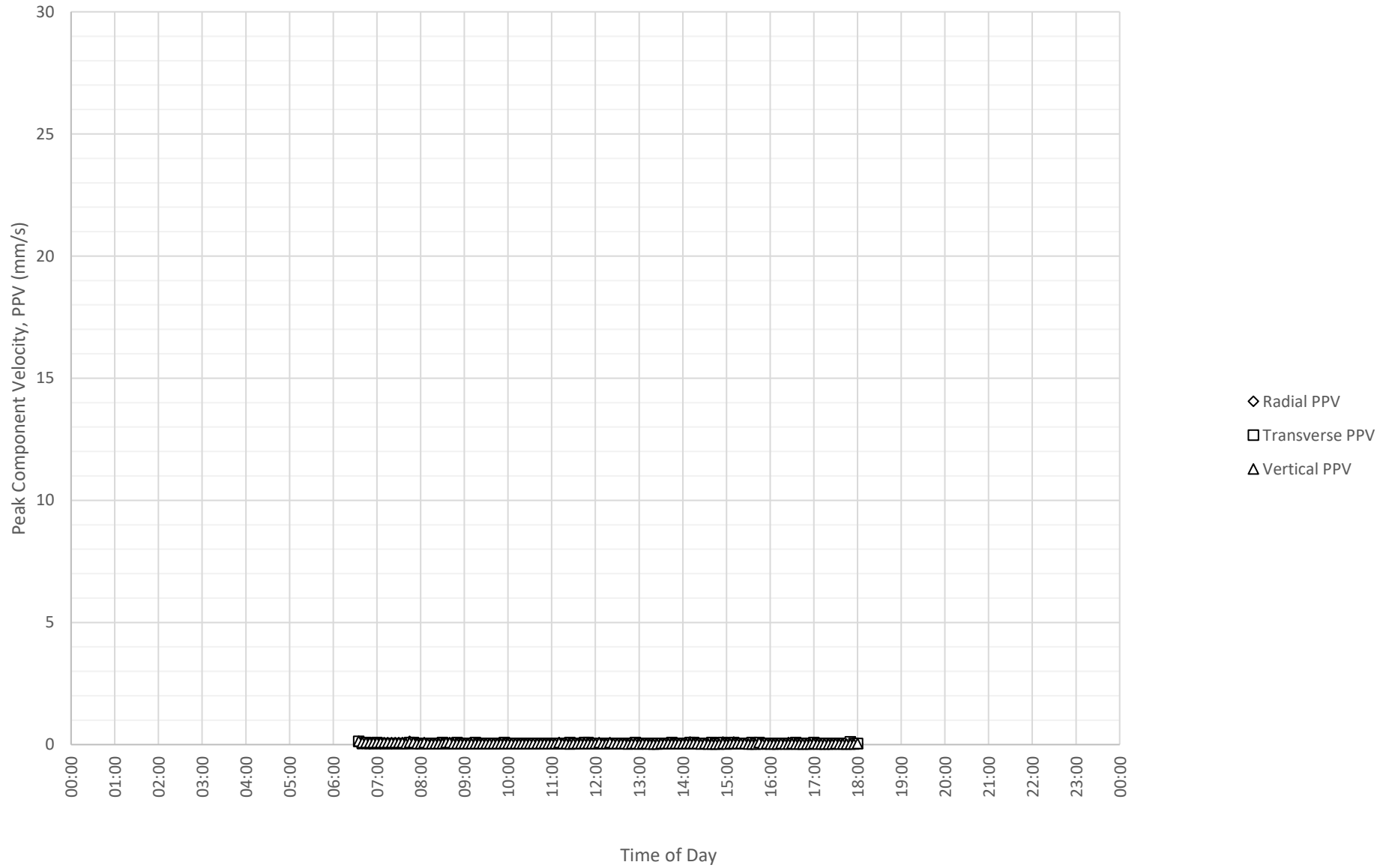
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 1-10-2022



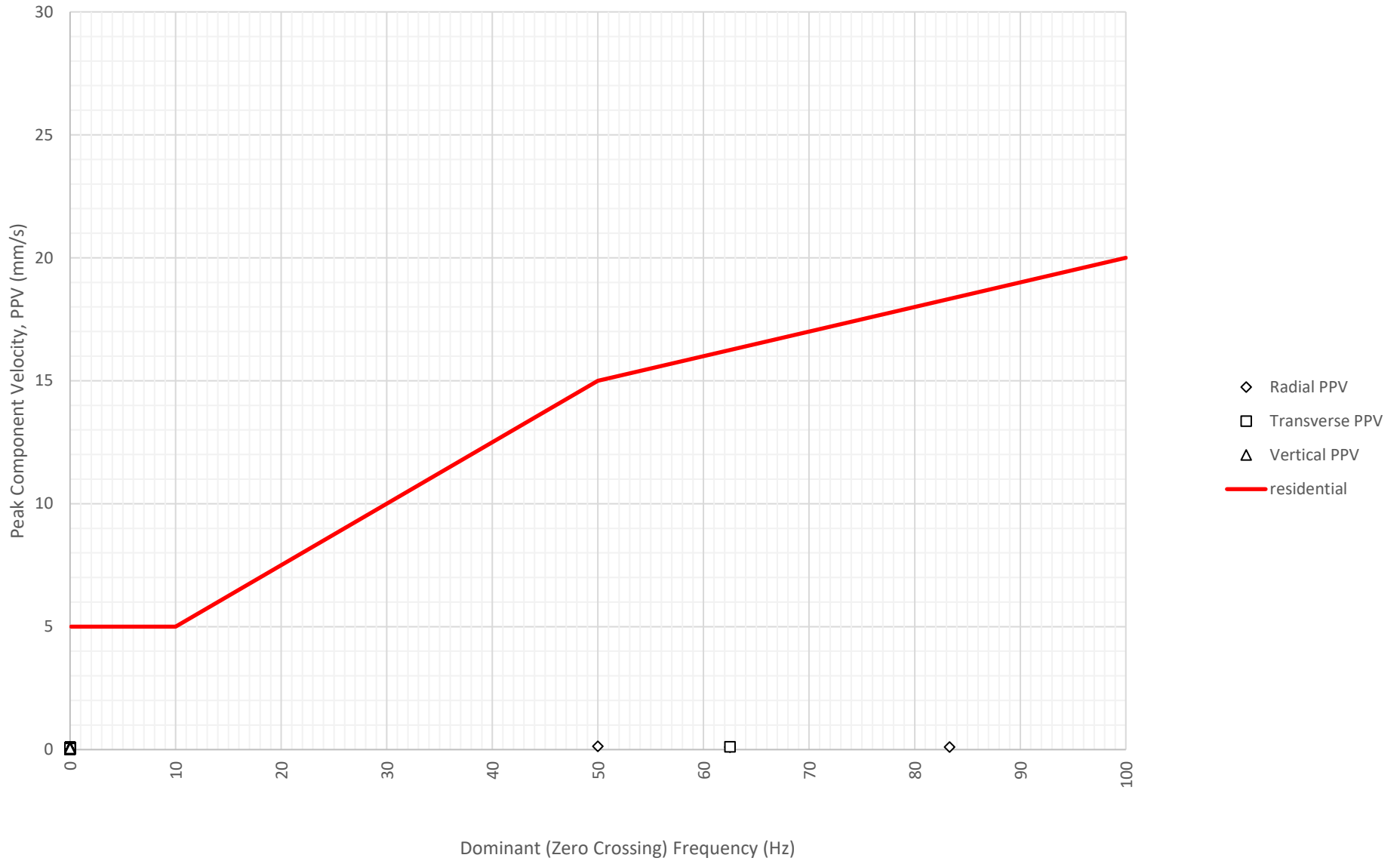
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 1-10-2022



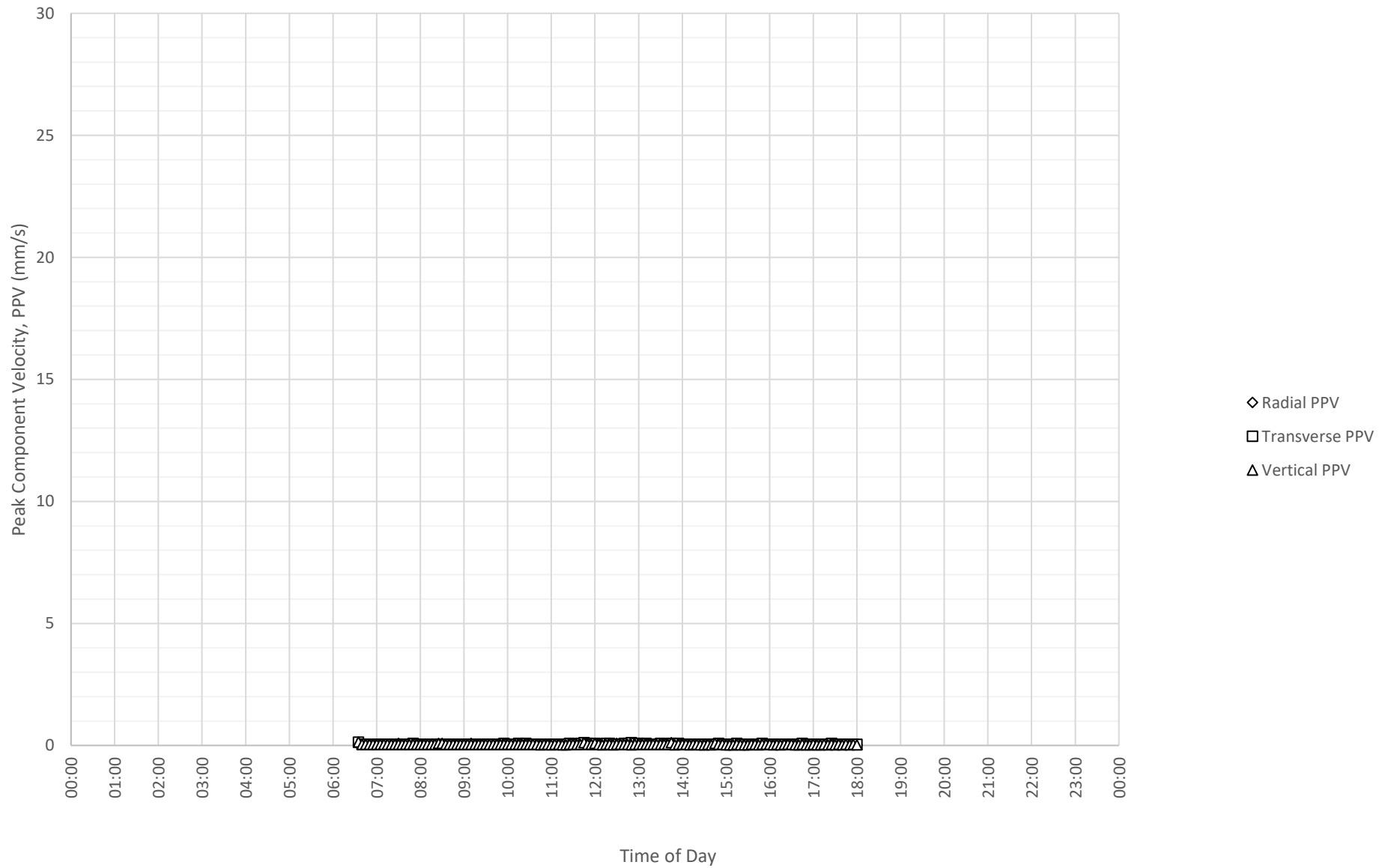
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 2-10-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 2-10-2022

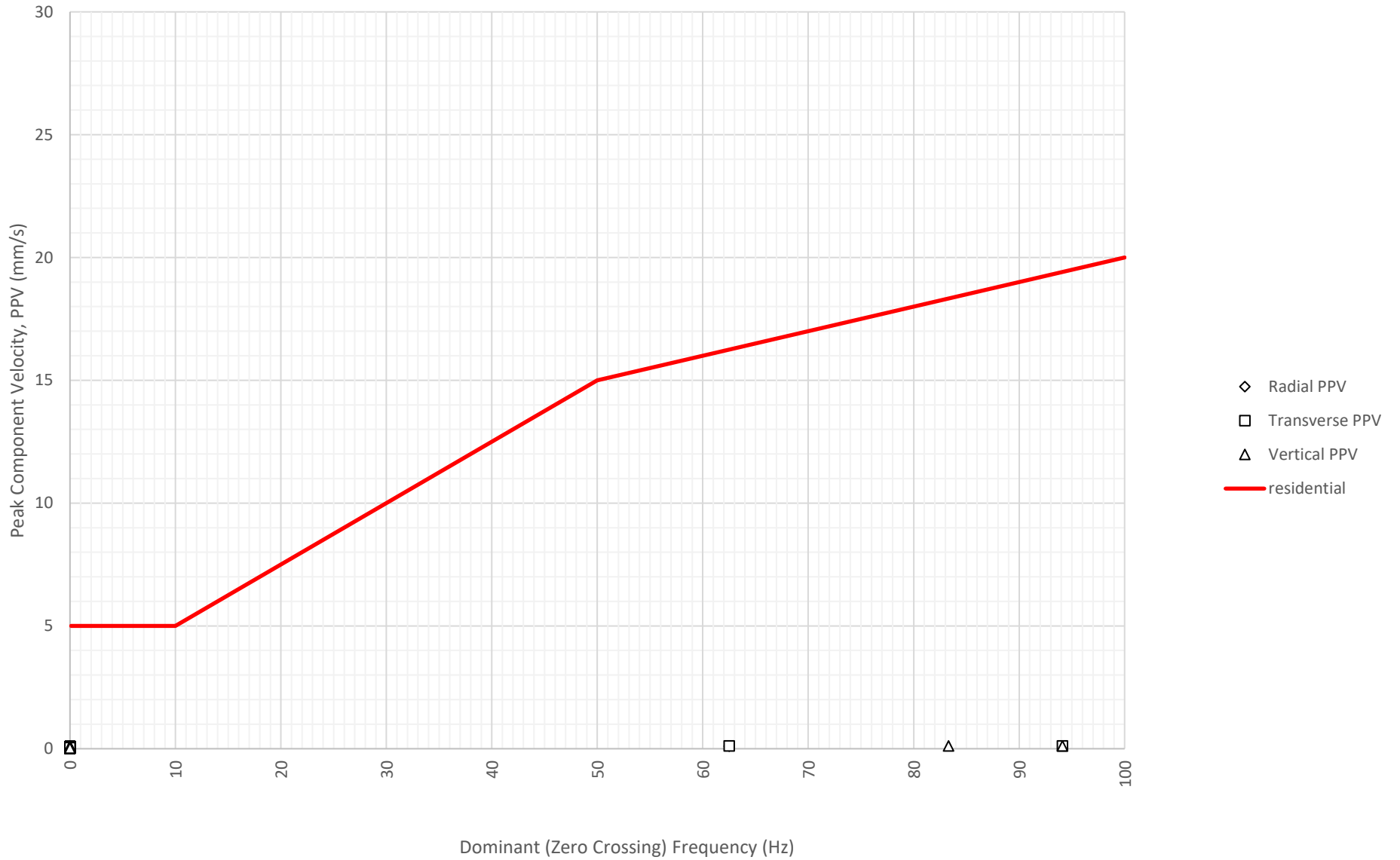


# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 3-10-2022

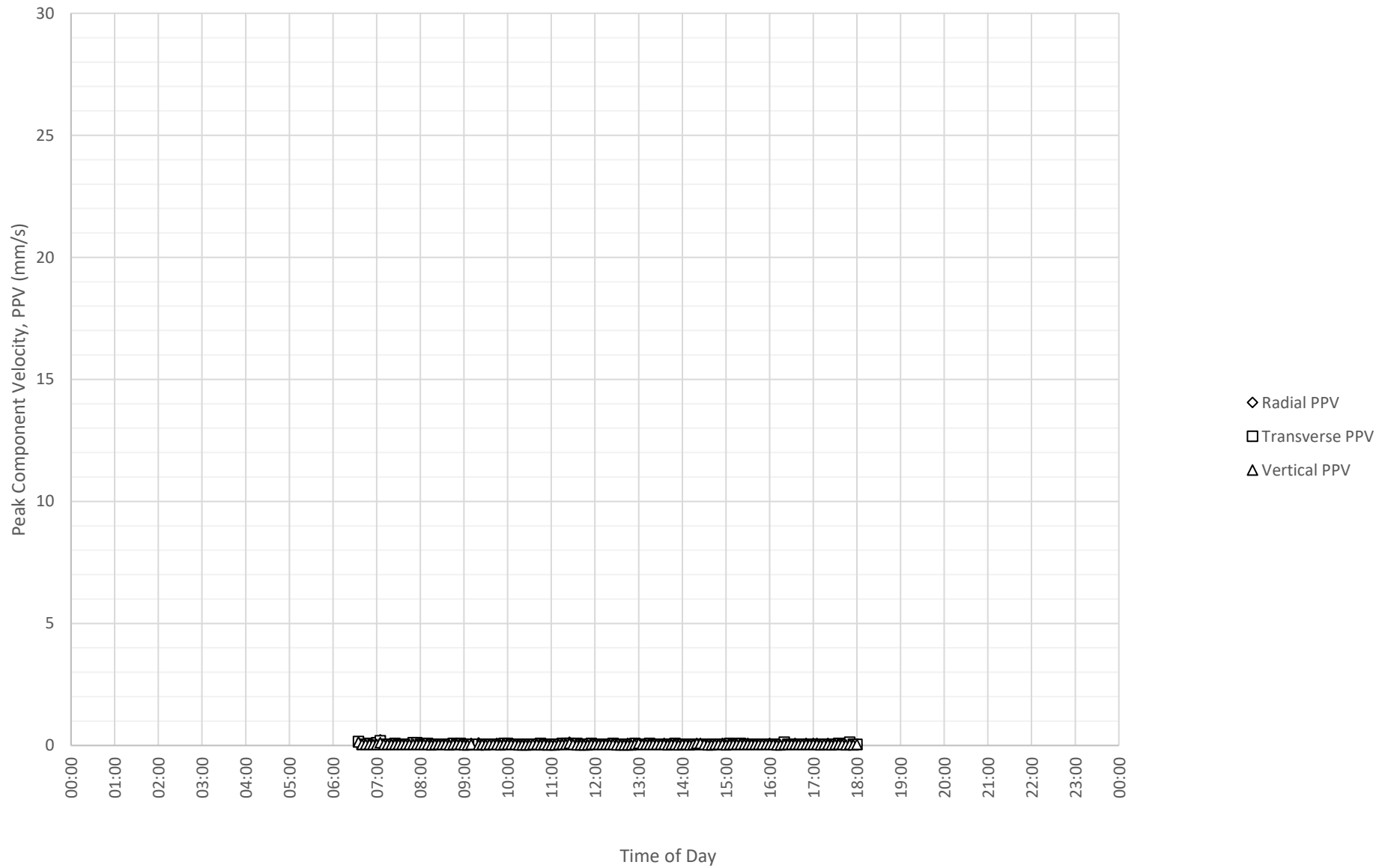




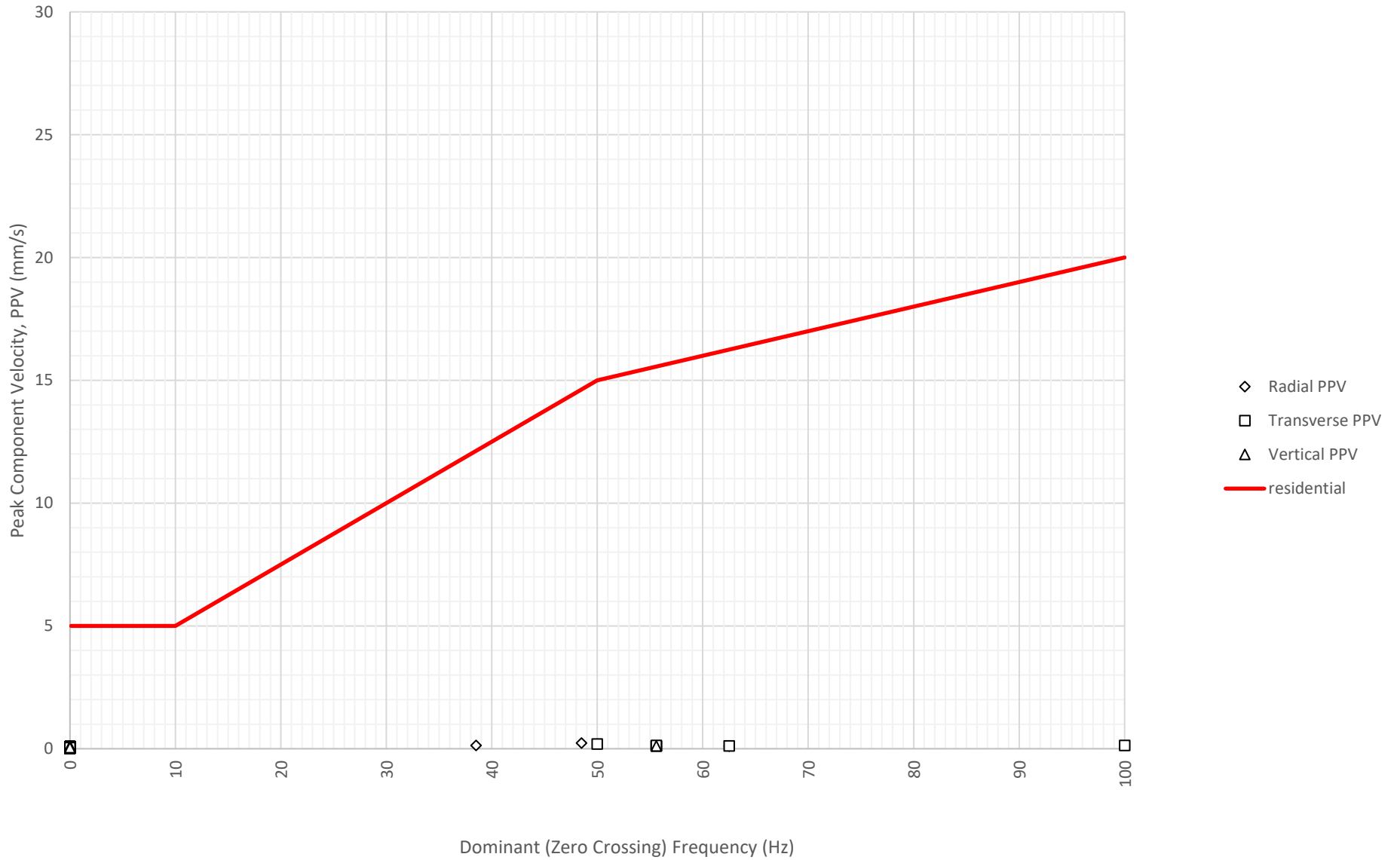
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 3-10-2022



