Sydney Metro City and Southwest – North Corridor Works

Summary Report – NCW Noise and Vibration Monitoring – November 2018 – April 2019

Project

Title	NCW Noise and Vibration Monitoring - Summary Report - November 2018 to April 2019
Client	Sydney Metro City and Southwest
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Revisions

Date	Version	Description
12/06/2019	V0.1	LOR-NCW-Noise and Vibration Monitoring (Nov18-Apr19) Summary Report
10/07/2020	V0.2	Revised draft report for client review

1. Overview

Main North and North Shore Corridor Works Project (MNNSCW): Portion 7 - Northern Corridor Works (NCW) are being carried out by Laing O'Rourke Australia Construction Pty Ltd (LOR) on behalf of Transport for New South Wales (TfNSW). LOR has engaged Environmental Resources Management Australia Pty Ltd (ERM) to undertake environmental noise and vibration monitoring during select works.

The monitoring is being undertaken with due regard to, and in accordance with, the NCW – Construction Noise and Vibration Management Plan (CNVMP), last updated March 2018 and other relevant policy, guidelines and standards as listed in the reference section of this report.

This technical report has been prepared to summarise the results and findings of operator attended noise and vibration monitoring as well as unattended noise and vibration monitoring completed between November 2018 to April 2019 inclusive.

The noise/vibration monitoring was conducted throughout various track possession works as described in the approved Out-of-Hours Work (OOHW) application forms, application numbers 07 to 23 prepared by LOR i.e. OOHWAF007-023. LOR identified the potential for these works to generate noise/vibration impacts, and as such the monitoring was conducted by qualified and/or suitably experienced specialists to measure levels, evaluated compliance and provide recommendations for any new or modified mitigation.

The structure of this report is as follows:

- **Section 1 (this section)**: brief overview of the 2018/2019 monitoring and report objectives.
- **Section 2**: summary of the monitoring conducted, highest results and technical discussion.
- **Section 3**: summary of typical monitoring outcomes and recommendations.
- **Appendix A**: noise monitoring methodology.
- **Appendix B**: vibration monitoring methodology.
- **Appendix C**: complete noise monitoring dataset (attended measurements).
- **Appendix D**: complete noise monitoring dataset (unattended monitoring).
- **Appendix E**: complete vibration monitoring dataset.

2. Monitoring Summary (2018)

Table 1 presents a summary of the highest measured site noise levels recorded during operator attended noise measurements. **Table 2** presents a summary of the highest measured site noise levels recorded on the unattended noise monitoring devices. As noted above the full noise data sets are provided in **Appendix B** and **C** for operator attended and unattended monitoring respectively. **Table 3** presents a summary of the highest measured noise levels recorded on the unattended noise monitoring devices not associated with a specific track possession.

Table 4 then presents a summary of the highest measured site vibration events recorded during operator attended vibration measurements. **Table 5** presents a summary of the highest measured site vibration events recorded during unattended vibration monitoring. The full vibration data set is provided in **Appendix D**.

Table 1 – Noise Monitoring Summary (Attended Measurements)

Measurement Details			Construction Activity at the Time of Measurement	NML vs. Measured Assessment ($L_{eq,\ 15\ minute}$ in dBA)			Discussion
Location ID	Date	Start Time (24 Hr)		Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML)	
A09	1-Nov-18	01:29	MW17 Works for Portion 7 of NCW.	40	69	29	Measured site noise level contributions (Leq, 15 minute) were between 41-69 dBA over the track possession, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the MW17 works were 22 dBA above the NML, which is to be expected for the type activities being undertaken. On average[1], actual emissions associated with MW17 works were 7 dBA above the predicted values in OOHWAF-020.
A01	30-Oct-18	23:39		40	66	26	
A09	1-Nov-18	00:05		40	65	25	
A01	30-Oct-18	23:59		40	65	25	
A01	29-Oct-18	01:45		40	64	24	
Project 013	3-Nov-18	22:31	WE18 Works for Portion 1-6 of NCW.	40	57	17	Measured site noise level contributions (Leq, 15 minute) were 54-63 dBA over the two days of monitoring, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the WE18 works were 13 dBA above the NML, which is to be expected for the type activities being undertaken. It indicates that on average[1], actual emissions associated with WE18 works were 1 dBA above the predicted values in OOHWAF-071.
Project 014	3-Nov-18	22:51		40	55	15	
Project 012	3-Nov-18	22:14		40	54	14	
Project 001	3-Nov-18	17:08		50	63	13	
Project 011	3-Nov-18	21:59		45	55	10	
Project 016	4-Nov-18	00:00	WE18 Works for Portion 7 of NCW.	40	72	32	Measured site noise level contributions (Leq, 15 minute) were between 58-72 dBA over the two days, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average1 site noise level contributions for the WE18 works were 24 dBA above the NML, which is to be expected for the type activities being undertaken. On average[1], actual emissions associated with WE18 works were 3 dBA above the predicted values in OOHWAF-021. It should be noted that the difference in noise levels is partly related to the implementation of INP penalties for offensive noise characteristics. It is therefore apparent that these INP penalties need to be considered during the OOHW applications and incorporated into predicted noise impacts.
Project 017	4-Nov-18	00:15		40	68	28	
Project 018	4-Nov-18	00:30		40	67	27	
Project 015	3-Nov-18	23:26		40	66	26	
Project 005	3-Nov-18	19:31		46	68	22	
Project 011	17-Nov-18	23:45	WE20 Works for Portion 7 of NCW.	40	77	37	Measured site noise level contributions (Leq, 15 minutes) were between 56-79 dBA over the two days, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the WE20 works were 28 dBA above the NML, which is to be expected for the type of activities being undertaken. On average[1], actual emissions associated with WE20 works were 2 dBA above the predicted values in OOHWAF-022.
Project 001	17-Nov-18	17:26		47	79	32	
Project 010	17-Nov-18	22:59		40	72	32	
Project 002	17-Nov-18	17:44		47	76	29	

Measurement Details			Construction Activity at the Time of Measurement	NML vs. Measured Assessment ($L_{eq,\ 15\ minute}$ in dBA)			Discussion
Location ID	Date	Start Time (24 Hr)		Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML)	
Project 007	17-Nov-18	20:57		46	73	27	
A01	22-Dec-18	14:50	WE25 Works for Portion 1-6 of NCW.	50	53	A01	Measured site noise level contributions (Leq, 15 minute) were 54-74 dBA over the two days of monitoring, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the WE25 works were 21 dBA above the NML, which is to be expected for the type activities being undertaken. On average[1], actual emissions associated with WE25 works were 10 dBA above the predicted values in OOHWAF-074.
A01	22-Dec-18	15:10		50	52	A01	
A02	22-Dec-18	18:22		45	60	A02	
A02	22-Dec-18	21:20		45	69	A02	
A02	22-Dec-18	21:51		45	68	A02	
A03	22-Dec-18	23:00		40	66	A03	
A03	23-Dec-18	14:45		40	54	A03	
A03	23-Dec-18	14:45	WE25 Works for Portion 7 of NCW.	40	54	14	Measured site noise level contributions (Leq, 15 minutes) were between 59-67 dBA over the two days, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the WE25 works were 23 dBA above the NML, which is to be expected for the type of activities being undertaken. On average[1], actual emissions associated with WE25 works were 9 dBA above the predicted values in OOHWAF-023.
A02	22-Dec-18	15:44		47	68	21	
A02	22-Dec-18	16:15		47	70	23	
A01	22-Dec-18	16:45		47	66	19	
A01	22-Dec-18	17:14		47	70	23	
A03	22-Dec-18	19:14		46	72	26	
A03	22-Dec-18	20:15		46	67	21	
A03	23-Dec-18	00:29		40	67	27	

Measurement Details			Construction Activity at the Time of Measurement	NML vs. Measured Assessment ($L_{eq,\ 15\ minute}$ in dBA)			Discussion
Location ID	Date	Start Time (24 Hr)		Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML)	
A03	23-Dec-18	00:45		40	66	26	
A02	23-Dec-18	15:44		47	70	23	
A02	23-Dec-18	17:14		47	65	18	
A01	23-Dec-18	17:45		47	64	17	
A03	23-Dec-18	18:15		46	66	20	
A03	23-Dec-18	18:30		47	67	20	
L01	4-Jan-19	13:46	MW26 and WE27 Works for Portion 7 of NCW.	40	67	27	Measured site noise level contributions (Leq, 15 minutes) were between 30-67 dBA over the monitoring period, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the MW26 and WE27 works were 19 dBA above the NML, which is to be expected for the type of activities being undertaken. On average[1], actual emissions associated with MW26 and WE27 works were 3 dBA above the predicted values in OOHWAF-075.
L01	3-Jan-19	23:00		40	63	23	
L02	3-Jan-19	23:30		40	62	22	
L02	5-Jan-19	00:15		40	62	22	
L02	4-Jan-19	03:00		40	61	21	
L01	3-Jan-19	22:30		40	60	20	
L02	4-Jan-19	03:30		40	60	20	
L02	4-Jan-19	00:00		40	60	20	
L01	5-Jan-19	03:16		40	59	19	

Measurement Details			Construction Activity at the Time of Measurement	NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location ID	Date	Start Time (24 Hr)		Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML)	
L02	5-Jan-19	03:45		40	59	19	
Project 016	14-Feb-19	02:00	MW32 Works for Portion 7 of NCW	40	75	35	Measured site noise level contributions (Leq, 15 minutes) were between 30-75 dBA over the monitoring period, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the MW32 works were 25 dBA above the NML, which is to be expected for the type of activities being undertaken. On average[1], actual emissions associated with MW32 works were 5 dBA below the predicted values in OOHWAF-025.
Project 018	14-Feb-19	02:33		40	74	34	
Project 017	14-Feb-19	02:16		40	71	31	
Project 026	15-Feb-19	01:16		40	70	30	
Project 013	13-Feb-19	00:00		40	68	28	
Project 025	15-Feb-19	01:00		40	66	26	
Project 020	14-Feb-19	22:46		40	65	25	
Project 021	14-Feb-19	23:01		40	64	24	
Project 000	11-Feb-19	22:45		40	58	18	
Project 006	12-Feb-19	22:30		40	58	18	
Project 021	22-Feb-19	23:44	MW33 Works for Portion 7 of NCW	40	77	37	Measured site noise level contributions (Leq, 15 minutes) were between 45-77 dBA over the monitoring period, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the MW33 works were 29 dBA above the NML, which is to be expected for the type of activities being undertaken. On average[1], actual emissions associated with MW33 works were 3 dBA below the predicted values in OOHWAF-025.
Project 022	23-Feb-19	00:15		40	77	37	
Project 026	23-Feb-19	02:15		40	76	36	
Project 025	23-Feb-19	01:50		40	74	34	
Project 027	23-Feb-19	02:45		40	73	33	
Project 009	19-Feb-19	23:49		40	70	30	

Measurement Details			Construction Activity at the Time of Measurement	NML vs. Measured Assessment ($L_{eq,\ 15\ minute}$ in dBA)			Discussion
Location ID	Date	Start Time (24 Hr)		Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML)	
Project 014	20-Feb-19	23:30		40	68	28	
Project 016	21-Feb-19	01:00		40	68	28	
Project 018	21-Feb-19	02:30		40	66	26	
Project 010	20-Feb-19	01:46		40	66	26	
Project 006	23-Feb-19	23:16	WE34 Works for Portion 7 of NCW	40	67	27	Measured site noise level contributions (Leq, 15 minutes) were between 58-73 dBA over the monitoring period, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site noise level contributions for the WE34 works were 22 dBA above the NML, which is to be expected for the type of activities being undertaken. On average[1], actual emissions associated with WE34 works were 4 dBA above the predicted values in OOHWAF-025.
Project 011	24-Feb-19	01:30		40	66	26	
Project 014	24-Feb-19	15:45		47	73	26	
Project 007	23-Feb-19	00:02		40	65	25	
Project 018	24-Feb-19	19:45		46	70	24	
Project 008	23-Feb-19	00:17		40	63	23	
Project 000	23-Feb-19	20:15		46	69	23	
Project 010	24-Feb-19	01:15		40	62	22	
Project 003	23-Feb-19	21:15		46	67	21	
Project 009	24-Feb-19	00:45		40	60	20	
Project 003	6-Mar-19	22:30	MW35 Works for Portion 7 of NCW	40	40	0	Measured site noise level contributions (Leq, 15 minutes) were between 22-40 dBA over the monitoring period, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site, noise level contributions for the MW35 works were 5 dBA below the NML. On average[1], actual emissions associated with MW35 works were 23 dBA below the predicted values in OOHWAF-027.
Project 002	6-Mar-19	22:12		40	40	0	
Project 004	7-Mar-19	01:00		40	38	-2	
Project 014	7-Mar-19	22:45		40	38	-2	
Project 013	7-Mar-19	22:31		40	35	-5	

Measurement Details			Construction Activity at the Time of Measurement	NML vs. Measured Assessment ($L_{eq,\ 15\ minute}$ in dBA)			Discussion
Location ID	Date	Start Time (24 Hr)		Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML)	
Project 016	7-Mar-19	23:15		40	35	-5	
Project 011	7-Mar-19	22:00		40	35	-5	
Project 015	7-Mar-19	23:00		40	35	-5	
Project 005	7-Mar-19	01:15		40	35	-5	
Project 001	6-Mar-19	21:57		46	40	-6	
L01 – Drake St	21-Mar-19	21:00	MW37 Works for Portion 7 of NCW	62	61	-1	Measured site noise level contributions (Leq, 15 minutes) were between 18 - 61 dBA over the monitoring period, depending on the type of construction activity and the duration of noise events that occurred within the sample period. On average[1] site, noise level contributions for the MW37 works were 8 dBA above the NML. On average[1], actual emissions associated with MW37 works were 10 dBA below the predicted values in OOHWAF-027.
L01 – Drake St	21-Mar-19	21:15		62	59	-3	
L01 – Drake St	21-Mar-19	20:15		62	59	-3	
L01 – Drake St	20-Mar-19	21:45		61	58	-3	
L01 – Drake St	19-Mar-19	23:00		61	52	-9	
L01 – Drake St	18-Mar-19	22:45		61	50	-11	
L01 – Drake St	19-Mar-19	22:45		61	49	-12	
L01 – Drake St	21-Mar-19	20:00		62	48	-14	
L01 – Drake St	19-Mar-19	21:30		61	47	-14	
L01 – Drake St	18-Mar-19	23:15		61	47	-14	
L03 – Drake St	24-Mar-19	17:30	WE38 Works for Portion 7 of NCW	69	70	1	Measured site noise level contributions (Leq, 15 minutes) were between 22 - 70 dBA over the monitoring period, depending on the type of construction activity and the duration of noise events that occurred within the sample period.
L03 – Drake St	24-Mar-19	17:15		69	69	0	

Measurement Details			Construction Activity at the Time of Measurement	NML vs. Measured Assessment ($L_{eq,\ 15\ minute}$ in dBA)			Discussion
Location ID	Date	Start Time (24 Hr)		Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML)	
L02 – Hawkins St	23-Mar-19	20:30		62	68	6	On average[1], site noise level contributions for the WE38 works were 17 dBA above the NML. On average[1], actual emissions associated with WE38 works were 1 dBA below the predicted values in OOHWAF-027.
L03 – Drake St	24-Mar-19	20:00		69	66	-3	
L03 – Drake St	23-Mar-19	16:45		69	66	-3	
L03 – Drake St	23-Mar-19	21:15		69	65	-4	
L02 – Hawkins St	23-Mar-19	20:45		62	65	3	
L02 – Hawkins St	24-Mar-19	16:30		62	65	3	
L02 – Hawkins St	23-Mar-19	16:15		62	65	3	
L02 – Hawkins St	24-Mar-19	16:45		62	65	3	

1. The logarithmic average of all measured site noise level contributions was calculated.
2. All noise levels are expressed in dBA re 2 x 10^{-5} Pa.
3. Measured site noise levels include consideration of INP penalties for offensive noise characteristics.

Table 2 – Noise Monitoring Summary (Unattended Monitoring)

Measurement Details				NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location	Date	Start Time (24 Hr)	Construction Activity at the Time of Measurement	Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML.)	
UNM02 (see Appendix A below)	2-Nov-18	01:00	MW17 Works for Portion 1-6 of NCW.	40	64	24	Project site noise contributions at UNM02 were dominated by site noise during times of documented activity on site. Estimated site noise level contributions at the nearest receptor varied however Leq, 15 minute emissions up to 64 dBA were identified by UNM02 at the nearest receptor. Estimated site noise level contributions were above the NML's at the associated UNM02 locations, which is expected for the type of activities being undertaken.
	1-Nov-18	17:45		40	62	22	
	1-Nov-18	10:15		40	58	18	
	31-Oct-18	11:00		40	58	18	
	31-Oct-18	15:00		40	58	18	
UNM01 (Drake Street Rail Corridor)	1-Nov-18	11:15	MW17 Works for Portion 7 of NCW.	40	68	28	Project site noise contributions at UNM01 were dominated by site noise during times of documented activity on site. Estimated site noise level contributions at the nearest receptor (12 Drake Street) varied however Leq, 15 minute emissions up to 68 dBA were identified by UNM01 at the nearest receptor. Estimated site noise level contributions were above the NML's at UNM01 which is expected for the type of activities being undertaken.
	1-Nov-18	12:45		40	68	28	
	1-Nov-18	10:45		40	67	27	
	1-Nov-18	11:30		40	67	27	
	1-Nov-18	11:45		40	67	27	
UNM02 (Gordon Substation temporary site compound)	3-Nov-18	22:00	WE18 Works for Portion 1-6 of NCW.	40	61	21	Project site noise contributions at UNM02 were dominated by site noise during times of documented activity on site. Estimated site noise level contributions at the nearest receptor varied however Leq, 15 minute emissions up to 67 dBA were identified by UNM02 at the nearest receptor. Estimated site noise level contributions were above the NML's at UNM02 which is expected for the type of activities being undertaken.
	4-Nov-18	03:15		40	57	17	
	3-Nov-18	16:45		50	67	17	
	3-Nov-18	16:30		50	66	16	
	4-Nov-18	04:45		40	56	16	
UNM01 (Drake Street Rail Corridor)	3-Nov-18	22:00	WE18 Works for Portion 7 of NCW.	40	61	21	Project site noise contributions at UNM01 were dominated by site noise during times of documented activity on site. Estimated site noise level contributions at the nearest receptor (12 Drake Street) varied however Leq, 15 minute emissions up to 61 dBA were identified by UNM01 at the nearest receptor Estimated site noise level contributions were above the NML's at UNM01 which is expected for the type of activities being undertaken.
	4-Nov-18	03:30		40	60	20	
	4-Nov-18	03:15		40	60	20	
	4-Nov-18	03:45		40	59	19	
	4-Nov-18	02:45		40	56	16	
UNM01 (Drake Street Rail Corridor)	18-Nov-18	11:45	WE20 Works for Portion 7 of NCW.	47	74	27	Project site noise contributions at UNM01 were dominated by site noise during times of documented activity on site. Estimated site noise level contributions at the nearest
	17-Nov-18	22:15		40	67	27	
	18-Nov-18	08:00		47	70	23	

Measurement Details				NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location	Date	Start Time (24 Hr)	Construction Activity at the Time of Measurement	Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML.)	
	18-Nov-18	03:15		40	62	22	receptor (12 Drake Street) varied, however, Leq, 15 minute emissions up to 74 dBA were identified by UNM01 at the nearest receptor.
	18-Nov-18	15:00		47	68	21	
UNM02 (Nelson Street Rail Corridor)	18-Nov-18	01:00		40	79	39	Project site noise contributions at UNM02 were dominated by site noise during times of documented activity on site. Estimated site noise level contributions at the nearest receptor (5 Nelson Street) varied, however, Leq, 15 minute emissions up to 79 dBA were identified by UNM01 at the nearest receptor.
	18-Nov-18	00:45		40	78	38	
	18-Nov-18	00:15		40	78	38	
	18-Nov-18	01:15		40	77	37	Estimated site noise level contributions were above the NML's at UNM01 and UNM02, which is expected for the type of activities being undertaken.
	17-Nov-18	22:15		40	76	36	
UNM01 (Drake Street Rail Corridor)	22-Dec-18	10:15	WE25 Works for Portion 7 of NCW.	47	80	33	Noise at UNM01-03 was dominated by project noise emissions during times of documented activity at the site. Estimated site noise level contributions varied at the nearest receptors, however the highest Leq, 15 minute values were recorded to be between: • 73 and 80 dBA at UNM01 • 73 and 74 dBA at UNM02 • 79 and 80 dBA at UNM03 Estimated site noise level contributions were above the NML's at UNM01 to UNM03, which is expected for the type of activities being undertaken.
	22-Dec-18	09:45		47	73	26	
	22-Dec-18	04:45		47	73	26	
UNM02 (Raleigh Street Rail Corridor)	22-Dec-18	07:45		47	74	27	
	23-Dec-18	09:15		47	74	27	
	22-Dec-18	14:30		47	73	26	
UNM03 (Hopetoun Street Rail Corridor)	22-Dec-18	10:30		47	80	33	
	22-Dec-18	17:15		47	79	32	
	22-Dec-18	17:00		47	79	32	
UNM01 (Drake Street Rail Corridor)	6-Jan-19	07:00	MW26 and WE27 Works for Portion 7 of NCW.	47	76	29	Noise at UNM01 and UNM02 was dominated by project noise emissions during times of documented activity at the site. Estimated site noise level contributions varied at the nearest receptors, however the highest Leq, 15 minute values were recorded to be between: • 70 and 76 dBA at UNM01 • 66 and 70 dBA at UNM02 Estimated site noise level contributions were above the NML's at UNM01 and UNM02, which is expected for the type of activities being undertaken.
	6-Jan-19	07:30		47	74	27	
	4-Jan-19	23:45		40	72	32	
	6-Jan-19	08:00		47	70	23	
	5-Jan-19	02:00		40	70	30	
UNM02 (Raleigh Street Rail Corridor)	5-Jan-19	18:30		46	70	24	
	5-Jan-19	18:15		46	67	21	
	6-Jan-19	07:15		47	66	19	

Measurement Details				NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location	Date	Start Time (24 Hr)	Construction Activity at the Time of Measurement	Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML.)	
	5-Jan-19	16:30		47	66	19	
	5-Jan-19	19:15		46	66	20	
UNM01 (Raleigh Street Rail Corridor)	3-Jan-19	09:45	Portion 7 of NCW: Nov 2018 to Jan 2019	52	73	21	Noise at UNM01 was dominated by project noise emissions during track possession works and activities at the site. Estimated site noise level contributions varied at the nearest receptors, however the highest Leq, 15 minute values were recorded to be between 70 and 73 dBA. Estimated site noise level contributions during track possession works were above the NML's at UNM01, which is expected for the type of activities being undertaken. During mid-week works within standard construction hours estimated site noise was generally below the NML's.
	22-Dec-18	07:30		52	73	21	
	23-Dec-18	09:00		52	73	21	
	22-Dec-18	14:15		52	72	20	
	22-Dec-18	03:45		40	70	30	
UNM01 (Drake Street Rail Corridor)	5-Feb-19	03:15	Portion 7 of NCW: Nov 2018 to Jan 2019	40	66	26	Noise at UNM01 was dominated by project noise emissions during track possession works and activities at the site. Estimated site noise level contributions varied at the nearest receptors, however the highest Leq, 15 minute values were recorded to be between 70 and 73 dBA. Estimated site noise level contributions during track possession works were above the NML's at UNM01, which is expected for the type of activities being undertaken. During mid-week works within standard construction hours estimated site noise was generally below the NML's.
	5-Feb-19	03:30		40	64	24	
	6-Feb-19	03:00		40	62	22	
	6-Feb-19	02:45		40	60	20	
UNM02 (Hopetoun Avenue)	5-Feb-19	04:15	Portion 7 of NCW: Nov 2018 to Jan 2019	40	63	23	Noise at UNM01, UNM02 and UNM03 were dominated by project noise emissions during track possession works and activities at the site. Estimated site noise level contributions varied at the nearest receptors, however the highest Leq, 15 minute values were recorded at 66 dBA. Estimated site noise level contributions during track possession works were above the NML's at UNM01, UNM02, which is expected for the type of activities being undertaken.
	7-Feb-19	00:15		40	62	22	
	7-Feb-19	00:00		40	62	22	
	8-Feb-19	00:15		40	62	22	
UNM03 (Raleigh Street Rail Corridor)	8-Feb-19	18:45		46	51	5	
	8-Feb-19	19:00		46	44	-2	
	6-Feb-19	00:15		40	37	-3	
	6-Feb-19	00:30		40	37	-3	
UNM01a/b (Drake Street / Brand	14-Feb-19	04:15	MW32 Works for Portion 7 of NCW.	40	64	24	The highest road traffic noise emissions were associated with the Pacific Highway, Brand Street and Mowbray Road.
	15-Feb-19	04:15		40	62	22	

Measurement Details				NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location	Date	Start Time (24 Hr)	Construction Activity at the Time of Measurement	Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML.)	
Street Rail Corridor)	12-Feb-19	03:45		40	56	16	Noise at UNM01 and UNM02 was dominated by project noise emissions during times of documented activity at the site. Estimated site noise level contributions varied at the nearest receptors, however the highest Leq, 15 minute values were recorded to be between: • 64 and 53 dBA at UNM01 • 70 and 62 dBA at UNM02 Estimated site noise level contributions were above the NML's at UNM01 and UNM02, which is expected for the type of activities being undertaken. Estimated site noise level contributions were below the NML's at UNM03.
	14-Feb-19	01:30		40	53	13	
UNM02a/b (Hopetoun Ave / Nelson Street Rail Corridor)	14-Feb-19	02:00		40	70	30	
	14-Feb-19	01:45		40	69	29	
	14-Feb-19	01:30		40	63	23	
	15-Feb-19	00:15		40	62	22	
UNM03 (Raleigh Street Rail Corridor)	13-Feb-19	00:15		40	37	-3	
	11-Feb-19	00:15		40	35	-5	
	11-Feb-19	00:00		40	35	-5	
	11-Feb-19	00:30		40	35	-5	
UNM01 (Brand Street Rail Corridor)	19-Feb-19	00:15	MW33 Works for Portion 7 of NCW.	40	68	28	The highest road traffic noise emissions were associated with the Pacific Highway, Brand Street and Mowbray Road. Noise at UNM01 and UNM02 was dominated by project noise emissions during times of documented activity at the site. Estimated site noise level contributions varied at the nearest receptors, however the highest Leq, 15 minute values were recorded to be between: • 60 and 68 dBA at UNM01 • 78 and 73 dBA at UNM02 • 44 and 43 dBA at UNM03 Estimated site noise level contributions were above the NML's at UNM01, UNM02, and periodically at UNM03, which is expected for the type of activities being undertaken.
	19-Feb-19	00:45		40	68	28	
	20-Feb-19	01:00		40	62	22	
	19-Feb-19	00:00		40	60	20	
UNM02 (Nelson Street Rail Corridor)	22-Feb-19	01:00		40	78	38	
	22-Feb-19	00:45		40	78	38	
	22-Feb-19	00:15		40	76	36	
	22-Feb-19	00:15		40	73	33	
UNM03 (Raleigh Street Rail Corridor)	20-Feb-19	01:00		40	44	4	
	19-Feb-19	00:00		40	43	3	
	20-Feb-19	02:45		40	37	-3	
	21-Feb-19	03:30		40	37	-3	
	24-Feb-19	03:45	WE34 Works for Portion 7 of NCW.	40	72	32	The highest road traffic noise emissions were associated with the Pacific Highway, Brand Street and Mowbray Road.
	24-Feb-19	09:00		47	78	31	

Measurement Details				NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location	Date	Start Time (24 Hr)	Construction Activity at the Time of Measurement	Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML.)	
UNM01 (Brand Street Rail Corridor)	23-Feb-19	23:30		40	70	30	Noise at UNM01, UNM02 and UNM03 was dominated by project noise emissions during times of documented activity at the site. Estimated site noise level contributions varied at the nearest receptors, however the highest Leq, 15 minute values were recorded to be between: • 78 and 66 dBA at UNM01 • 69 and 68 dBA at UNM02 • 54 and 51 at UNM03 Estimated site noise level contributions were above the NML's at UNM01, UNM02 and UNM03, which is expected for the type of activities being undertaken.
	24-Feb-19	06:30		40	66	26	
UNM02 (Nelson Street Temporary work site)	23-Feb-19	06:45		40	69	29	
	23-Feb-19	00:00		40	68	28	
	23-Feb-19	00:15		40	68	28	
	23-Feb-19	06:30		40	68	28	
UNM03 (Raleigh Street Rail Corridor)	24-Feb-19	06:45		40	54	14	
	24-Feb-19	06:30		40	51	11	
	24-Feb-19	03:45		40	51	11	
	23-Feb-19	23:45		40	51	11	
UNM01 (Brand Street Rail Corridor)	5-Mar-19	05:00	MW35 Works for Portion 7 of NCW.	40	63	23	Noise at UNM01 and UNM03 was dominated by project noise emissions during times of documented activity at the site. Estimated site noise level contributions varied at the nearest receptors, however, the highest Leq, 15 minute values were recorded to be between: • 62 and 63 dBA at UNM01 • 39 and 40 dBA at UNM03 Estimated site noise level contributions were above the NML's at UNM01, which is expected for the type of activities being undertaken. Estimated site noise level contributions were at or below the NML's at UNM03.
	7-Mar-19	22:30		40	63	23	
	6-Mar-19	23:45		40	62	22	
	7-Mar-19	23:00		40	62	22	
	6-Mar-19	23:30		40	62	22	
UNM03 (Raleigh Street Rail Corridor)	6/03/2019	22:15		40	40	0	
	6/03/2019	23:45		40	39	-1	
	7/03/2019	23:15		40	39	-1	
	6/03/2019	22:45		40	39	-1	
	4/03/2019	23:45		40	39	-1	
UNM01 (Brand Street Rail Corridor)	18/03/2019	23:45	MW37 Works for Portion 7 of NCW.	40	79	39	The highest road traffic noise emissions were associated with the Pacific Highway, Brand Street and Mowbray Road. Noise at UNM01 and UNM03 was generally dominated by extraneous sources, as project noise emissions were barely audible during times of documented activity at the site, with the exception of a few isolated events.
	19/03/2019	00:00		40	74	34	
	19/03/2019	15:45		46	70	24	
	18/03/2019	23:30		40	52	12	

Measurement Details				NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location	Date	Start Time (24 Hr)	Construction Activity at the Time of Measurement	Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML.)	
	19-Mar-19	00:30		40	49	9	Estimated site noise level contributions varied at the nearest receptors, however, the highest Leq, 15 minute values were recorded to be between 49 and 79 dBA at UNM01 and 38 and 44 dBA at UNM03. Estimated site noise level contributions were generally below the NML's at UNM01 and UNM03, with the exception of a few isolated events, which is expected for the type of activities being undertaken.
UNM03 (Raleigh Street Rail Corridor)	18-Mar-19	00:15		40	40	0	
	18-Mar-19	0:45		40	40	0	
	18-Mar-19	00:00		40	39	-1	
	18-Mar-19	04:45		40	38	-2	
	18-Mar-19	20:00		46	44	-2	
UNM01 (Brand Street Rail Corridor)	24-Mar-19	11:15	WE38 Works for Portion 7 of NCW.	52	78	26	Noise at UNM01, UNM02 and UNM03 was dominated by project noise emissions during times of documented activity at the site. Estimated site noise level contributions varied at the nearest receptors, however, the highest Leq, 15 minute values were recorded to be between: • 61 and 78 dBA at UNM01 • 58 and 62 dBA at UNM02 • 50 and 53 dBA at UNM03 Estimated site noise level contributions were generally above the NML's at UNM01 and UNM02, which is expected for the type of activities being undertaken.
	24-Mar-19	07:15		52	74	22	
	23-Mar-19	00:45		40	62	22	
	23-Mar-19	04:30		40	61	21	
UNM02 (Nelson Street Site Compound)	24-Mar-19	22:15		40	66	26	
	24-Mar-19	22:30		40	62	22	
	24-Mar-19	22:45		40	58	18	
	24-Mar-19	23:00		40	58	18	
UNM03 (Raleigh Street Rail Corridor)	24-Mar-19	02:00		40	53	13	
	24-Mar-19	4:30 AM		40	53	13	
	24-Mar-19	2:30 AM		40	53	13	
	24-Mar-19	02:45		40	53	13	

1. All noise levels are expressed in dBA re 2 x 10^{-5} Pa.
2. Measured site noise levels include consideration of INP penalties for offensive noise characteristics.

Table 3 – Unattended Noise Monitoring Unattended (Unreported)

Measurement Details				NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location	Date	Start Time (24 Hr)	Construction Activity at the Time of Measurement	Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML.)	
UNM01	28-Dec-18	12:30	December 2018 Unattended Noise Monitoring	52	60	8	Noise at UNM01 is expected to be a combination of site-related noises during standard construction (i.e. not during a track possession) and extraneous noise sources (e.g. train and other vehicle movements, wind-blown vegetation, birds and animals etc.). Estimated site noise level contributions varied at the nearest receptors, however, the highest Leq, 15 minute values were recorded to be between 52 and 60 dBA at UNM01 Estimated site noise level contributions were generally above the NML's at UNM01, which is expected for the type of activities being undertaken during standard construction works.
	28-Dec-18	15:15		52	60	8	
	31-Dec-18	19:15		46	54	8	
	20-Dec-18	18:45		46	52	6	
	20-Dec-18	19:00		46	52	6	
UNM01	19-Jan-19	06:15	January 2019 Unattended Noise Monitoring	40	56	16	Noise at UNM01 is expected to be a combination of site-related noises during standard construction (i.e. not during a track possession) and extraneous noise sources (e.g. train and other vehicle movements, wind-blown vegetation, birds and animals etc.). Estimated site noise level contributions varied at the nearest receptors, however, the highest Leq, 15 minute values were recorded to be between 56 and 67 dBA at UNM01 Estimated site noise level contributions were generally above the NML's at UNM01, which is expected for the type of activities being undertaken during standard construction works.
	10-Jan-19	12:15		52	68	16	
	10-Jan-19	12:00		52	68	16	
	10-Jan-19	14:00		52	67	15	
	11-Jan-19	10:30		52	67	15	
UNM01	09-Feb-19	14:30	February 2019 Unattended Noise Monitoring	47	66	19	Noise at UNM01 and UNM03 are expected to be a combination of site-related noises during standard construction (i.e. not during a track possession) and extraneous noise sources (e.g. train and other vehicle movements, wind-blown vegetation, birds and animals etc.). Estimated site noise level contributions varied at the nearest receptors, however, the highest Leq, 15 minute values were recorded to be • between 51 and 66 dBA at UNM01; and • between 48 and 52 at UNM03 Estimated site noise level contributions were generally above the NML's at UNM01 and UNM03, which is expected for the type of activities being undertaken during standard construction works.
	10-Feb-19	06:00		40	52	12	
	10-Feb-19	05:45		40	52	12	
	10-Feb-19	06:15		40	51	11	
	10-Feb-19	06:45		40	51	11	
UNM03	09-Feb-19	18:30		46	52	6	
	09-Feb-19	18:45		46	52	6	
	09-Feb-19	18:15		46	51	5	
	22-Feb-19	12:00		52	50	3	
	09-Feb-19	19:00		46	48	2	

Measurement Details				NML vs. Measured Assessment (Leq, 15 minute in dBA)			Discussion
Location	Date	Start Time (24 Hr)	Construction Activity at the Time of Measurement	Noise Management Level (NML)	Measured Site Noise Level Contribution	Comparison Δ (Meas. – NML.)	
UNM01	30-Mar-19	04:00	March 2019 Unattended Noise Monitoring	40	51	11	Noise at UNM01, UNM02 and UNM03 are expected to be a combination of site-related noises during standard construction (i.e. not during a track possession) and extraneous noise sources (e.g. train and other vehicle movements, wind-blown vegetation, birds and animals etc.). Estimated site noise level contributions varied at the nearest receptors, however, the highest Leq, 15 minute values were recorded to be: • between 49 and 57 dBA at UNM01; • 50 dBA at UNM02; and • between 42 and 50 at UNM03 Estimated site noise level contributions were generally above the NML's at UNM01, UNM02 and UNM03 (with the exception of one measurement at UNM03), which is expected for the type of activities being undertaken during standard construction works.
	30-Mar-19	04:15		40	50	10	
	27-Mar-19	16:15		52	57	10	
	27-Mar-19	15:45		52	56	9	
	30-Mar-19	04:45		40	49	9	
UNM02	27-Mar-19	06:00		40	50	10	
	27-Mar-19	07:00		40	50	10	
	26-Mar-19	07:00		40	50	10	
	27-Mar-19	05:30		40	50	10	
	27-Mar-19	05:45		40	50	10	
UNM03	12-Mar-19	15:45		52	55	3	
	12-Mar-19	11:30		52	54	2	
	30-Mar-19	04:00		40	42	2	
	30-Mar-19	04:45		40	42	2	
	30-Mar-19	04:15		40	42	2	
UNM03)	13-Apr-19	12:15	April 2019 Unattended Noise Monitoring	47	47	0	Noise at UNM03 is expected to be a combination of site-related noises during standard construction (i.e. not during a track possession) and extraneous noise sources (e.g. train and other vehicle movements, wind-blown vegetation, birds and animals etc.). Estimated site noise level contributions varied at the nearest receptors, however, the highest Leq, 15 minute values were recorded to be between 46 and 47 dBA at UNM03. Estimated site noise level contributions were generally in line, and below the NML at UNM03.
	13-Apr-19	12:30		47	47	0	
	06-Apr-19	09:45		47	47	0	
	13-Apr-19	12:00		47	47	0	
	06-Apr-19	09:30		47	46	-1	

1. All noise levels are expressed in dBA re 2 x 10^{-5} Pa.
2. Measured site noise levels include consideration of INP penalties for offensive noise characteristics.

Table 4 – Vibration Monitoring Summary (Attended Measurements)

Measurement Details				Construction Activity at the Time of Measurement	Compliance Assessment (Peak Particle Velocity (PPV), mm/s)				Discussion
					Limiting Vibration Limit/Criteria[1]	Site Vibration Event			
Location ID	Location	Start time (24 hour)	Date			PPV, mm/s	Frequency, Hz	Comparison to Criteria	
V01	Hawkins Street	09:45	15-Feb-19	Vibratory Rolling	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	16.56	30	Comply	Vibration generated by actual and simulated vibratory rolling works was perceptible at V01. When in progress the vibration generated by this source dominated the emissions perceived and detected at the receptor. Other general construction activities were also occurring at the same time but vibration generated by these other works was imperceptible. Ambient vibration associated with the existing acoustics environment also remained imperceptible. Despite the vibratory rolling activity generating vibration that was perceptible, clearly detectable and the dominant emission source at this receptor, the highest measured vibration levels (PPV in mm/s) and associated characteristic frequencies (in Hz) are below and compliant with the applicable BS7385 vibration guideline values, as identified in the CNVMP.
V01	Hawkins Street	09:47	15-Feb-19			16.26	30	Comply	
V01	Hawkins Street	09:50	15-Feb-19			16	30	Comply	
V01	Hawkins Street	09:48	15-Feb-19			15.84	30	Comply	
V01	Hawkins Street	09:46	15-Feb-19			15.8	28	Comply	
V02	Hawkins Street	11:17	15-Feb-19	Vibratory Rolling	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	6.87	34	Comply	Vibration generated by actual vibratory rolling works was perceptible at V02. When in progress the vibration generated by this source again dominated the emissions perceived and detected at the receptor. Other general construction activities were also occurring at the same time but vibration generated by these other works was imperceptible. Ambient vibration associated with the existing acoustics environment also remained imperceptible. Despite the vibratory rolling activity generating vibration that was perceptible, clearly detectable and the dominant emission source at this receptor, the highest measured vibration levels (PPV in mm/s) and associated characteristic frequencies (in Hz) are below and compliant with the applicable BS7385 vibration guideline values, as identified in the CNVMP.
V02	Hawkins Street	11:14	15-Feb-19			6.76	34	Comply	
V02	Hawkins Street	11:16	15-Feb-19			5.7	34	Comply	
V02	Hawkins Street	11:15	15-Feb-19			5.57	34	Comply	
V02	Hawkins Street	11:13	15-Feb-19			4.81	34	Comply	

1. Structural Damage Criteria – BS7385

Table 5 – Vibration Monitoring Summary (Unattended Monitoring)

Measurement Details				Construction Activity at the Time of Measurement	Compliance Assessment (Peak Particle Velocity (PPV), mm/s)				Discussion
					Limiting Vibration Limit/Criteria[1]	Site Vibration Event			
Location ID	Location	Start time (24 hour)	Date			PPV, mm/s	Frequency, Hz	Comparison to Criteria	
UVM01	Hopetoun Ave	13:00:45	31-Oct-18	Augured Piling / General Construction Activities	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	4.3	51	Comply	Vibration events have been identified throughout the measured data set and compared to times of known site activity, including augured piling. Based on the highest vibration events generated by augured piling at UVM01 it is anticipated that vibration was perceptible at the nearest affected receptor locations. The remainder of the measured dataset was dominated by general construction activities on site, and ambient vibration events not associated with the project. The highest measured vibration level at UVM01 was 4.3 mm/s (PPV) with its characteristic frequency of 51Hz. This PPV value was measured during a time of known construction works on site.
UVM01	Hopetoun Ave	13:05:40	2-Nov-18			3.3	43	Comply	
UVM01	Hopetoun Ave	00:17:45	1-Nov-18			2.9	73	Comply	
UVM01	Hopetoun Ave	00:54:45	1-Nov-18			2.3	39	Comply	
UVM01	Hopetoun Ave	15:10:39	30-Oct-18			1.8	57	Comply	
UVM01	Hopetoun Ave	22:02:54	4-Nov-18	General Construction Activities	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	2.7	>100	Comply	Vibration events have been identified throughout the measured data set and compared to times of known site activity, including general construction activities. Based on the highest vibration events generated by construction activities at UVM01 it is anticipated that vibration was perceptible at the nearest affected receptor locations. The remainder of the measured dataset was dominated by general construction activities on site, and ambient vibration events not associated with the project. The highest measured vibration level at UVM01 was 2.7 mm/s (PPV) with its characteristic frequency of >100Hz. This PPV value was measured during a time of known construction works on site.
UVM01	Hopetoun Ave	18:58:48	8-Nov-18			2	47	Comply	
UVM01	Hopetoun Ave	07:42:38	8-Nov-18			1.9	51	Comply	
UVM01	Hopetoun Ave	15:15:38	8-Nov-18			1.9	47	Comply	
UVM01	Hopetoun Ave	13:14:39	7-Nov-18			1.7	51	Comply	

Measurement Details				Construction Activity at the Time of Measurement	Compliance Assessment (Peak Particle Velocity (PPV), mm/s)				Discussion
					Limiting Vibration Limit/Criteria[1]	Site Vibration Event			
Location ID	Location	Start time (24 hour)	Date			PPV, mm/s	Frequency, Hz	Comparison to Criteria	
UVM01	Hopetoun Ave	17:35:56	18-Nov-18	Jack Hammering / Excavation Activities	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	5.2	>100	Comply	Vibration events have been identified throughout the measured data set and compared to times of known site activity, including jack hammering and excavation activities. Based on the highest vibration events generated by site works at UVM01 it is anticipated that vibration was perceptible at the nearest affected receptor locations. The remainder of the measured dataset was dominated by general construction activities on site, and ambient vibration events not associated with the project. The highest measured vibration level at UVM01 was 5.2 mm/s (PPV) with its characteristic frequency of >100Hz. This PPV value was measured during a time of known construction works on site.
UVM01	Hopetoun Ave	17:28:14	18-Nov-18			3.4	>100	Comply	
UVM01	Hopetoun Ave	17:09:14	18-Nov-18			2.9	>100	Comply	
UVM01	Hopetoun Ave	17:08:14	18-Nov-18			2.7	>100	Comply	
UVM01	Hopetoun Ave	20:09:47	17-Nov-18			2.7	30	Comply	
UVM02	Nelson St	08:22:40	18-Nov-18	Rock Breaking / Excavation Activities	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	5.2	>100	Comply	Vibration events have been identified throughout the measured data set and compared to times of known site activity, including rock breaking / excavation activities. Based on the highest vibration events generated by site works at UVM02 it is anticipated that vibration was perceptible at the nearest affected receptor locations. The remainder of the measured dataset was dominated by general construction activities on site, and ambient vibration events not associated with the project. The highest measured vibration level at UVM02 was 5.2 mm/s (PPV) with its characteristic frequency of >100Hz. This PPV value was measured during a time of known construction works on site.
UVM02	Nelson St	08:22:15	18-Nov-18			3.7	>100	Comply	
UVM02	Nelson St	08:21:15	18-Nov-18			2.2	>100	Comply	
UVM02	Nelson St	08:19:15	18-Nov-18			1.9	>100	Comply	
UVM02	Nelson St	08:20:15	18-Nov-18			1.7	>100	Comply	

Measurement Details				Construction Activity at the Time of Measurement	Compliance Assessment (Peak Particle Velocity (PPV), mm/s)				Discussion
					Limiting Vibration Limit/Criteria[1]	Site Vibration Event			
Location ID	Location	Start time (24 hour)	Date			PPV, mm/s	Frequency, Hz	Comparison to Criteria	
UVM01	Drake St	22:05:00	22-Dec-18	Excavation and construction Activities	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	1	57	Comply	Vibration events have been identified throughout the measured data set and compared to times of known site activity, including excavation and construction activities. Based on the highest vibration events generated by site works at UVM01 it is anticipated that vibration was perceptible at the nearest affected receptor locations. The remainder of the measured dataset was dominated by general construction activities on site, and ambient vibration events not associated with the project. The highest measured vibration level at UVM01 was 1 mm/s (PPV) with its characteristic frequency of 57 Hz. This PPV value was measured during a time of potential construction works on site.
UVM01	Drake St	22:08	22/12/2018			1	30	Comply	
UVM01	Drake St	22:07	22/12/2018			0.81	39	Comply	
UVM01	Drake St	22:10	22/12/2018			0.65	34	Comply	
UVM01	Drake St	14:51	23/12/2018			0.61	34	Comply	
UNM02	Raleigh St	09:32	23/12/2018	Excavation and construction Activities	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	2.52	57	Comply	Vibration events have been identified throughout the measured data set and compared to times of known site activity, excavation and construction activities. Based on the highest vibration events generated by site works at UVM02 it is anticipated that vibration was perceptible at the nearest affected receptor locations. The remainder of the measured dataset was dominated by general construction activities on site, and ambient vibration events not associated with the project. The highest measured vibration level at UVM02 was 2.52 mm/s (PPV) with its characteristic frequency of 57 Hz. This PPV value was measured during a time of potential construction works on site.
UNM02	Raleigh St	17:06	21/12/2018			1.71	85	Comply	
UNM02	Raleigh St	07:16	23/12/2018			1.63	16	Comply	
UNM02	Raleigh St	09:15	23/12/2018			1.54	43	Comply	
UNM02	Raleigh St	08:46	23/12/2018			1.16	57	Comply	

Measurement Details				Construction Activity at the Time of Measurement	Compliance Assessment (Peak Particle Velocity (PPV), mm/s)				Discussion
					Limiting Vibration Limit/Criteria[1]	Site Vibration Event			
Location ID	Location	Start time (24 hour)	Date			PPV, mm/s	Frequency, Hz	Comparison to Criteria	
UVM01	Hopetoun Ave	Day	22-Feb-19	WE34 Works for Portion 7 of NCW.	Residential buildings 16 hr day: 0.8 to 1.6 m/s1.75 Residential buildings 8 hr night: 0.4 to 0.8 m/s1.75	1.26	0.8 to 1.6	Yes	Vibration generated by WE38 works was at times perceptible at both UVM01 and UVM02. When vibration-generating activities occurred the vibration generated by the works dominated the emissions perceived and detected at the receptor. General construction activities were occurring throughout WE38 however, vibration generated by the majority of works was imperceptible. Ambient vibration associated with the existing acoustics environment also remained imperceptible. Despite certain events being perceptible throughout WE38, the highest measured vibration levels (PPV in mm/s) and associated characteristic frequencies (in Hz) are below and compliant with the applicable BS7385 vibration guideline values, as identified in the CNVMP.
UVM01	Hopetoun Ave	Night	22/02/2019 to 23/02/19			0.35	0.4 to 0.8	Yes	
UVM01	Hopetoun Ave	Day	23-Feb-19			0.55	0.8 to 1.6	Yes	
UVM01	Hopetoun Ave	Night	23/02/2019 to 24/02/19			1	0.4 to 0.8	No	
UVM01	Hopetoun Ave	Day	24-Feb-19			0.64	0.8 to 1.6	Yes	
UVM01	Hopetoun Ave	03:26:00	24-Feb-19	WE34 Works for Portion 7 of NCW.	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	5.32	28	Comply	Vibration events have been identified throughout the measured data set and compared to times of known site activity, including excavation and construction activities. Based on the highest vibration events generated by site works at UVM01 it is anticipated that vibration was perceptible at the nearest affected receptor locations. The remainder of the measured dataset was dominated by general construction activities on site, and ambient vibration events not associated with the project. The highest measured vibration level at UVM01 was 5.32 mm/s (PPV) with its characteristic frequency of 28 Hz. This PPV value was measured during a time of potential construction works on site.
UVM01	Hopetoun Ave	03:22:00	24-Feb-19			5.46	27	Comply	
UVM01	Hopetoun Ave	03:26:00	24-Feb-19			4.19	28	Comply	
UVM01	Hopetoun Ave	03:14:00	24-Feb-19			4.02	37	Comply	
UVM01	Hopetoun Ave	03:22:00	24-Feb-19			3.48	39	Comply	

Measurement Details				Construction Activity at the Time of Measurement	Compliance Assessment (Peak Particle Velocity (PPV), mm/s)				Discussion
					Limiting Vibration Limit/Criteria[1]	Site Vibration Event			
Location ID	Location	Start time (24 hour)	Date			PPV, mm/s	Frequency, Hz	Comparison to Criteria	
UVM01	Hopetoun Avenue	03:24:00	24-Mar-19	WE38 Works for Portion 7 of NCW.	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz then 20mm/s at 15 Hz increasing to 50mm/s at 40 Hz and above	2.27	32	Comply	Vibration generated by WE38 works was at times perceptible at both UVM01 and UVM02. When vibration-generating activities occurred the vibration generated by the works dominated the emissions perceived and detected at the receptor. General construction activities were occurring throughout WE38 however, vibration generated by the majority of works was imperceptible. Ambient vibration associated with the existing acoustics environment also remained imperceptible. Despite certain events being perceptible throughout WE38, the highest measured vibration levels (PPV in mm/s) and associated characteristic frequencies (in Hz) are below and compliant with the applicable BS7385 vibration guideline values, as identified in the CNVMP.
UVM01	Hopetoun Avenue	03:14:00	24-Mar-19			2.21	32	Comply	
UVM01	Hopetoun Avenue	03:20:00	24-Mar-19			1.83	30	Comply	
UVM01	Hopetoun Avenue	03:07:00	24-Mar-19			1.79	30	Comply	
UVM01	Hopetoun Avenue	03:12:00	24-Mar-19			1.52	28	Comply	
UVM02	Raleigh Street	06:49	24/03/2019			1.51	22	Comply	
UVM02	Raleigh Street	13:11:00	24-Mar-19			1.43	57	Comply	
UVM02	Raleigh Street	13:19:00	24-Mar-19			1.32	47	Comply	
UVM02	Raleigh Street	13:26:00	24-Mar-19			1.32	51	Comply	

Measurement Details				Construction Activity at the Time of Measurement	Compliance Assessment (Peak Particle Velocity (PPV), mm/s)				Discussion
						Site Vibration Event			
Location ID	Location	Start time (24 hour)	Date		Limiting Vibration Limit/Criteria[1]	PPV, mm/s	Frequency, Hz	Comparison to Criteria	
UVM02	Raleigh Street	22:25:00	24-Mar-19			1.3	64	Comply	

1. Structural Damage Criteria – BS7385

3. Outcomes and Recommendations

Technical reports were prepared for each monitoring event throughout November 2018 to April 2019 with specific recommendations provided throughout, based on the compliance evaluation and the magnitude and extent of impacts measured and/or observed. LOR (and their sub-contractors) were successful in implementing these recommendations where feasible, reasonable, practical and safe to do so.

Examples of the types of noise and vibration reducing mitigation and management measures that have been implemented throughout November 2018 to April 2019 are provided below:

- **Respite management measures** i.e. providing one hour of respite between every three hours of noise-generating activities.
- Utilising the **existing rail corridor noise barriers** to reduce site emissions. Based on measurements conducted during 2018-2019 , the current rail noise barrier is reducing site noise emissions by approximately 10 dBA or more.
  - This measure has been implemented for OOHW, particularly near the Hopetoun Avenue access/egress point, and for any high noise-generating activities.
  - Additionally, temporary acoustic fencing was established along the fence line near the Drake Street site entrance, which was observed to reduce site noise emissions by approximately 5 dBA.
- Continued implementation of the **CNVMP** (established with due regard to the CNVIS) during all NCW activities.
- Implementation of the **Additional Mitigation Measures Matrix** (AMMM) as outlined in the CNVMP.
- **Noise (and/or vibration) monitoring** as per the requirements specified in the construction noise and vibration monitoring program established for NCW.
- Continued application the TfNSW **safe working distances for vibration intensive activities** to all works undertaken as part of the project, as far as practicable.

Where measured noise levels were found to repeatedly exceed predicted noise levels for specific work activities, Additional Mitigation Measures were recommended as outlined in the CNVMP. Through consultation with ERM acoustics consultants, training was provided to LOR on how to predict more accurate noise levels for certain construction activities. Future OOHWAs contained more accurate predictions for work activities, which aligned more closely to measured values during attended noise monitoring. More accurate predictions in the OOHWA process allowed for a more appropriate level of mitigation to be applied during specific OOHW activities, to minimise impacts as much as practical during track possessions.

4. Conclusion

LOR continue to remain aware of the potential for nuisance, or unacceptable levels of amenity, to occur due to construction noise and vibration, and continues to plan for and then manage construction works on the NCW project accordingly.

Construction noise and vibration levels have been reduced and impacts minimised with the successful implementation of the actions summarised in **Section 3** above.

Impacts may not always be reduced to negligible levels for all receptors during all construction activities; however, the summarised above have ensured that any residual impacts have been minimised as far as is practically achievable.

References

Laing O'Rourke - Sydney Metro City and Southwest - Northern Corridor Works - **Construction Noise and Vibration Impact Statement (CNVIS)**, prepared by ERM and last updated February 2018

Laing O'Rourke - Sydney Metro City and Southwest - Northern Corridor Works - **Construction Noise and Vibration Management Plan (CNVMP)**, prepared by ERM and dated October 2017

Laing O'Rourke - Sydney Metro City and Southwest - Northern Corridor Works - **Construction Noise and Vibration Monitoring Program**, prepared by ERM and dated October 2017

NSW Environment Protection Authority – NSW Environmental Noise Management – **Industrial Noise Policy (INP)**, January 2000 and relevant application notes

NSW Department of Environment and Climate Change – **NSW Interim Construction Noise Guideline (ICNG)**, July 2009

NSW Government – Sydney Metro **Construction Noise and Vibration Strategy (CNVS)**, August 2017

Standards Australia AS1055–1997™ (AS1055) – **Description and Measurement of Environmental Noise**, Parts 1, 2 and 3

Standards Australia AS IEC 61672.1–2004™ (AS61672) – Electro Acoustics - Sound Level Meters Specifications Monitoring or Standards Australia AS1259.2-1990™ (AS1259) – **Acoustics – Sound Level Meters – Integrating Averaging**

Standards Australia AS/IEC 60942:2004/IEC 60942:2003 (IEC60942) – Australian Standard™ – **Electroacoustics – Sound Calibrators**

Appendix A – Noise Monitoring Methodology

A summary of the noise monitoring methodology is provided below. The monitoring was conducted with due regard to and by the CNVMP and other relevant policy, guidelines and standards as listed in the reference section of this report; and as per the construction noise and vibration monitoring program established for NCW.

1. Overview

1.1 Attended noise monitoring

For all monitoring events. A qualified and suitably experienced operator visited community areas surrounding the NCW works and completed operator attended noise measurements. In all cases, the closest receptors were targeted for monitoring, with actual measurement locations selected based on the position of site works and the potentially most affected receptors.

Overall noise levels (L_{max}, L_{min}, L_{eq}, L_1, L_{10} and L_{90} in dBA) were measured at all locations; refer **Figures A1.0 to A17.0**. Based on the measured overall values and observations made during each operator attended noise measurement a site $L_{eq, 15minute}$ noise level contribution in dBA was determined in the absence of any influential source not associated with the project.

1.2 Unattended noise monitoring

Details of the unattended noise monitoring are summarised below:

- Unattended noise monitoring was conducted continuously at the location. Refer to **Figures A1.0 to A17.0**. Overall noise levels (L_{max}, L_{min}, L_{eq}, L_1, L_{10} and L_{90} in dBA) were measured in 15 minutes samples;
- The unattended noise monitoring devices do not directly measure the site contribution. To estimate potential site noise contributions (in the absence of any influential source not associated with the project), it has been assumed that any measured $L_{eq, 15\text{-}minute}$ noise level above 35 dBA at the noise monitoring devices are associated with the site, while works are known to be in progress. These threshold values were determined based on recent monitoring and observations completed near the site;
- Where unattended noise monitors were located onsite, the estimated site noise values were extrapolated to the closest receptor location. This extrapolation was based on the distance from the works on site to the receptor, and takes into account the presence of noise walls (or other mitigation measures implemented) between the receptor and the area of works;

The results of the unattended noise data analysis have been provided in **Appendix D.**

The highest values (and comparison to the NML identified in the CNVMP) for attended and unattended monitoring are presented in **Table 1** and **Table 2** of this report.

1.3 Monitoring Locations

The figures below identify the monitoring locations referenced in this report and other items of importance e.g. nearby roads. Each monitoring location is individually described in the corresponding OOHW technical monitoring report.

2. Technical Requirements

All construction noise monitoring was undertaken in accordance with the "construction noise and vibration monitoring guideline" that is included in Appendix A of the Construction Noise and Vibration Strategy (CNVS) and outlines the minimum requirements for contractors undertaking monitoring on the Sydney Metro Project.

In accordance with the CNVIS, both attended and unattended measurements were the focus of all noise monitoring based on the scope of works for P7. Attended noise monitoring results fed back directly to the project team and actions taken without delay during the works.

In accordance with Condition of Approval (CoA) – C11 monitoring data was made available to the construction team, and LOR and this report can be provided to the Environmental Representative and/or Acoustics Advisor, the Department of Planning and Environment (DP&E) and the NSW Environment Protection Authority (EPA) if needed.

2.1 Noise Monitoring Equipment

All noise measurements were conducted by suitably experienced and qualified personnel with due regard to, and by, the relevant local and international standards for environmental monitoring.

The noise measurement instrumentation used to conduct the monitoring complied with the requirements of AS 61672.1 and AS/IEC 60942. Each noise device had the current National Association of Testing Authorities, Australia (NATA) calibration certificates, with certification at intervals not exceeding two years at the time of use.

Noise instrument calibration was checked prior to monitoring and again at the conclusion with no difference noted between the two measurements. A suitably experienced person has completed all data handling and analysis and subsequently reviewed by a qualified and experienced acoustician.

The equipment utilized during attended noise monitoring is provided below. The quantities of noise logging equipment varied to suit the requirements of each possession.

- ARL Ngara (Type 1) Environmental Noise Loggers
    - Serial 878196, last calibration 23/05/2017 (valid for two years)
    - Serial 878184, last calibration 15/01/2018 (valid for two years)
    - Serial 87801C, last calibration 30/11/2017 (valid for two years)
- Brüel & Kjær 2250 Investigator (Type 1) Sound Analyser (Serial No. 3009001, last calibration 21/12/2017 – valid for two years).
- NTi Audio XL2 Sound Level Meter (Serial No. A2A-06883-E0, last calibration 23/07/2018); and
- Brüel & Kjær 4231 (Type 1) Sound Level Calibrator (Serial No. 2605910, last calibration 17/01/2018).

2.2 Other requirements

All attended measurements were conducted by appropriately trained personnel in the analysis and assessment of construction noise and vibration. They are familiar with the requirements of the relevant standards and procedures.

The noise measurement procedures employed throughout the monitoring were established by the requirements of the Australian Standard (AS) 1055:1997 *Acoustics - Description and Measurement of Environmental Noise*.

Attended noise measurements were conducted by an operator using a handheld Type 1 'integrating-averaging' sound level meter. All analyses were completed with the sound level meter mounted to a tripod and with a windscreen fitted, at the height of 1.2 to 1.5 metres above the ground.

Instantaneous noise levels for all noted noise emission sources (extraneous or otherwise), meteorological conditions (average and maximum wind speeds, temperature, precipitation and cloud cover etc.) were recorded during all measurements. Relevant measurement parameters, i.e. L_{eq}, L_{min}, L_{max}, L_1, L_{10} and L_{90} were recorded in dBA. All noise samples were recorded using the "fast" time response of the sound level meter.

Noise monitoring was not completed within 3.5 metres of any reflective structure or wall, unless behind a barrier. A reduction of up to 2.5 dB was not applied to the measured ambient or site noise contribution ($L_{eq,\ 15\ minute}$ in dBA) as the barrier was reducing noise emissions from the site and in general, did not increase noise due to the reflective properties of the surface.

Noise monitoring was not completed during periods where wind speeds exceeded 5 m/s at the microphone. Noise monitoring was conducted during rain events however the rain was very light and had no effect on the measured data (if applicable).

The general setup of the sound level meter for attended noise measurements was as per Photo 4.1 of the Construction Noise and Vibration Monitoring Program established for NCW, as reproduced below as **Photo A2.1**.

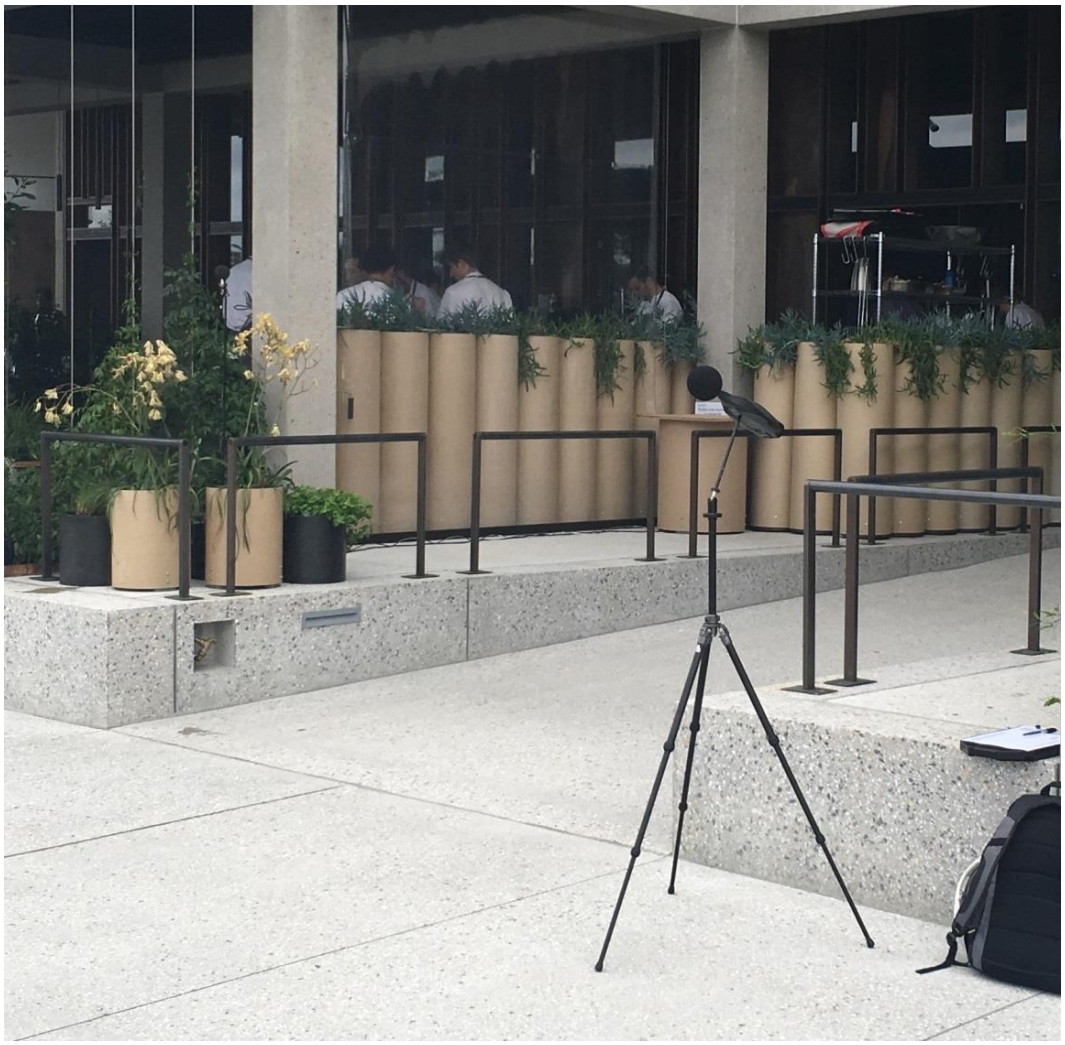


Photo A2.1: Example Attended Noise Monitoring Setup

Attended noise measurements were undertaken at the potentially most affected receptors identified in the LOR noise assessment (adapted for the phase of works) to confirm that the noise levels in the adjacent community were consistent with the predictions provided by LOR. Other potentially affected receptors were also considered as part of the monitoring regime. Monitoring occurred once works were underway but not at the commencement of activities. The duration of all community noise measurement samples was 15 minutes. The device's microphone was focused on the noise emission centre of the equipment being tested.

Figure A1.0 – Raleigh Street - Unattended Noise Monitoring Location

– NCW P7 (November 2018 to January 2019)

Figure A1.0 – Attended (L01-L02) and Unattended (UNM02) Noise Monitoring Locations

– NCW Portion 1-6 –Gordon to Killara- (WE18 - Saturday, 03 November to Sunday, 04 November 2018)

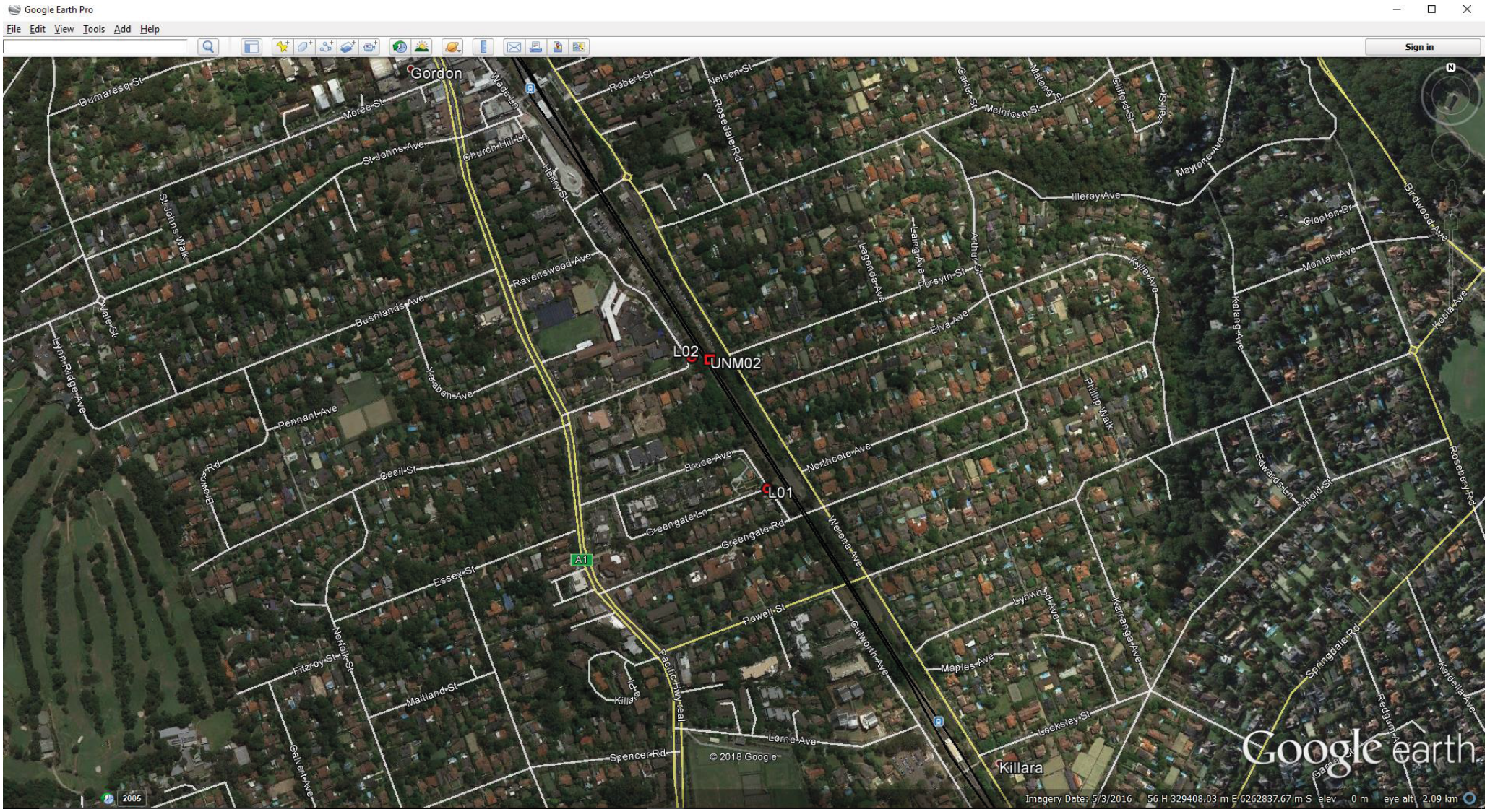


Figure A1.0 – Attended (A01-A02) and Unattended (UNM01) Noise Monitoring Locations

– NCW Portion 7A (WE18 - Saturday, 03 November to Sunday, 04 November 2018)

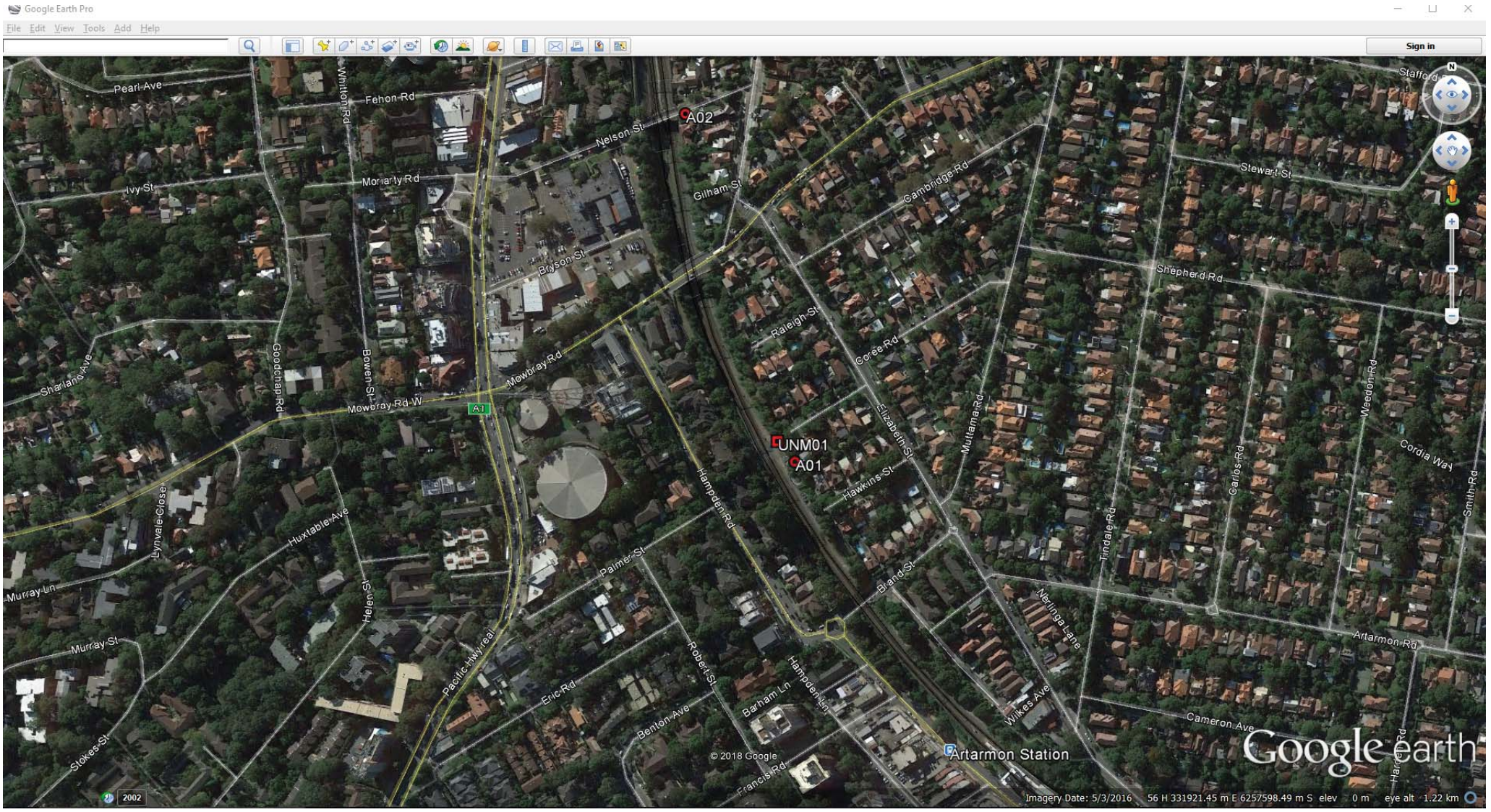


Figure A1.0 – Attended (A01-A03) and Unattended (UNM01 and UNM02) Noise Monitoring Locations

– NCW Portion 7A (WE20 - Saturday, 17 November to Sunday, 18 November 2018)

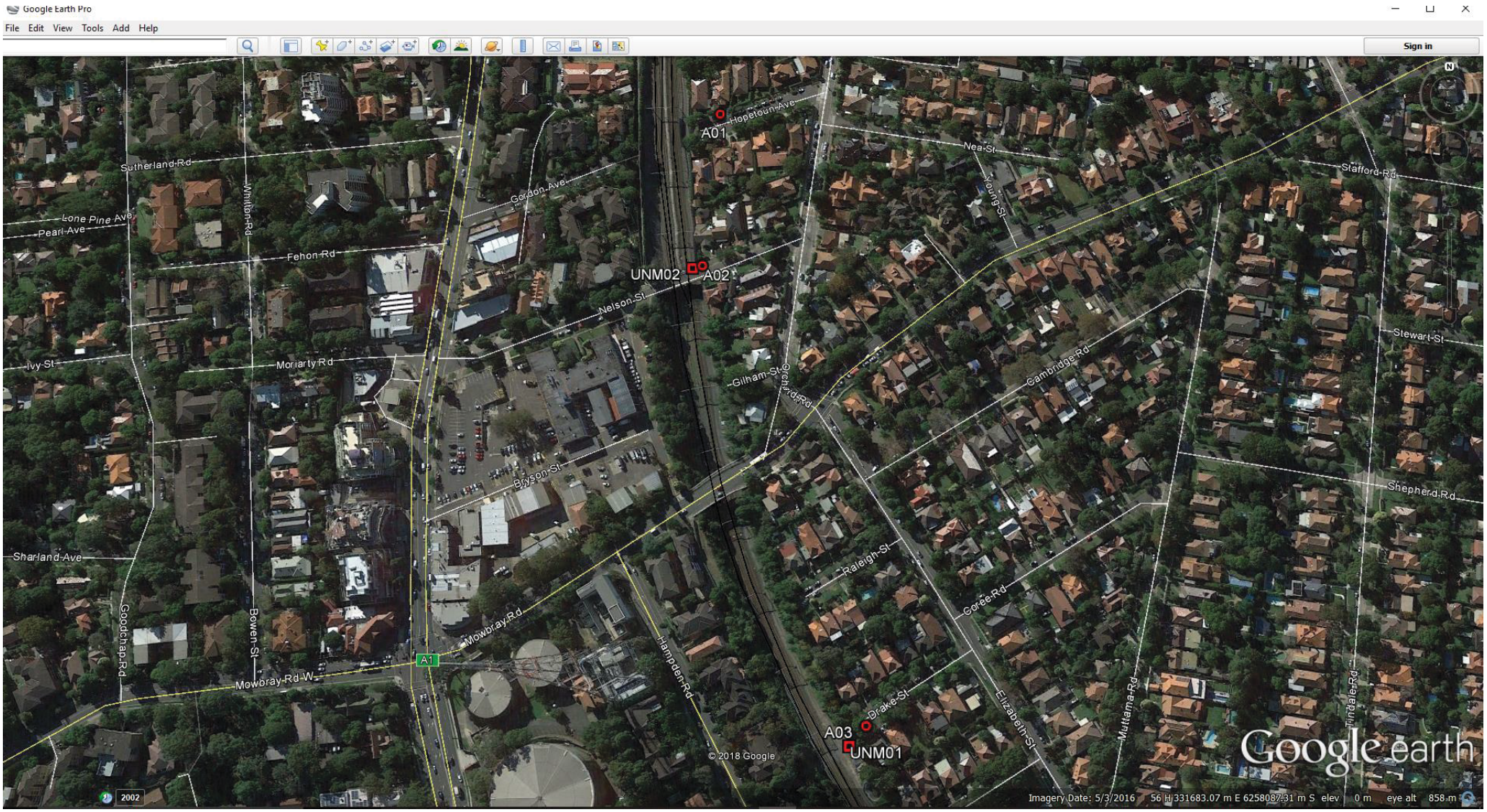


Figure A1.0 – OOHW WE25 – Attended and Unattended Noise Monitoring Locations

– NCW P7 (Saturday, 22 December to Sunday, 23 December 2018)

Figure A1.0 – OOHW WE25 – Attended Noise Monitoring Locations - Killara

– NCW P1-6 (Saturday, 22 December to Sunday, 23 December 2018)

Figure A1.1 – OOHW WE25 – Attended Noise Monitoring Locations - Chatswood – NCW P1-6 (Saturday, 22 December to Sunday, 23 December 2018)

Figure A1.1 – Portion 7 Attended and Unattended Noise Monitoring Locations

– NCW (MW26 + WE27 - Thursday, 03 January to Monday, 7 January 2018)

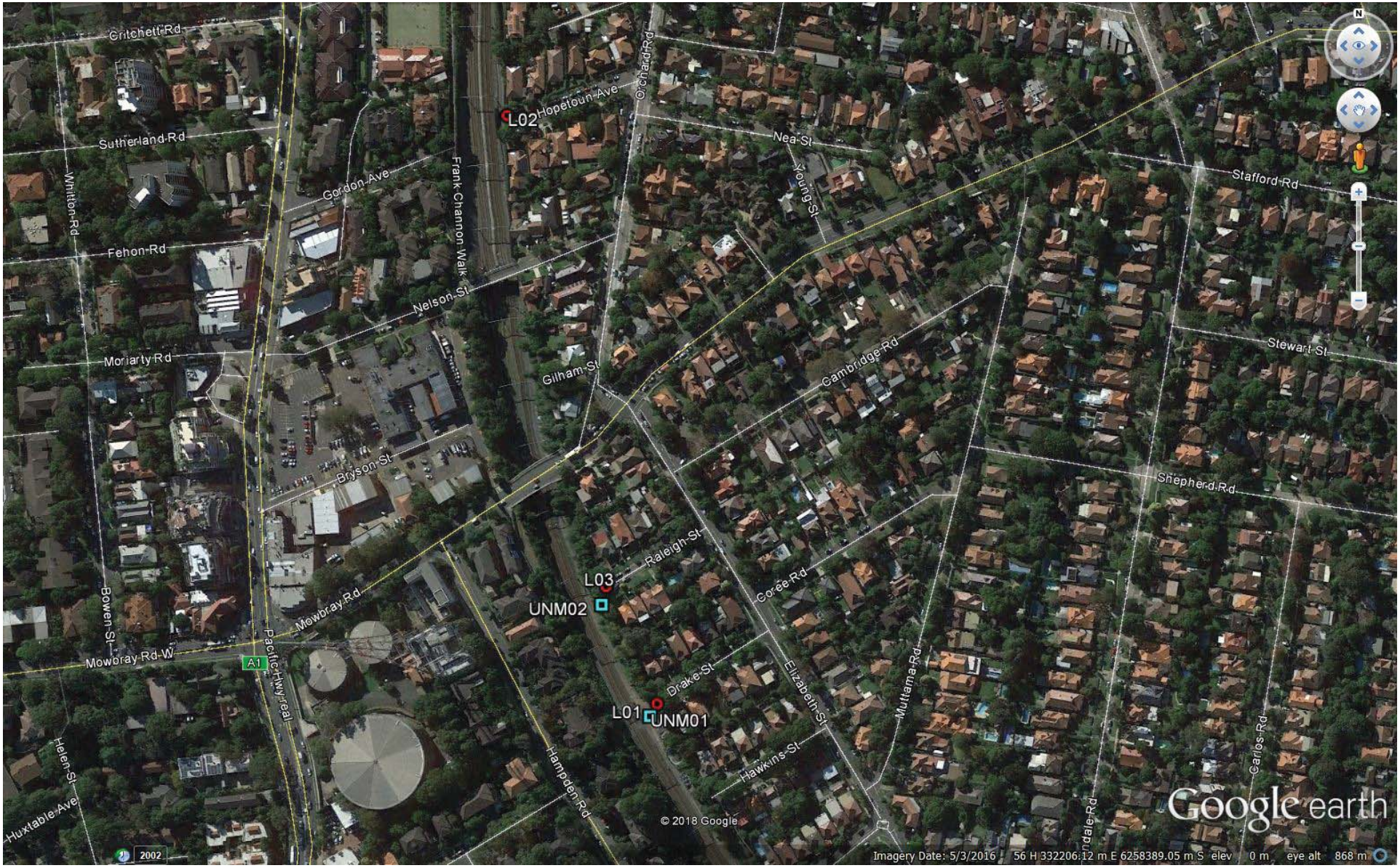


Figure A1.2 – Portion 1-6 Attended Noise Monitoring Locations

– NCW (MW26 + WE27 - Thursday, 03 January to Monday, 7 January 2018)

Figure A1.0 – OOHW MW31 - Unattended Noise Monitoring Locations

– NCW P7 (Monday, 4 February to Friday, 8 February 2019)

Figure A1.0 – OOHW MW32 – Attended and Unattended Noise Monitoring Locations

– NCW P7 (Monday, 11 February to Friday, 15 February 2019)

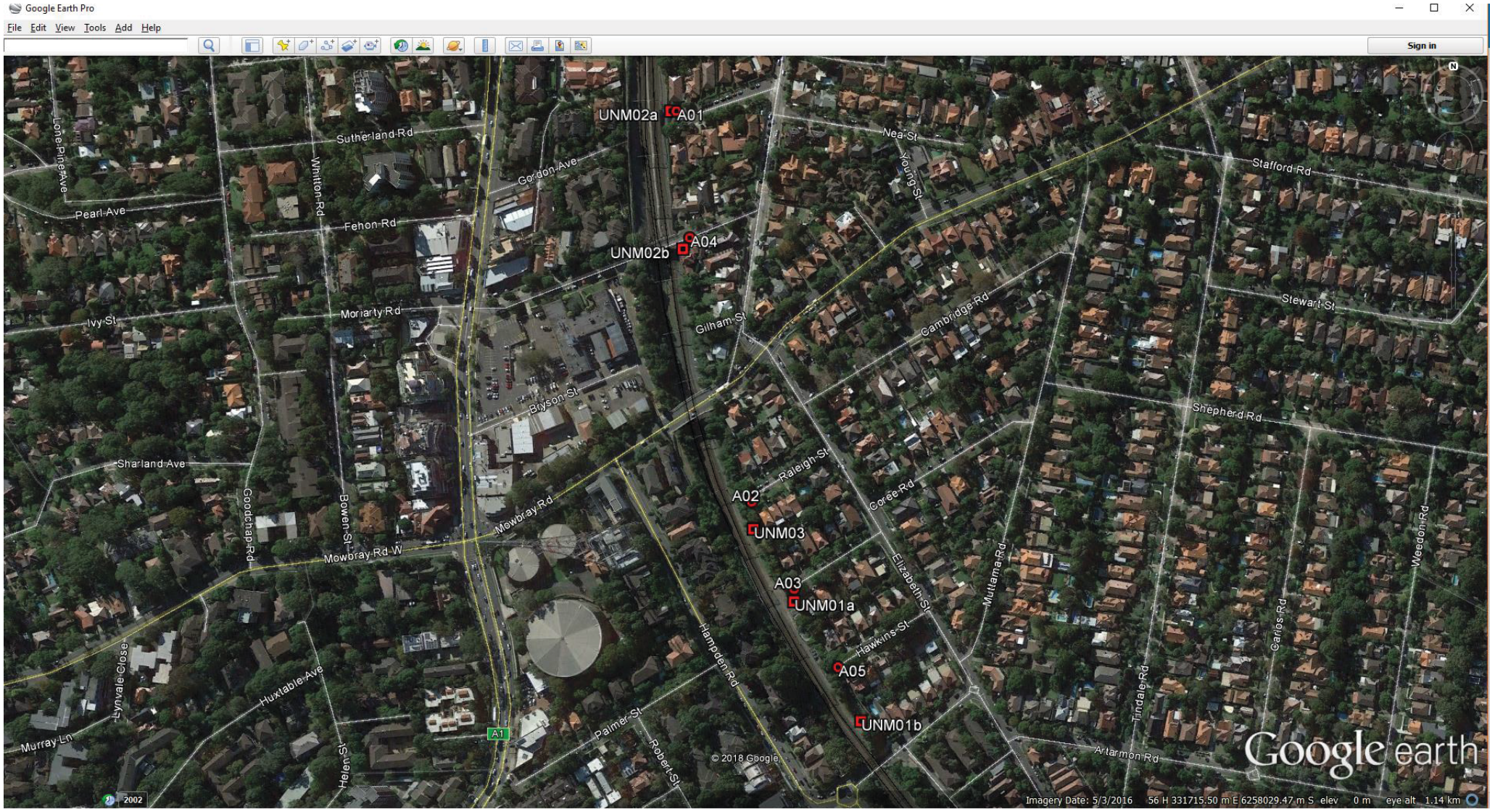


Figure A1.0 – OOHW MW33 – Attended and Unattended Noise Monitoring Locations

– NCW P7 (Monday, 18 February to Friday, 22 February 2019)

Figure A1.0 – OOHW WE34 – Attended and Unattended Noise (and Vibration) Monitoring Locations – NCW P7 (Saturday, 23 February to Sunday, 24 February 2019)

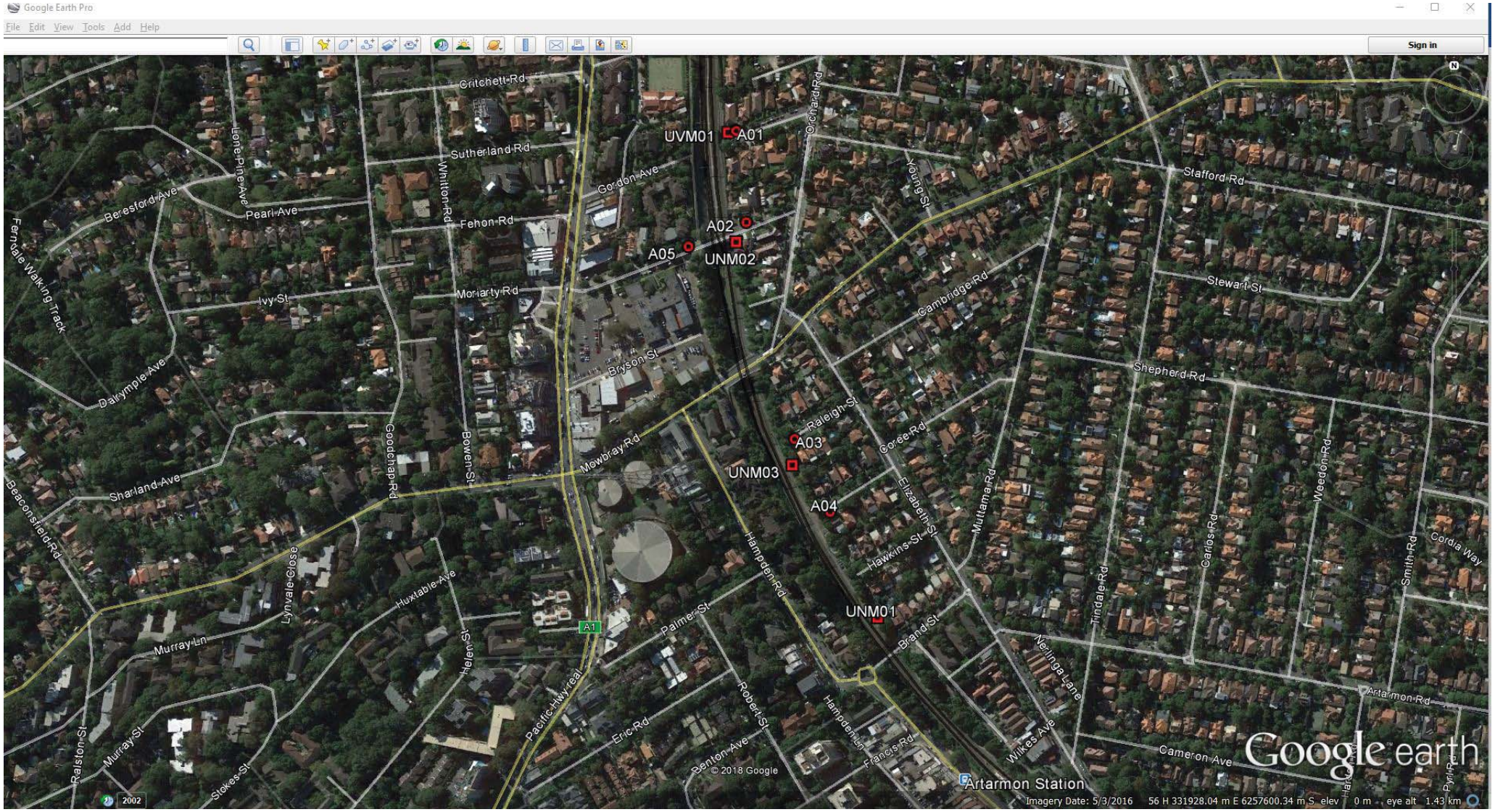


Figure A1.0 – OOHW MW33 – Attended and Unattended Noise, and Unattended Vibration Monitoring Locations – NCW P7 (Monday, 04 March to Friday, 08 March 2019)

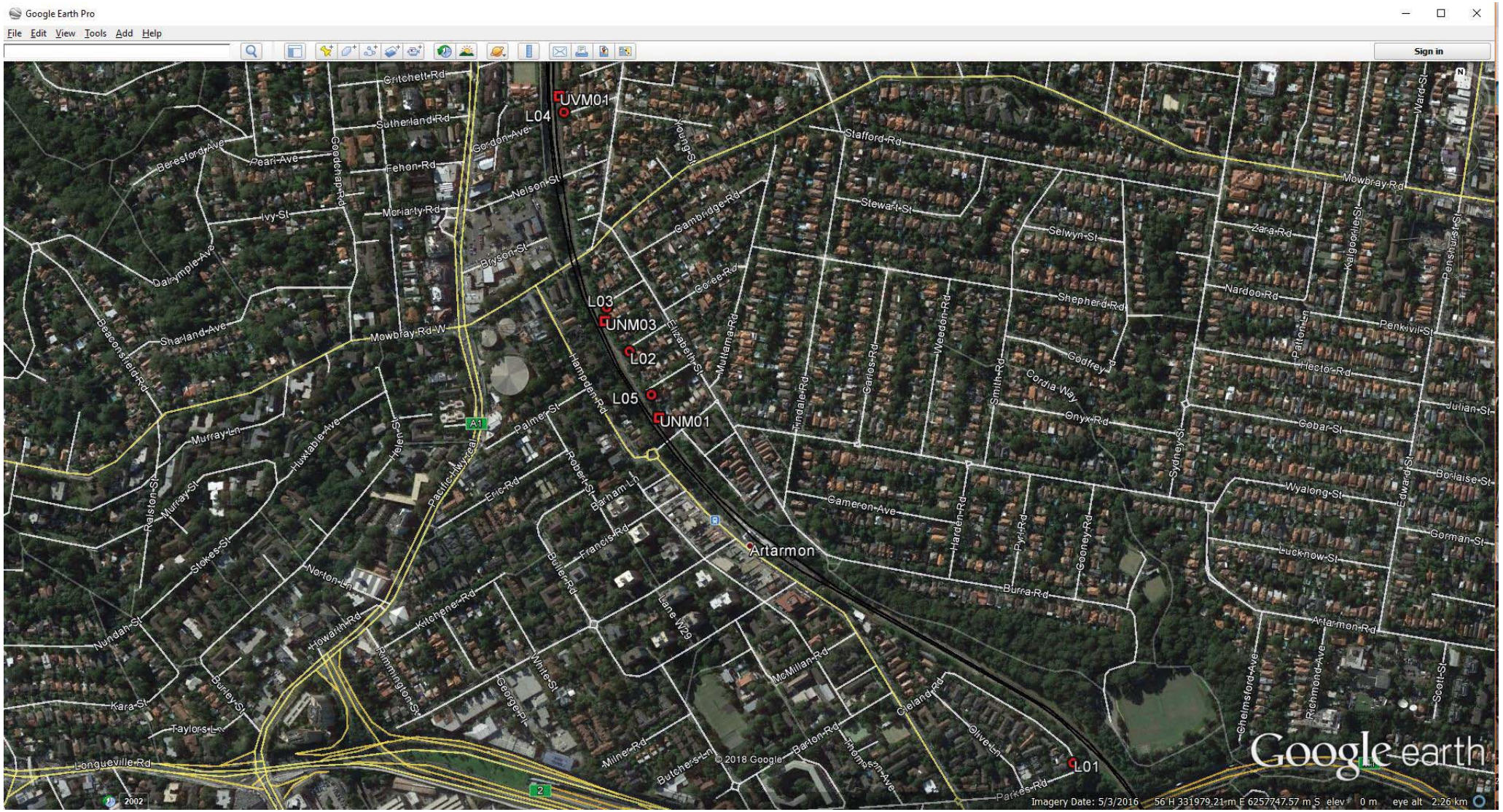


Figure A1.0 – OOHW MW37 – Attended and Unattended Noise Monitoring Locations – NCW P7 (Monday, 18 March to Friday, 22 March 2019)

Figure A1.0 – OOHW WE38 – Attended and Unattended Noise Monitoring Locations

– NCW P7 (Saturday, 23 March to Sunday, 24 March 2019)

Appendix B – Vibration Monitoring Methodology

1. Monitoring Overview

1.1 Vibration Monitoring

Attended Vibration Monitoring

For all monitoring events, a qualified and suitably experienced operator visited the NCW P7 project site to conduct operator attended noise measurements at the monitoring locations outlines below, refer **Section 1.2** of **Appendix B**. The closest receptors were targeted for monitoring when outside of the rail corridor, with actual measurement locations selected based on the position of site works and the potentially most affected receptors. Vibration levels were measured to determine Peak Particle Velocity (PPV, mm/s and Frequency, Hz); refer **Table 3** of this report.