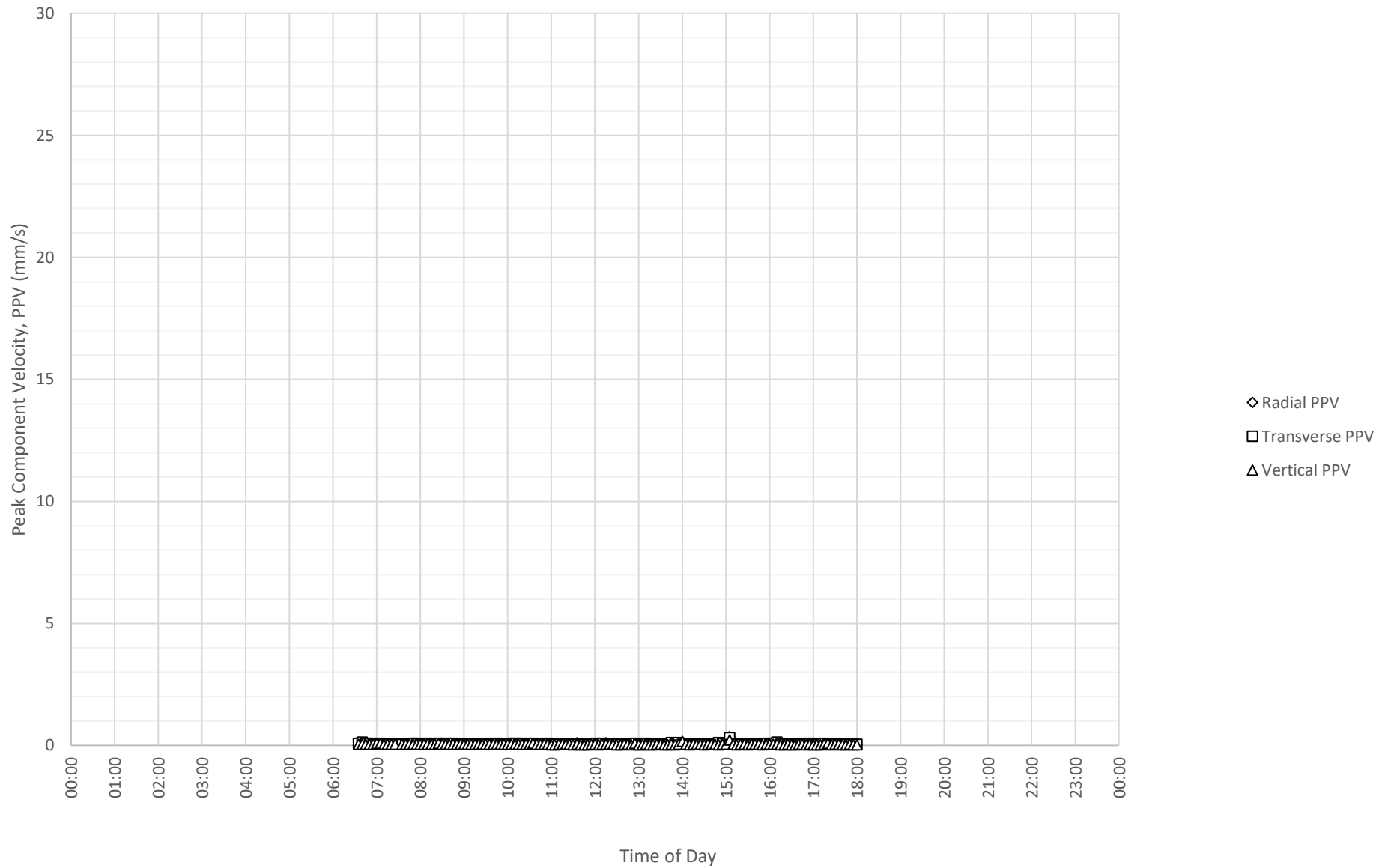
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 4-10-2022



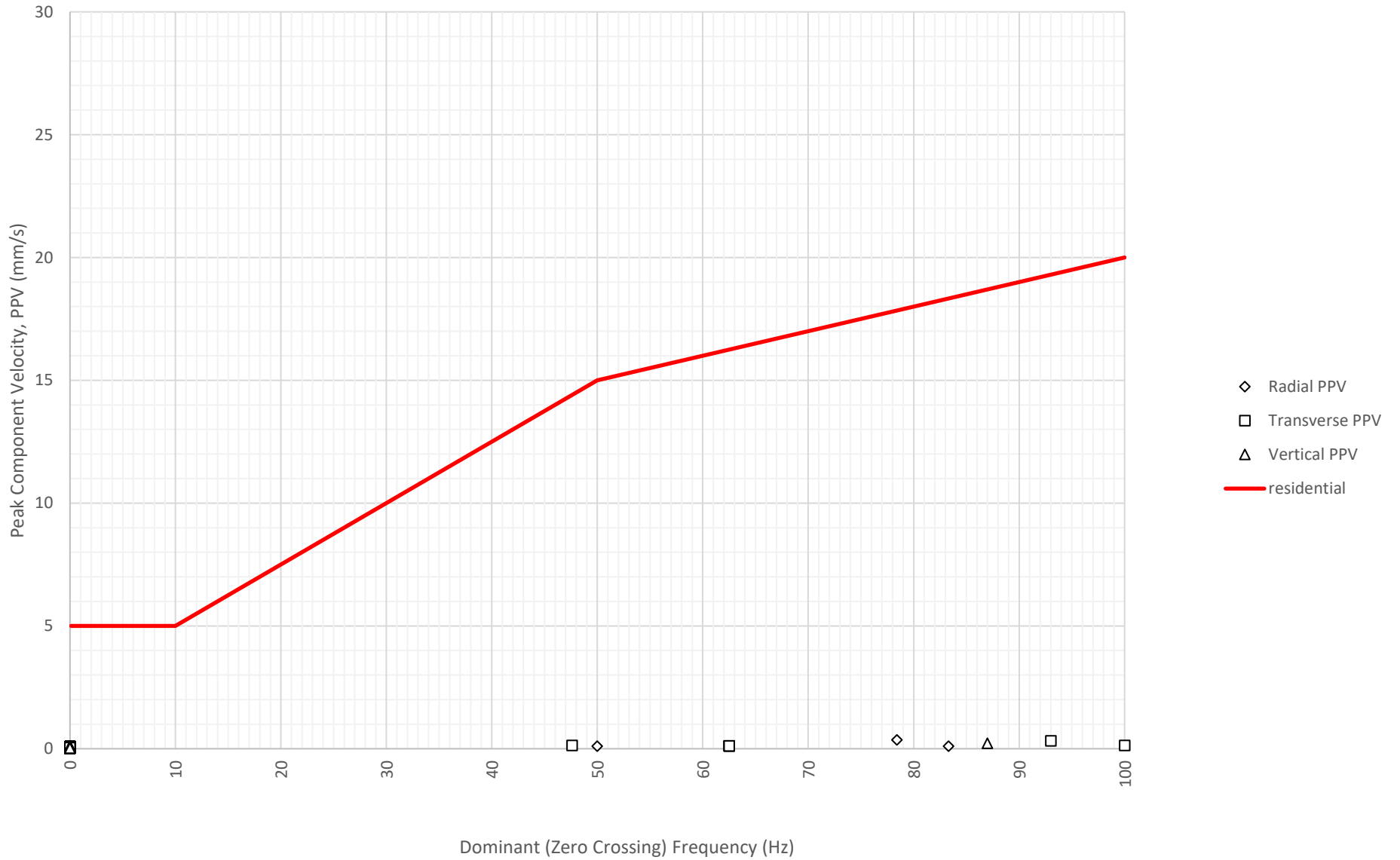
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 4-10-2022



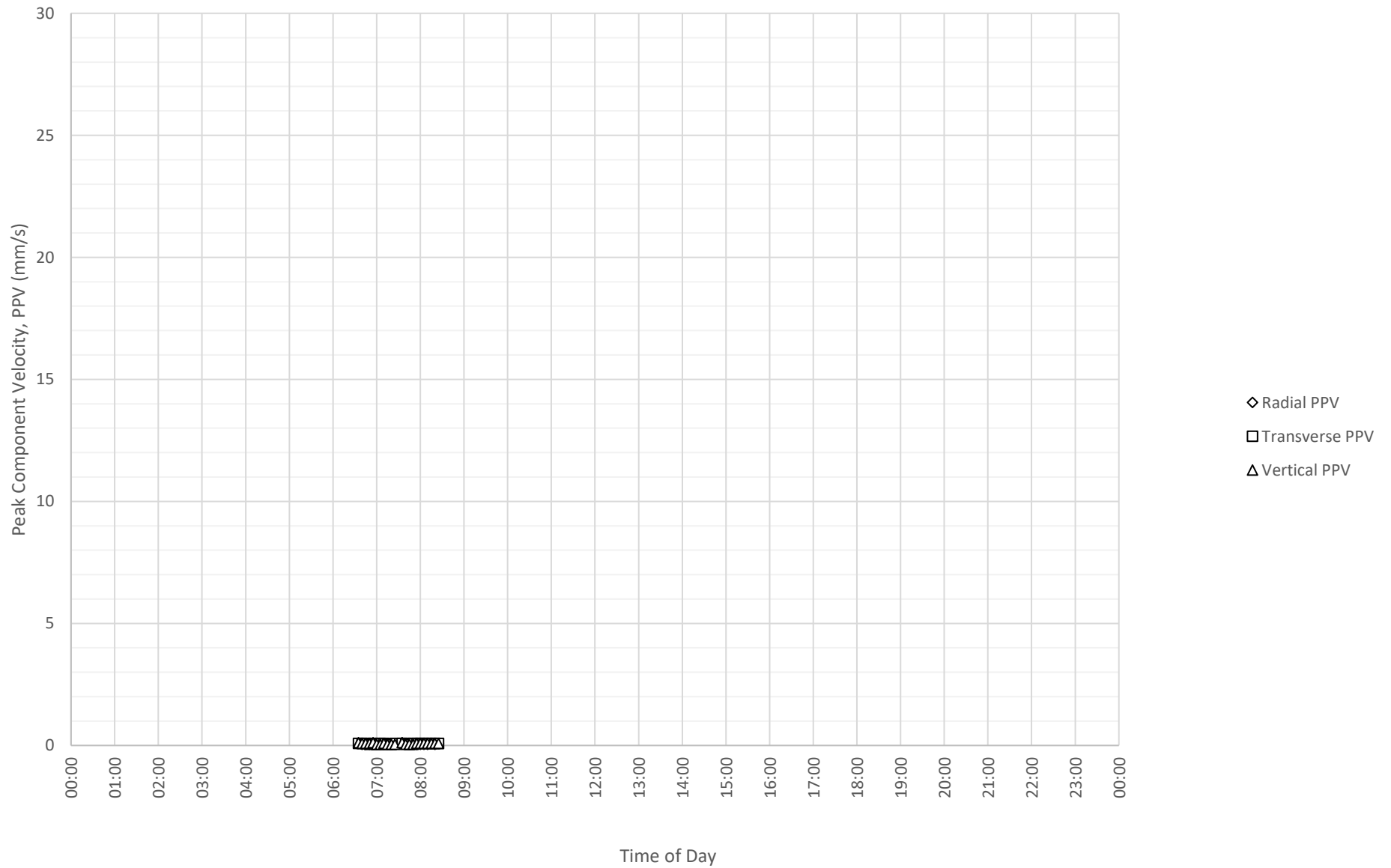
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 5-10-2022



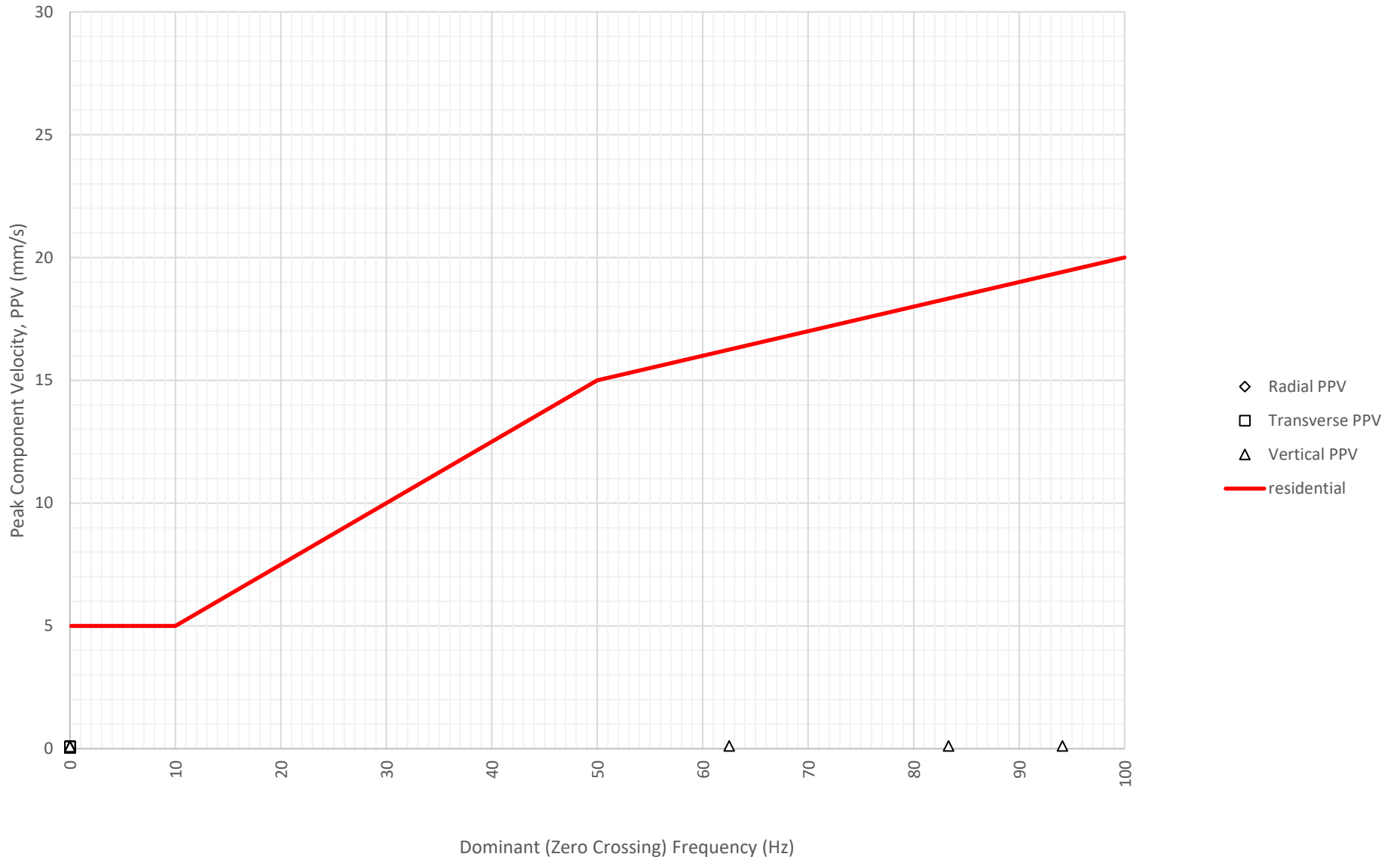
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 5-10-2022



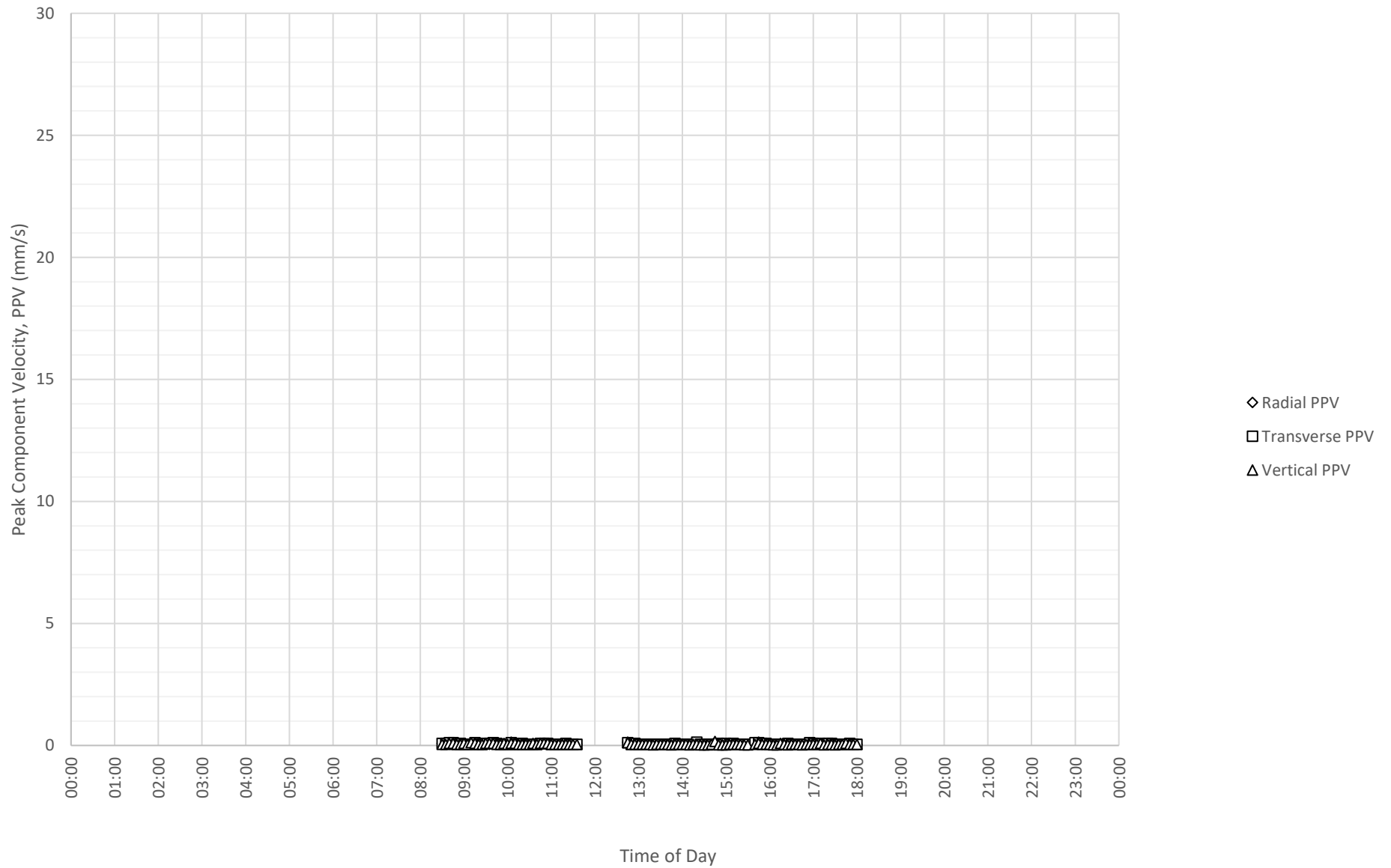
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 6-10-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 6-10-2022

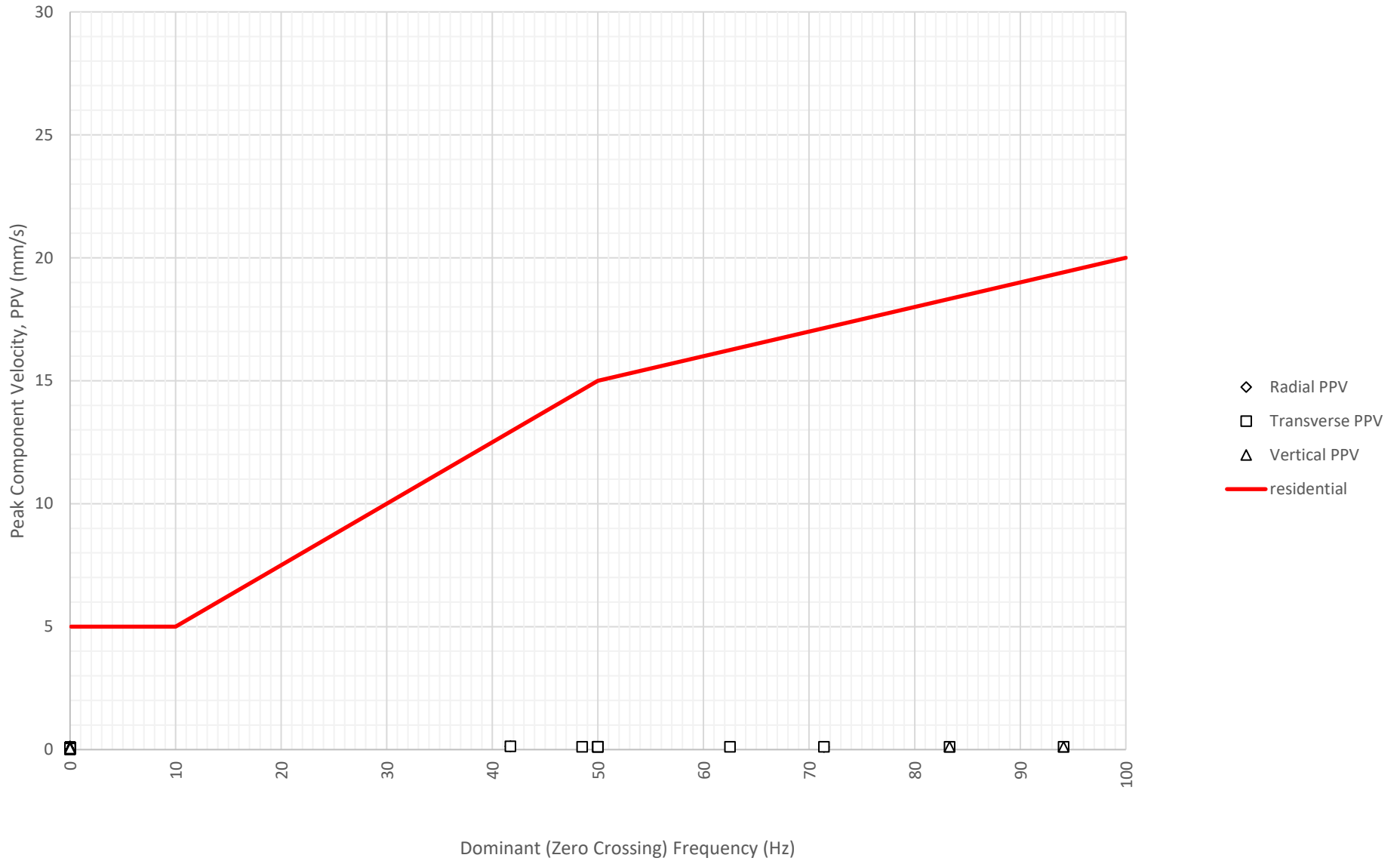


# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 6-10-2022

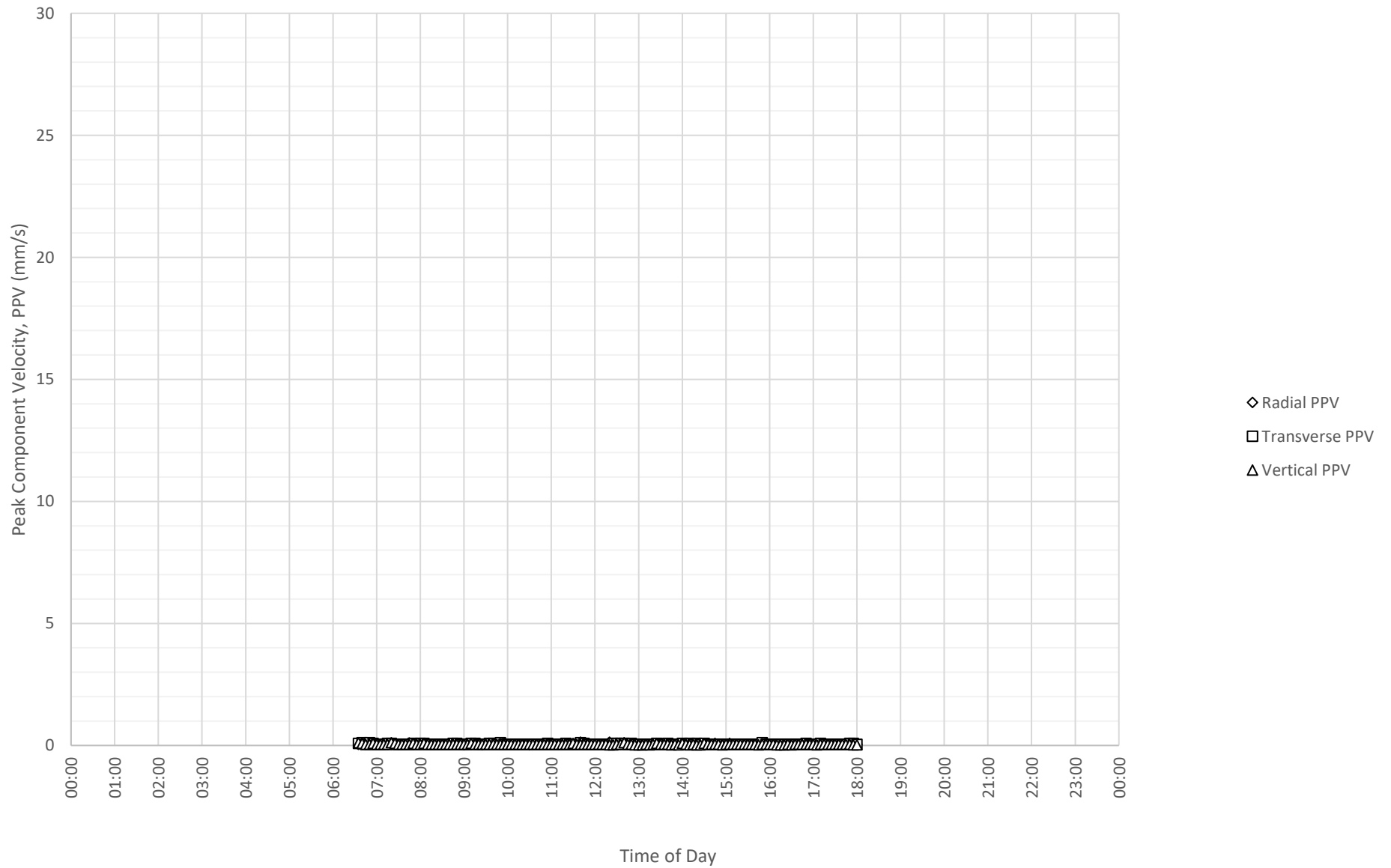




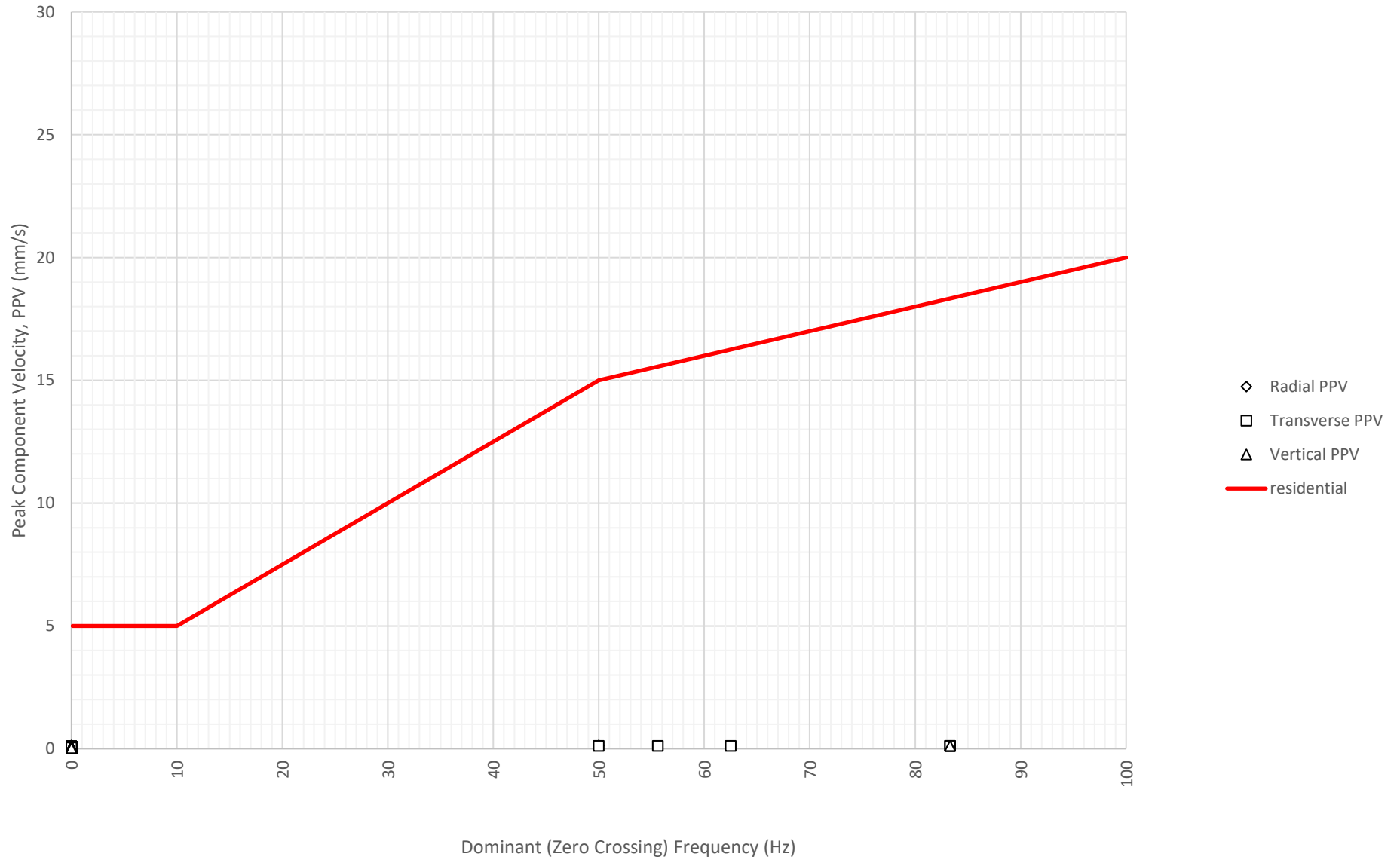
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 6-10-2022



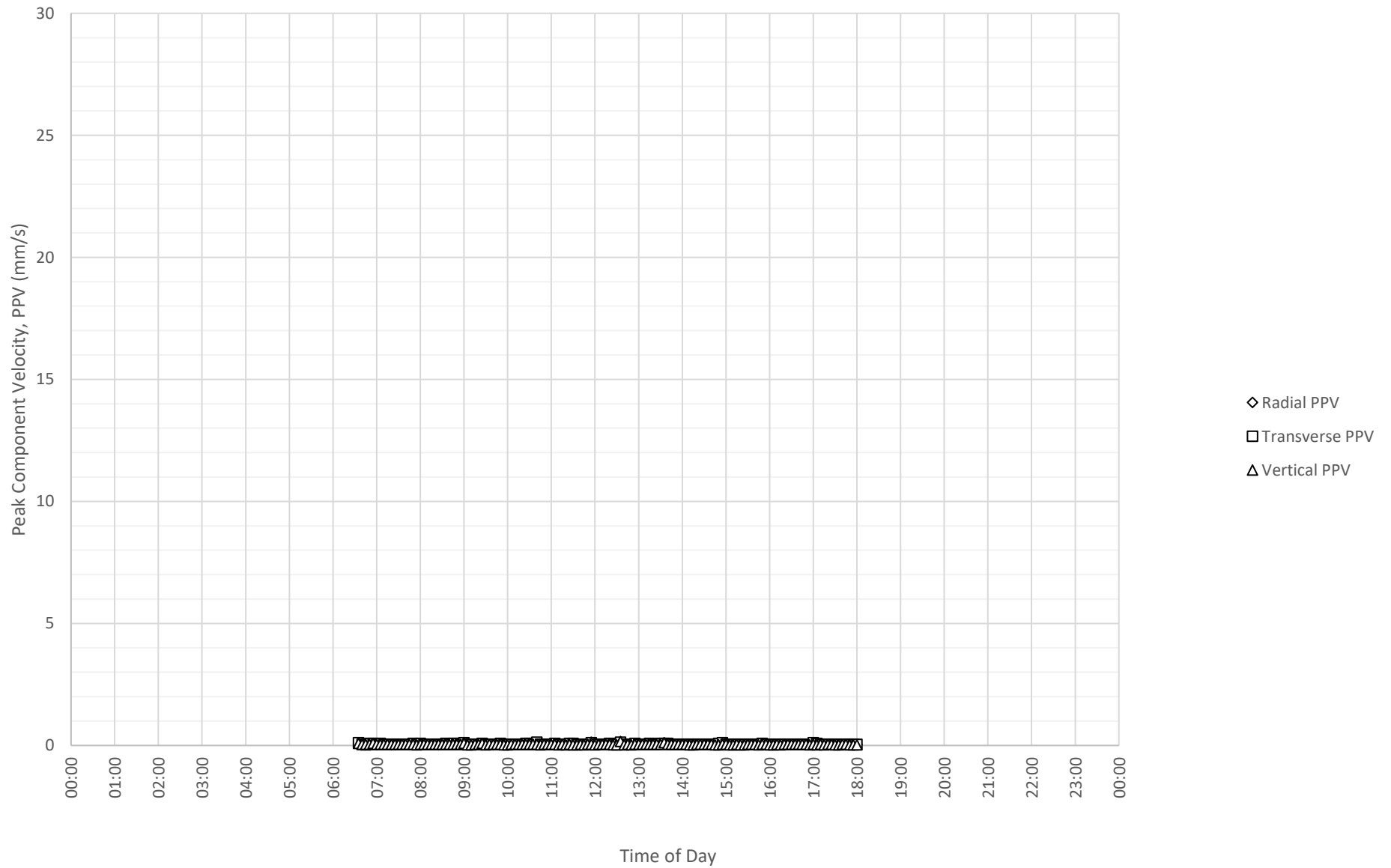
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 7-10-2022



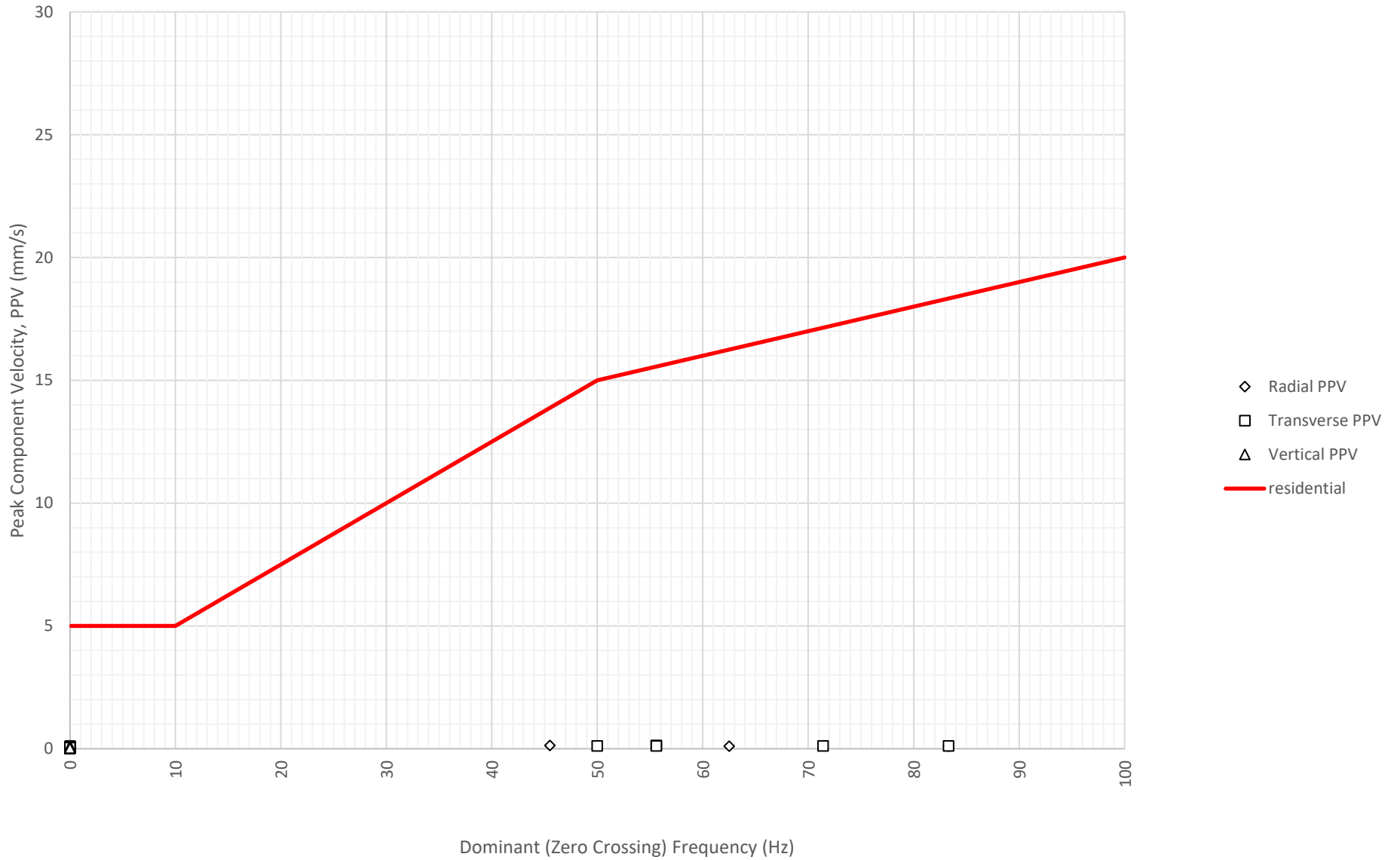
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 7-10-2022



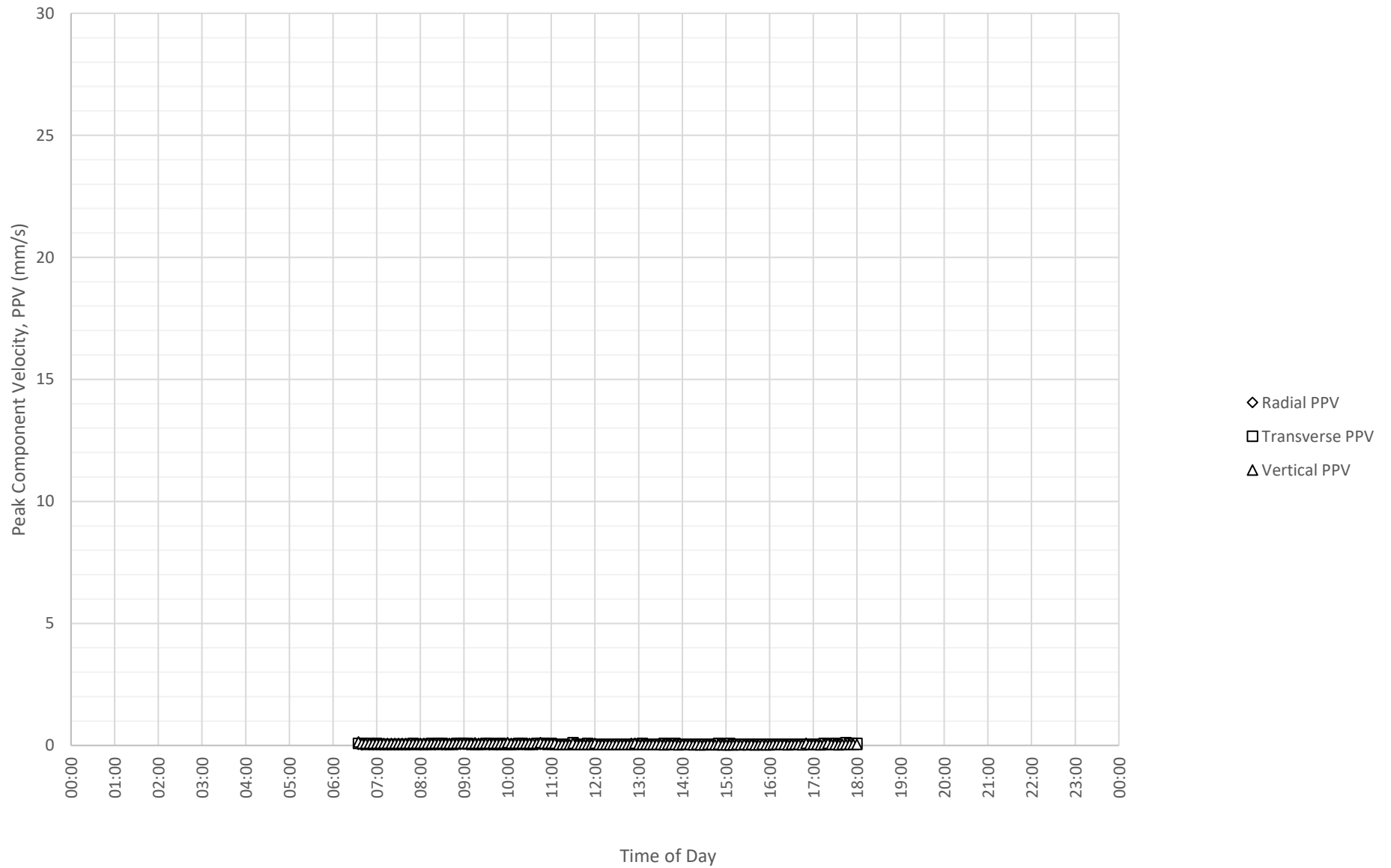
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 8-10-2022