Unattended vibration monitoring

Unattended vibration monitoring was undertaken within the rail corridor / project site (refer to **Figures B1.0 to B5.0**). The highest results of the measured vibration data at each location are summarised in **Table 4** of this report, the full vibration data set (measured PPV over time, all relevant data captured during the monitoring period) is provided in **Annex E.**

1.2 Monitoring Locations

Figures B1.0 to B3.0 identify the key work areas and all monitoring locations referenced in this report and other items of importance to this. Each monitoring location is individually described in the corresponding OOHW technical monitoring report.

1.3 Vibration Monitoring Equipment

All vibration measurements were conducted by suitably experienced and qualified ERM personnel with due regard to, and in accordance with, the relevant local and international standards for environmental monitoring.

Vibration equipment was calibrated and checked to the manufacturer's specification, with certification at intervals not exceeding one year at the time of use.

A qualified and experienced acoustician has completed all data handling and analysis.

The equipment utilized during attended noise monitoring is provided below. The quantities of vibration logging equipment varied to suit the requirements of each possession.

- Saros Minimate Plus (Series III) Environmental Vibration Monitor
    - Serial No. BE13734, last calibration 23/04/2018
    - Serial No. BE14130, last calibration 04/05/2018

Figure B1.0 – Unattended (UVM01) Vibration Monitoring Location

– NCW Portion 7A (MW15 to MW18 - Thursday, 18 October to Saturday, 10 November 2018)

Figure B2.0 – Unattended (UVM01 and UVM02) Vibration Monitoring Locations

– NCW Portion 7A (WE20 - Saturday, 17 November to Sunday, 18 November 2018)

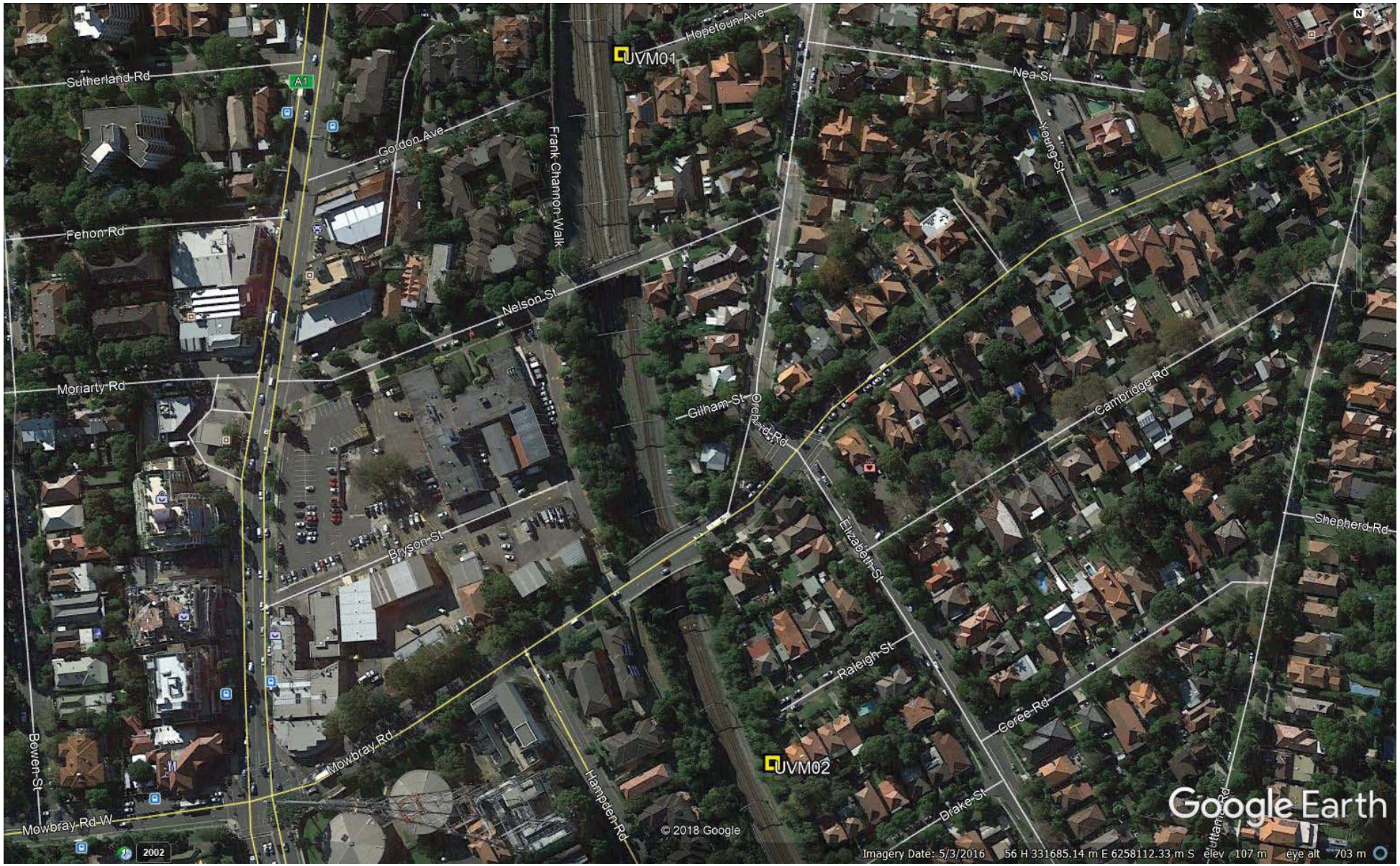
Figure B3.0 – OOHW WE25 – Unattended Vibration Monitoring Locations

– NCW P7 (Saturday, 22 December to Sunday, 23 December 2018)

Figure B4.0 – Attended Vibration Monitoring Locations and Indicative Vibratory Rolling Work Areas – NCW P7 (Friday, 15 February 2019)

Figure B5.0 – OOHW WE38 – Unattended Vibration Monitoring Locations

– NCW P7 (Saturday, 23 March to Sunday, 24 March 2019)



Appendix C – Completed Noise Data Set – Attended Measurements

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	INP Impulsive Modifying Factor?	INP Tonal Modifying Factor?	INP LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 001	03-Nov-18	17:08	00:15:00	78.99	50.76	59.11	69.33	60.53	53.65	70	63	-	5.0	-	77	L01	Day	45	50	57	60	18	13	6	17	Project 001-002 (L01). Measurement taken on the corner of Bruce Avenue and Greengate Lane, near Greengate Park, generally facing east towards works within rail corridor. NCW P1-6 works involved activities 4-5 (OHW works) and general construction activities, which included the use of a movement of light vehicles, Hi-rail plant of varying sizes, generators and lighting towers, and general hand tools. Distant traffic and aeroplanes passing by, estimated noise: 56-68 dBA. Music and kids playing nearby, estimated noise: 47-53 dBA during times of low site activity. Site activities outlined above contributed to approximately 50-70% of the measured LAeq noise level over the two measurements, with non-project related traffic and other noise sources audible during times of low activity on site.
Project 002	03-Nov-18	17:23	00:15:00	74.79	44.08	56.45	67.57	58.83	48.37	50	58	-	5.0	-	70	L01	Day	45	50	57	60	13	8	1	10	
Project 011	03-Nov-18	21:59	00:15:00	79.4	48.56	54.8	64.29	54.9	51.42	100	55	-	-	-	79	L02	Evening	40	45	57	55	15	10	-2	24	
Project 012	03-Nov-18	22:14	00:15:00	78.68	46.04	54.42	63.64	54.09	49.41	100	54	-	-	-	71	L02	Night	35	40	57	50	19	14	-3	21	
Project 013	03-Nov-18	22:31	00:15:00	72.52	46.28	51.71	61.56	52.6	47.77	100	57	-	5.0	-	70	L02	Night	35	40	57	50	22	17	0	20	Project 007 (L02). Measurement taken at the corner of Cecil and Henry Streets, Gordon, facing east towards works within the rail corridor and UNM02. NCW P1-6 predominantly involved Activity 5 (Temporary Site Compound Sign on/off), OHW works and general construction activities, which included the use of a light vehicle access/egress, lighting towers and generators, hi-rail plant and equipment, and hand tools. Passing traffic, estimated noise: 54-64 dBA. Distant traffic, estimated noise: 48-54 dBA. Site activities outlined above contributed to between 50-100% of the measured LAeq noise level over the six measurements, with non-project related traffic and other noise sources audible during times of low activity on site.
Project 014	03-Nov-18	22:51	00:15:00	64.68	46.58	50.11	60.61	50.5	47.66	100	55	-	5.0	-	49	L02	Night	35	40	57	50	20	15	-2	-1	
Project 022	04-Nov-18	16:36	00:15:00	74.48	45.63	55.68	65.37	58.06	48.73	50	58	-	5.0	-	66	L02	Day	45	50	57	60	13	8	1	6	
Project 023	04-Nov-18	16:54	00:15:00	73.58	49.21	55.7	63.88	57.92	51.51	50	58	-	5.0	-	67	L02	Day	45	50	57	60	13	8	1	7	

Weather 06-Oct-18: Generally fine weather, cloudy with low-moderate winds. Temperature ranged between 18 - 14 degrees Celsius.
Weather 07-Oct-18: Almost constant rain and low/moderate winds. Temperature ranged between 16 - 13 degrees Celsius.
Note: all predicted noise levels were reproduced from the LOR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The total penalty is shown in the column adjacent to the site noise level contribution. The site noise contribution reported here is inclusive of all modifying factors.

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	INP Impulsive Modifying Factor?	INP Tonal Modifying Factor?	INP LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Exceedance to Sleep Disturbance Screening Level - LAmax	Description
Project 003	03-Nov-18	18:30	00:15:00	85.64	56.05	58.59	62.86	58.9	56.97	90	58	-	-	-	70	NCA-01	Evening	41	46	55	56	17	12	3	14	
Project 004a	03-Nov-18	18:45	00:15:00	72.6	55.8	58	60.5	58.7	57	100	58	-	-	-	63	NCA-01	Evening	41	46	55	56	17	12	3	7	Project 003-004a/b (A01): Measurements taken within the pedestrian walkway between Drake and Hawkins Streets, facing west towards the works within the rail corridor. NCW P7 works mainly included activity, (sign on/off at site) along with general construction activities, which included the use of a lighting towers and generators, movement of plant within the rail corridor, and general hand tools. Passing traffic along Elizabeth street was inaudible during site activities. Nearby wildlife, estimated noise: 55-64 dBA. Wind-blown vegetation, estimated noise: ~55 dBA. Site activities outlined above dominated the measurements and contributed to 90-100% of the measured LAeq noise levels over the three measurements, with non-project related noise sources generally inaudible throughout the measurement during times of site activity.
Project 004b	03-Nov-18	19:01	00:15:00	67	55.4	58.4	61.7	59.4	57.3	100	58	-	-	-	63	NCA-01	Evening	41	46	55	56	17	12	3	7	
Project 005	03-Nov-18	19:31	00:15:00	76.69	53.84	63.19	71.01	65.62	57.51	100	68	-	5.0	-	74	NCA-01	Evening	41	46	65	56	27	22	3	18	
Project 006	03-Nov-18	19:46	00:15:00	75.64	54.19	60.7	65.33	62.76	56.62	100	66	-	5.0	-	75	NCA-01	Evening	41	46	65	56	25	20	1	19	
Project 007	03-Nov-18	20:30	00:15:00	75.43	52.24	60.99	65.84	64.26	53.68	100	66	-	5.0	-	65	NCA-01	Evening	41	46	65	56	25	20	1	9	
Project 008	03-Nov-18	20:45	00:15:00	74.32	53.29	58.13	64.31	60.19	55.17	100	63	-	5.0	-	65	NCA-01	Evening	41	46	65	56	22	17	-2	9	
Project 009	03-Nov-18	21:01	00:15:00	75.93	49.1	57.85	62.86	60.72	53.22	100	63	-	5.0	-	63	NCA-01	Evening	41	46	65	56	22	17	-2	7	Project 005-010 and 015-018 (A02): Measurements taken at outside 2 Nelson Street, facing south west towards works within the rail corridor. NCW P7 works involved a number of activities outlined within OOHWA-019 (including ULX crossing construction and OHW works) along with general construction activities, which included the use of excavators and hi-rail equipment of varying sizes, dump trucks, wacker packers, sucker trucks, and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level for all 10 measurements, with non-project related noise sources inaudible throughout the measurement during times of high activity on site.
Project 010	03-Nov-18	21:16	00:15:00	79.88	47.82	59.62	63.72	61.68	54.43	100	65	-	5.0	-	74	NCA-01	Evening	41	46	65	56	24	19	0	18	
Project 015	03-Nov-18	23:26	00:15:00	77.35	48.51	61.26	65.76	62.76	52.89	100	66	-	5.0	-	70	NCA-01	Night	35	40	65	50	31	26	1	20	
Project 016	04-Nov-18	00:00	00:15:00	78.98	58.5	67.15	71.14	69.37	62.94	100	72	-	5.0	-	74	NCA-01	Night	35	40	65	50	37	32	7	24	
Project 017	04-Nov-18	00:15	00:15:00	78.32	50.17	63.1	69.51	65.91	53.01	100	68	-	5.0	-	70	NCA-01	Night	35	40	65	50	33	28	3	20	
Project 018	04-Nov-18	00:30	00:15:00	91.46	53.17	67.31	76.14	69.62	56.32	100	67	-	-	-	89	NCA-01	Night	35	40	65	50	32	27	2	39	
Project 019	04-Nov-18	14:50	00:15:00	71.78	54.81	56.65	59.75	57.36	55.77	70	60	-	5.0	-	59	NCA-01	Day	42	47	55	57	18	13	5	2	Project 019 (A01): Measurements location identified above (A01). NCW P7 works mainly included activity, (sign on/off at site) along with general construction activities, which included the use of a lighting towers and generators, movement of plant within the rail corridor, and general hand tools. Passing traffic along Elizabeth street was inaudible during site activities. Wind-blown vegetation, estimated noise: 54-58 dBA. Site activities outlined above dominated the measurements and contributed to approximately 70% of the measured LAeq noise levels over the measurement, with non-project related noise sources generally audible during times of high wind and low activity on site.
Project 020	04-Nov-18	15:18	00:15:00	74.3	52.38	61.29	68.19	64.4	55.34	100	61	-	-	-	70	NCA-01	Day	42	47	60	57	19	14	1	13	Project 020 and 021 (A02): Measurements location identified above (A02). NCW P7 works involved a number of activities outlined within OOHWA-019 (including ULX crossing construction and OHW works) along with general construction activities, which included the use of excavators and hi-rail equipment of varying sizes, and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level for both measurements, with non-project related noise sources inaudible throughout the measurement during times of high activity on site.
Project 021	04-Nov-18	15:37	00:15:00	83.47	50.76	60.05	68.17	62.21	55	100	60	-	-	-	82	NCA-01	Day	42	47	60	57	18	13	0	25	

Weather 03-04-Nov-18: Hot and humid with moderate winds; fairly overcast. Slight rain on Saturday night. Temperature ranged between 25-17 degrees Celsius over the weekend.
Note: all predicted noise levels were reproduced from the LOR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	INP Impulsive Modifying Factor?	INP Tonal Modifying Factor?	INP LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	NML - LAeq, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 001	17-Nov-18	17:26	00:15:00	84.36	53.13	74.31	81.26	77.15	59.61	100	79	-	5.0	-	82	NCA-01	Day	42	47	79	57	37	32	0	25	Project 001-002 (A01): Measurements taken 13 Hopetoun Avenue, facing west towards the works within the rail corridor. NCW P7 works mainly included Activities 9, 15 and 16 (Tamping of worksite, removal of noise wall and concrete capping beam at the Hopetoun Avenue Ramp) along with general construction activities, which included the use of a lighting towers and generators, Tamper and work train, Hi Rail equipment and excavators of varying sizes, concrete saws, jackhammers, dump trucks, and power and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise levels over the two measurements, with non-project related noise sources inaudible throughout the measurement during times of activity on site.
Project 002	17-Nov-18	17:44	00:15:00	87.43	54.8	75.52	82.23	78.51	67.9	100	76	-	-	-	78	NCA-01	Day	42	47	79	57	34	29	-3	21	
Project 003	17-Nov-18	18:45	00:15:00	74.17	52.64	58.05	66.4	60.13	54.45	90	58	-	-	-	65	NCA-01	Evening	41	46	60	56	17	12	-2	9	
Project 004	17-Nov-18	19:15	00:15:00	76.54	52.59	60.78	66.79	63.3	55.01	100	61	-	-	-	69	NCA-01	Evening	41	46	60	56	20	15	1	13	Project 003-006 (A02): Measurements taken at outside 5 Nelson Street, generally facing west towards works within the rail corridor. NCW P7 works involved a number of activities outlined within OOHWA-022 (Tamping of worksite, excavation and installation of material) along with general construction activities, which included the use of excavators and hi-rail equipment of varying sizes, Tamper and work train, dump trucks and dozers, and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the four measurements, with non-project related noise sources inaudible throughout the measurement during times of high activity on site.
Project 005	17-Nov-18	20:00	00:15:00	74.32	49.99	55.92	63.67	57.91	51.7	100	61	-	5.0	-	69	NCA-01	Evening	41	46	60	56	20	15	1	13	
Project 006	17-Nov-18	20:18	00:15:00	87.82	59.78	67.34	80.43	67.97	60.86	100	72	-	5.0	-	81	NCA-01	Evening	41	46	72	56	31	26	0	25	
Project 007	17-Nov-18	20:57	00:15:00	86.64	55.93	68.38	77.95	70.48	63.91	100	73	-	5.0	-	81	NCA-01	Evening	41	46	72	56	32	27	1	25	Project 007-008 (A01): Measurement location identified above (A01). NCW P7 works mainly included Activities 9, 15 and 16 (Tamping of worksite, removal of noise wall and concrete capping beam at the Hopetoun Avenue Ramp) along with general construction activities, which included the use of a lighting towers and generators, Tamper and work train, Hi Rail equipment and excavators of varying sizes, concrete saws, jackhammers, dump trucks, and power and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise levels over the two measurements, with non-project related noise sources inaudible throughout the measurement during times of activity on site.
Project 008	17-Nov-18	21:29	00:15:00	89.49	55.31	67.1	75.14	68.53	56.75	100	72	-	5.0	-	80	NCA-01	Evening	41	46	72	56	31	26	0	24	
Project 009	17-Nov-18	22:00	00:15:00	67.54	56.31	59.38	62.07	60.48	58.16	100	64	-	5.0	-	61	NCA-01	Night	35	40	60	50	29	24	4	11	Project 009 (A03): Measurement taken outside 12 Drake Street, generally facing west towards site entrance and works within the rail corridor. NCW P7 works included a number of activities outlined throughout OOHWA-022 (Tamping of work site, movement of train and unload of ballast, concrete pouring, stockpiling) along with general construction activities, which included the use of a lighting towers and generators, Tamper and work train, Hi Rail equipment and excavators of varying sizes, concrete trucks, dump trucks, and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the measurement, with non-project related noise sources inaudible throughout the measurement during times of activity on site.
Project 010	17-Nov-18	22:59	00:15:00	80.37	56.65	61.74	66.25	64.41	58.9	100	72	-	5.0	5.0	76	NCA-01	Night	35	40	72	50	37	32	0	26	
Project 011	17-Nov-18	23:45	00:15:00	86.32	53.04	72.23	83.61	76.96	57.57	100	77	-	5.0	-	85	NCA-01	Night	35	40	72	50	42	37	5	35	
Project 012	18-Nov-18	13:44	00:15:00	86.59	51.19	72.29	81.8	77.38	55.17	100	72	-	-	-	84	NCA-01	Day	42	47	64	57	30	25	8	27	Project 010-013 (A02): Measurement location identified above. NCW P7 works involved a number of activities outlined within OOHWA-022 (Tamping of worksite, excavation and installation of material) along with general construction activities, which included the use of excavators and hi-rail equipment of varying sizes, Tamper and work train, dump trucks and dozers, and general hand tools. Site activities outlined above dominated the measurements and contributed to 90-100% of the measured LAeq noise level over the four measurements, with non-project related noise sources inaudible throughout the measurement during times of high activity on site.
Project 013	18-Nov-18	14:15	00:15:00	88.77	47.65	74.54	85.3	79	55.74	90	74	-	-	-	85	NCA-01	Day	42	47	72	57	32	27	2	28	
Project 014	18-Nov-18	15:21	00:15:00	95.33	39.81	67.81	75.24	66.48	44.19	80	72	-	5.0	-	94	NCA-01	Day	42	47	72	57	30	25	0	37	Project 014-015 (A01): Measurement location identified above (A01). NCW P7 works mainly included Activities 9, 15 and 16 (Tamping of worksite, removal of noise wall and concrete capping beam at the Hopetoun Avenue Ramp) along with general construction activities, which included the use of a lighting towers and generators, Tamper and work train, Hi Rail equipment and excavators of varying sizes, concrete saws, jackhammers, dump trucks, and power and general hand tools. Site activities outlined above dominated the measurements and contributed to 80-100% of the measured LAeq noise levels over the two measurements, with non-project related noise sources generally inaudible throughout the measurement during times of activity on site.
Project 015	18-Nov-18	15:39	00:15:00	92.48	61.93	66.9	74.53	67.28	64.22	100	67	-	-	-	92	NCA-01	Day	42	47	72	57	25	20	-5	35	
Project 016	18-Nov-18	17:01	00:15:00	71.55	46.81	57.31	65.85	60.95	49.92	80	56	-	-	-	67	NCA-01	Day	42	47	60	57	14	9	-4	10	Project 016-017 (A02): Measurement location identified above. NCW P7 works involved a number of activities outlined within OOHWA-022 (Tamping of worksite, excavation and installation of material) along with general construction activities, which included the use of excavators and hi-rail equipment of varying sizes, Tamper and work train, dump trucks and dozers, and general hand tools. Site activities outlined above dominated the measurements and contributed to 80-90% of the measured LAeq noise level over the two measurements, with non-project related noise sources generally inaudible throughout the measurement during times of high activity on site.
Project 017	18-Nov-18	17:30	00:15:00	71.55	48.39	62.61	68.78	65.87	52.1	90	62	-	-	-	70	NCA-01	Day	42	47	60	57	20	15	2	13	
Project 018	18-Nov-18	17:52	00:15:00	86.45	51.19	65.84	72.54	69.36	55.29	100	71	-	5.0	-	72	NCA-01	Day	42	47	72	57	29	24	-1	15	Project 018-019 (A01): Measurement location identified above (A01). NCW P7 works mainly included Activities 9, 15 and 16 (Tamping of worksite, removal of noise wall and concrete capping beam at the Hopetoun Avenue Ramp) along with general construction activities, which included the use of a lighting towers and generators, Tamper and work train, Hi Rail equipment and excavators of varying sizes, concrete saws, jackhammers, dump trucks, and power and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise levels over the two measurements, with non-project related noise sources inaudible throughout the measurement during times of activity on site.
Project 019	18-Nov-18	18:09	00:15:00	89.41	56.92	70.78	80.99	74.34	62.91	100	71	-	-	-	88	NCA-01	Evening	41	46	72	56	30	25	-1	32	
Project 020	18-Nov-18	18:45	00:15:00	85.86	40.78	58.24	70.76	59.2	43.84	70	57	-	-	-	67	NCA-01	Evening	41	46	55	56	16	11	2	11	Project 020 (A03): Measurement location identified above (A03). NCW P7 works included a number of activities outlined throughout OOHWA-022 (Tamping of work site, movement of train and unload of ballast, concrete pouring, stockpiling) along with general construction activities, which included the use of a lighting towers and generators, Tamper and work train, Hi Rail equipment and excavators of varying sizes, concrete trucks, dump trucks, and general hand tools. Site activities outlined above dominated the measurements and contributed to 100% of the measured LAeq noise level over the measurement, with non-project related noise sources inaudible throughout the measurement during times of activity on site.

Weather 17-18 Nov 2018: Fine weather with some winds; fairly overcast. Slight rain on Saturday evening. Temperature ranged between 23-17 degrees Celsius over the weekend.
Note: all predicted noise levels were reproduced from the LOR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	INP Impulsive Modifying Factor?	INP Tonal Modifying Factor?	INP LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LAeq Period	NML - LAeq 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LAeq Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 001	22-Dec-18	14:50	00:15:00	79.1	45.0	56.8	66.4	58.2	50.2	40	53		0.0		54	A01	Day	45	50	60	60	8	3	-7	-6	Project 001 (A01). Measurement taken on Wilson Street, facing east towards works within rail corridor. NCW P1-6 works at this location involved activities 9 (OHW works) and general construction activities, which included the use of a movement of light vehicles, Hi-rail plant of varying sizes, and general hand tools. Distant traffic, estimated noise: 56-75 dBA. Kids playing nearby, estimated noise: 49-57 dBA during times of low site activity. Site activities outlined above contributed to approximately 40% of the measured LAeq noise level over the measurement, with non-project related traffic and other noise sources audible during times of low activity on site.
Project 002	22-Dec-18	15:10	00:15:00	74.4	45.5	56.2	64.6	58.6	50.3	40	52	-	0.0	-	56	A01	Day	45	50	60	60	7	2	-8	-4	
Project 007	22-Dec-18	18:22	00:15:00	79.2	41.8	63.9	73.4	68.8	48.0	40	60		0.0		68	A02	Evening	40	45	55	55	20	15	5	13	Project 007 and 010 (A02). Measurement taken outside 11 Werona St, Killara, facing east towards works within the rail corridor. NCW P1-6 predominantly involved Activity 4 (signalling construction works) and Activity 11 (fence construction), OHW works and general construction activities, which included the use of a light vehicle access/egress, lighting towers and generators, hi-rail plant and equipment, and hand tools. Passing traffic and aeroplanes overhead, estimated noise: 56-74 dBA. Bird activity, estimated noise: 51-67 dBA. Site activities outlined above contributed to between 40% of the measured LAeq noise level over the two measurements, with non-project related traffic and other noise sources audible during times of low activity on site.
Project 010	22-Dec-18	21:20	00:15:00	79.1	54.0	65.9	74.4	70.7	56.3	70	69		5.0		74	A02	Evening	40	45	55	55	29	24	14	19	
Project 011	22-Dec-18	21:51	00:15:00	78.6	57.1	63.5	73.9	65.5	58.9	90	68		5.0		66	A03	Evening	40	45	55	55	28	23	13	11	Project 011, 012 and 015 undertaken outside 8 Culworth Ave, Killara, facing west towards works within the rail corridor. NCW P1-6 predominantly involved Activity 4 (signalling construction works) and Activity 11 (fence construction), OHW works and general construction activities, which included the use of a light vehicle access/egress, lighting towers and generators, hi-rail plant and equipment, and hand tools. Passing traffic and aeroplanes overhead, estimated noise: 56-74 dBA. Bird activity, estimated noise: 51-67 dBA. Site activities outlined above contributed to between 40% of the measured LAeq noise level over the two measurements, with non-project related traffic and other noise sources audible during times of low activity on site.
Project 012	22-Dec-18	23:00	00:15:00	82.7	57.5	61.6	69.5	61.8	59.5	90	66		5.0		62	A03	Night	35	40	57	50	31	26	9	12	
Project 015	23-Dec-18	14:45	00:15:00	84.3	42.2	58.0	70.6	58.5	46.2	40	54		0.0		61	A03	Day	45	40	57	60	9	14	-3	1	

Weather 22-Dec-18: Generally good weather, cloudy with low-moderate winds. Some rain in the evening. Temperature ranged between 18-20 degrees Celsius.
Weather 23-Dec-18: Weather very fine with low winds and very little cloud. Temperature ranged between 22-25 degrees celsius.
Note: all predicted noise levels were reproduced from the LOR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The total penalty is shown in the column adjacent to the site noise level contribution. The site noise contribution reported here is inclusive of all modifying factors.

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	INP Impulsive Modifying Factor?	INP Tonal Modifying Factor?	INP LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 003	22-Dec-18	15:44	00:15:00	77.0	58.3	63.0	68.4	65.9	59.2	90	68	-	5.0	-	69	A02	Day	42	47	60	57	26	21	8	12	Project 003 and 004 (A02). Measurements undertaken to the west of 14 Raleigh Street, facing west towards works within the rail corridor. NCW P7 works involved a number of activities outlined within OOWHA-023 (excavation, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 004	22-Dec-18	16:15	00:15:00	85.8	56.9	65.2	72.9	68.8	57.9	100	70	-	5.0	-	72	A02	Day	42	47	60	57	28	23	10	15	
Project 005	22-Dec-18	16:45	00:15:00	81.4	48.7	61.8	71.0	65.4	50.9	80	66	-	5.0	-	77	A01	Day	42	47	60	57	24	19	6	20	Project 005 and 006 (A02). Measurements undertaken to the in front of 13 Drake Street, facing west towards works within the rail corridor. NCW P7 works involved a number of activities outlined within OOWHA-023 (excavation, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 006	22-Dec-18	17:14	00:15:00	85.0	46.4	65.1	78.4	65.5	48.7	90	70	-	5.0	-	78	A01	Day	42	47	60	57	28	23	10	21	
Project 008	22-Dec-18	19:14	00:15:00	93.5	51.8	67.2	74.8	61.9	55.4	100	72	-	5.0	-	91	A03	Evening	41	46	57	56	31	26	15	35	Measurement 008, 009, 013 and 014 (A03). Measurements undertaken in front of 13 Hopetoun Ave, facing north towards works within the rail corridor. NCW P7 works involved a number of activities outlined within OOWHA-023 (excavation, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 009	22-Dec-18	20:15	00:15:00	85.8	50.5	61.9	69.2	65.4	53.4	100	67	-	5.0	-	67	A03	Evening	41	46	60	56	26	21	7	11	
Project 013	23-Dec-18	00:29	00:15:00	82.4	48.2	61.8	75.1	58.2	49.6	100	67	-	5.0	-	80	A03	Night	35	40	72	50	32	27	-5	30	
Project 014	23-Dec-18	00:45	00:15:00	78.3	47.2	61.0	69.6	67.0	48.7	100	66	-	5.0	-	70	A03	Night	35	40	57	50	31	26	9	20	
Project 016	23-Dec-18	15:44	00:15:00	74.3	47.4	61.7	67.4	65.3	49.9	60	70	-	5.0	5.0	65	A02	Day	42	47	60	57	28	23	10	8	Project 016 and 017 (A02).Measurements undertaken to the west of 14 Raleigh Street, facing west towards works within the rail corridor. NCW P7 works involved a number of activities outlined within OOWHA-023 (excavation, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 017	23-Dec-18	17:14	00:15:00	79.5	46.8	60.5	69.6	64.4	50.0	90	65	-	5.0	-	71	A02	Day	42	47	60	57	23	18	5	14	
Project 018	23-Dec-18	17:45	00:15:00	82.5	44.4	59.7	72.0	60.1	47.0	90	64	-	5.0	-	81	A01	Day	42	47	60	57	22	17	4	24	Project 005 and 006 (A02). Measurements undertaken to the in front of 13 Drake Street, facing west towards works within the rail corridor. NCW P7 works involved a number of activities outlined within OOWHA-023 (excavation, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 019	23-Dec-18	18:15	00:15:00	73.9	47.7	60.7	64.7	62.9	52.8	100	66	-	5.0	-	78	A03	Evening	41	46	60	56	25	20	6	22	Measurements 019 and 020 (A03). Measurements undertaken in front of 13 Hopetoun Ave, facing north towards works within the rail corridor. NCW P7 works involved a number of activities outlined within OOWHA-023 (excavation, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 020	23-Dec-18	18:30	00:15:00	86.9	45.1	62.2	74.0	61.9	48.5	100	67	-	5.0	-	71	A03	Day	42	47	60	57	25	20	7	14	

Weather 22-23 Nov 2018: Fine weather with some winds; fairly overcast. Slight rain on Saturday evening. Temperature ranged between 18-25 degrees Celsius over the weekend.
Note: all predicted noise levels were reproduced from the LOR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 000	03-Jan-19	22:30	00:15:00	66	49	51	55	51	50	95	60	3.0	2.0	5.0	65	NCA01	Night	35	40	57	50	25	20	3	15	L01 - Project 000 and 001. Measurements undertaken outside 13 Drake Street, Artarmon. Generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 001	03-Jan-19	23:00	00:15:00	68	49	51	56	51	50	95	63	3.0	5.0	5.0	68	NCA01	Night	35	40	57	50	28	23	6	18	
Project 002	03-Jan-19	23:30	00:15:00	68	46	55	61	58	48	95	62	3.0	-	5.0	60	NCA01	Night	35	40	57	50	27	22	5	10	L02 - Project 002 and 003. Measurements undertaken to the west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor . NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 003	04-Jan-19	00:00	00:15:00	67	46	55	62	59	48	95	60	-	-	5.0	62	NCA01	Night	35	40	57	50	25	20	3	12	
Project 004	04-Jan-19	01:15	00:15:00	53	35	40	48	41	37	10	30	-	-	-	41	NCA01	Night	35	40	57	50	-5	-10	-27	-9	L03 - Project 004. Measurements undertaken in front of 13 Hopetoun Ave, facing north-west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 005	04-Jan-19	01:46	00:15:00	83	52	57	65	58	53	100	67	-	5.0	5.0	83	NCA01	Night	35	40	57	50	32	27	10	33	L01 - Project 005. Measurements undertaken outside 13 Drake Street, Artarmon. Generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 006	04-Jan-19	02:16	00:15:00	67	35	48	61	49	37	50	45	-	-	-	54	NCA01	Night	35	40	57	50	10	5	-12	4	L03 - Project 006. Measurements undertaken in front of 13 Hopetoun Ave, facing north-west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities contributed to approximately 50% of the measurement with the remaining sources being non-site related noises (e.g. traffic and insects).
Project 007	04-Jan-19	03:00	00:15:00	69	48	59	66	63	51	100	61	2.0	-	-	65	NCA01	Night	35	40	57	50	26	21	4	15	
Project 008	04-Jan-19	03:30	00:15:00	69	50	55	61	58	52	100	60	-		5.0	63	NCA01	Night	35	40	57	50	25	20	3	13	L02 - Project 007 and 008. Measurements undertaken to the west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor . NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 009	04-Jan-19	22:30	00:15:00	54	38	44	49	45	41	1	24	-	-	-	0	NCA01	Night	35	40	57	50	-11	-16	-33	-50	L03 - Project 009. Measurements undertaken in front of 13 Hopetoun Ave, facing north-west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement and the site was inaudible.
Project 010	04-Jan-19	23:00	00:15:00	68	50	52	59	52	51	80	58	2.0	-	5.0	60	NCA01	Night	35	40	57	50	23	18	1	10	L01 - Project 000 and 001. Measurements undertaken outside 13 Drake Street, Artarmon. Generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 011	04-Jan-19	23:30	00:15:00	68	42	48	56	49	44	90	56	4.0	-	5.0	68	NCA01	Night	35	40	57	50	21	16	-1	18	L03 - Project 011. Measurements undertaken in front of 13 Hopetoun Ave, facing north-west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 012	04-Jan-19	23:45	00:15:00	67	42	50	62	53	43	95	55	-	-	5.0	67	NCA01	Night	35	40	57	50	20	15	-2	17	
Project 013	05-Jan-19	00:15	00:15:00	67	43	53	59	56	46	95	62	4.0	-	5.0	63	NCA01	Night	35	40	57	50	27	22	5	13	L02 - Project 012 and 013. Measurements undertaken to the west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor . NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 014	05-Jan-19	00:45	00:15:00	62	39	45	53	46	41	20	38		-	-	40	NCA01	Night	35	40	57	50	3	-2	-19	-10	L03 - Project 011. Measurements undertaken in front of 13 Hopetoun Ave, facing north-west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 015	05-Jan-19	01:45	00:15:00	79	32	54	67	49	34	10	44	-	-	-	51	-	Night	35	40	54	50	9	4	-10	1	L04 - Project 015. Measurements undertaken outside 1 Werona Avenue, Killara. Facing south-west towards site works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 016	05-Jan-19	02:30	00:15:00	78	37	53	66	48	38	20	46	-	-	-	40	-	Night	35	40	55	50	11	6	-9	-10	L05 - Project 016. Measurements undertaken outside 2 Forsyth Street, Gordon. Facing south-west towards site works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 017	05-Jan-19	03:16	00:15:00	69	49	51	57	51	50	90	59	4.0	-	5.0	68	NCA01	Night	35	40	57	50	24	19	2	18	L01 - Project 017. Measurements undertaken outside 13 Drake Street, Artarmon. Generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 018	05-Jan-19	03:45	00:15:00	76	41	57	69	58	44	95	59	2.0	-	-	74	NCA01	Night	35	40	57	50	24	19	2	24	L02 - Project 018. Measurements undertaken to the west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor . NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 019	06-Jan-19	02:03	00:15:00	79	42	57	70	52	43	70	55	-	-	-	52	-	Night	35	40	54	50	20	15	1	2	L04 - Project 019 and 020. Measurements undertaken outside 1 Werona Avenue, Killara. Facing south-west towards site works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities contributed to approximately 60-70% of the measurement with the remaining sources being non-site related noises (e.g. traffic and insects).
Project 020	06-Jan-19	02:21	00:15:00	86	42	61	74	59	43	60	59	-	-	-	60	-	Night	35	40	54	50	24	19	5	10	
Project 021	06-Jan-19	02:41	00:15:00	73	40	50	64	46	41	80	49	-	-	-	58	-	Night	35	40	55	50	14	9	-6	8	L05 - Project 021. Measurements undertaken outside 2 Forsyth Street, Gordon. Facing south-west towards site works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 022	06-Jan-19	21:15	00:15:00	79	38	56	66	60	40	10	46	-	-	-	62	NCA01	Night	35	40	57	50	11	6	-11	12	L01 - Project 017. Measurements undertaken outside 13 Drake Street, Artarmon. Generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 023	06-Jan-19	21:45	00:15:00	69	35	45	53	47	38	40	41	-	-	-	65	NCA01	Night	35	40	57	50	6	1	-16	15	L02 - Project 018. Measurements undertaken to the west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor . NCW involved a number of activities outlined within OOWHA-075 (e.g. removal of redundant equipment, installation of OHW and structures) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.

Weather 03-07 Jan 2019: Fine weather with light winds; fairly overcast. Rain on Sunday night. Temperature ranged between 19-23 degrees Celsius over the monitoring periods.
Note: all predicted noise levels were reproduced from the LOR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 5minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 5minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 5minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 000	11-Feb-19	22:45	00:15:00	64	44	52	57	54	45	80	58	-	2.0	5.0	64	NCA01	Night	35	40	61	50	23	18	-3	14	A01 - Project 000. Measurements undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 001	11-Feb-19	23:15	00:15:00	57	38	44	50	45	40	30	43	-	-	5.0	55	NCA01	Night	35	40	56	50	8	3	-13	5	A02 - Project 001. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 002	11-Feb-19	23:45	00:15:00	85	34	53	61	46	36	30	47	-	-	-	85	NCA01	Night	35	40	56	50	12	7	-9	35	A03 - Project 002. Measurement undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials, site access and egress) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 003	11-Feb-19	00:15	00:15:00	55	37	38	44	39	37	50	35	-	-	-	40	NCA01	Night	35	40	56	50	0	-5	-21	-10	A02 - Project 003. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Both site-related noises and extraneous sources (e.g. traffic and insects) contributed evenly to the overall noise level throughout the measurement.
Project 004	12-Feb-19	00:45	00:15:00	55	38	41	44	42	38	60	39	-	-	-	43	NCA01	Night	35	40	59	50	4	-1	-20	-7	A01 - Project 004 - 008. Measurements undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Site contributions varied between measurements, ranging between 30% - 80% of the overall noise levels, with the remainder of the measurement influenced by non-site related traffic and other noise sources.
Project 005	12-Feb-19	01:01	00:15:00	80	39	45	44	43	40	50	42	-	-	-	42	NCA01	Night	35	40	59	50	7	2	-17	-8	
Project 006	12-Feb-19	22:30	00:15:00	71	42	49	58	50	44	80	58	-	5.0	5.0	66	NCA01	Night	35	40	59	50	23	18	-1	16	
Project 007	13-Feb-19	01:00	00:15:00	64	44	50	56	52	47	20	43	-	-	-	54	NCA01	Night	35	40	59	50	8	3	-16	4	
Project 008	13-Feb-19	01:15	00:15:00	80	44	50	53	50	46	30	49	-	5.0	-	60	NCA01	Night	35	40	59	50	14	9	-10	10	
Project 009	13-Feb-19	01:46	00:15:00	66	46	49	52	50	48	10	39	-	-	-	39	NCA01	Night	35	40	56	50	4	-1	-17	-11	A04 - Project 009 - 010. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site contributions varied between measurements ranging between 10% - 40% of the overall noise levels, predominantly influenced by non-site related traffic and other noise sources.
Project 010	13-Feb-19	02:01	00:15:00	78	47	51	55	51	48	40	47	-	-	-	51	NCA01	Night	35	40	56	50	12	7	-9	1	
Project 011	13-Feb-19	02:30	00:15:00	58	39	45	51	47	42	30	39	-	-	-	45	NCA01	Night	35	40	56	50	4	-1	-17	-5	A02 - Project 011. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 012	13-Feb-19	22:30	00:15:00	65	44	50	52	51	48	20	43	-	-	-	52	NCA01	Night	35	40	56	50	8	3	-13	2	A01 - Project 012. Measurements undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 013	13-Feb-19	00:00	00:15:00	73	49	64	71	67	52	90	68	-	5.0	-	73	NCA01	Night	35	40	73	50	33	28	-5	23	A04 - Project 013. Measurement undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 014	13-Feb-19	00:30	00:15:00	71	43	52	59	56	47	80	56	-	5.0	-	65	NCA01	Night	35	40	59	50	21	16	-3	15	A01 - Project 014. Measurements undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 015	14-Feb-19	01:01	00:15:00	60	37	41	46	42	38	80	40	-	-	-	45	NCA01	Night	35	40	56	50	5	0	-16	-5	A02 - Project 011. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials, excavation works) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Site activities dominated the measurement with only minimal input from non-site related noises.

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LAeq Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 016	14-Feb-19	02:00	00:15:00	76	50	70	75	73	53	90	75	-	5.0	-	74	NCA01	Night	35	40	73	50	40	35	2	24	
Project 017	14-Feb-19	02:16	00:15:00	75	50	66	72	71	51	90	71	-	5.0	-	72	NCA01	Night	35	40	73	50	36	31	-2	22	A04 - Project 016 - 018. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurements (approximately 90% contribution across all three measurements) with only minimal input from non-site related noises.
Project 018	14-Feb-19	02:33	00:15:00	86	50	75	84	83	52	90	74	-	-	-	86	NCA01	Night	35	40	73	50	39	34	1	36	
Project 019	14-Feb-19	03:45	00:15:00	72	43	47	51	47	45	20	40	-	-	-	50	NCA01	Night	35	40	59	50	5	0	-19	0	A01 - Project 019. Measurement undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 020	14-Feb-19	22:46	00:15:00	73	63	65	67	65	64	100	65	-	-	-	73	NCA01	Night	35	40	73	50	30	25	-8	23	A04 - Project 020 - 021. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurements (approximately 100% contribution across all three measurements) with only minimal input from non-site related noises.
Project 021	14-Feb-19	23:01	00:15:00	73	63	64	66	65	64	100	64	-	-	-	73	NCA01	Night	35	40	73	50	29	24	-9	23	
Project 022	14-Feb-19	23:30	00:15:00	69	41	49	52	51	44	50	50	-	5.0	-	56	NCA01	Night	35	40	59	50	15	10	-9	6	A01 - Project 022. Measurement undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Both site-related noises and extraneous sources (e.g. traffic and insects) contributed evenly to the overall noise level throughout the measurement.
Project 023	14-Feb-19	00:00	00:15:00	54	38	41	48	42	39	20	34	-	-	-	41	NCA01	Night	35	40	56	50	-1	-6	-22	-9	A02 - Project 001. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 024	14-Feb-19	00:30	00:15:00	77	34	51	65	48	36	70	49	-	-	-	77	NCA01	Night	35	40	56	50	14	9	-7	27	A03 - Project 024. Measurement undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials, site access and egress) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within the rail corridor. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 025	15-Feb-19	01:00	00:15:00	64	52	56	59	57	54	100	66	-	5.0	5.0	64	NCA01	Night	35	40	73	50	31	26	-8	14	A04 - Project 025 - 026. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurements (approximately 100% contribution across all three measurements) with only minimal input from non-site related noises.
Project 026	15-Feb-19	01:16	00:15:00	71	55	65	67	66	65	100	70	-	5.0	-	70	NCA01	Night	35	40	73	50	35	30	-3	20	
Project 027	15-Feb-19	01:45	00:15:00	56	43	48	52	51	44	80	52	-	5.0	-	52	NCA01	Night	35	40	52	50	17	12	0	2	A01 - Project 027. Measurement undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 028	15-Feb-19	02:15	00:15:00	55	36	37	39	37	36	20	30	-	-	-	39	NCA01	Night	35	40	60	50	-5	-10	-30	-11	A05 - Project 028. Measurement taken outside 11 Hawkins Street, Artarmon. Generally facing west towards works on site within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably OSD the excavation works) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 029	15-Feb-19	02:45	00:15:00	64	54	55	56	55	55	100	55	-	-	-	63	NCA01	Night	35	40	56	50	20	15	-1	13	A04 - Project 029 - 030. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurements (approximately 100% contribution across all three measurements) with only minimal input from non-site related noises.
Project 030	15-Feb-19	03:00	00:15:00	72	54	56	58	56	55	100	56	-	-	-	56	NCA01	Night	35	40	56	50	21	16	0	6	
Project 031	15-Feb-19	03:30	00:15:00	53	39	40	41	41	40	30	35	-	-	-	41	NCA01	Night	35	40	59	50	0	-5	-24	-9	A01 - Project 019. Measurement undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.

Weather 11-15 Feb 2019: Fine weather with light winds, overcast at times. Temperature ranged between 18-30 degrees Celsius over the monitoring periods.
Note: all predicted noise levels were reproduced from the LCR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 001	18-Feb-19	22:00	00:15:00	68	48	55	61	58	50	80	54	-	-	-	63	NCA01	Night	35	40	73	50	19	14	-19	13	A01 - Project 001 - 002. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities including the use of hand and power tools, and the movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurements (between 80%-100% contribution across the two measurements) with only minimal input from non-site related noises.
Project 002	18-Feb-19	22:20	00:15:00	75	50	58	65	61	53	100	58	-	-	-	68	NCA01	Night	35	40	73	50	23	18	-15	18	
Project 003	18-Feb-19	23:00	00:15:00	68	36	49	59	51	40	40	45	-	-	-	60	NCA01	Night	35	40	56	50	10	5	-11	10	A03 - Project 002. Measurement undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials, site access and egress) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with approximately 40% contribution from site-related noises.
Project 004	18-Feb-19	23:35	00:15:00	81	55	57	62	58	56	95	57	-	-	-	61	NCA01	Night	35	40	73	50	22	17	-16	11	A01 - Project 004 - 018. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal, concrete cutting etc.) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site contributions mostly dominated the noise measurements (generally ranging between 90% and 100% of the overall noise levels) with minor influence from non-site related traffic and other noise sources.
Project 005	19-Feb-19	00:10	00:15:00	79	47	53	63	55	49	50	50	-	-	-	66	NCA01	Night	35	40	73	50	15	10	-23	16	
Project 006	19-Feb-19	21:45	00:15:00	81	57	59	63	59	58	90	58	-	-	-	70	NCA01	Evening	41	46	73	56	17	12	-15	14	
Project 007	19-Feb-19	22:30	00:15:00	71	56	58	60	58	57	100	63	-	5.0	-	61	NCA01	Night	35	40	73	50	28	23	-10	11	
Project 008	19-Feb-19	23:30	00:15:00	70	57	59	66	61	58	100	59	-	-	-	67	NCA01	Night	35	40	73	50	24	19	-14	17	
Project 009	19-Feb-19	23:49	00:15:00	81	57	70	77	75	59	100	70	-	-	-	78	NCA01	Night	35	40	73	50	35	30	-3	28	
Project 010	20-Feb-19	01:46	00:15:00	82	57	61	67	60	58	100	66	-	5.0	-	80	NCA01	Night	35	40	73	50	31	26	-7	30	
Project 011	20-Feb-19	03:17	00:15:00	70	50	59	63	61	51	100	64	-	5.0	-	68	NCA01	Night	35	40	73	50	29	24	-9	18	
Project 012	20-Feb-19	22:45	00:15:00	72	56	60	66	62	58	100	65	-	5.0	-	67	NCA01	Night	35	40	73	50	30	25	-8	17	
Project 013	20-Feb-19	23:10	00:15:00	72	57	60	67	62	58	100	60	-	-	-	69	NCA01	Night	35	40	73	50	25	20	-13	19	
Project 014	20-Feb-19	23:30	00:15:00	83	58	68	77	72	60	100	68	-	-	-	81	NCA01	Night	35	40	73	50	33	28	-5	31	
Project 015	21-Feb-19	00:40	00:15:00	80	58	65	73	69	59	100	65	-	-	-	72	NCA01	Night	35	40	73	50	30	25	-8	22	
Project 016	21-Feb-19	01:00	00:15:00	78	58	68	75	73	59	100	68	-	-	-	75	NCA01	Night	35	40	73	50	33	28	-5	25	
Project 017	21-Feb-19	01:30	00:15:00	78	58	64	71	67	60	100	64	-	-	-	70	NCA01	Night	35	40	73	50	29	24	-9	20	
Project 018	21-Feb-19	02:30	00:15:00	78	57	66	75	70	59	100	66	-	-	-	75	NCA01	Night	35	40	73	50	31	26	-7	25	
Project 019	21-Feb-19	03:00	00:10:00	76	57	64	73	68	58	100	64	-	-	-	74	NCA01	Night	35	40	73	50	29	24	-9	24	

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LAeq Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 020	21-Feb-19	22:23	00:15:00	76	44	55	62	58	48	90	60	-	5.0	-	60	NCA01	Night	35	40	59	50	25	20	1	10	A03 - Project 020. Measurement undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables, concrete cutting) along with general construction activities, including use of hand and power tools. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 021	22-Feb-19	23:44	00:15:00	89	64	77	85	80	68	100	77	-	-	-	88	NCA01	Night	35	40	73	50	42	37	4	38	A04 - Project 021 - 022. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal including concrete cutting) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurements (approximately 100% contribution across the two measurements) with only minimal input from non-site related noises.
Project 022	23-Feb-19	00:15	00:15:00	85	64	77	81	79	72	100	77	-	-	-	81	NCA01	Night	35	40	73	50	42	37	4	31	
Project 023	23-Feb-19	00:40	00:15:00	70	41	53	60	57	44	100	58	-	5.0	-	58	NCA01	Night	35	40	59	50	23	18	-1	8	A03 - Project 023 - 024. Measurement undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables, concrete cutting) along with general construction activities, including use of hand and power tools. Site activities dominated the measurements (approximately 100% contribution across the two measurements) with only minimal input from non-site related noises.
Project 024	23-Feb-19	01:30	00:15:00	66	39	50	57	54	41	100	50	-	-	-	55	NCA01	Night	35	40	59	50	15	10	-9	5	
Project 025	23-Feb-19	01:50	00:15:00	85	60	74	81	78	65	100	74	-	-	-	84	NCA01	Night	35	40	73	50	39	34	1	34	A04 - Project 025 - 026. Measurements undertaken outside temporary work site situated opposite 2 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal including concrete cutting) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurements (approximately 100% contribution across all four measurements) with only minimal input from non-site related noises.
Project 026	23-Feb-19	02:15	00:15:00	89	60	76	84	80	62	100	76	-	-	-	88	NCA01	Night	35	40	73	50	41	36	3	38	
Project 027	23-Feb-19	02:45	00:15:00	81	61	73	76	74	70	100	73	-	-	-	77	NCA01	Night	35	40	73	50	38	33	0	27	
Project 028	23-Feb-19	03:14	00:15:00	77	58	65	73	70	60	100	65	-	-	-	69	NCA01	Night	35	40	73	50	30	25	-8	19	

Weather 18-22 Feb 2019: Generally overcast weather, with light winds and periods of rainfall throughout the monitoring period. Temperature ranged between 19-25 degrees Celsius over the monitoring periods.
Note: all predicted noise levels were reproduced from the LCR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LAeq Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 000	23-Feb-19	20:15	00:15:00	92	53	64	76	65	56	90	69	-	5.0	-	81	NCA01	Evening	41	46	74	56	28	23	-5	25	A01 - Project 000 - 001. Measurements undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 001	23-Feb-19	20:30	00:15:00	67	49	53	57	55	51	100	58	-	-	5.0	67	NCA01	Evening	41	46	59	56	17	12	-1	11	
Project 002	23-Feb-19	21:00	00:15:00	77	62	65	70	66	63	100	65	-	-	-	77	NCA01	Evening	41	46	73	56	24	19	-8	21	A02 - Project 002 - 003. Measurements undertaken outside temporary work site situated opposite 1 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurement (approximately 100% contribution to the overall noise measurements) with only minimal input from non-site related noises.
Project 003	23-Feb-19	21:15	00:15:00	89	63	67	74	70	64	100	67	-	-	-	88	NCA01	Evening	41	46	73	56	26	21	-6	32	
Project 004	23-Feb-19	21:47	00:15:00	67	45	53	58	56	48	100	58	-	-	5.0	63	NCA01	Evening	41	46	59	56	17	12	-1	7	A01 - Project 004. Measurements undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 005	23-Feb-19	22:47	00:15:00	68	53	57	62	58	54	100	57	-	-	-	68	NCA01	Night	35	40	60	50	22	17	-4	18	A03 - Project 005. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Both site-related noises and extraneous sources (e.g. traffic and insects) contributed evenly to the overall noise level throughout the measurement.
Project 006	23-Feb-19	23:16	00:15:00	84	53	67	77	72	57	100	67	-	-	-	83	NCA01	Night	35	40	60	50	32	27	7	33	A04 - Project 006. Measurement undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials, site access and egress) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with only minimal input from site related noises.
Project 007	23-Feb-19	00:02	00:15:00	77	57	60	64	60	59	100	65	-	-	5.0	77	NCA01	Night	35	40	73	50	30	25	-8	27	A02 - Project 007 - 008. Measurements undertaken outside temporary work site situated opposite 1 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurement (approximately 100% contribution to the overall noise measurements) with only minimal input from non-site related noises.
Project 008	23-Feb-19	00:17	00:15:00	67	57	58	60	59	58	100	63	-	-	5.0	63	NCA01	Night	35	40	73	50	28	23	-10	13	
Project 009	24-Feb-19	00:45	00:15:00	79	51	55	60	56	53	100	60	-	-	5.0	74	NCA01	Night	35	40	59	50	25	20	1	24	A01 - Project 009. Measurements undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. removal of redundant cables, excavation of Hopetoun Ave ramp, shotcreting, installation of GST and cables) along with general construction activities, including use of hand and power tools. Site activities dominated the measurement with only minimal input from non-site related noises.
Project 010	24-Feb-19	01:15	00:15:00	81	59	62	70	61	60	100	62	-	-	-	81	NCA01	Night	35	40	73	50	27	22	-11	31	A05 - Project 010-011. Nelson St WEST
Project 011	24-Feb-19	01:30	00:15:00	67	59	61	62	61	60	100	66	-	-	5.0	66	NCA01	Night	35	40	73	50	31	26	-7	16	
Project 012	24-Feb-19	14:33	00:15:00	86	57	61	72	60	58	100	66	-	5.0	-	74	NCA01	Day	42	47	73	57	24	19	-7	17	A02 - Project 012. Measurement undertaken outside temporary work site situated opposite 1 Nelson Street, Chatswood, outside the rail corridor. Generally facing west towards site and rail corridor. NCW involved a number of activities outlined within OOWHA-025 (most notably, preparation for the Nelson Street Bridge removal) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within and around the rail corridor. Site activities dominated the measurement (approximately 100% contribution to the overall noise measurement) with only minimal input from non-site related noises.
Project 013	24-Feb-19	15:15	00:15:00	80	57	66	76	68	60	100	66	-	-	-	77	NCA01	Day	42	47	60	57	24	19	6	20	A03 - Project 013 - 014. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Site activities dominated the measurement (approximately 100% contribution to the overall noise measurement) with only minimal input from non-site related noises.
Project 014	24-Feb-19	15:45	00:15:00	82	58	68	75	71	60	100	73	-	5.0	-	74	NCA01	Day	42	47	60	57	31	26	13	17	
Project 015	24-Feb-19	16:15	00:15:00	81	50	60	67	63	52	100	65	-	5.0	-	65	NCA01	Day	42	47	60	57	23	18	5	8	A04 - Project 015. Measurement undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials, site access and egress) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within the rail corridor. Site activities dominated the measurement (approximately 100% contribution to the overall noise measurement) with only minimal input from non-site related noises (wind-blown vegetation, distant traffic etc.).
Project 016	24-Feb-19	18:00	00:15:00	79	50	59	68	63	52	100	64	-	5.0	-	68	NCA01	Evening	41	46	60	56	23	18	4	12	A03 - Project 0116. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Site activities dominated the measurement (approximately 100% contribution to the overall noise measurement) with only minimal input from non-site related noises (wind-blown vegetation, distant traffic etc.).
Project 017	24-Feb-19	18:44	00:15:00	84	53	66	73	68	59	100	66	-	-	-	74	NCA01	Evening	41	46	60	56	25	20	6	18	A04 - Project 017. Measurement undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials, site access and egress) along with general construction activities, including use of hand and power tools and movement of vehicles and plant within the rail corridor. Site activities dominated the measurement (approximately 100% contribution to the overall noise measurement) with only minimal input from non-site related noises (wind-blown vegetation, distant traffic etc.).
Project 018	24-Feb-19	19:45	00:15:00	84	59	65	70	67	61	100	70	-	5.0	-	70	NCA01	Evening	41	46	60	56	29	24	10	14	A03 - Project 018. Measurement taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-025 (e.g. installation of cables and other OHW activities, stockpiling of materials) along with general construction activities, including use of hand and power tools, and movement of vehicles and plant within the rail corridor. Site activities dominated the measurement (approximately 100% contribution to the overall noise measurement) with only minimal input from non-site related noises (wind-blown vegetation, distant traffic etc.).

Weather 11-15 Feb 2019: Fine weather with light winds; overcast at times. Temperature ranged between 18-30 degrees Celsius over the monitoring periods.
Note: all predicted noise levels were reproduced from the LDR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 001	06-Mar-19	21:57	00:15:00	71	48	57	65	58	52	2	40	-	-	-	54	NCA01	Evening	41	46	58	56	-1	-6	-18	-2	
Project 002	06-Mar-19	22:12	00:15:00	71	47	55	64	56	50	0	40	-	-	-	40	NCA01	Night	35	40	58	50	5	0	-18	-10	A01 - Project 001-003. Measurements taken outside 2 Cleland Road, facing north-east towards site entrance and sign-in area. NCW predominantly involved Activity 1 outlined within OOWHA-027 (Sign on/off at Cleland Road) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with very minimal contribution from site-related noises. As the site was completely inaudible during Project's 002-003, the L90 parameter (minus 10dBA) has been used to evaluate a site contribution.
Project 003	06-Mar-19	22:30	00:15:00	75	46	55	66	57	50	0	40	-	-	-	40	NCA01	Night	35	40	58	50	5	0	-18	-10	
Project 004	07-Mar-19	01:00	00:15:00	69	36	48	63	44	38	10	38	-	-	-	45	NCA01	Night	35	40	61	50	3	-2	-23	-5	A02 - Project 004-006. Measurements undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with approximately 5-10% contribution from site-related noises.
Project 005	07-Mar-19	01:15	00:15:00	65	38	45	54	47	40	10	35	-	-	-	50	NCA01	Night	35	40	61	50	0	-5	-26	0	
Project 006	07-Mar-19	01:30	00:15:00	57	38	43	48	45	40	5	30	-	-	-	41	NCA01	Night	35	40	61	50	-5	-10	-31	-9	
Project 007	07-Mar-19	02:00	00:15:00	57	38	42	48	44	40	1	22	-	-	-	41	NCA01	Night	35	40	61	50	-13	-18	-39	-9	A03 - Project 007-008. Measurements taken west of 14 Raleigh Street, Artarmon. Along the laneway, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with very minimal contribution from site-related noises.
Project 008	07-Mar-19	02:15	00:15:00	68	38	43	47	44	40	1	23	-	-	-	41	NCA01	Night	35	40	61	50	-12	-17	-38	-9	
Project 009	07-Mar-19	02:45	00:15:00	54	38	41	44	42	40	0	30	-	-	-	30	NCA01	Night	35	40	61	50	-6	-11	-32	-20	A04 - Project 009-010. Measurements undertaken outside 13 Hopetoun Avenue, Chatswood, facing north-west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with very minimal contribution from site-related noises. As the site was completely inaudible during Project's 009-010, the L90 parameter (minus 10dBA) has been used to evaluate a site contribution.
Project 010	07-Mar-19	03:00	00:15:00	58	39	42	47	44	40	0	30	-	-	-	30	NCA01	Night	35	40	61	50	-5	-10	-31	-20	
Project 011	07-Mar-19	22:00	00:15:00	66	35	48	63	45	37	5	35	-	-	-	45	NCA01	Night	35	40	61	50	0	-5	-26	-5	A05 - Project 011-016. Measurements taken outside 14 Hawkins Street, Artarmon, generally facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with very minimal contribution from site-related noises.
Project 012	07-Mar-19	22:15	00:15:00	70	34	48	63	43	36	1	28	-	-	-	40	NCA01	Night	35	40	61	50	-7	-12	-33	-10	
Project 013	07-Mar-19	22:31	00:15:00	67	33	49	64	42	35	5	35	-	-	-	40	NCA01	Night	35	40	61	50	0	-5	-26	-10	
Project 014	07-Mar-19	22:45	00:15:00	68	33	48	63	45	35	10	38	-	-	-	51	NCA01	Night	35	40	61	50	3	-2	-23	1	
Project 015	07-Mar-19	23:00	00:15:00	68	32	48	63	42	34	5	35	-	-	-	41	NCA01	Night	35	40	61	50	0	-5	-26	-9	
Project 016	07-Mar-19	23:15	00:15:00	67	31	48	63	41	33	5	35	-	-	-	39	NCA01	Night	35	40	61	50	0	-5	-26	-11	

Weather 06-07 Mar 2019: Generally overcast weather, with light-moderate winds. Temperature ranged between 18-21 degrees Celsius over the monitoring periods.
Note: all predicted noise levels were reproduced from the LOR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 001	18-Mar-19	22:45	00:15:00	68	36	50	58	56	39	100	50	-	-	-	60	NCA01	Night	35	40	61	50	15	10	-11	10	
Project 002	18-Mar-19	23:00	00:15:00	68	36	43	51	45	39	100	43	-	-	-	50	NCA01	Night	35	40	61	50	8	3	-18	0	
Project 003	18-Mar-19	23:15	00:15:00	71	35	47	58	48	38	100	47	-	-	-	65	NCA01	Night	35	40	61	50	12	7	-14	15	L01 - Project 001-005. Measurements undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site-related noises dominated the majority of measurments with approximately 15-100% contribution. Extraneous sources were also observed to include trains, traffic and insects.
Project 004	18-Mar-19	23:31	00:14:33	63	35	40	46	42	37	50	37	-	-	-	45	NCA01	Night	35	40	61	50	2	-3	-24	-5	
Project 005	18-Mar-19	23:45	00:15:00	64	37	43	52	44	39	15	34	-	-	-	45	NCA01	Night	35	40	61	50	-1	-6	-27	-5	
Project 006	19-Mar-19	00:15	00:15:00	62	34	41	51	43	36	100	41	-	-	-	55	NCA01	Night	35	40	61	50	6	1	-20	5	
Project 007	19-Mar-19	00:30	00:15:00	67	33	42	52	44	35	100	42	-	-	-	55	NCA01	Night	35	40	61	50	7	2	-19	5	L02 - Project 006-008. Measurements undertaken outside 14 Hawkins Street, Artarmon, generally facing south west towards the works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site-related noises dominated the majority of measurements with approximately 15-100% contribution. Extraneous sources were also observed to include trains, traffic and insects.
Project 008	19-Mar-19	00:45	00:15:00	68	34	39	46	40	35	15	31	-	-	-	45	NCA01	Night	35	40	61	50	-4	-9	-30	-5	
Project 009	19-Mar-19	21:30	00:15:00	71	38	53	66	54	41	30	47	-	-	-	55	NCA01	Evening	41	46	61	56	6	1	-14	-1	
Project 010	19-Mar-19	21:45	00:15:00	69	36	53	66	51	40	20	46	-	-	-	55	NCA01	Evening	41	46	61	56	5	0	-15	-1	
Project 011	19-Mar-19	22:00	00:15:00	74	37	51	65	48	40	30	45	-	-	-	53	NCA01	Night	35	40	61	50	10	5	-16	3	
Project 012	19-Mar-19	22:45	00:15:00	68	38	50	61	52	41	70	49	-	-	-	58	NCA01	Night	35	40	61	50	14	9	-12	8	
Project 013	19-Mar-19	23:00	00:15:00	74	37	52	64	53	41	100	52	-	-	-	65	NCA01	Night	35	40	61	50	17	12	-9	15	L01 - Project 009-0016. Measurements undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site-related noises dominated the majority of measurements with approximately 20-100% contribution. Extraneous sources were also observed to include trains, traffic and insects.
Project 014	20-Mar-19	21:45	00:15:00	76	44	58	69	61	45	100	58	-	-	-	75	NCA01	Night	35	40	61	50	23	18	-3	25	
Project 015	20-Mar-19	22:00	00:15:00	70	44	52	67	49	46	20	45	-	-	-	60	NCA01	Night	35	40	61	50	10	5	-16	10	
Project 016	20-Mar-19	22:45	00:15:00	63	44	49	55	52	45	20	42	-	-	-	55	NCA01	Night	35	40	61	50	7	2	-19	5	
Project 017	20-Mar-19	23:15	00:15:00	84	40	55	64	59	42	0	22	-	-	-	0	NCA01	Night	35	40	61	50	-13	-18	-39	-50	
Project 018	20-Mar-19	23:30	00:15:00	54	39	43	48	45	41	0	21	-	-	-	0	NCA01	Night	35	40	61	50	-14	-19	-40	-50	L03 - Project 017-019. Measurements undertaken outside 14 Raleigh Street, Artarmon, generally facing west towards the works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources dominated the majority of measurements with site noise being largely inaudible (at most 5% contribution from site noise). Extraneous sources were observed to include trains, traffic and insects.
Project 019	20-Mar-19	23:45	00:15:00	65	39	51	62	53	41	<5	21	-	-	-	31	NCA01	Night	35	40	61	50	-14	-19	-40	-19	

File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 020	21-Mar-19	00:30	00:15:00	57	36	40	46	42	38	0	18	-	-	-	0	NCA01	Night	35	40	61	50	-17	-22	-43	-50	L01 - Project 020-021. Measurements undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources dominated the majority of measurements with site noise being inaudible. Extraneous sources were observed to include traffic and insects.
Project 021	21-Mar-19	00:45	00:15:00	52	37	41	45	42	39	0	19	-	-	-	0	NCA01	Night	35	40	61	50	-16	-21	-42	-50	
Project 022	21-Mar-19	01:15	00:15:00	63	40	43	49	45	41	2	26	-	-	-	42	NCA01	Night	35	40	61	50	-9	-14	-35	-8	L03 - Project 022-023. Measurements undertaken outside 14 Raleigh Street, Artarmon, generally facing west towards the works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources dominated the majority of measurements with site noise being largely inaudible (at most 2% contribution from site noise). Extraneous sources were observed to include trains, traffic and insects.
Project 023	21-Mar-19	01:30	00:15:00	55	39	43	49	44	40	0	29	-	-	-	0	NCA01	Night	35	40	61	50	-15	-20	-41	-50	
Project 024	21-Mar-19	19:45	00:15:00	71	47	58	69	58	52	0	32	-	-	-	0	NCA01	Evening	41	46	62	56	-9	-14	-30	-56	L01 - Project 023. Measurement undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources dominated the majority of measurements with site noise being inaudible. Extraneous sources were observed to include trains, traffic and insects.
Project 025	21-Mar-19	20:00	00:14:49	75	42	56	67	58	44	15	48	-	-	-	65	NCA01	Evening	41	46	62	56	7	2	-14	9	L01 - Project 001-005. Measurements undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site-related noises dominated the majority of measurments with approximately 15-100% contribution. Extraneous sources were also observed to include trains, traffic and insects.
Project 026	21-Mar-19	20:15	00:15:00	79	41	59	70	62	43	100	59	-	-	-	70	NCA01	Evening	41	46	62	56	18	13	-3	14	
Project 027	21-Mar-19	20:30	00:15:00	70	40	55	68	53	44	0	24	-	-	-	0	NCA01	Evening	41	46	62	56	-17	-22	-38	-56	L01 - Project 026 - 027. Measurement undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources dominated the majority of measurements with site noise being inaudible. Extraneous sources were observed to include trains, traffic and insects.
Project 028	21-Mar-19	20:45	00:15:00	68	42	54	67	52	44	0	24	-	-	-	0	NCA01	Evening	41	46	62	56	-17	-22	-38	-56	
Project 029	21-Mar-19	21:00	00:15:00	78	41	58	69	63	44	100	61	3.0	-	-	75	NCA01	Evening	41	46	62	56	20	15	-1	19	L01 - Project 029-030. Measurements undertaken outside 12 Drake Street, Artarmon, generally facing west towards site entrance and works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. HV feeders relocations, Cable pull/Construction works) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site-related noises dominated the majority of measurments with approximately 100% contribution. Extraneous sources were also observed to include trains, traffic, residents and insects.
Project 030	21-Mar-19	21:15	00:15:00	77	41	57	70	57	44	100	59	2.0	-	-	75	NCA01	Evening	41	46	62	56	18	13	-3	19	

Weather 18-22 Mar 2019: Generally overcast weather, with calm winds. Temperature ranged between 18-23 degrees Celsius over the monitoring periods.
Note: all predicted noise levels were reproduced from the LCR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

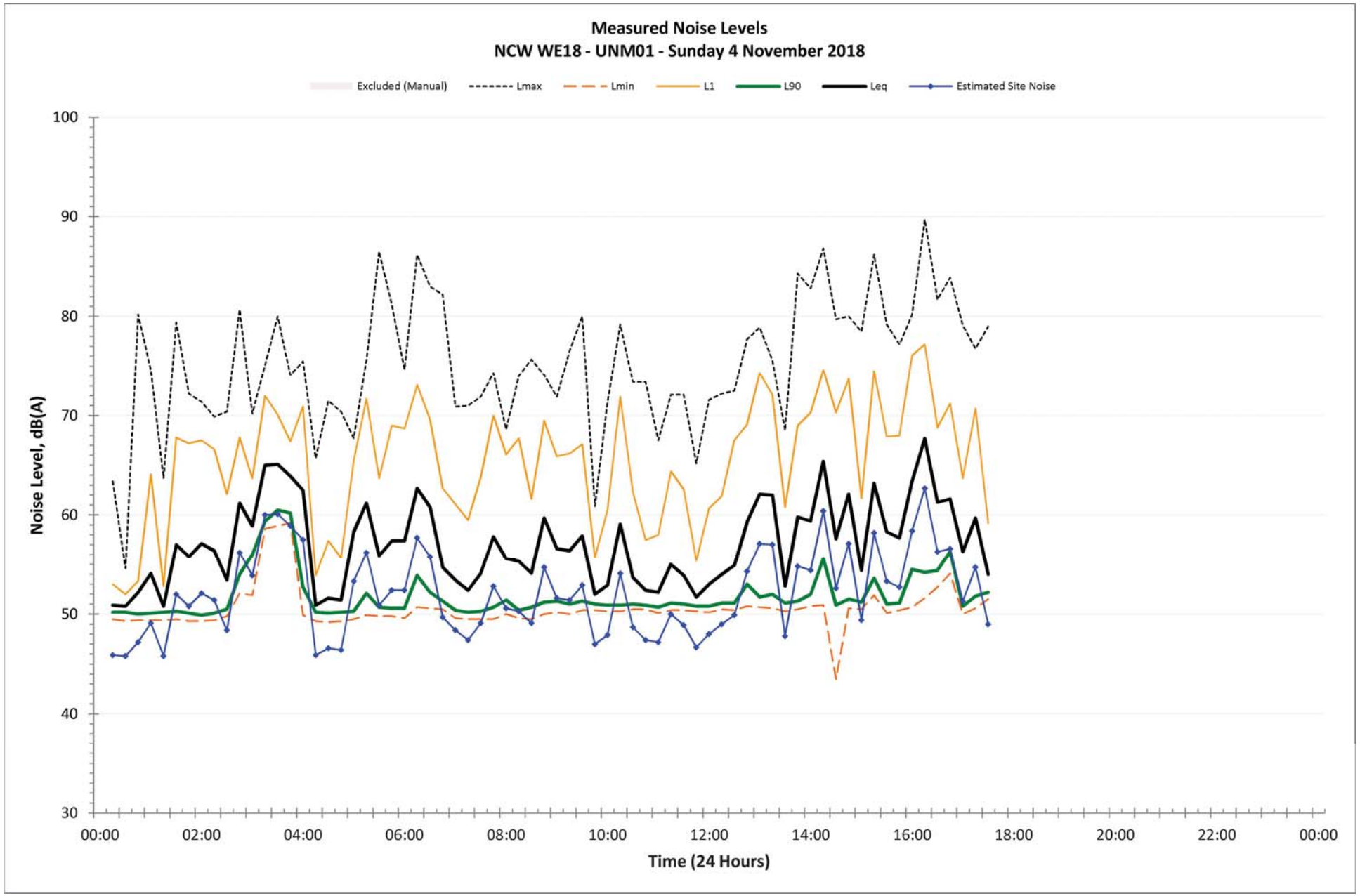
File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 001	23-Mar-19	15:00	00:15:00	81	44	66	76	70	52	2	49	-	-	-	54	NCA01	Day	42	47	65	-	7	2	-16	-	L01 - Project 001-002. Measurements taken outside 13 Brand Street, facing north-west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and tains) dominated the measurement with <5 to 30 % contribution from site-related noises.
Project 002	23-Mar-19	15:30	00:15:00	80	49	67	76	71	55	30	61	-	-	-	62	NCA01	Day	42	47	65	-	19	14	-4	-	
Project 003	23-Mar-19	16:00	00:15:00	70	45	57	67	59	48	100	57	-	-	-	65	NCA01	Day	42	47	62	-	15	10	-5	-	L02 - Project 003-004. Measurements taken outside 14 Hawkins Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 004	23-Mar-19	16:15	00:15:00	73	54	60	69	62	56	100	65	-	5.0	-	68	NCA01	Day	42	47	62	-	23	18	3	-	
Project 005	23-Mar-19	16:45	00:15:00	83	48	66	75	69	53	100	66	-	-	-	80	NCA01	Day	42	47	69	-	24	19	-3	-	L03 - Project 005-006. Measurements taken outside 12 Drake Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 006	23-Mar-19	17:00	00:15:00	80	54	65	73	68	60	100	65	-	-	-	78	NCA01	Day	42	47	69	-	23	18	-4	-	
Project 007	23-Mar-19	17:30	00:15:00	67	52	57	66	60	53	100	57	-	-	-	62	NCA01	Day	42	47	59	-	15	10	-2	-	L04 - Project 007-008. Measurements taken outside 14 Raleigh Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 008	23-Mar-19	17:45	00:14:57	70	43	55	65	56	52	100	55	-	-	-	62	NCA01	Day	42	47	59	-	13	8	-4	-	
Project 009	23-Mar-19	19:00	00:15:00	81	42	65	75	69	47	2	48	-	-	-	52	NCA01	Evening	41	46	65	-	7	2	-17	-	L01 - Project 009-010. Measurements taken outside 13 Brand Street, facing north-west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and tains) dominated the measurement with <5 % contribution from site-related noises.
Project 010	23-Mar-19	19:15	00:15:00	77	45	64	74	69	50	2	47	-	-	-	52	NCA01	Evening	41	46	65	-	6	1	-18	-	
Project 011	23-Mar-19	20:30	00:15:00	83	48	58	67	59	50	100	68	-	5.0	5.0	78	NCA01	Evening	41	46	62	-	27	22	6	-	L02 - Project 011-012. Measurements taken outside 14 Hawkins Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 012	23-Mar-19	20:45	00:15:00	70	48	55	66	57	50	100	65	-	5.0	5.0	78	NCA01	Evening	41	46	62	-	24	19	3	-	
Project 013	23-Mar-19	21:15	00:15:00	88	51	62	70	65	53	100	65	3.0	-	-	70	NCA01	Evening	41	46	69	-	24	19	-4	-	L03 - Project 013-014. Measurements taken outside 12 Drake Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 014	23-Mar-19	21:30	00:15:00	77	46	59	69	65	47	100	64	-	5.0	-	75	NCA01	Evening	41	46	69	-	23	18	-5	-	
Project 015	23-Mar-19	22:00	00:15:00	57	41	45	51	48	43	0	23	-	-	-	0	NCA01	Night	35	40	59	50	-12	-17	-36	-50	L04 - Project 015-016. Measurements taken outside 14 Raleigh Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with the site remaining inaudible for the duration of the measurments.
Project 016	23-Mar-19	22:15	00:15:00	54	41	45	49	47	42	0	22	-	-	-	0	NCA01	Night	35	40	59	50	-13	-18	-37	-50	
Project 017	23-Mar-19	22:45	00:15:00	67	46	49	55	51	48	0	28	-	-	-	0	NCA01	Night	35	40	80	50	-7	-12	-52	-50	L05 - Project 017-018. Measurements taken outside 5 Nelson Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with the site remaining inaudible for the duration of the measurments.
Project 018	23-Mar-19	23:00	00:15:00	59	45	49	55	51	47	0	27	-	-	-	0	NCA01	Night	35	40	80	50	-8	-13	-53	-50	
Project 019	23-Mar-19	23:30	00:15:00	60	55	57	57	57	56	0	36	-	-	-	0	NCA01	Night	35	40	69	50	1	-4	-33	-50	L06 - Project 019-020. Measurements taken outside 13 Hopetoun Aveune, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with the site remaining inaudible for the duration of the measurments.