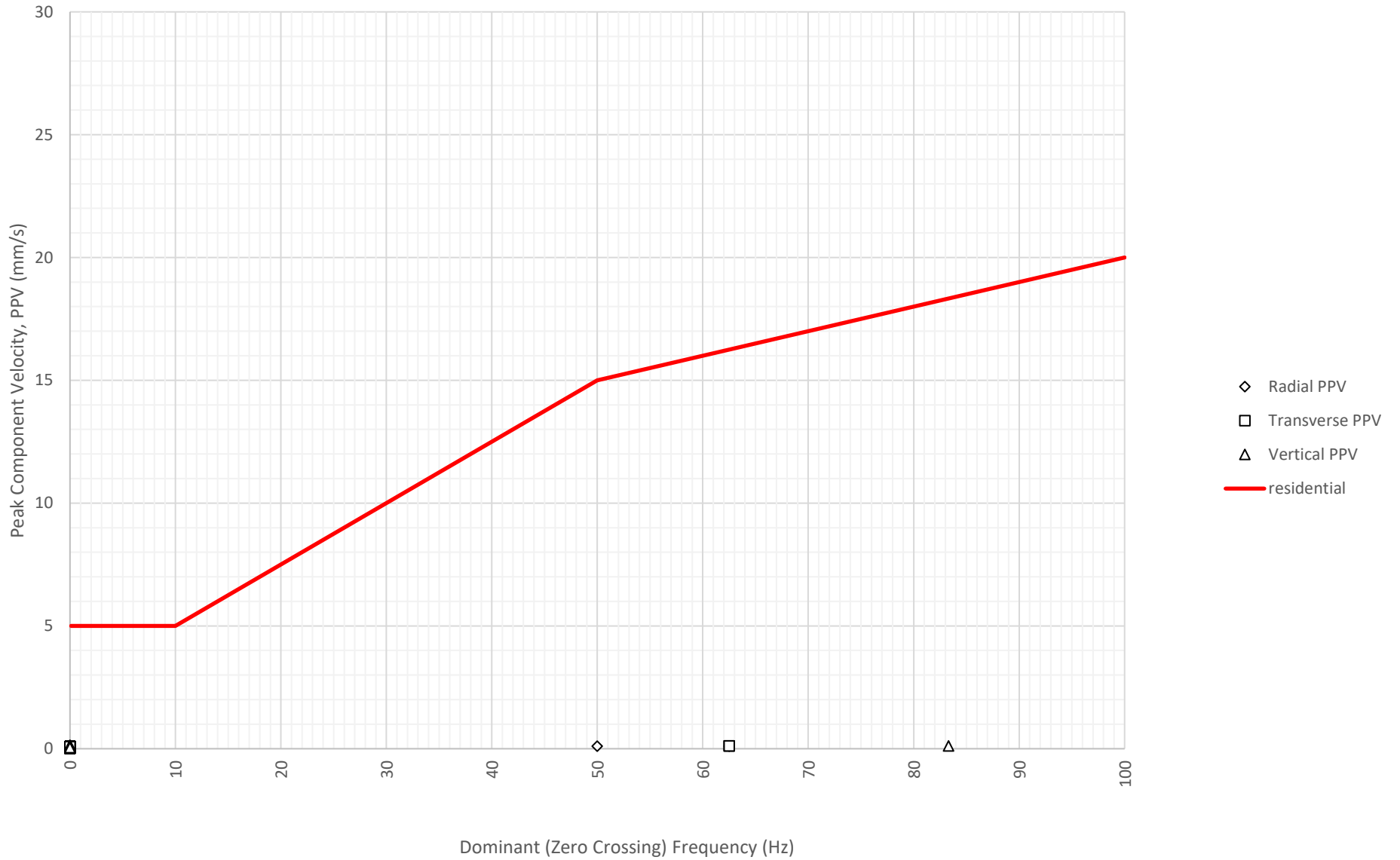
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 8-10-2022



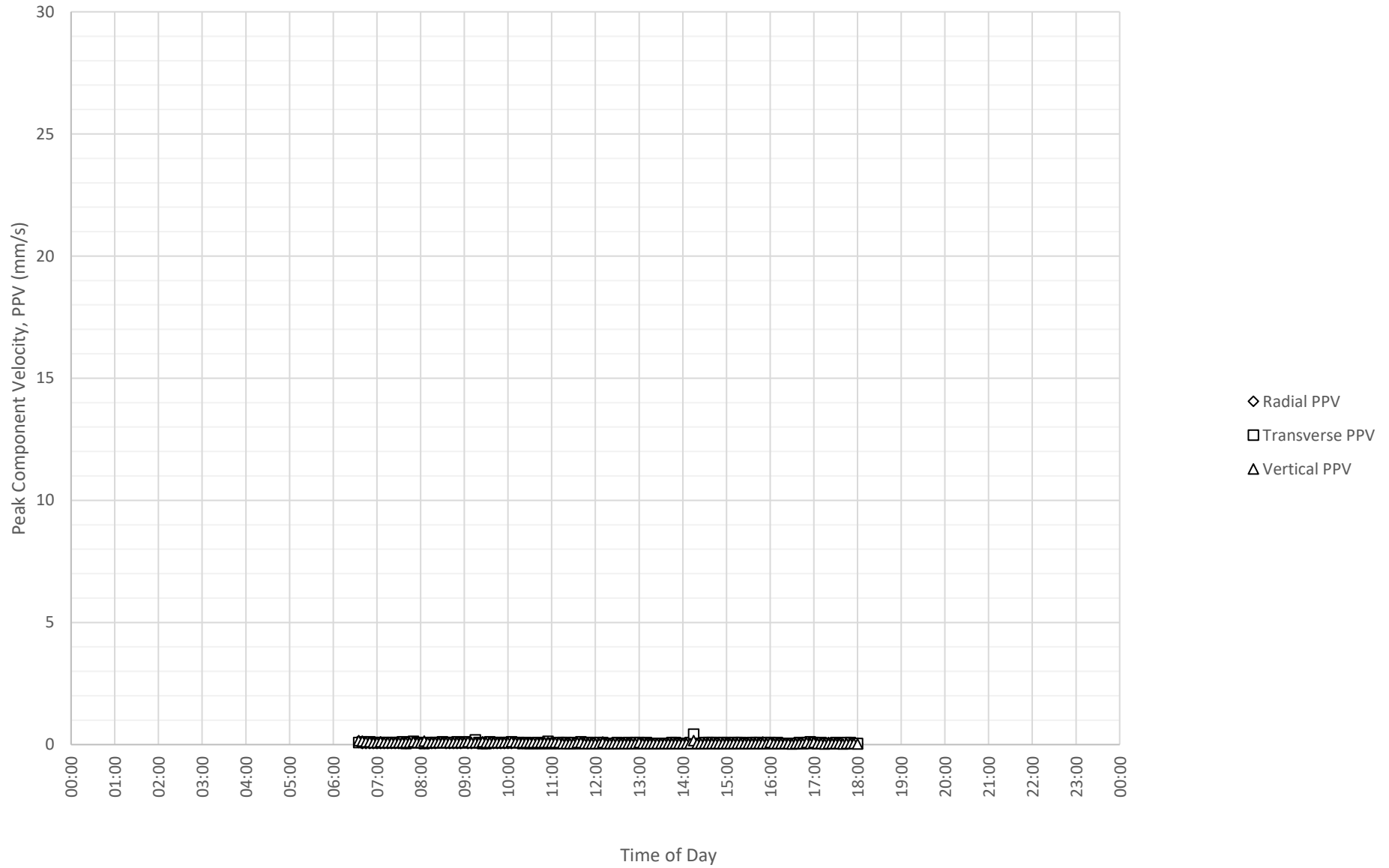
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 9-10-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 9-10-2022

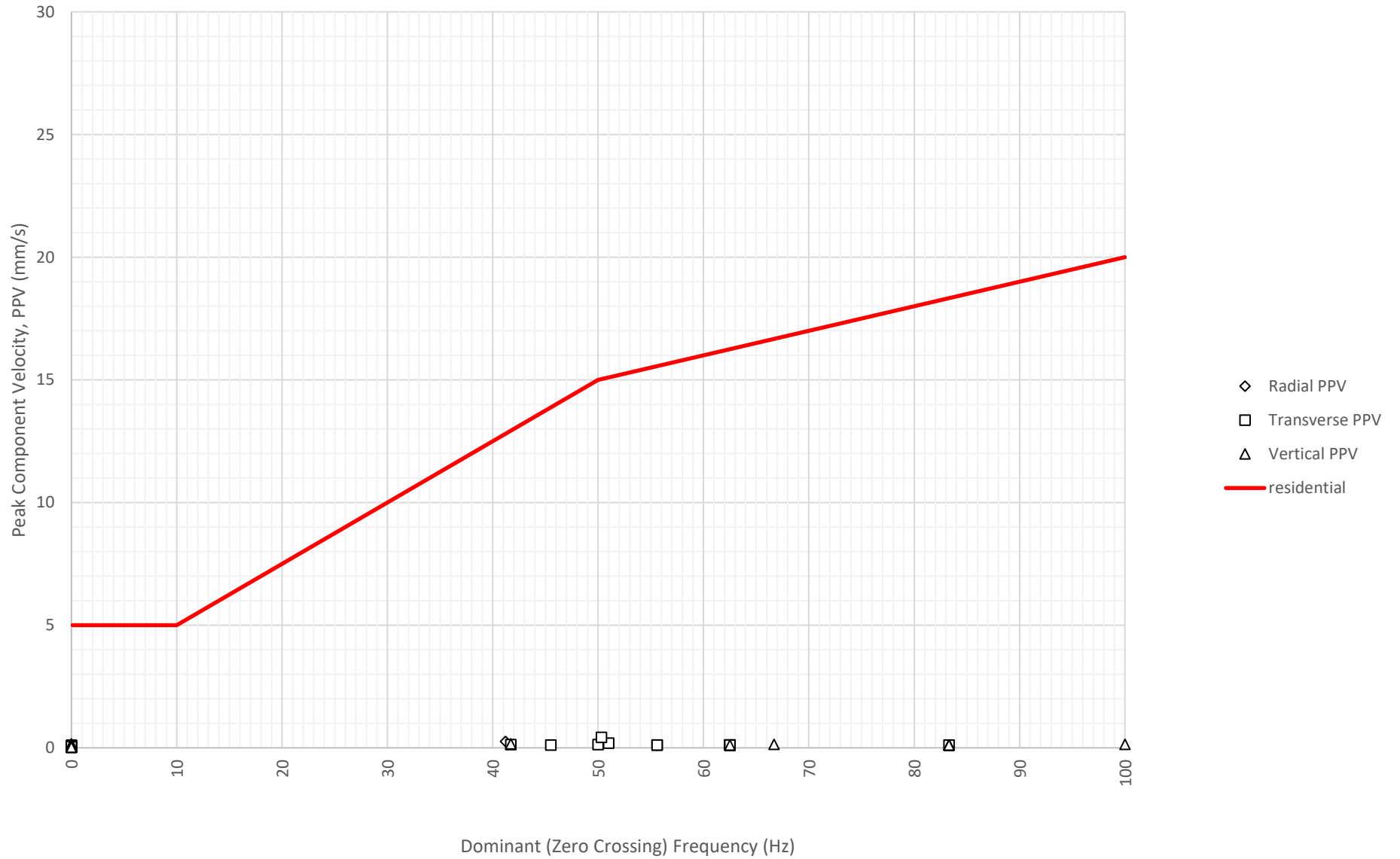


# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 10-10-2022

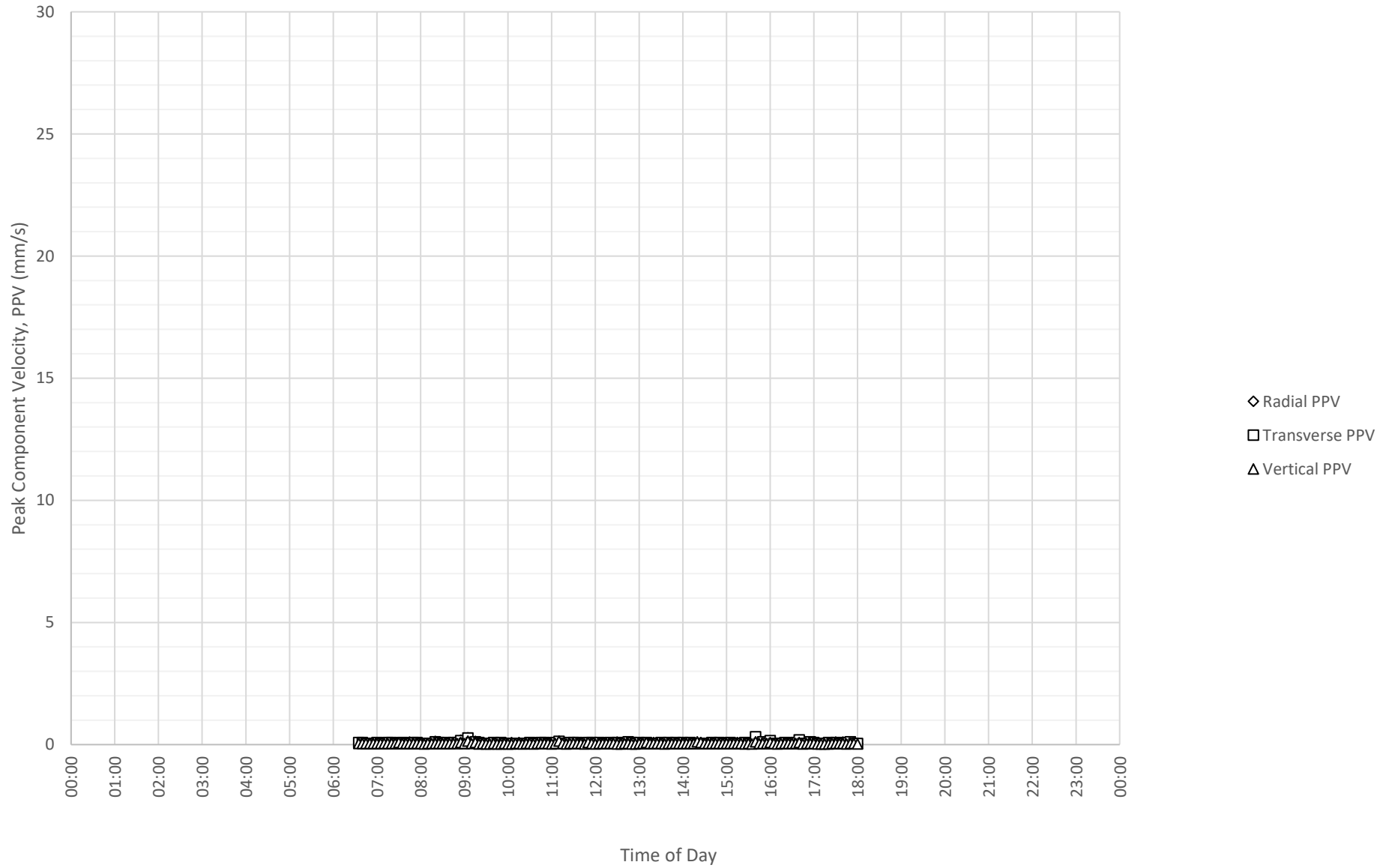




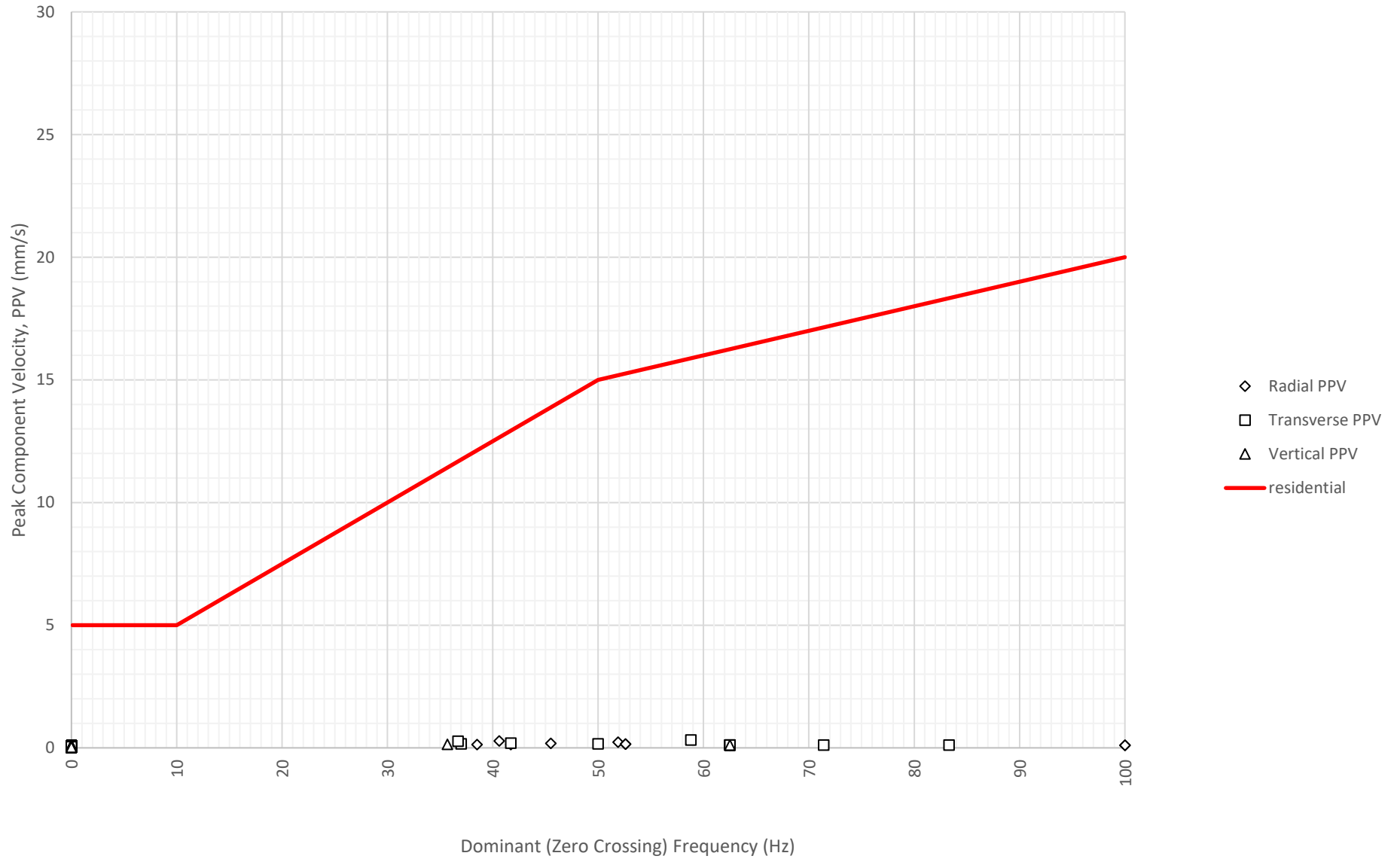
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 10-10-2022



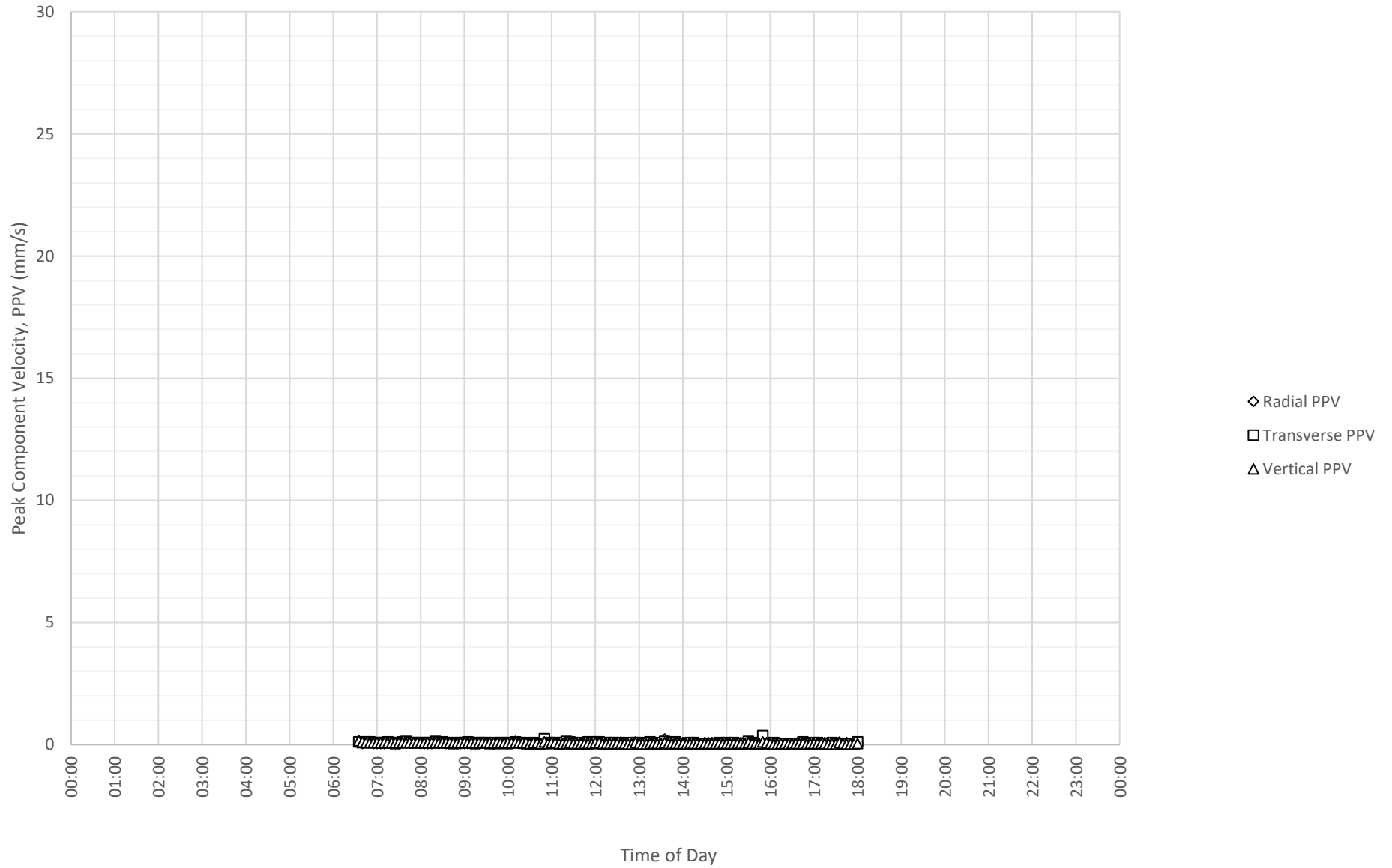
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 11-10-2022



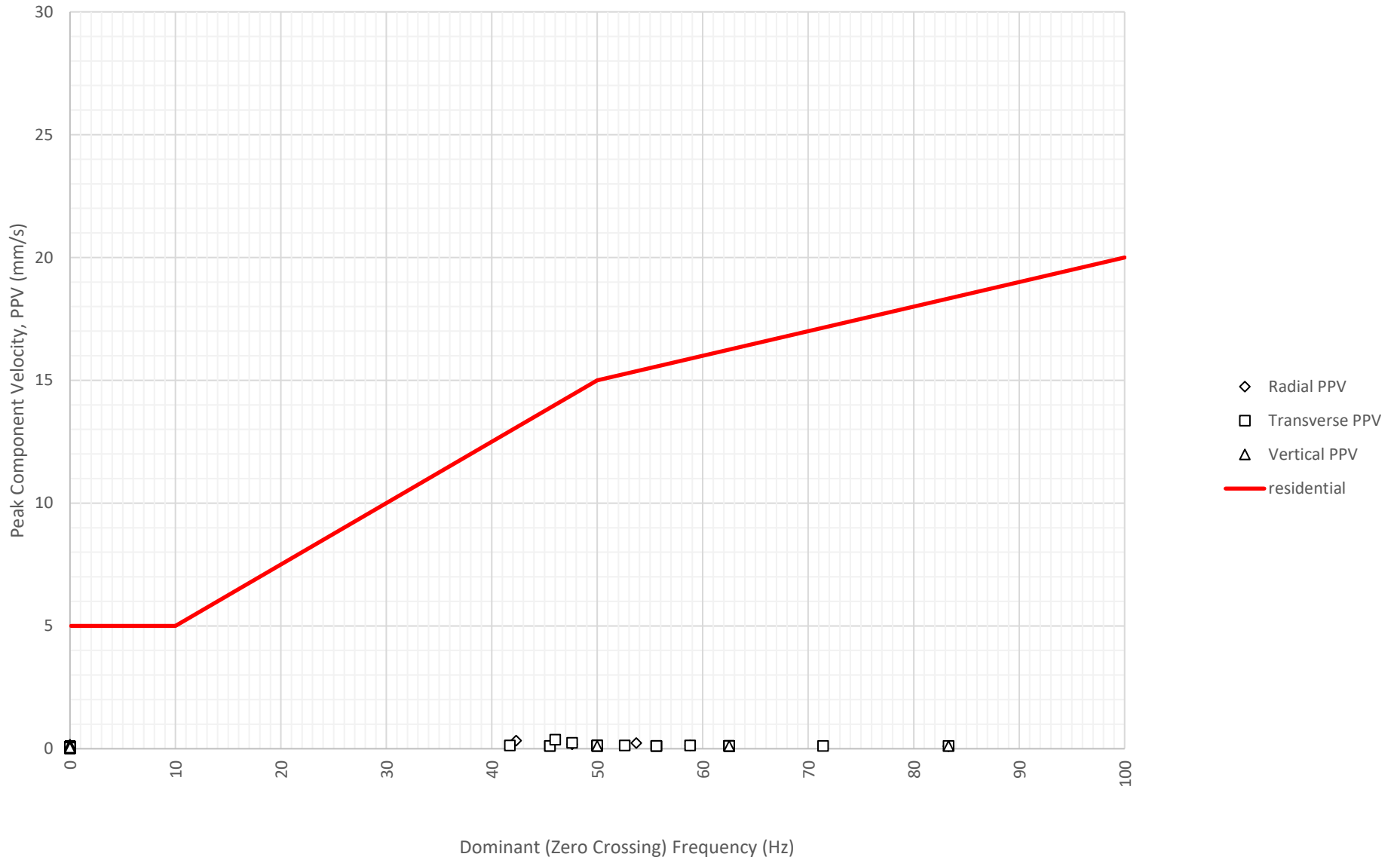
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 11-10-2022



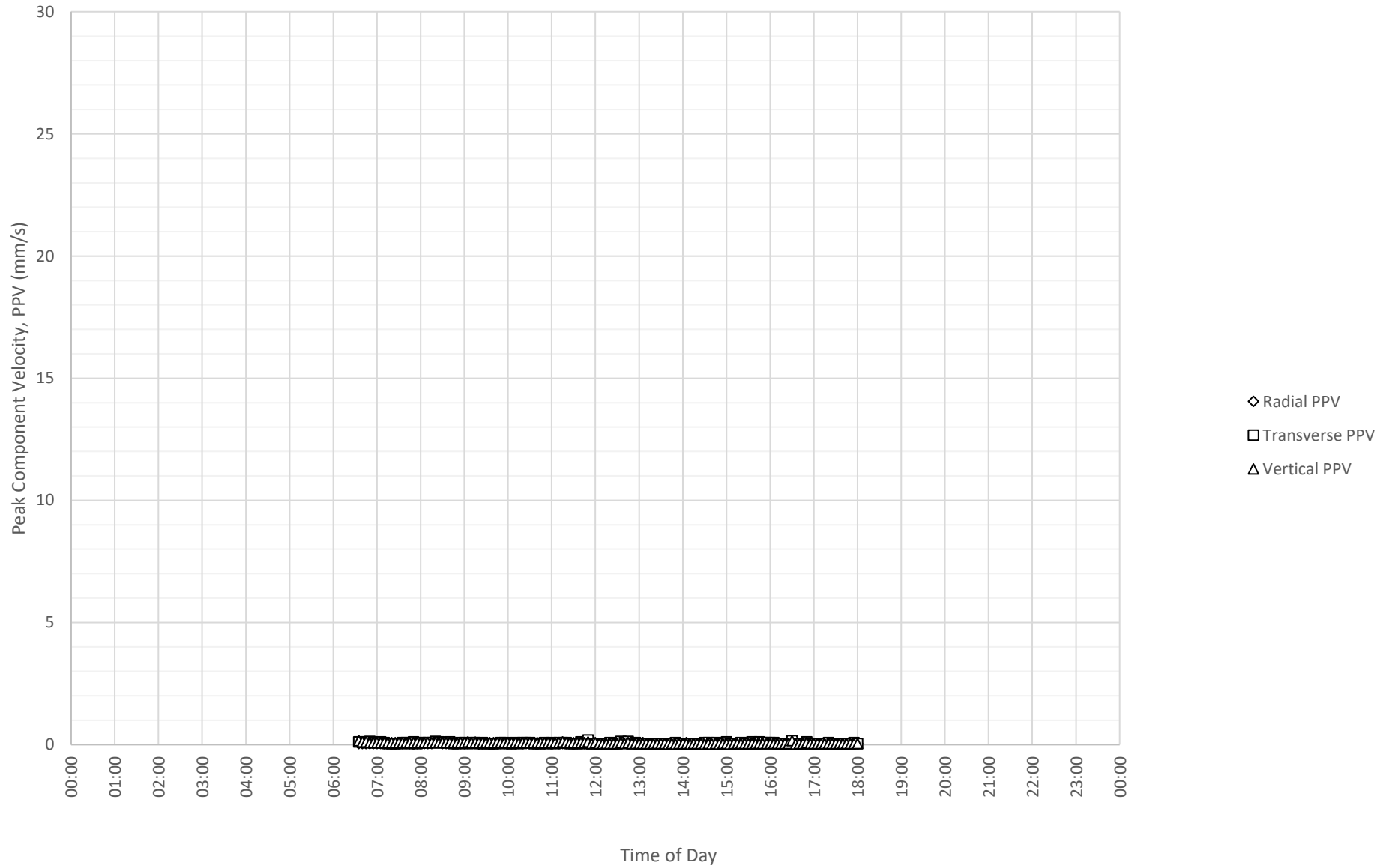
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 12-10-2022



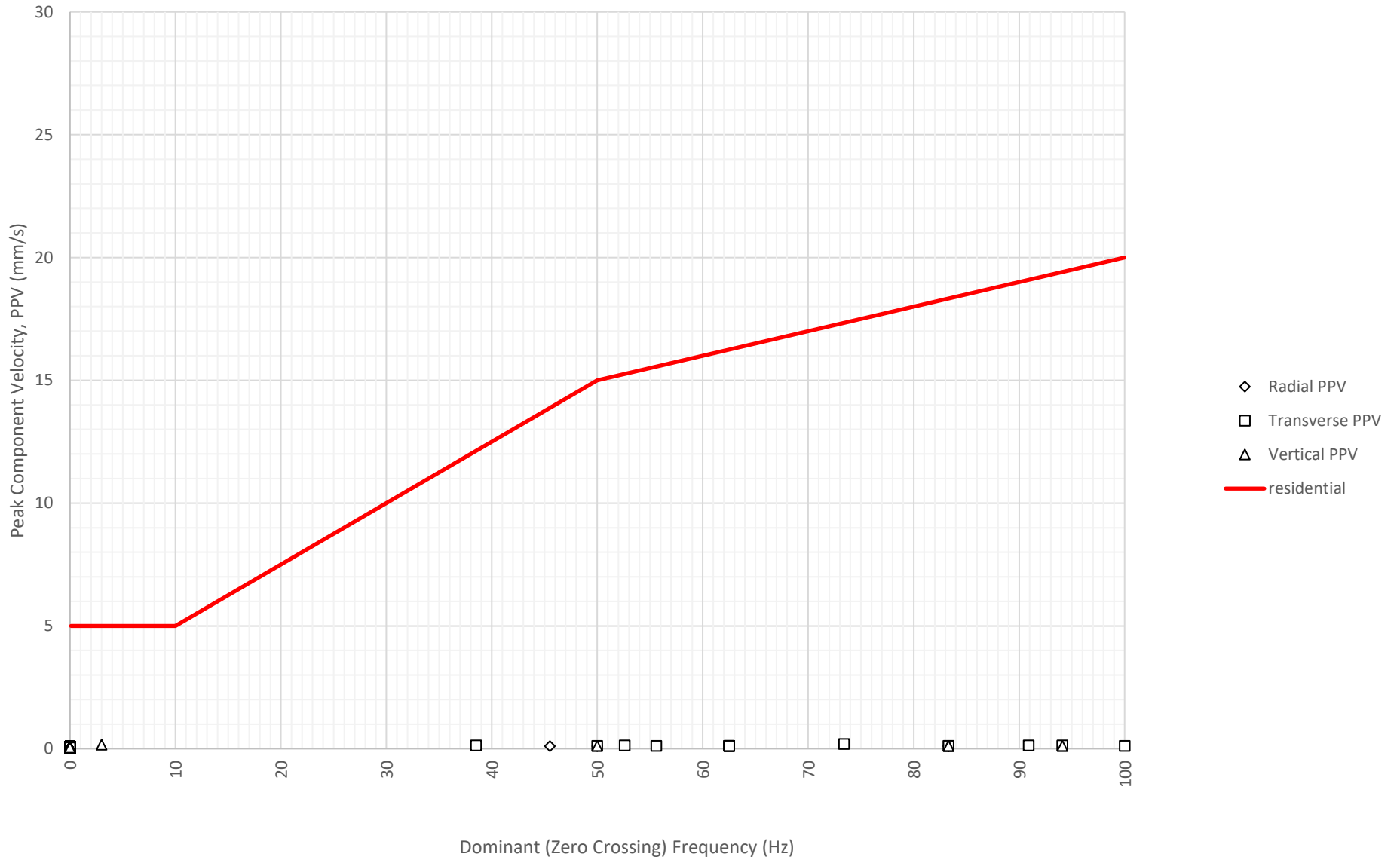
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on  
12-10-2022



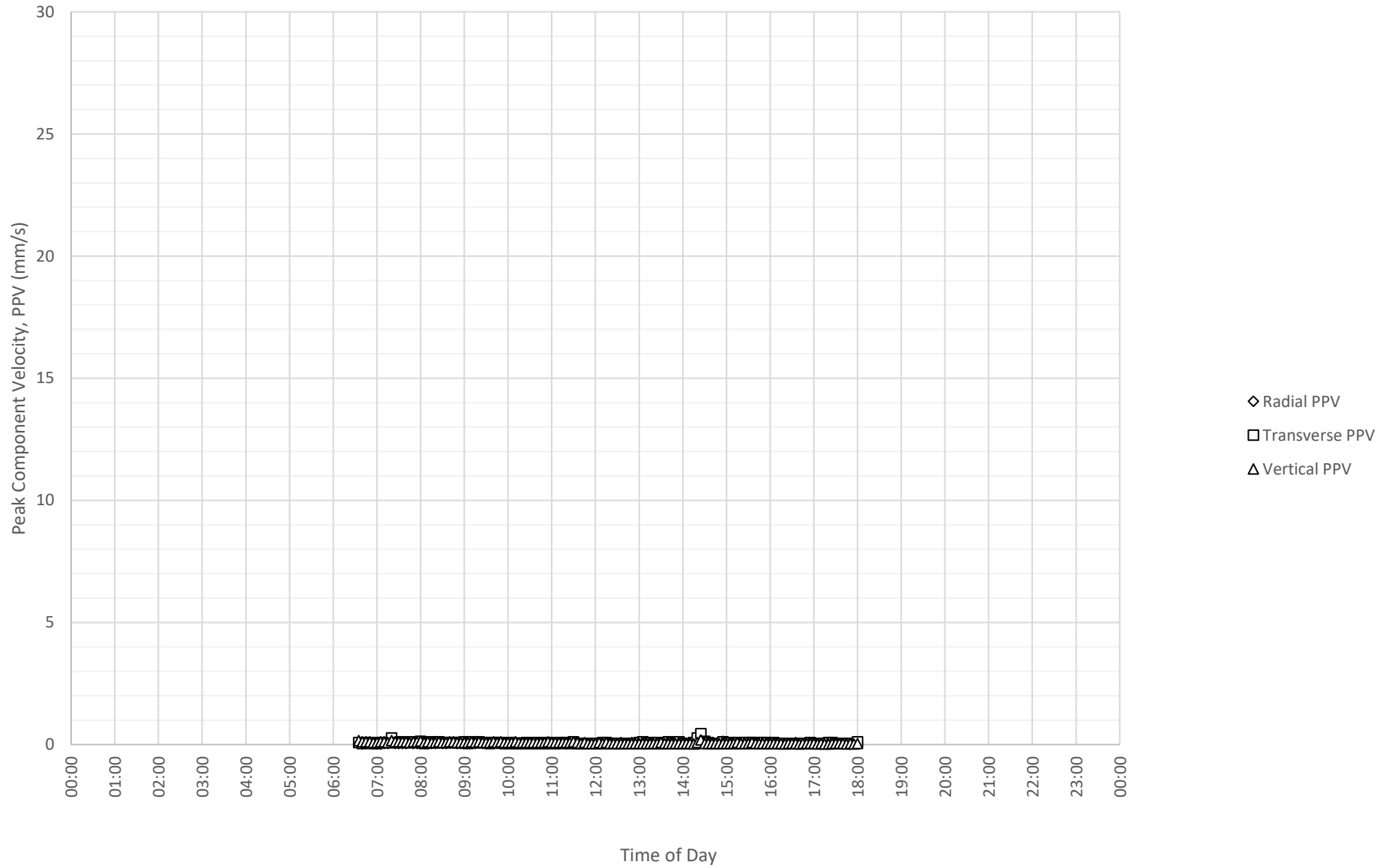
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 13-10-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 13-10-2022