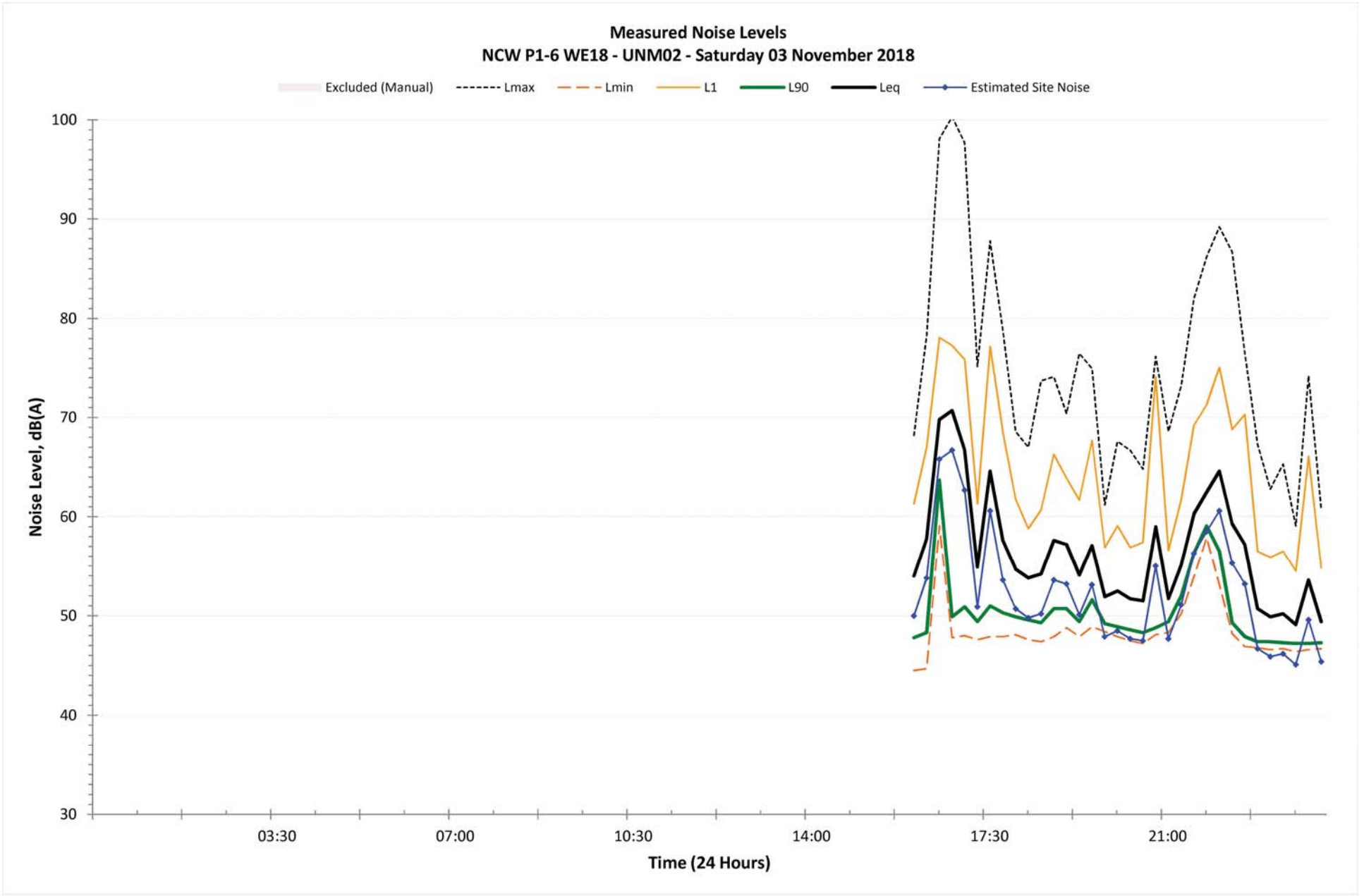
File Name	Date	Start Time	Elapsed Time	LAFmax	LAFmin	LAeq	LAF1.0	LAF10.0	LAF90.0	Percentage Site Contribution (%)	Measured Site Noise Level - LAeq, 15minute	Impulsive Modifying Factor?	Tonal Modifying Factor?	LF Modifying Factor?	Measured Site Noise Level - LAmax	NCA	Period	RBL - LA90, Period	NML - LAeq, 15 minute	Predicted Site Noise Level - LAeq, 15minute	Sleep Disturbance Screening Level - LAmax	Comparison to RBL - LA90, Period	Comparison to NML - LAeq, 15 minute	Comparison to Predicted Site Noise Level - LAeq, 15minute	Comparison to Sleep Disturbance Screening Level - LAmax	Description
Project 020	23-Mar-19	23:45	00:15:00	68	55	56	57	57	56	0	36	-	-	-	0	NCA01	Night	35	40	69	50	1	-4	-33	-50	L06 - Project 019-020. Measurements taken outside 13 Hopetoun Aveune, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and insects) dominated the measurement with the site remaining inaudible for the duration of the measurments.
Project 021	24-Mar-19	15:45	00:15:00	86	46	68	78	71	57	1	48	-	-	-	50	NCA01	Day	42	47	65	-	6	1	-17	-	
Project 022	24-Mar-19	16:00	00:15:00	79	45	66	75	69	54	1	46	-	-	-	52	NCA01	Day	42	47	65	-	4	-1	-19	-	L01 - Project 021-022. Measurements taken outside 13 Brand Street, facing north-west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Extraneous sources (e.g. traffic and tains) dominated the measurement with <5% contribution from site-related noises.
Project 023	24-Mar-19	16:30	00:15:00	80	59	62	68	63	60	100	65	3.0	-	-	70	NCA01	Day	42	47	62	-	23	18	3	-	
Project 024	24-Mar-19	16:45	00:15:00	78	48	62	71	65	54	100	65	3.0	-	-	72	NCA01	Day	42	47	62	-	23	18	3	-	L02 - Project 023-024. Measurements taken outside 14 Hawkins Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 025	24-Mar-19	17:15	00:15:00	93	52	66	74	66	60	100	69	3.0	-	-	91	NCA01	Day	42	47	69	-	27	22	0	-	
Project 026	24-Mar-19	17:30	00:15:00	93	52	70	76	73	57	100	70	-	-	-	93	NCA01	Day	42	47	69	-	28	23	1	-	L03 - Project 025-026. Measurements taken outside 12 Drake Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 027	24-Mar-19	18:00	00:15:00	75	57	63	70	65	60	100	63	-	-	-	70	NCA01	Evening	41	46	59	-	22	17	4	-	
Project 028	24-Mar-19	18:15	00:15:00	78	57	63	69	65	59	100	65	2.0	-	-	76	NCA01	Evening	41	46	59	-	24	19	6	-	L04 - Project 027-028. Measurements taken outside 14 Raleigh Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 029	24-Mar-19	19:30	00:15:00	87	49	59	68	61	51	100	63	4.0	-	-	82	NCA01	Evening	41	46	69	-	22	17	-6	-	L06 - Project 029. Measurements taken outside 13 Hopetoun Aveune, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 030	24-Mar-19	20:00	00:15:00	82	52	66	77	71	53	100	66	-	-	-	80	NCA01	Evening	41	46	69	-	25	20	-3	-	
Project 031	24-Mar-19	20:15	00:15:00	76	49	60	68	63	51	100	60	-	-	-	76	NCA01	Evening	41	46	69	-	19	14	-9	-	L03 - Project 030-032. Measurements taken outside 12 Drake Street, facing west towards works within the rail corridor. NCW involved a number of activities outlined within OOWHA-027 (e.g. Drainage Works, HV feeders relocations and Nelson St Bridge removal) along with general construction activities, including use of hand tools and movement of vehicles and plant within the rail corridor. Site noise dominated the measurements with minimal contribution from extraneous noises (e.g. Traffic).
Project 032	24-Mar-19	20:30	00:15:00	73	51	59	66	62	53	100	62	3.0	-	-	68	NCA01	Evening	41	46	69	-	21	16	-7	-	

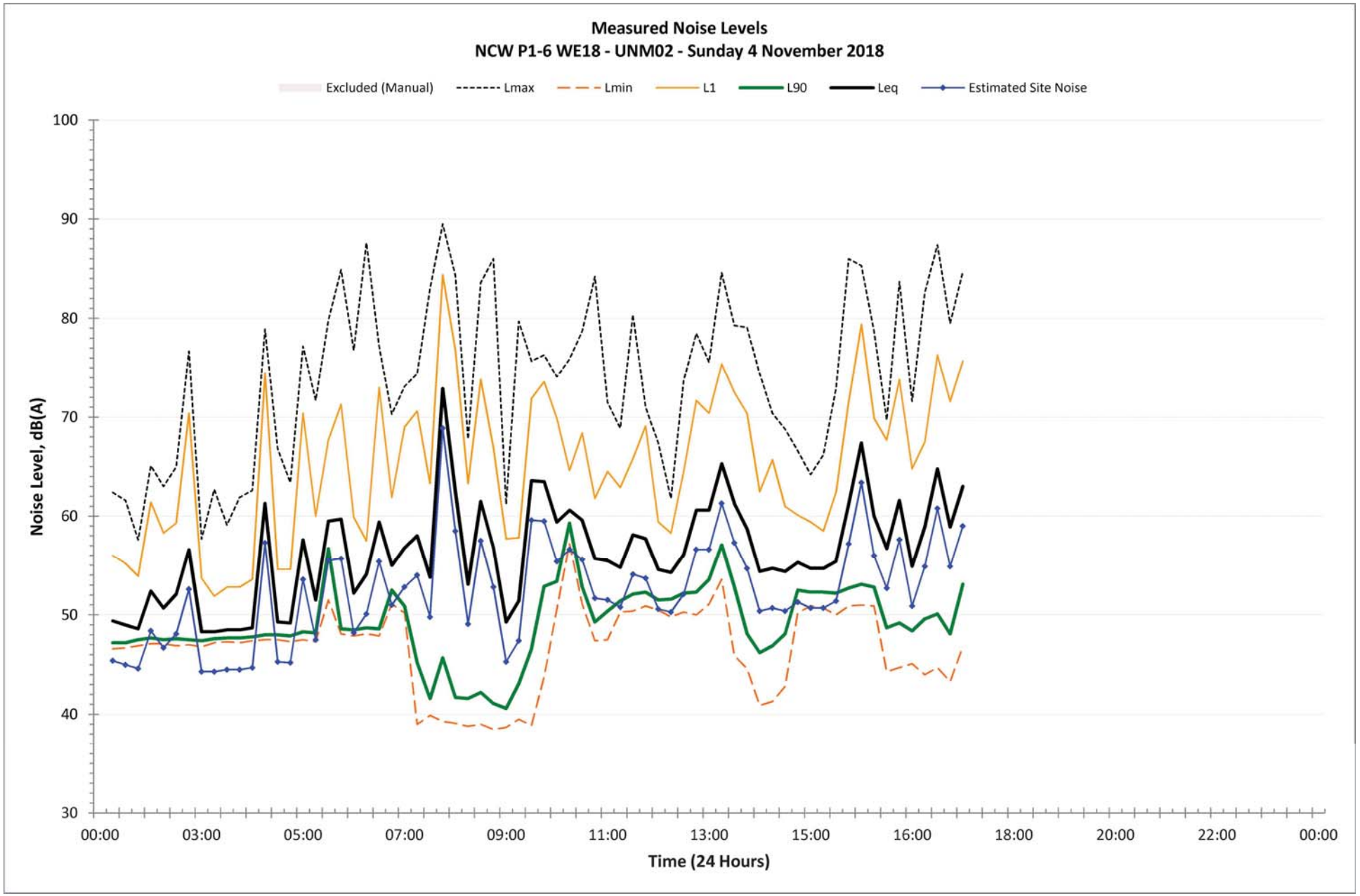
Weather 23-24 Mar 2019: Generally overcast weather, with light to calm wind conditions. Temperature ranged between 21-30 degrees Celsius over the monitoring periods.
Note: all predicted noise levels were reproduced from the LOR OOHWA Form for this track possession.
Note: Low frequency, tonality and impulsive noise tests were conducted in accordance with the INP. The measured Leq data was applied in all cases. Modifying factor (penalty) values were applied as applicable to the low frequency, tonal or impulsive components detectable or attributable to the sites noise emission. The site noise contribution reported here is inclusive of all modifying factors (if applicable).

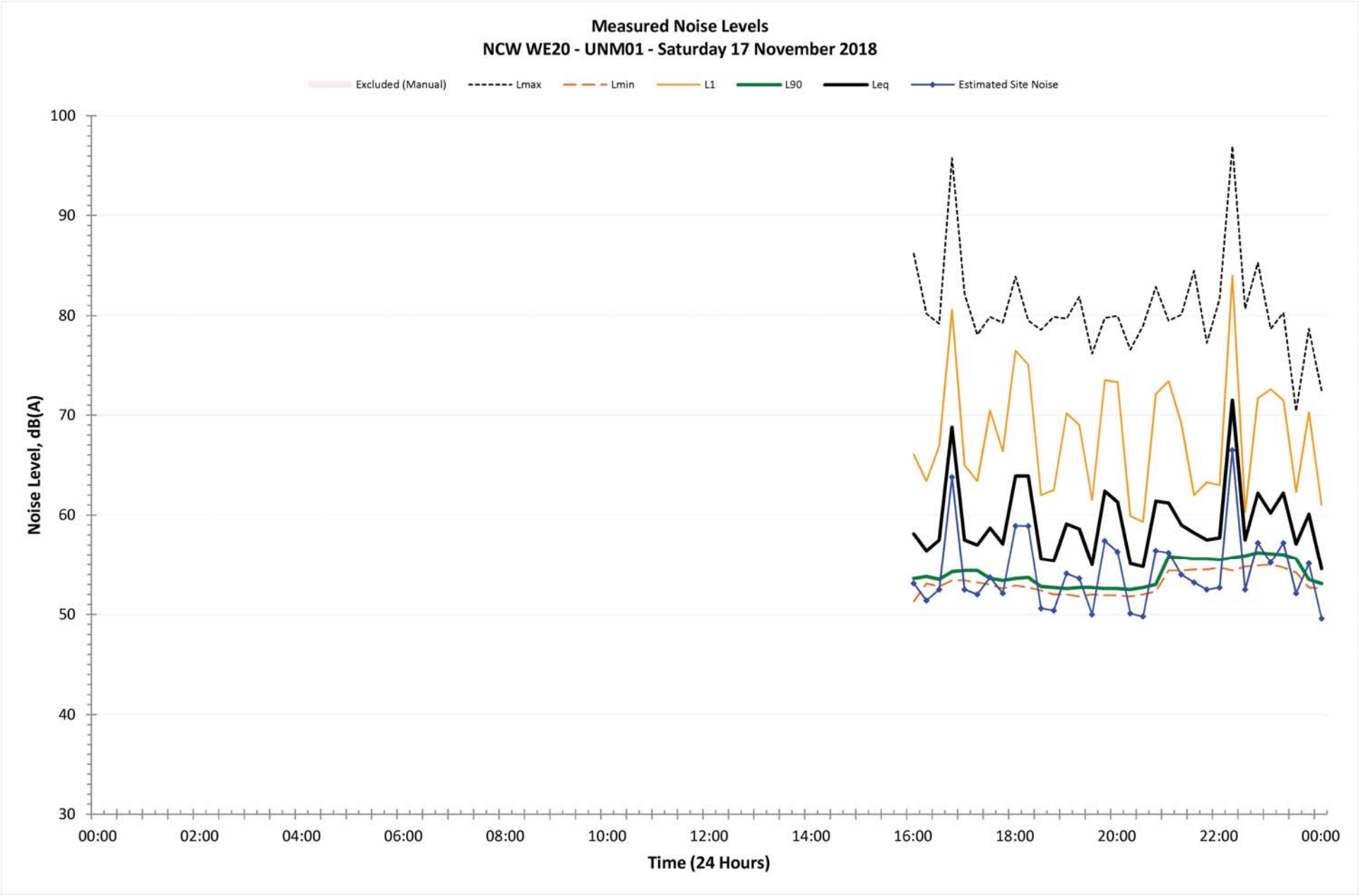
Appendix D – Complete Noise Data Set – Unattended Monitoring

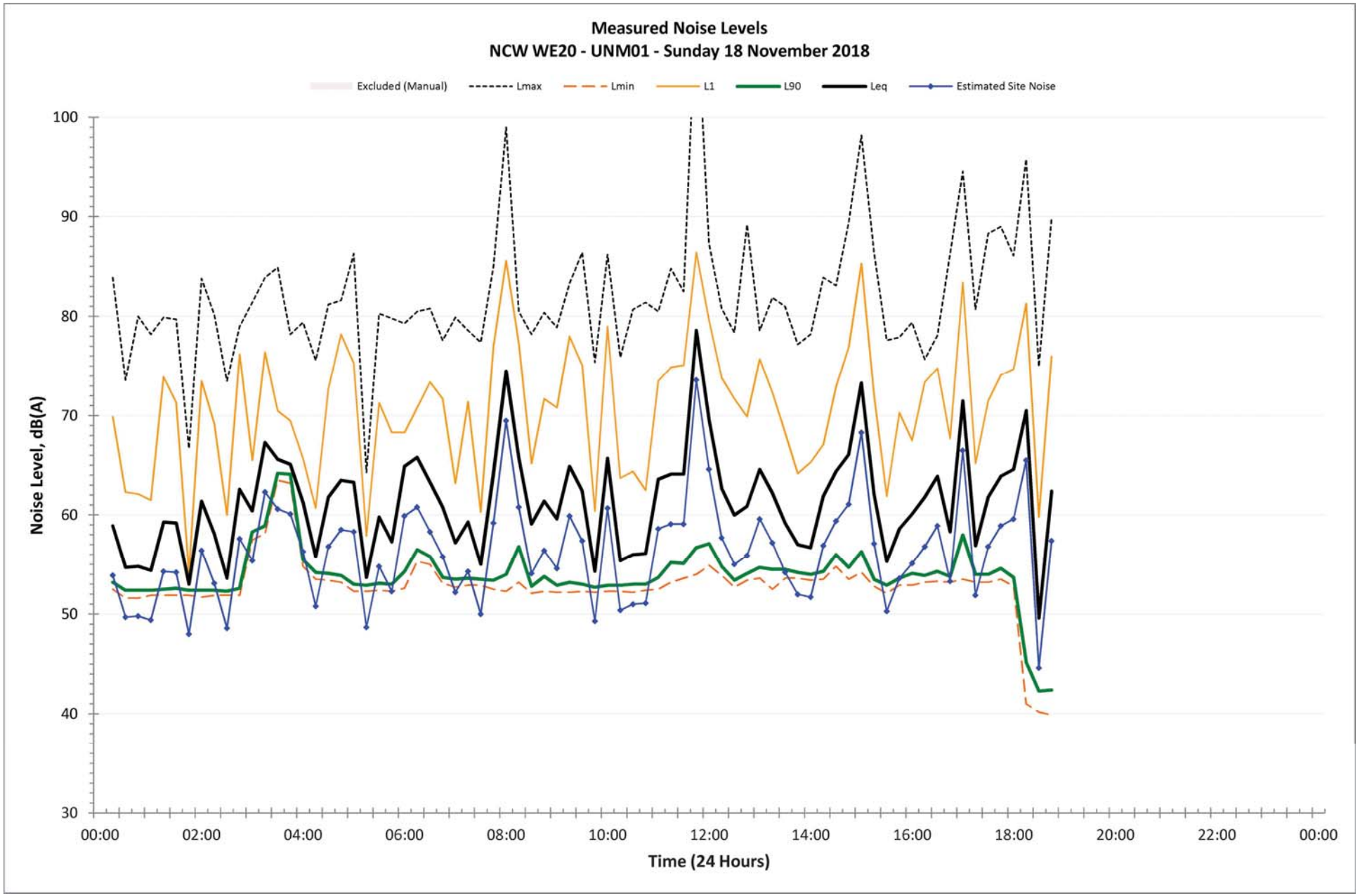

Measured Noise Levels
NCW WE18 - UNM01 - Saturday 3 November 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

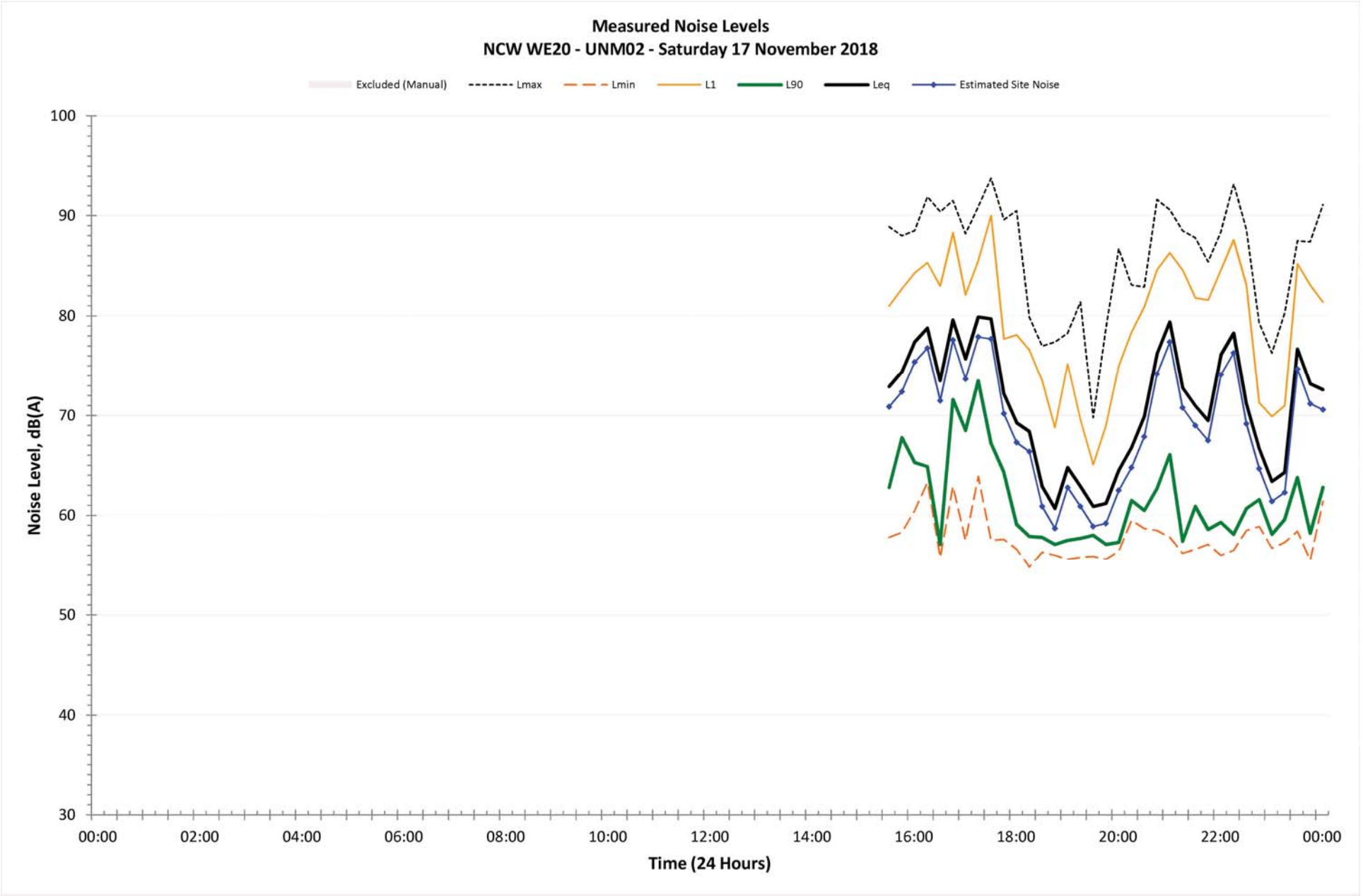

Measured Noise Levels
NCW WE18 - UNM01 - Sunday 4 November 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

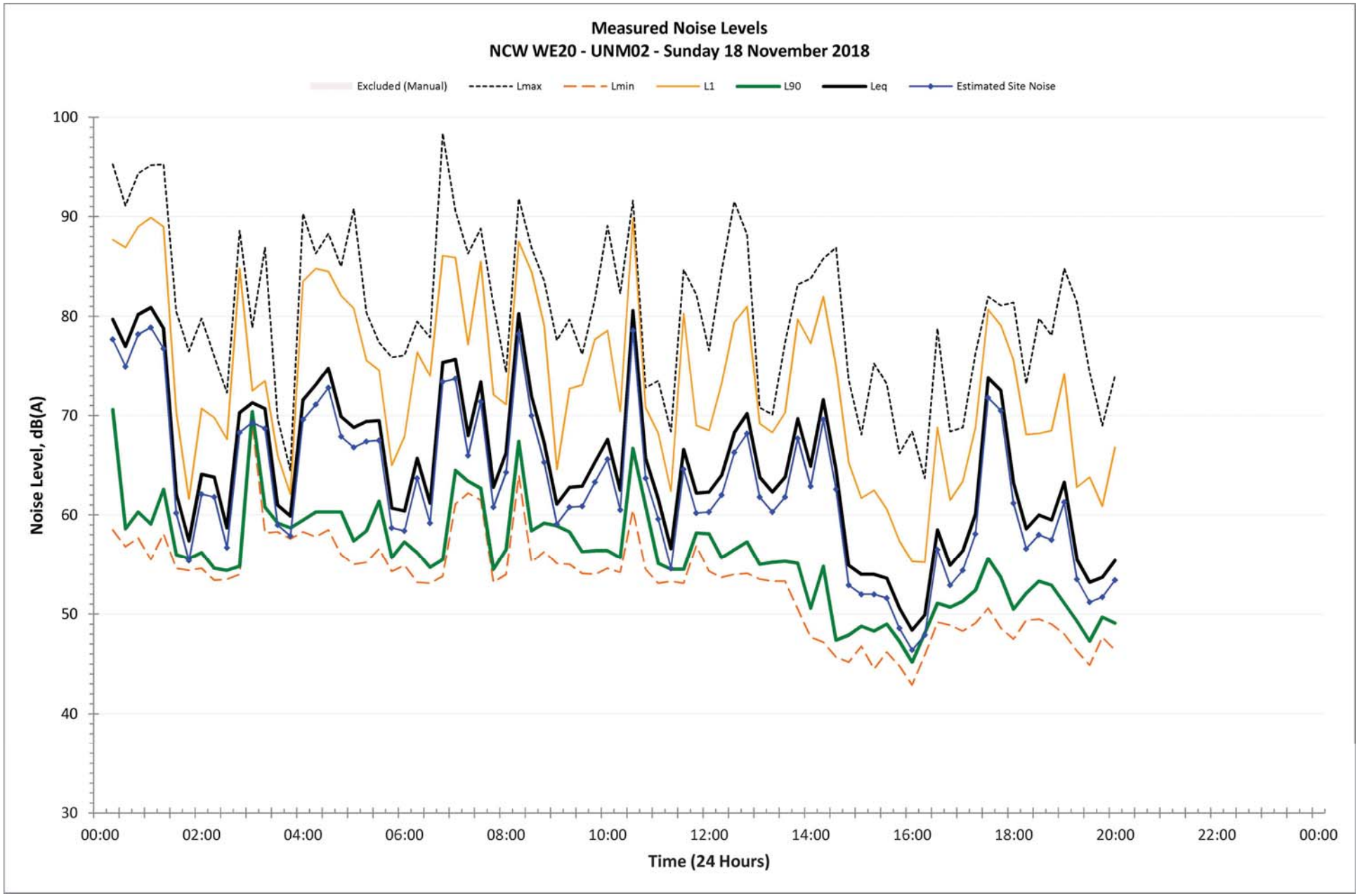

Measured Noise Levels
NCW P1-6 WE18 - UNM02 - Saturday 03 November 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
100
90
80
70
60
50
40
30
Noise Level, dB(A)
03:30
07:00
10:30
14:00
17:30
21:00
Time (24 Hours)

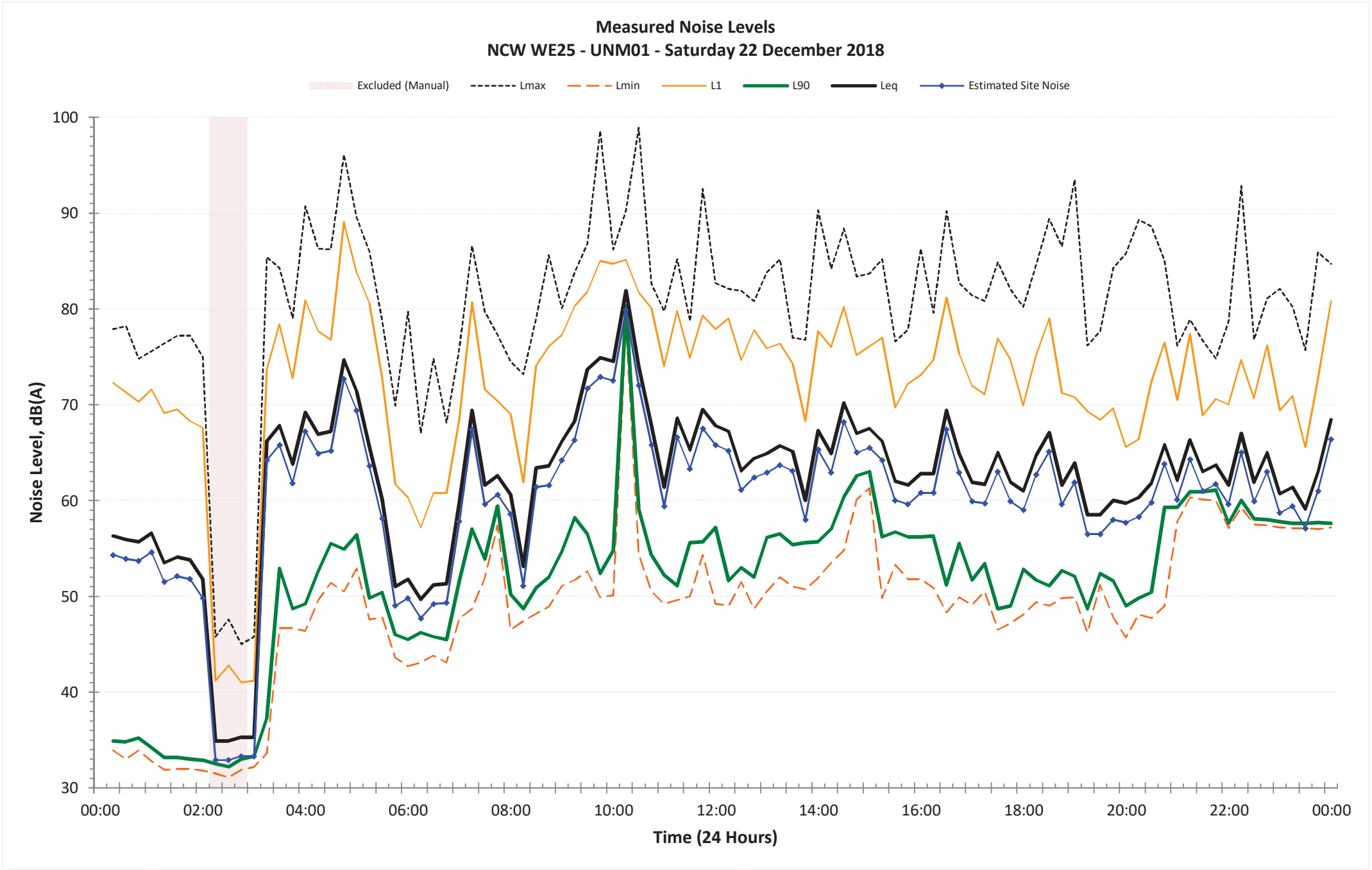

Measured Noise Levels
NCW P1-6 WE18 - UNM02 - Sunday 4 November 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
03:00
05:00
07:00
09:00
11:00
13:00
15:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

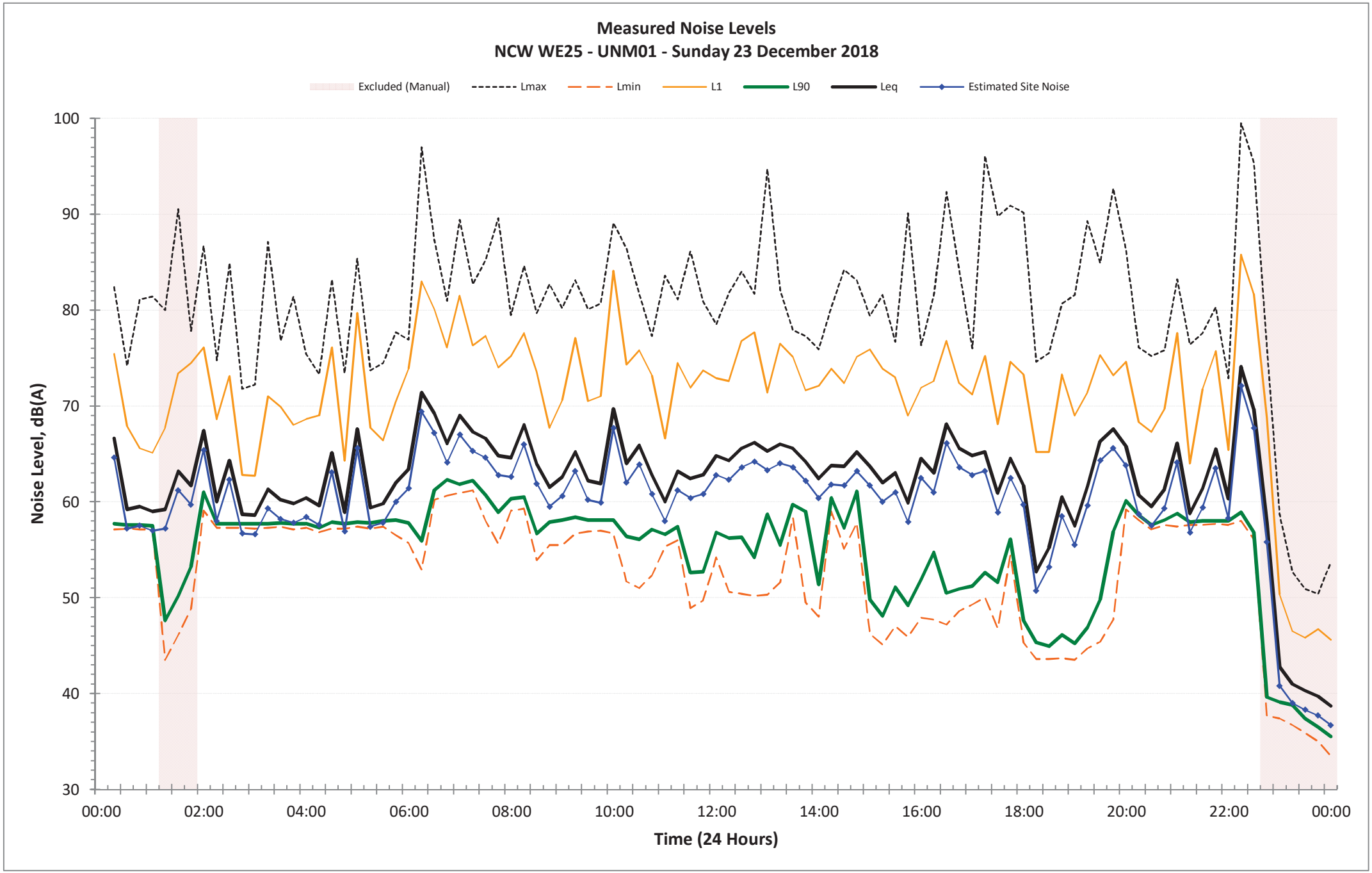

Measured Noise Levels
NCW WE20 - UNM01 - Saturday 17 November 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

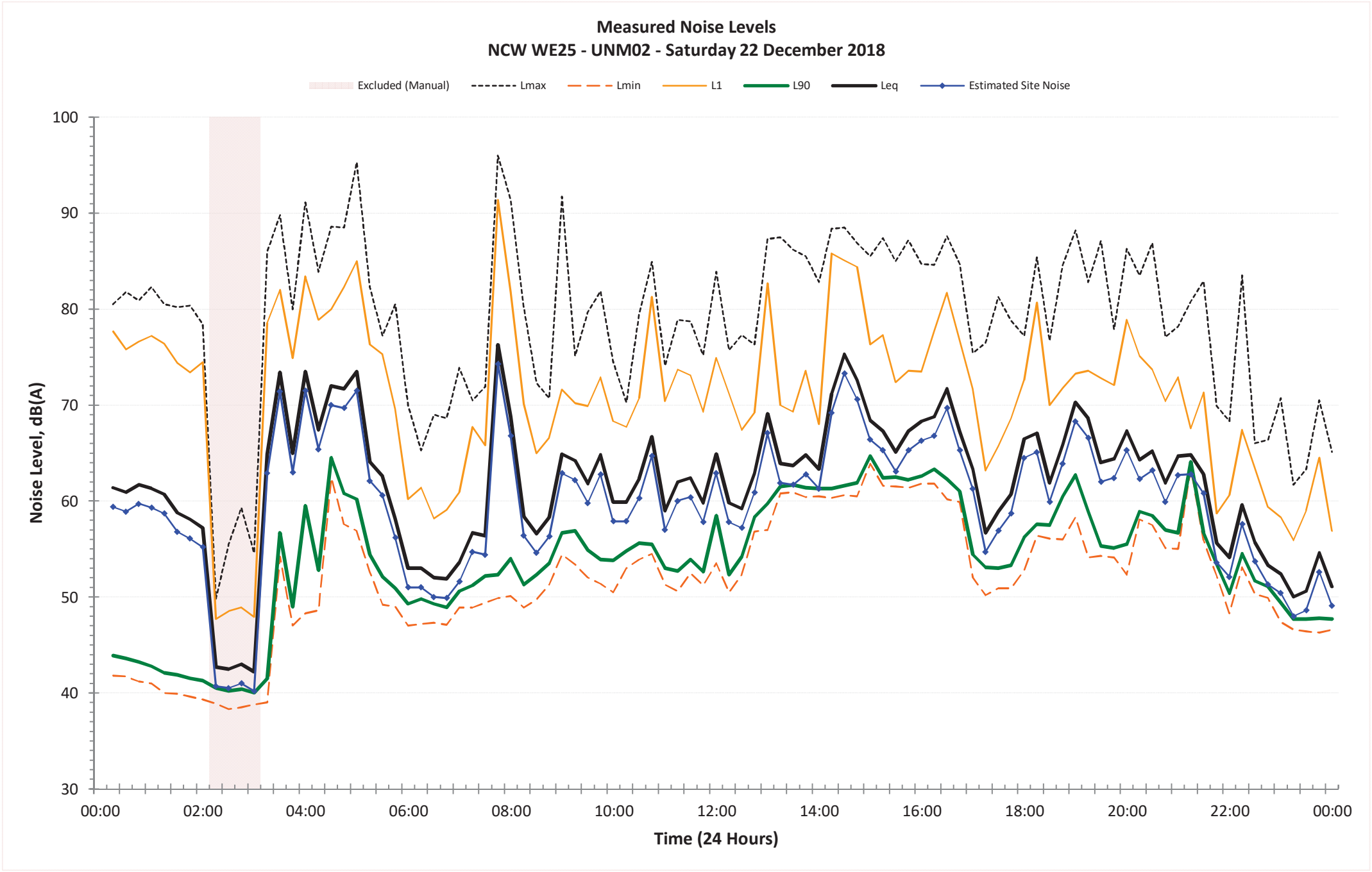

Measured Noise Levels
NCW WE20 - UNM01 - Sunday 18 November 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW WE20 - UNM02 - Saturday 17 November 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

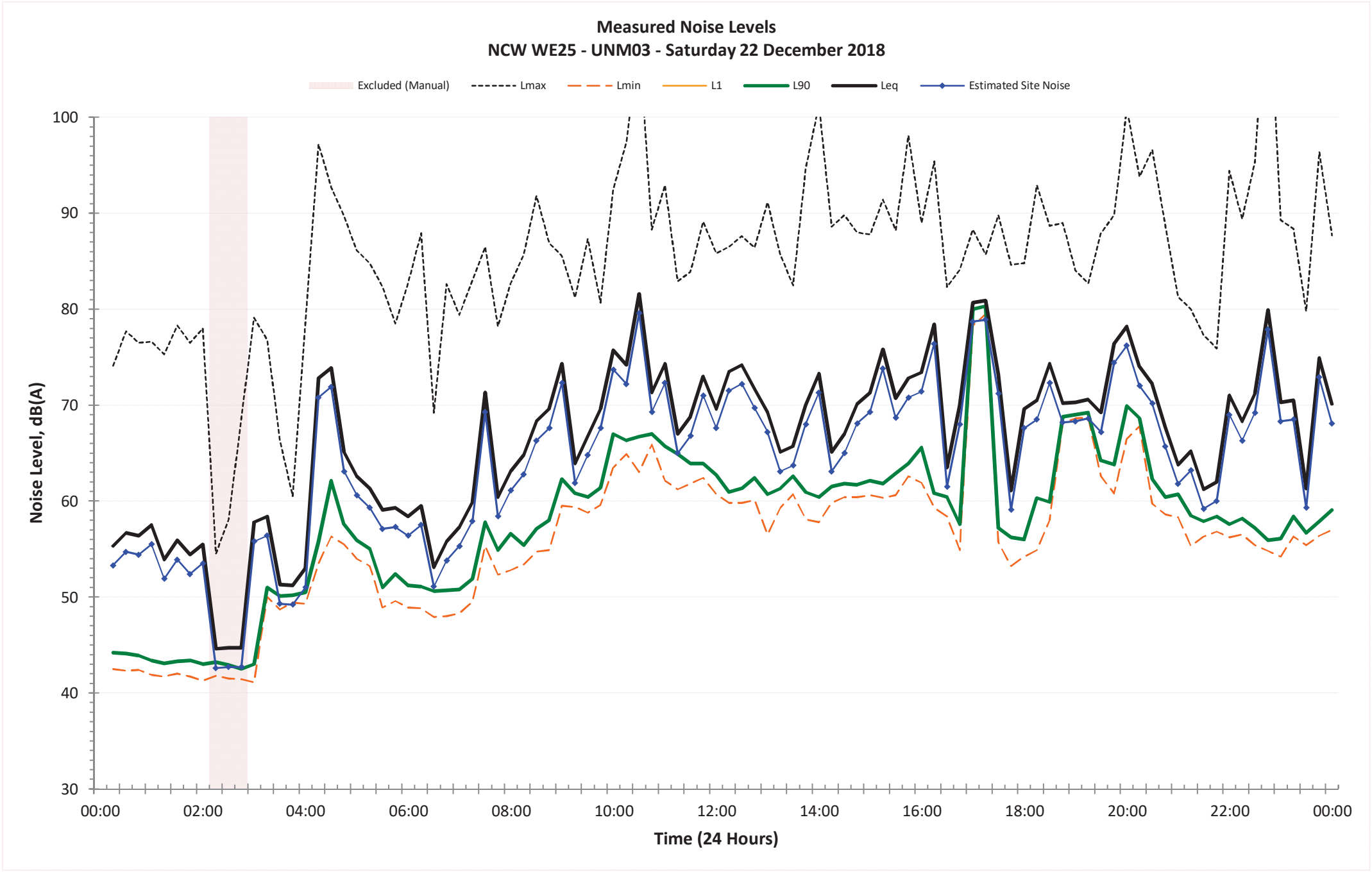

Measured Noise Levels
NCW WE20 - UNM02 - Sunday 18 November 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

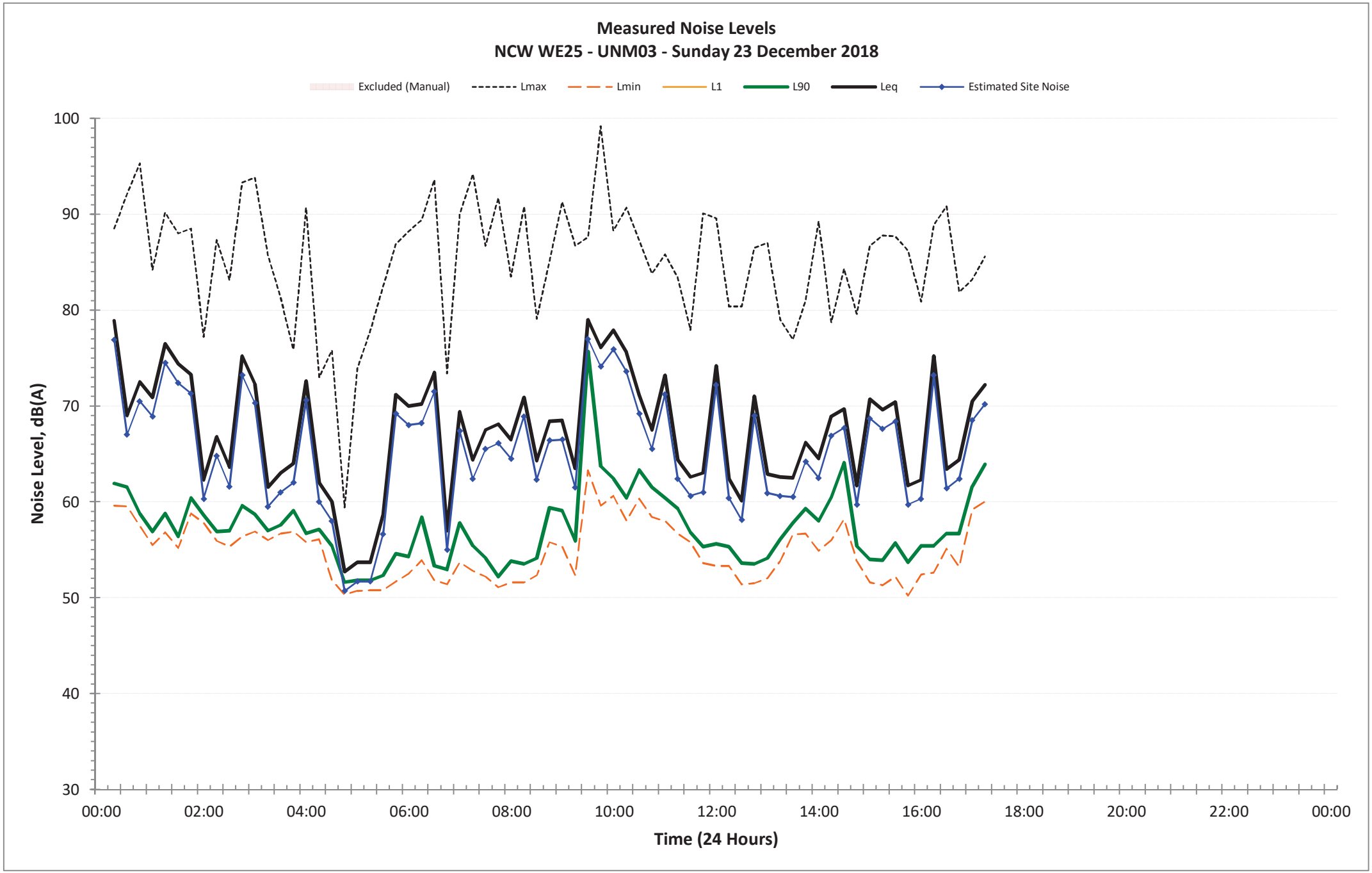

Measured Noise Levels
NCW WE25 - UNM01 - Saturday 22 December 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW WE25 - UNM01 - Sunday 23 December 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

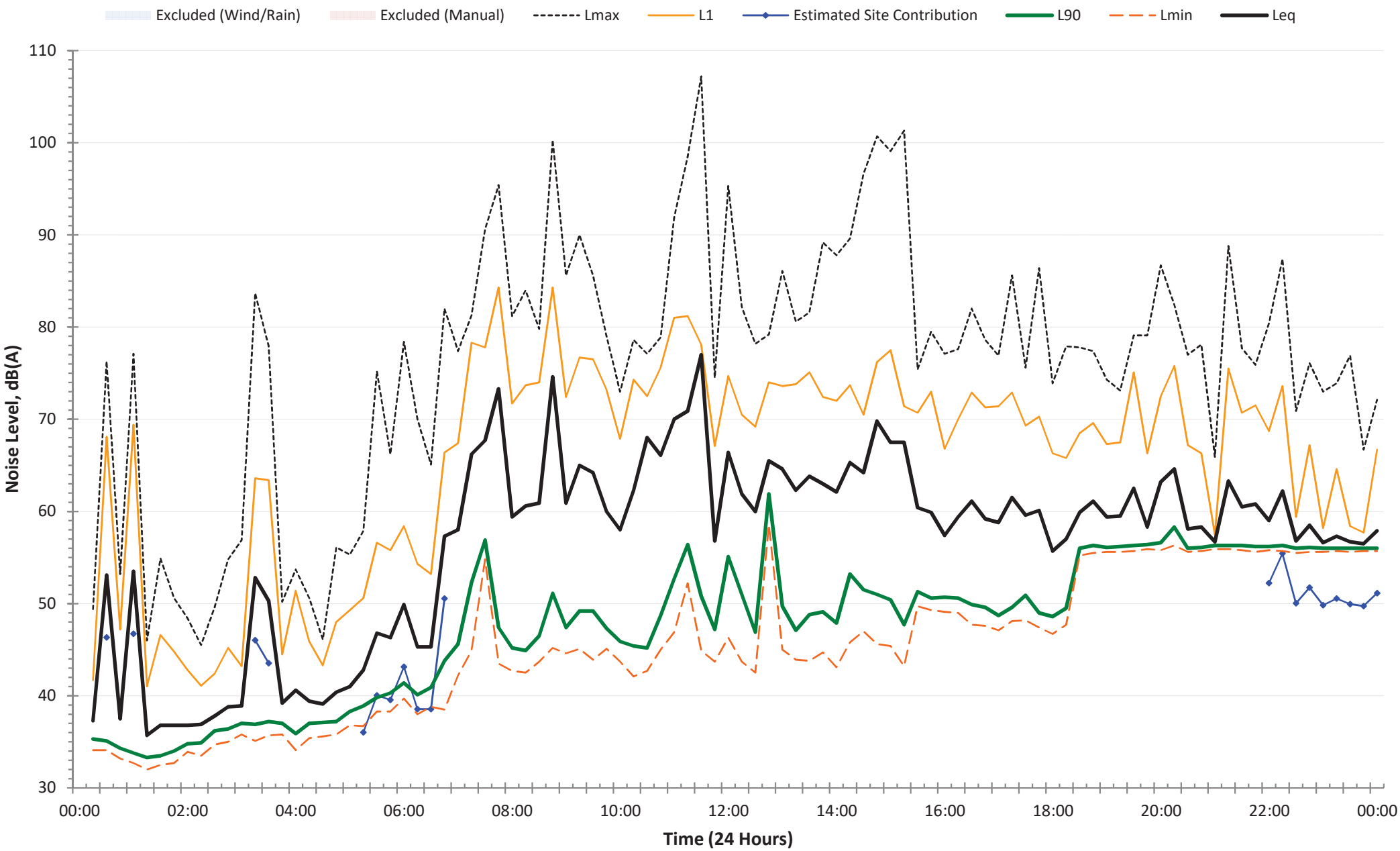

Measured Noise Levels
NCW WE25 - UNM02 - Saturday 22 December 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

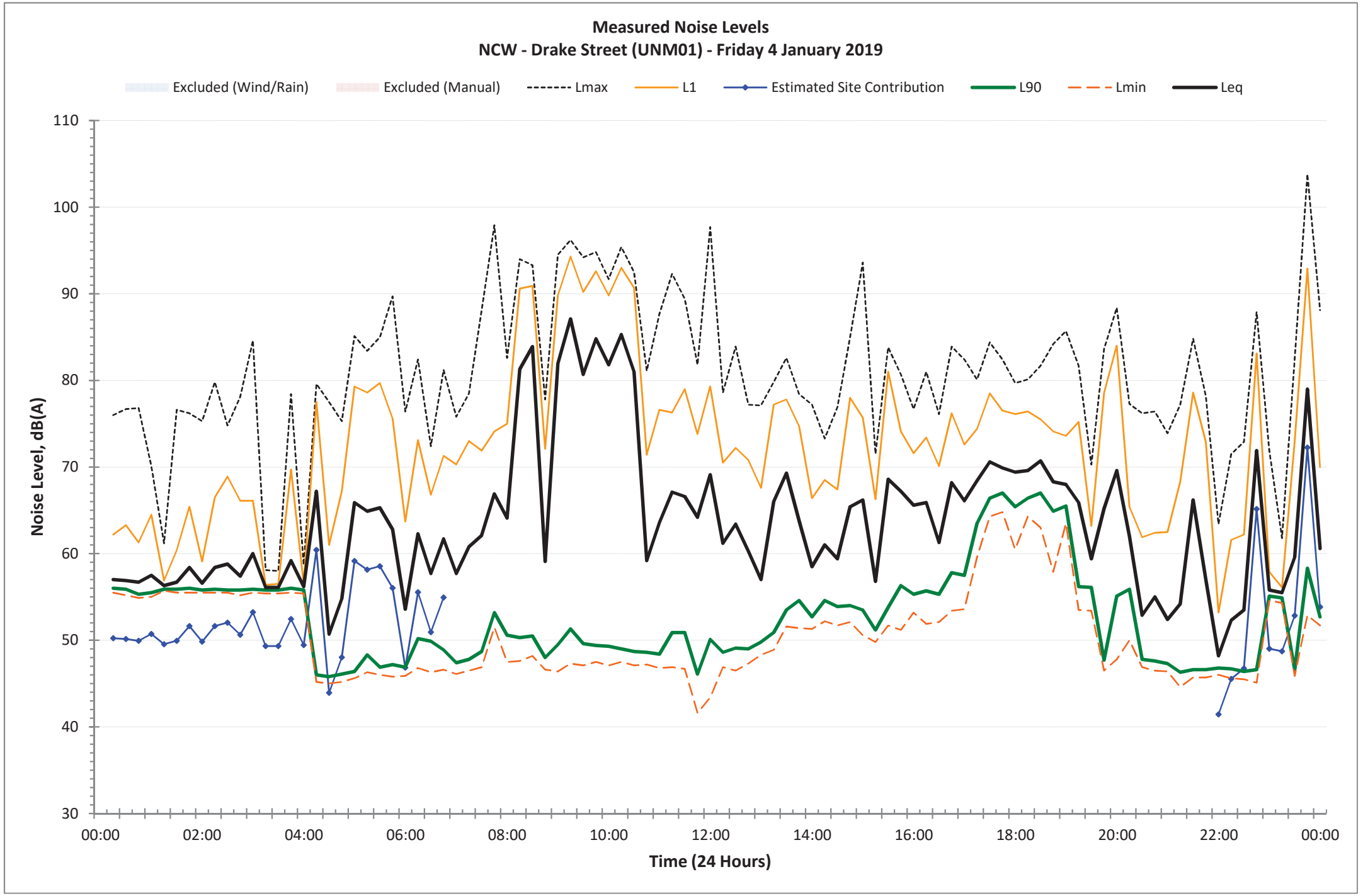

Measured Noise Levels
NCW WE25 - UNM02 - Sunday 23 December 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

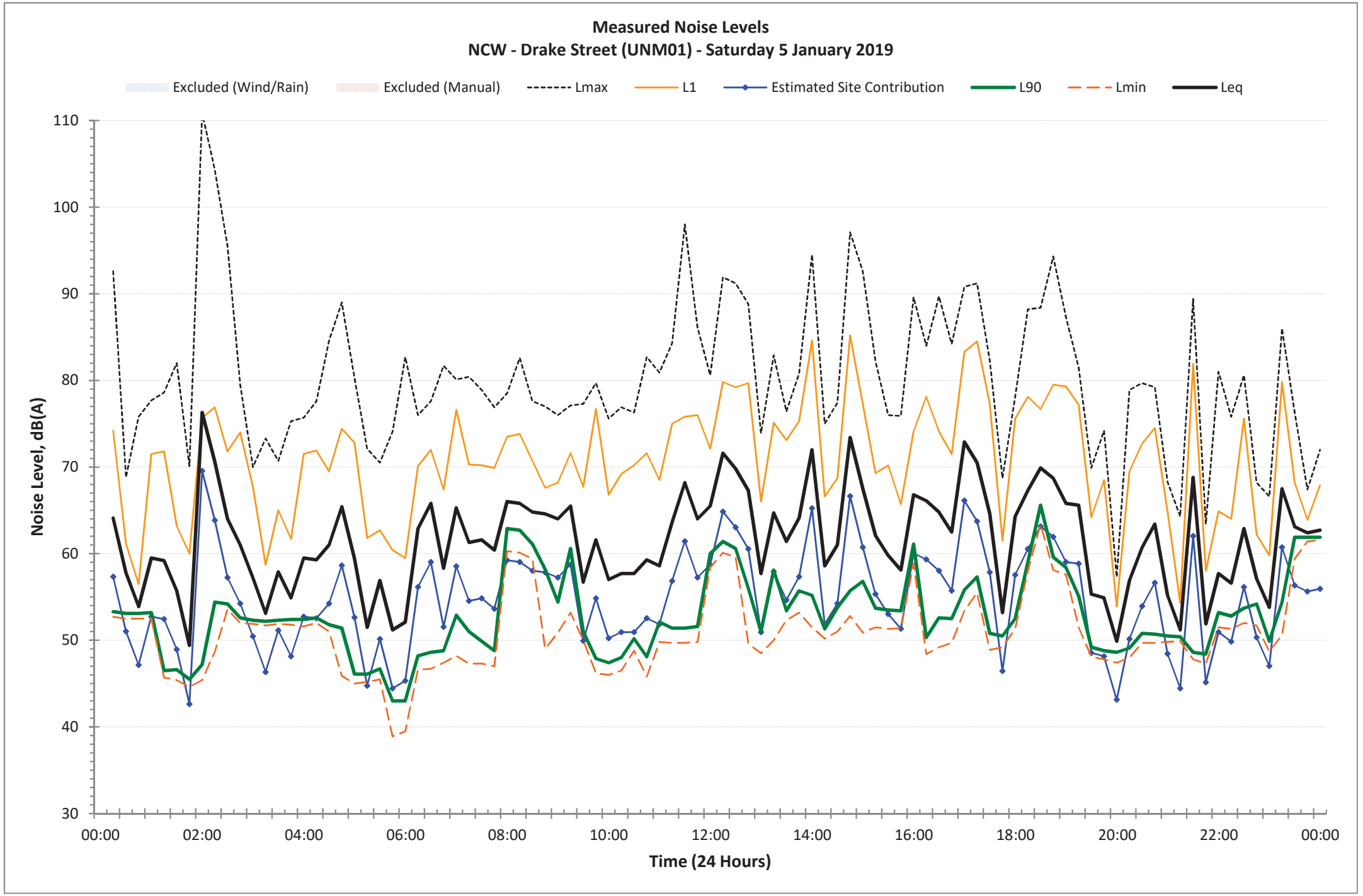

Measured Noise Levels
NCW WE25 - UNM03 - Saturday 22 December 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

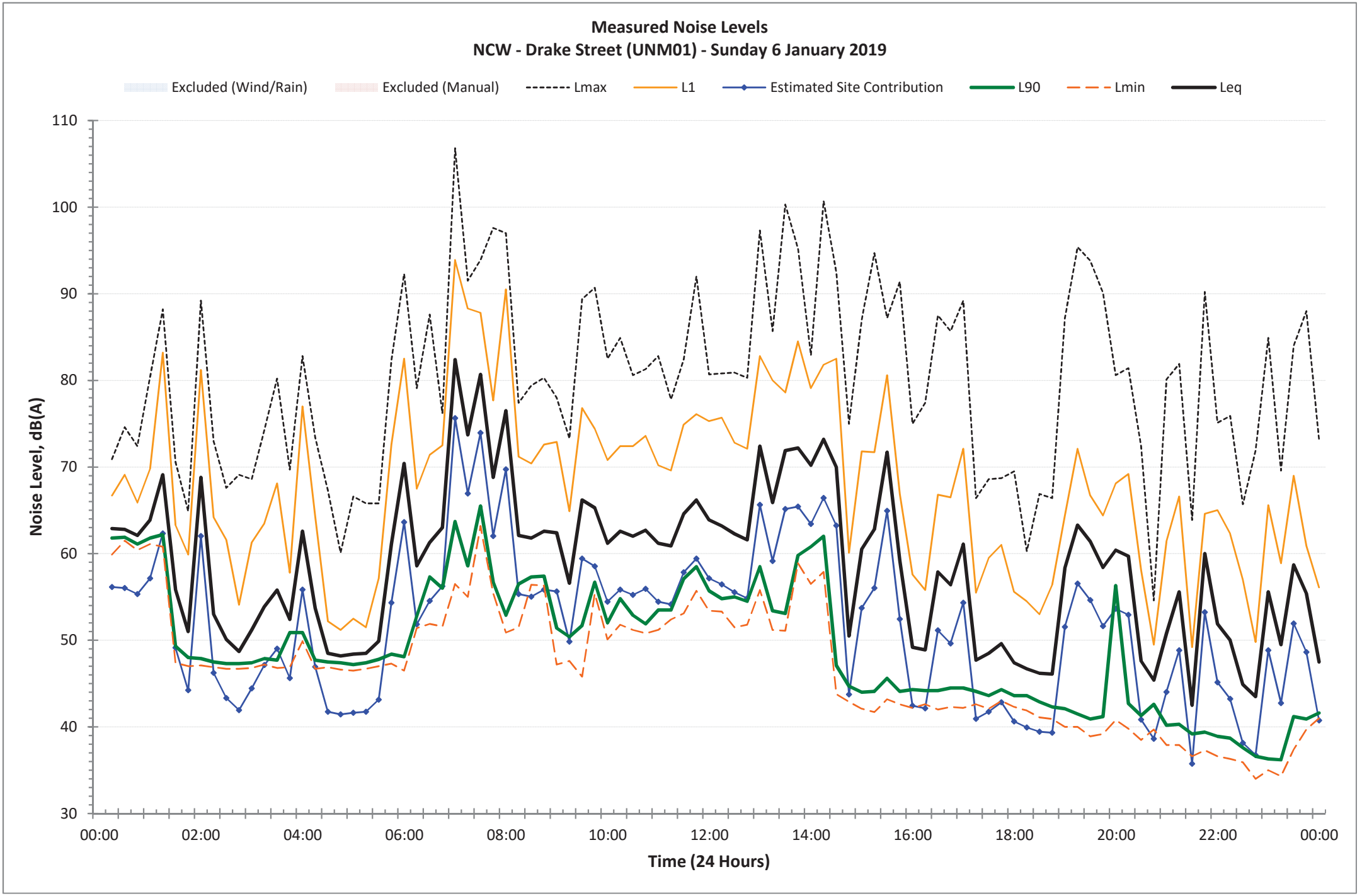

Measured Noise Levels
NCW WE25 - UNM03 - Sunday 23 December 2018
Excluded (Manual)
Lmax
Lmin
L1
L90
Leq
Estimated Site Noise
Noise Level, dB(A)
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

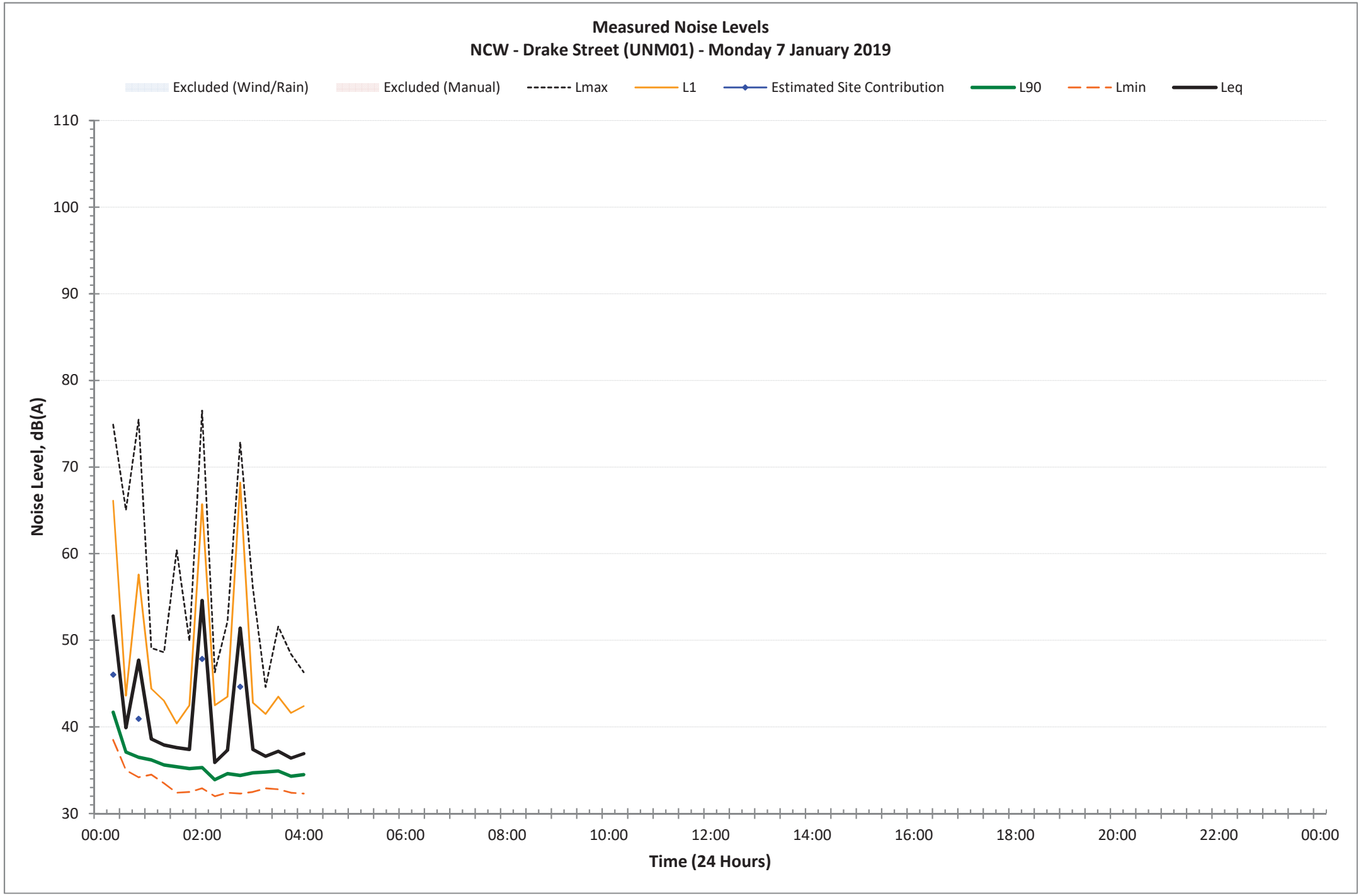
Measured Noise Levels
NCW - Drake Street (UNM01) - Thursday 3 January 2019



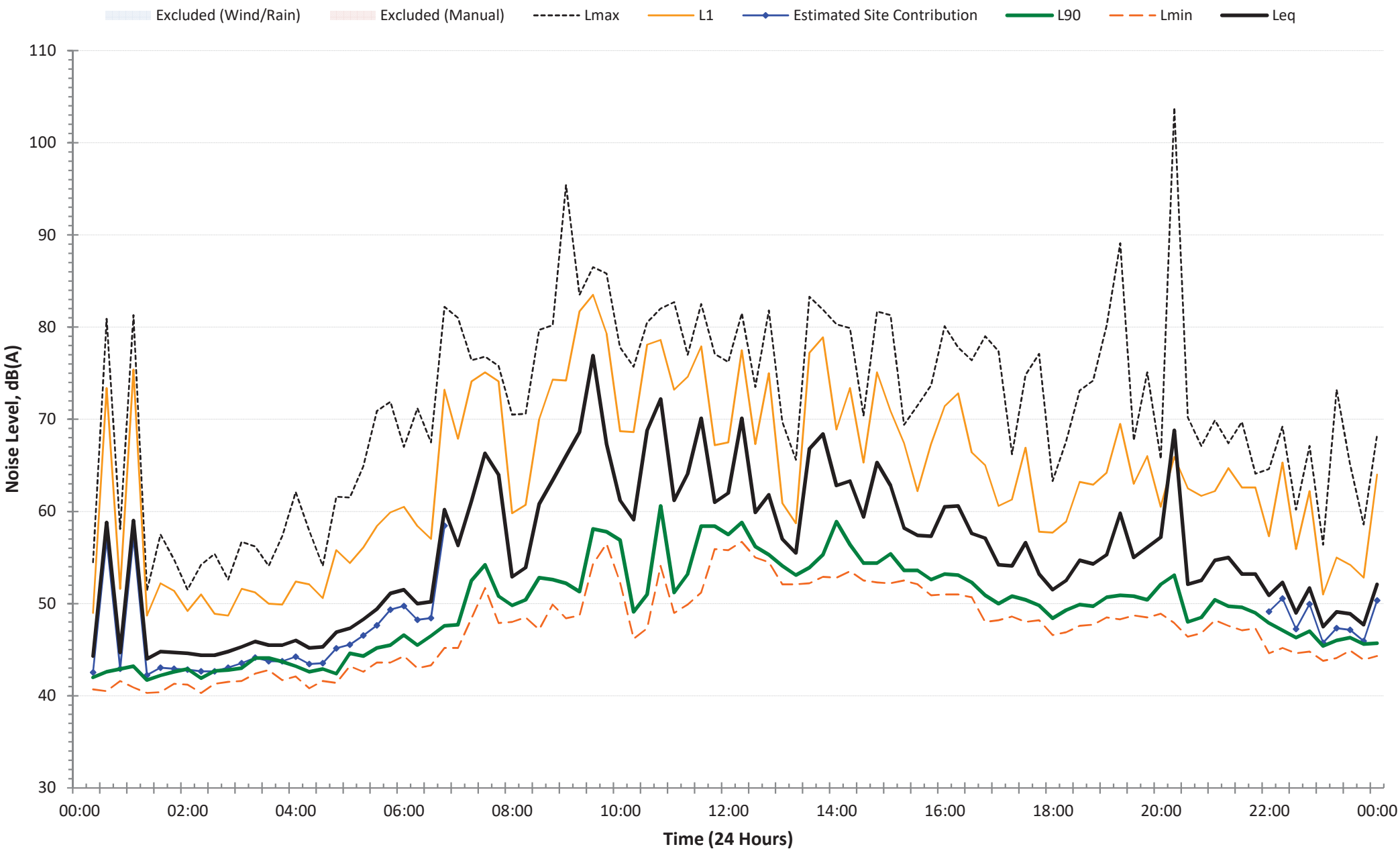

Measured Noise Levels
NCW - Drake Street (UNM01) - Friday 4 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
Lmax
L1
Estimated Site Contribution
L90
Lmin
Leq
Noise Level, dB(A)
110
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

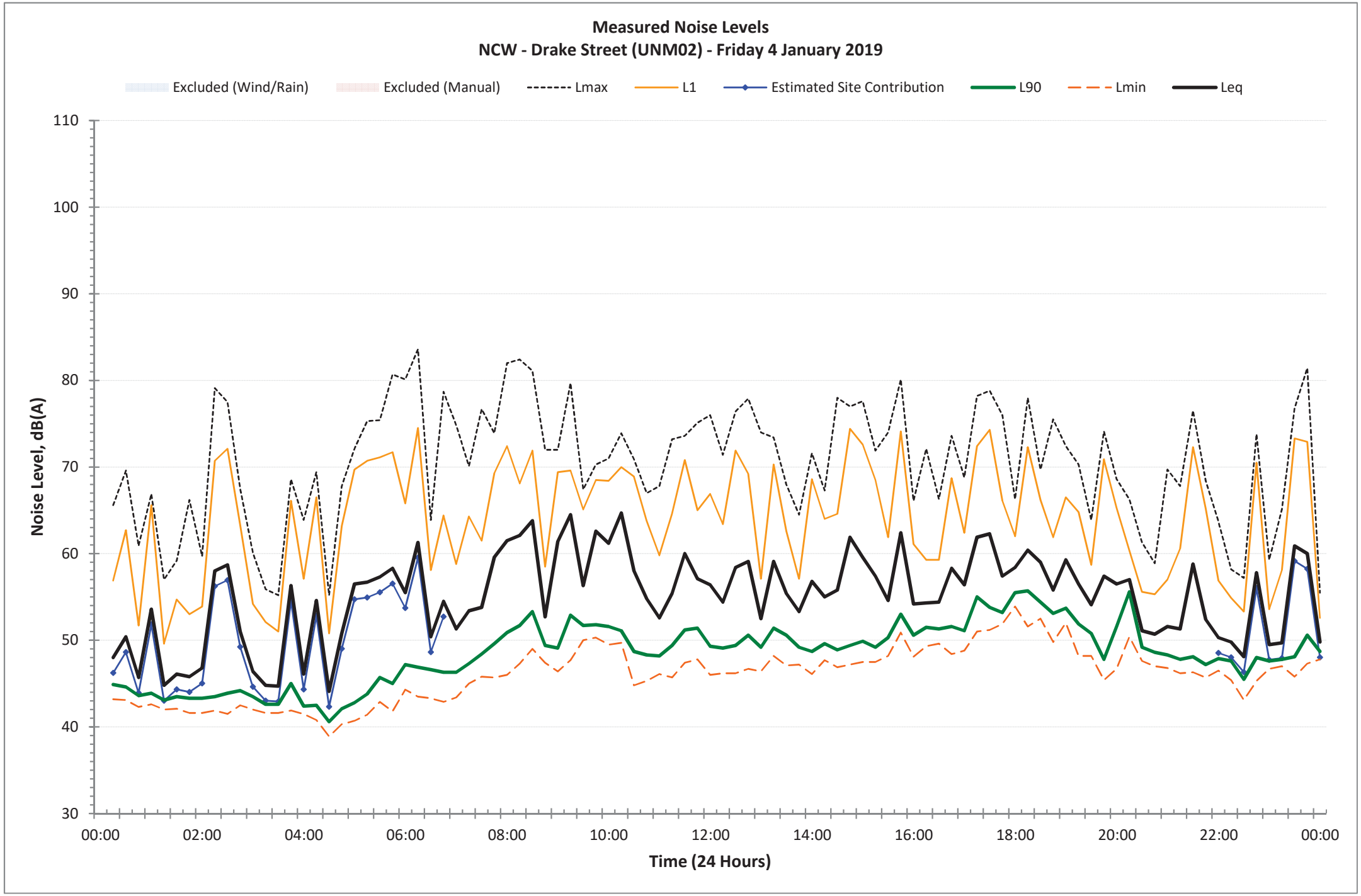

Measured Noise Levels
NCW - Drake Street (UNM01) - Saturday 5 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
Lmax
L1
Estimated Site Contribution
L90
Lmin
Leq
Noise Level, dB(A)
110
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

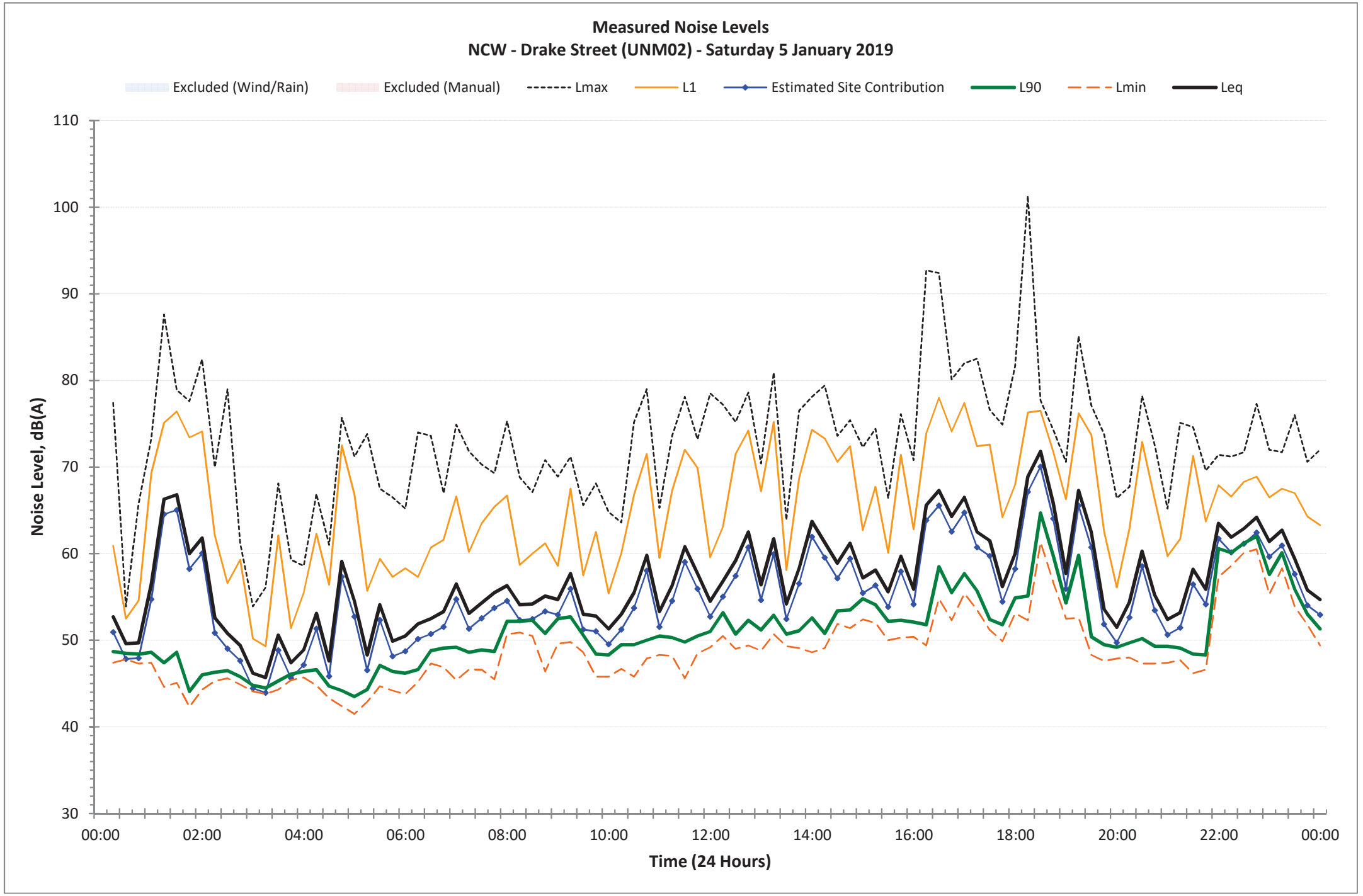

Measured Noise Levels
NCW - Drake Street (UNM01) - Sunday 6 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
Lmax
L1
Estimated Site Contribution
L90
Lmin
Leq
Noise Level, dB(A)
110
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

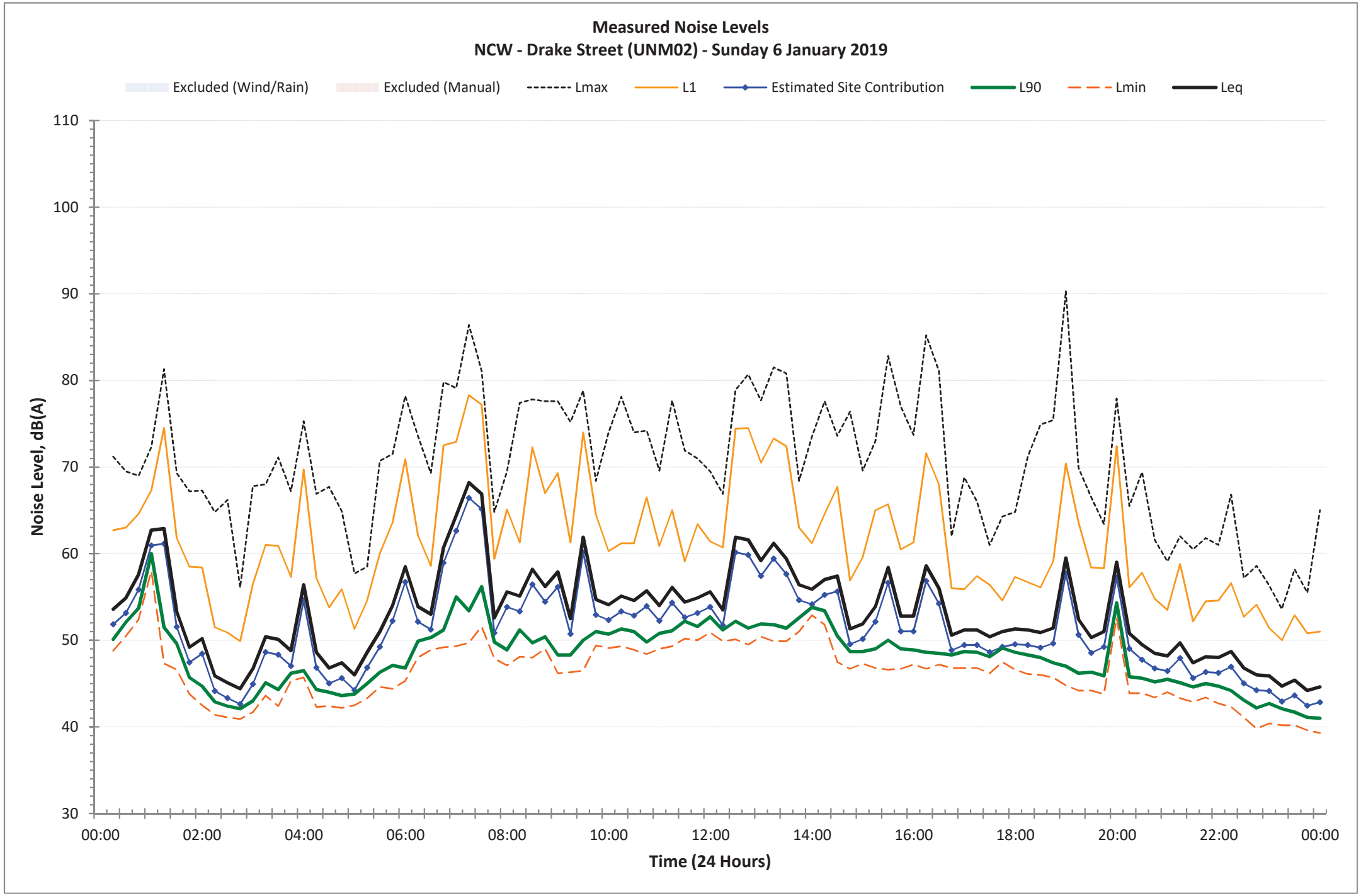

Measured Noise Levels
NCW - Drake Street (UNM01) - Monday 7 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
Lmax
L1
Estimated Site Contribution
L90
Lmin
Leq
Noise Level, dB(A)
110
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

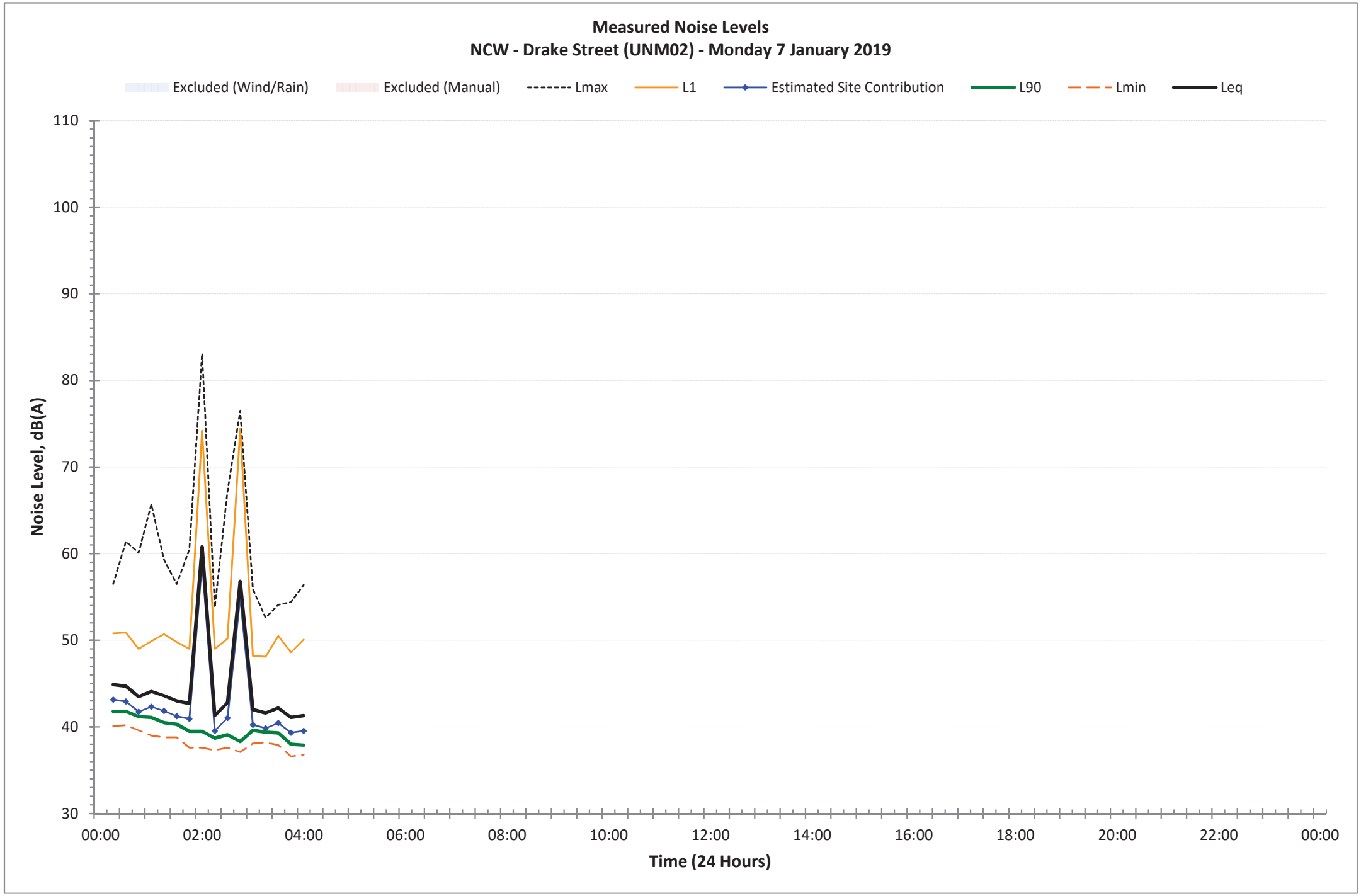
Measured Noise Levels
NCW - Drake Street (UNM02) - Thursday 3 January 2019

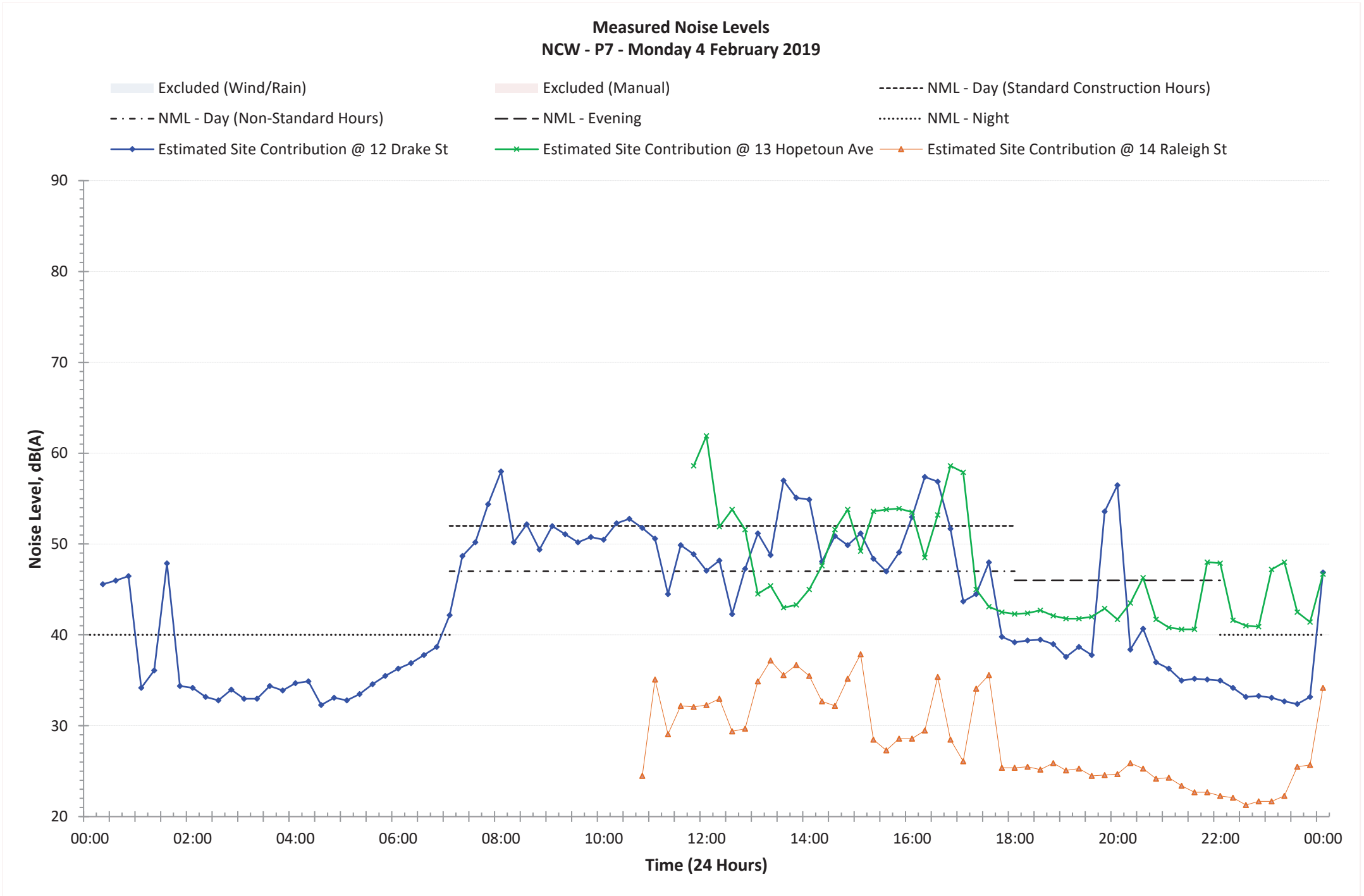


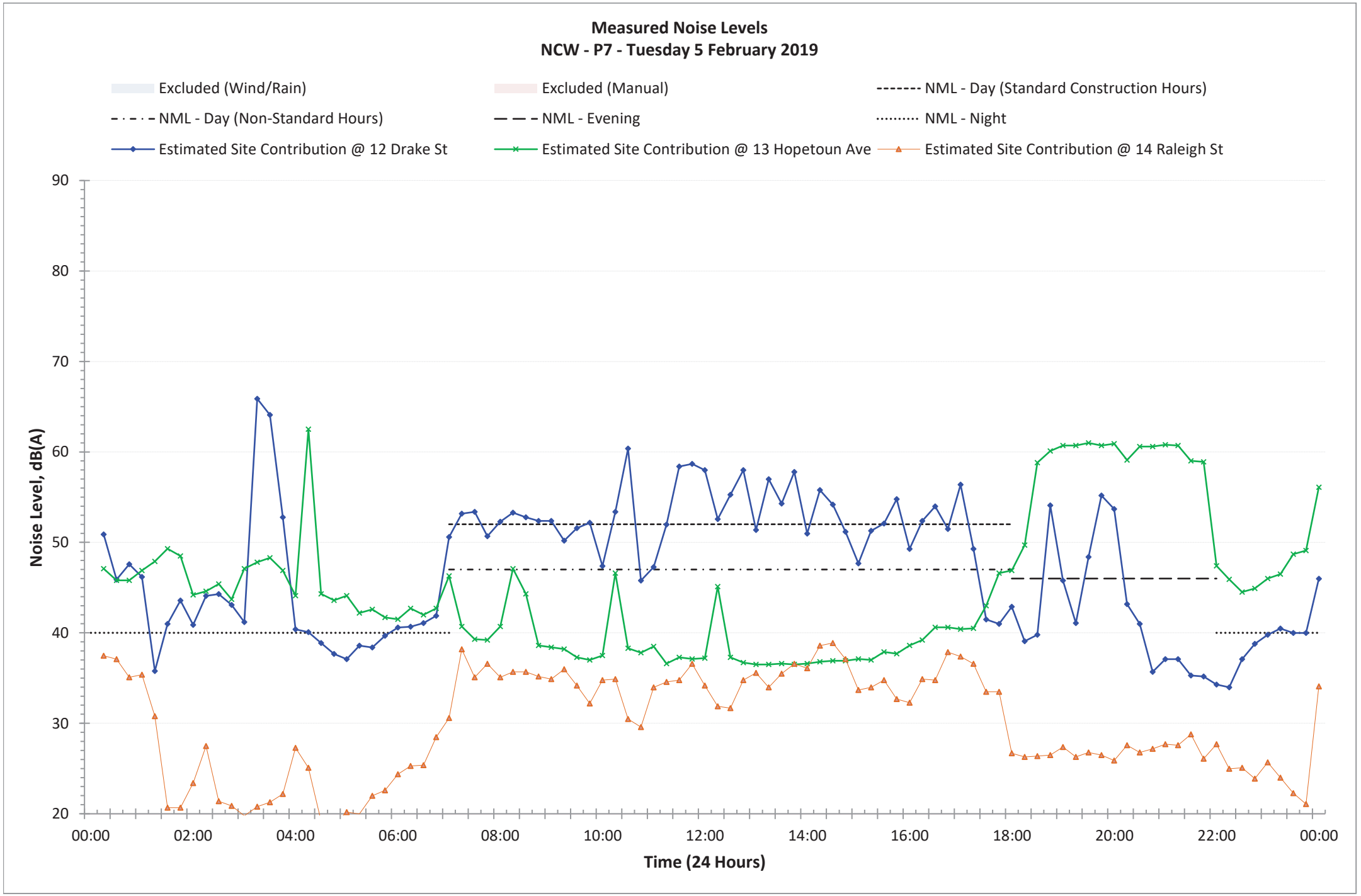

Measured Noise Levels
NCW - Drake Street (UNM02) - Friday 4 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
Lmax
L1
Estimated Site Contribution
L90
Lmin
Leq
Noise Level, dB(A)
110
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

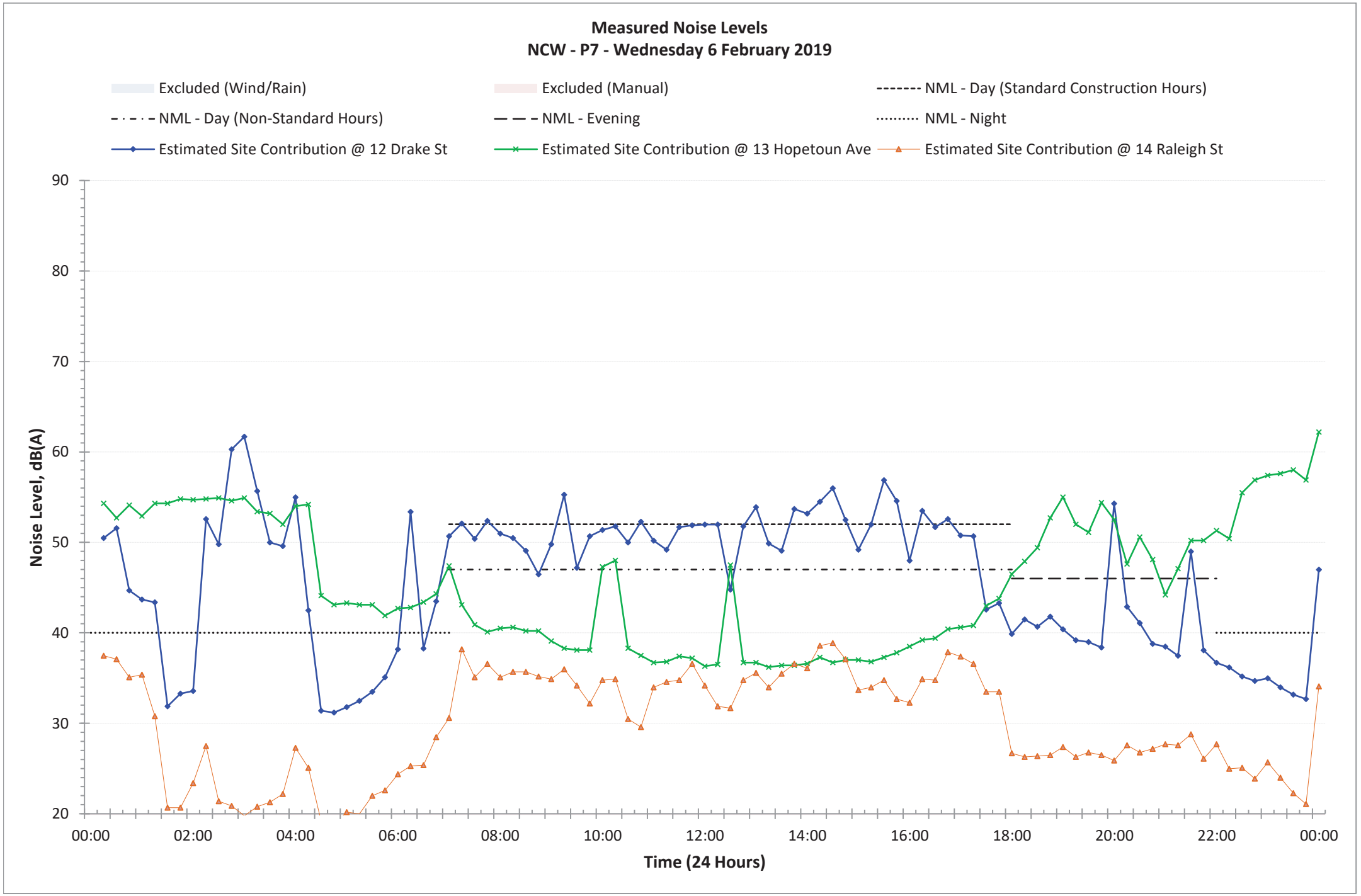

Measured Noise Levels
NCW - Drake Street (UNM02) - Saturday 5 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
Lmax
L1
Estimated Site Contribution
L90
Lmin
Leq
Noise Level, dB(A)
110
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

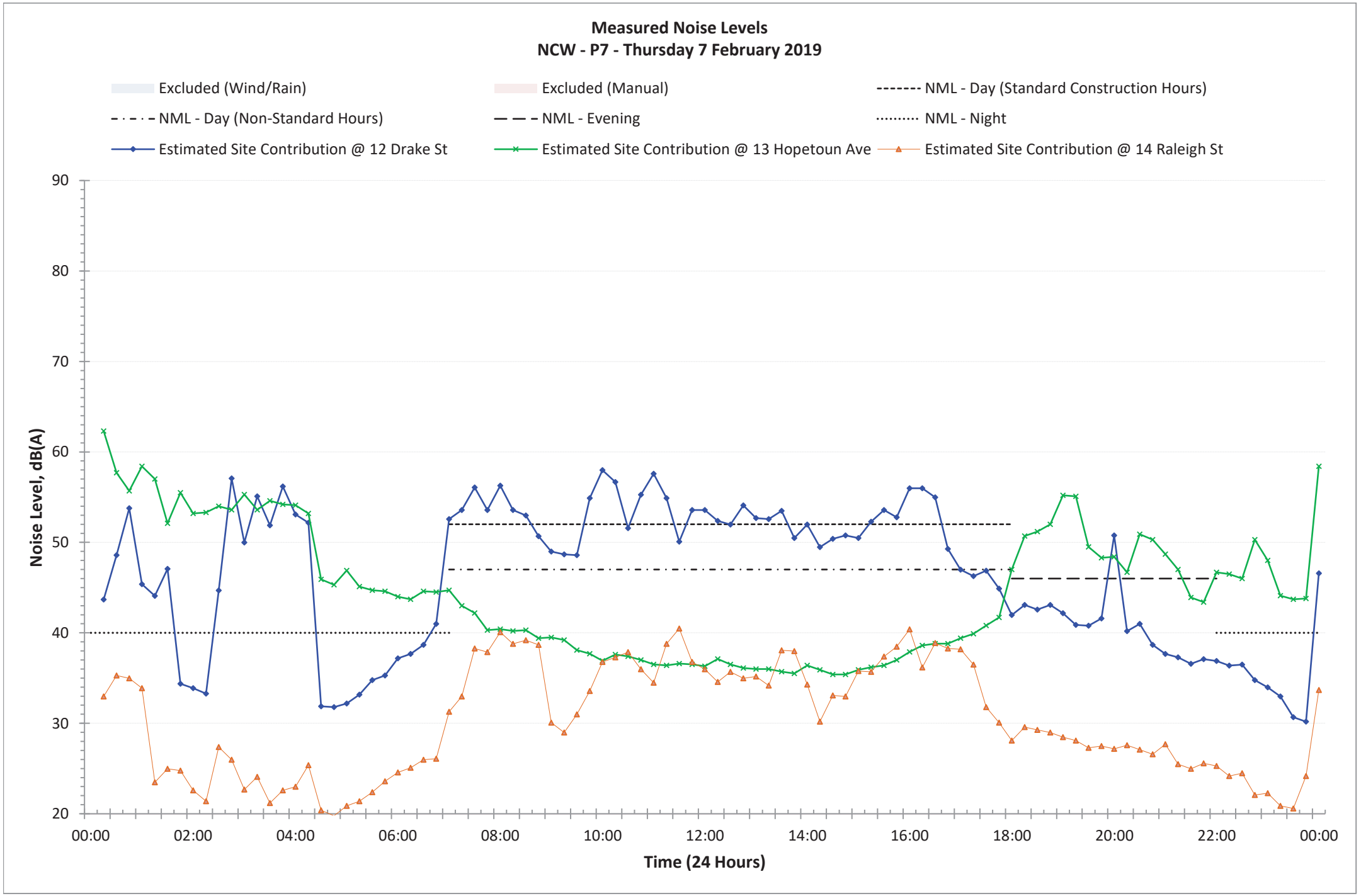

Measured Noise Levels
NCW - Drake Street (UNM02) - Sunday 6 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
Lmax
L1
Estimated Site Contribution
L90
Lmin
Leq
Noise Level, dB(A)
110
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

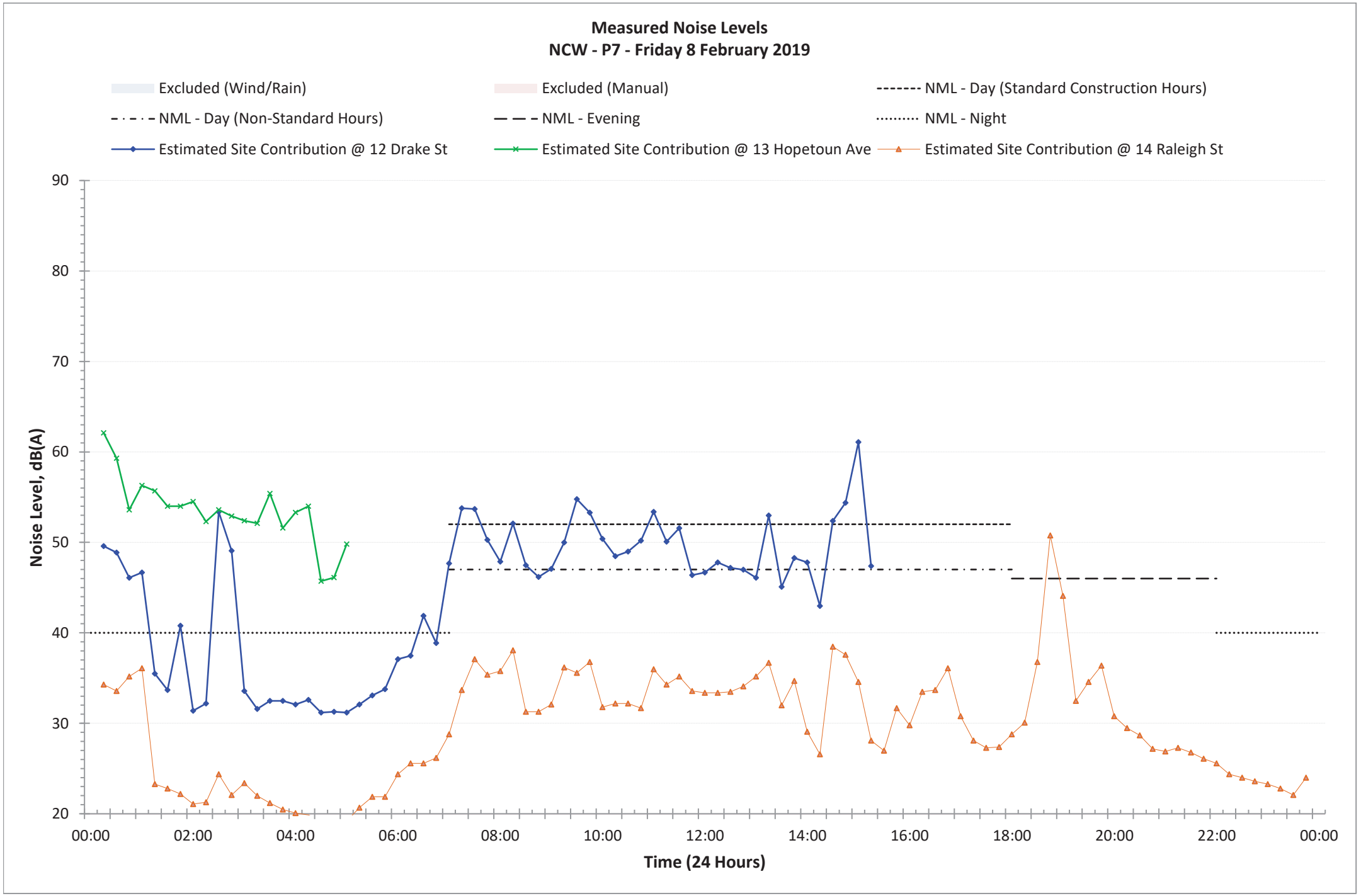

Measured Noise Levels
NCW - Drake Street (UNM02) - Monday 7 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
Lmax
L1
Estimated Site Contribution
L90
Lmin
Leq
Noise Level, dB(A)
110
100
90
80
70
60
50
40
30
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

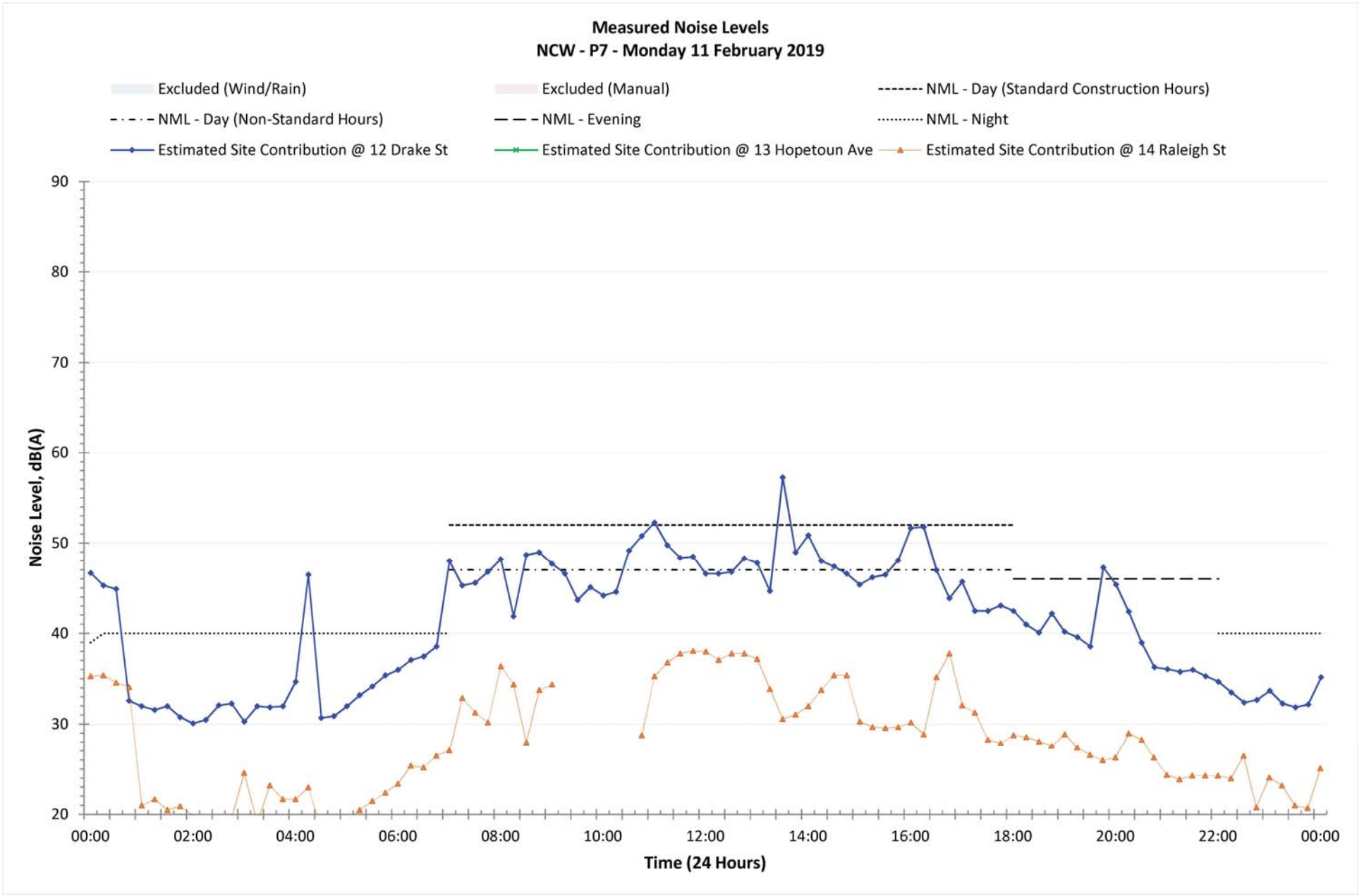

Measured Noise Levels
NCW - P7 - Monday 4 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

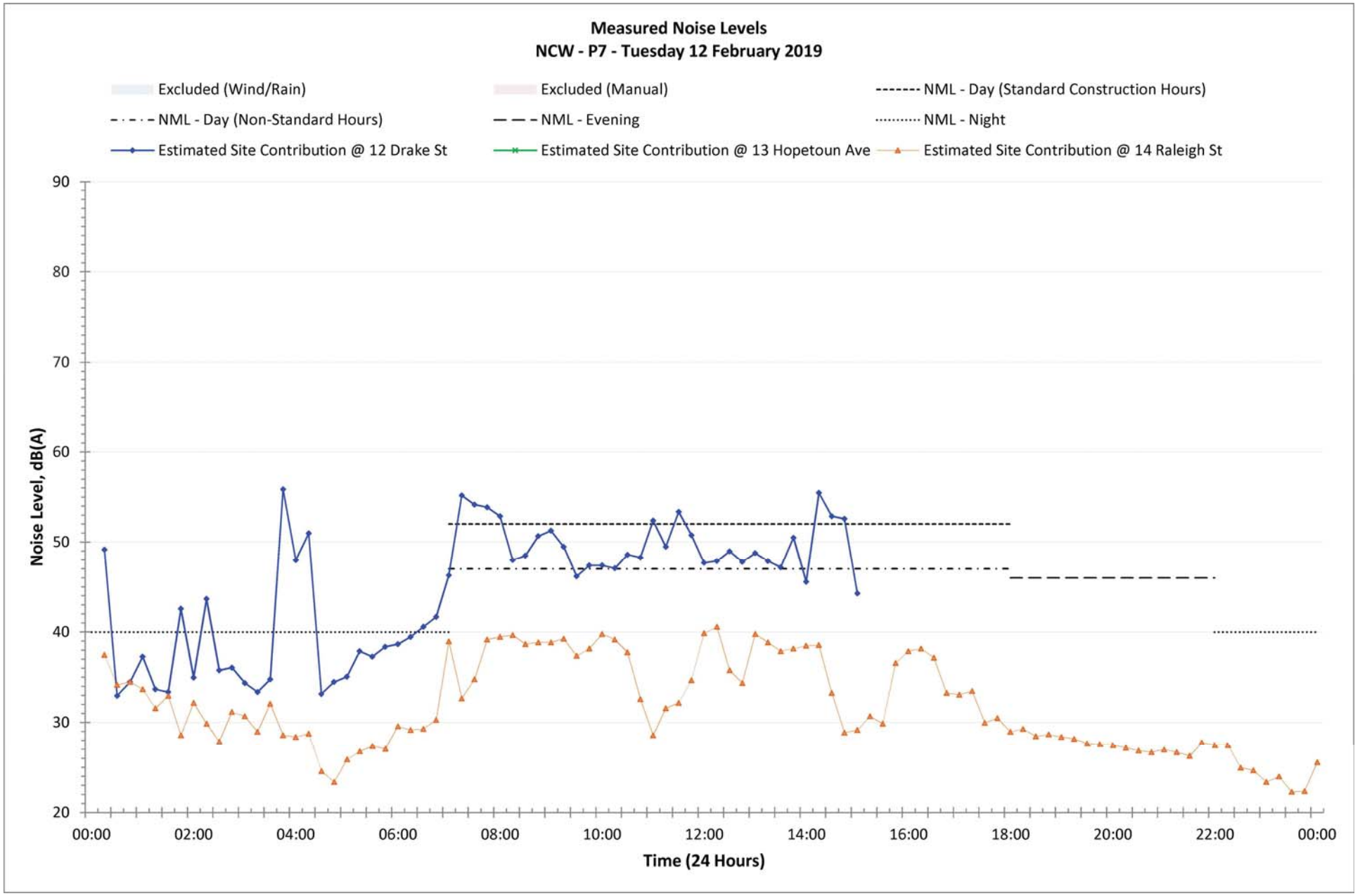

Measured Noise Levels
NCW - P7 - Tuesday 5 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

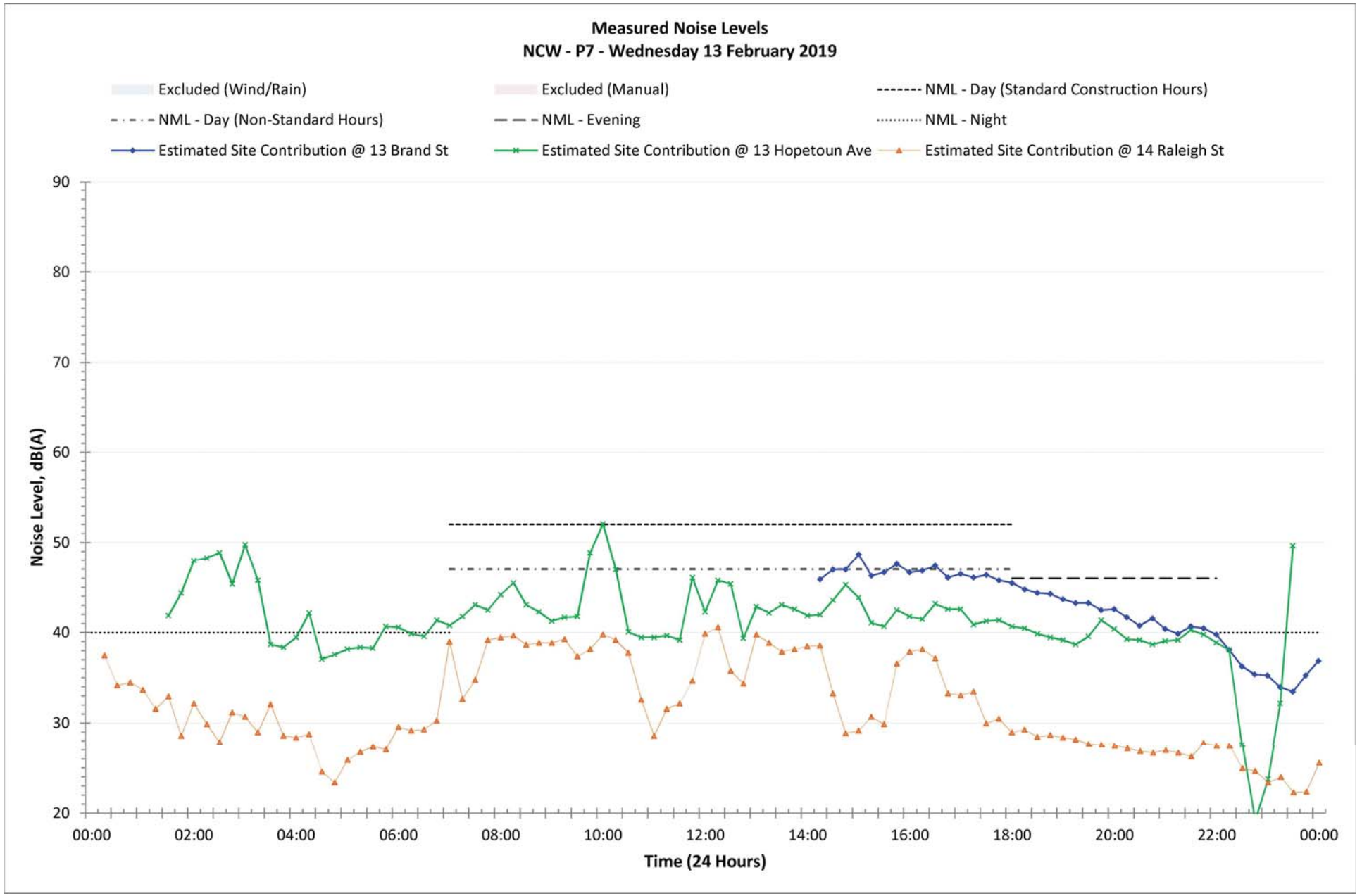

Measured Noise Levels
NCW - P7 - Wednesday 6 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

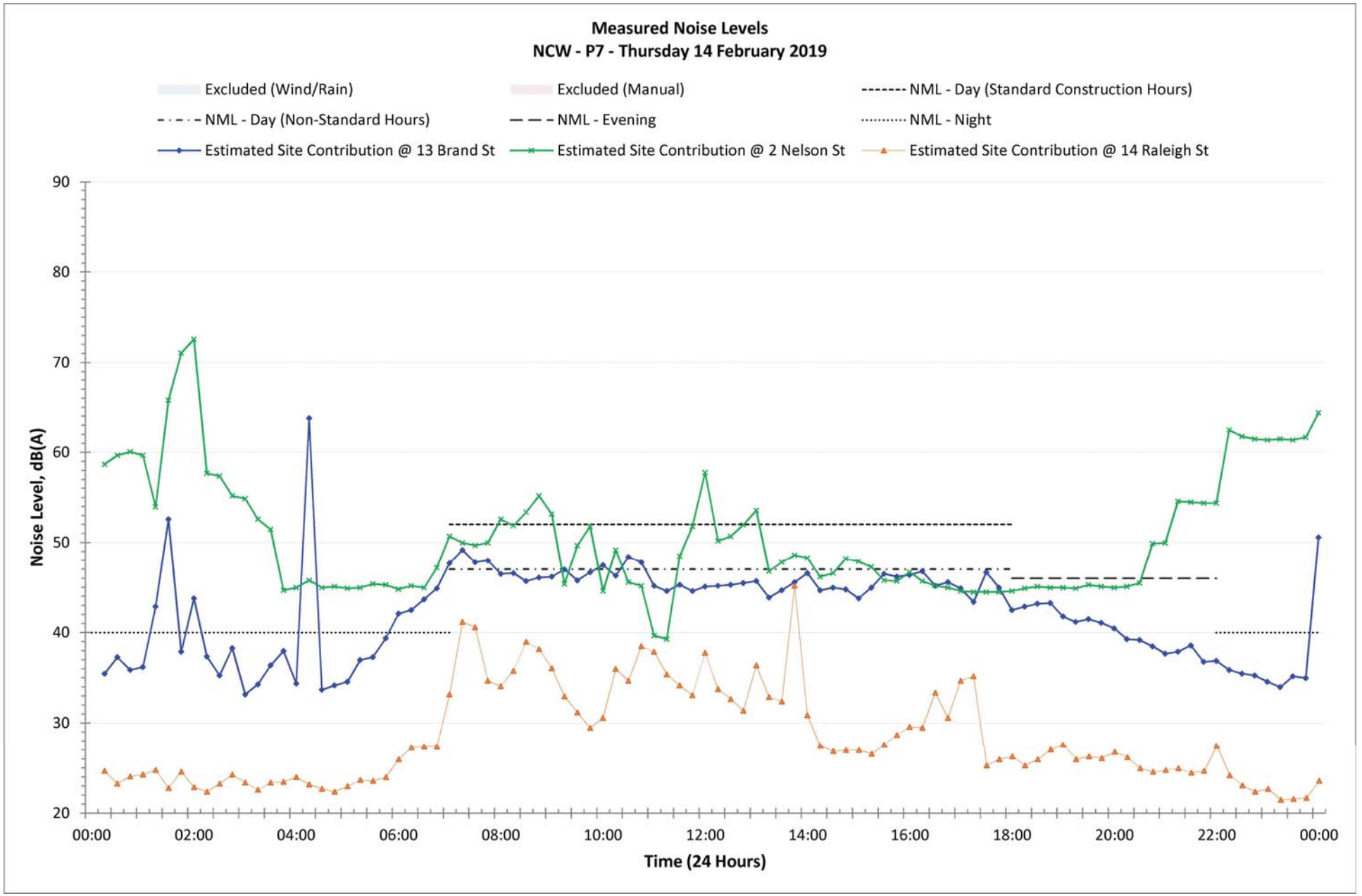

Measured Noise Levels
NCW - P7 - Thursday 7 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

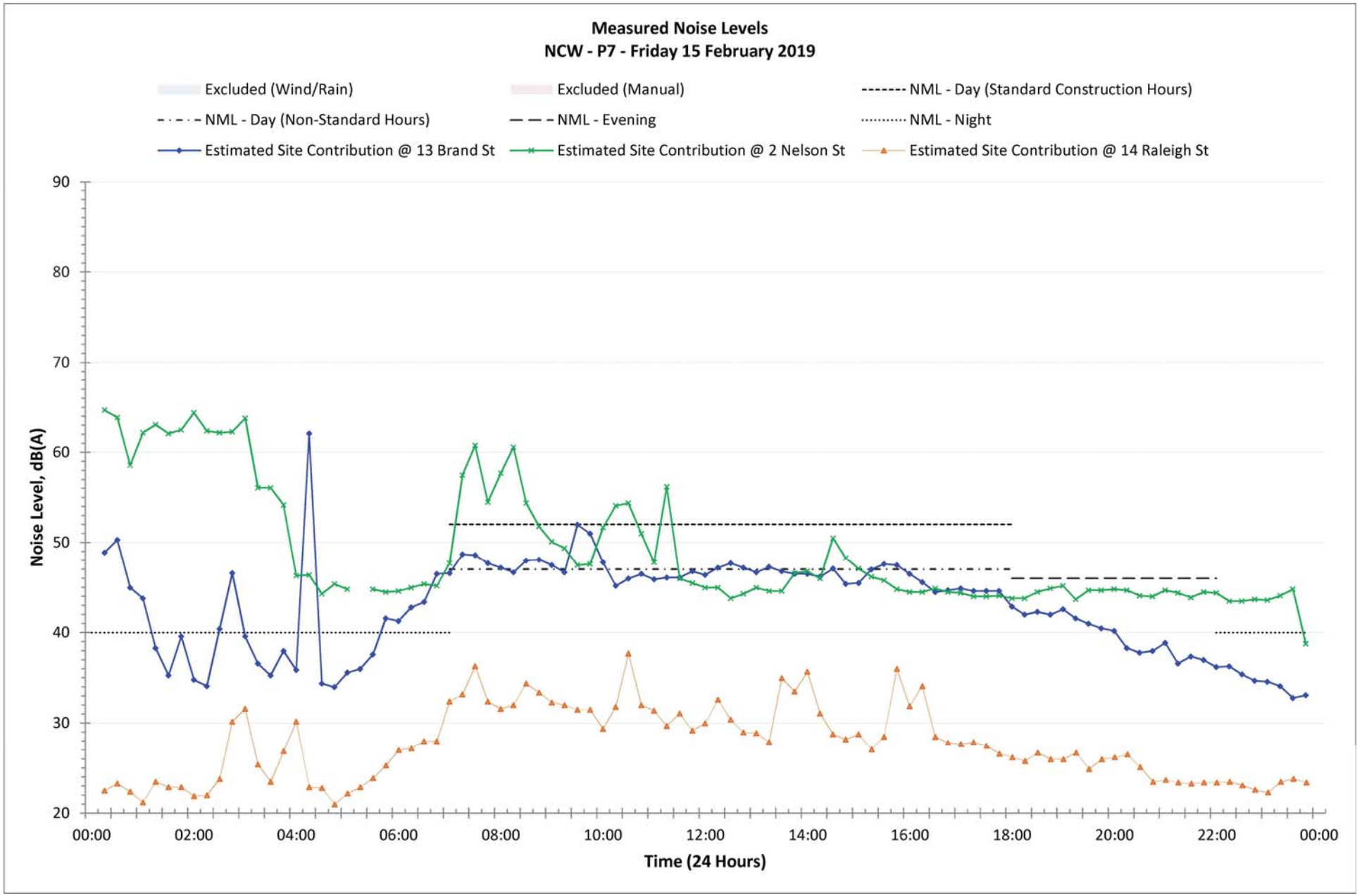

Measured Noise Levels
NCW - P7 - Friday 8 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

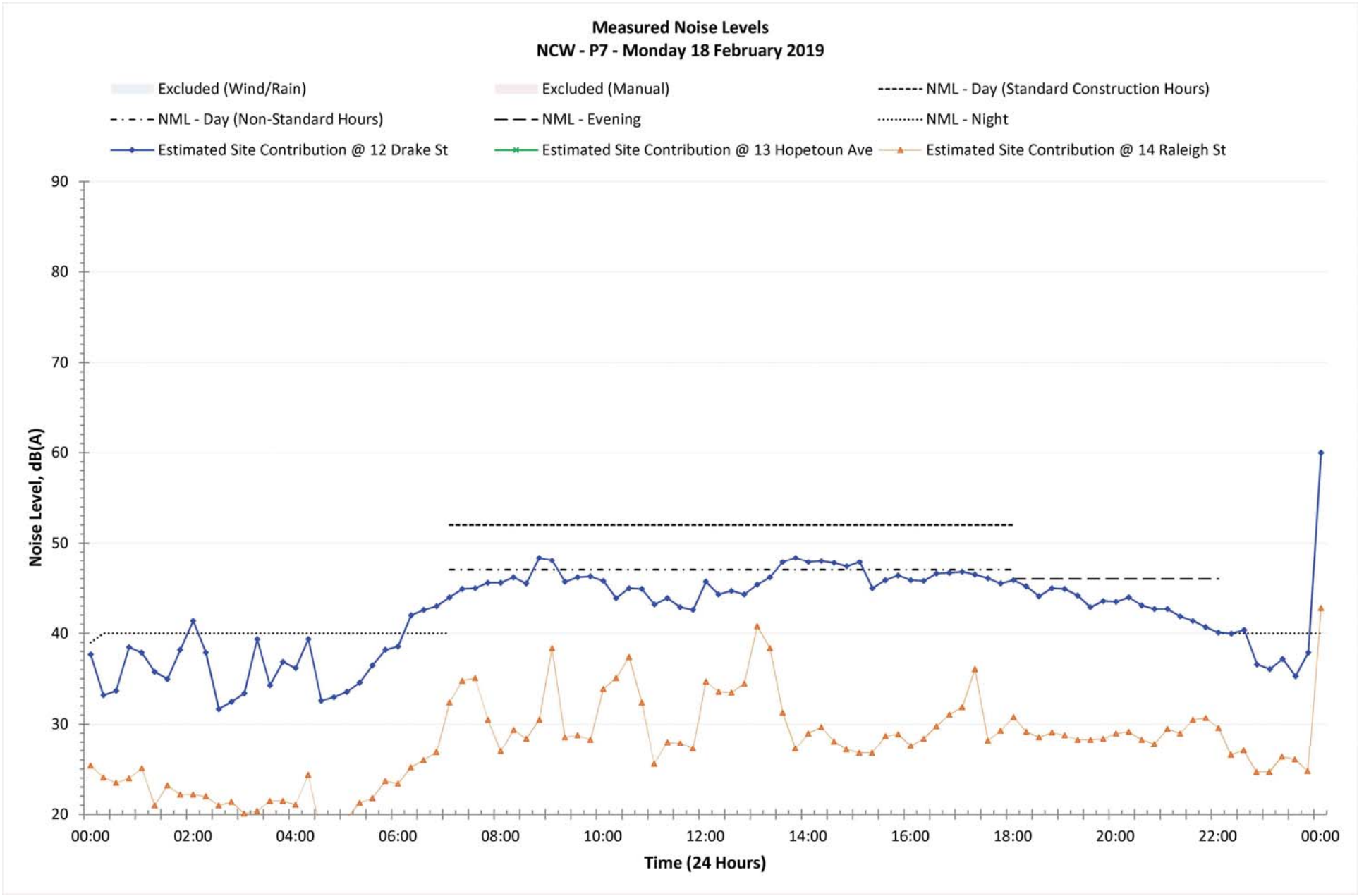

Measured Noise Levels
NCW - P7 - Monday 11 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

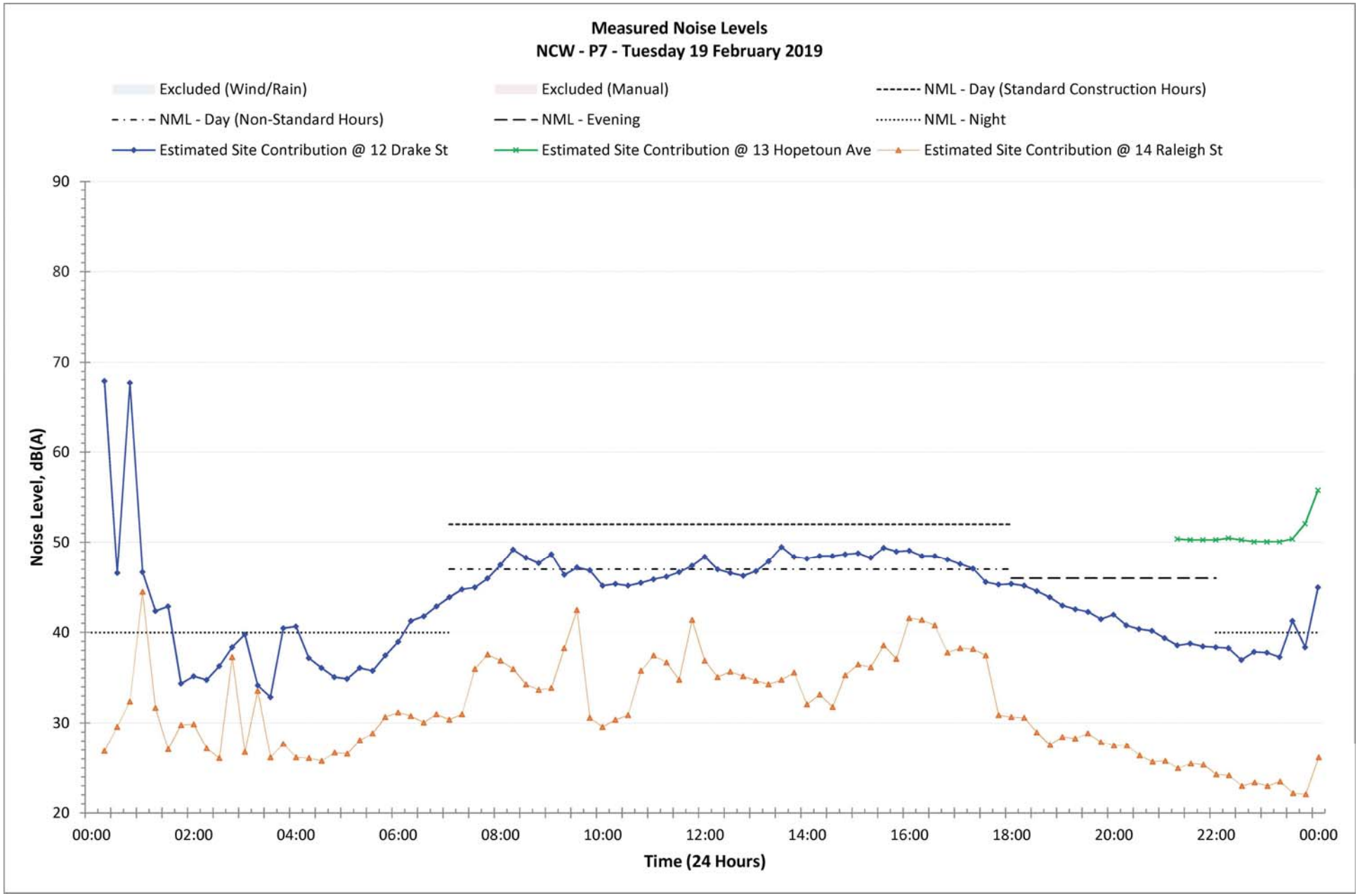

Measured Noise Levels
NCW - P7 - Tuesday 12 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

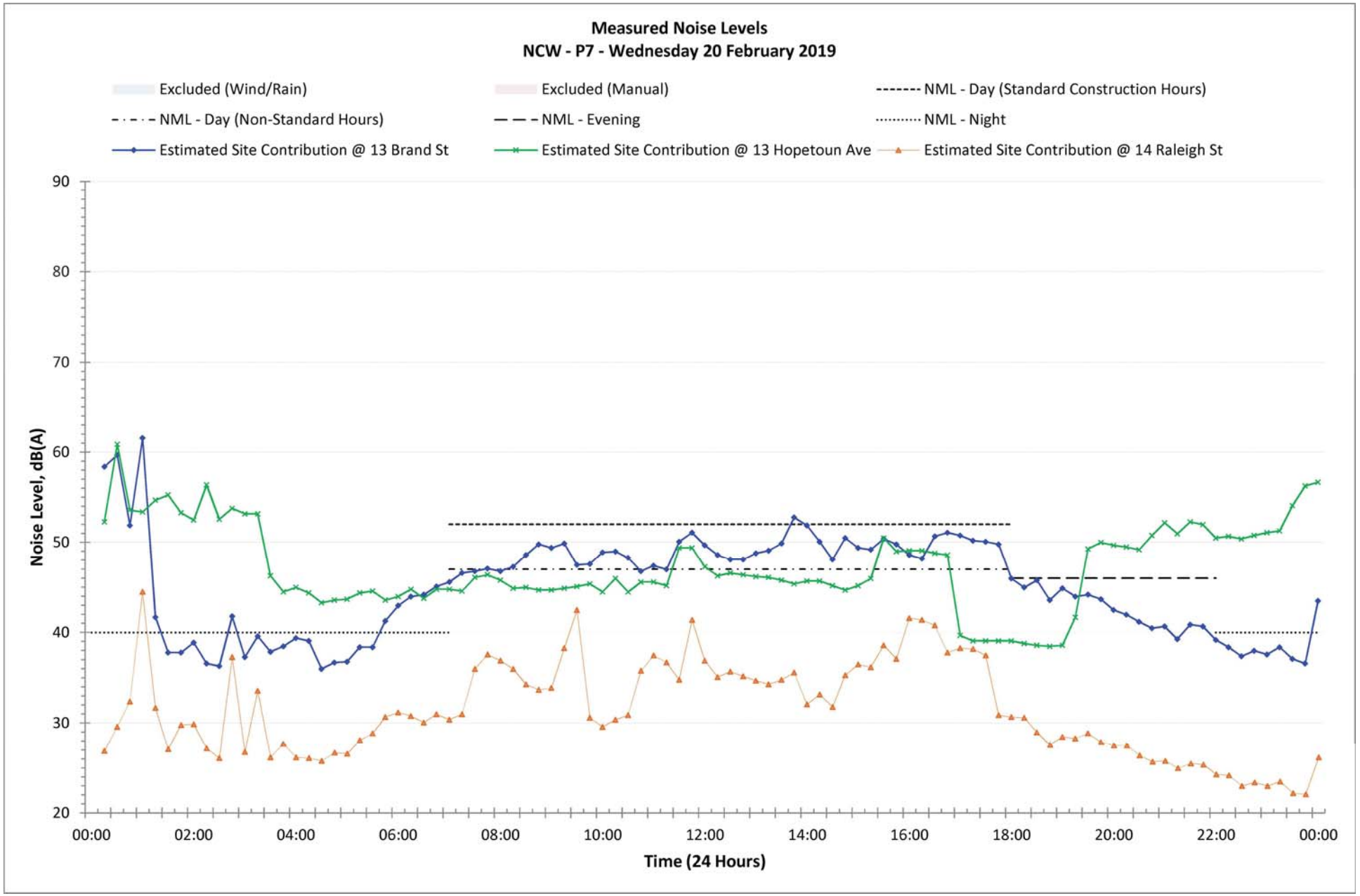

Measured Noise Levels
NCW - P7 - Wednesday 13 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 13 Brand St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

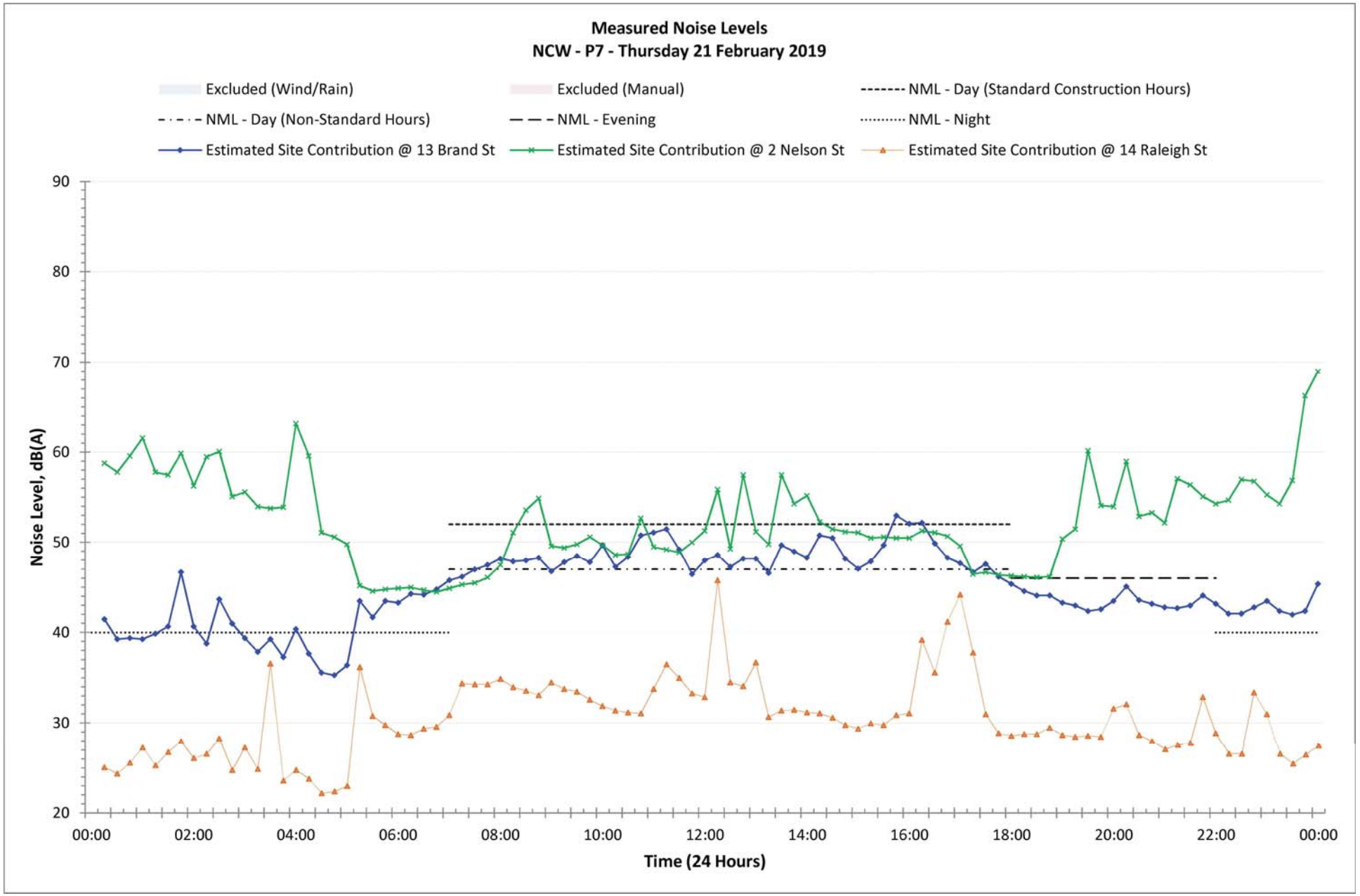

Measured Noise Levels
NCW - P7 - Thursday 14 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 13 Brand St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

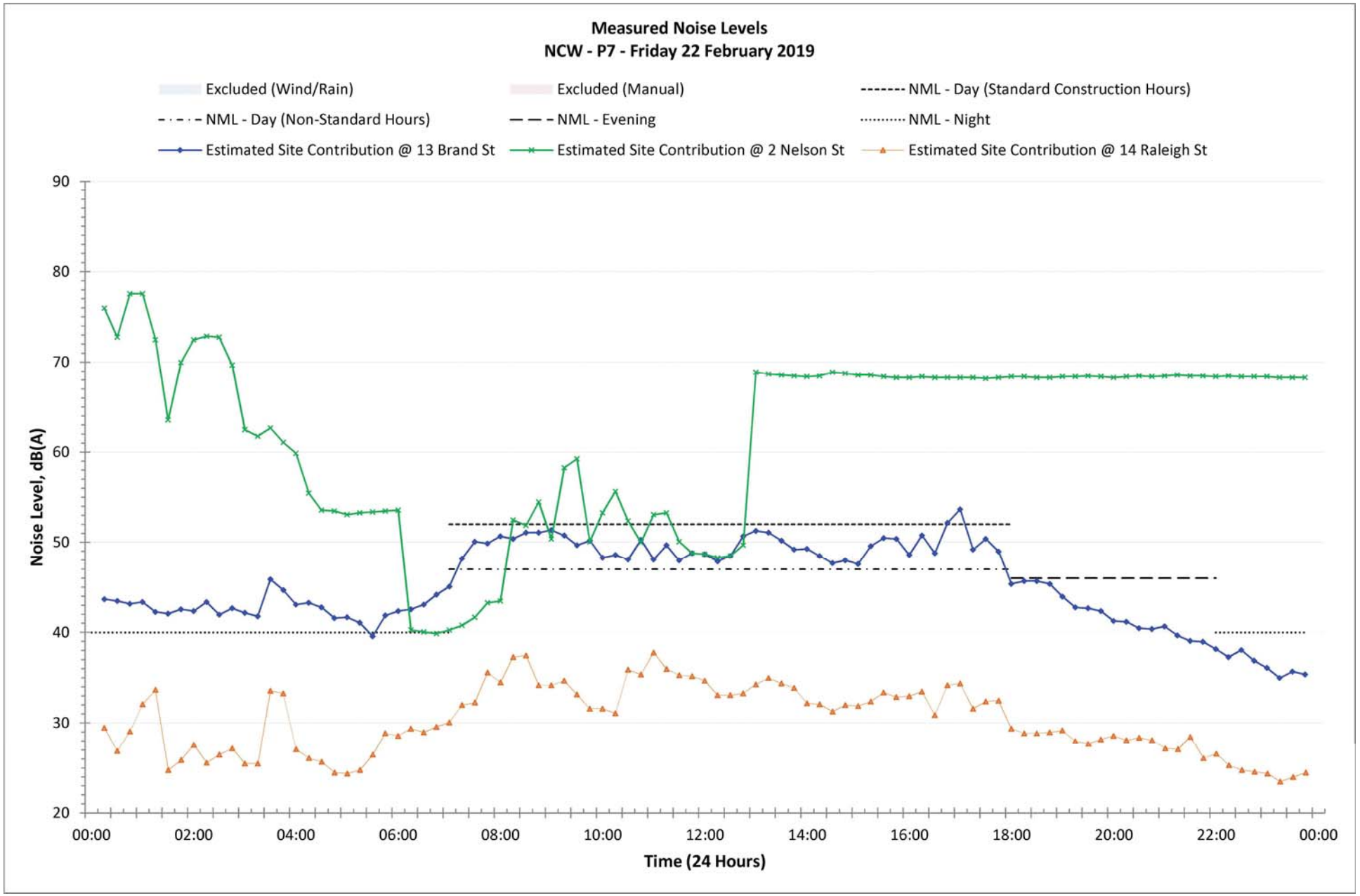

Measured Noise Levels
NCW - P7 - Friday 15 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 13 Brand St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

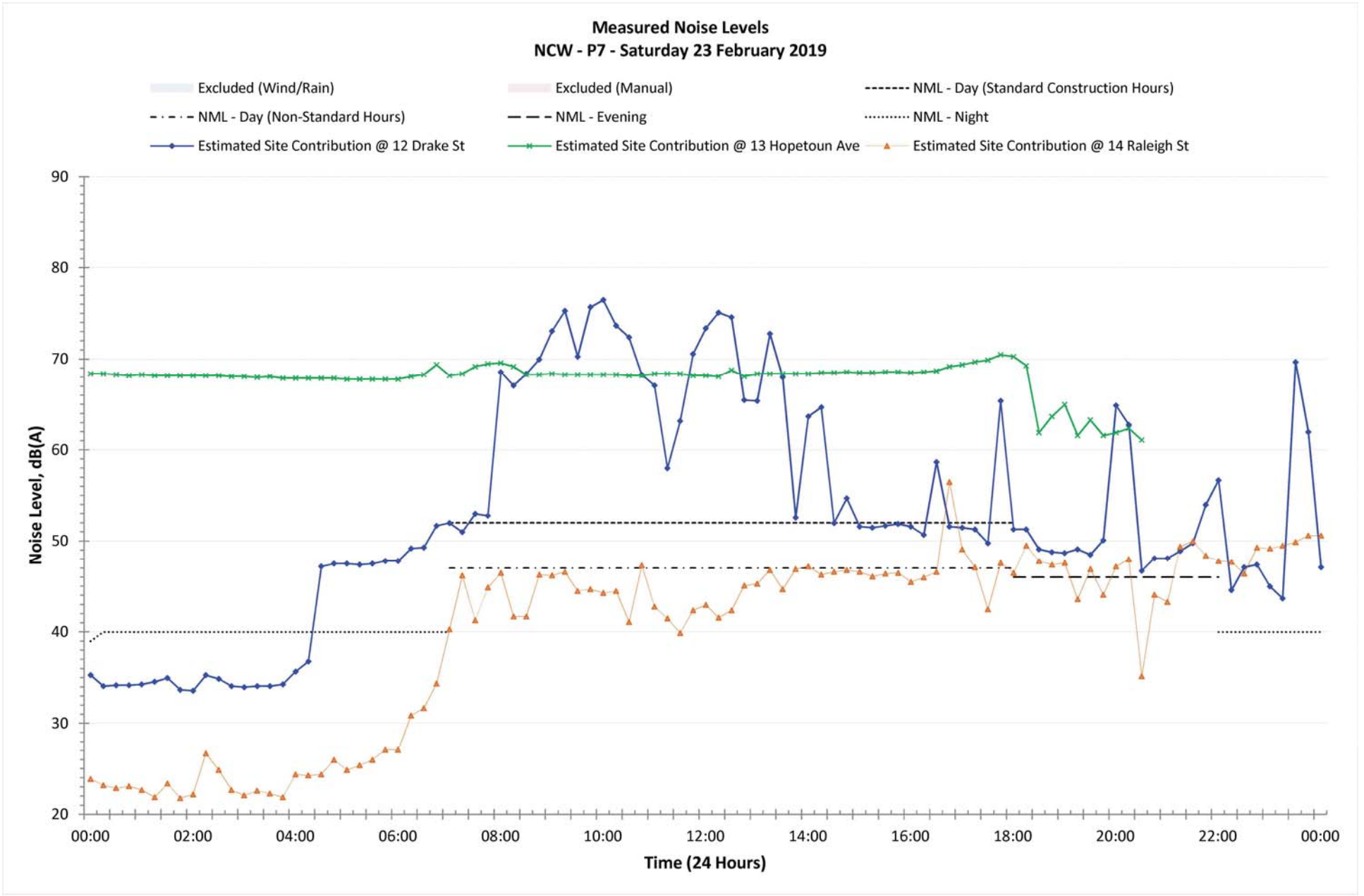

Measured Noise Levels
NCW - P7 - Monday 18 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

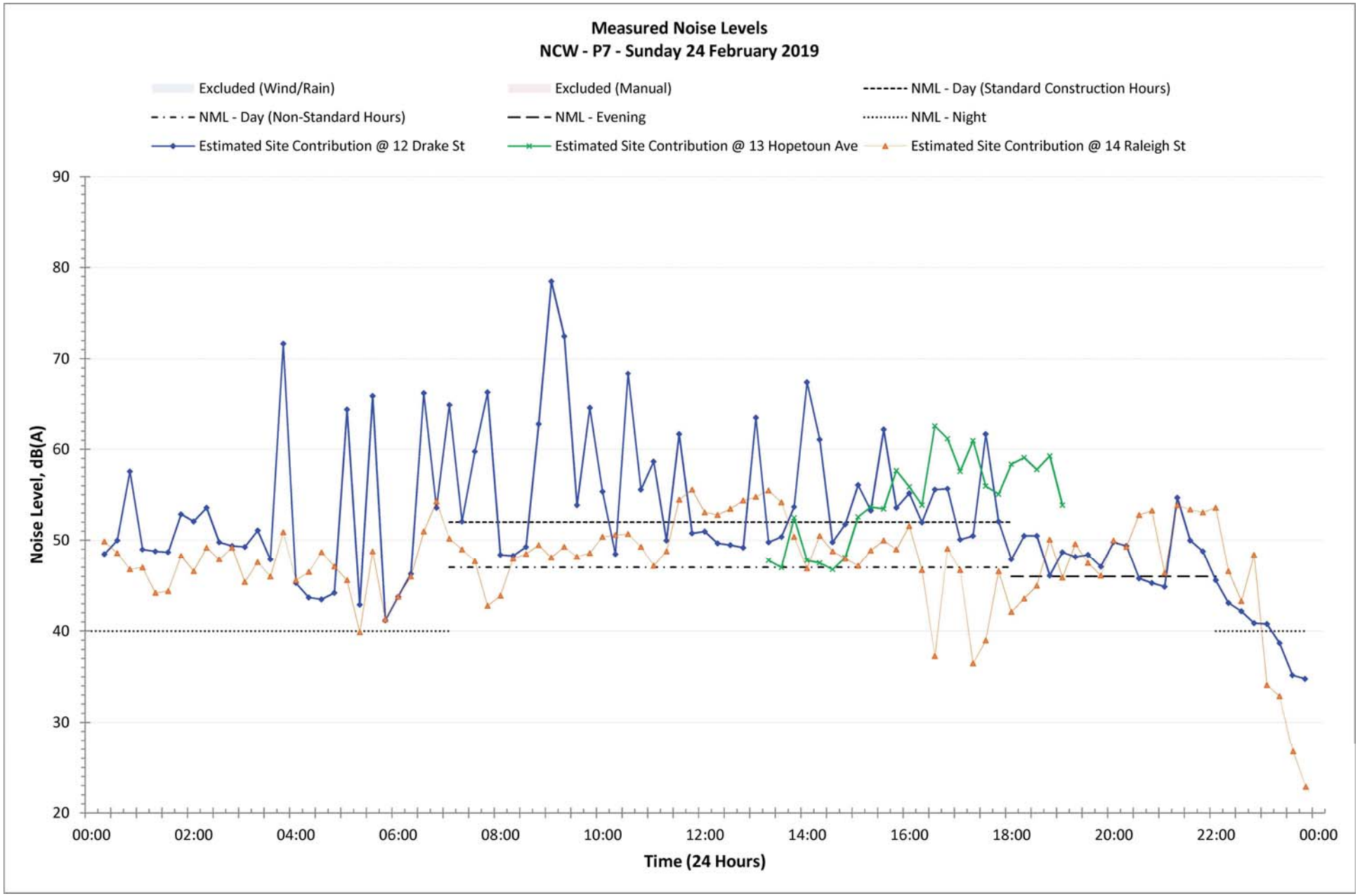

Measured Noise Levels
NCW - P7 - Tuesday 19 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Wednesday 20 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 13 Brand St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

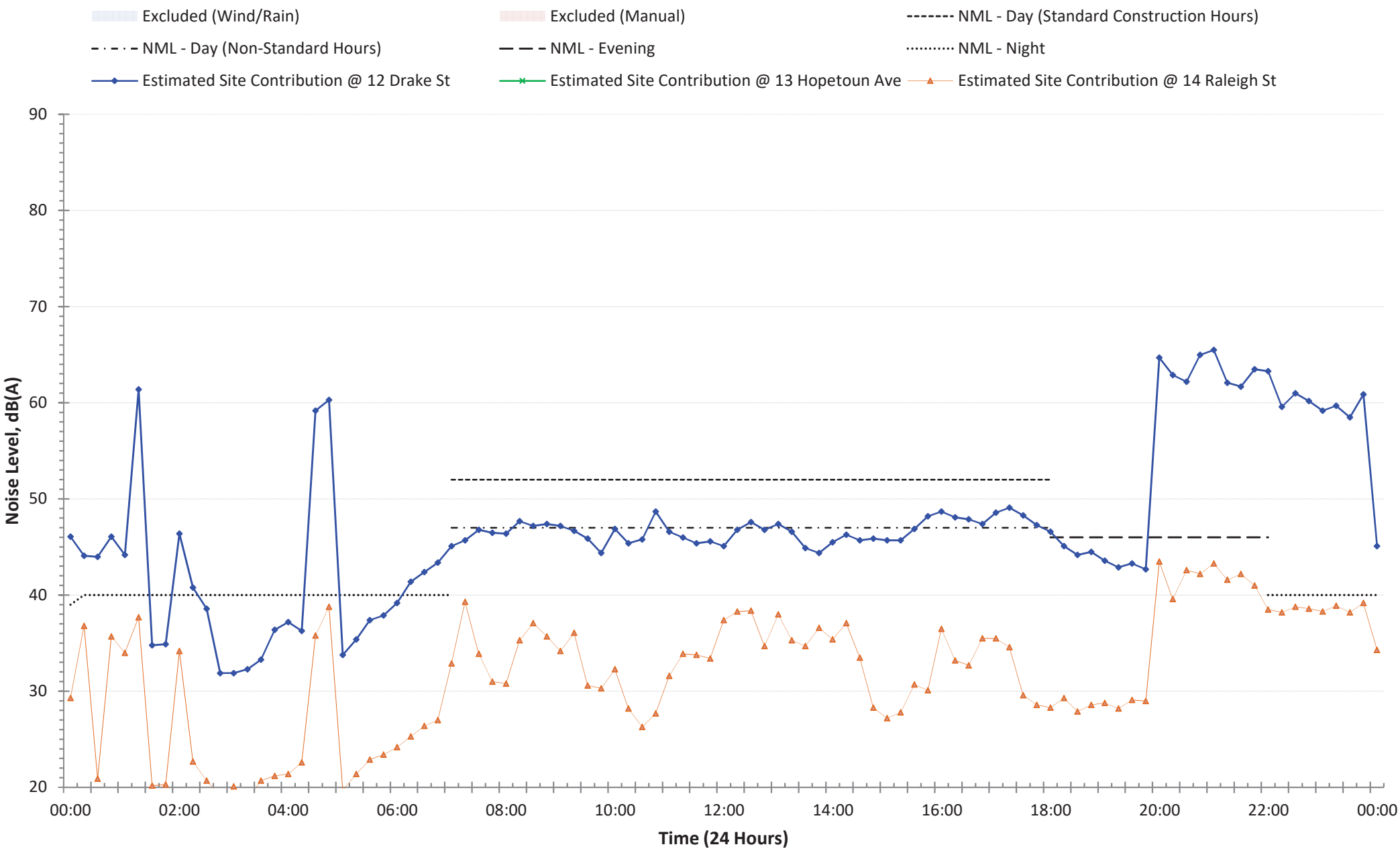

Measured Noise Levels
NCW - P7 - Thursday 21 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 13 Brand St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

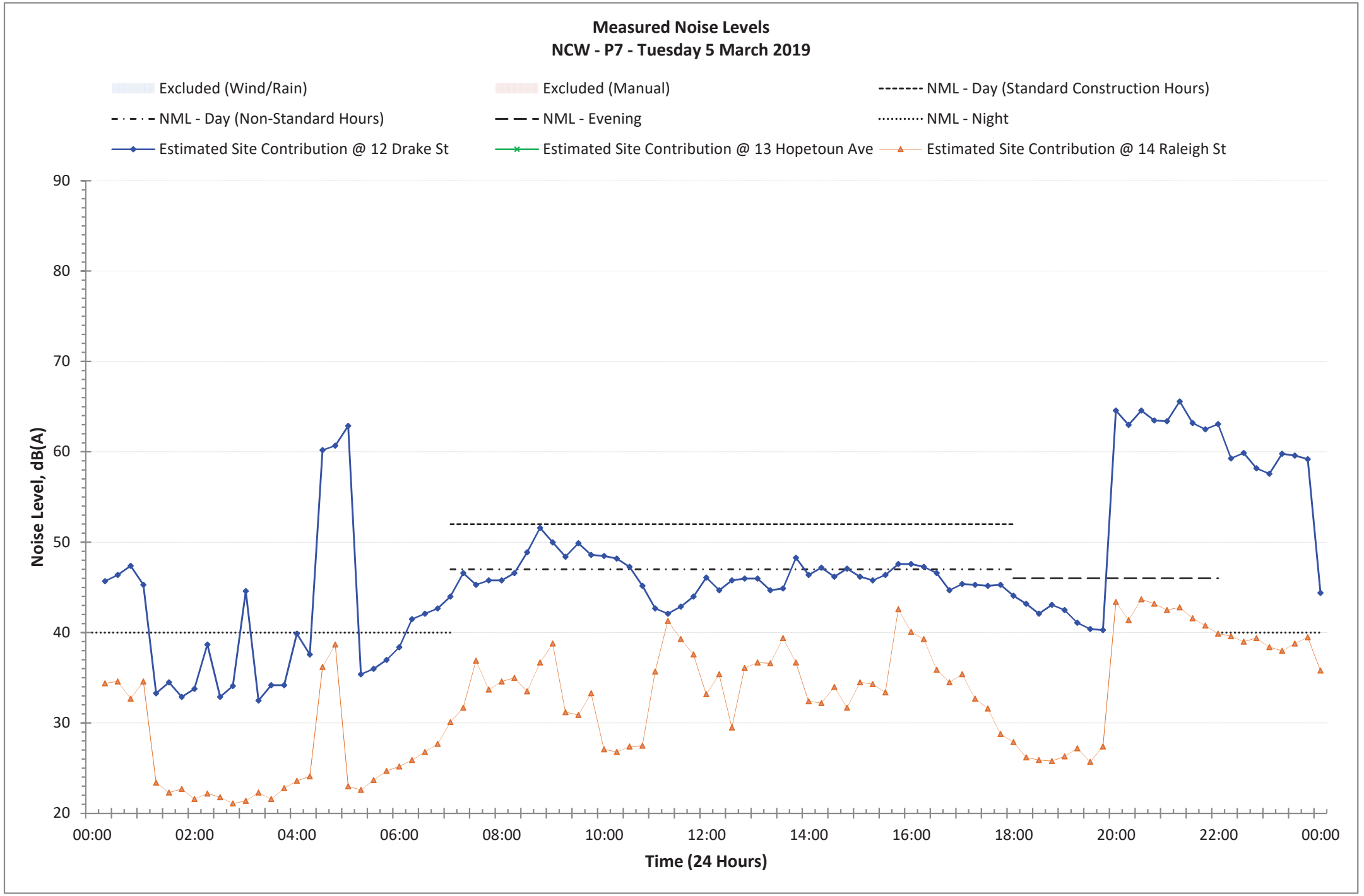

Measured Noise Levels
NCW - P7 - Friday 22 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 13 Brand St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

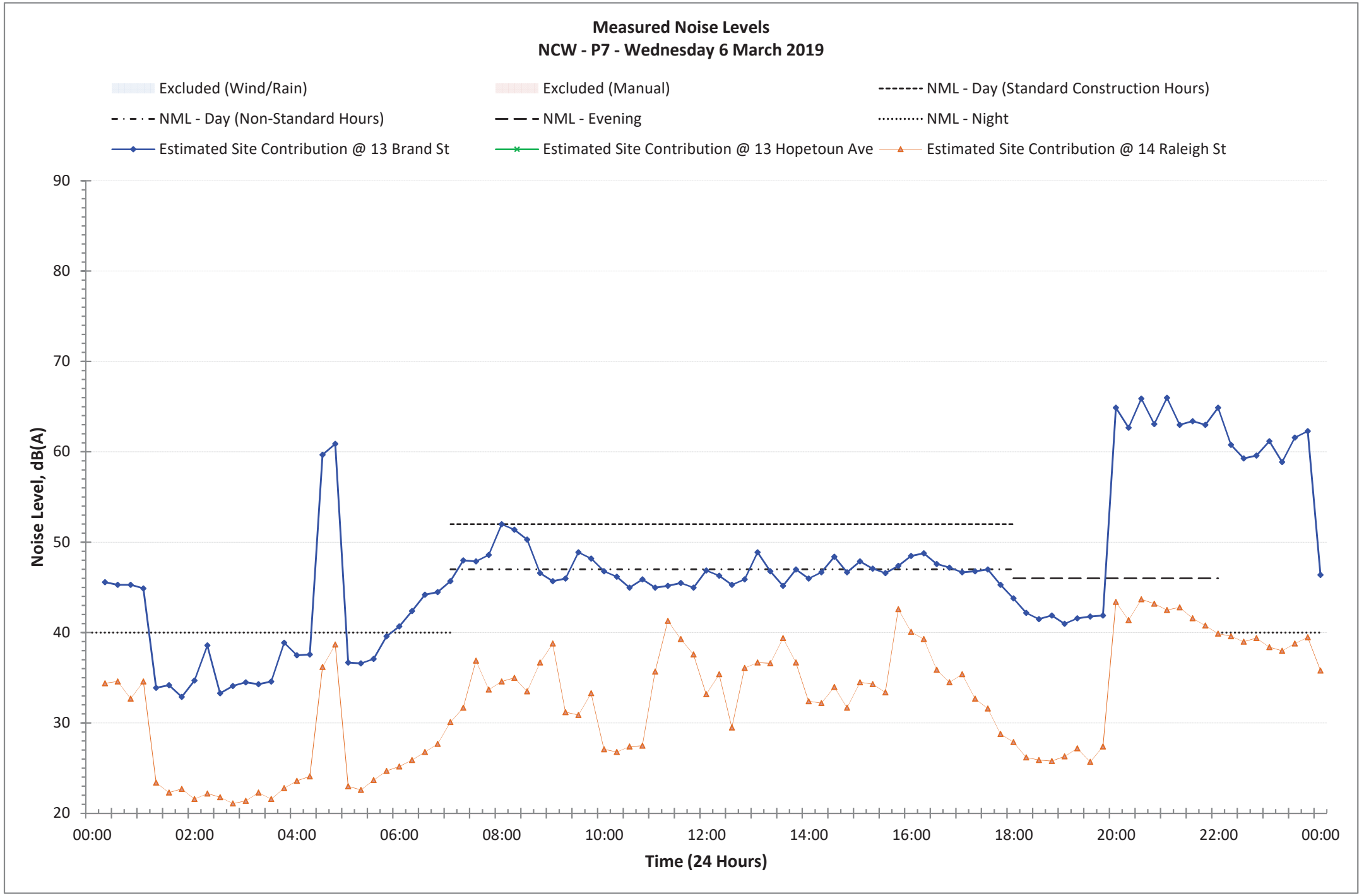

Measured Noise Levels
NCW - P7 - Saturday 23 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

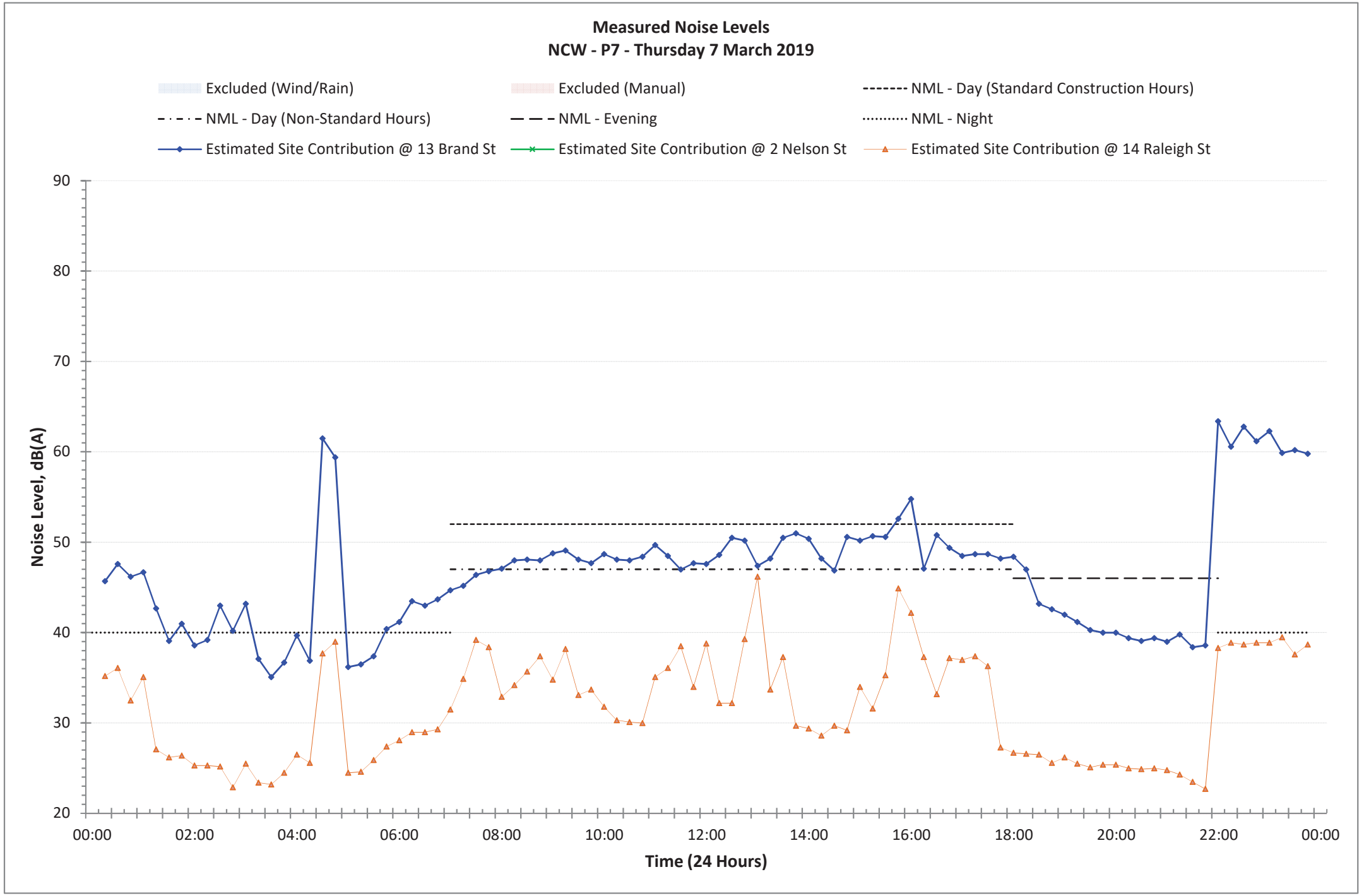

Measured Noise Levels
NCW - P7 - Sunday 24 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

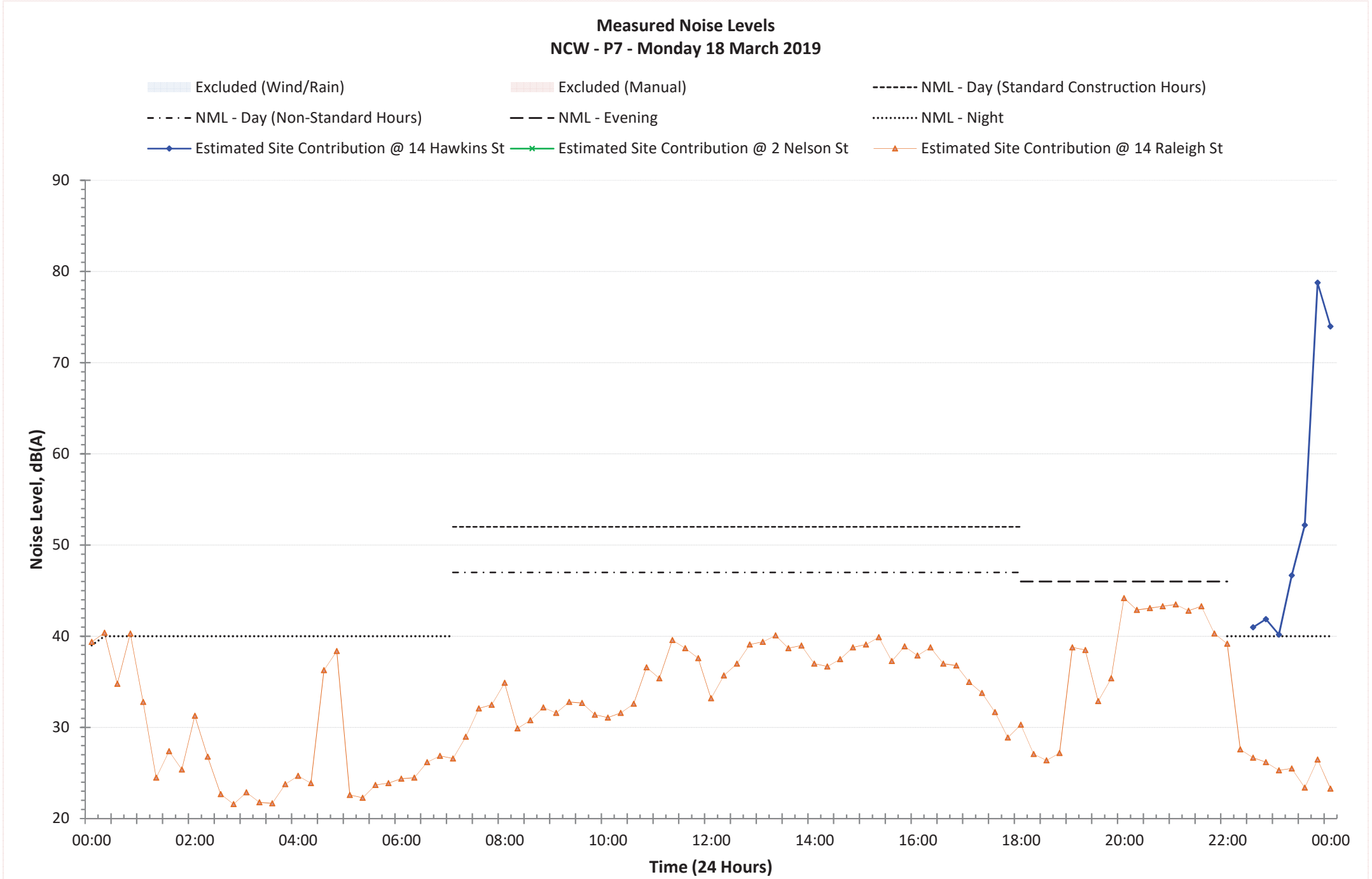
Measured Noise Levels
NCW - P7 - Monday 4 March 2019