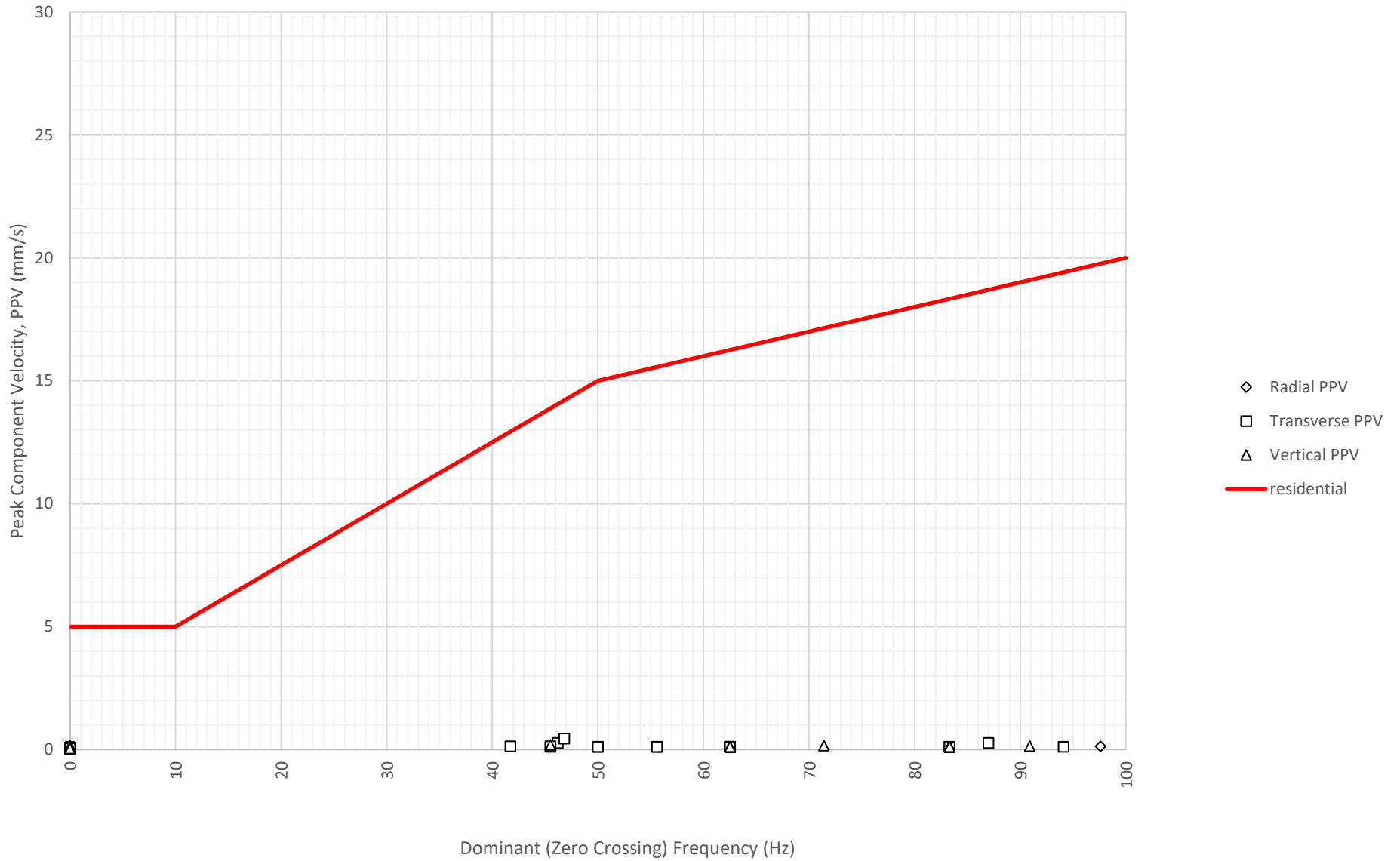


# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 14-10-2022

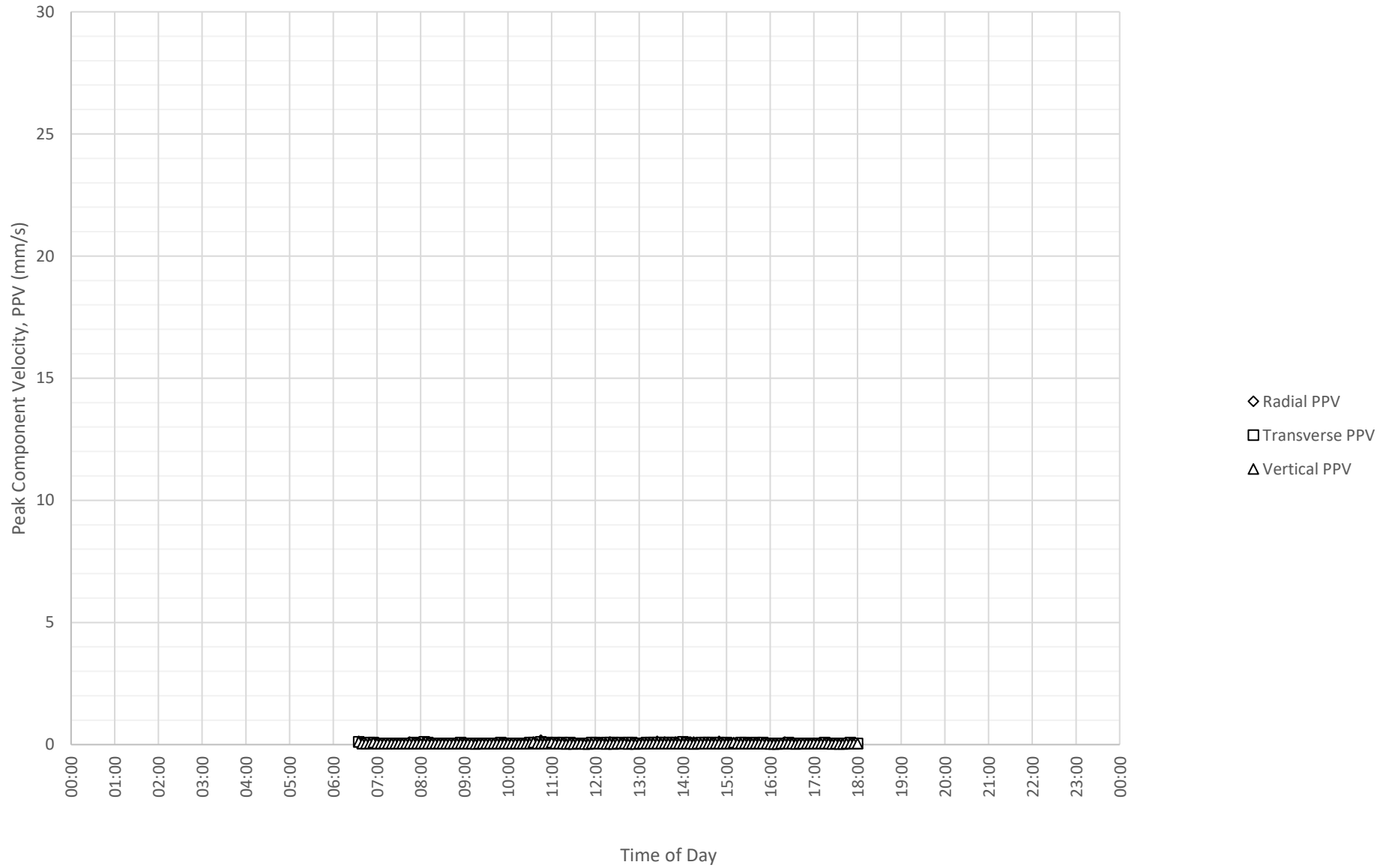




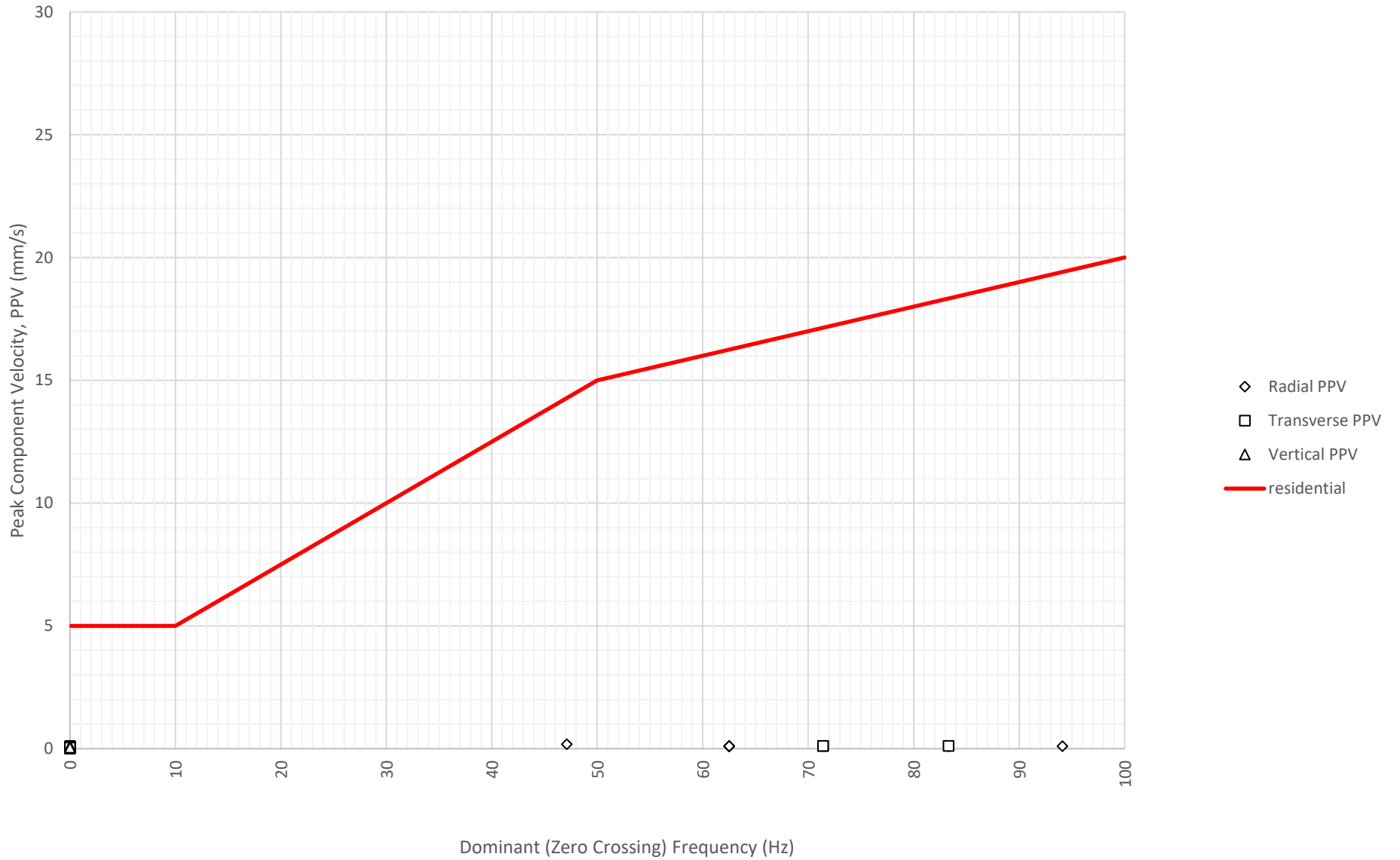
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 14-10-2022



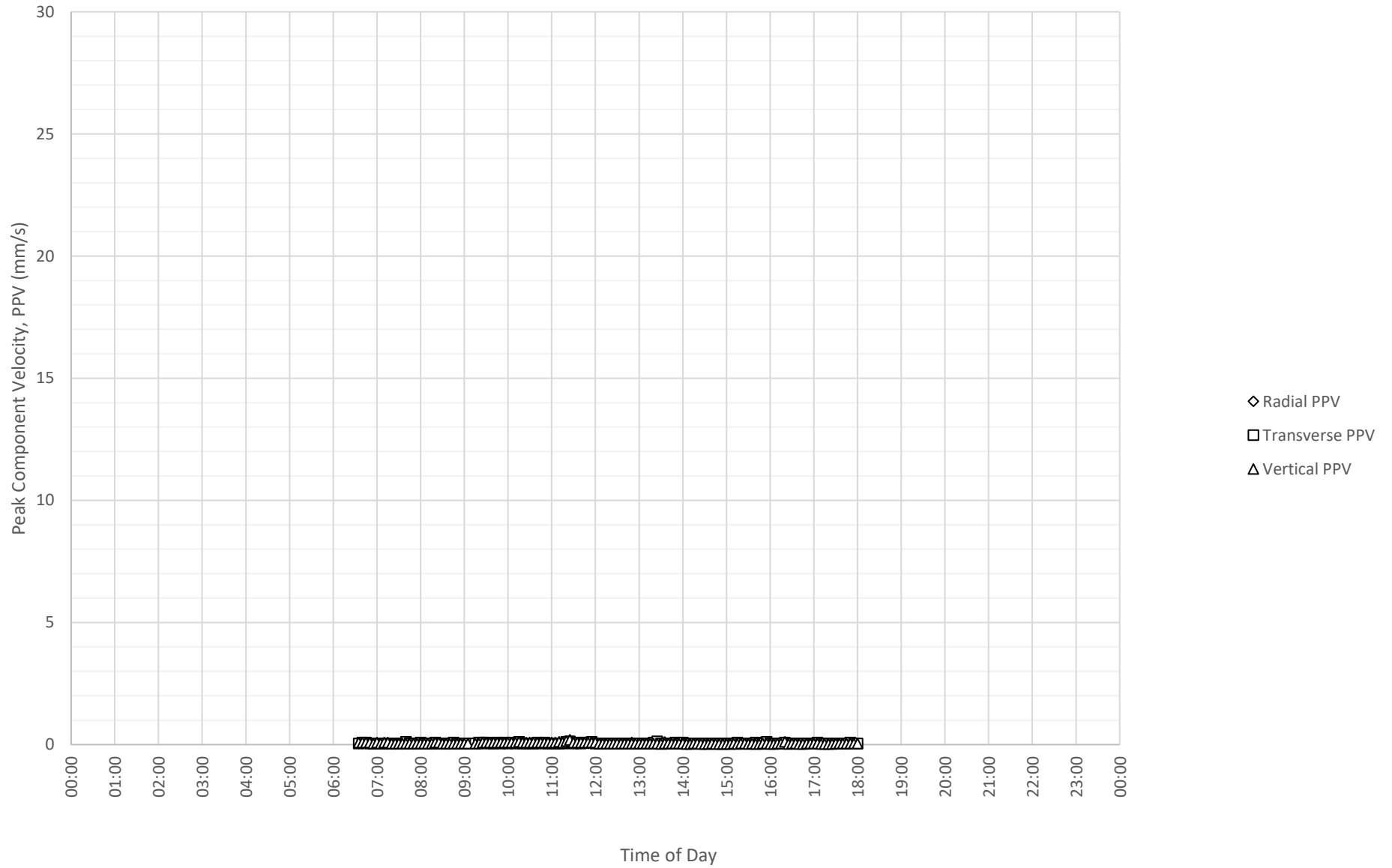
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 15-10-2022



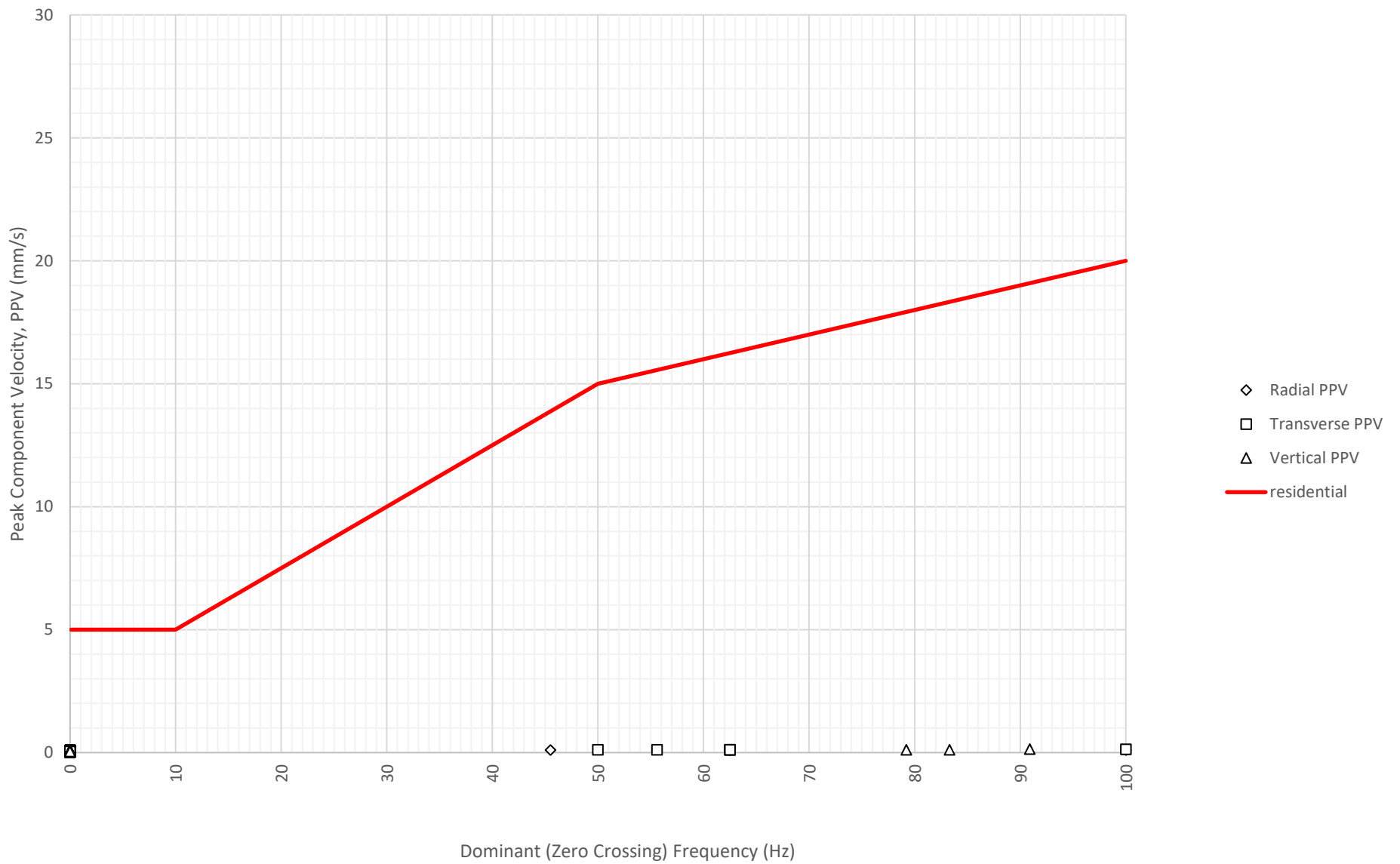
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 15-10-2022



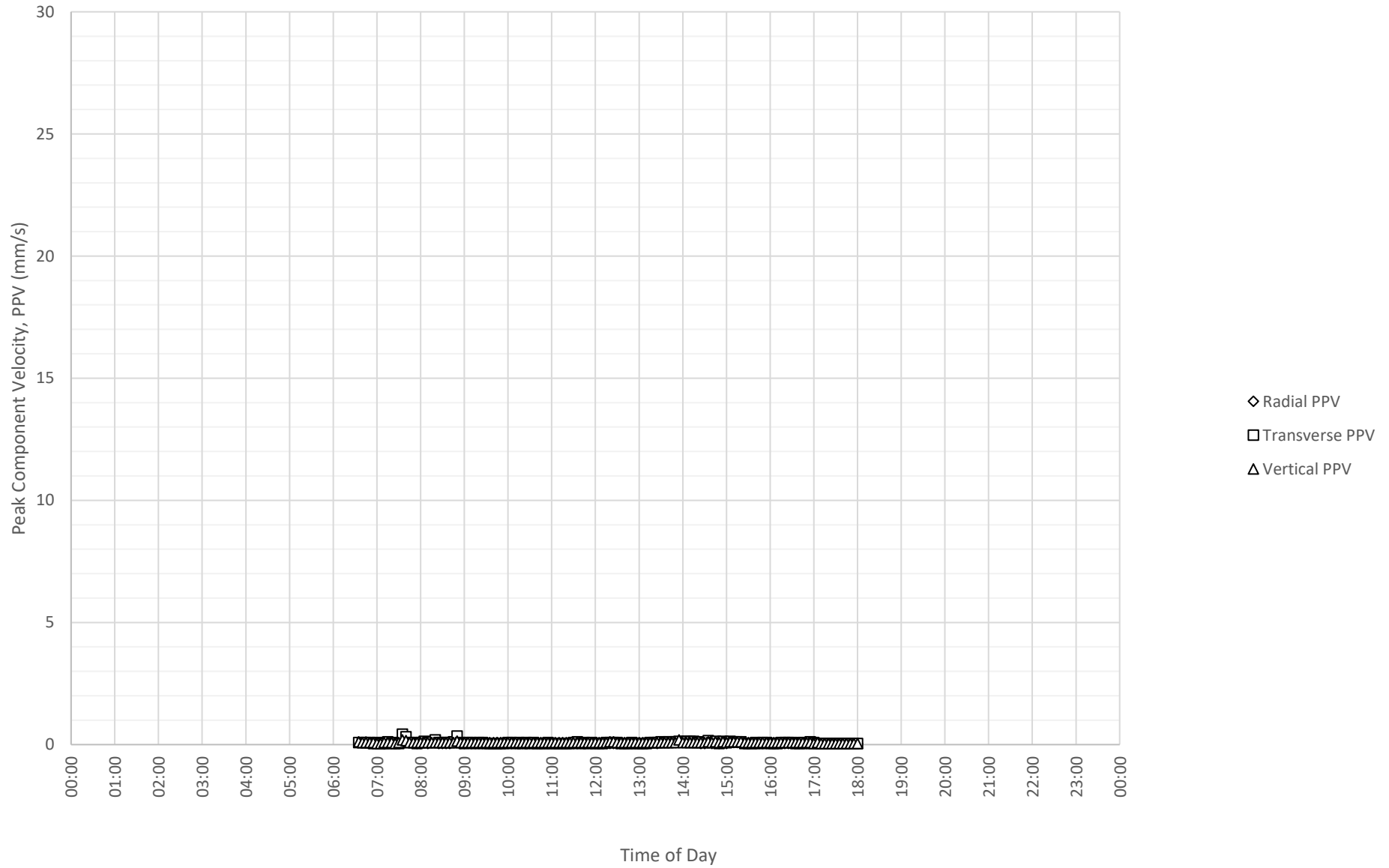
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 16-10-2022



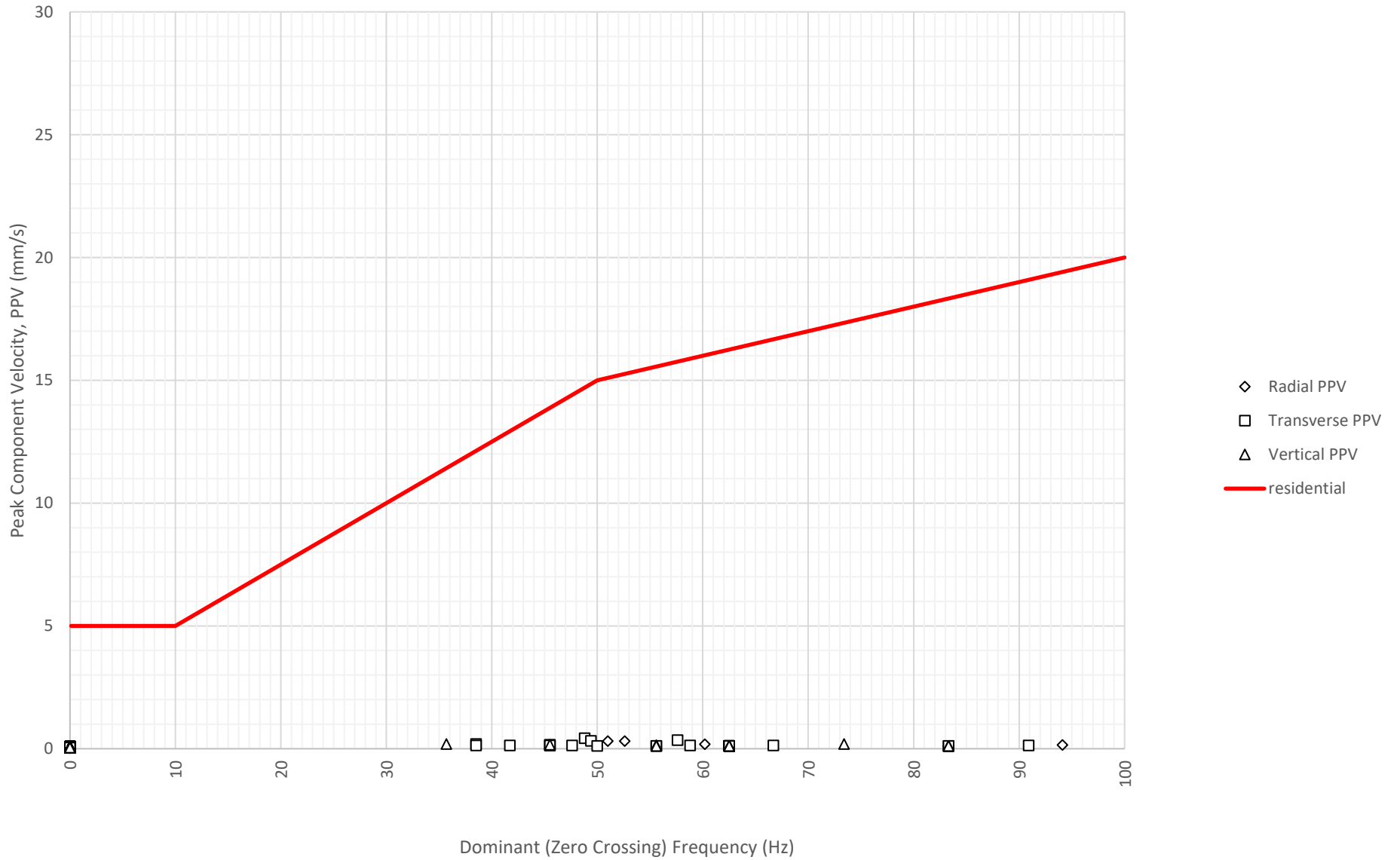
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 16-10-2022



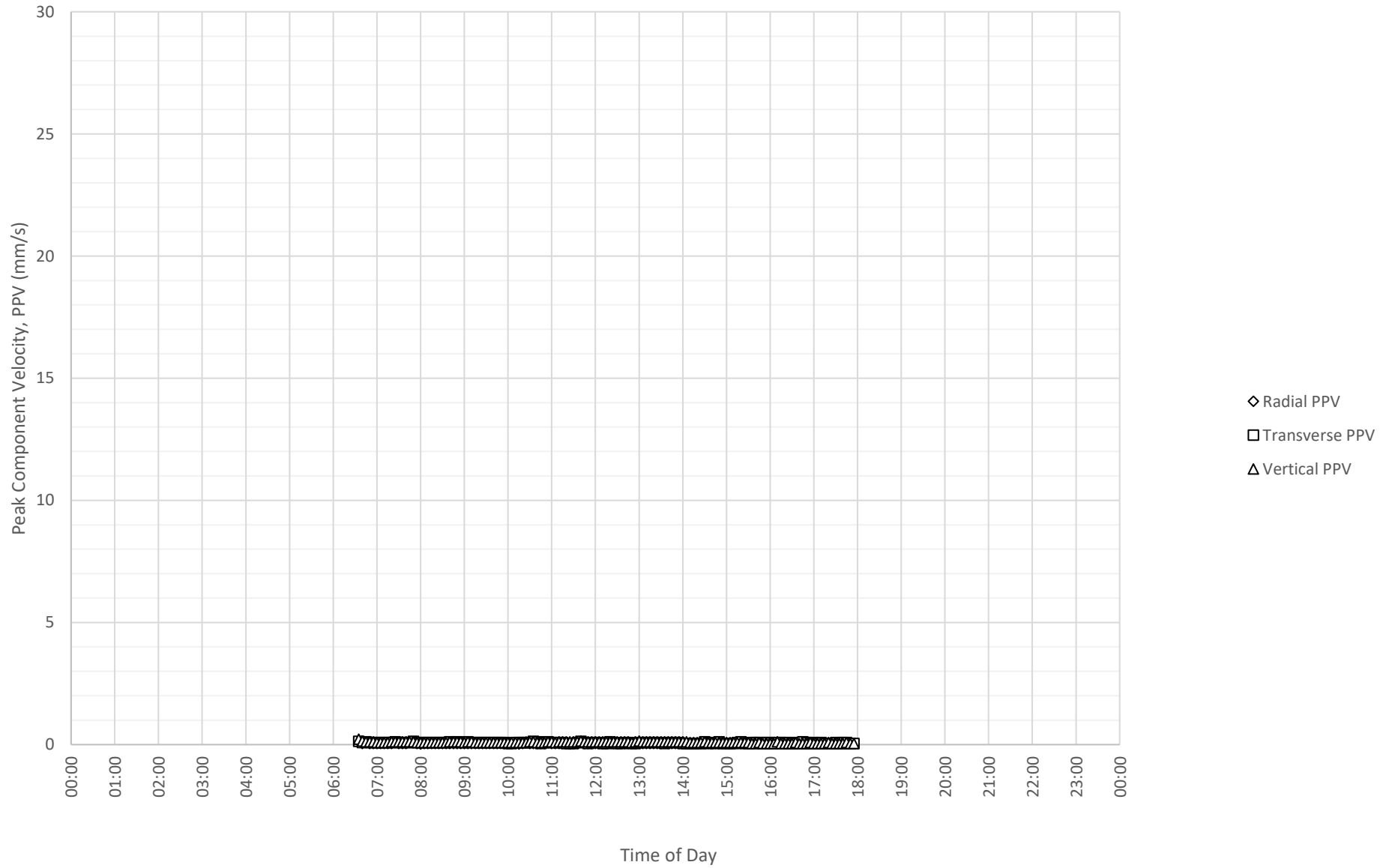
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 17-10-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 17-10-2022

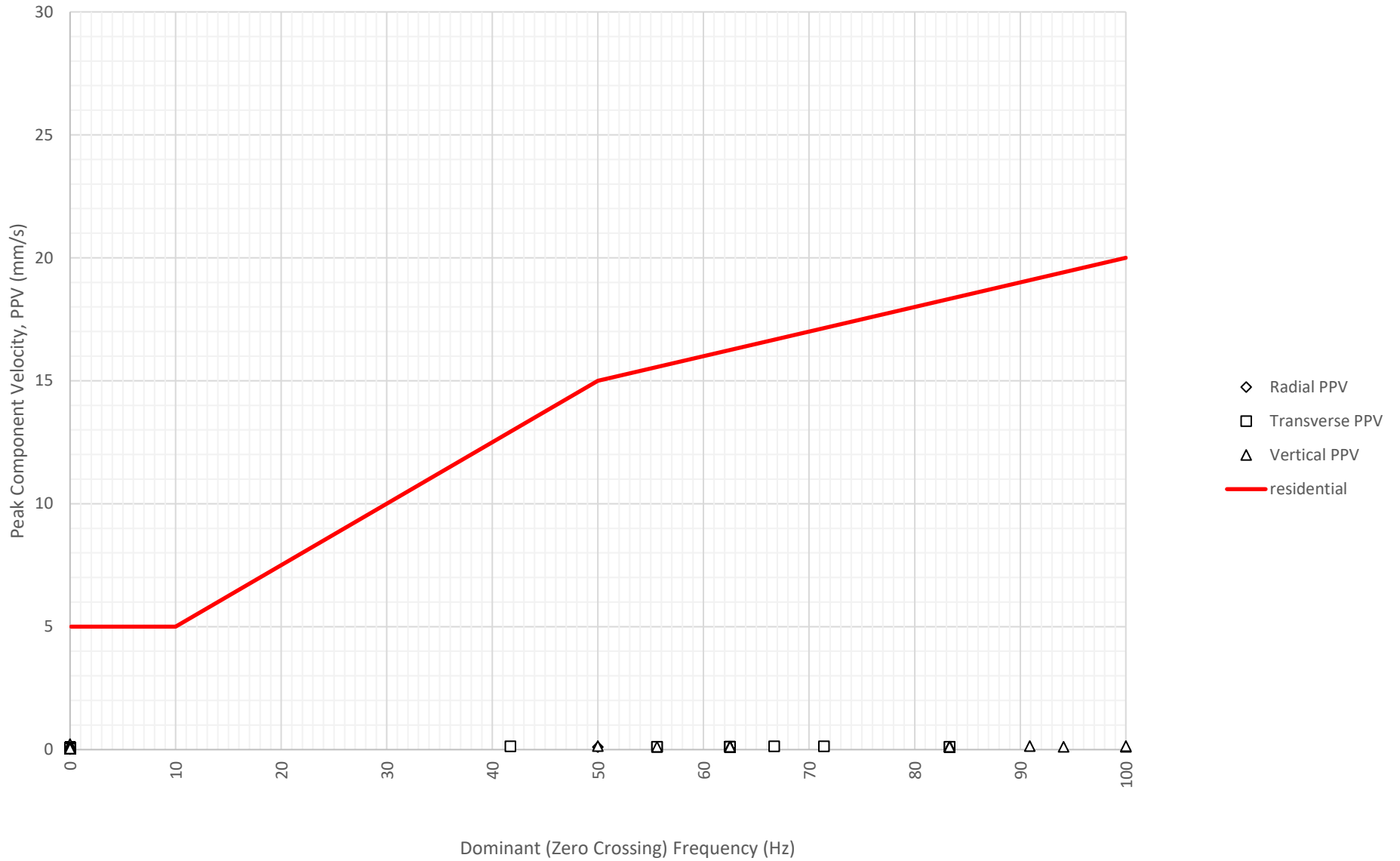


# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 18-10-2022

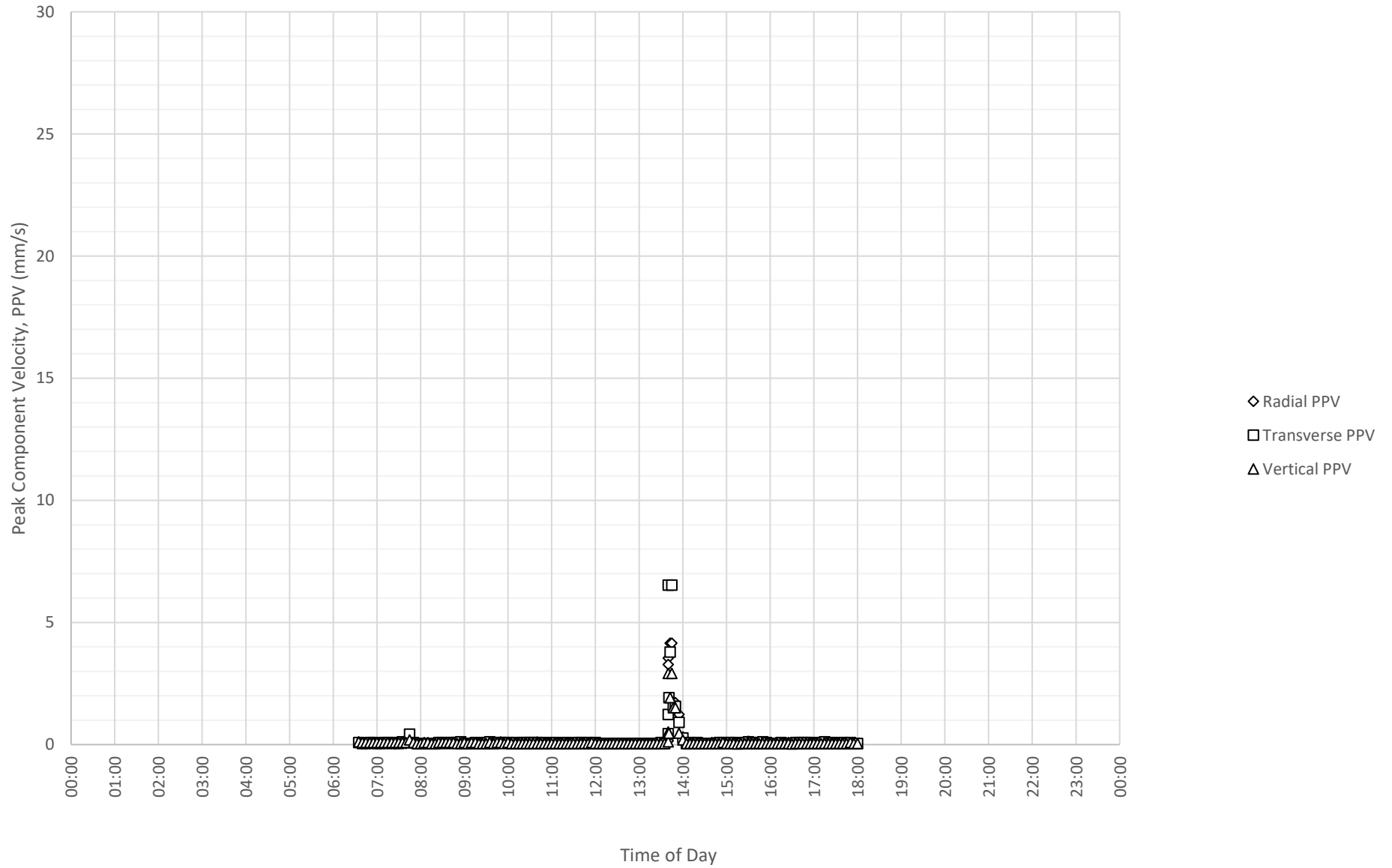




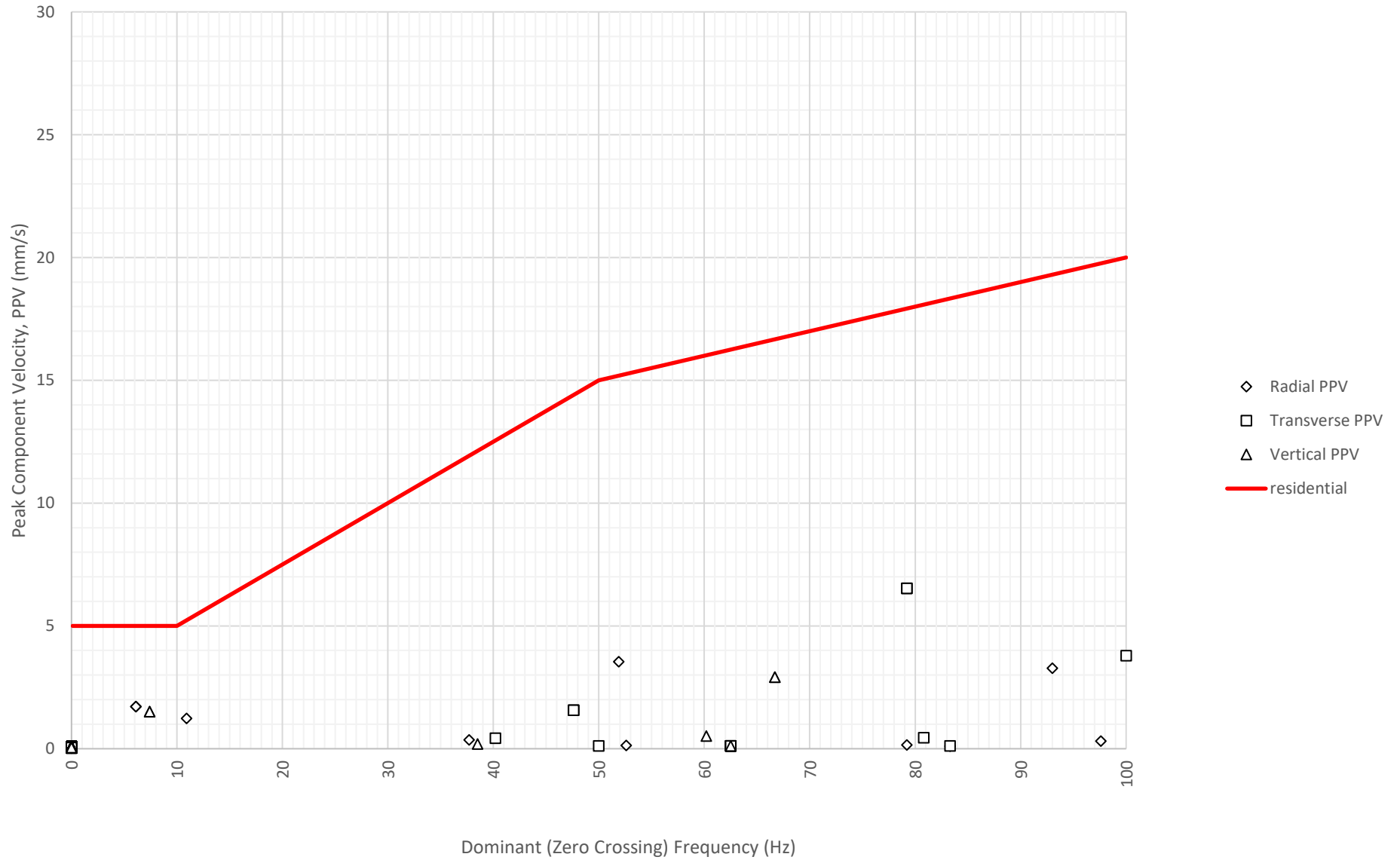
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 18-10-2022



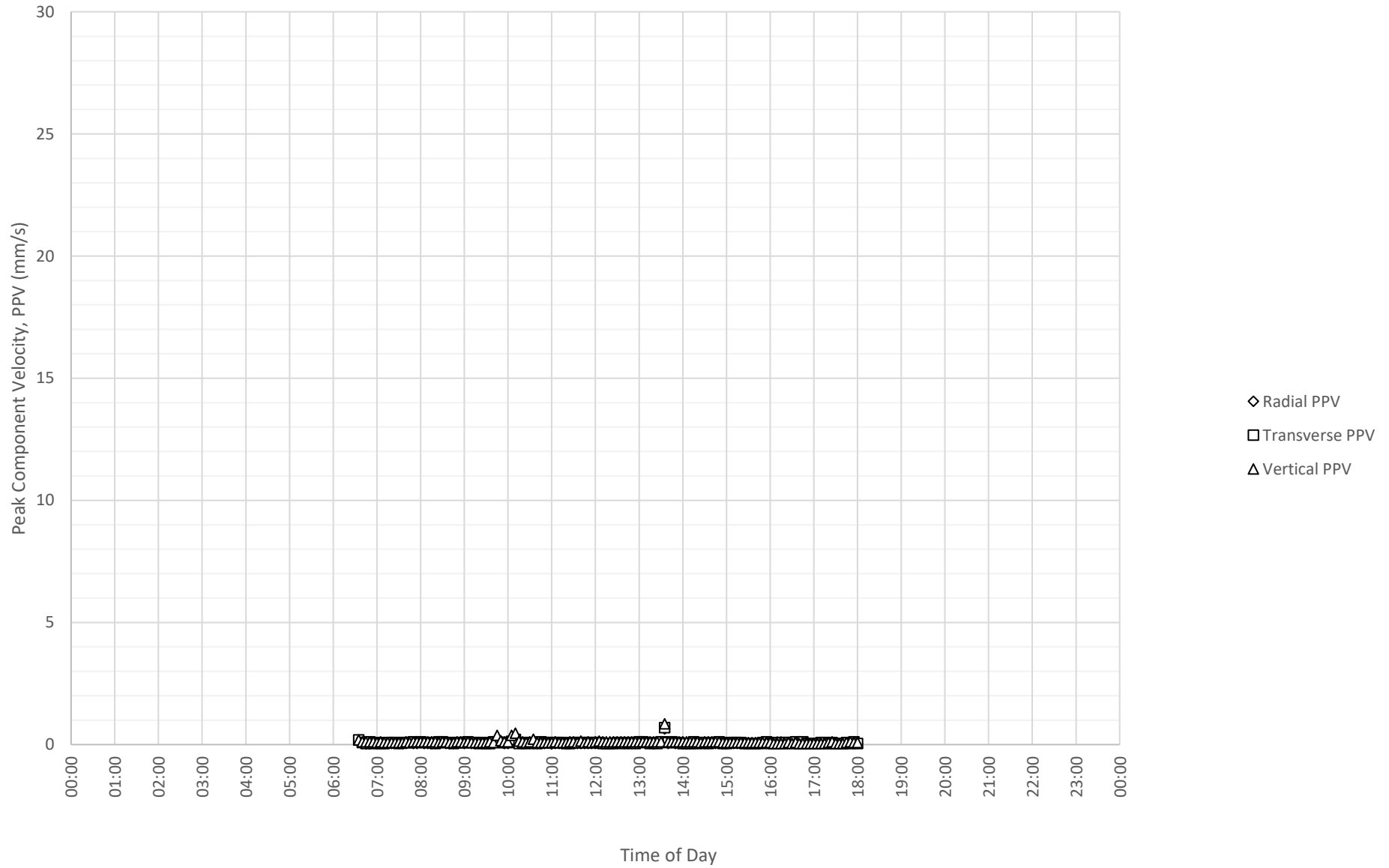
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 19-10-2022



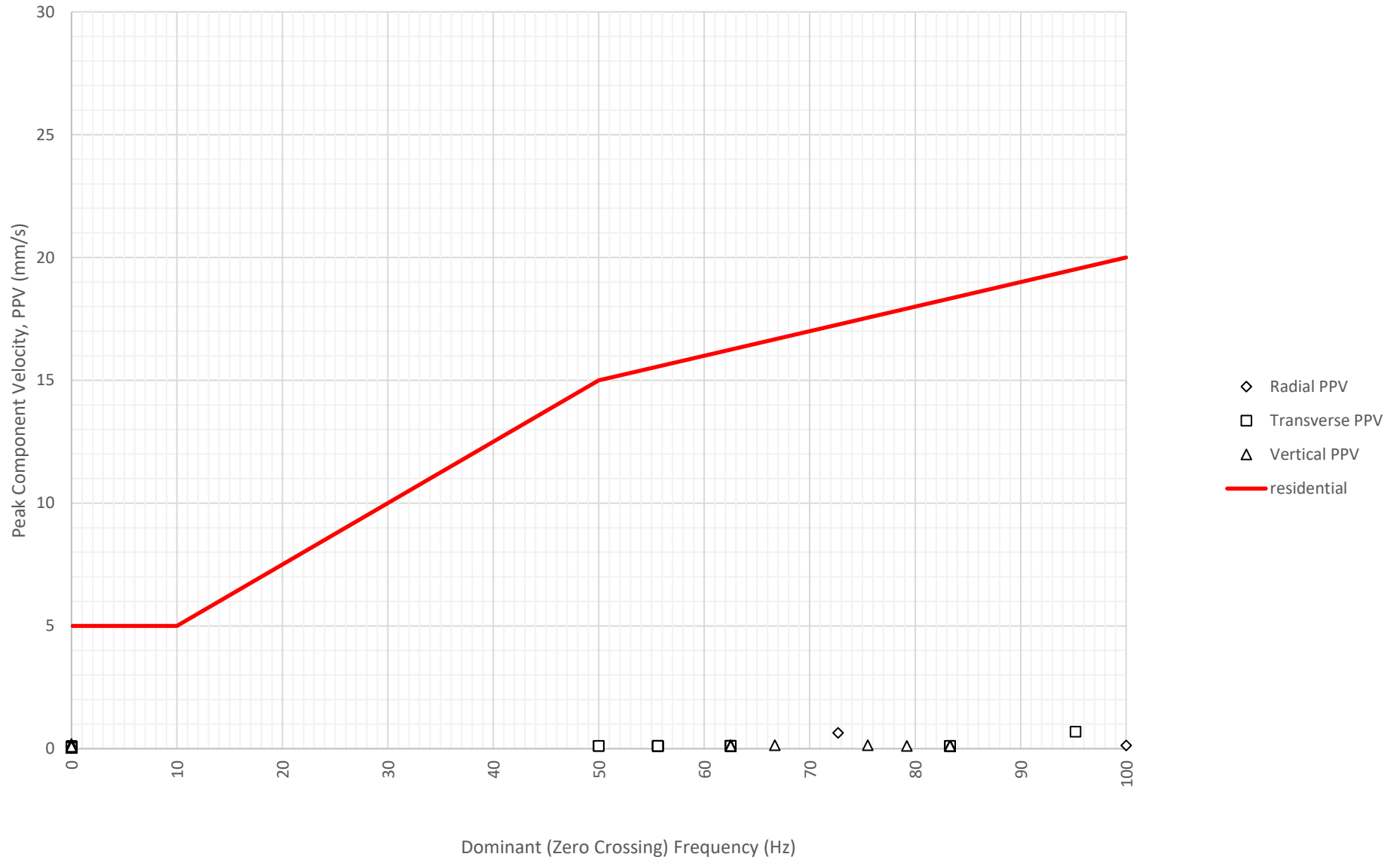
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 19-10-2022