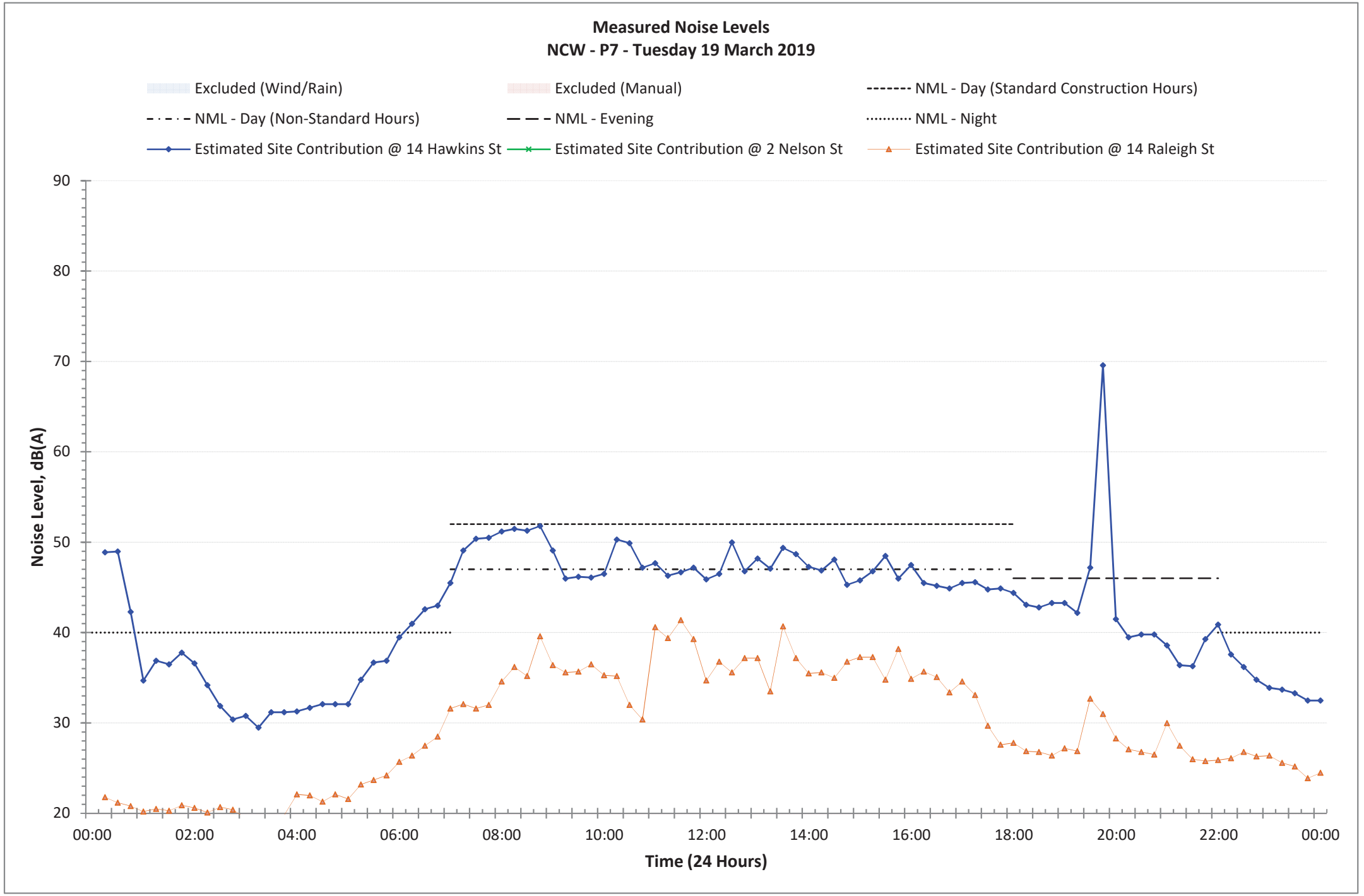


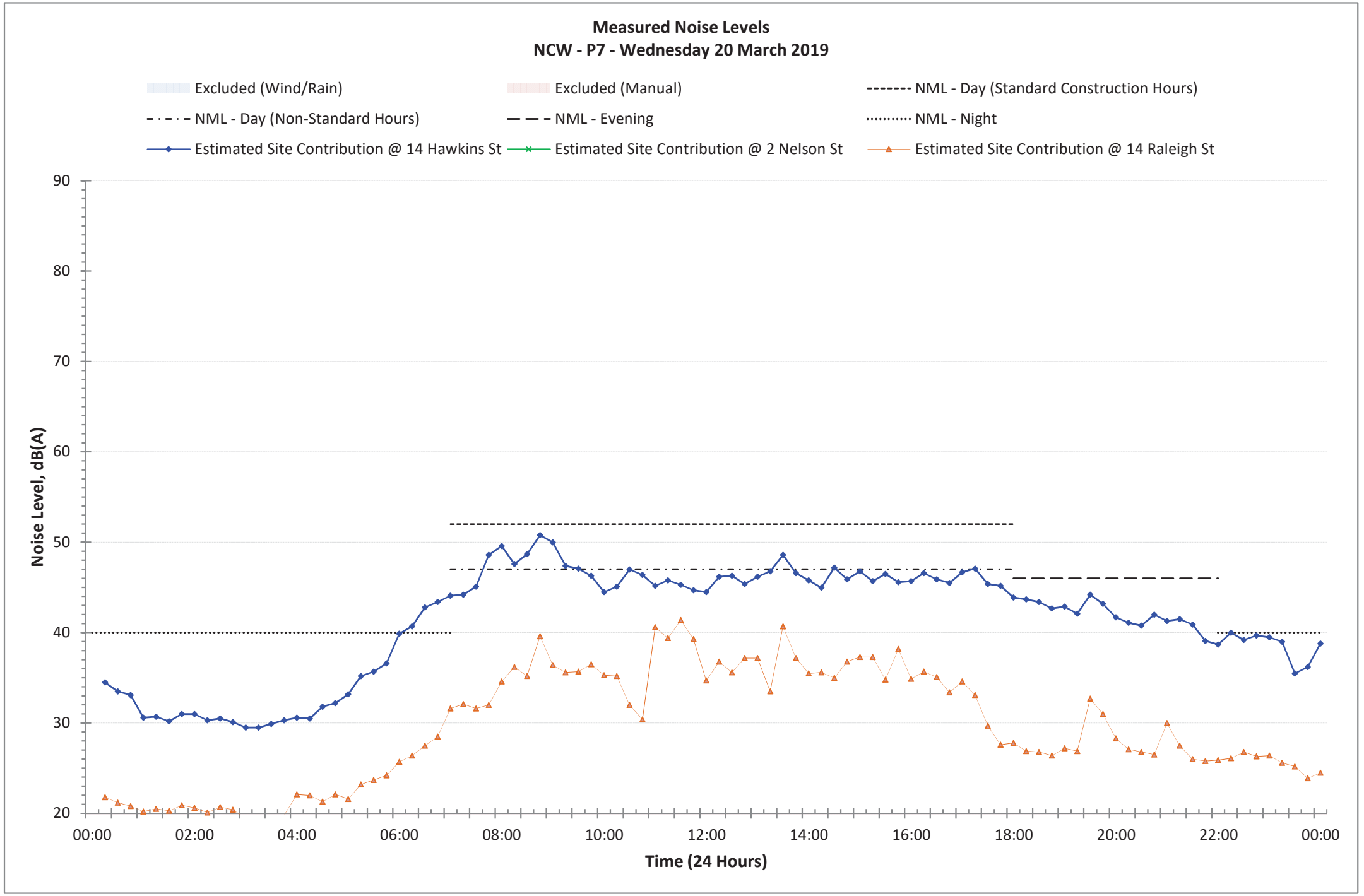

Measured Noise Levels
NCW - P7 - Tuesday 5 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 12 Drake St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

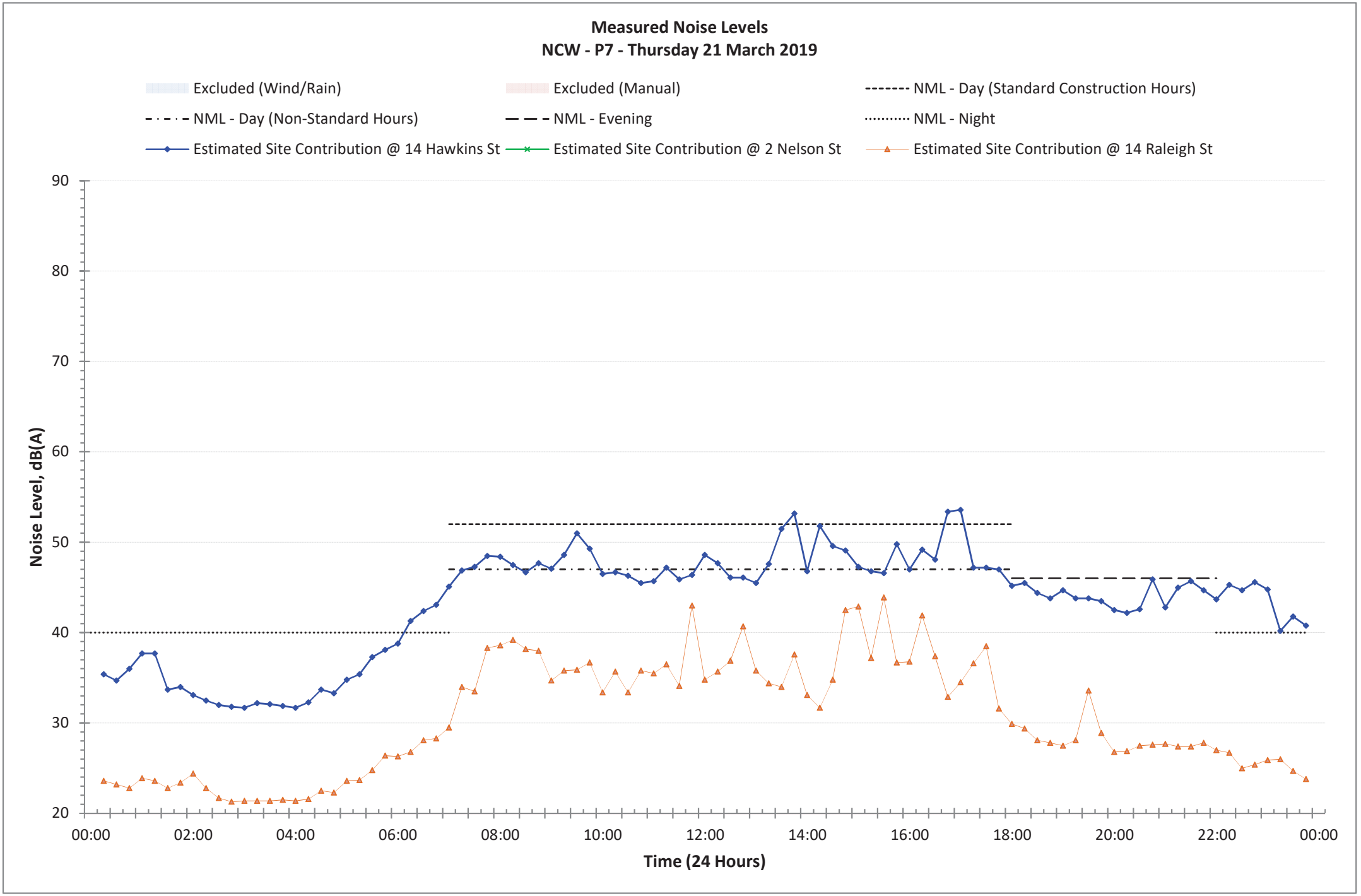

Measured Noise Levels
NCW - P7 - Wednesday 6 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 13 Brand St
Estimated Site Contribution @ 13 Hopetoun Ave
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

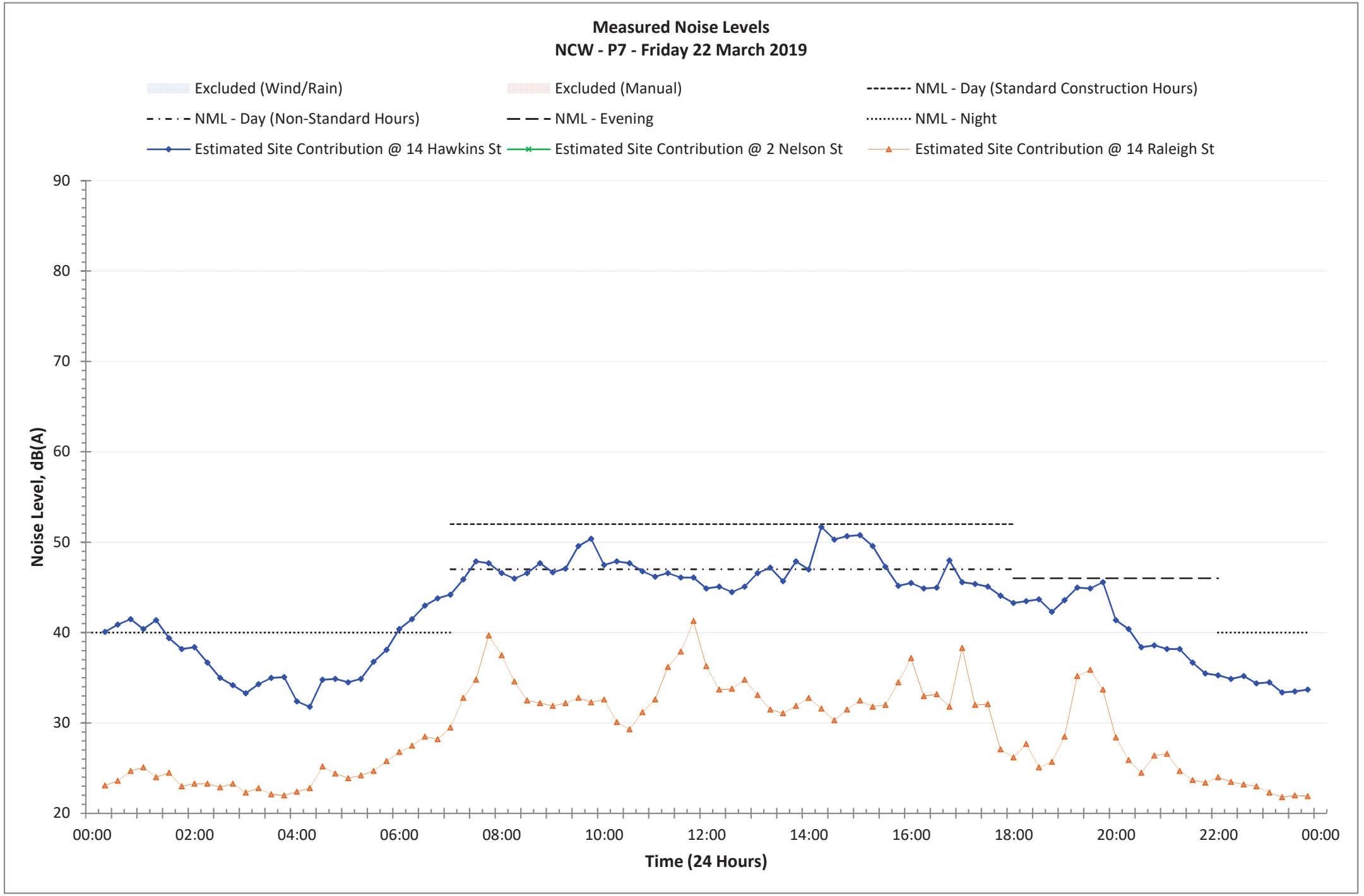

Measured Noise Levels
NCW - P7 - Thursday 7 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 13 Brand St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Monday 18 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 14 Hawkins St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

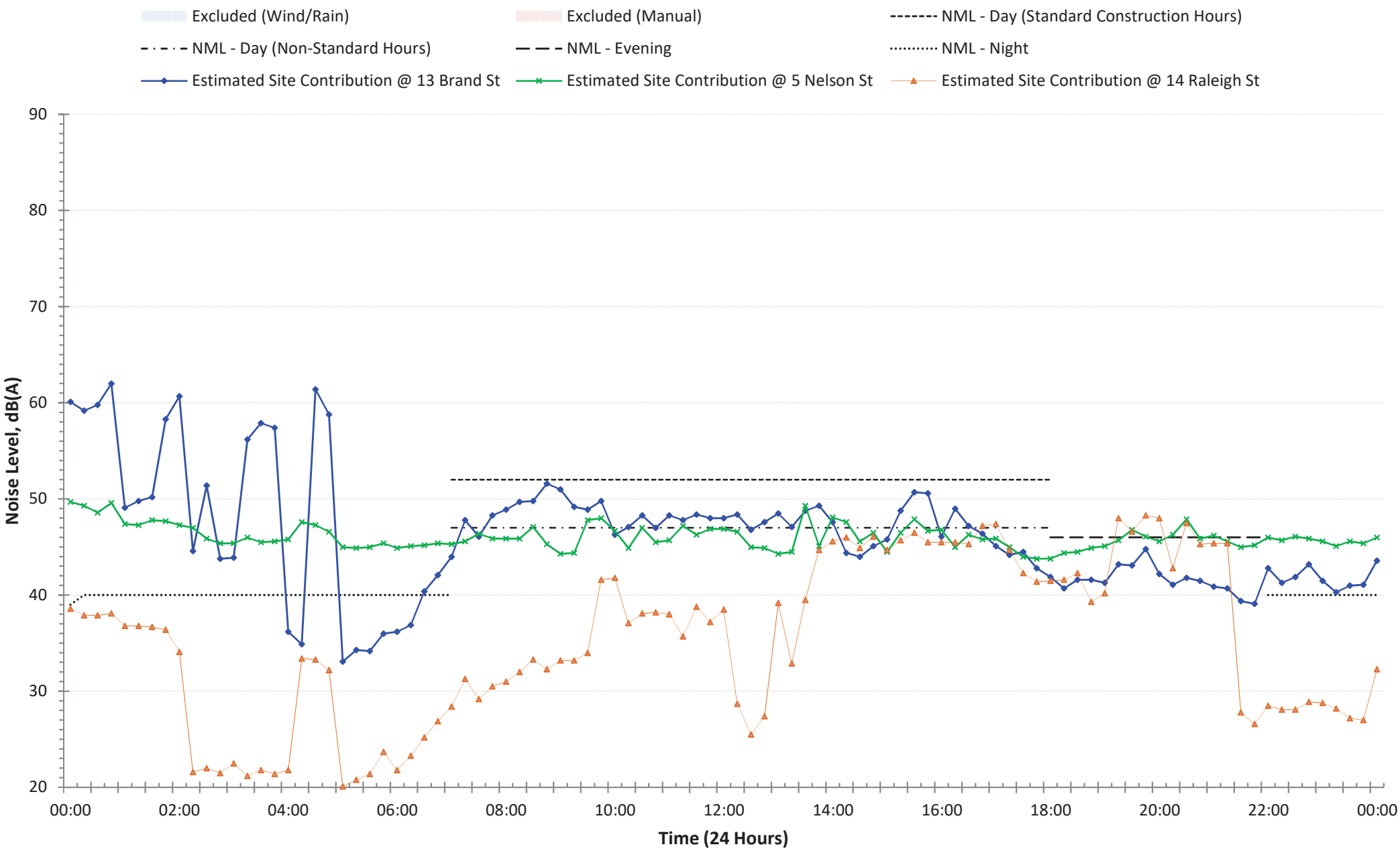

Measured Noise Levels
NCW - P7 - Tuesday 19 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 14 Hawkins St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Wednesday 20 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 14 Hawkins St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

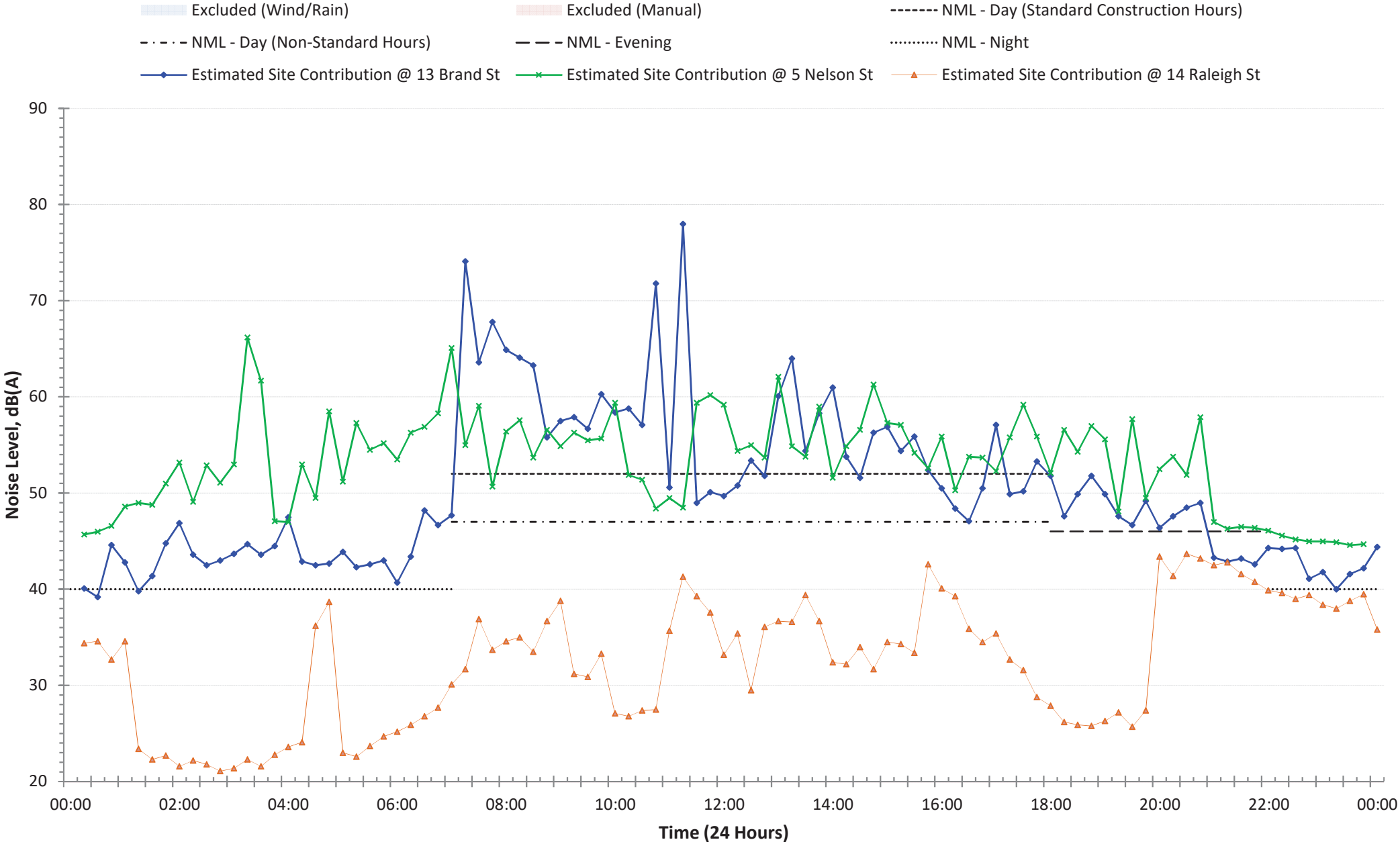

Measured Noise Levels
NCW - P7 - Thursday 21 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 14 Hawkins St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Friday 22 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ 14 Hawkins St
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ 14 Raleigh St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

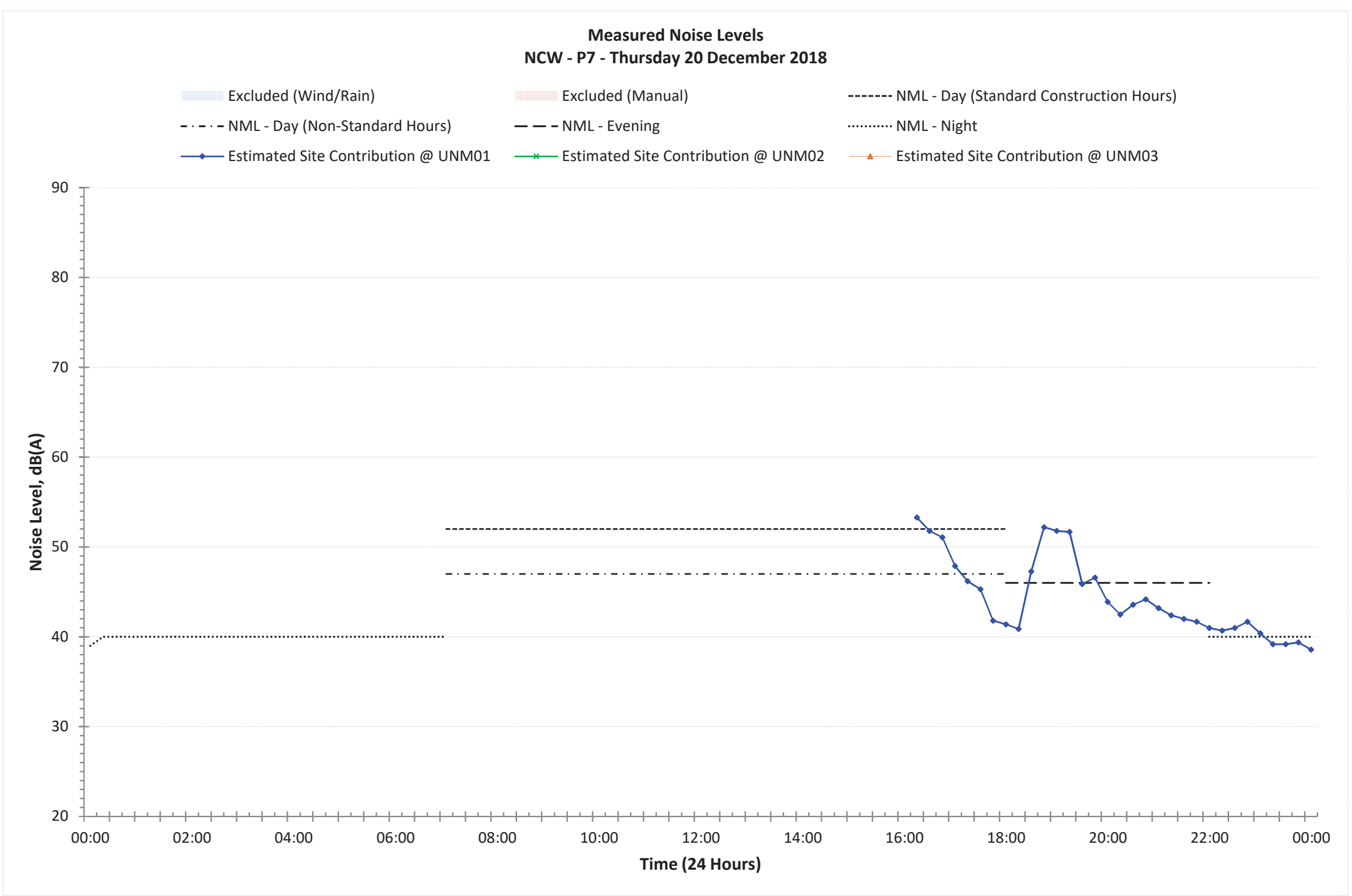
Measured Noise Levels
NCW - P7 - Saturday 23 March 2019

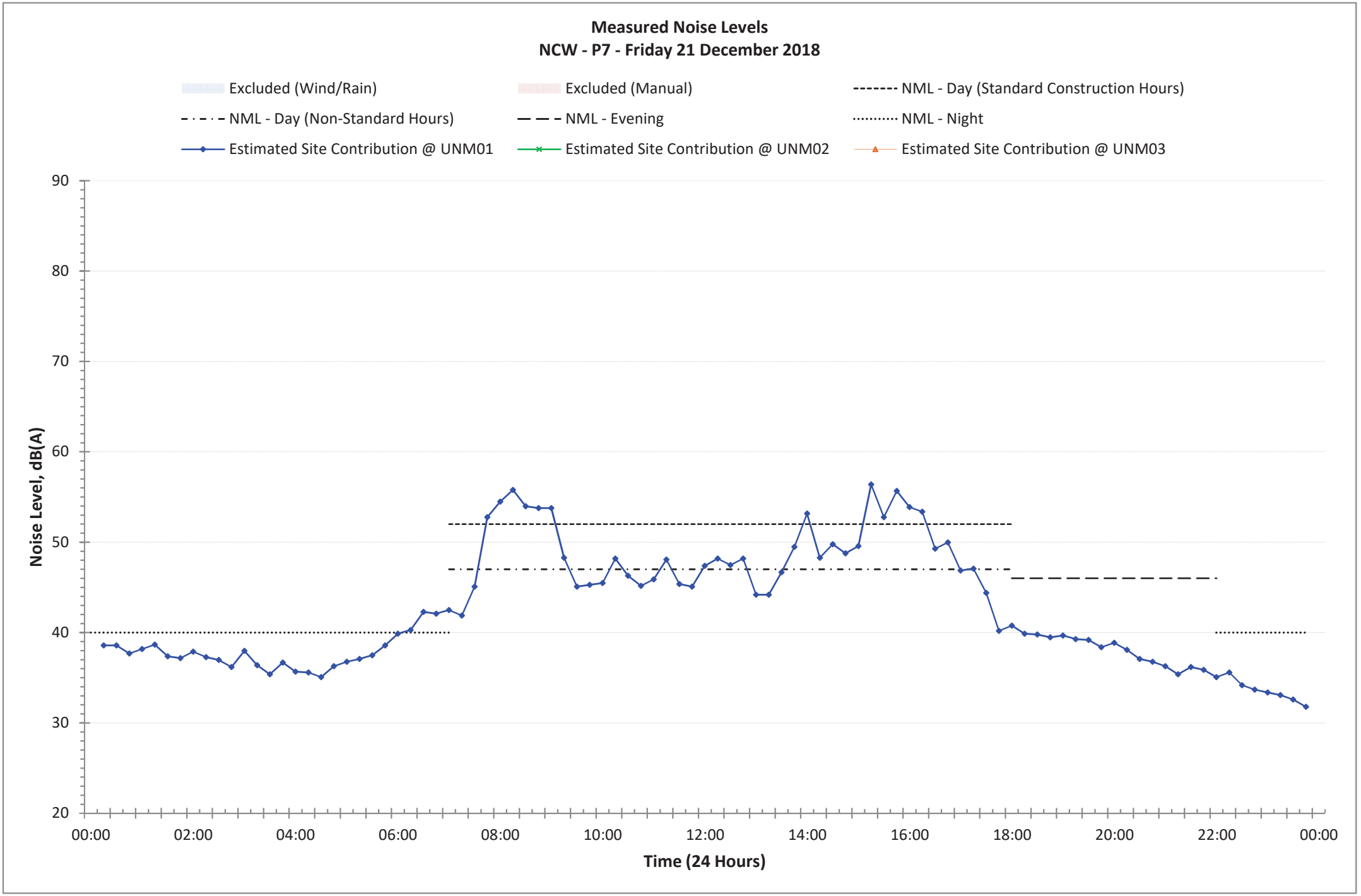


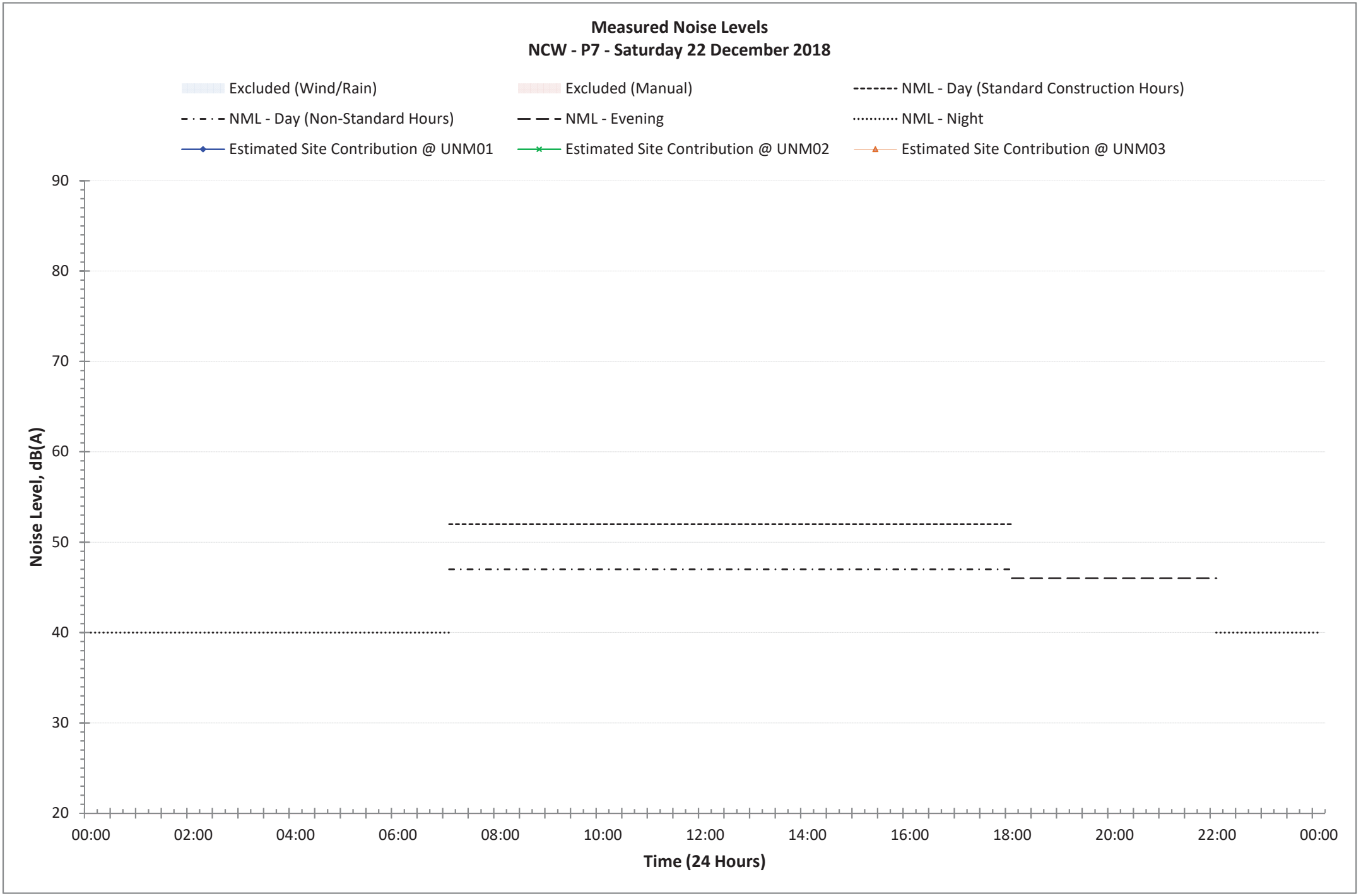
Measured Noise Levels
NCW - P7 - Sunday 24 March 2019

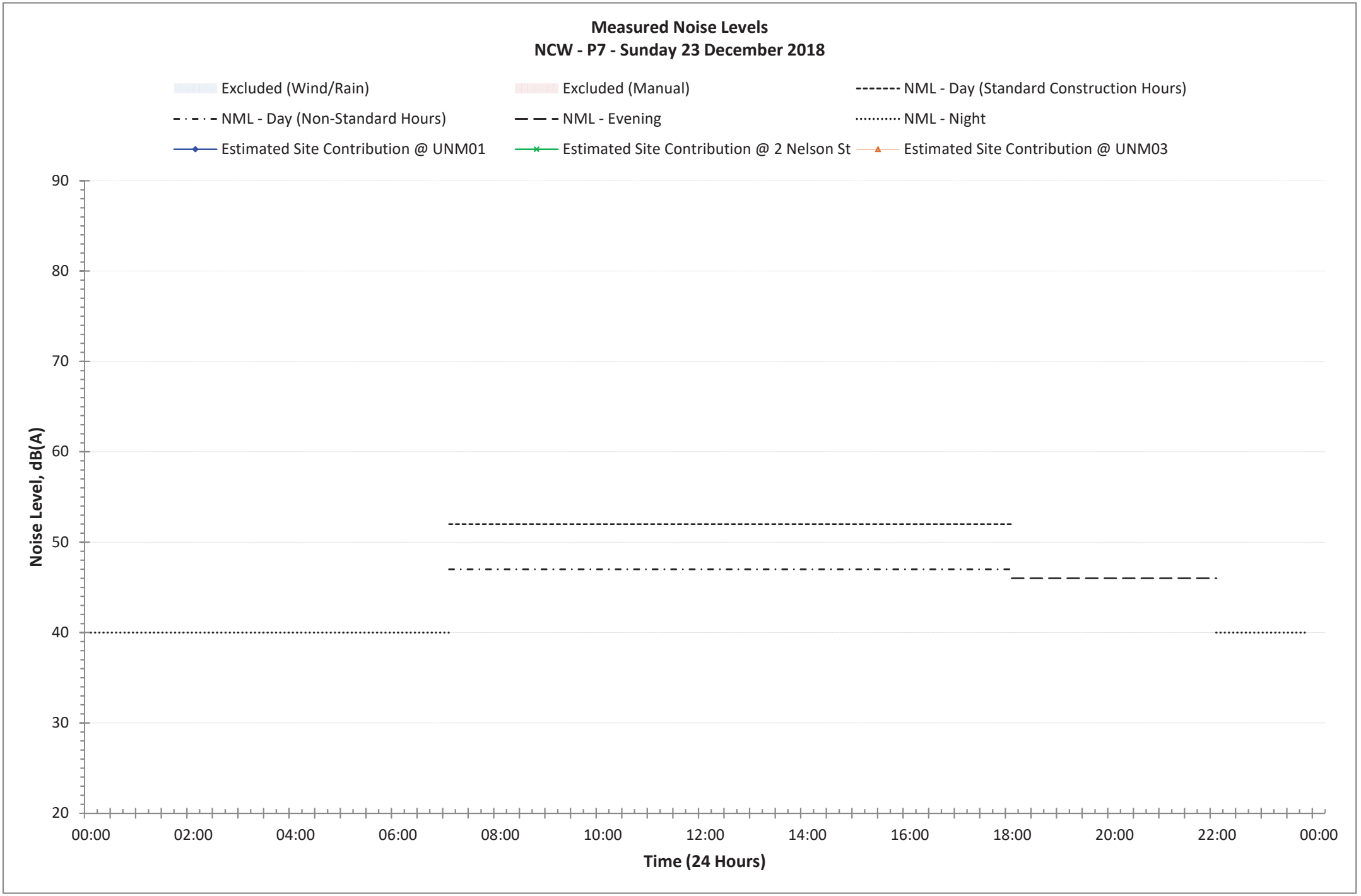


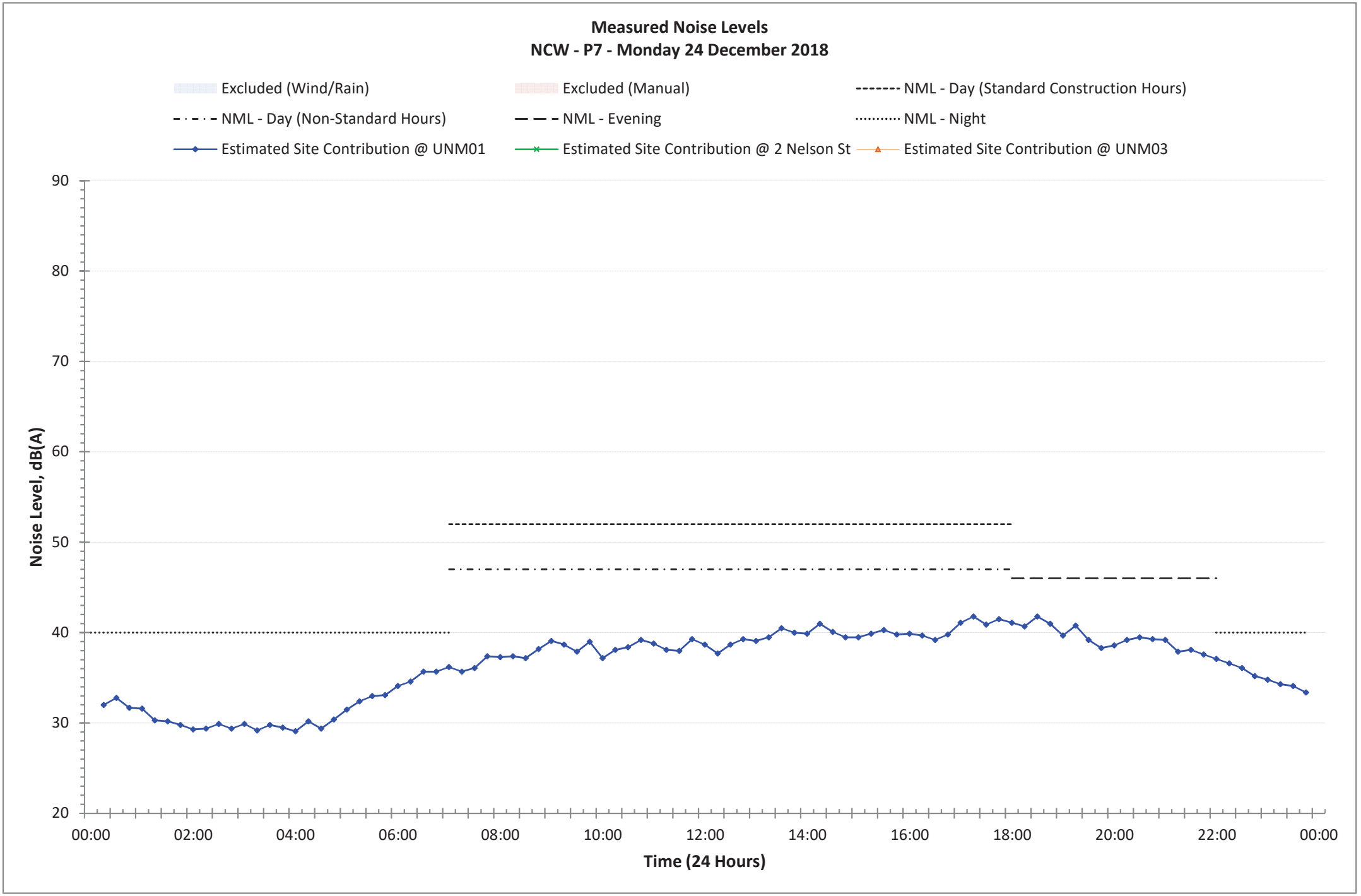
Appendix E – Unreported Unattended Noise Monitoring Charts – November 2018 to April 2019

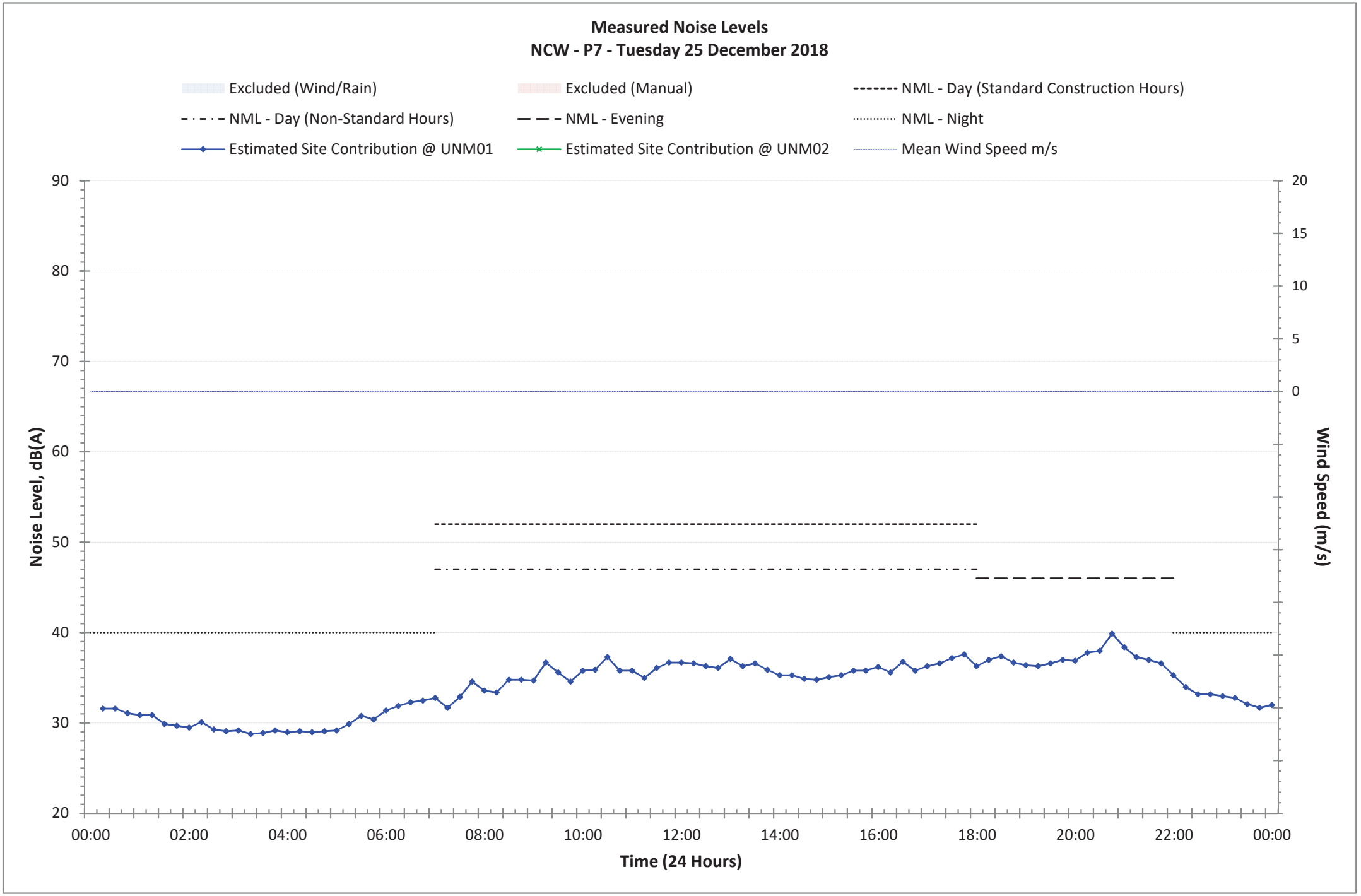

Measured Noise Levels
NCW - P7 - Thursday 20 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

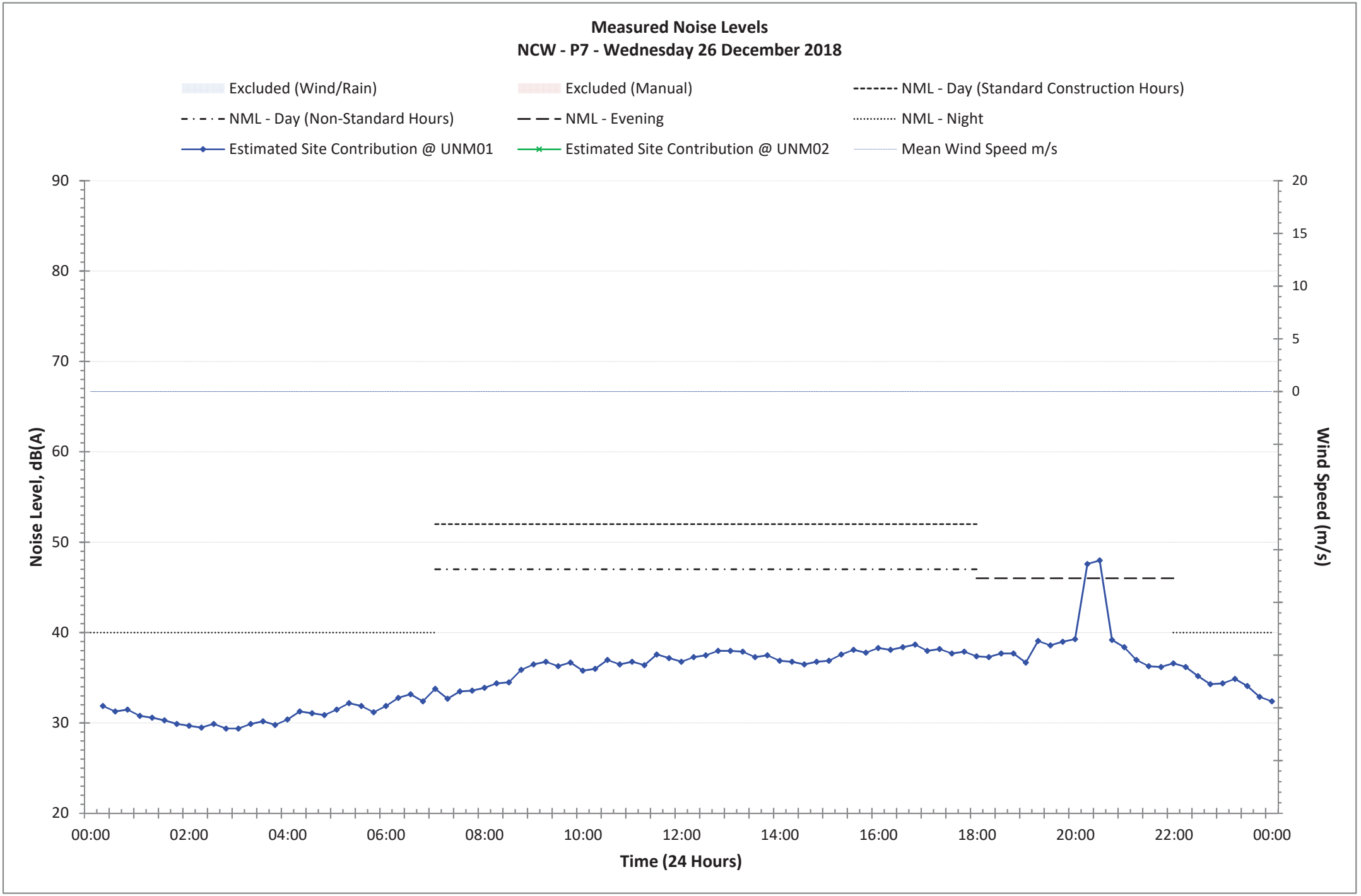

Measured Noise Levels
NCW - P7 - Friday 21 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

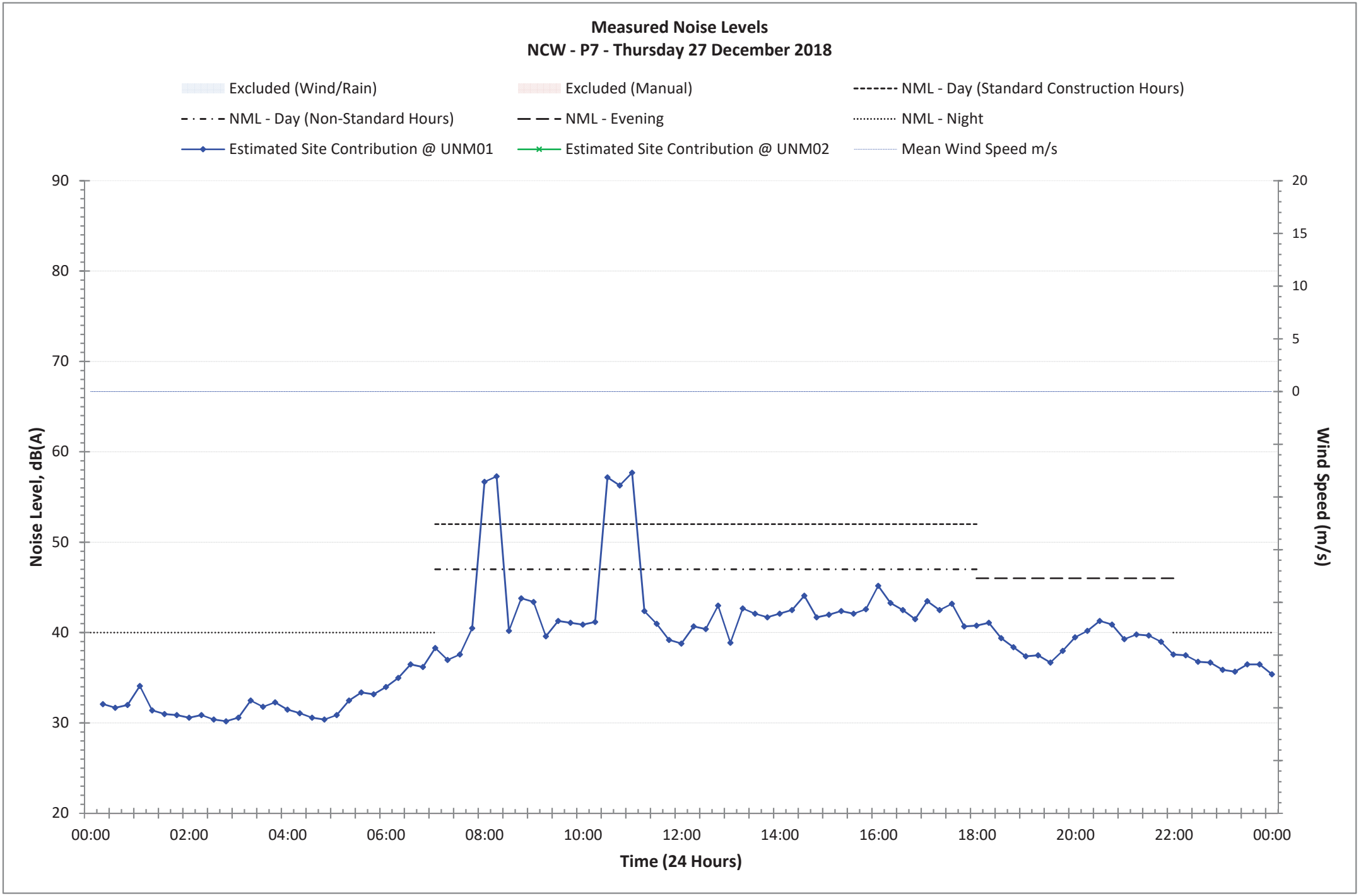

Measured Noise Levels
NCW - P7 - Saturday 22 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

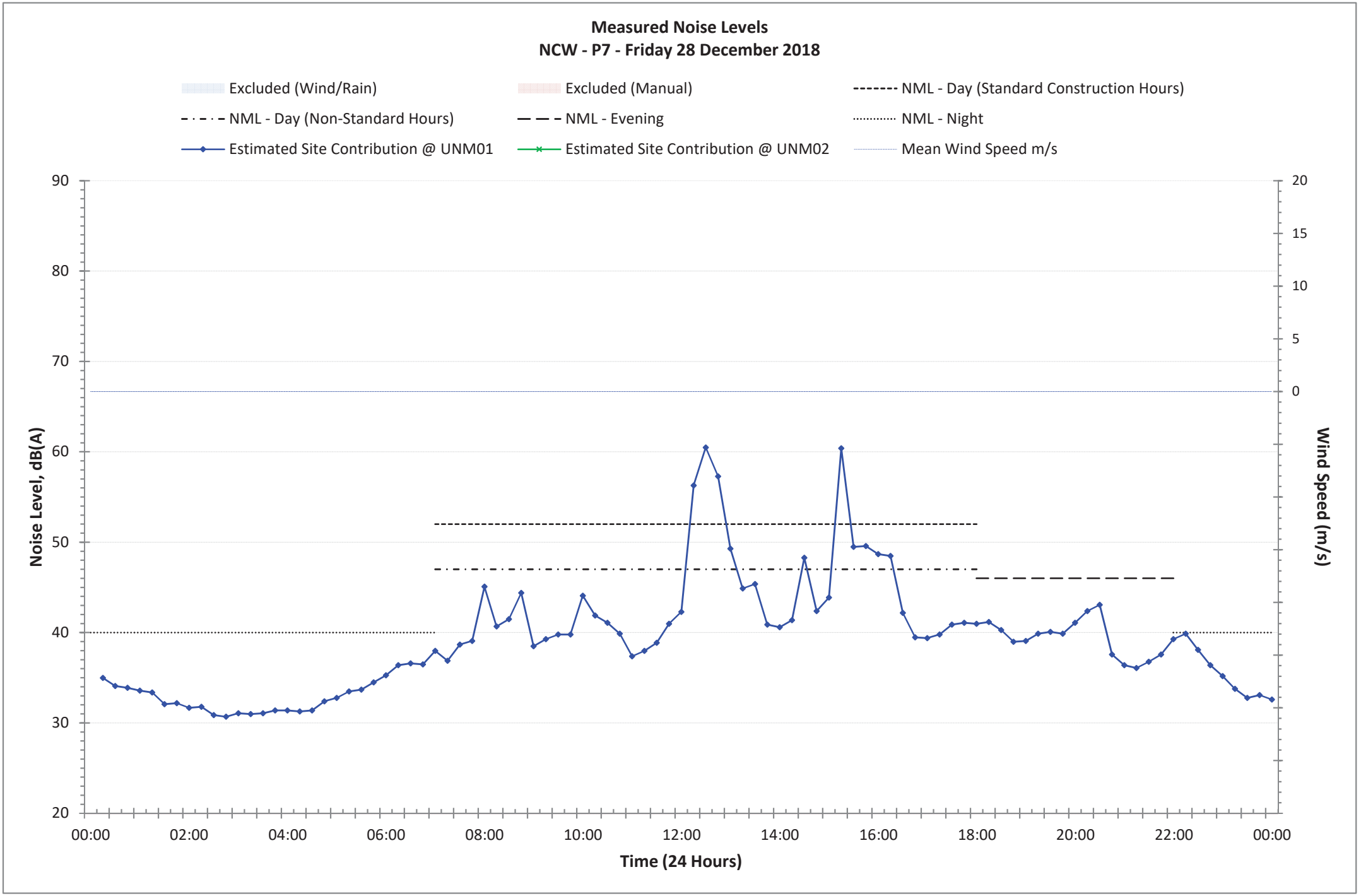

Measured Noise Levels
NCW - P7 - Sunday 23 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

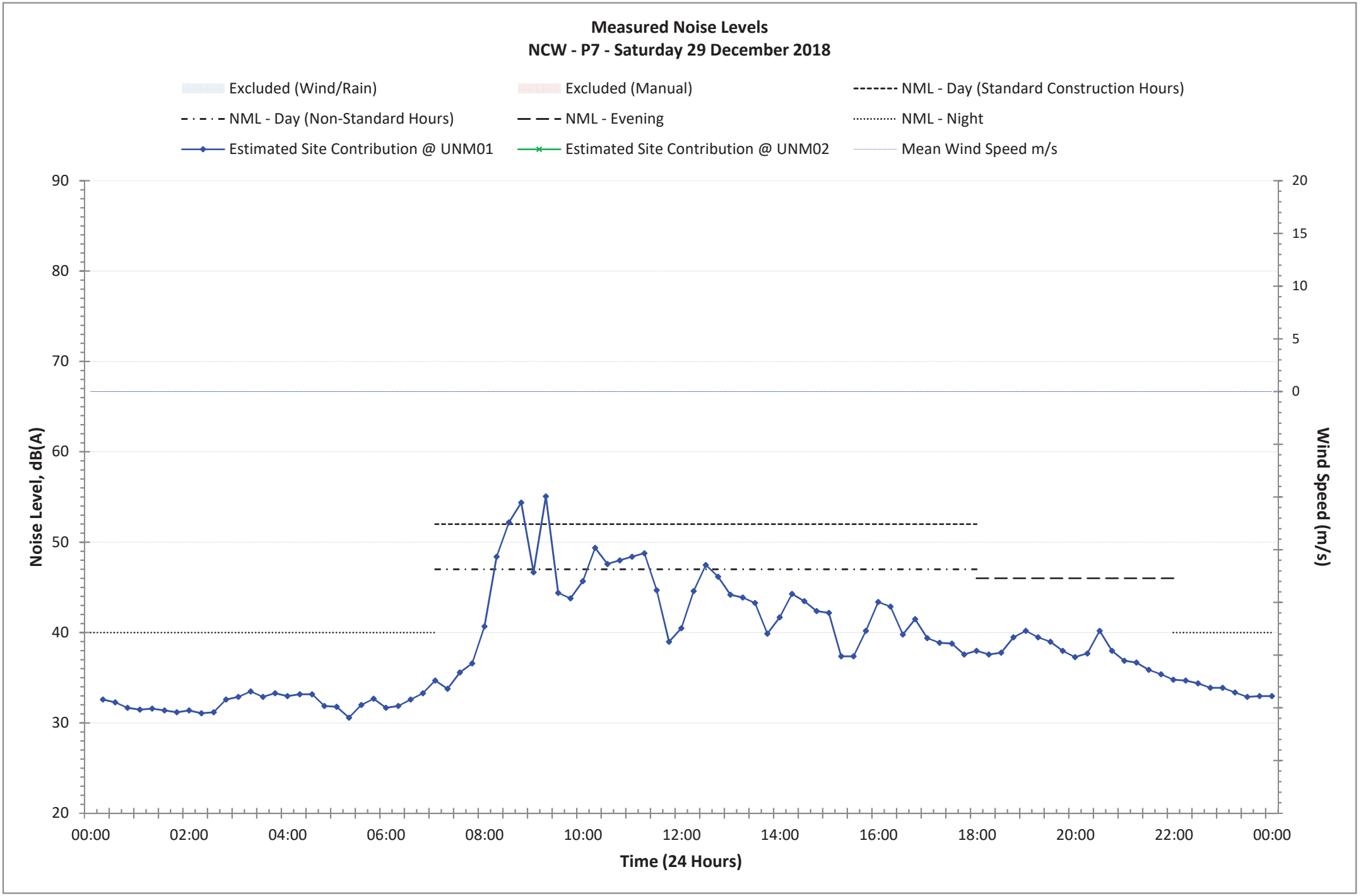

Measured Noise Levels
NCW - P7 - Monday 24 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

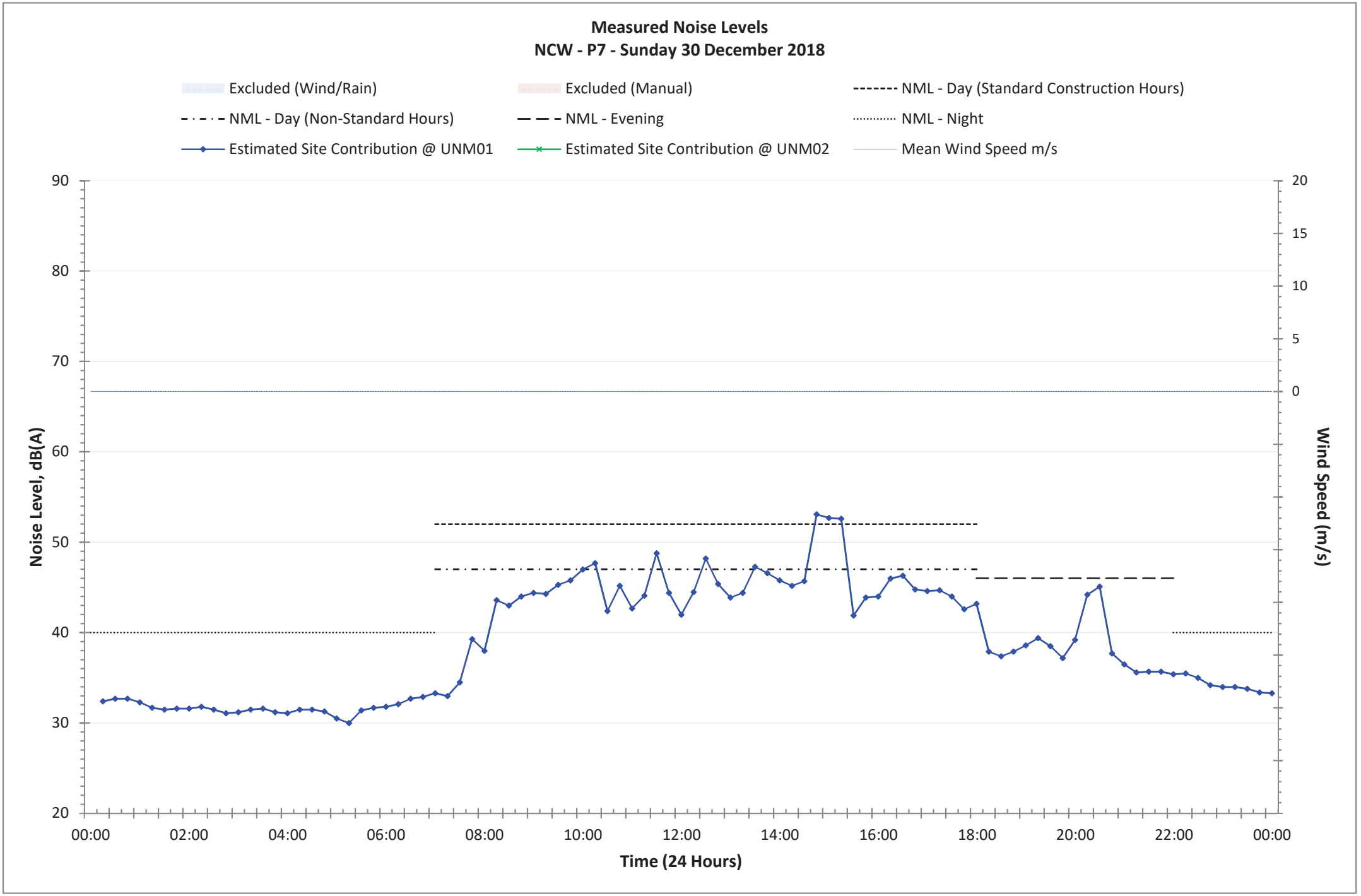

Measured Noise Levels
NCW - P7 - Tuesday 25 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

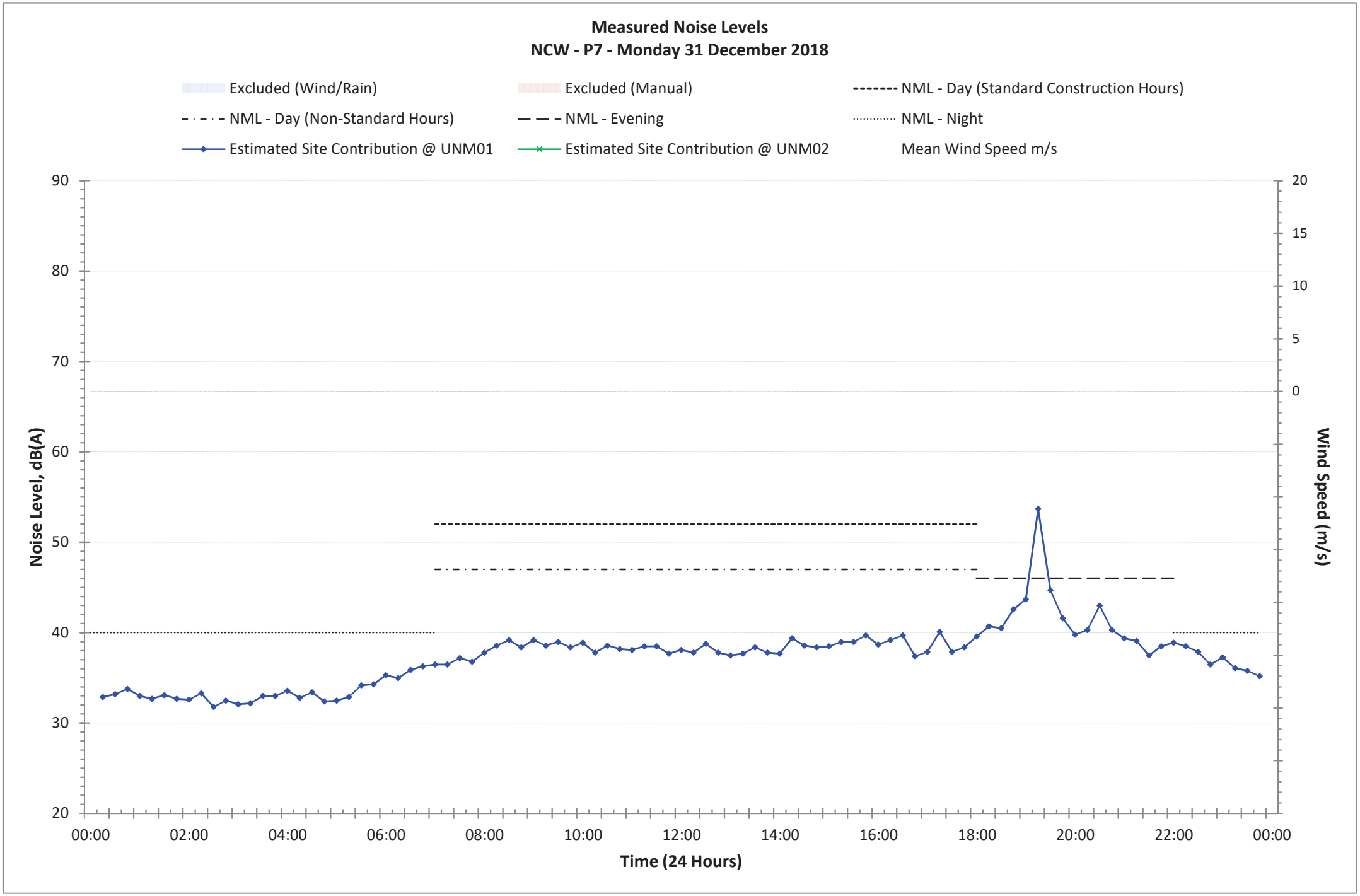

Measured Noise Levels
NCW - P7 - Wednesday 26 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

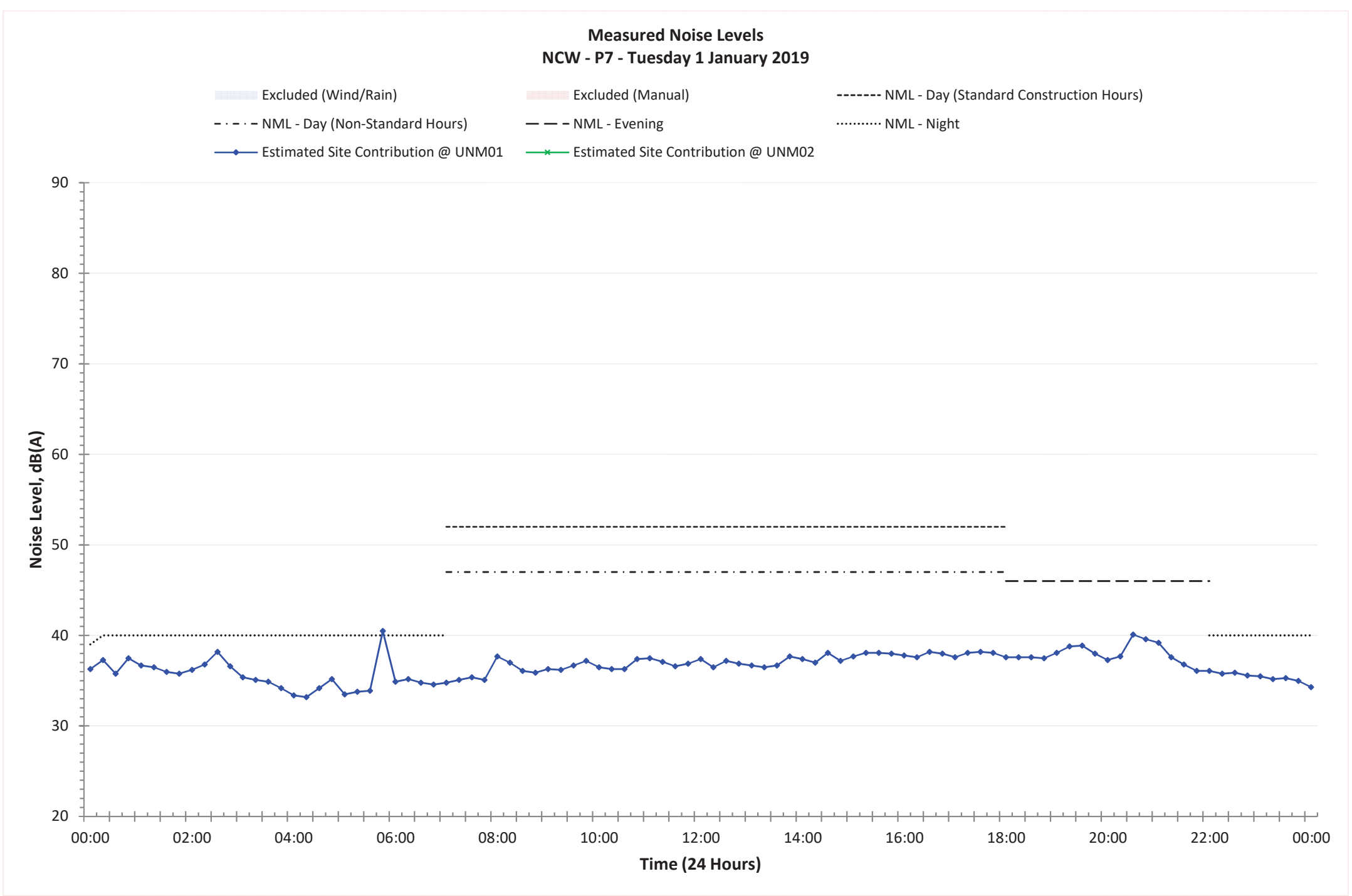

Measured Noise Levels
NCW - P7 - Thursday 27 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

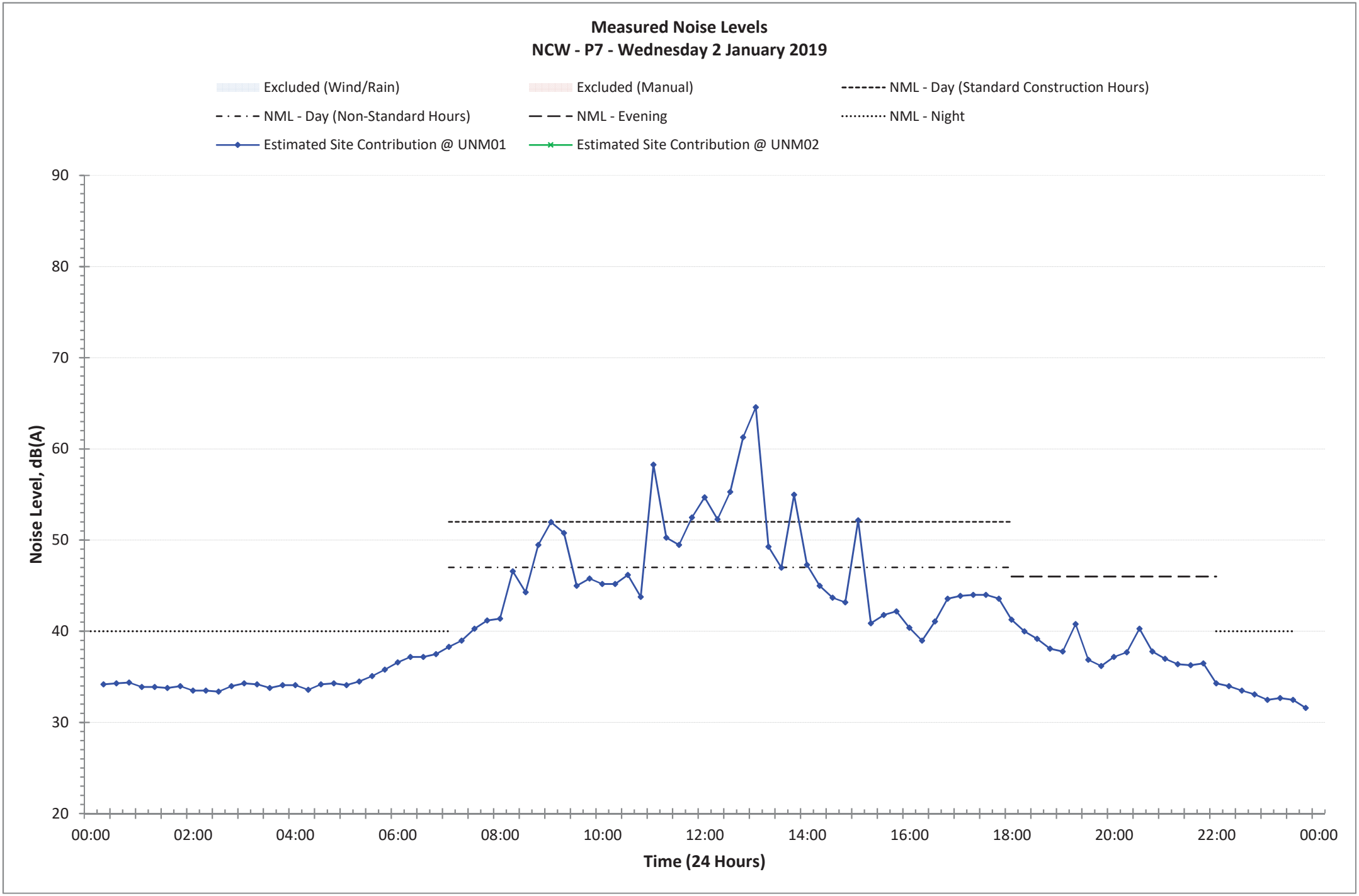

Measured Noise Levels
NCW - P7 - Friday 28 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

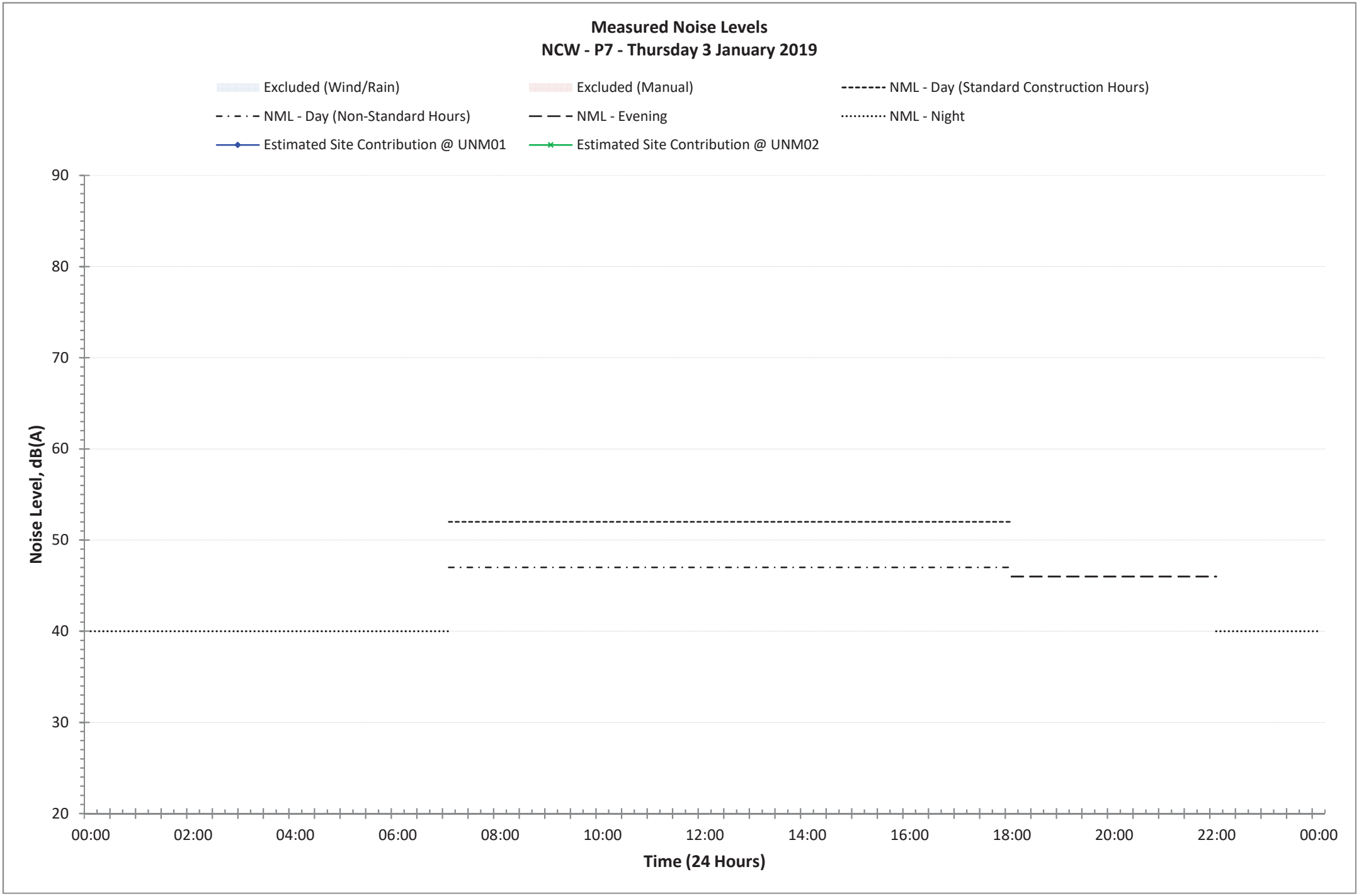

Measured Noise Levels
NCW - P7 - Saturday 29 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

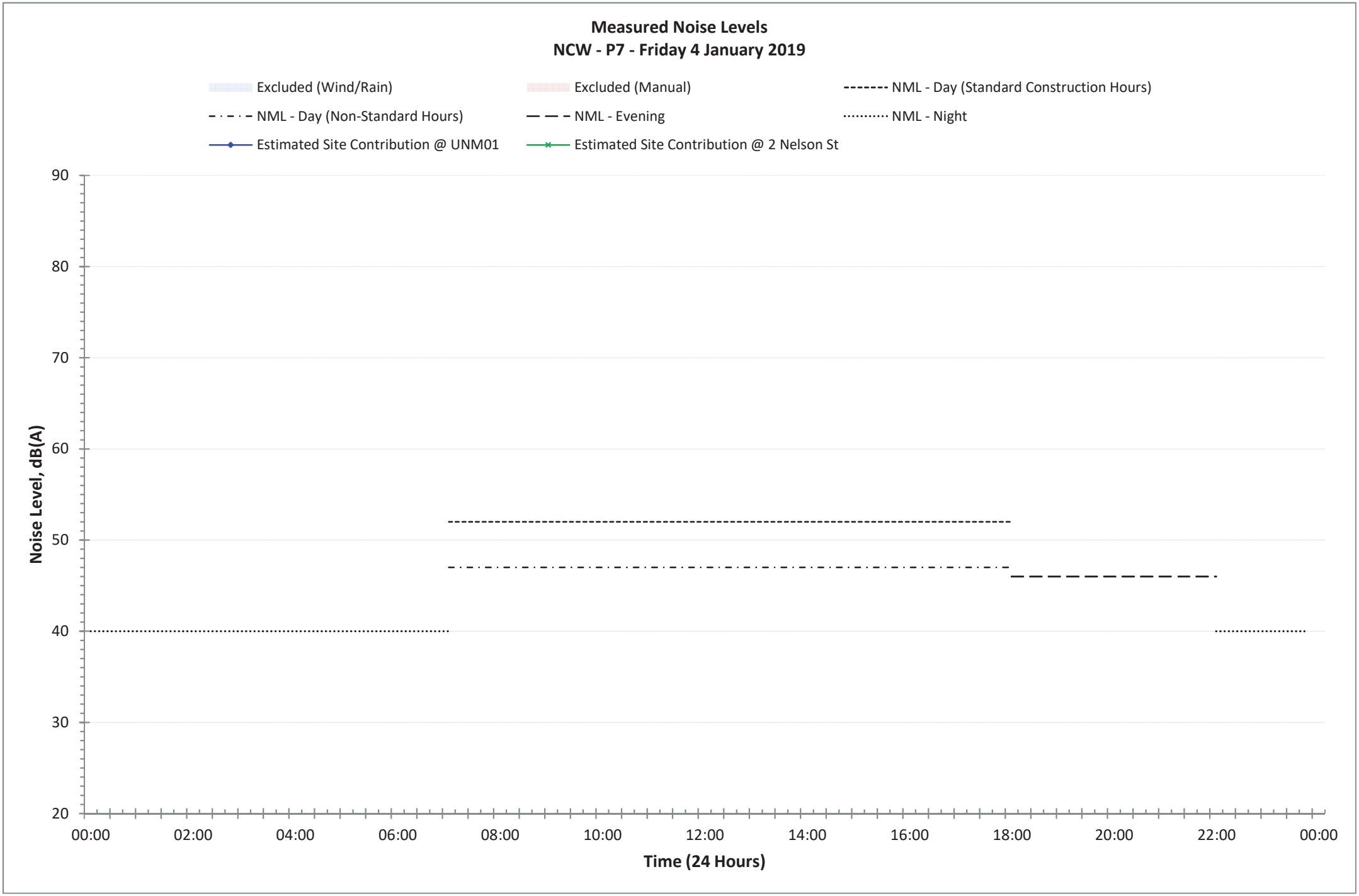

Measured Noise Levels
NCW - P7 - Sunday 30 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

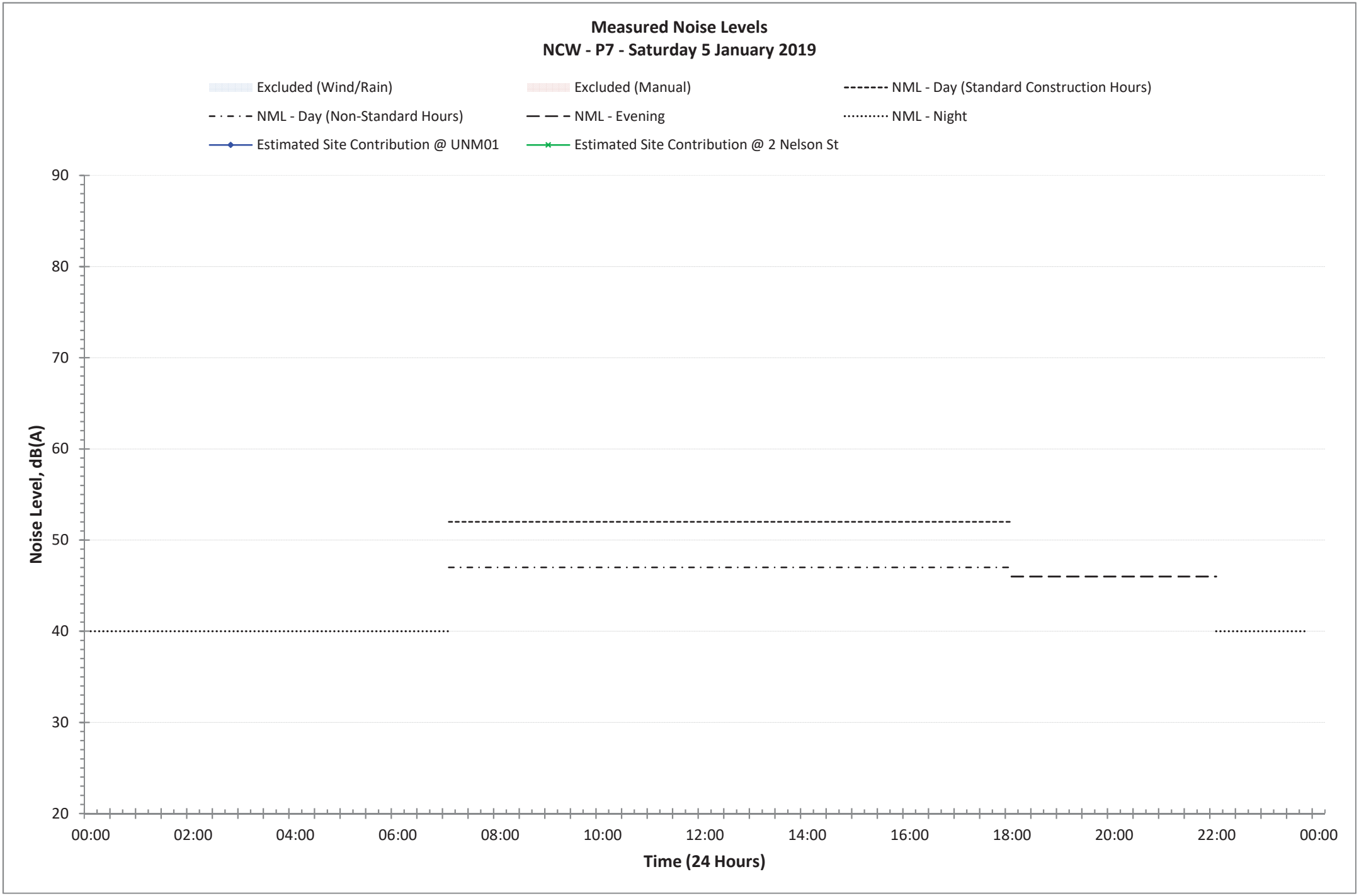

Measured Noise Levels
NCW - P7 - Monday 31 December 2018
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

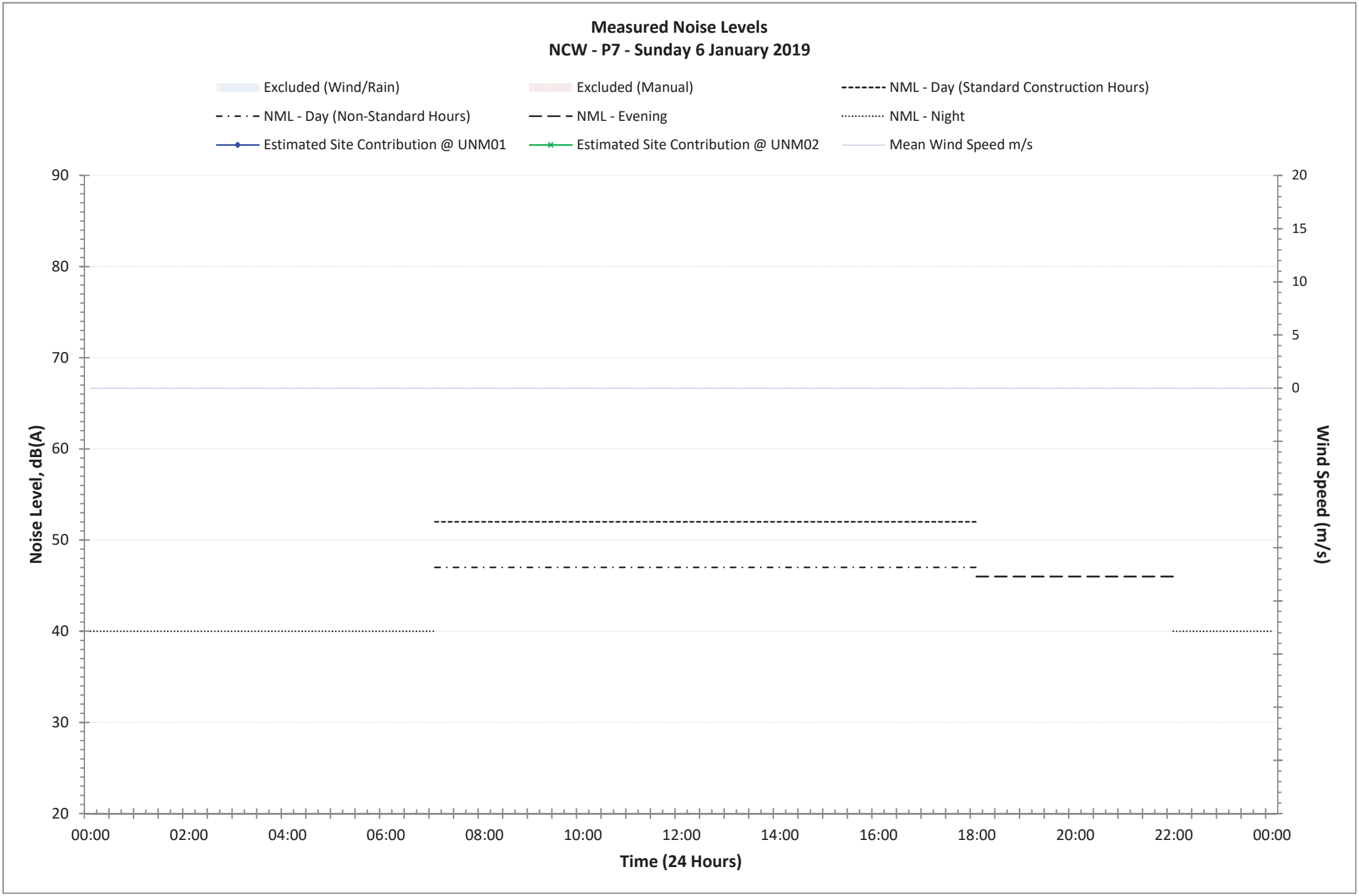

Measured Noise Levels
NCW - P7 - Tuesday 1 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

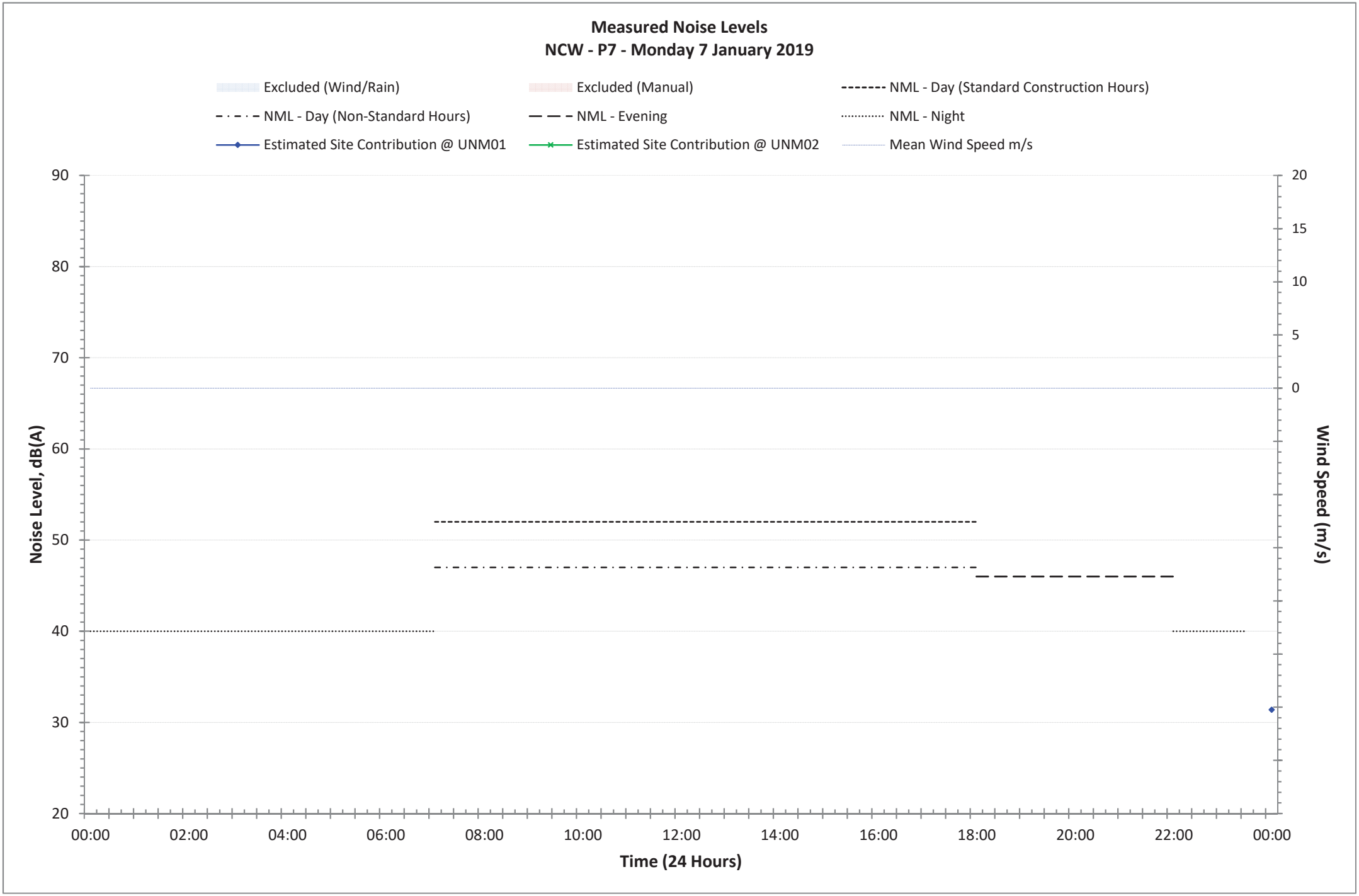

Measured Noise Levels
NCW - P7 - Wednesday 2 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

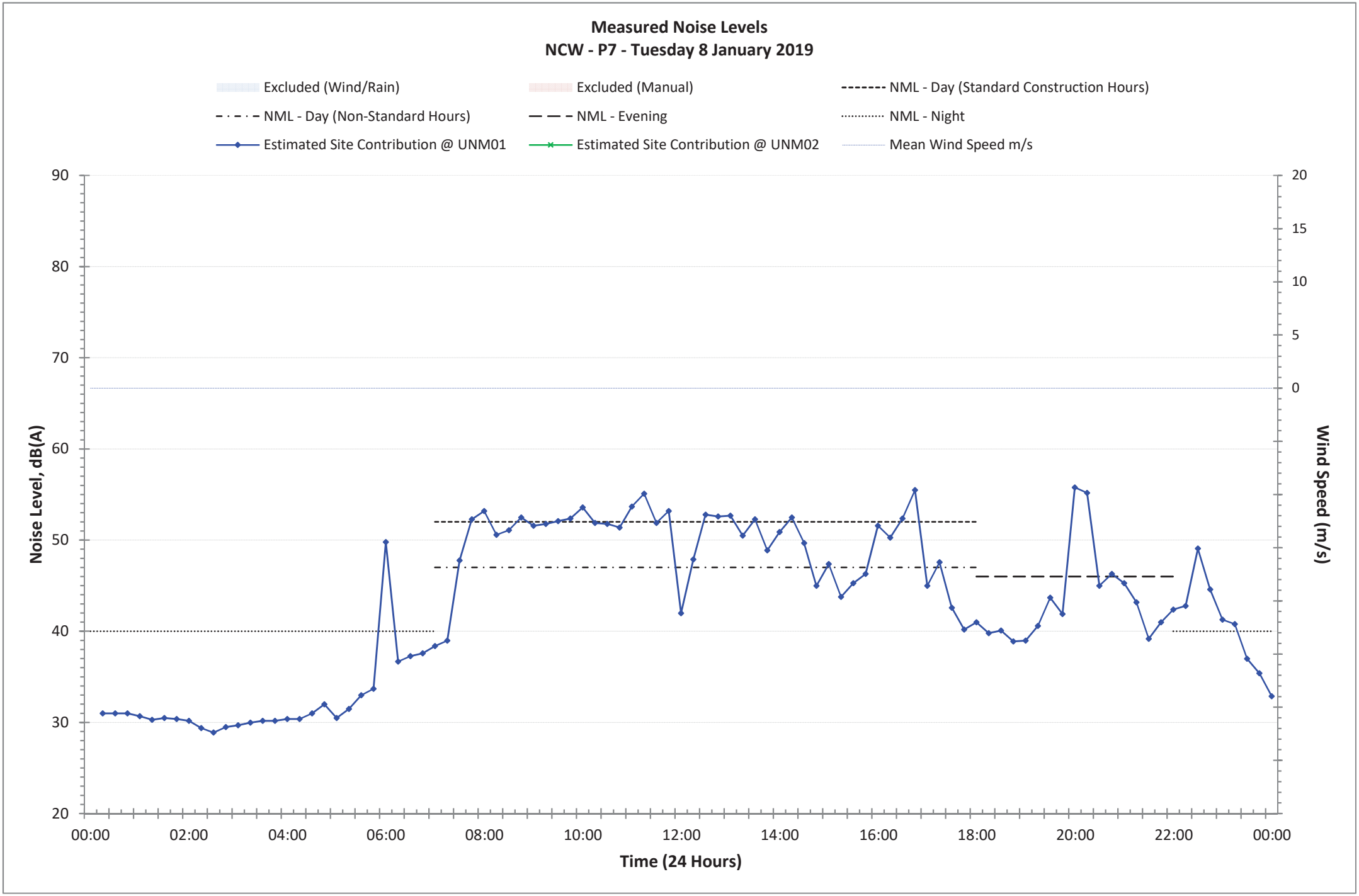

Measured Noise Levels
NCW - P7 - Thursday 3 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

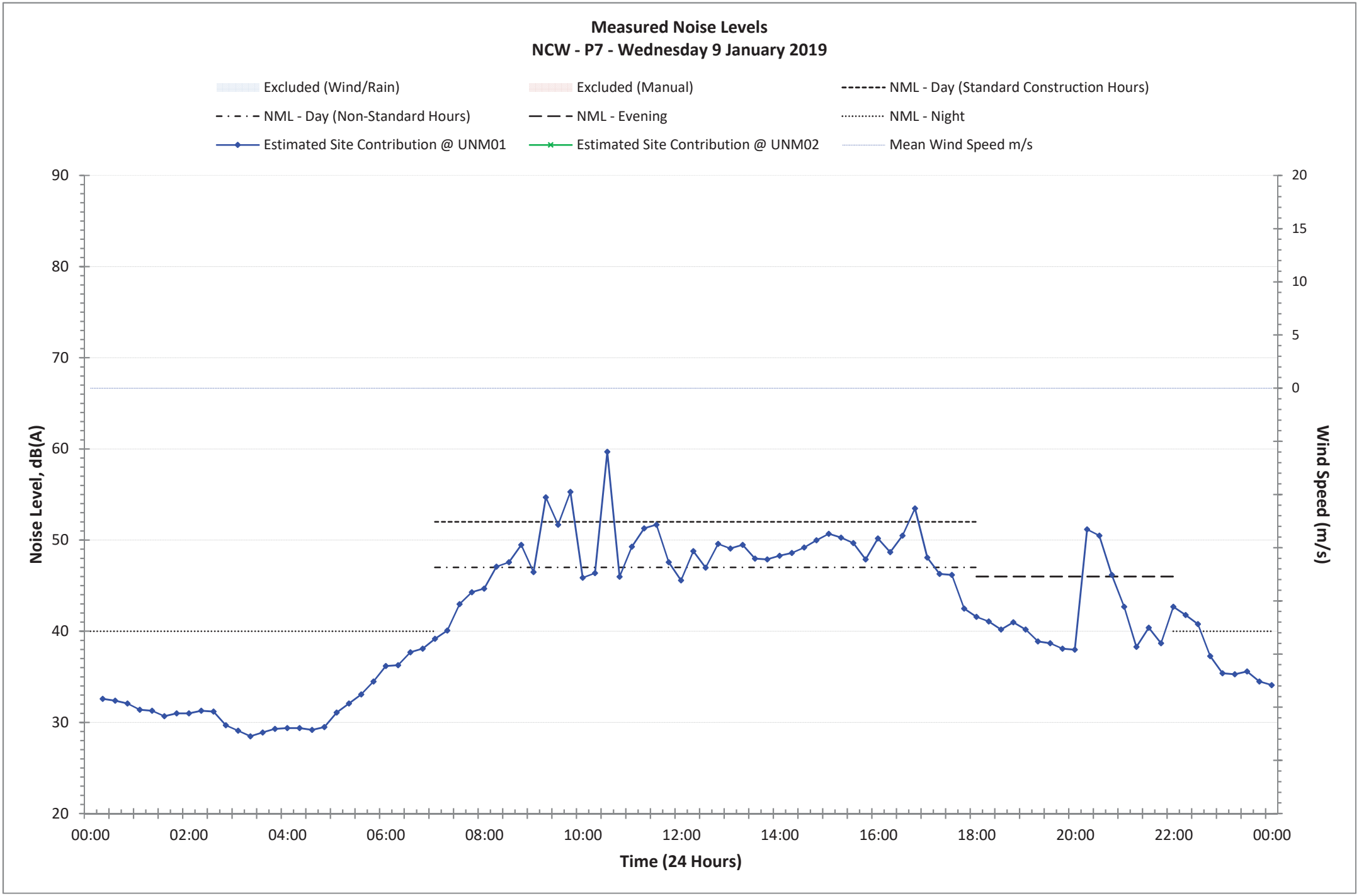

Measured Noise Levels
NCW - P7 - Friday 4 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ 2 Nelson St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

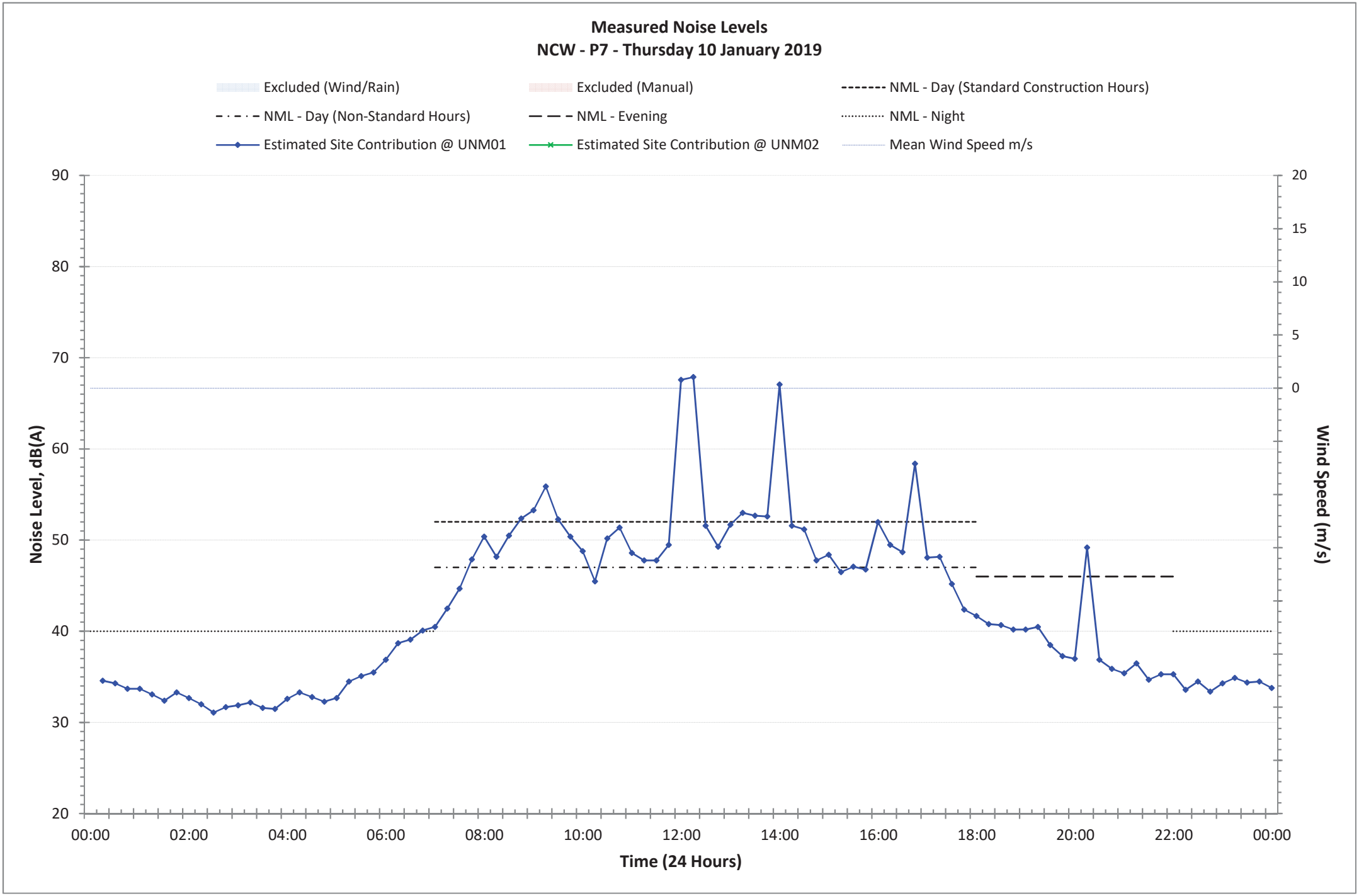

Measured Noise Levels
NCW - P7 - Saturday 5 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ 2 Nelson St
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

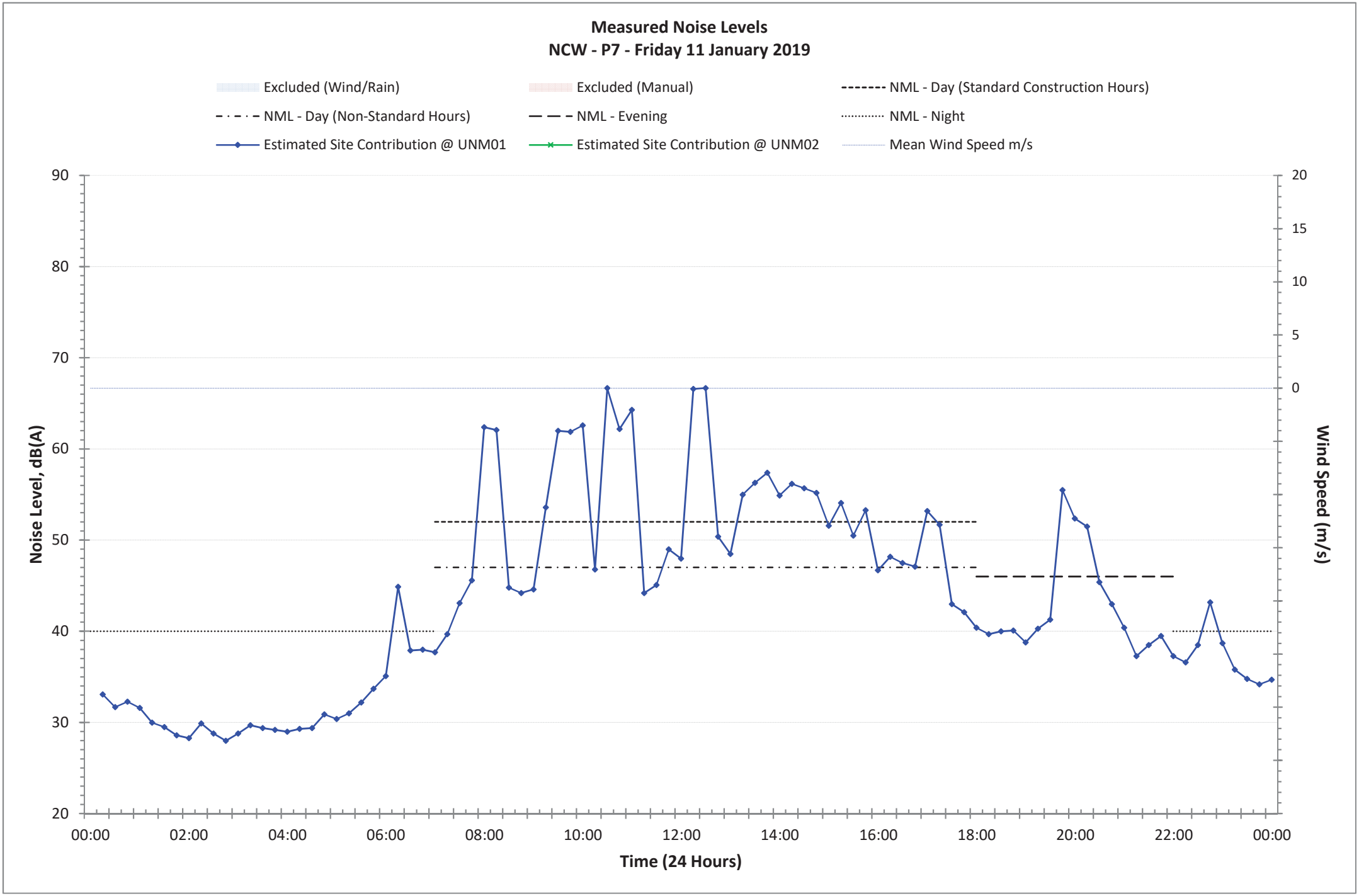

Measured Noise Levels
NCW - P7 - Sunday 6 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

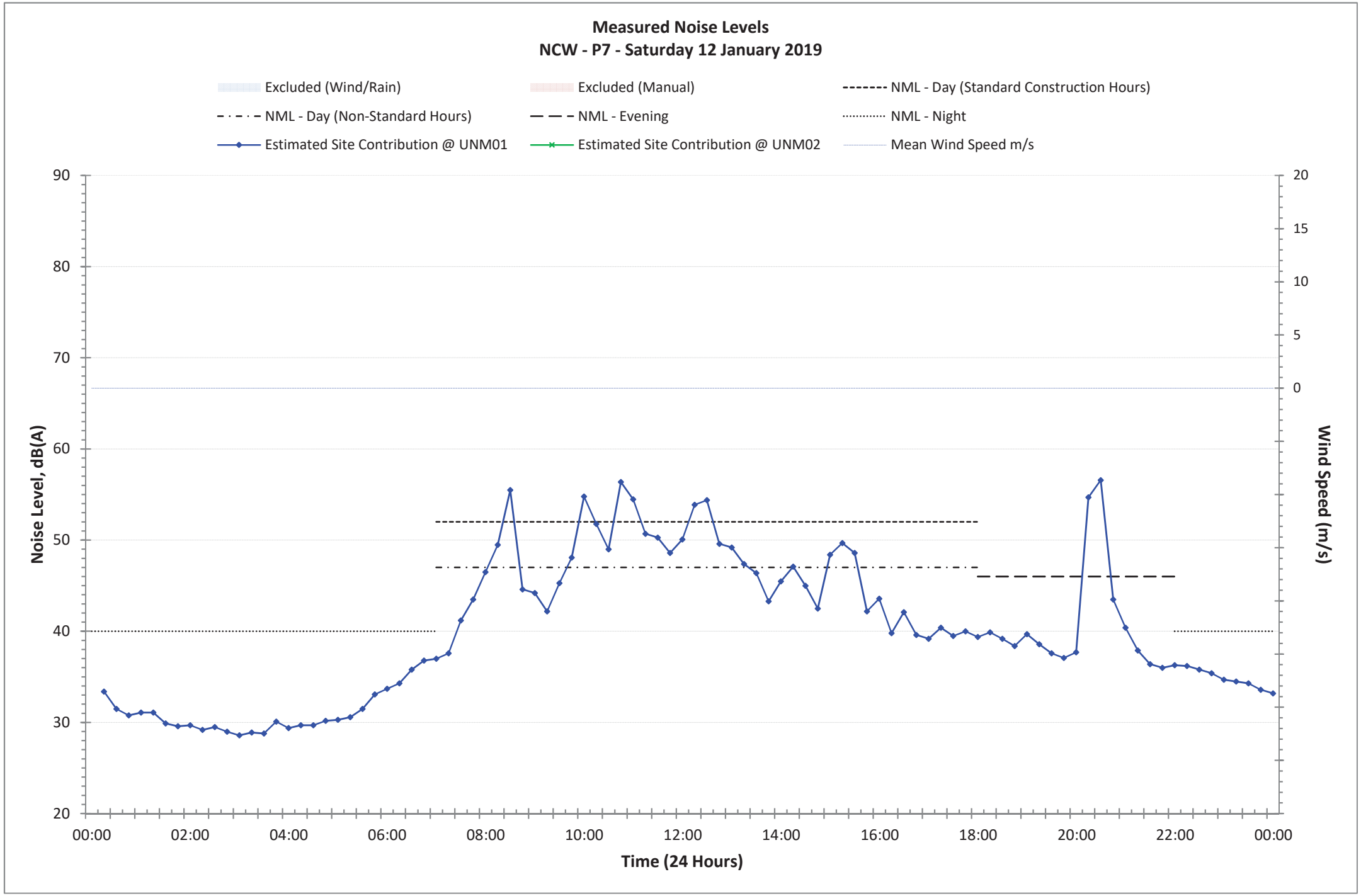

Measured Noise Levels
NCW - P7 - Monday 7 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

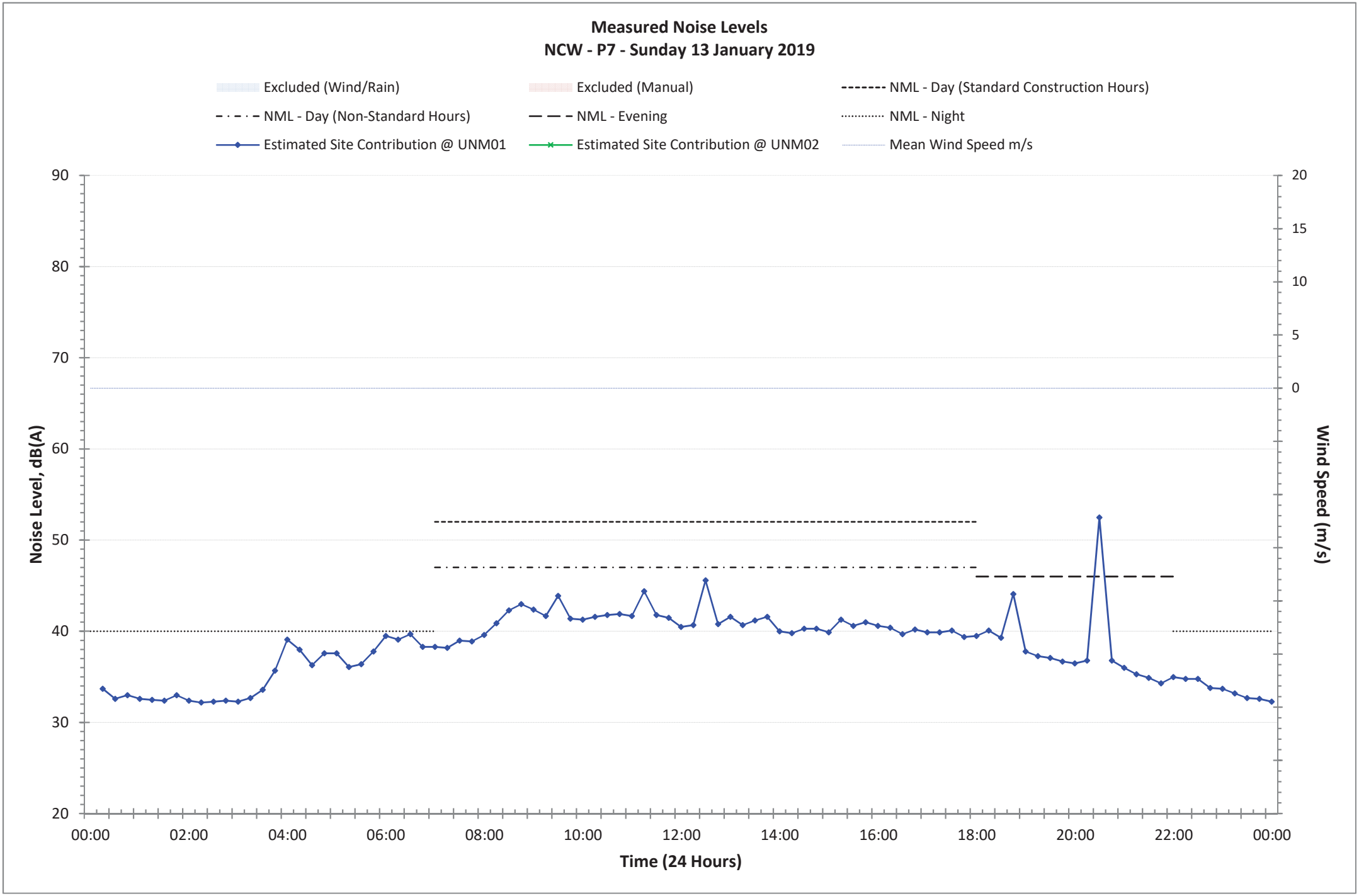

Measured Noise Levels
NCW - P7 - Tuesday 8 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

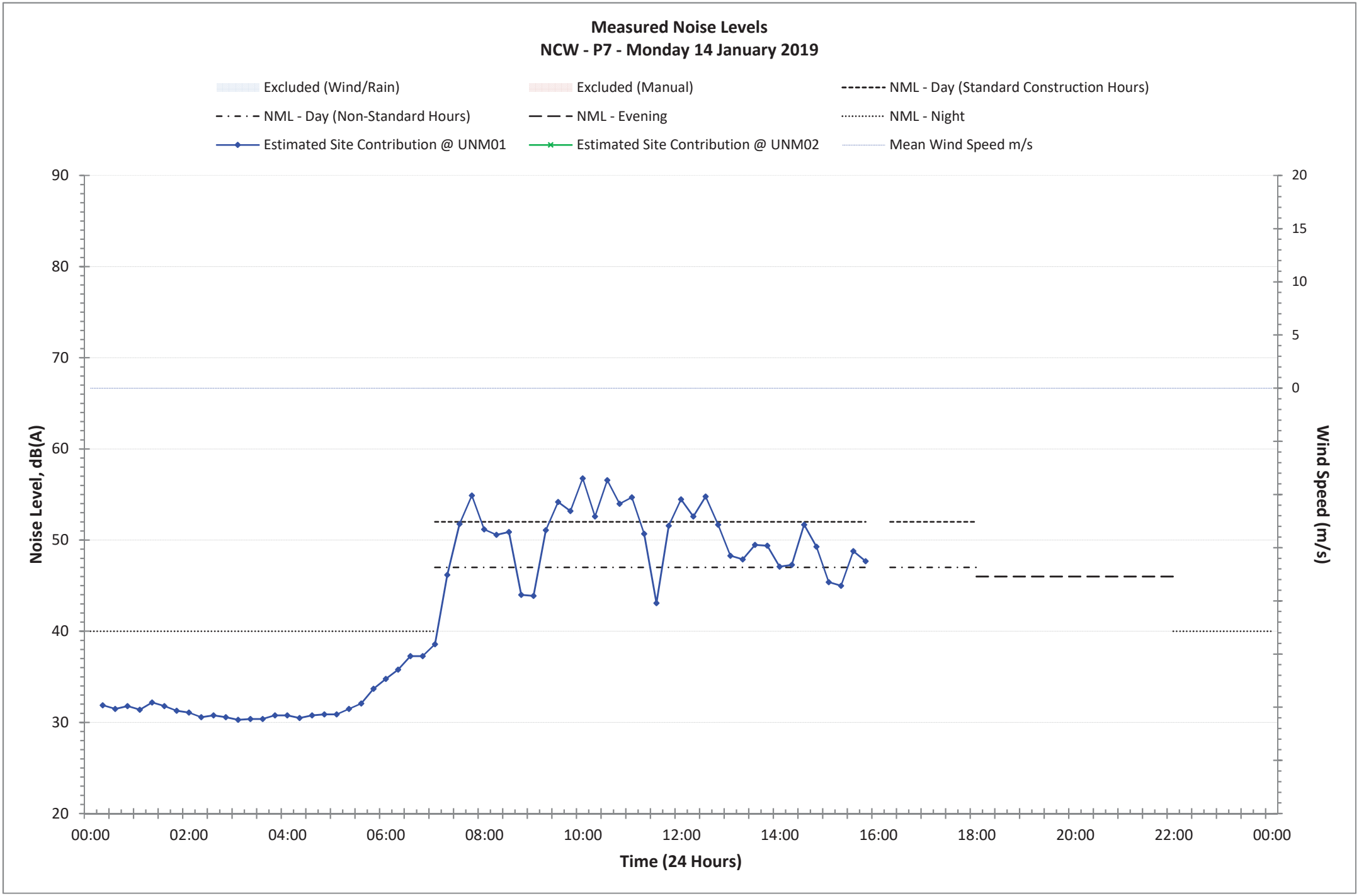

Measured Noise Levels
NCW - P7 - Wednesday 9 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

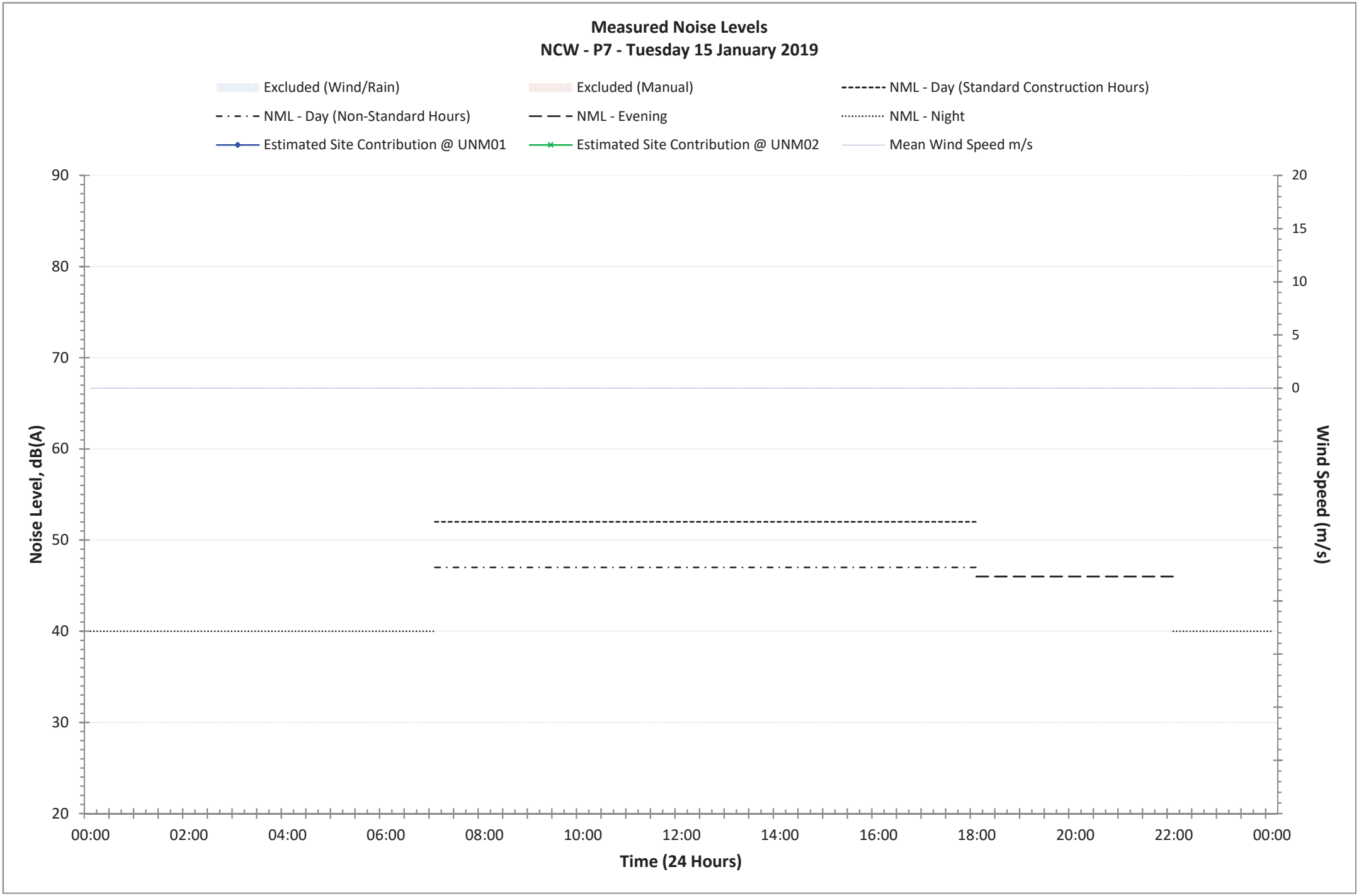

Measured Noise Levels
NCW - P7 - Thursday 10 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

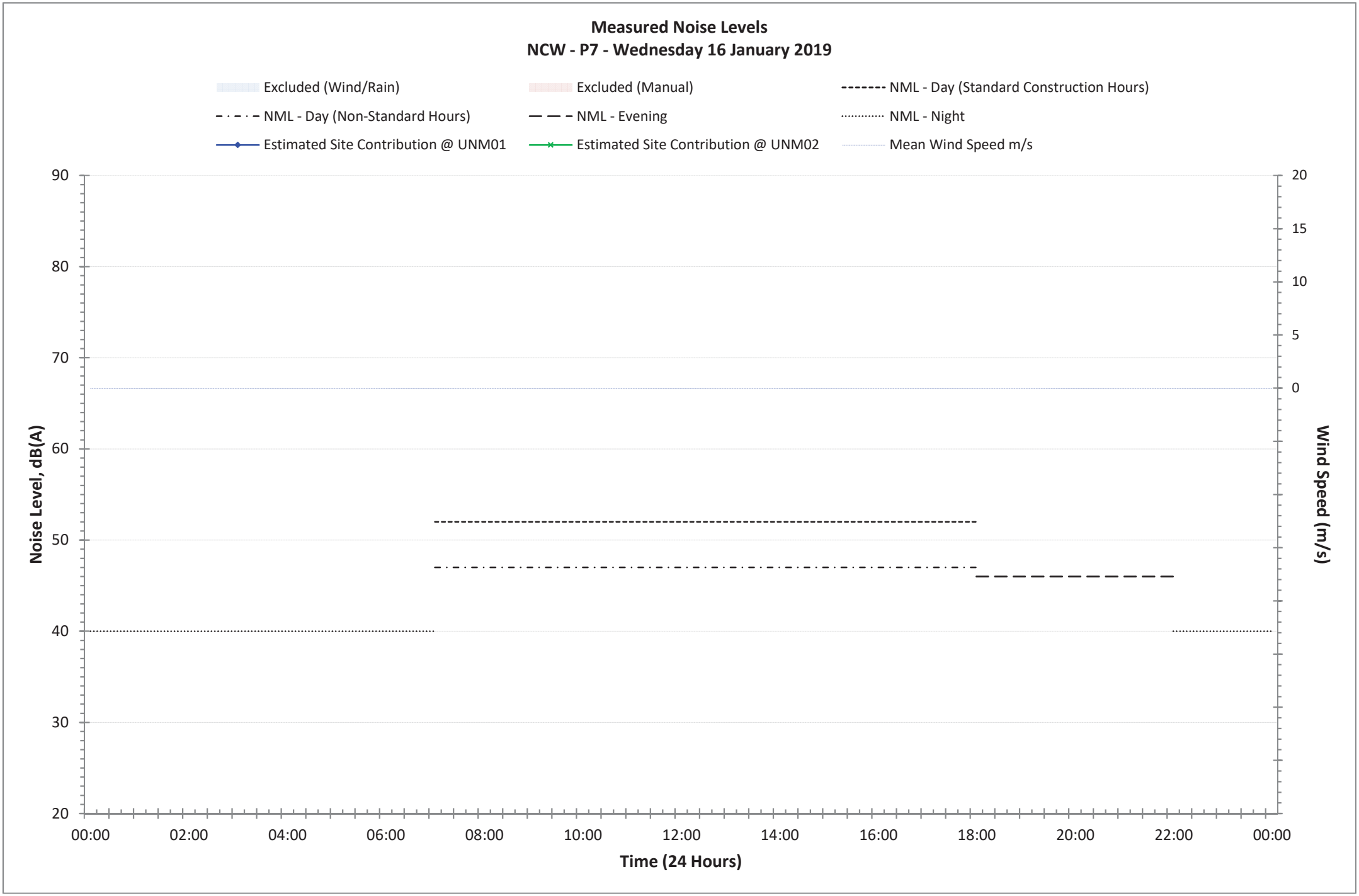

Measured Noise Levels
NCW - P7 - Friday 11 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

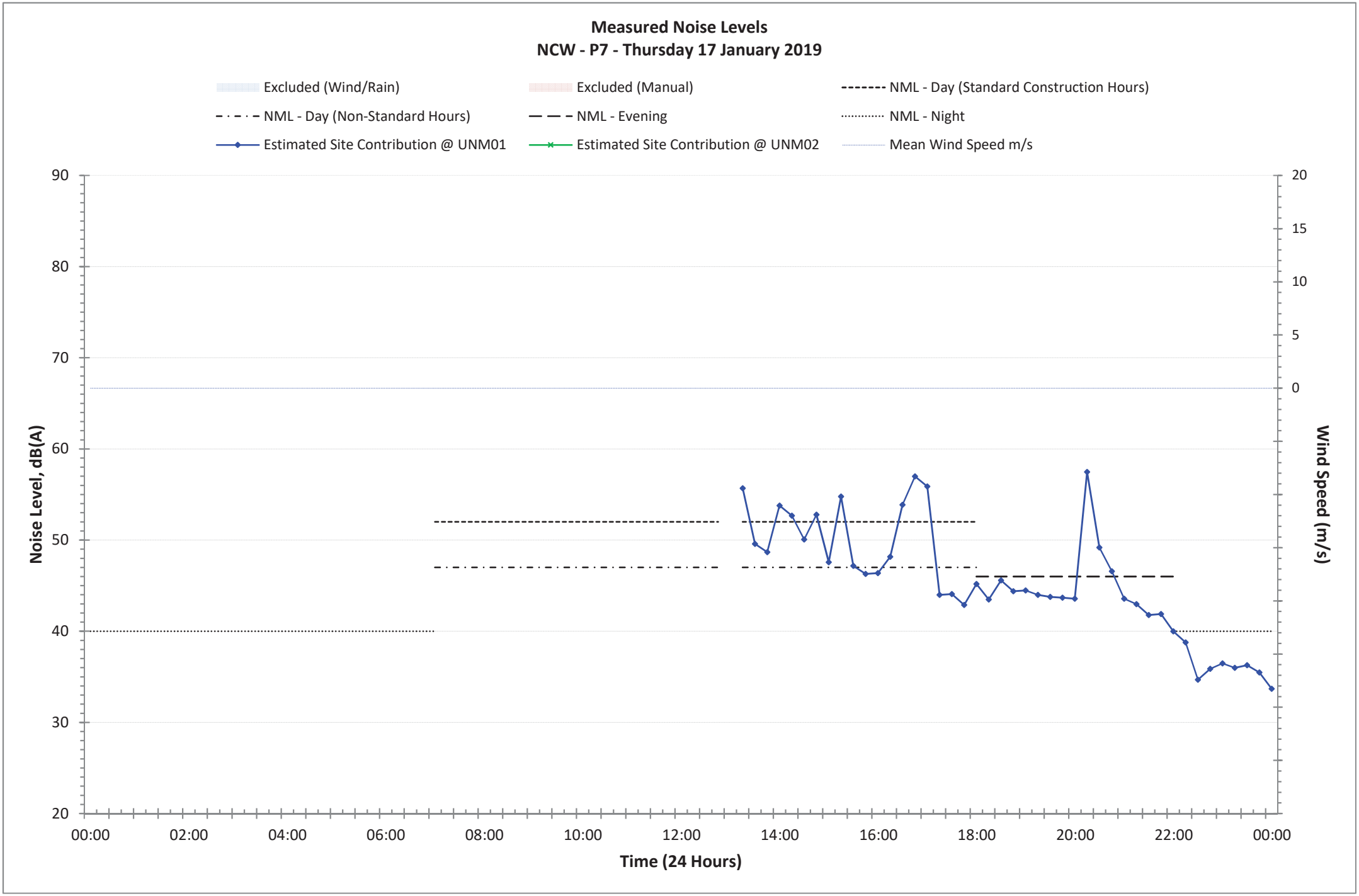

Measured Noise Levels
NCW - P7 - Saturday 12 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

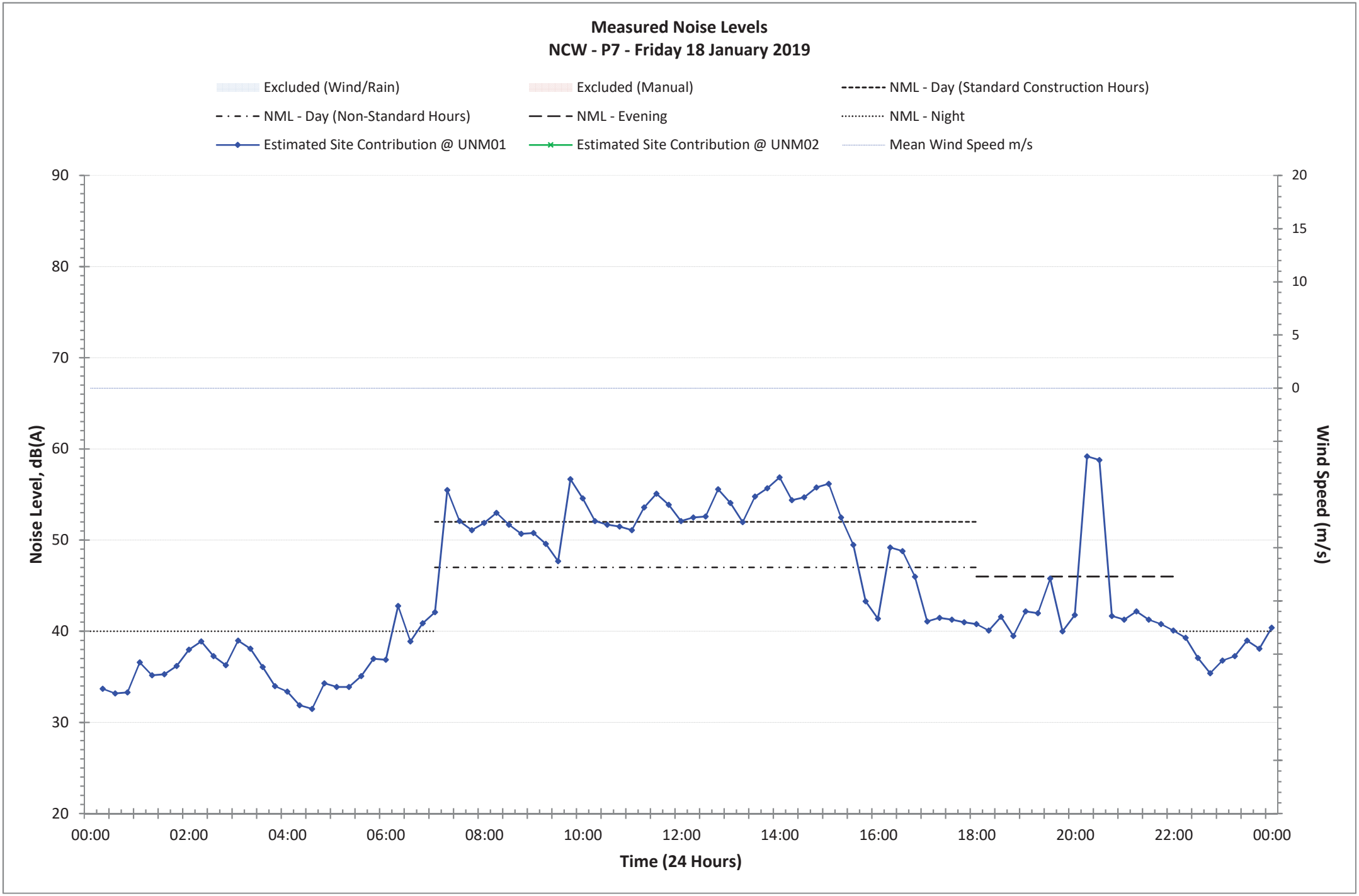

Measured Noise Levels
NCW - P7 - Sunday 13 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

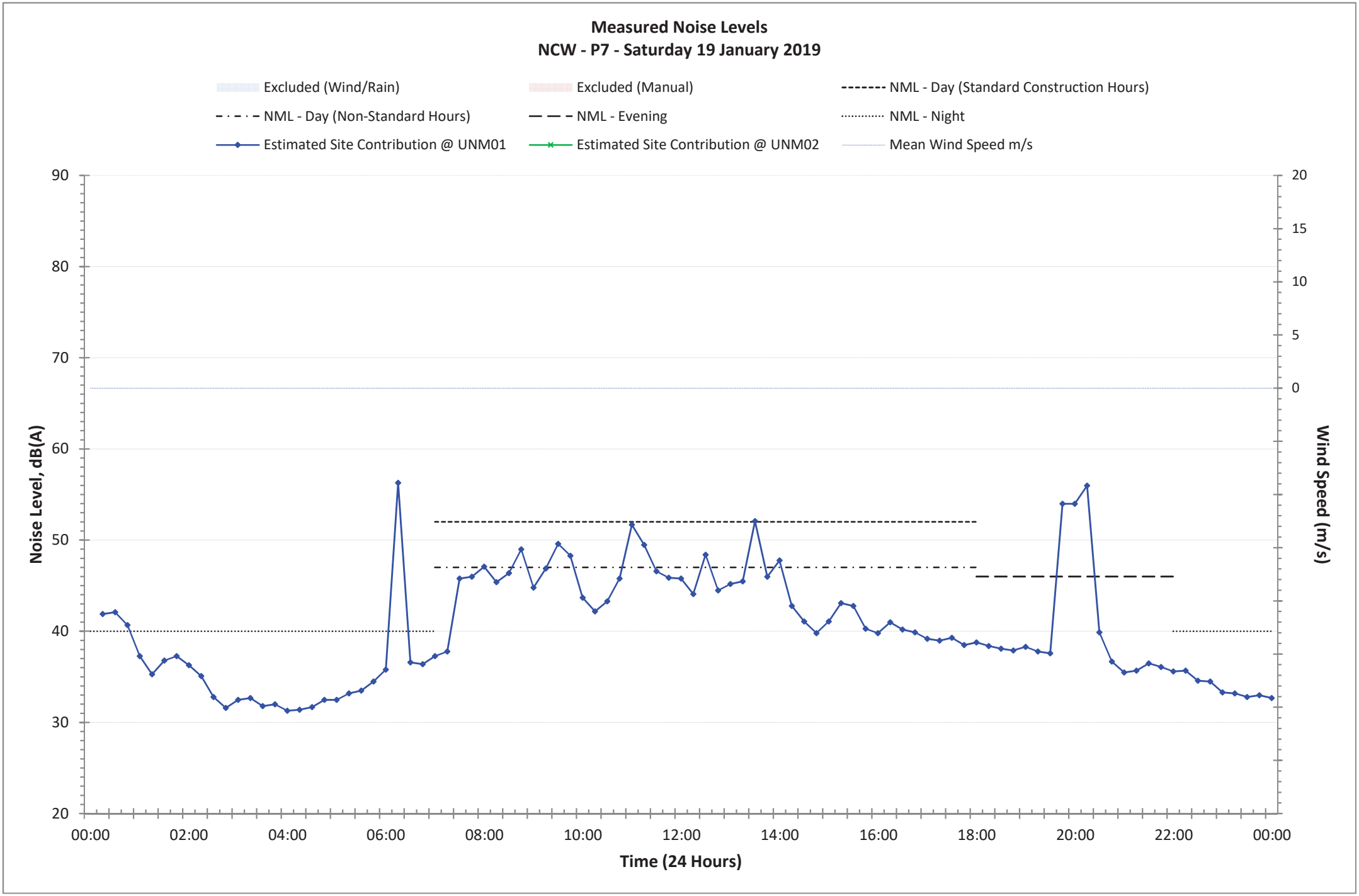

Measured Noise Levels
NCW - P7 - Monday 14 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

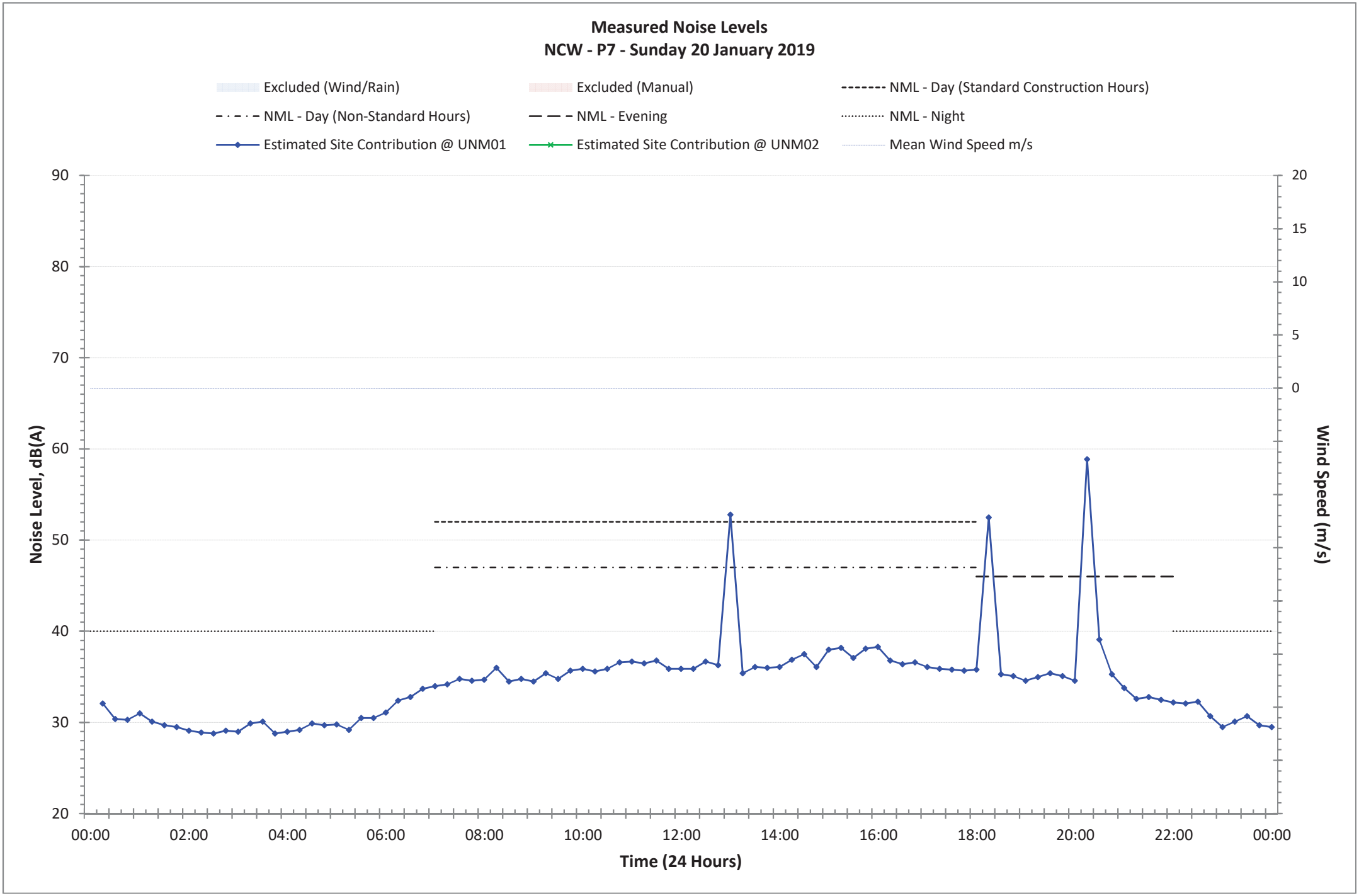

Measured Noise Levels
NCW - P7 - Tuesday 15 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

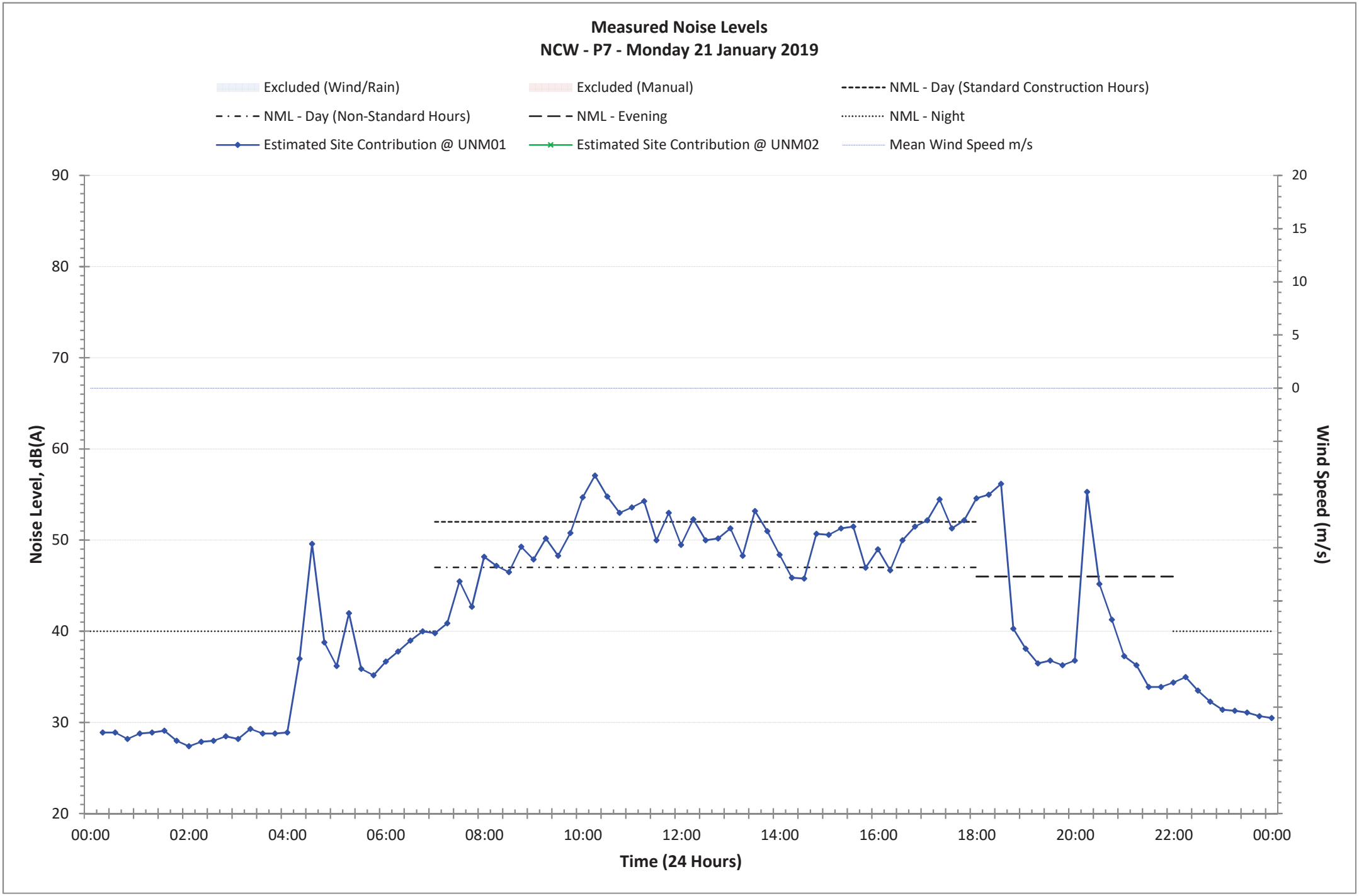

Measured Noise Levels
NCW - P7 - Wednesday 16 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

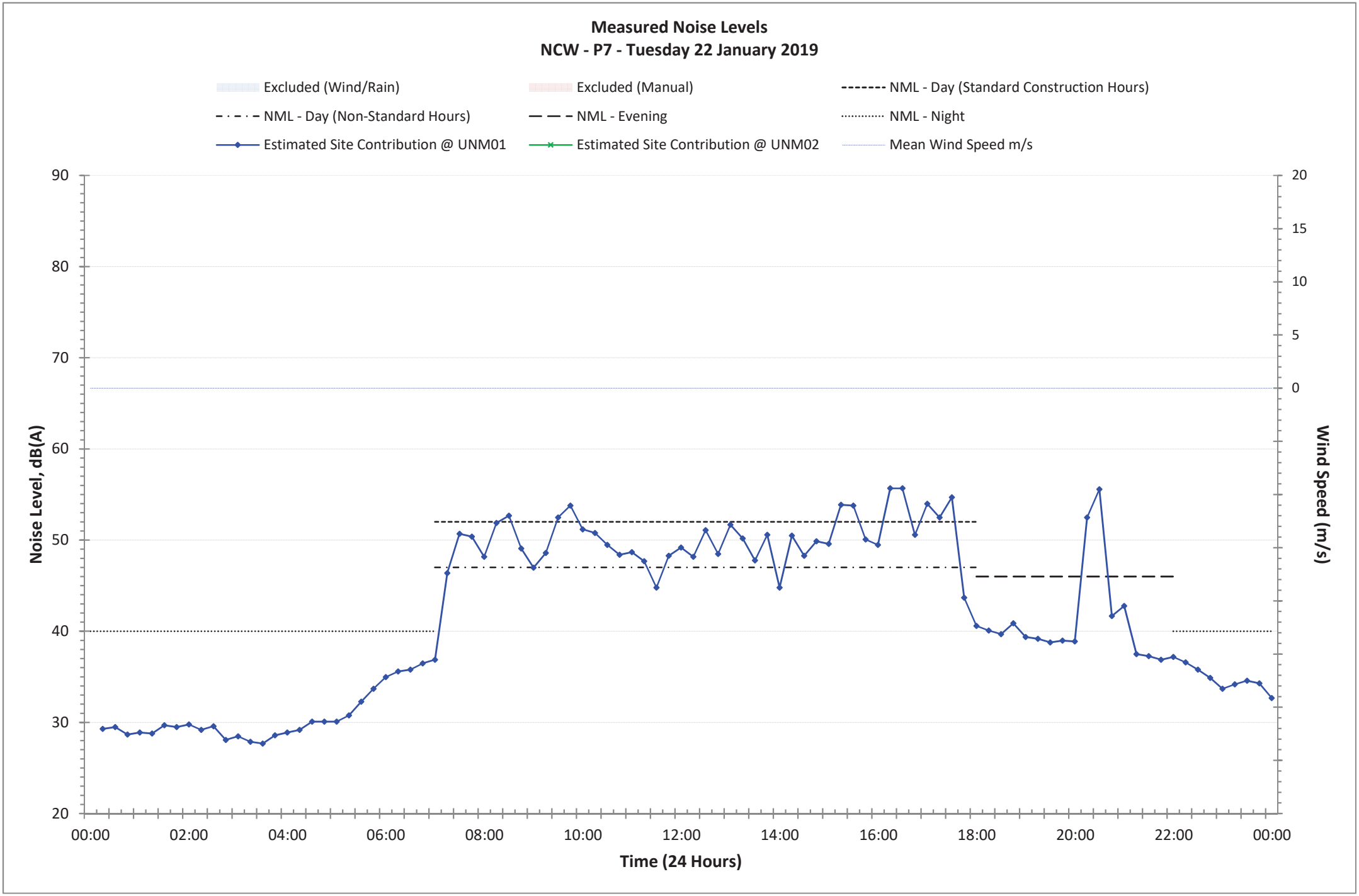

Measured Noise Levels
NCW - P7 - Thursday 17 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Friday 18 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Saturday 19 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Sunday 20 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Monday 21 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Tuesday 22 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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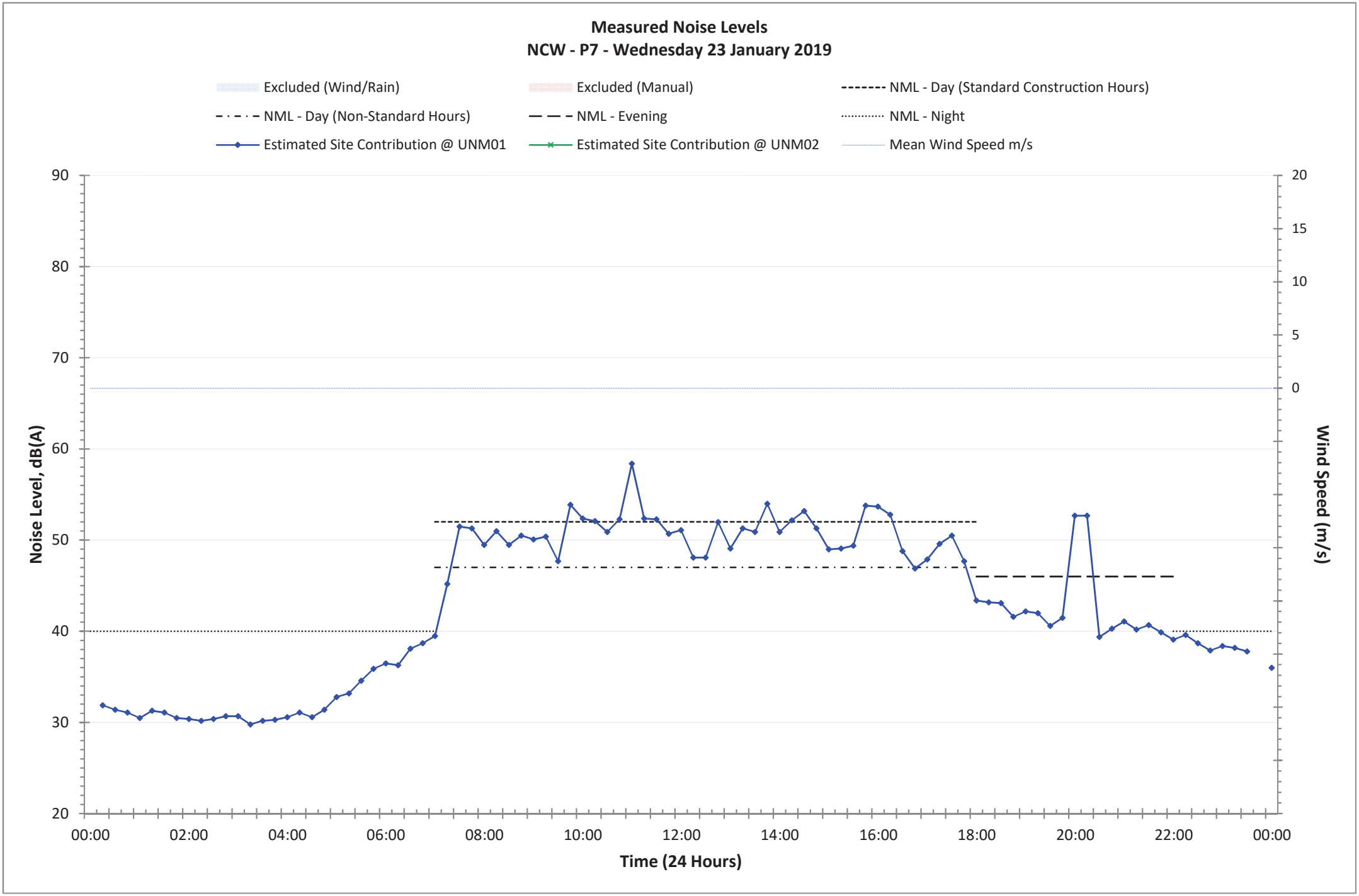
Measured Noise Levels
NCW - P7 - Wednesday 23 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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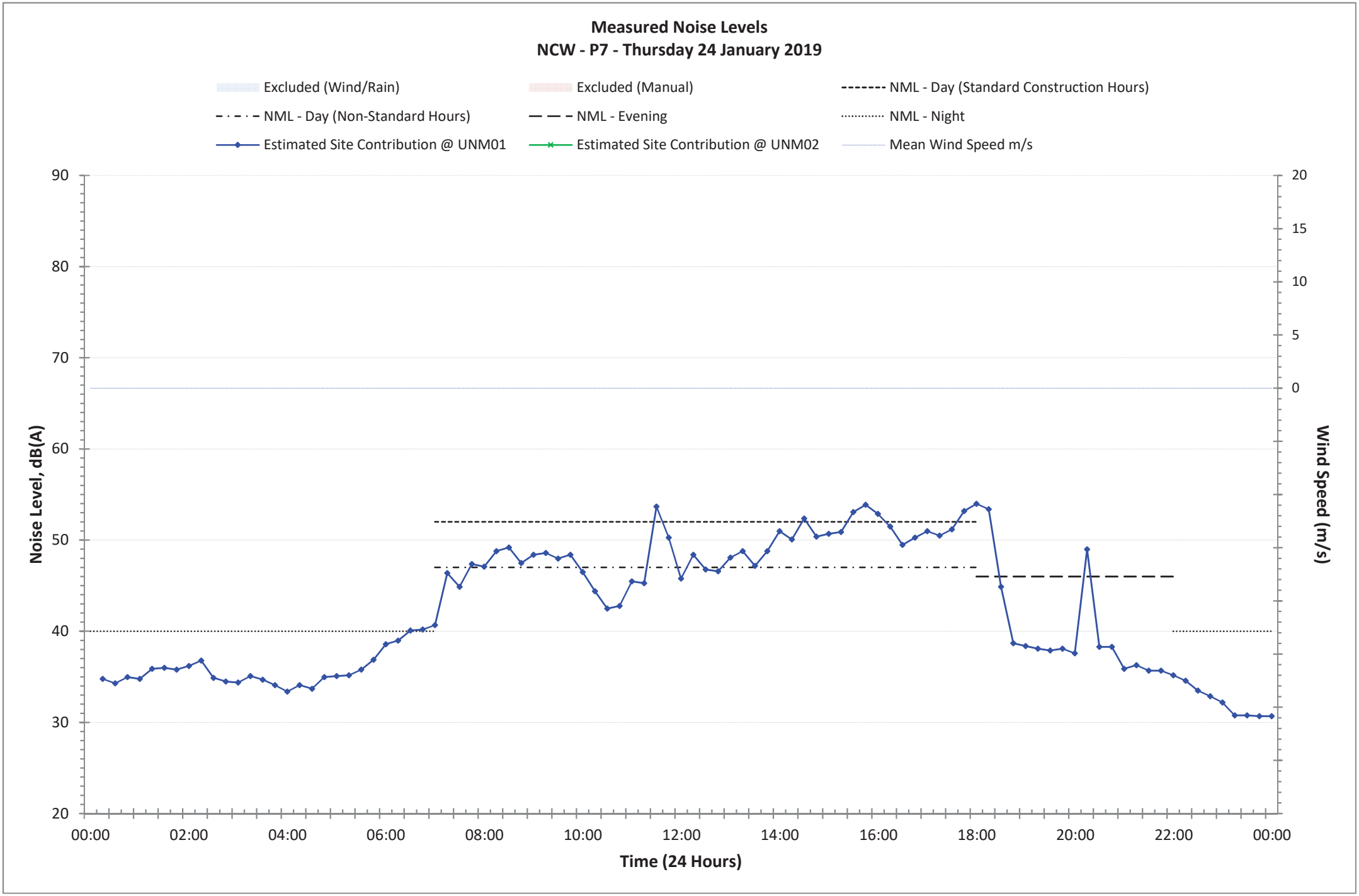
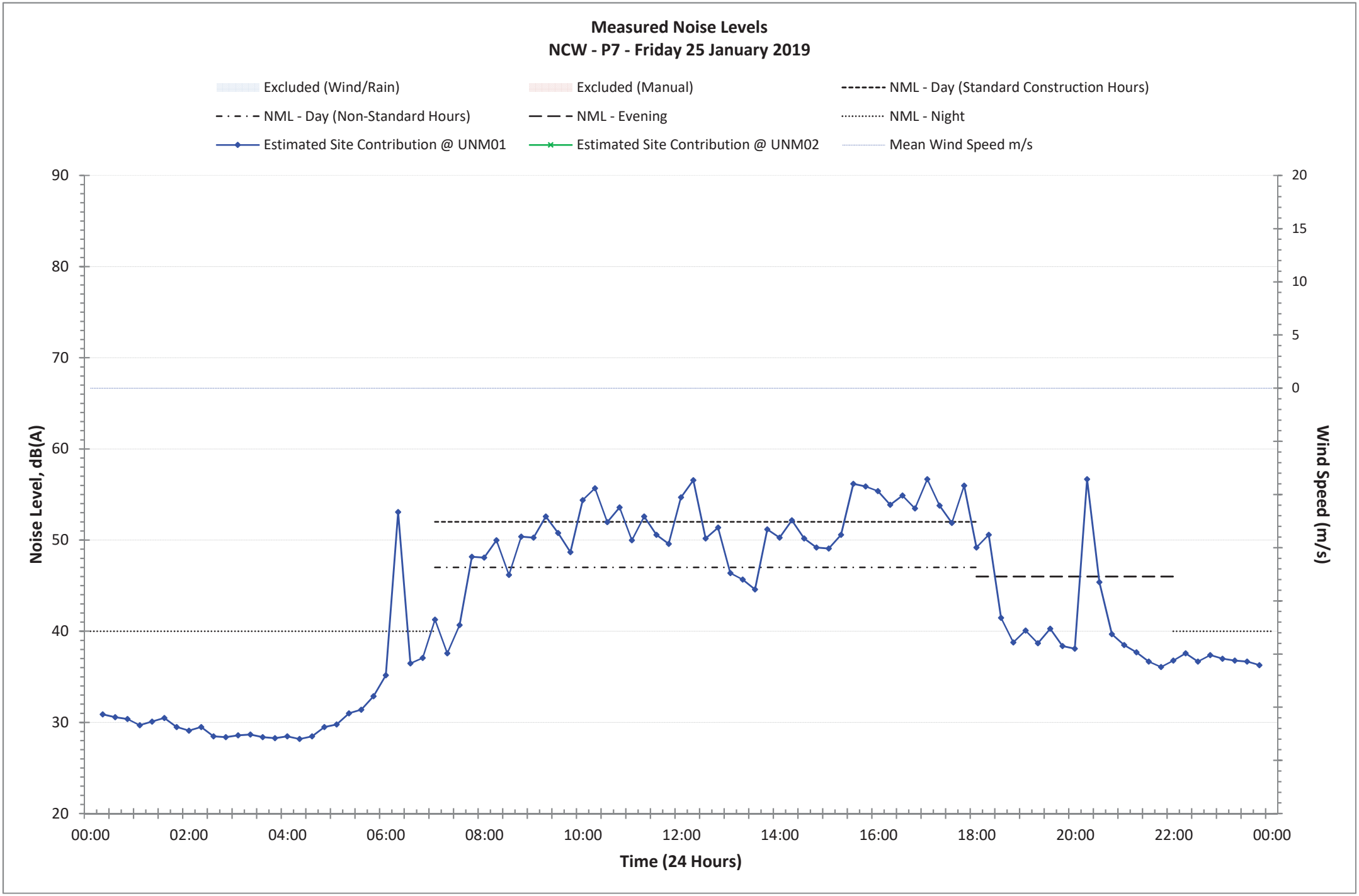
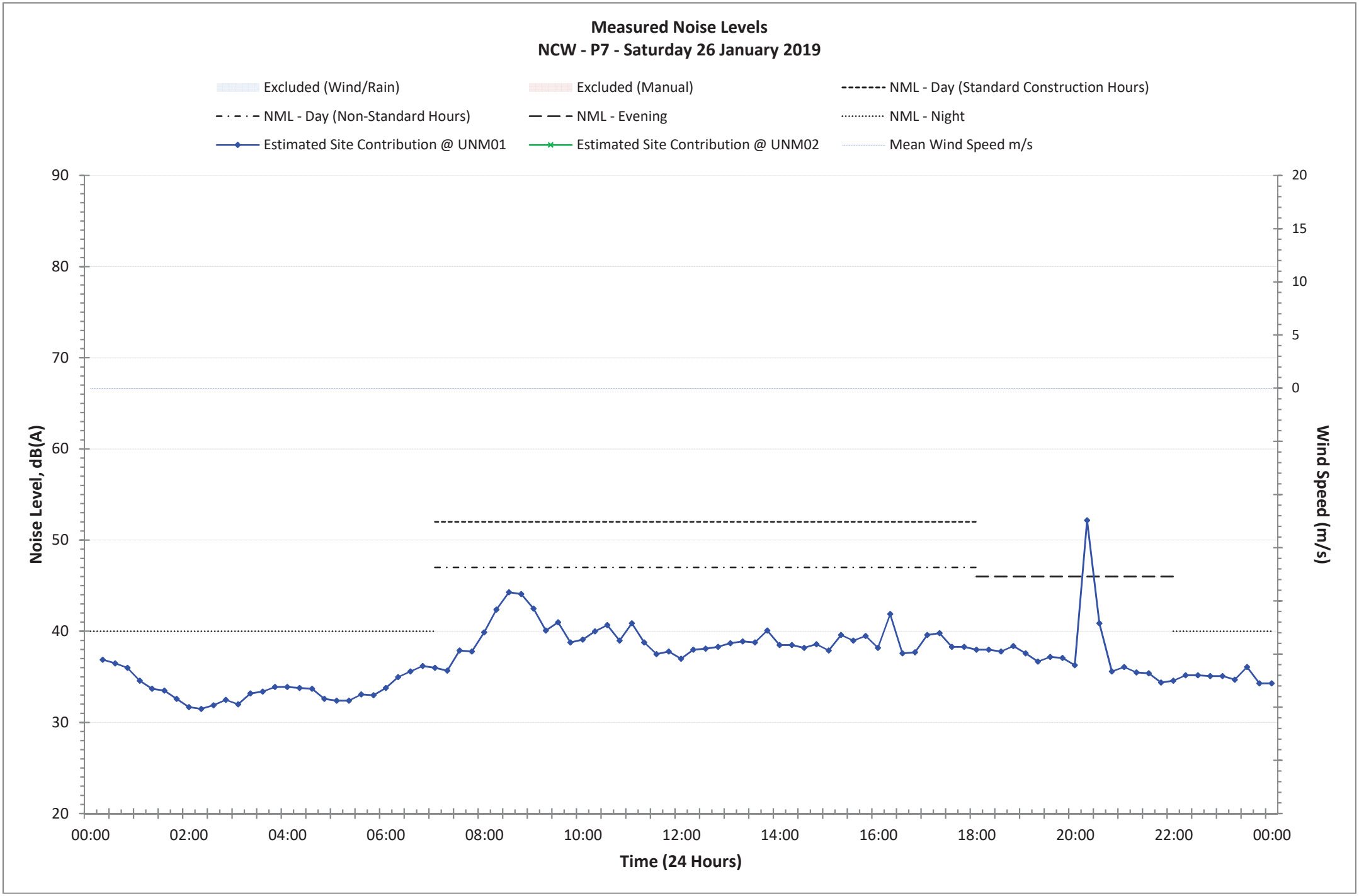