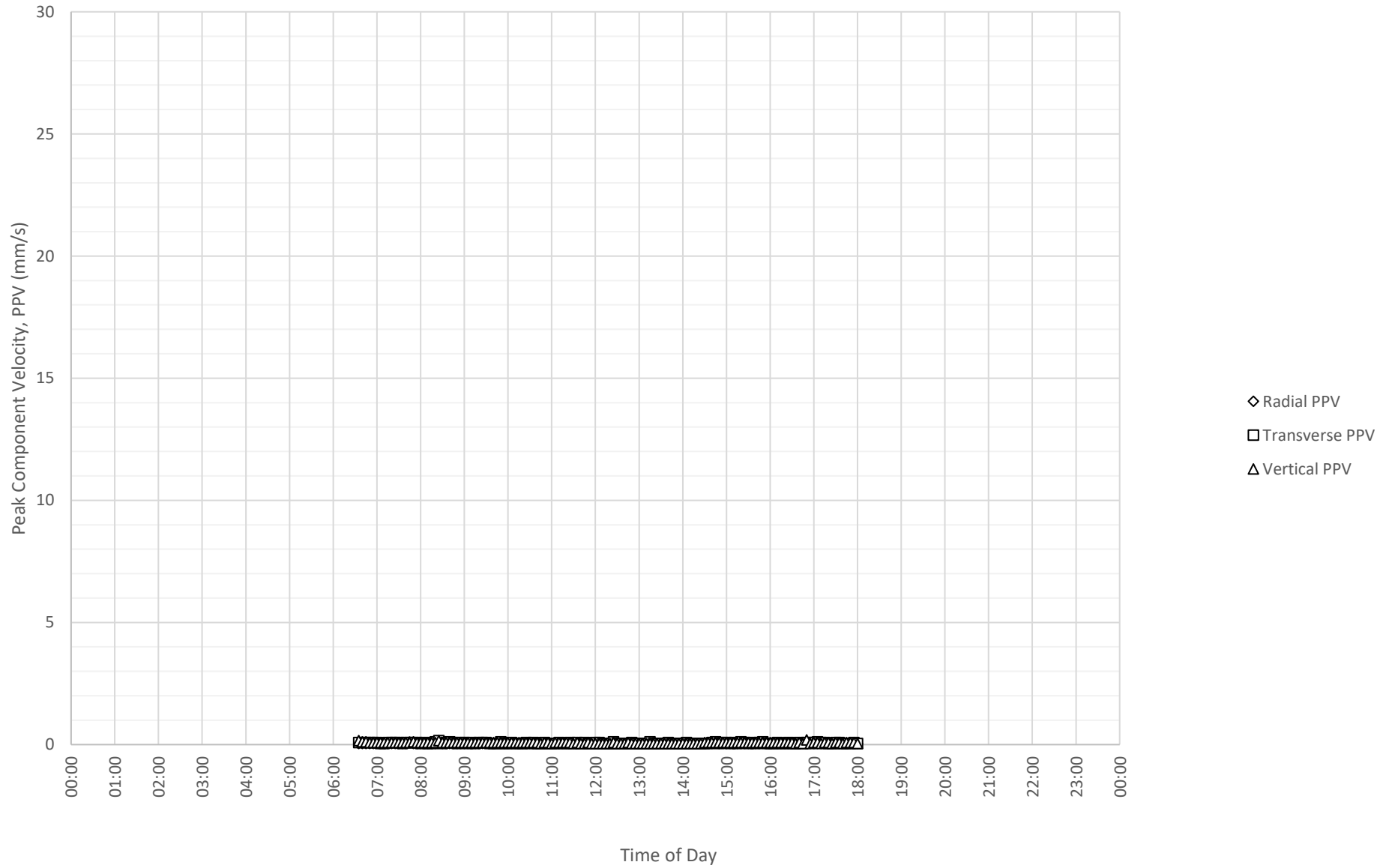
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 20-10-2022



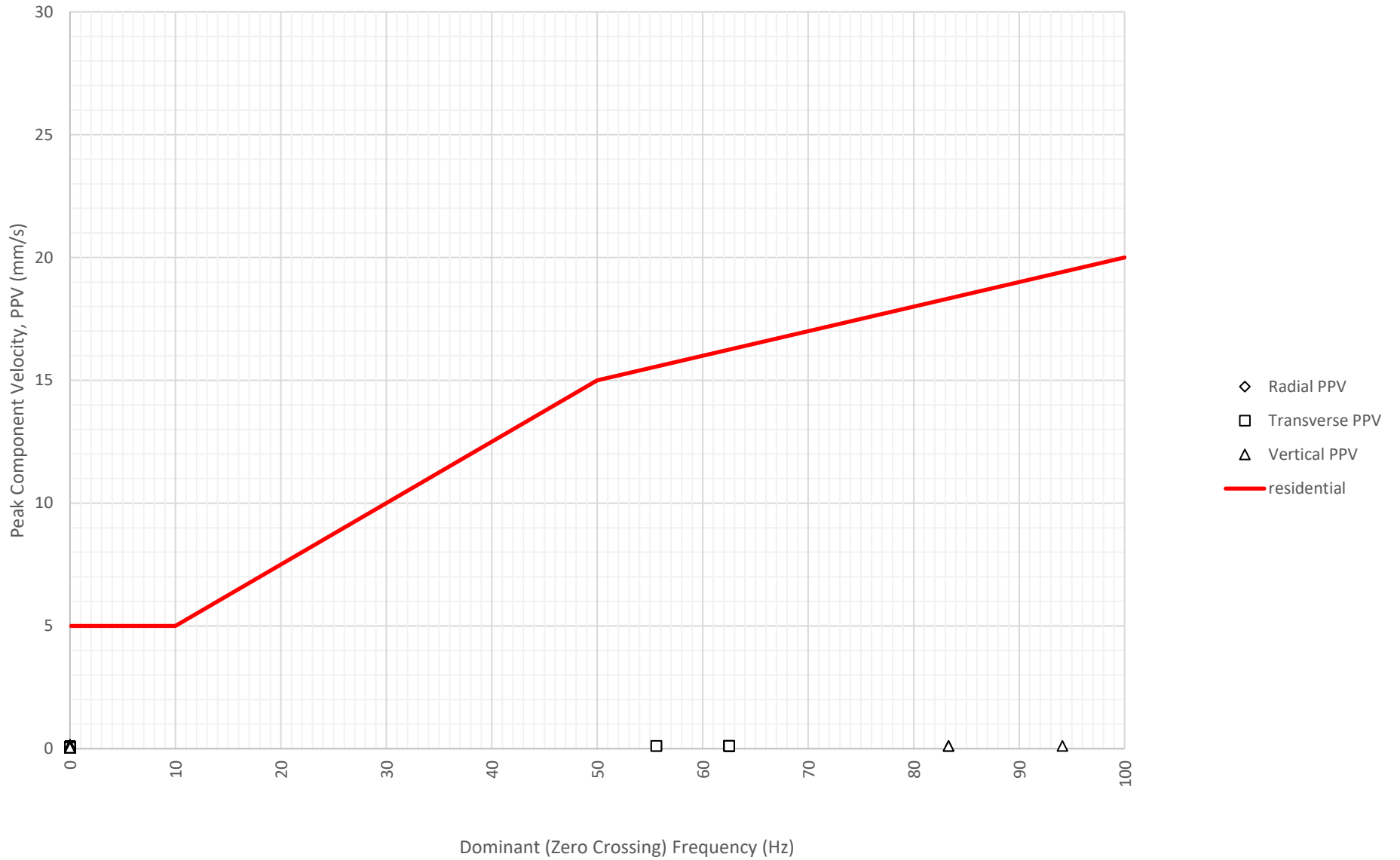
Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 20-10-2022



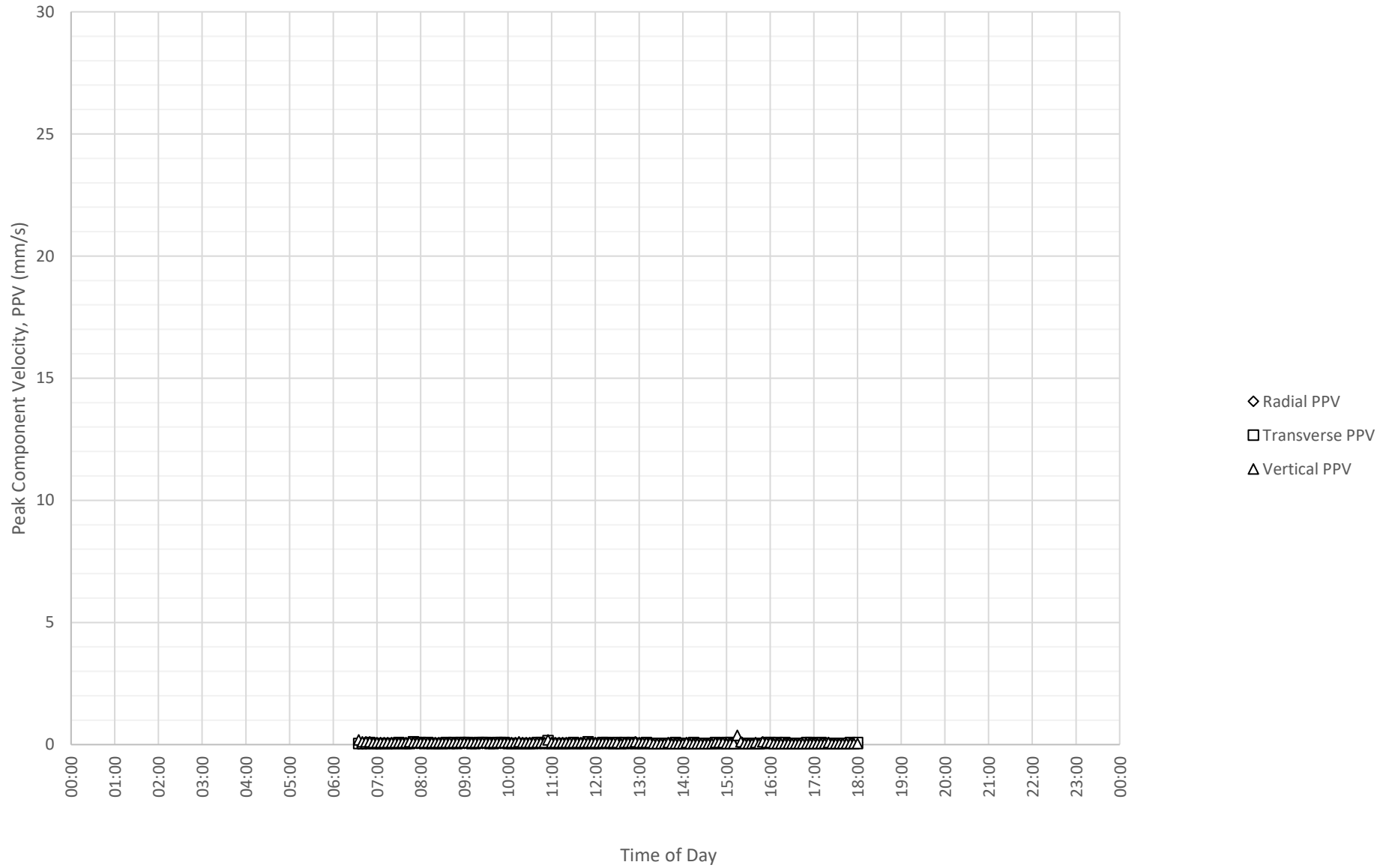
# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 21-10-2022



Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on  
21-10-2022

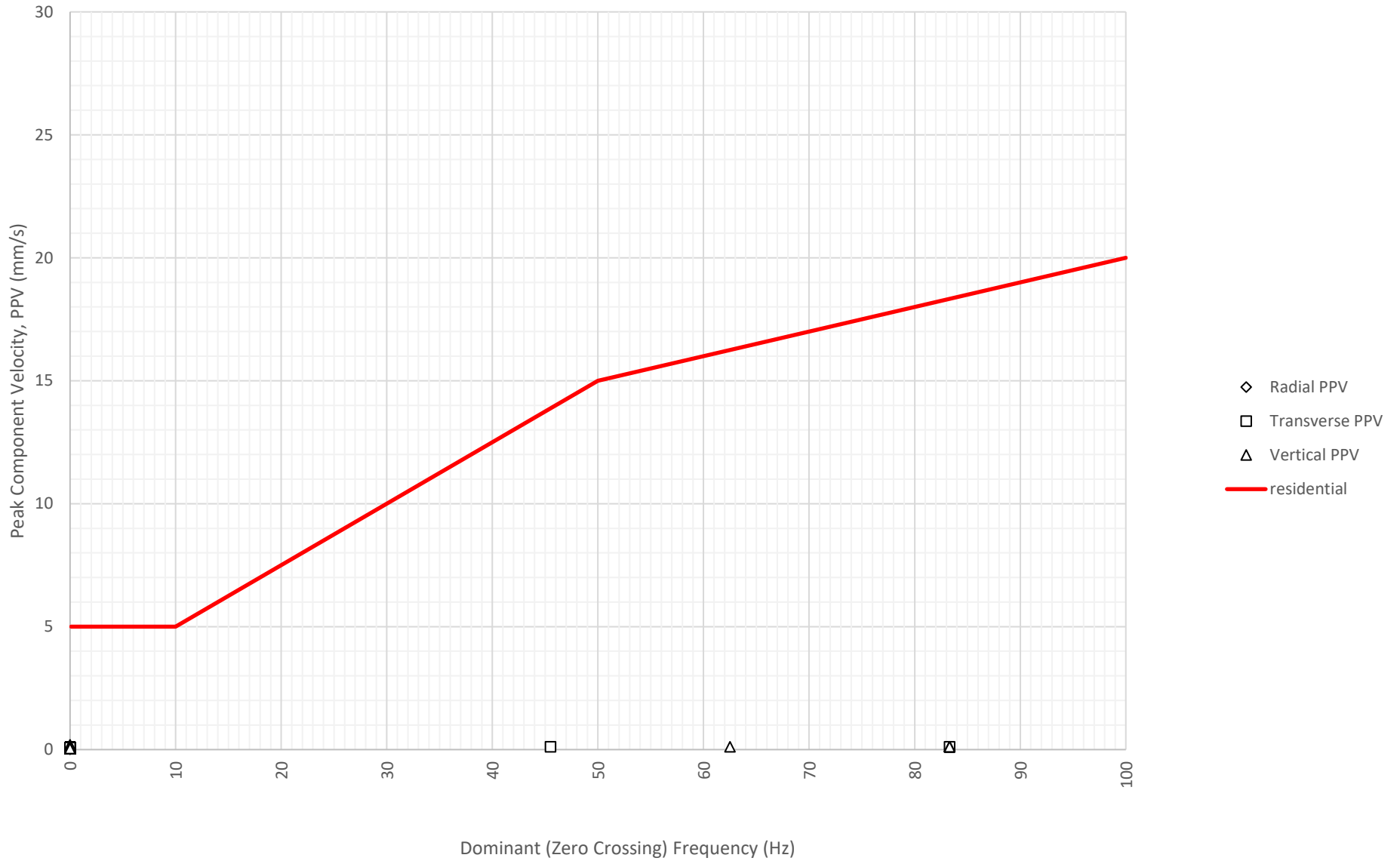


# Daily Monitored Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on 22-10-2022





Frequency Content of Vibration Levels at Corner of Tweed Coast Rd and Cudgen Rd, Tweed Valley on  
22-10-2022

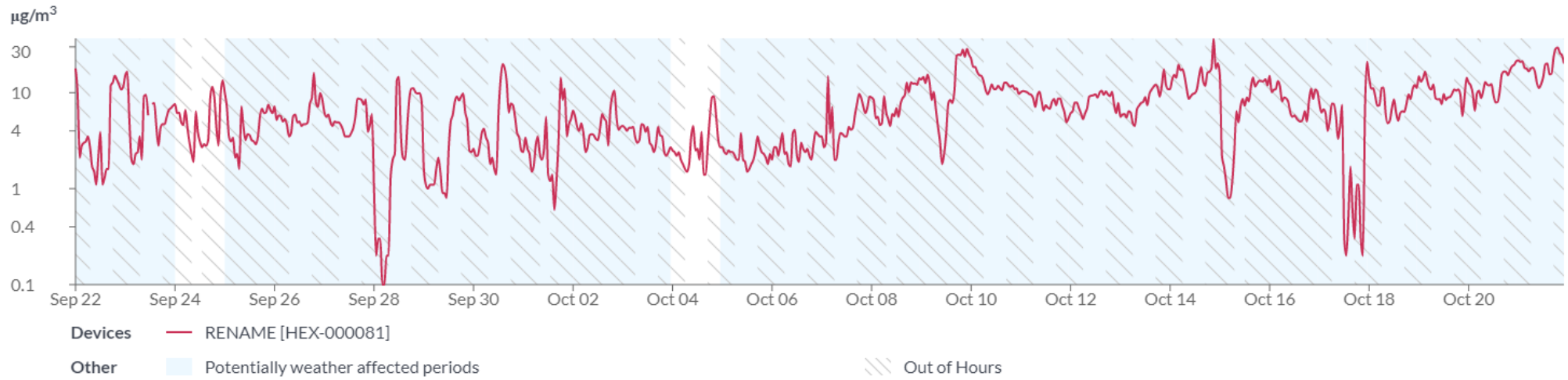


## APPENDIX 3 – DUST MONITORING RESULTS

## Hourly Average

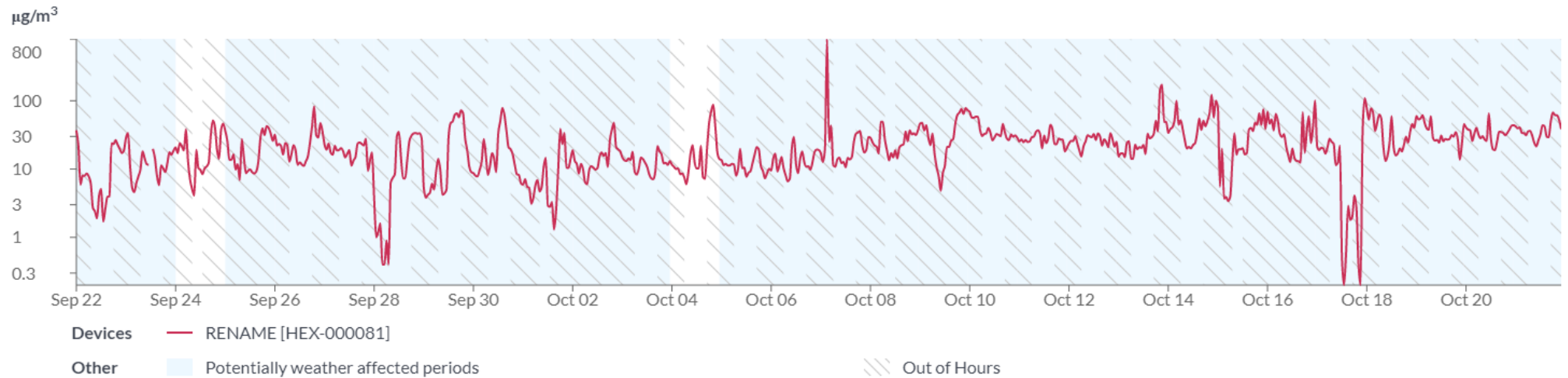
PM2.5

Sep 22 2022 - Oct 21 2022



PM10

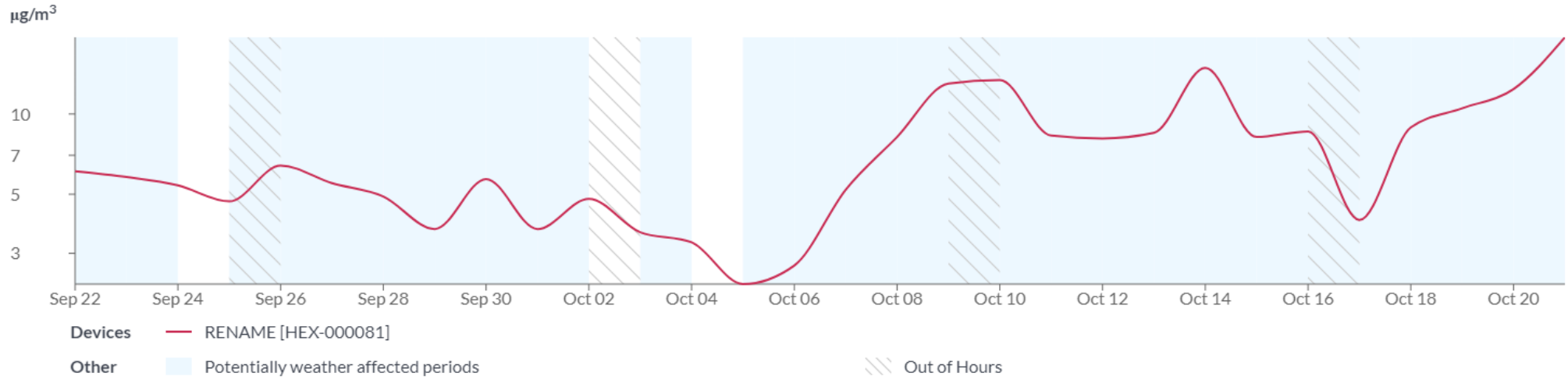
Sep 22 2022 - Oct 21 2022



## Daily average

PM2.5

Sep 22 2022 - Oct 21 2022



PM10

Sep 22 2022 - Oct 21 2022