Measured Noise Levels
NCW - P7 - Thursday 24 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Friday 25 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Saturday 26 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
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12:00
14:00
16:00
18:00
20:00
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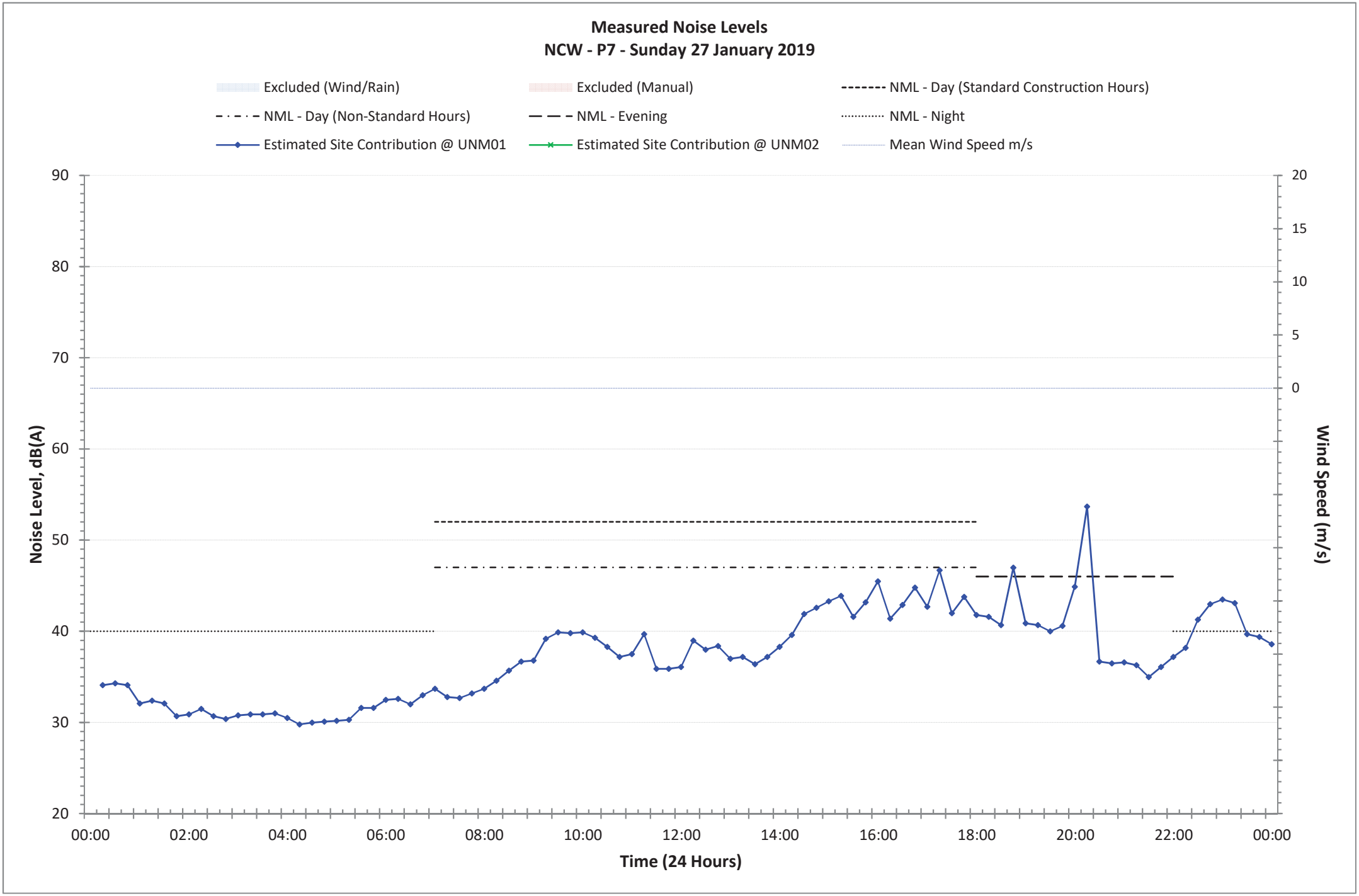
Measured Noise Levels
NCW - P7 - Sunday 27 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
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16:00
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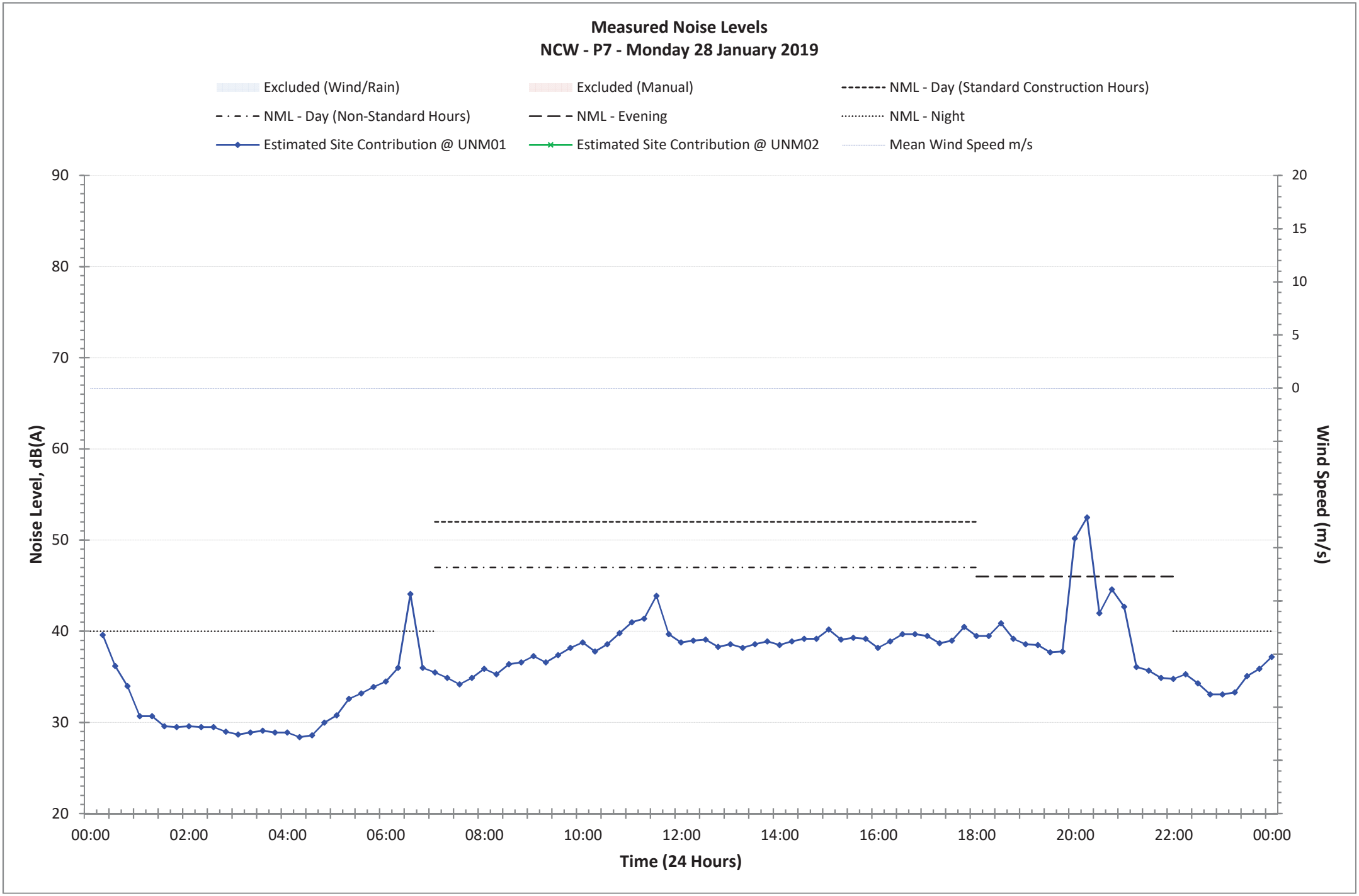
Measured Noise Levels
NCW - P7 - Monday 28 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
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16:00
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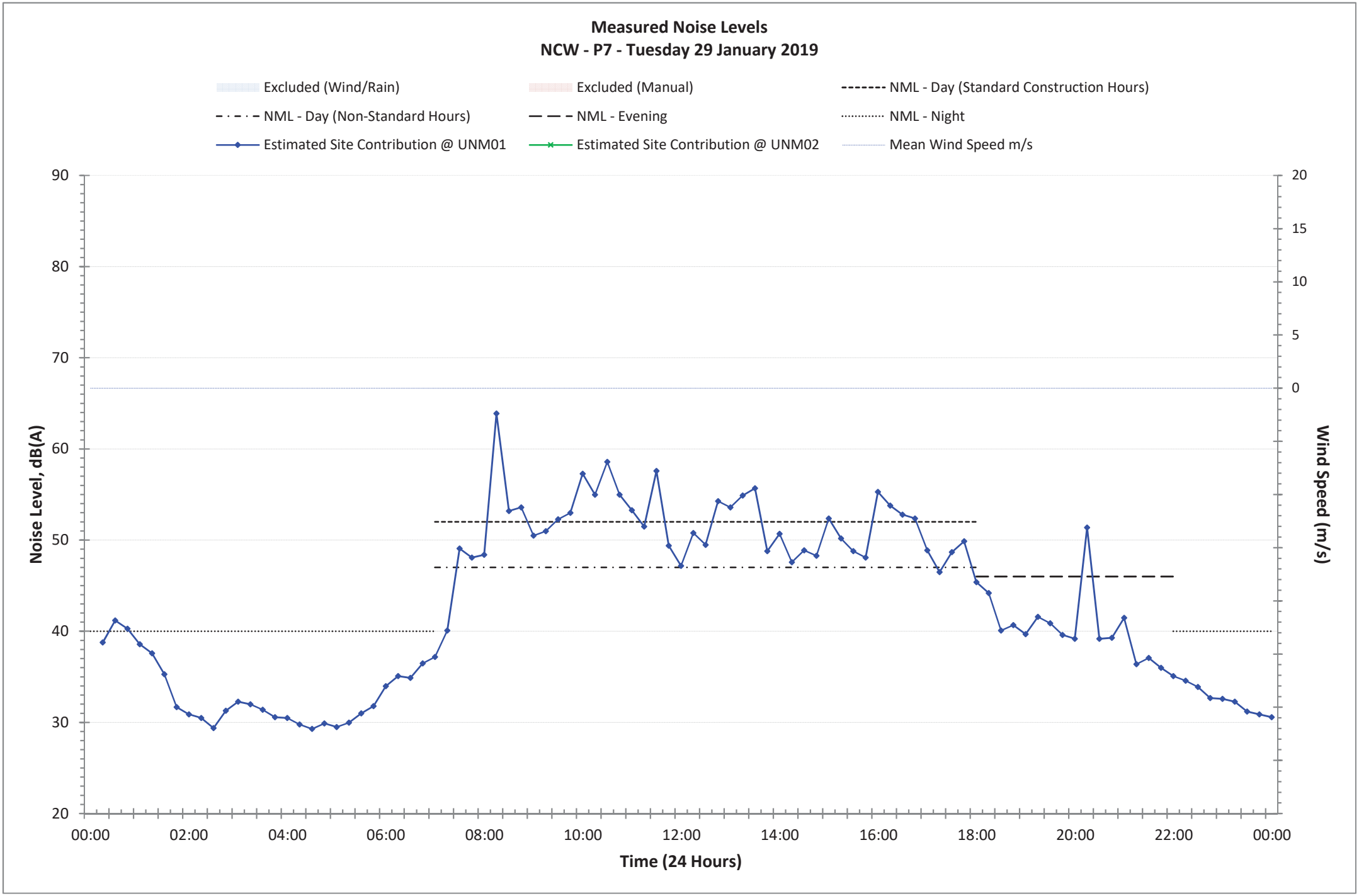
Measured Noise Levels
NCW - P7 - Tuesday 29 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
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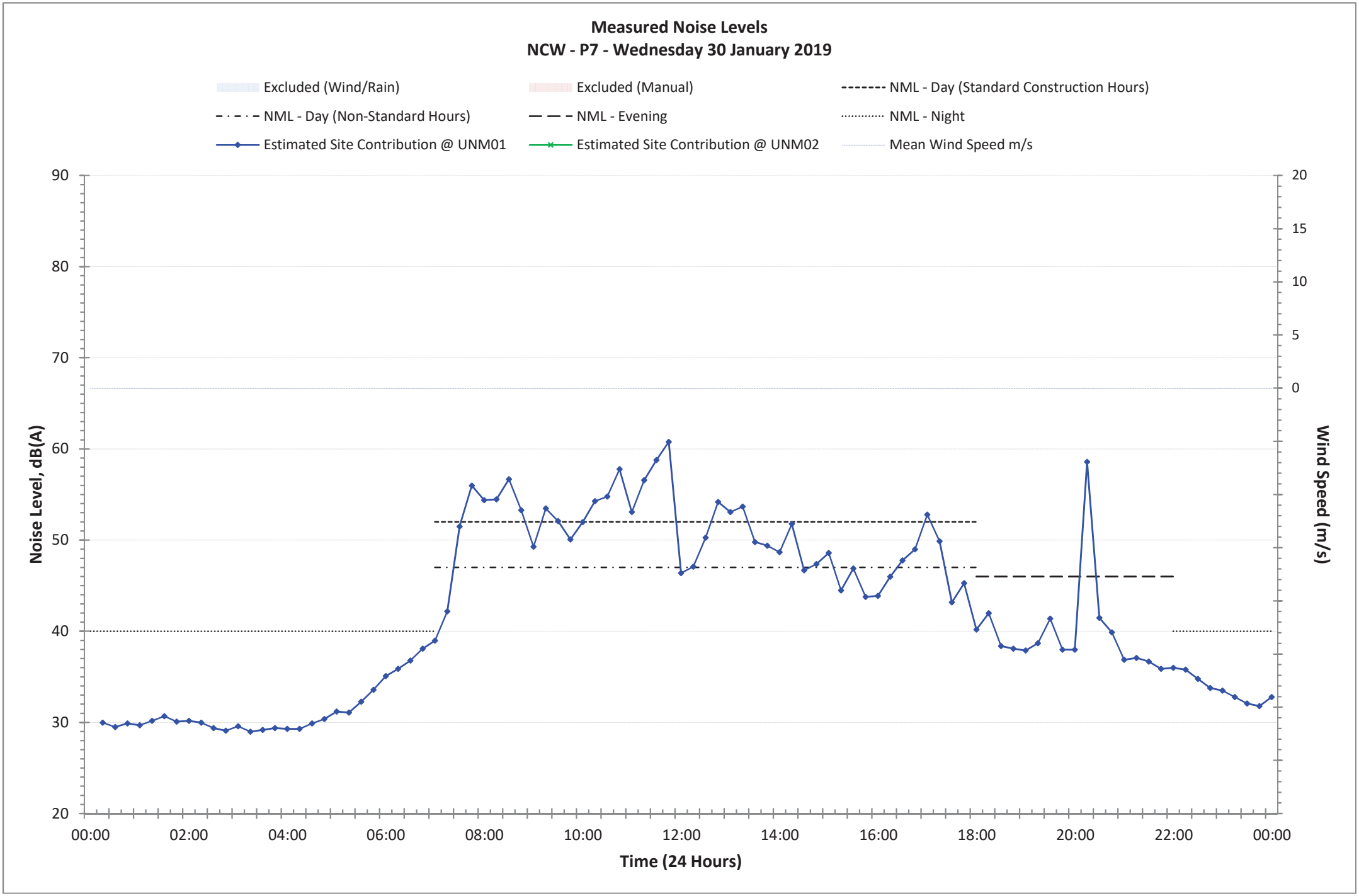
Measured Noise Levels
NCW - P7 - Wednesday 30 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
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02:00
04:00
06:00
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14:00
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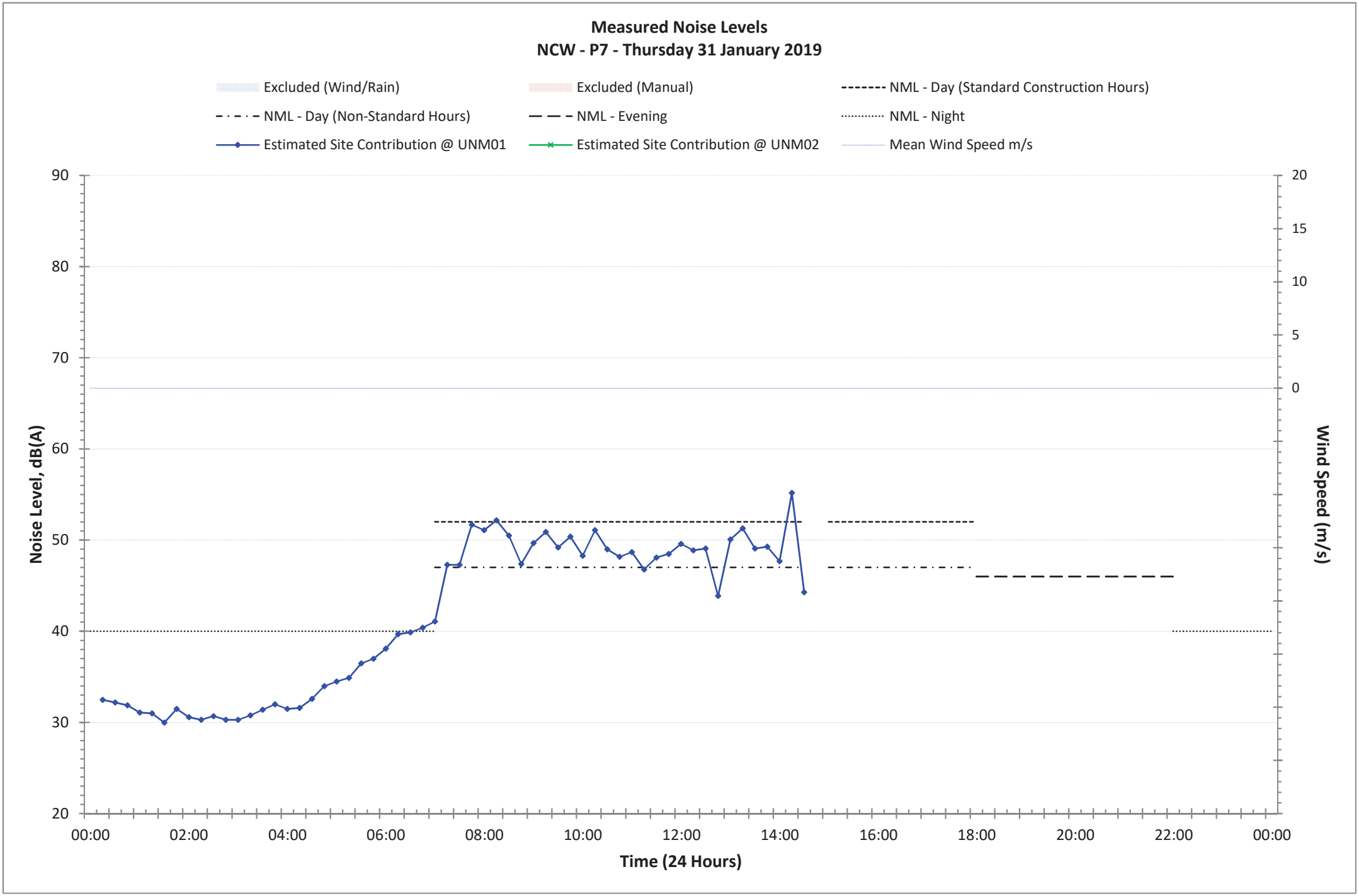
Measured Noise Levels
NCW - P7 - Thursday 31 January 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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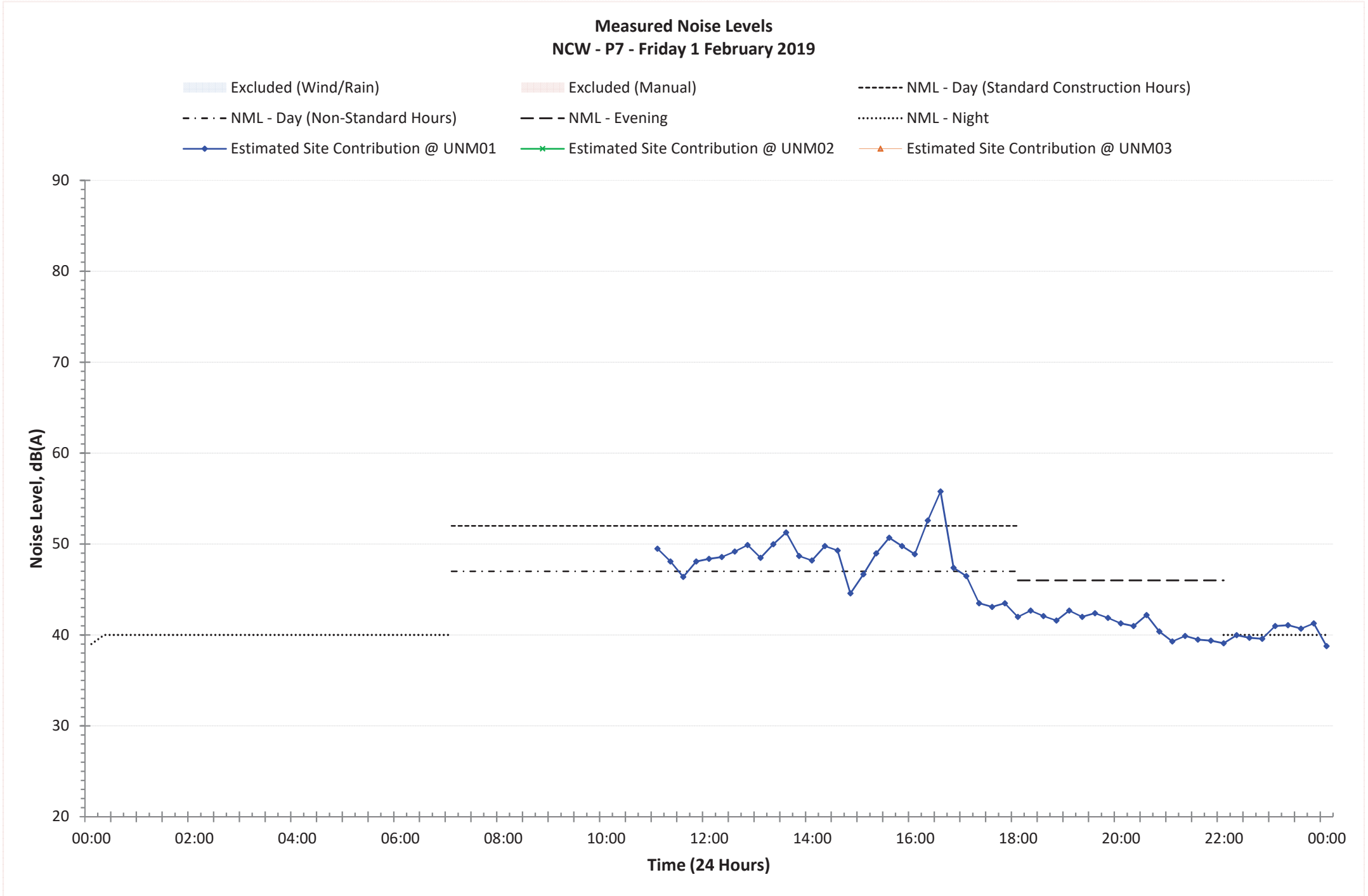
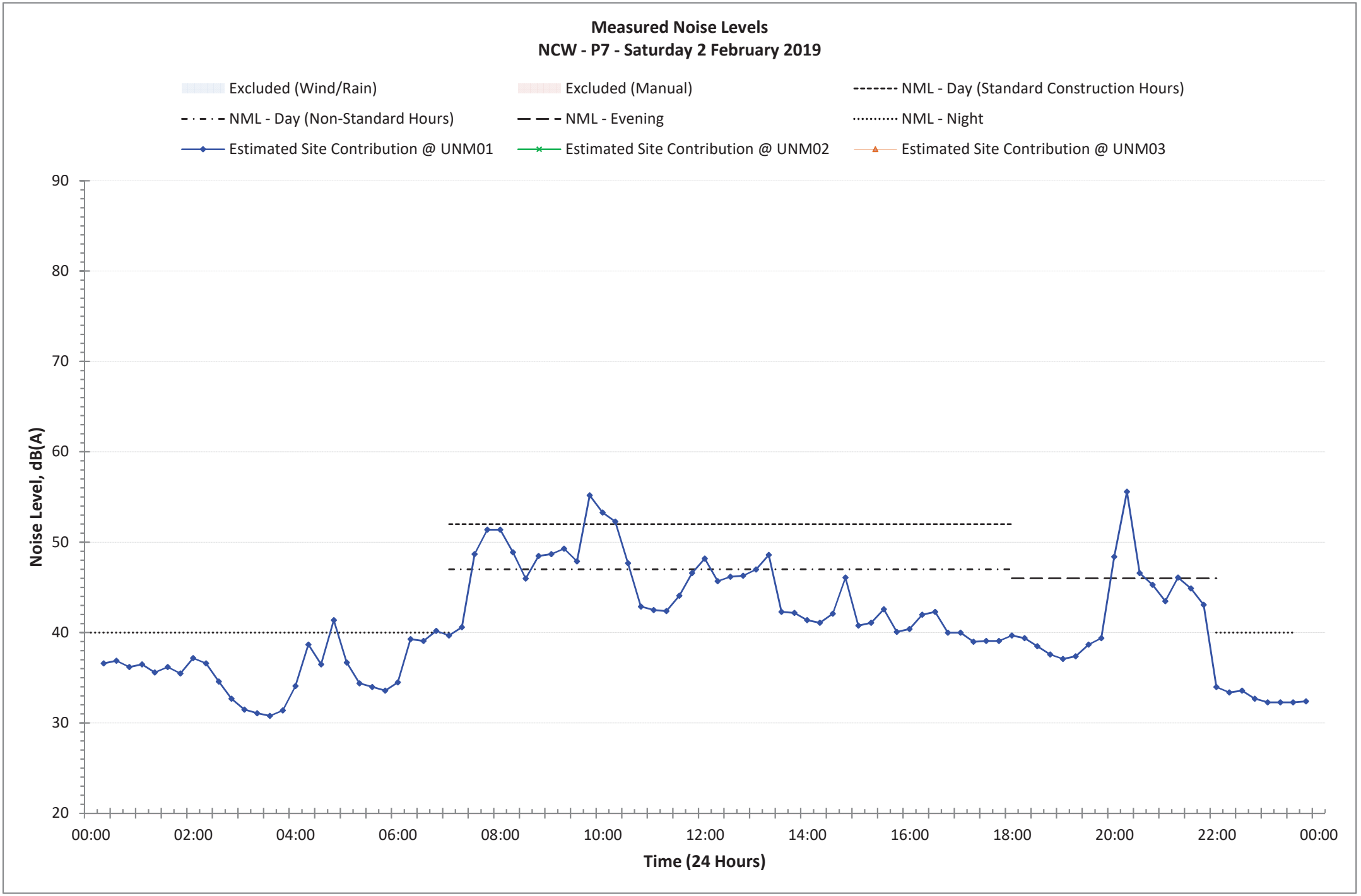
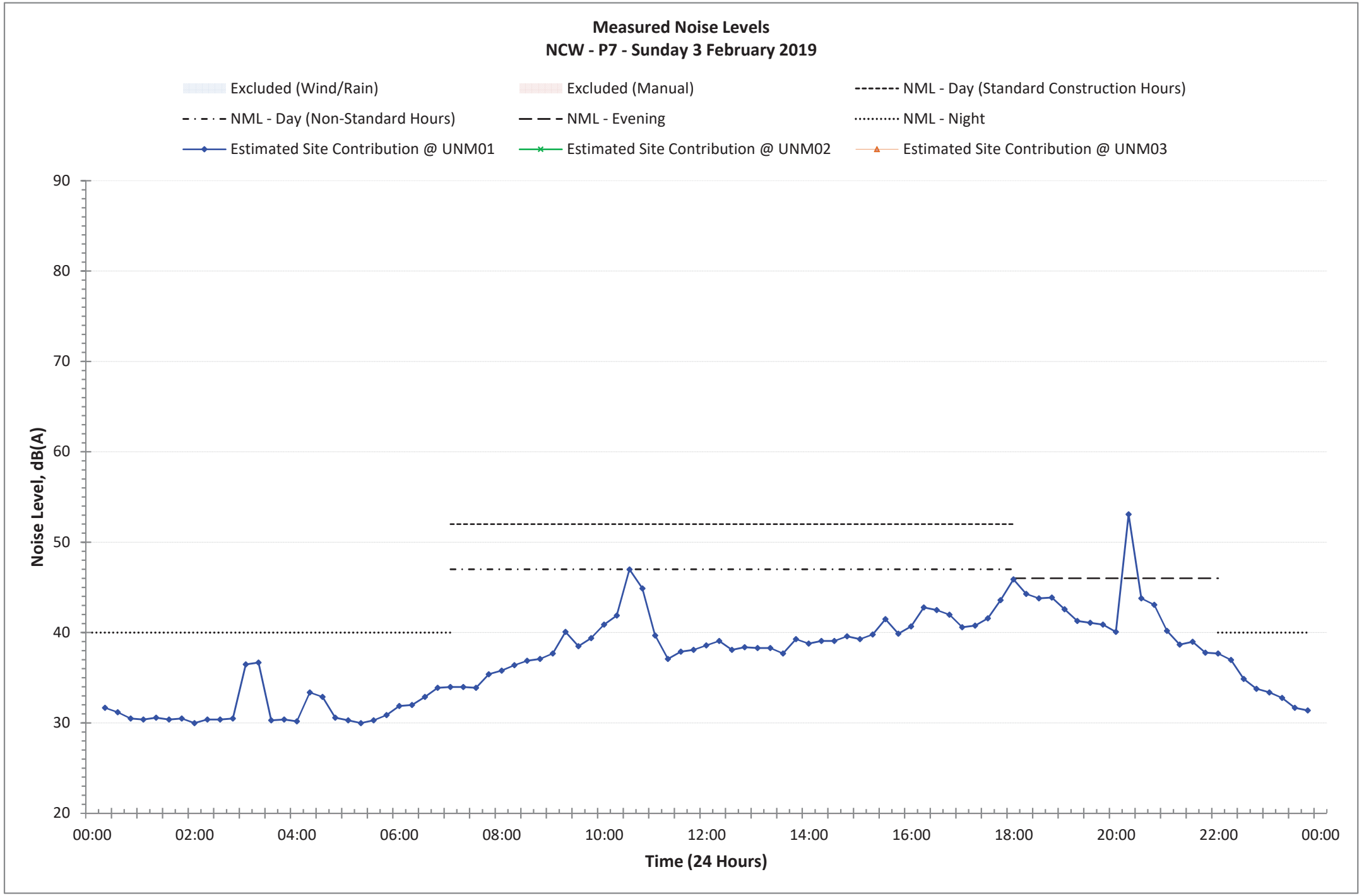
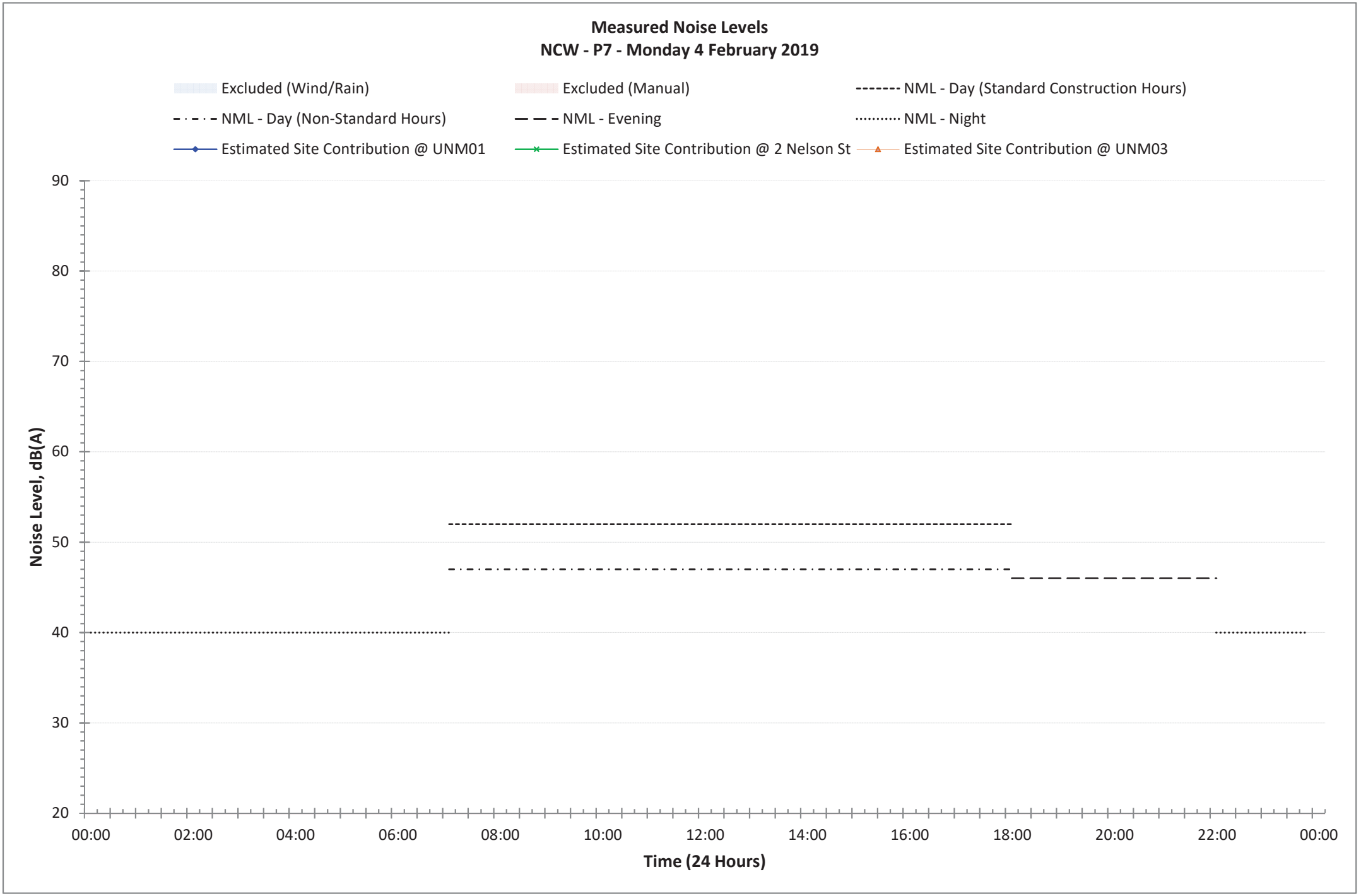
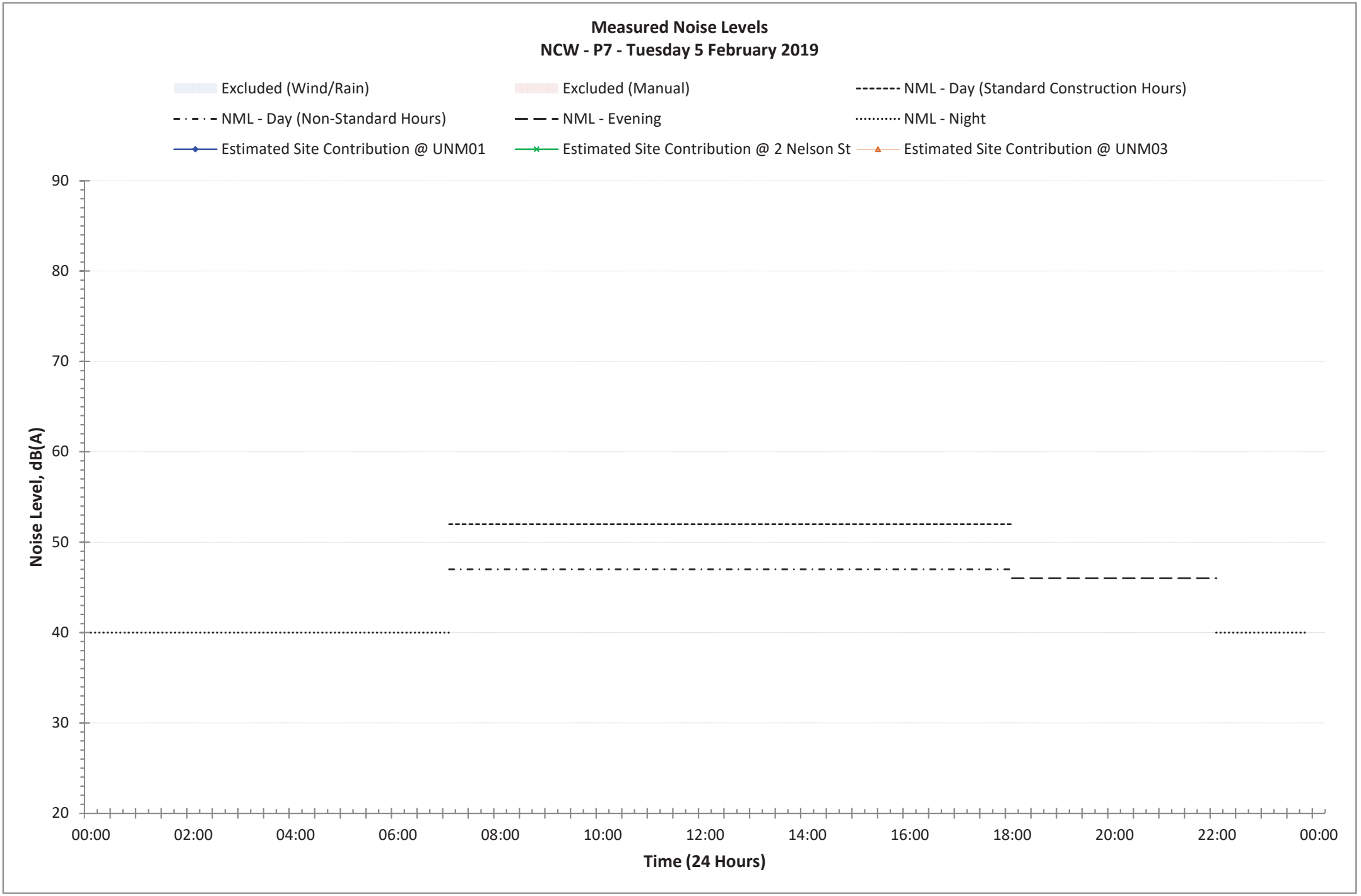
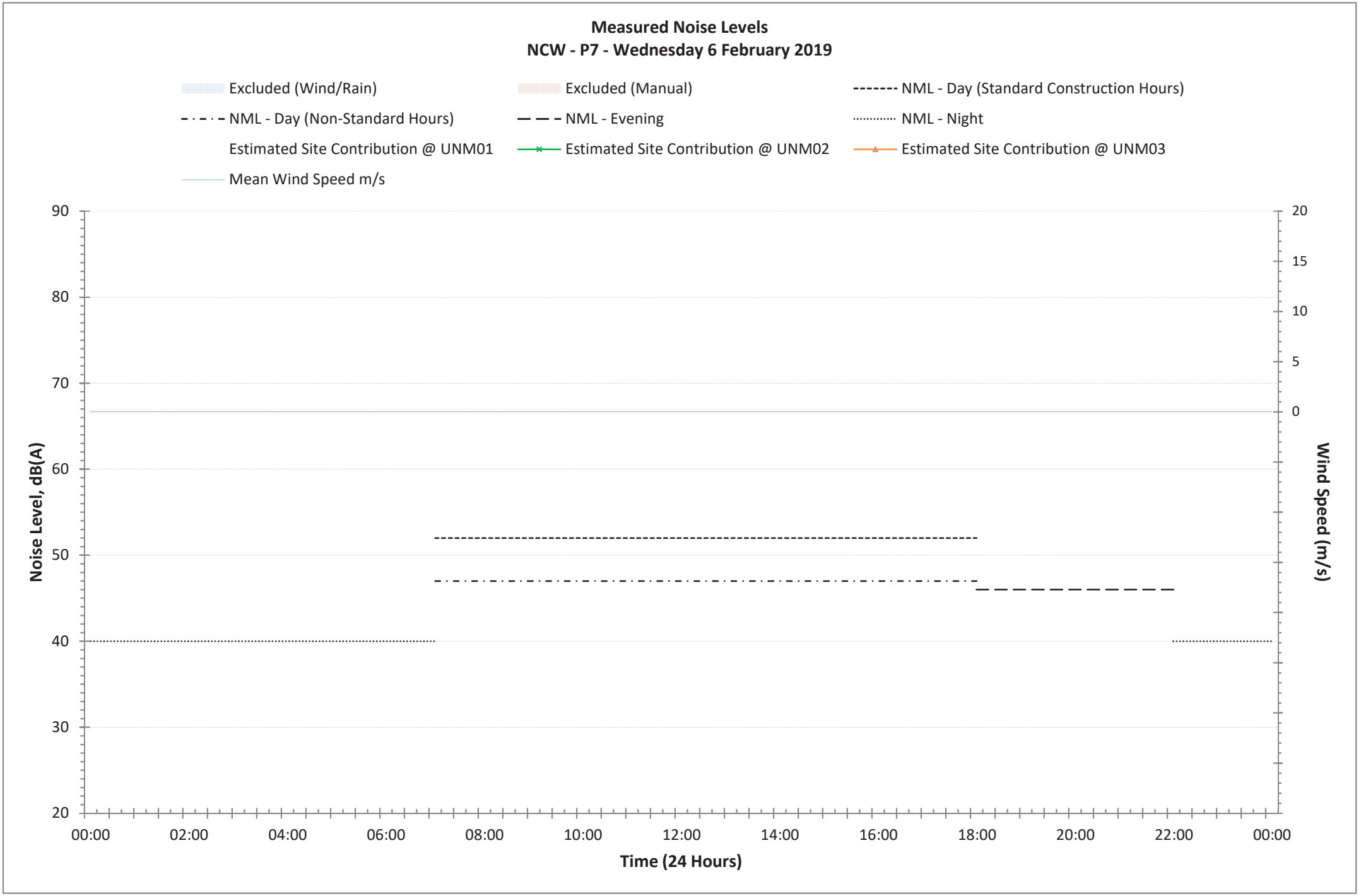

Measured Noise Levels
NCW - P7 - Friday 1 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Saturday 2 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Sunday 3 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Monday 4 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Tuesday 5 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Wednesday 6 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
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06:00
08:00
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12:00
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22:00
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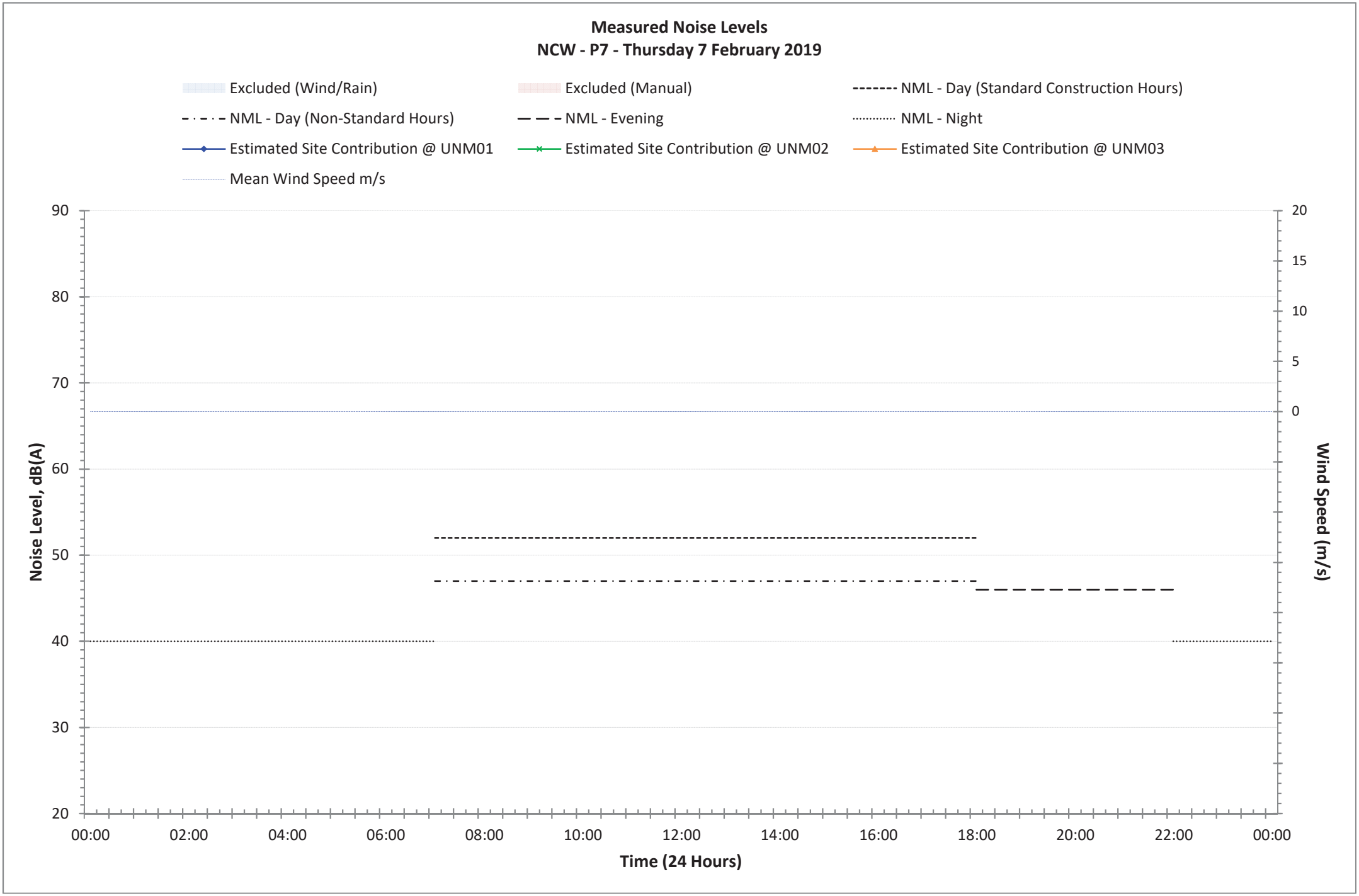
Measured Noise Levels
NCW - P7 - Thursday 7 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
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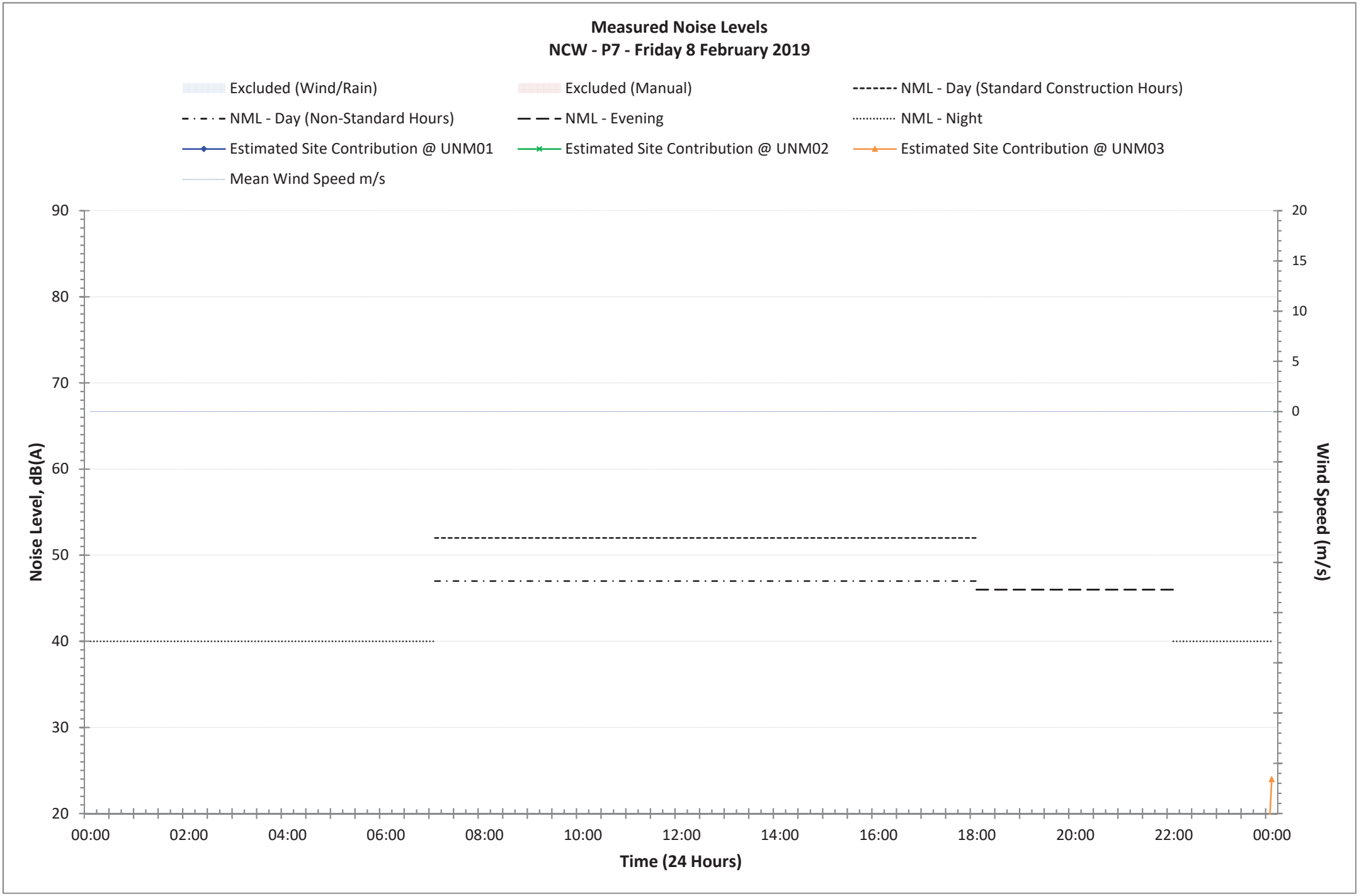
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Friday 8 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
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04:00
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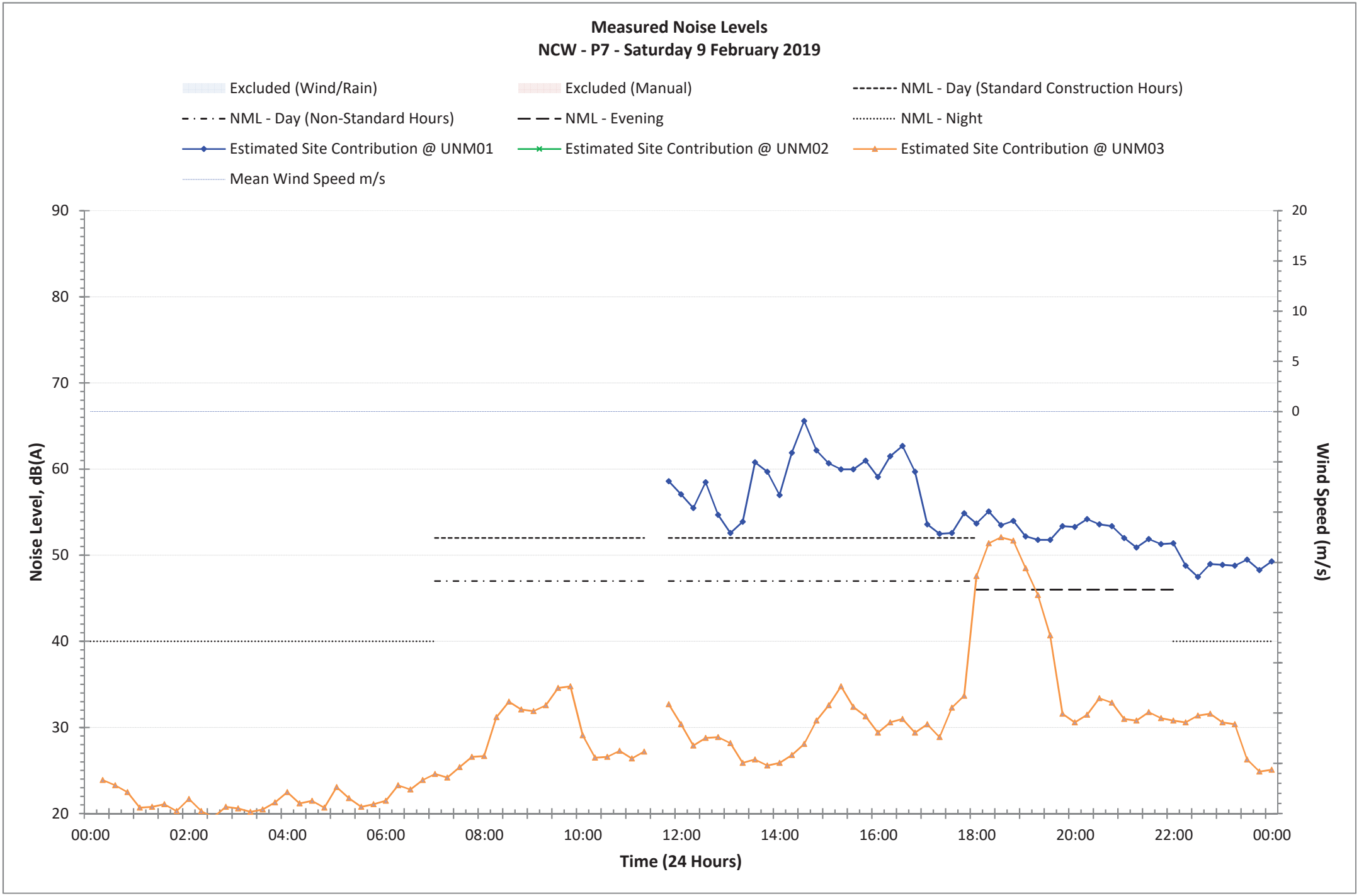
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Saturday 9 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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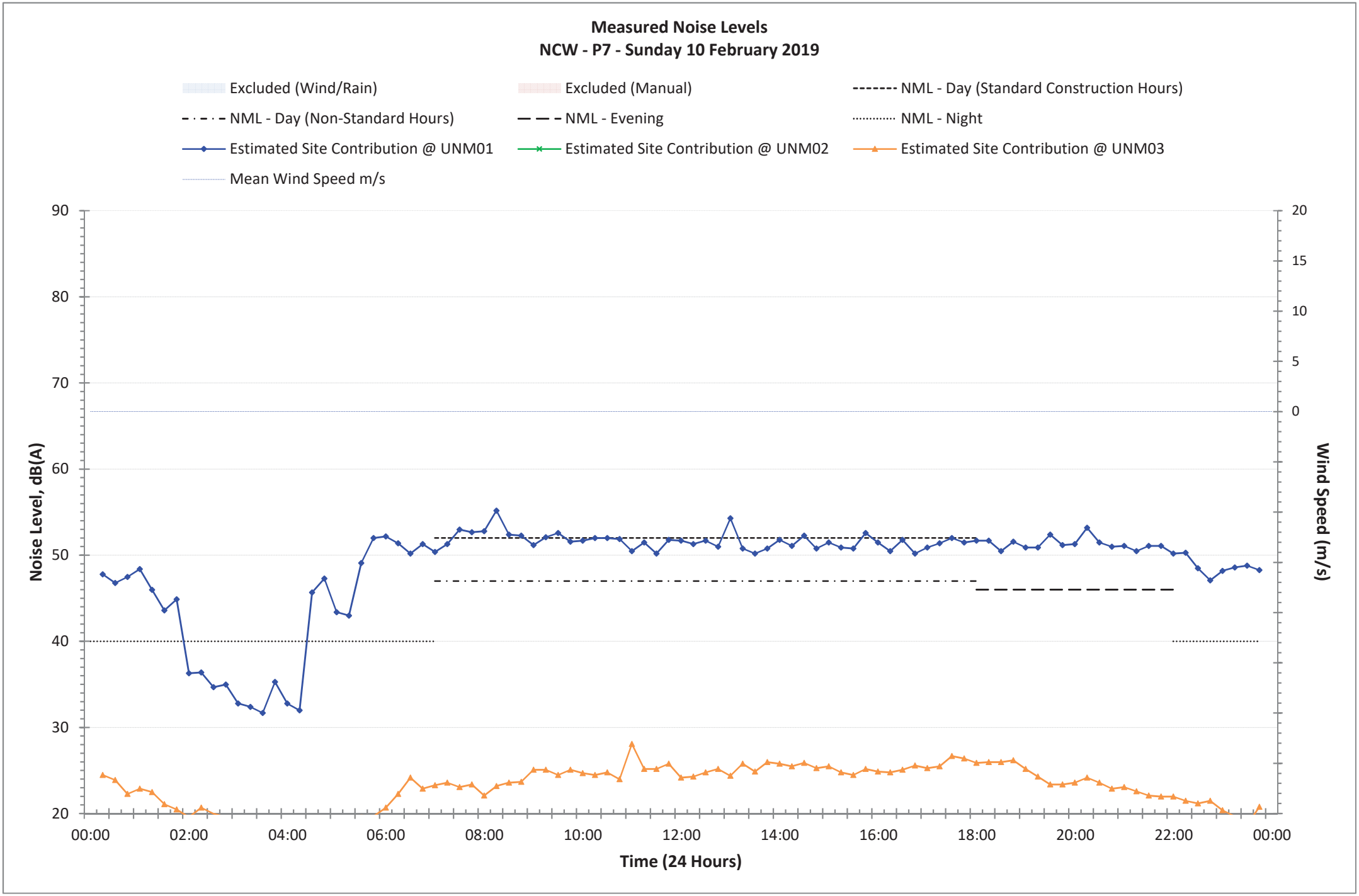
Measured Noise Levels
NCW - P7 - Sunday 10 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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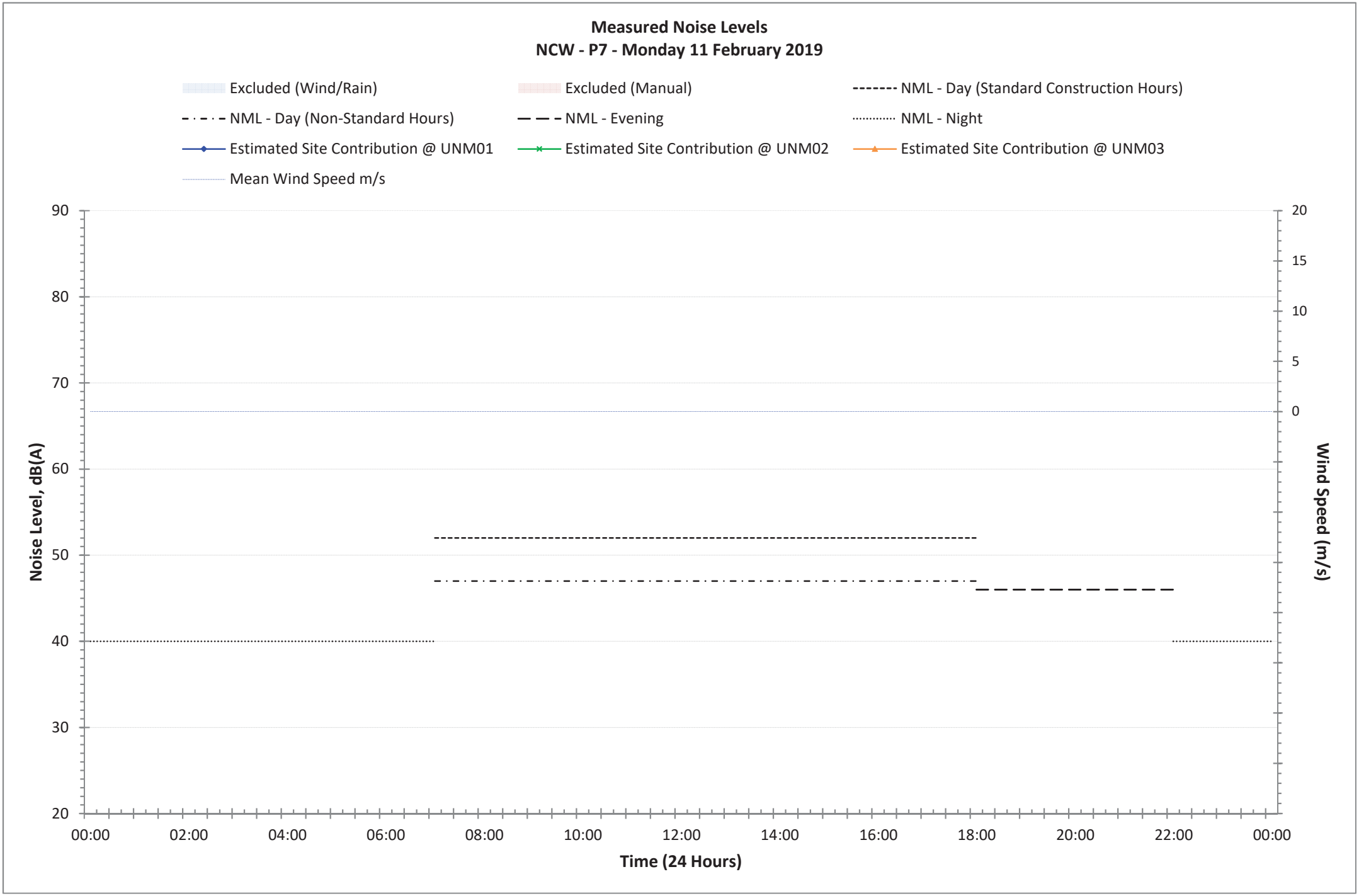
Measured Noise Levels
NCW - P7 - Monday 11 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
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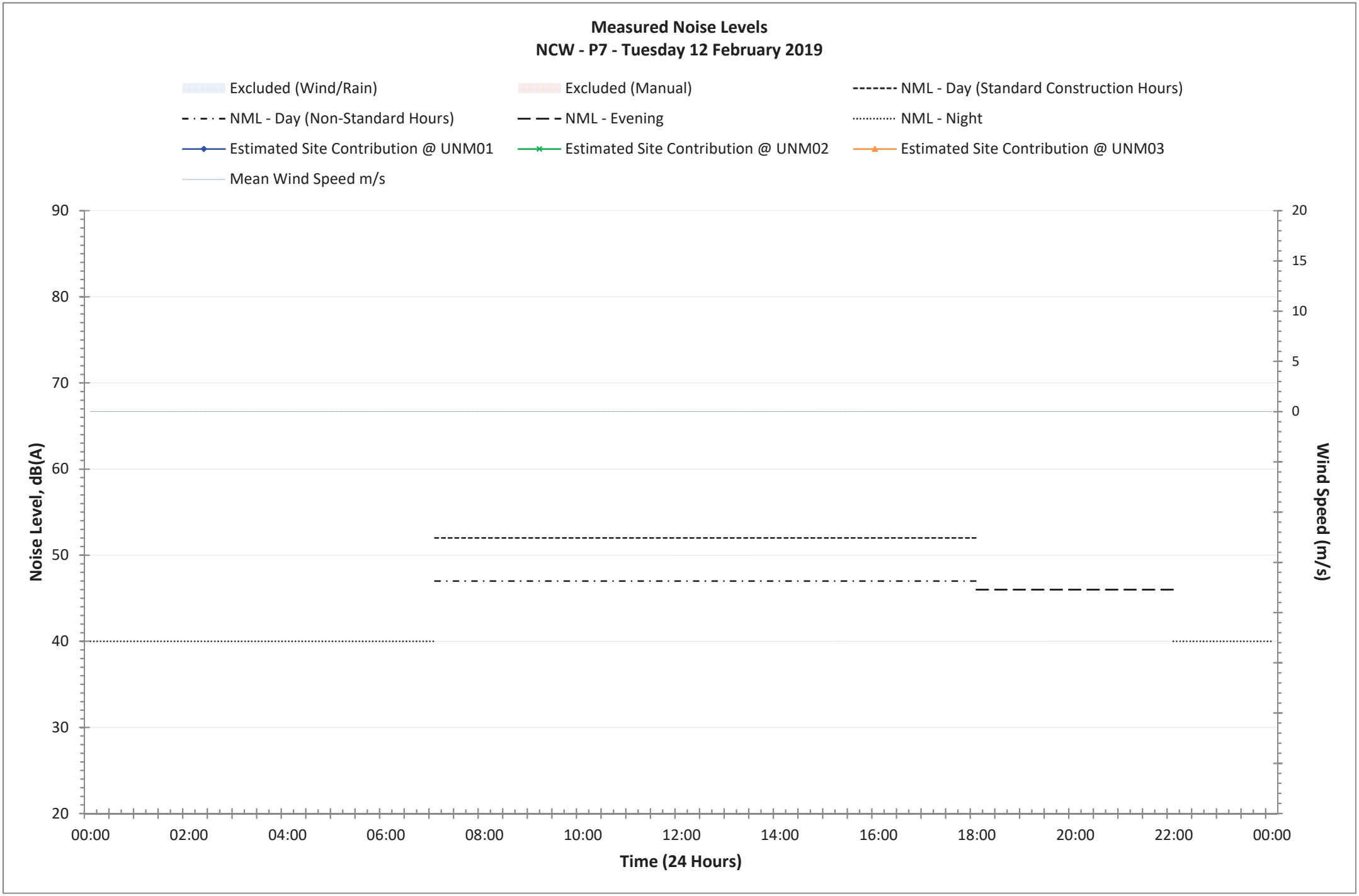
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Tuesday 12 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
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00:00
02:00
04:00
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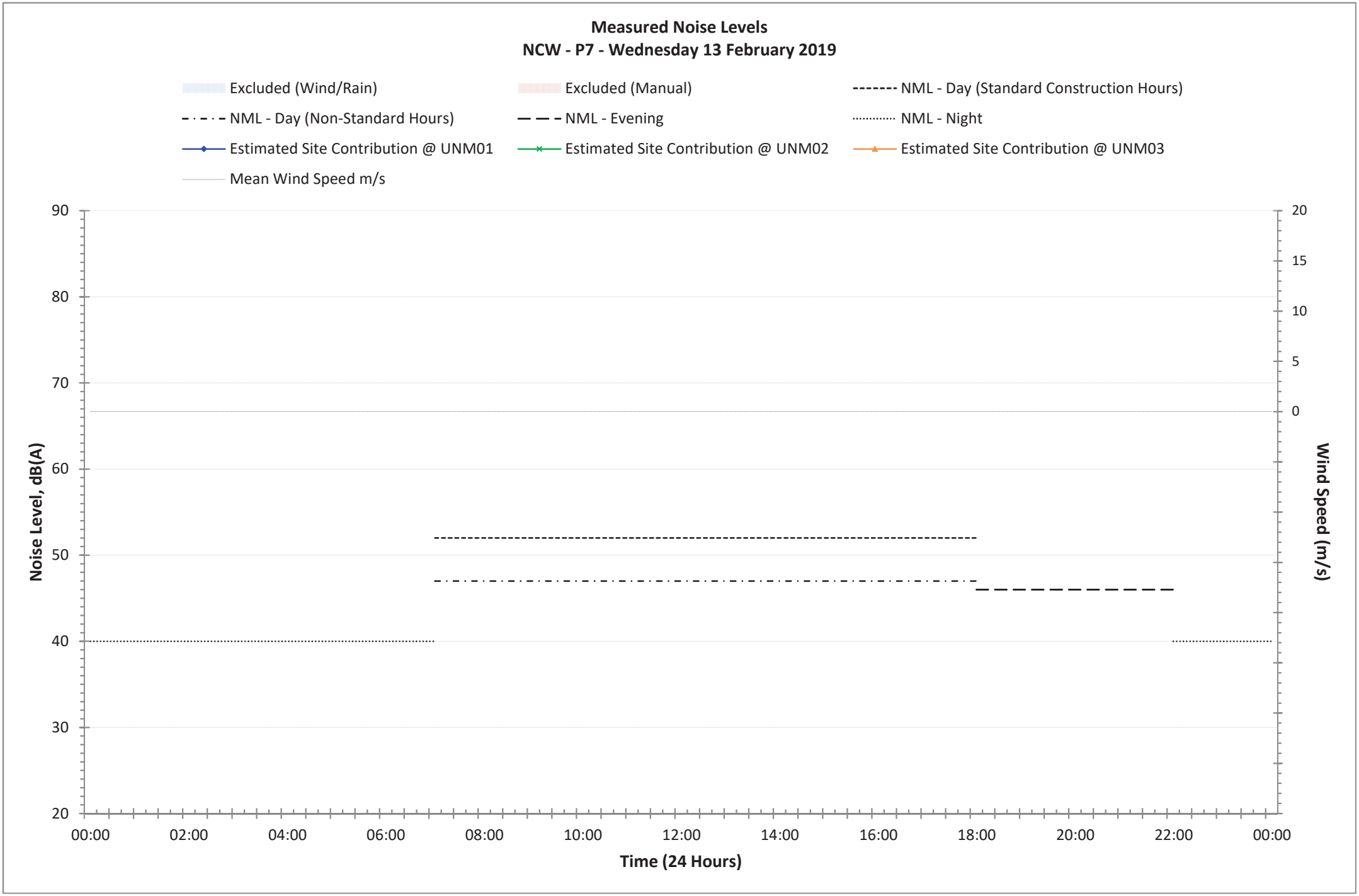
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Wednesday 13 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
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02:00
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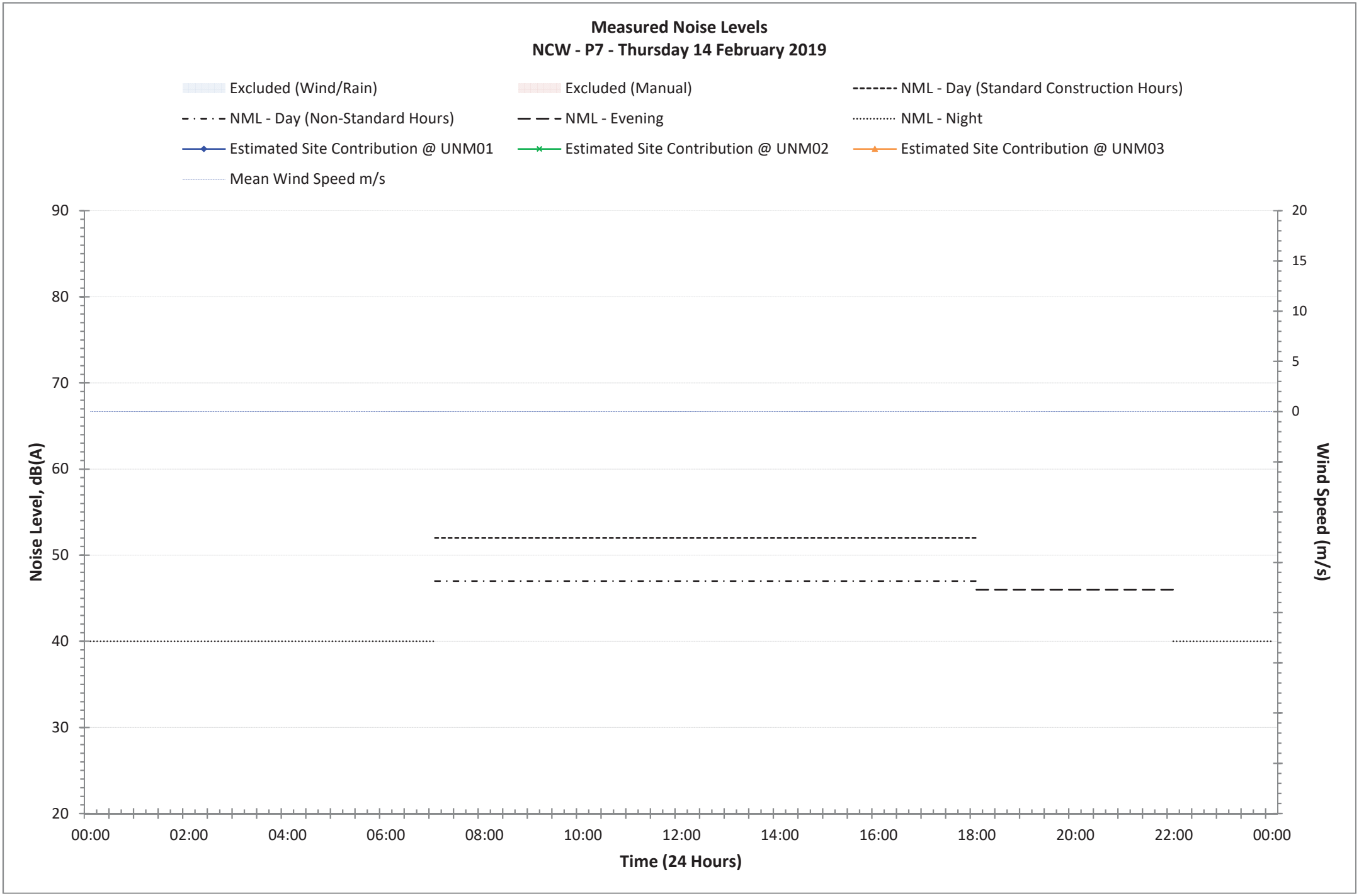
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Thursday 14 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
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12:00
14:00
16:00
18:00
20:00
22:00
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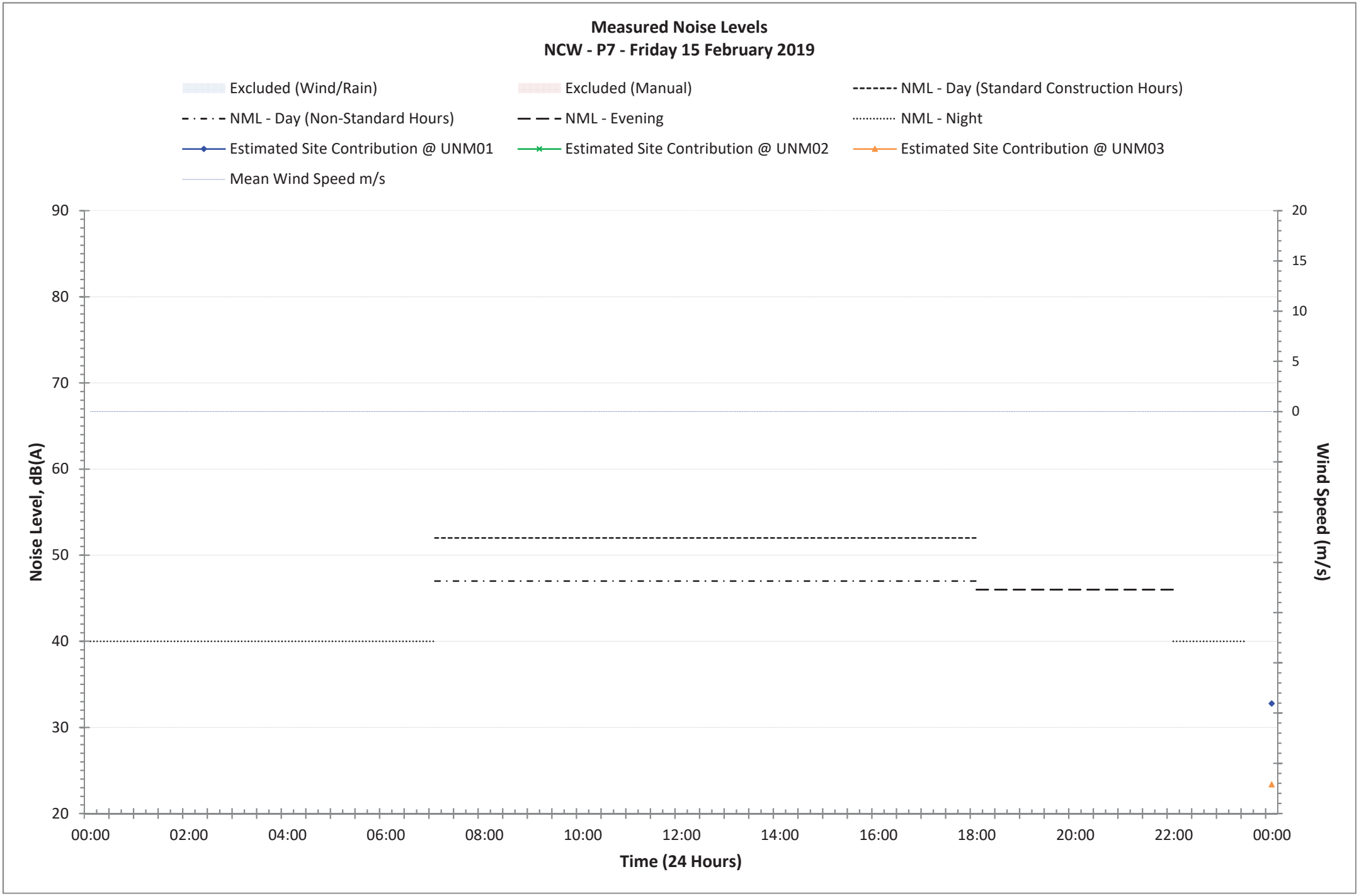
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Friday 15 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
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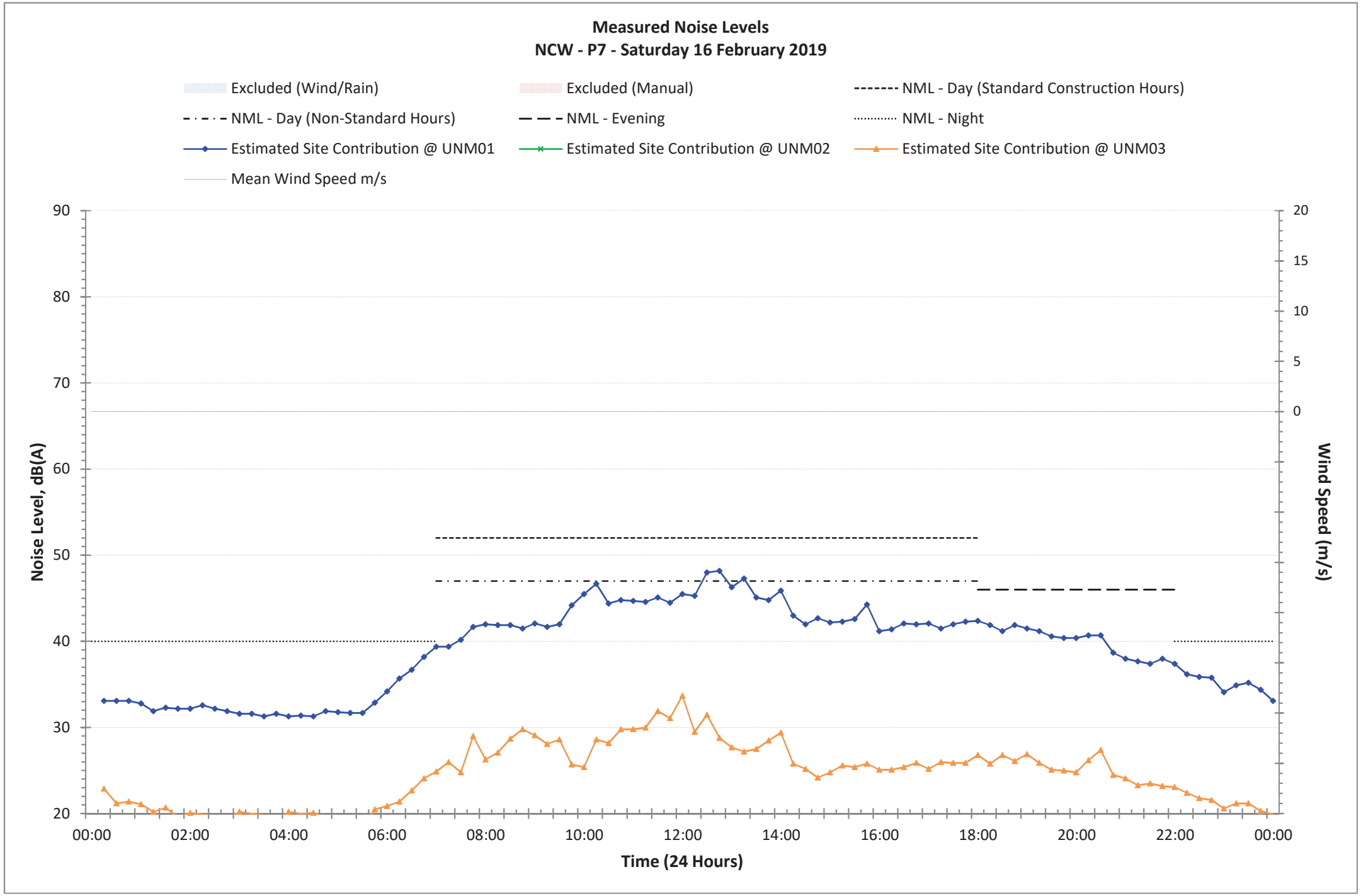
Measured Noise Levels
NCW - P7 - Saturday 16 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
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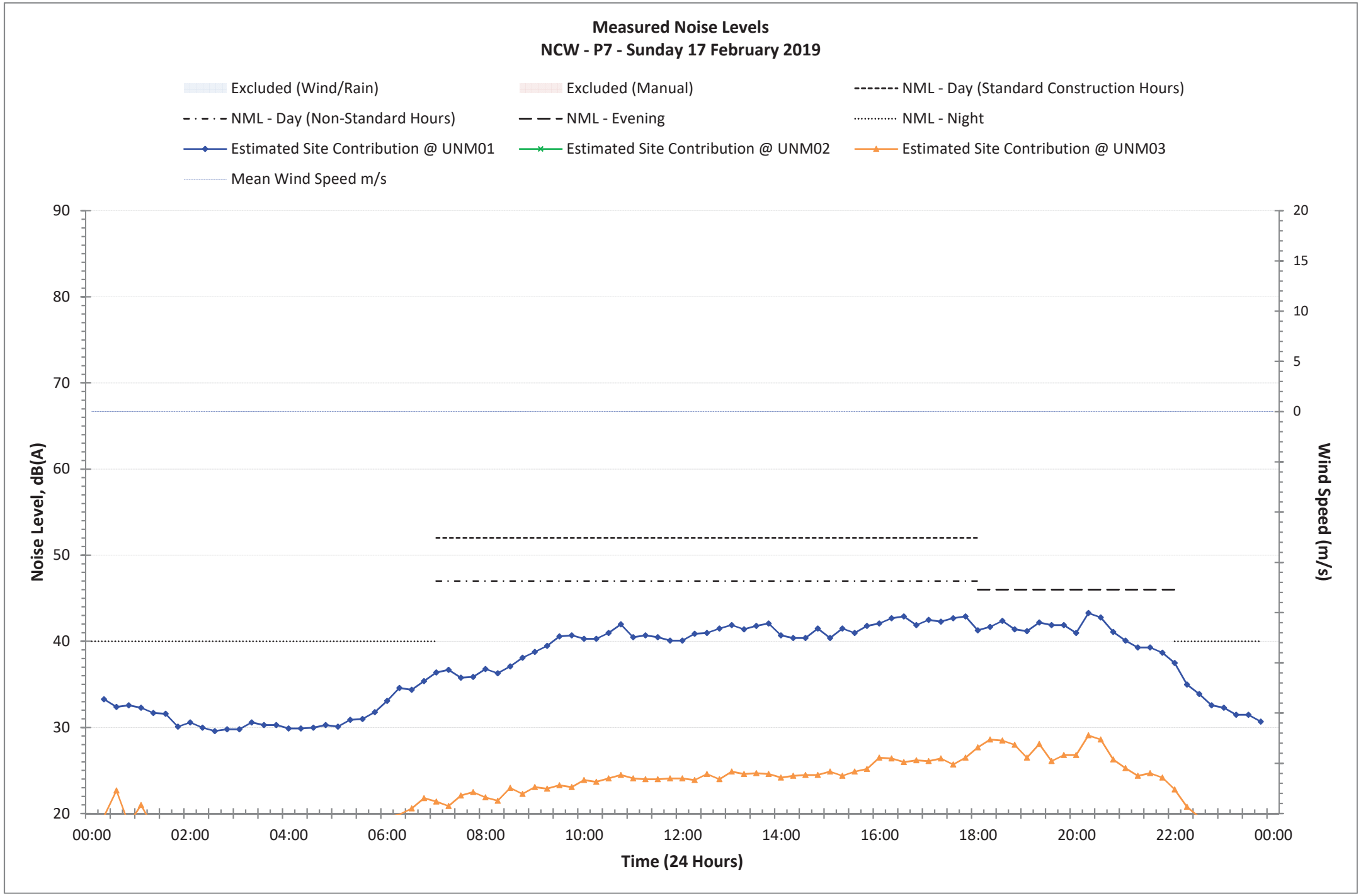
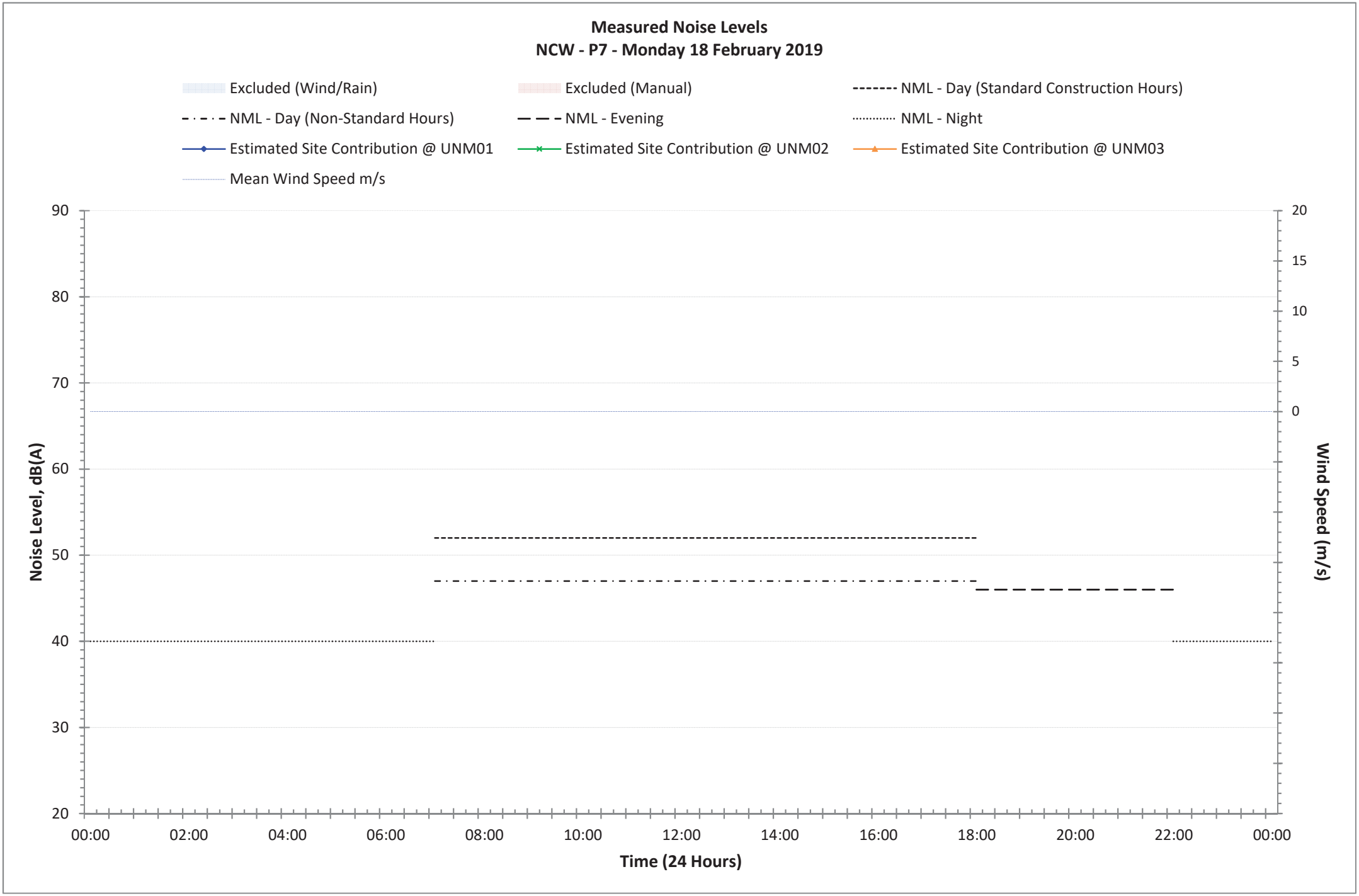
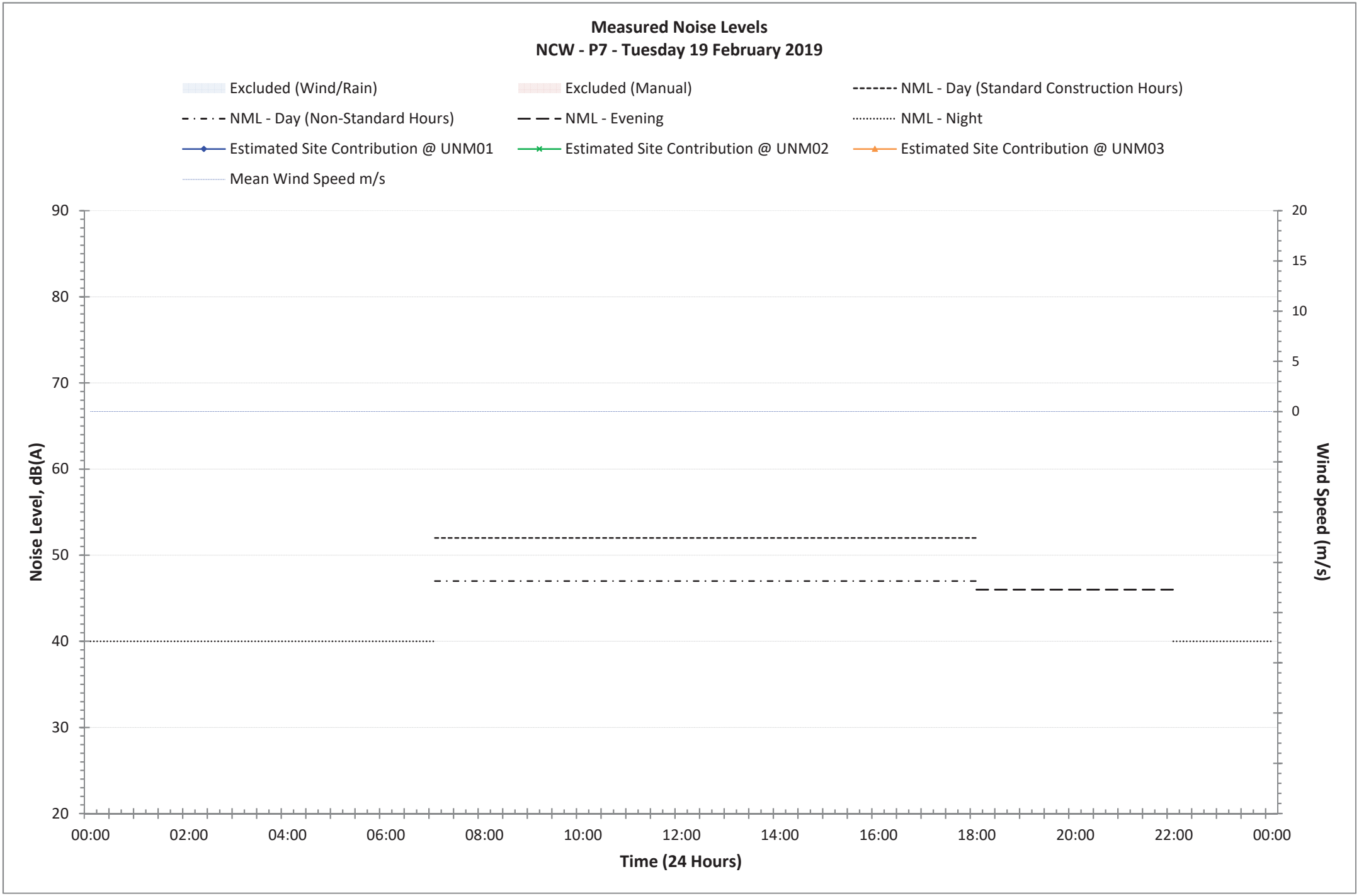
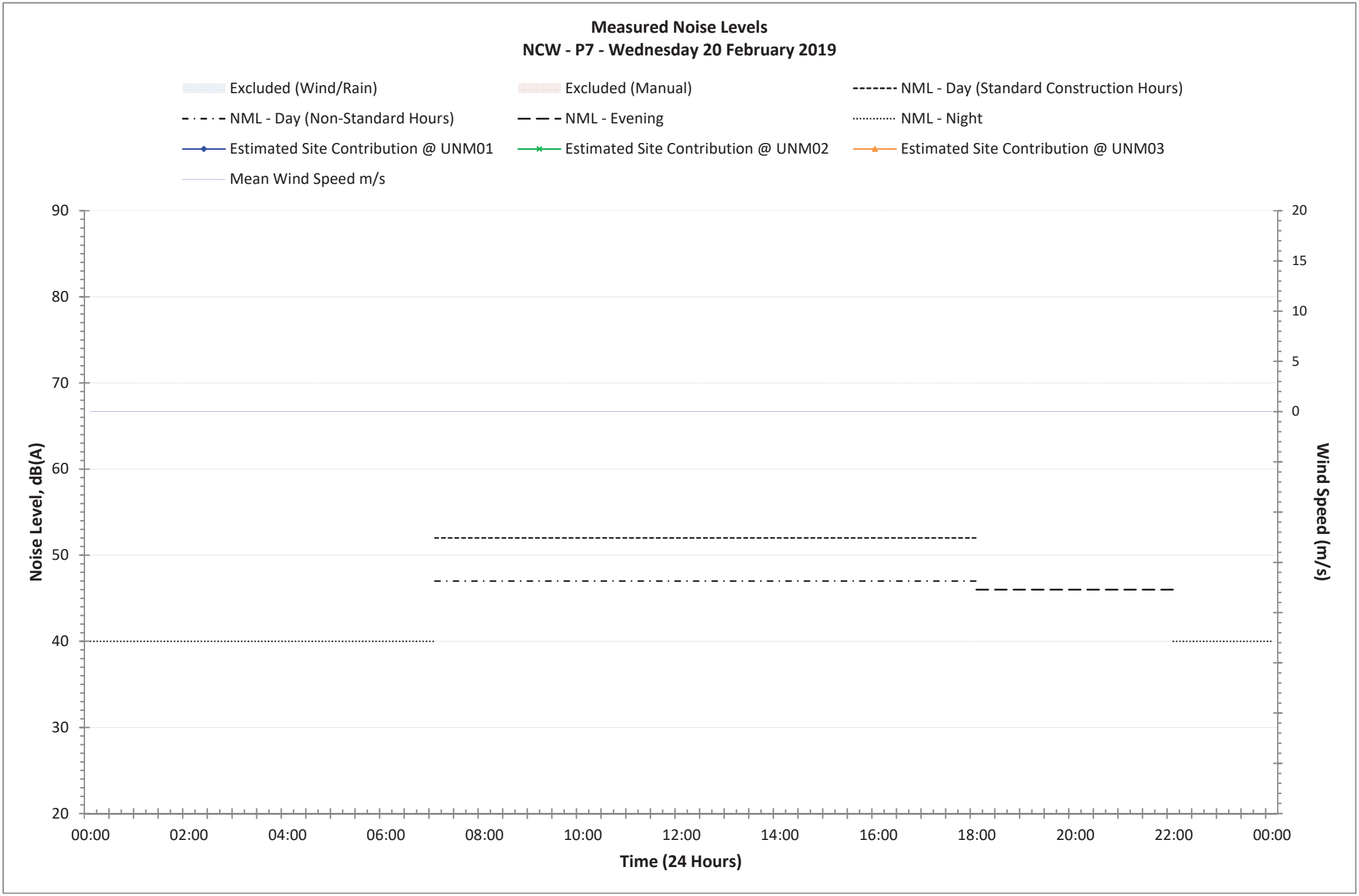
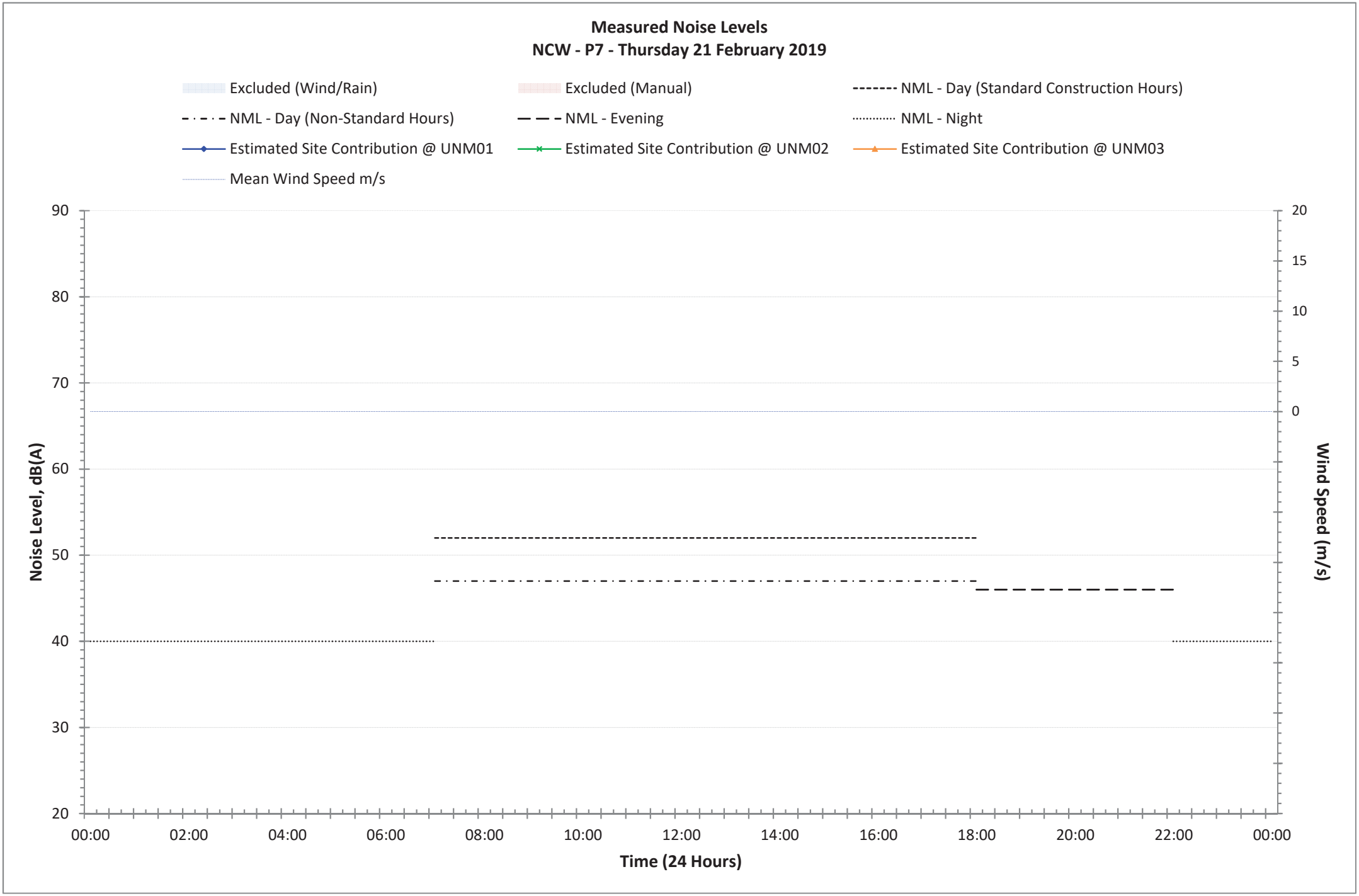
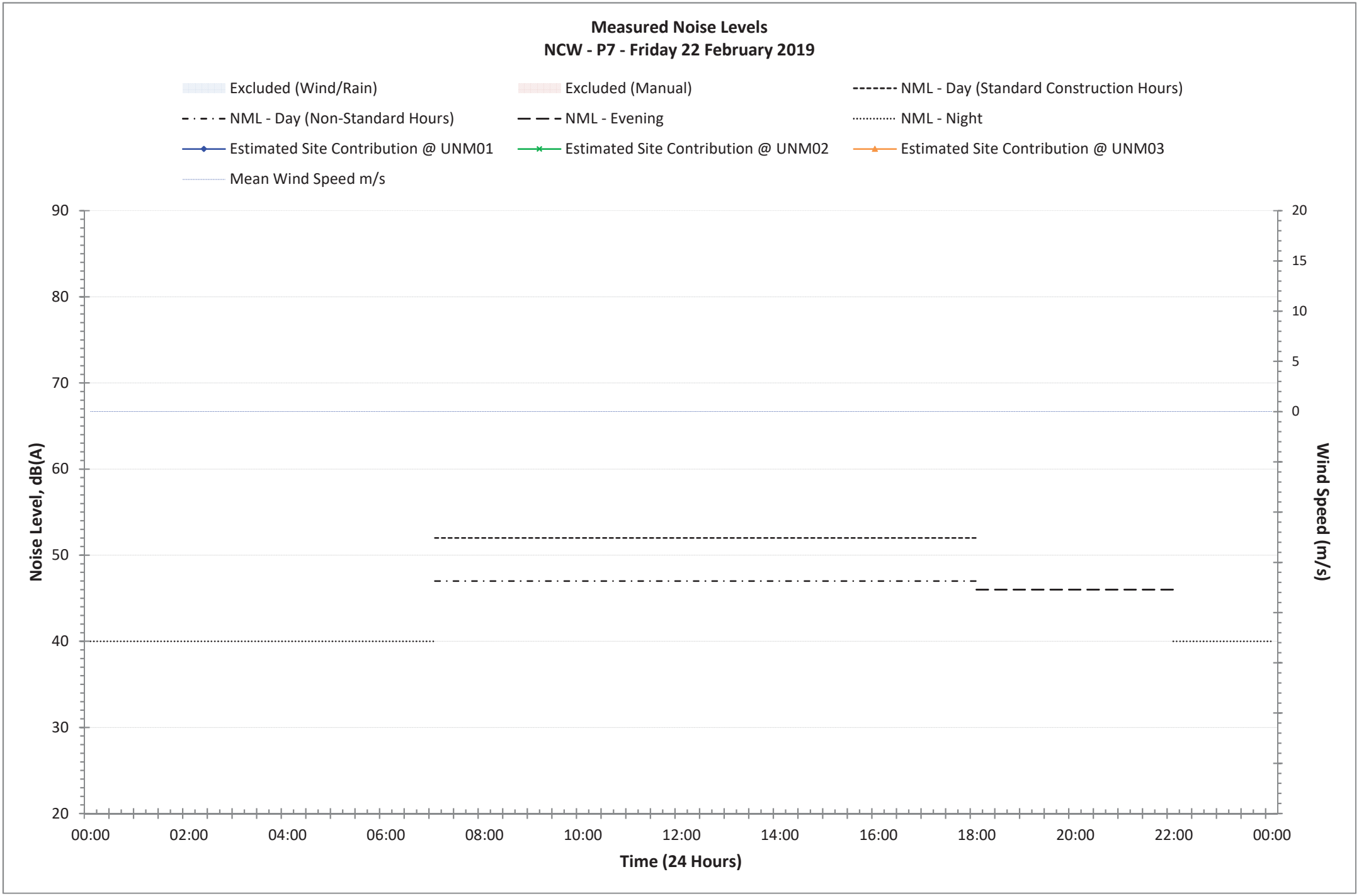

Measured Noise Levels
NCW - P7 - Sunday 17 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

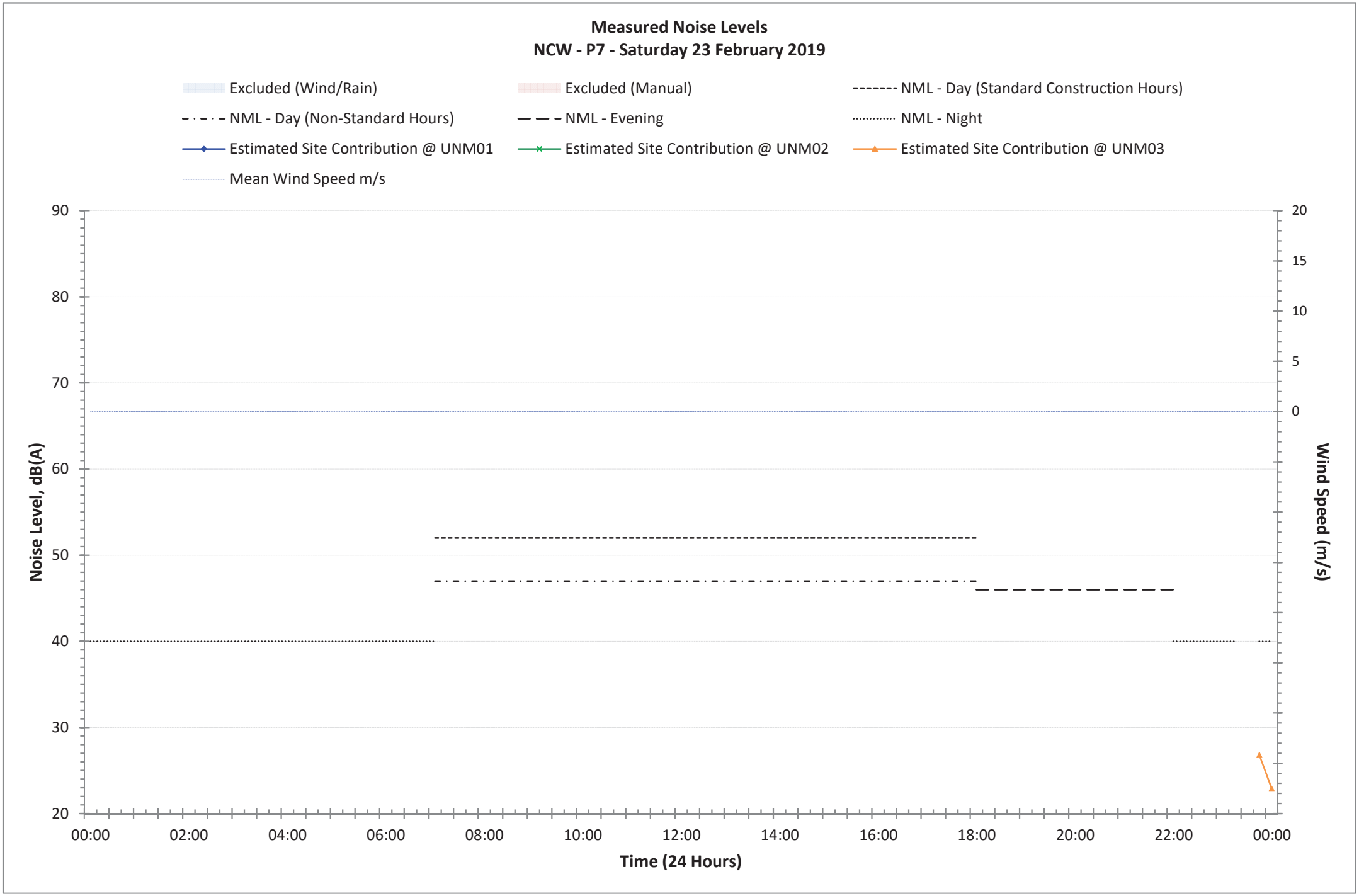

Measured Noise Levels
NCW - P7 - Monday 18 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

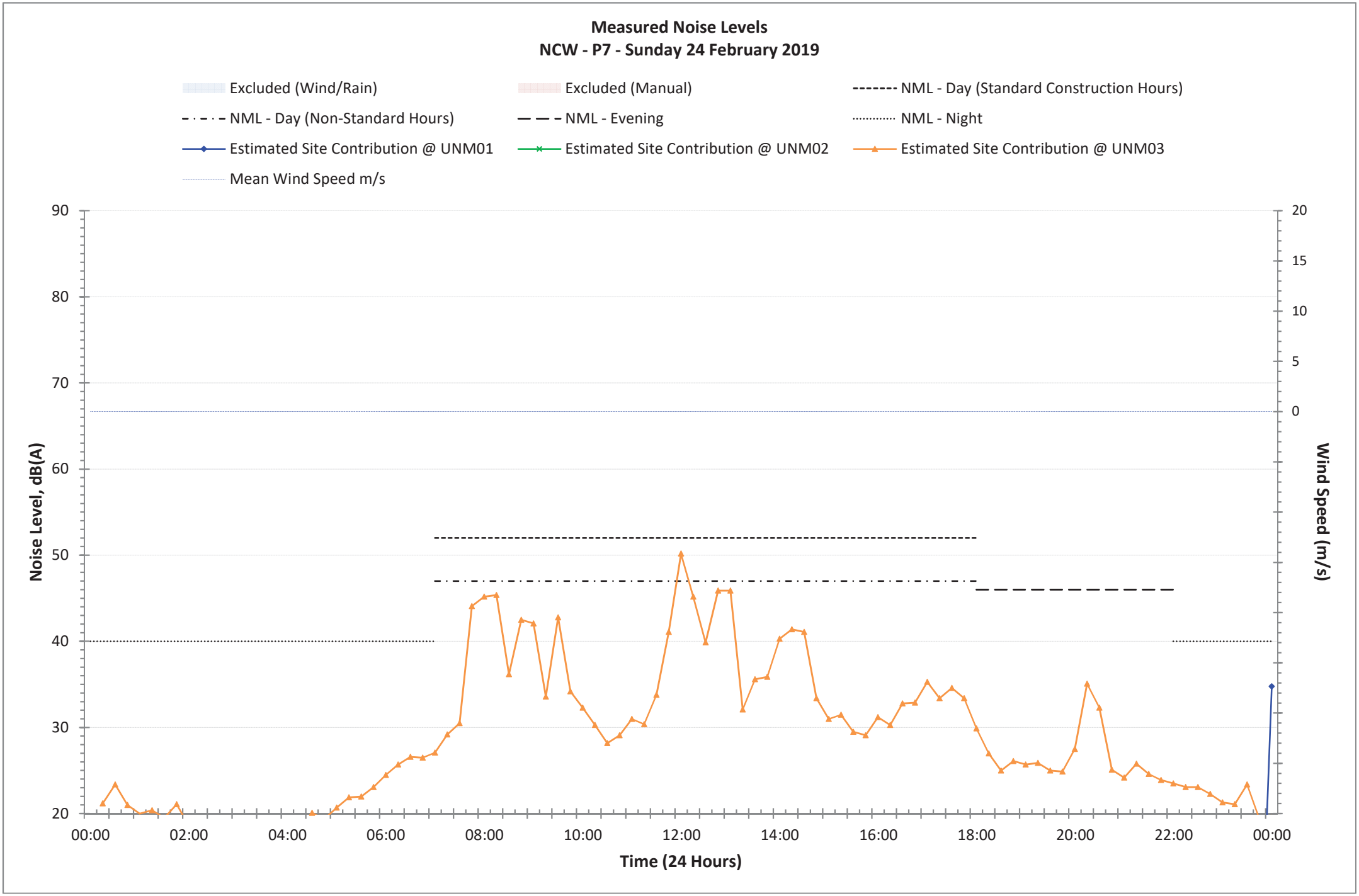

Measured Noise Levels
NCW - P7 - Tuesday 19 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Wednesday 20 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Thursday 21 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Friday 22 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Saturday 23 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Sunday 24 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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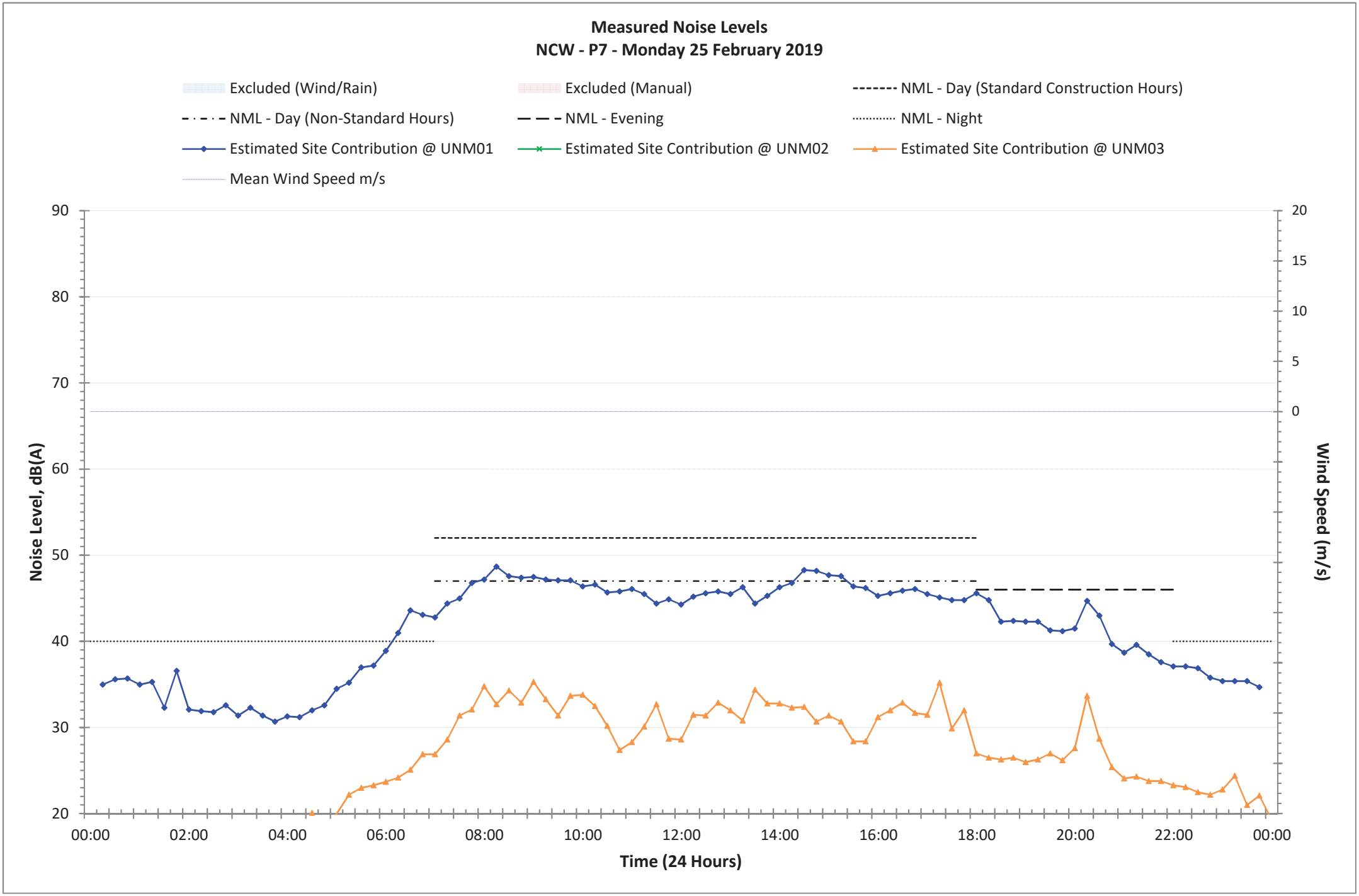
Measured Noise Levels
NCW - P7 - Monday 25 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
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02:00
04:00
06:00
08:00
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14:00
16:00
18:00
20:00
22:00
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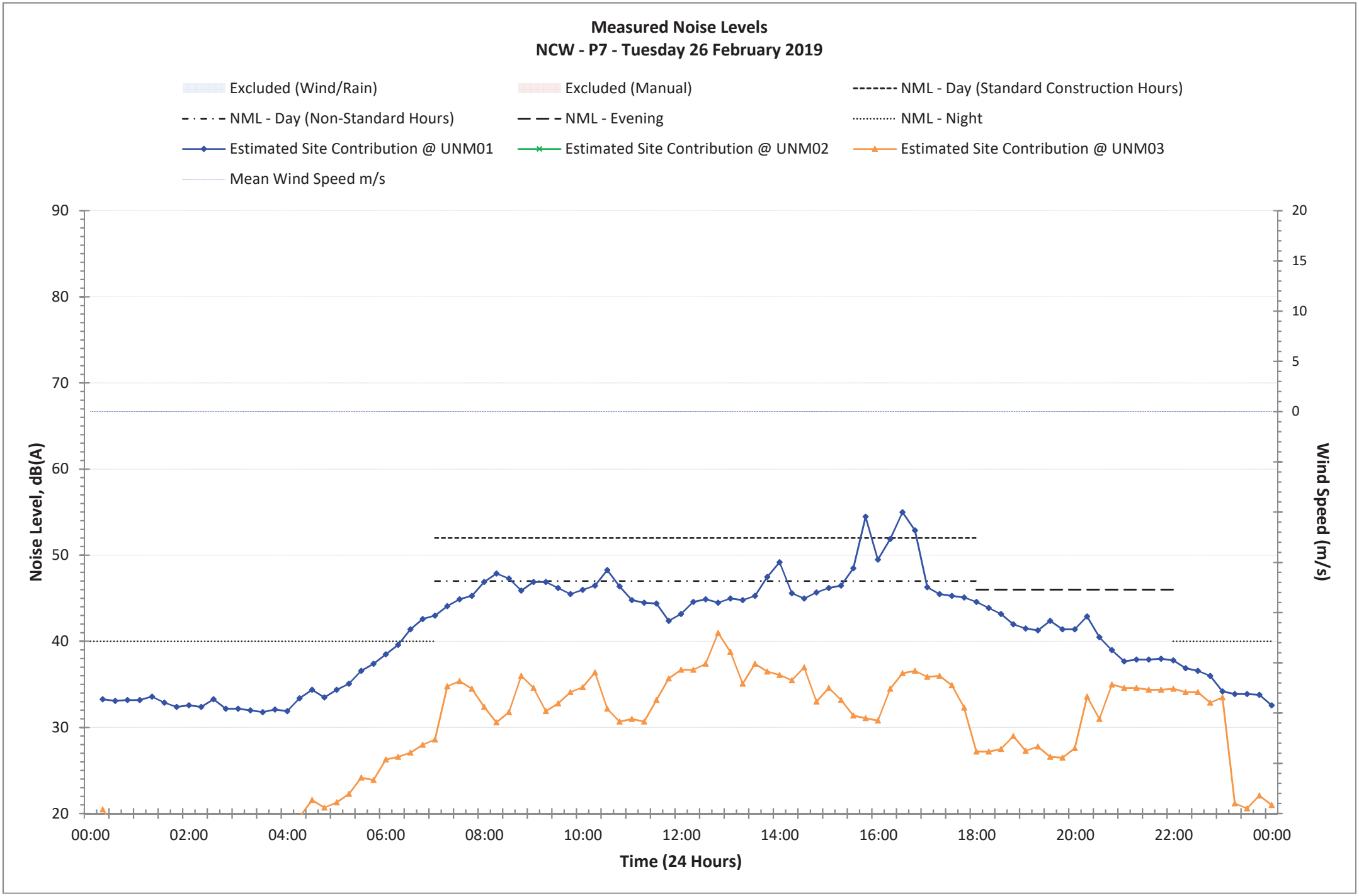
Measured Noise Levels
NCW - P7 - Tuesday 26 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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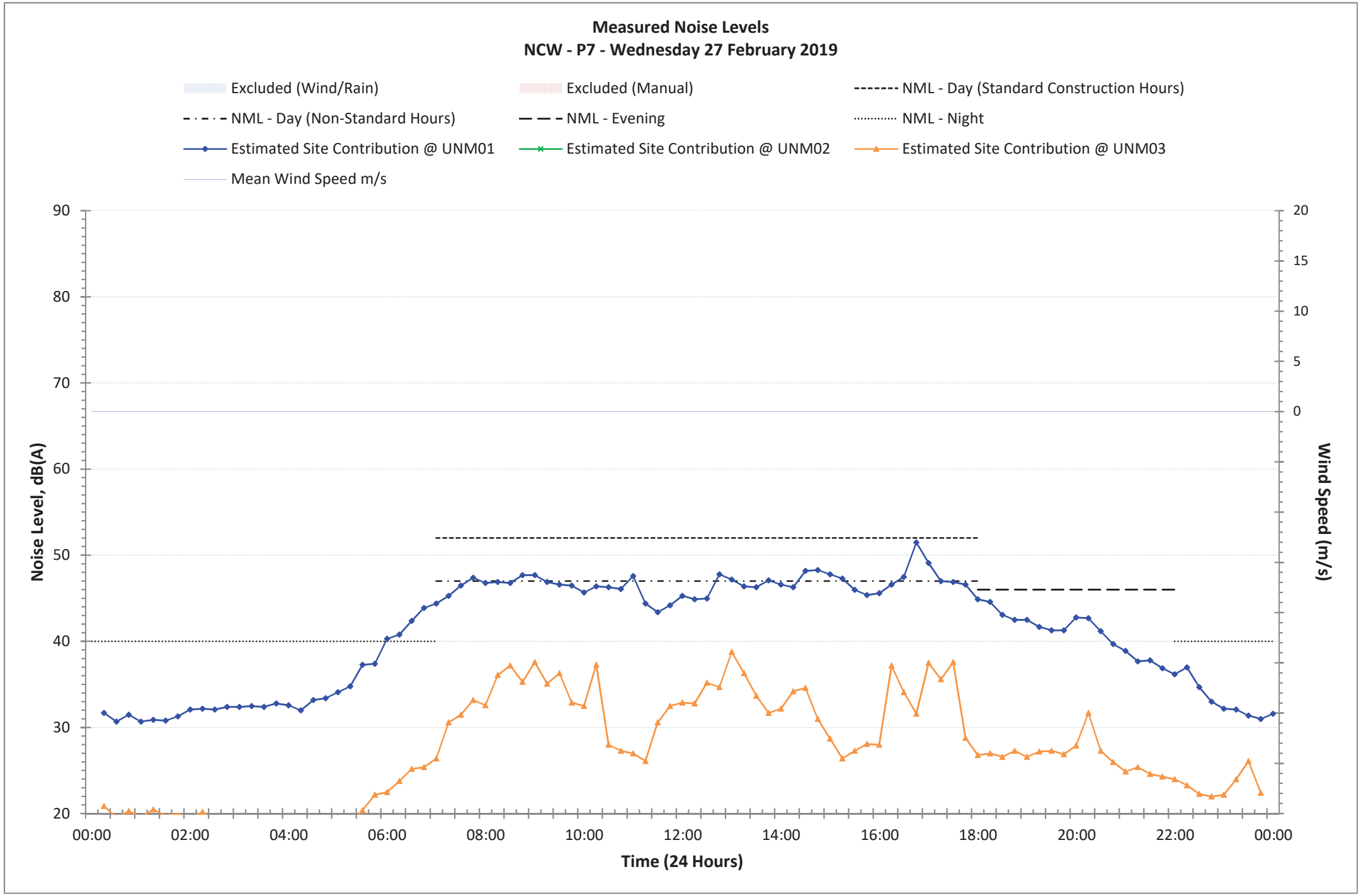
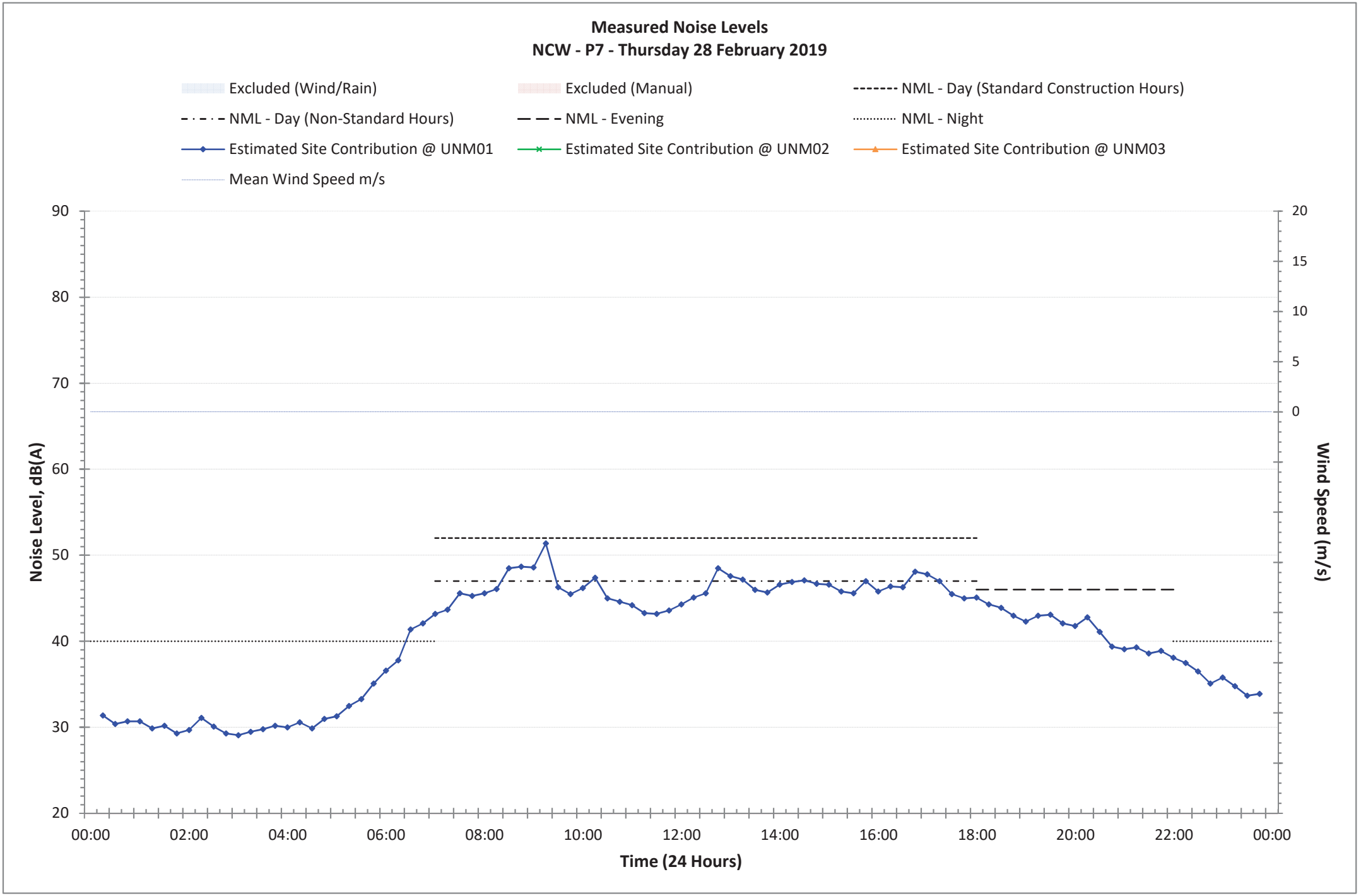
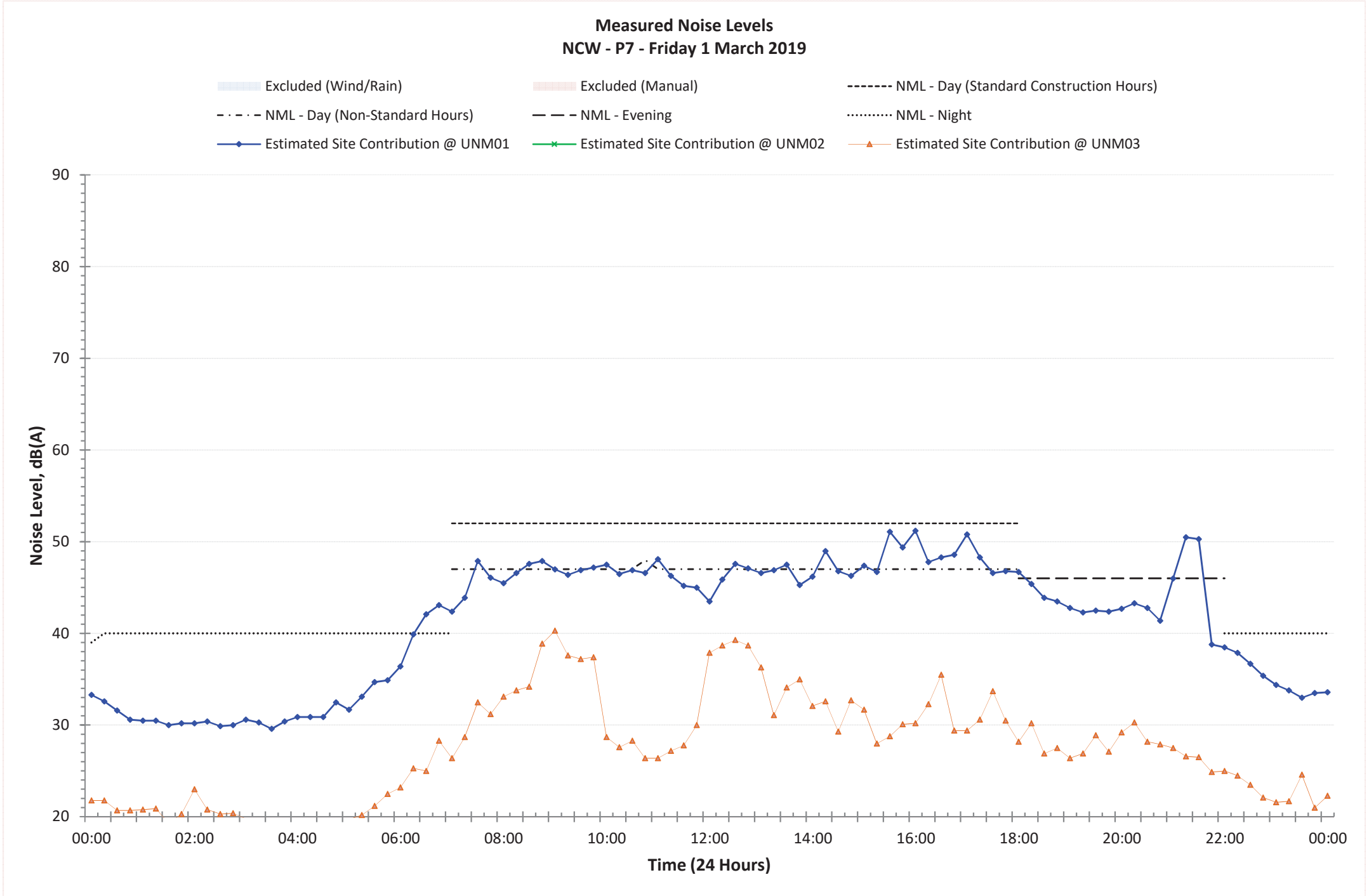
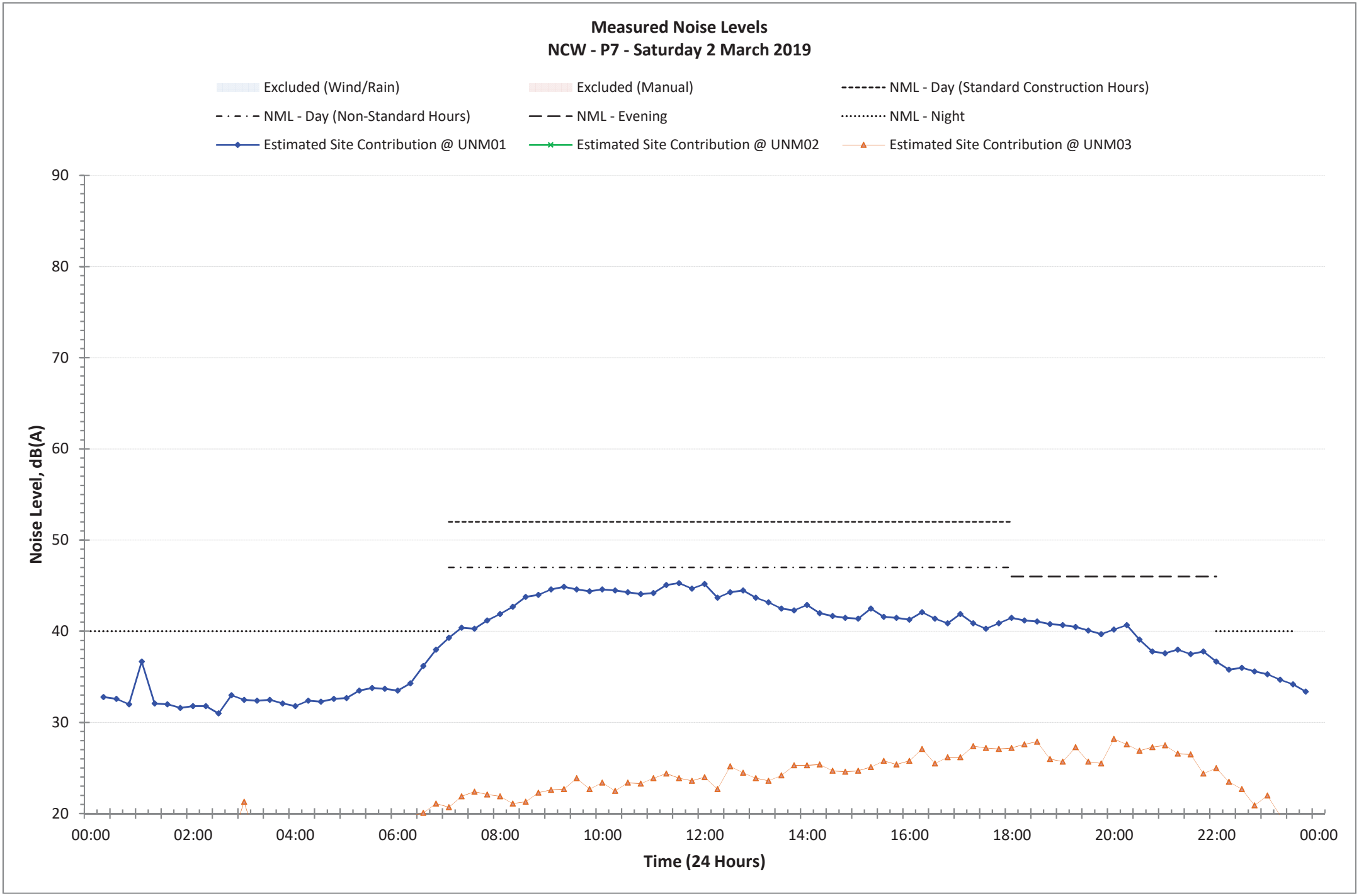
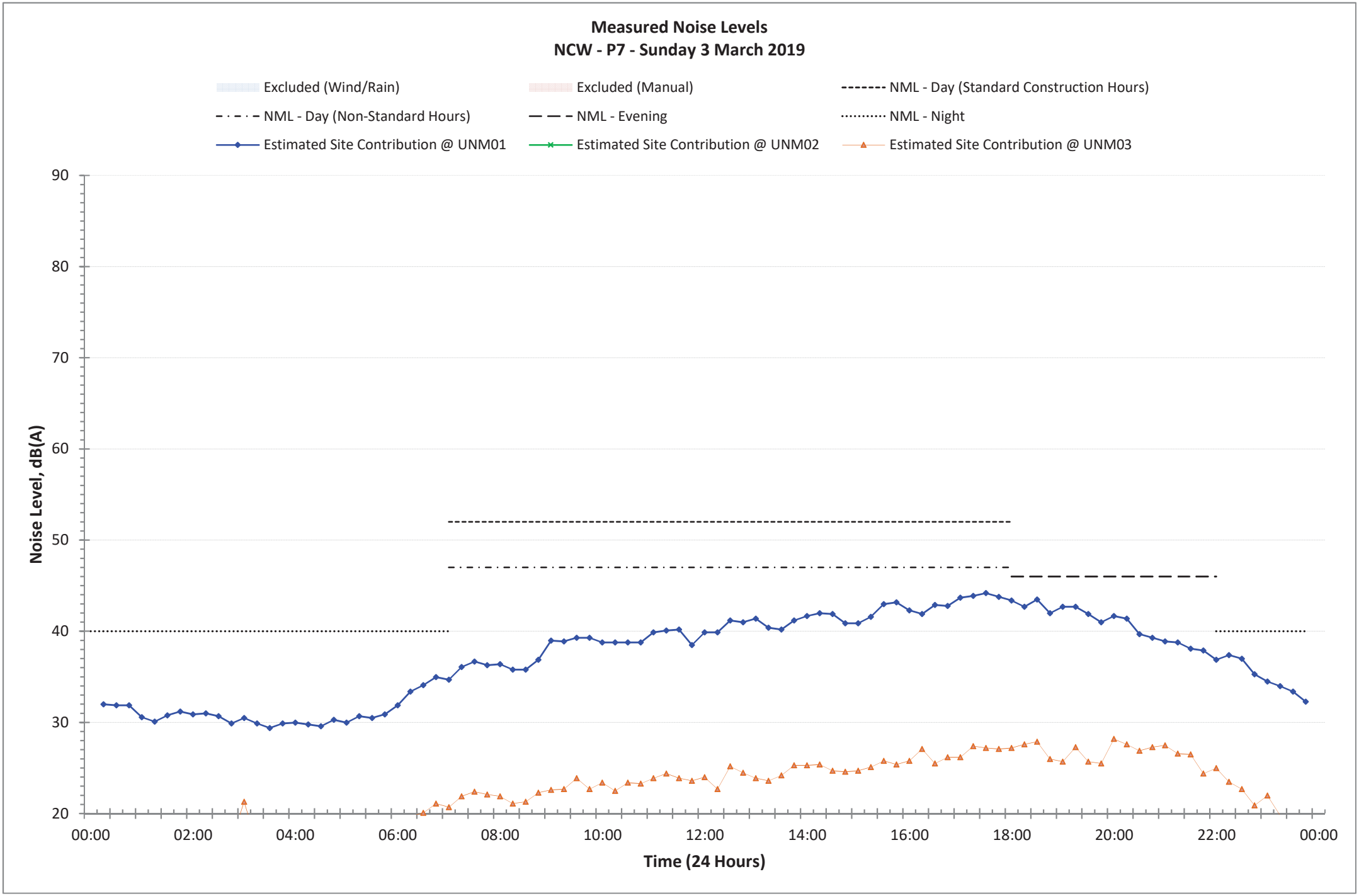
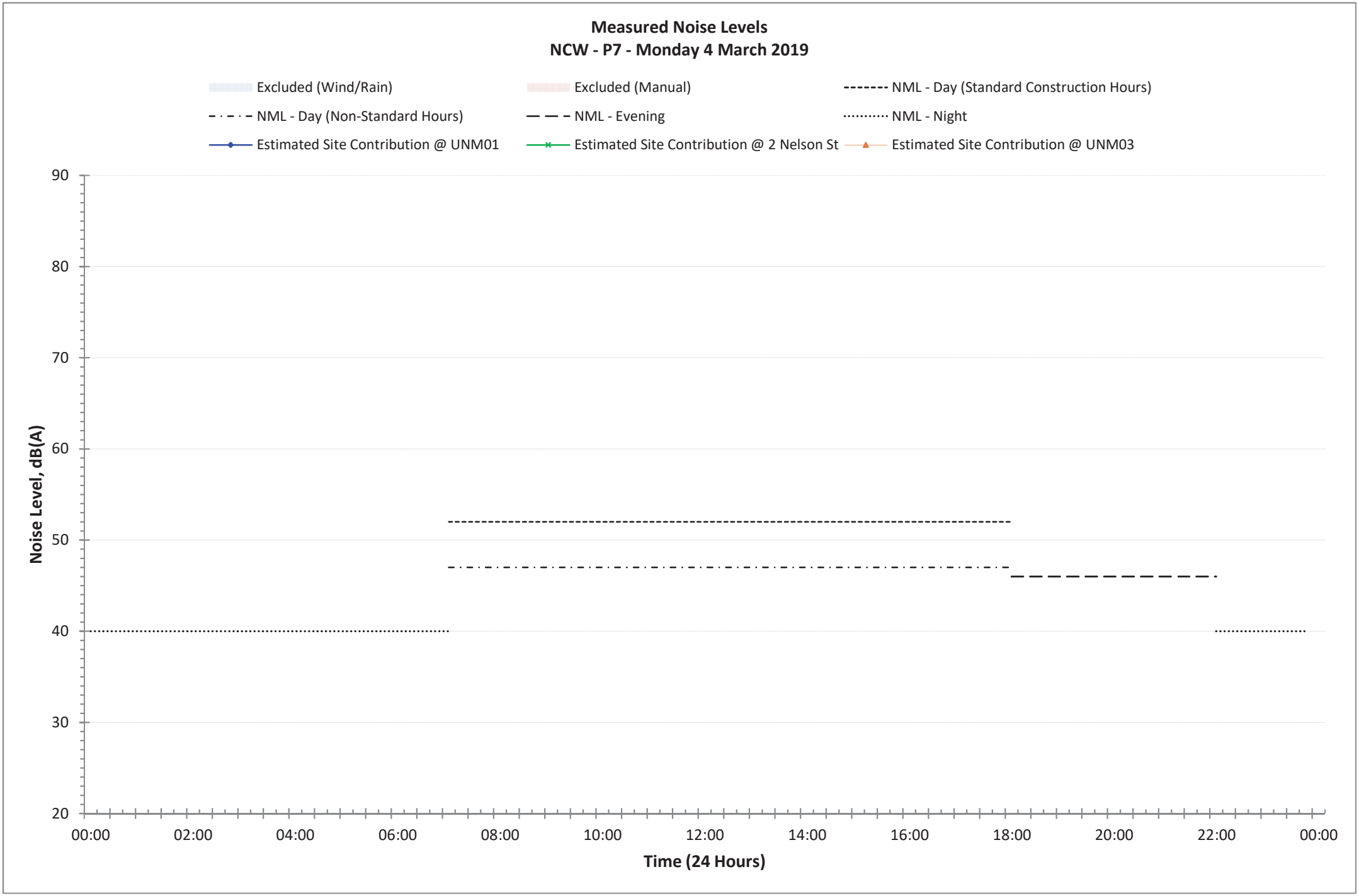

Measured Noise Levels
NCW - P7 - Wednesday 27 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

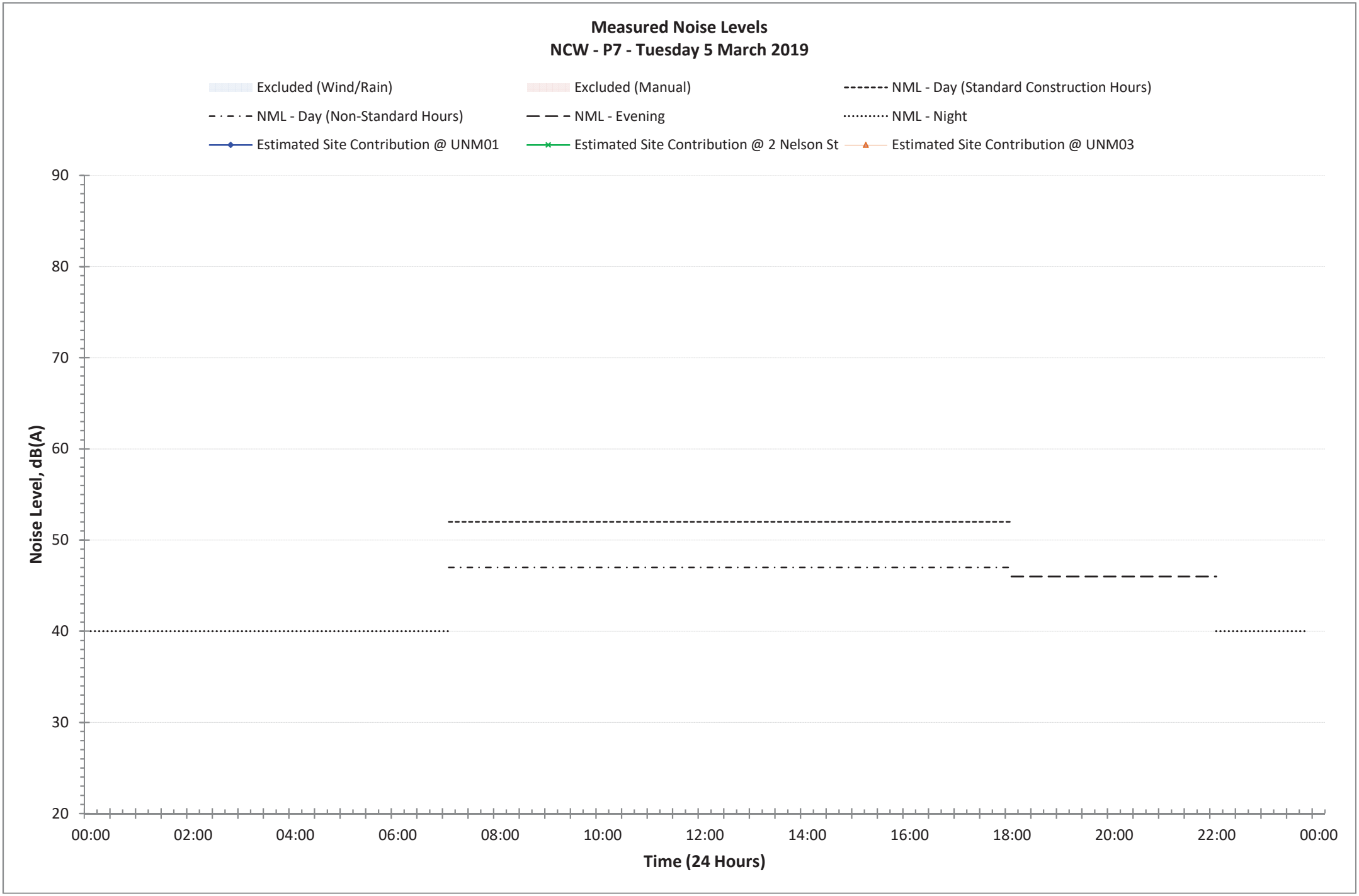

Measured Noise Levels
NCW - P7 - Thursday 28 February 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

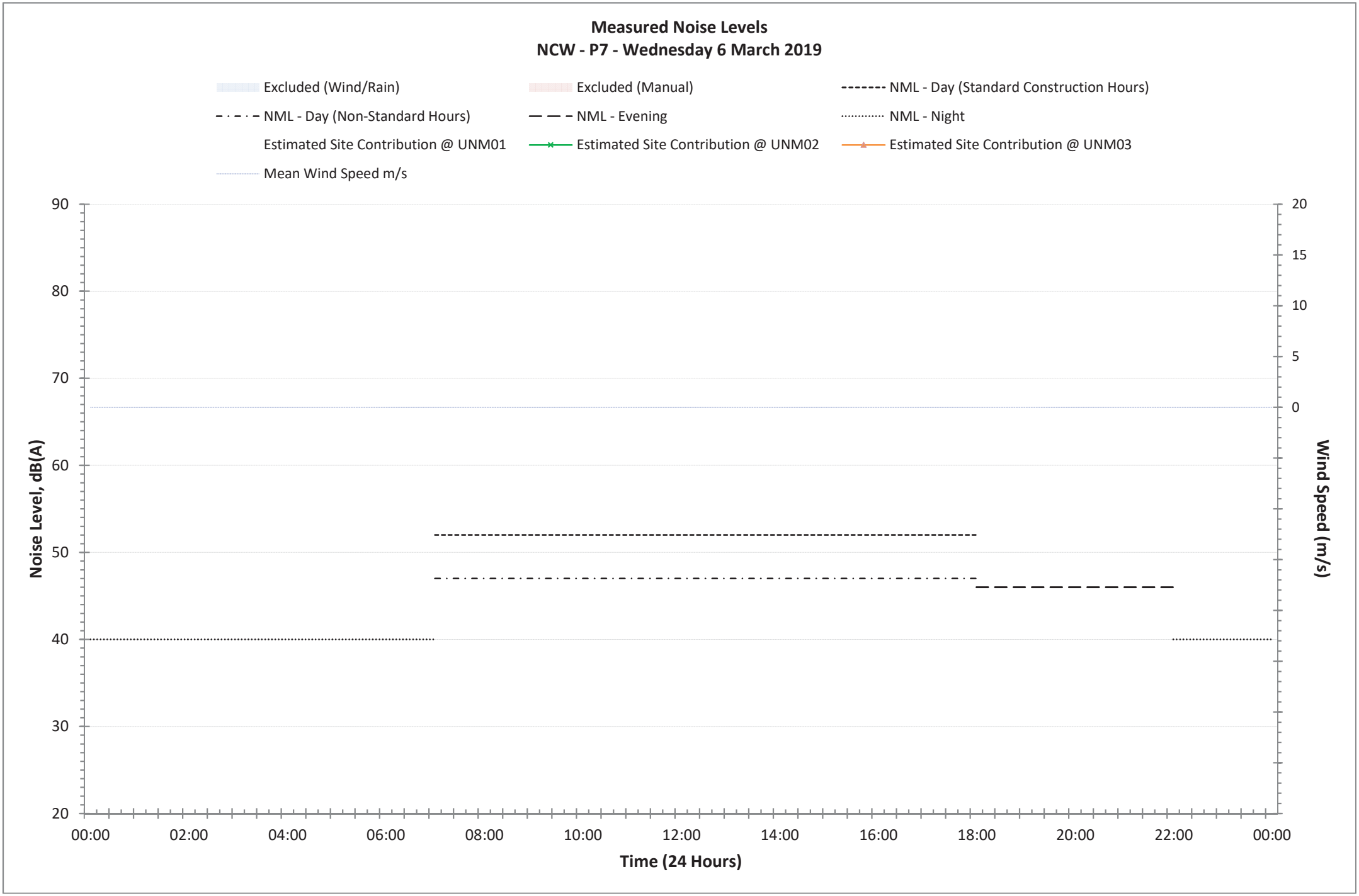

Measured Noise Levels
NCW - P7 - Friday 1 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

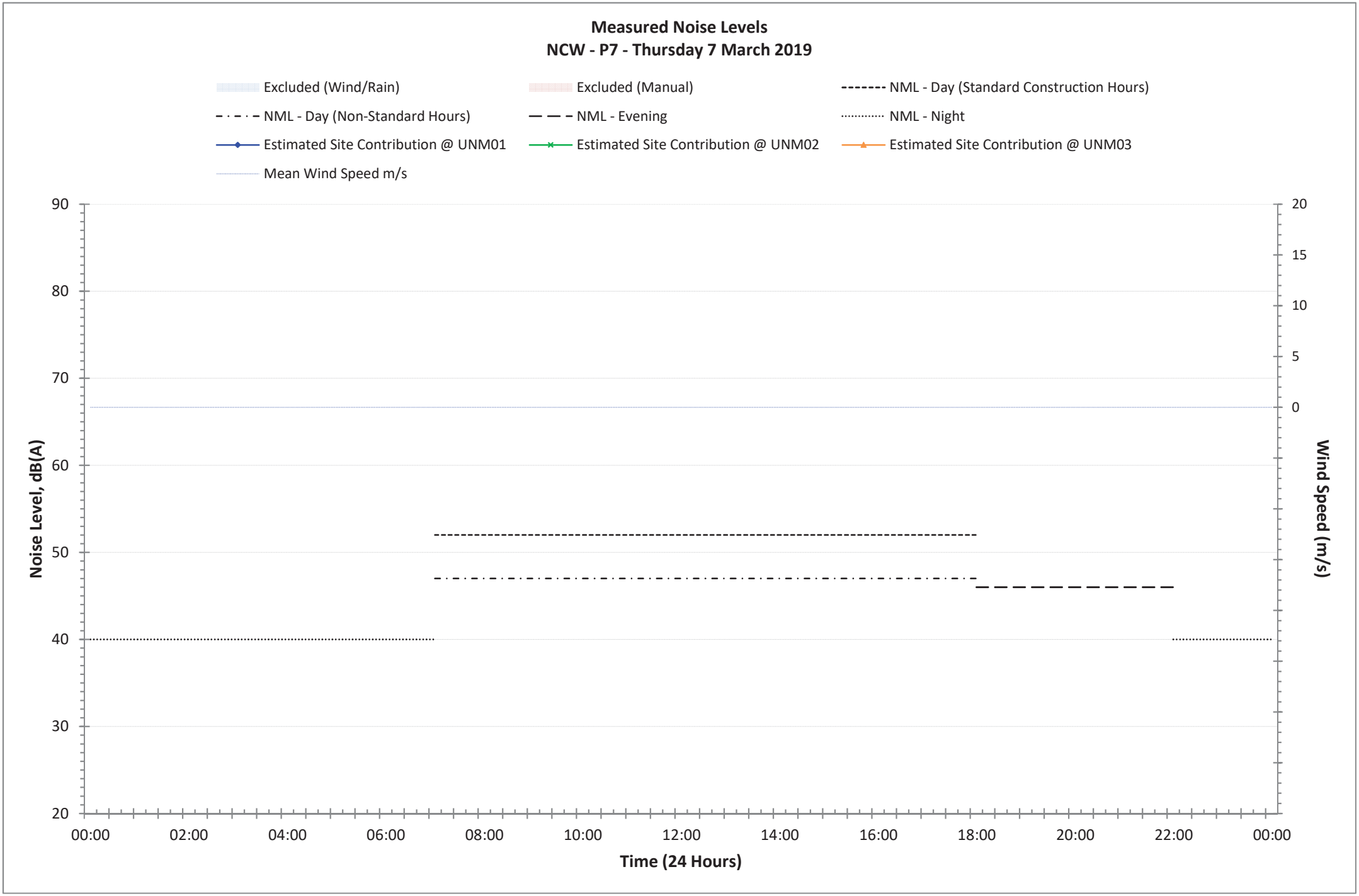

Measured Noise Levels
NCW - P7 - Saturday 2 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

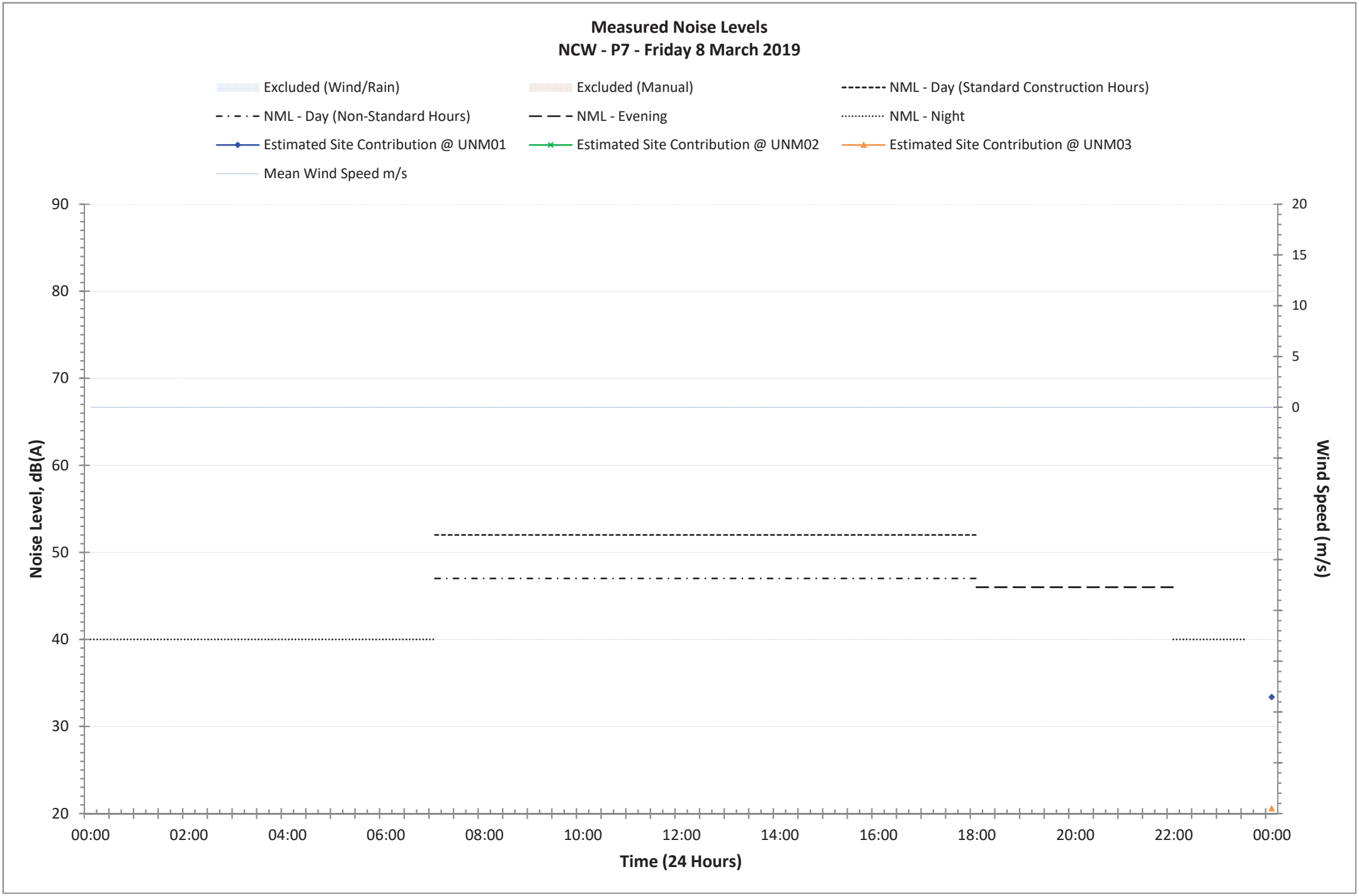

Measured Noise Levels
NCW - P7 - Sunday 3 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Monday 4 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Tuesday 5 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Wednesday 6 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
90
80
70
60
50
40
30
20
Noise Level, dB(A)
20
15
10
5
0
Wind Speed (m/s)
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Thursday 7 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
90
80
70
60
50
40
30
20
Noise Level, dB(A)
20
15
10
5
0
Wind Speed (m/s)
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Friday 8 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
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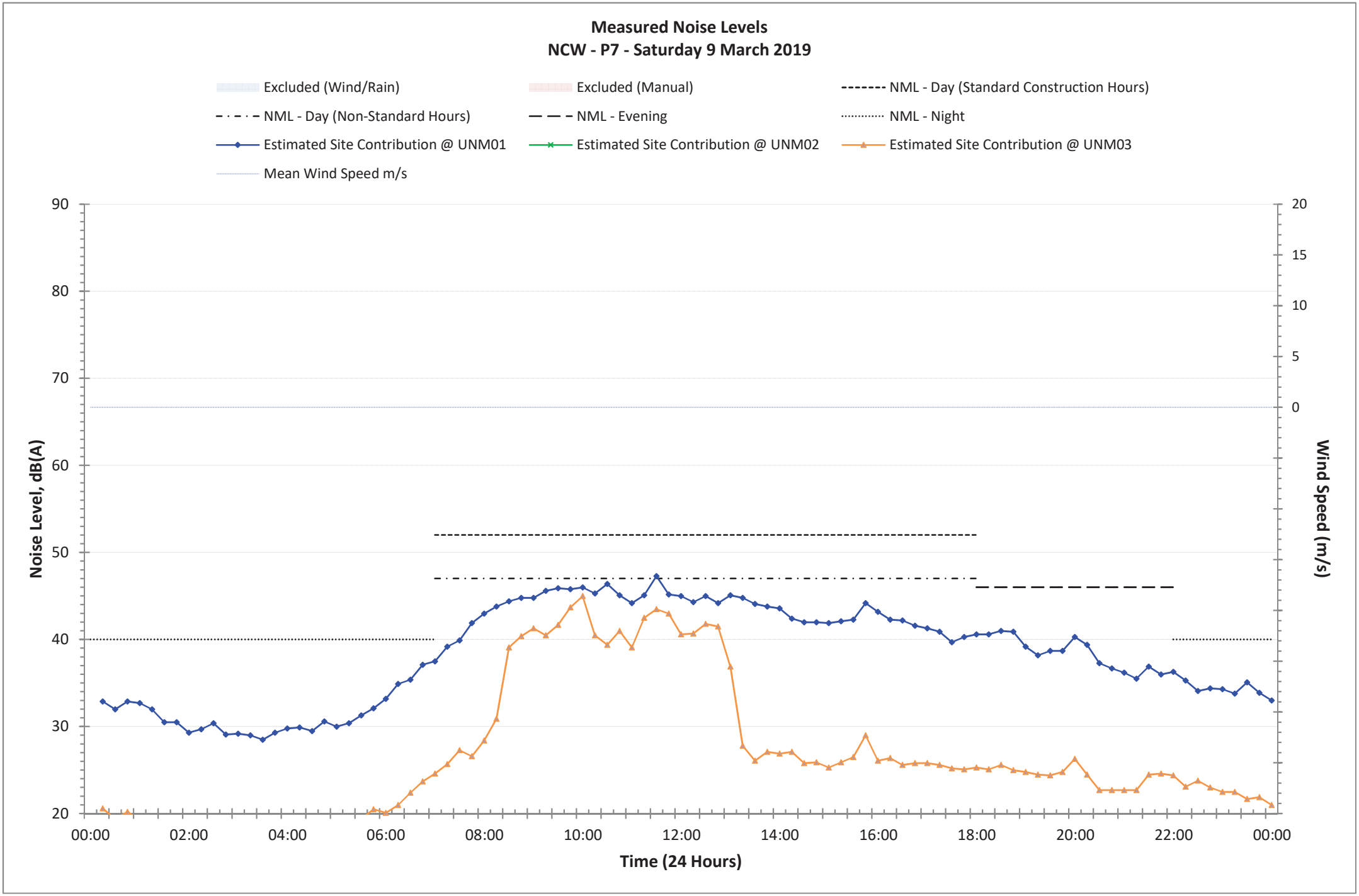
Measured Noise Levels
NCW - P7 - Saturday 9 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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16:00
18:00
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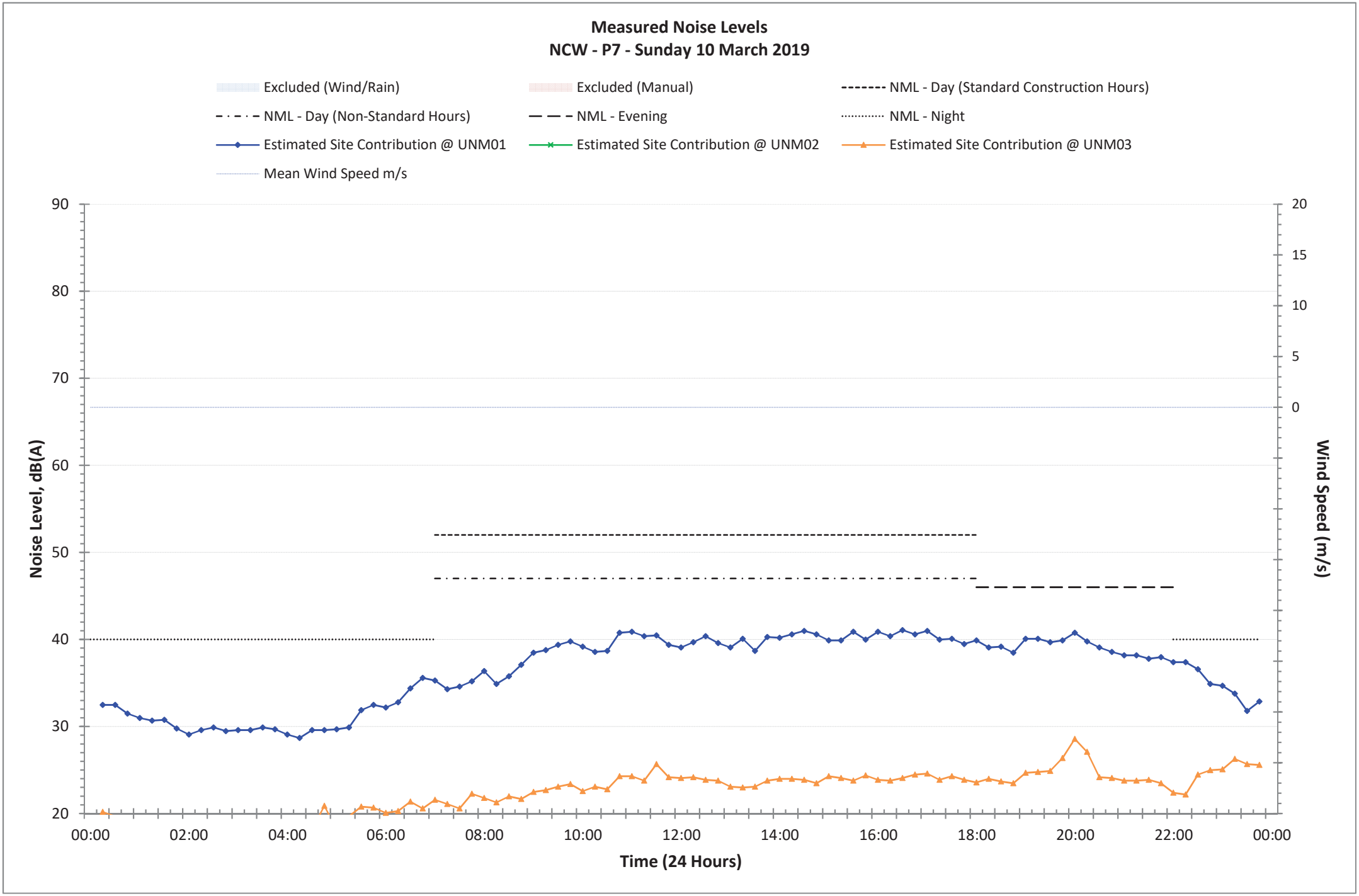
Measured Noise Levels
NCW - P7 - Sunday 10 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
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16:00
18:00
20:00
22:00
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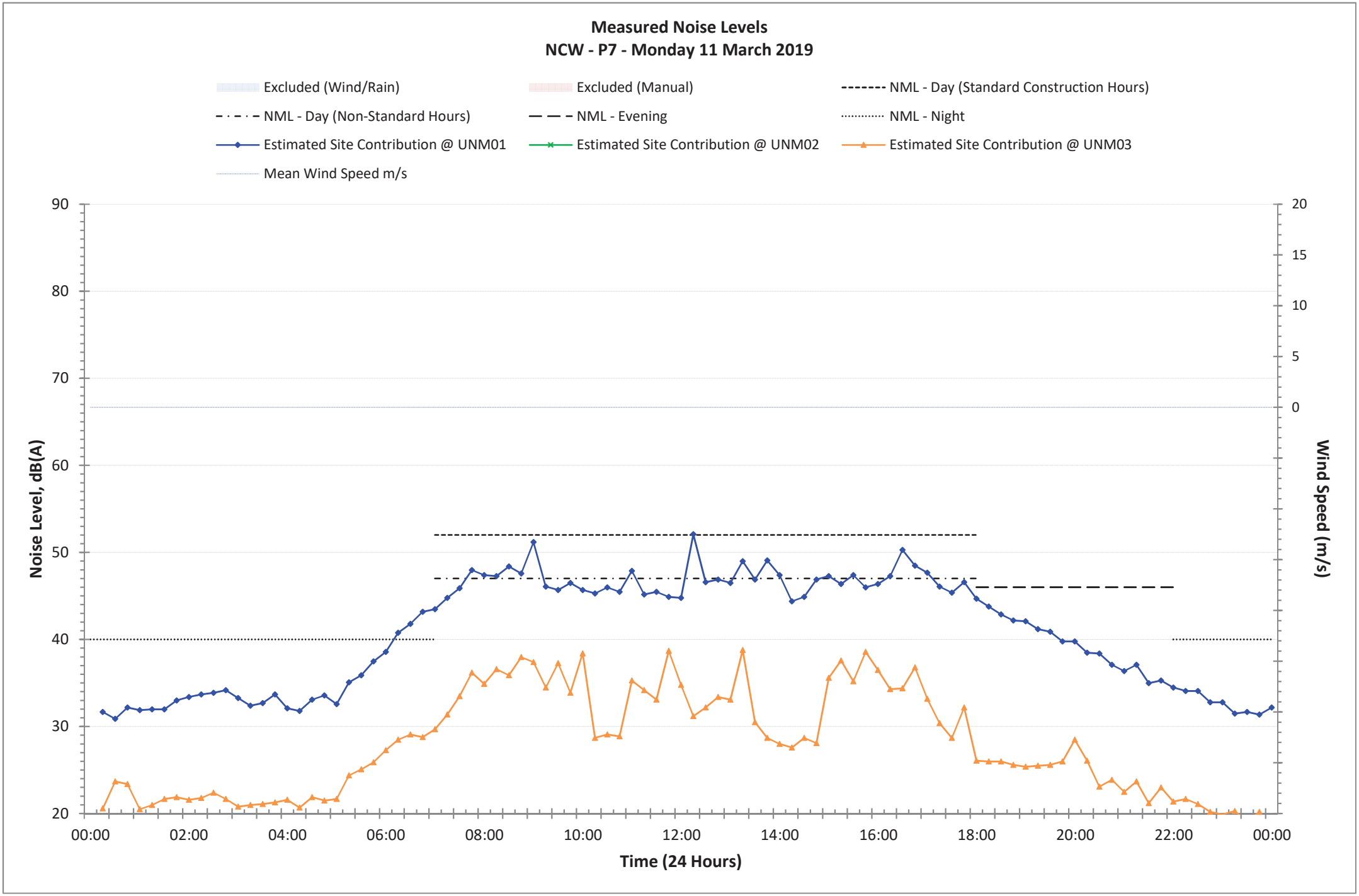
Measured Noise Levels
NCW - P7 - Monday 11 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
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22:00
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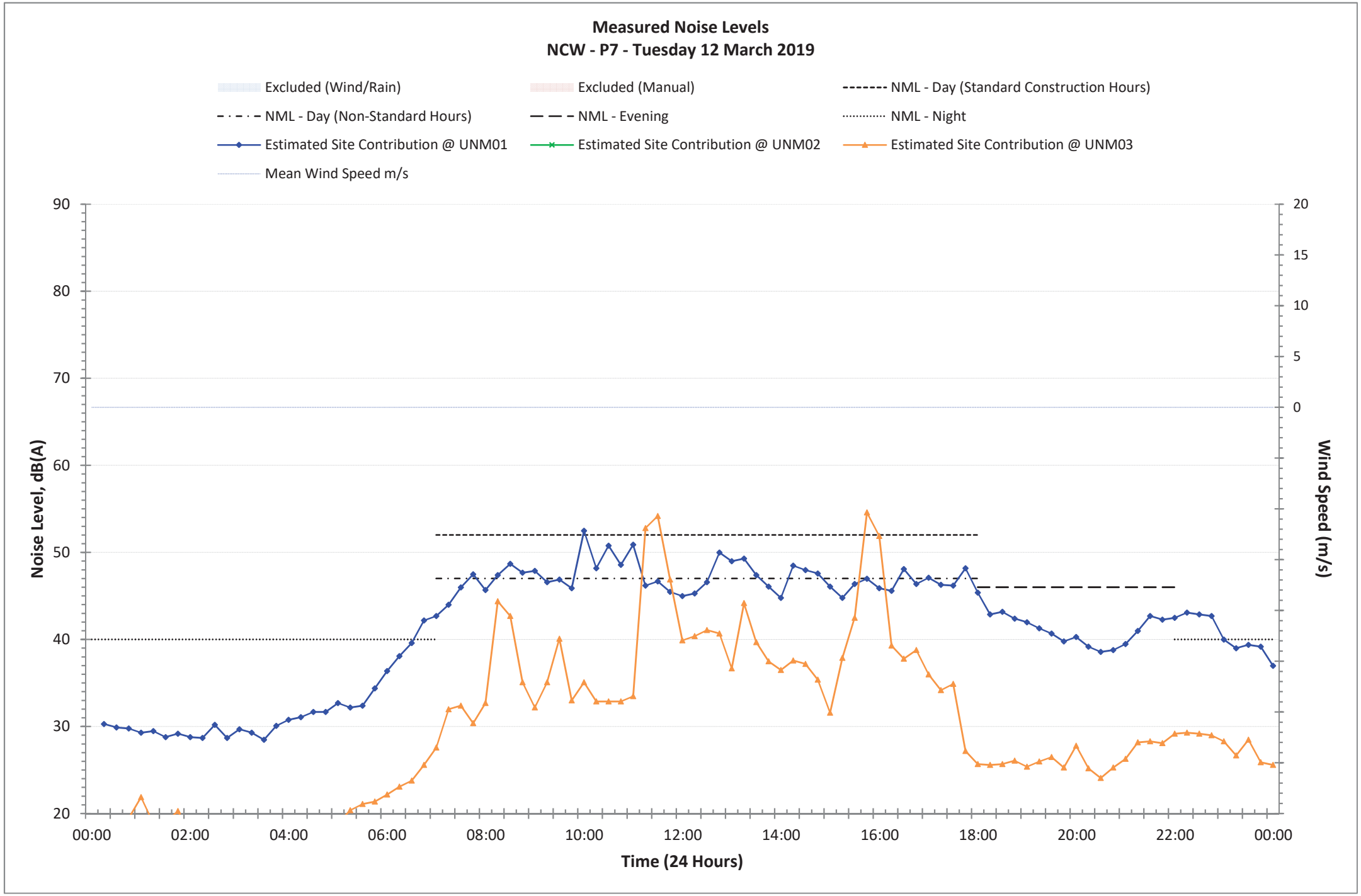
Measured Noise Levels
NCW - P7 - Tuesday 12 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
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14:00
16:00
18:00
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22:00
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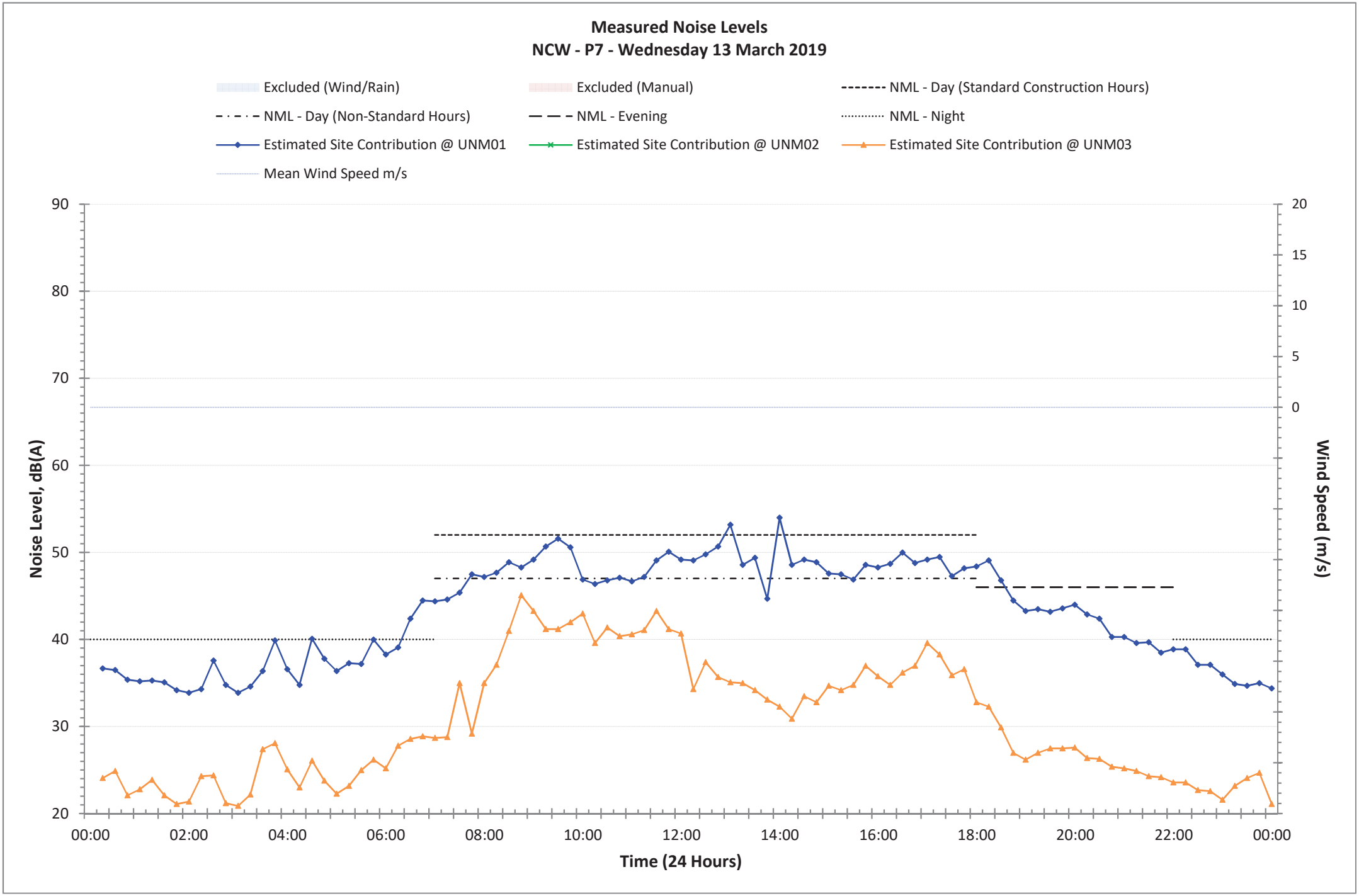
Measured Noise Levels
NCW - P7 - Wednesday 13 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
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06:00
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16:00
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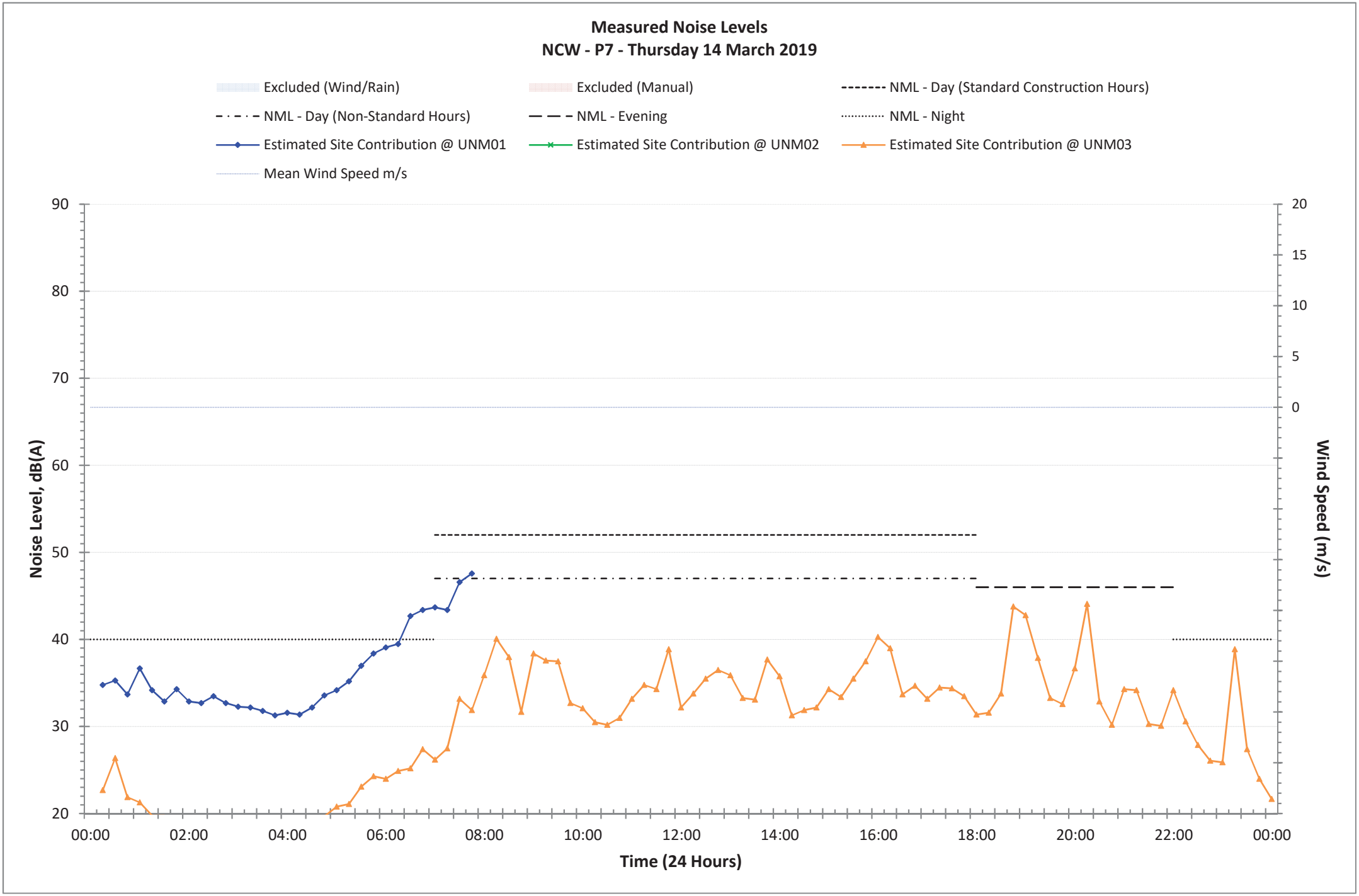
Measured Noise Levels
NCW - P7 - Thursday 14 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
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16:00
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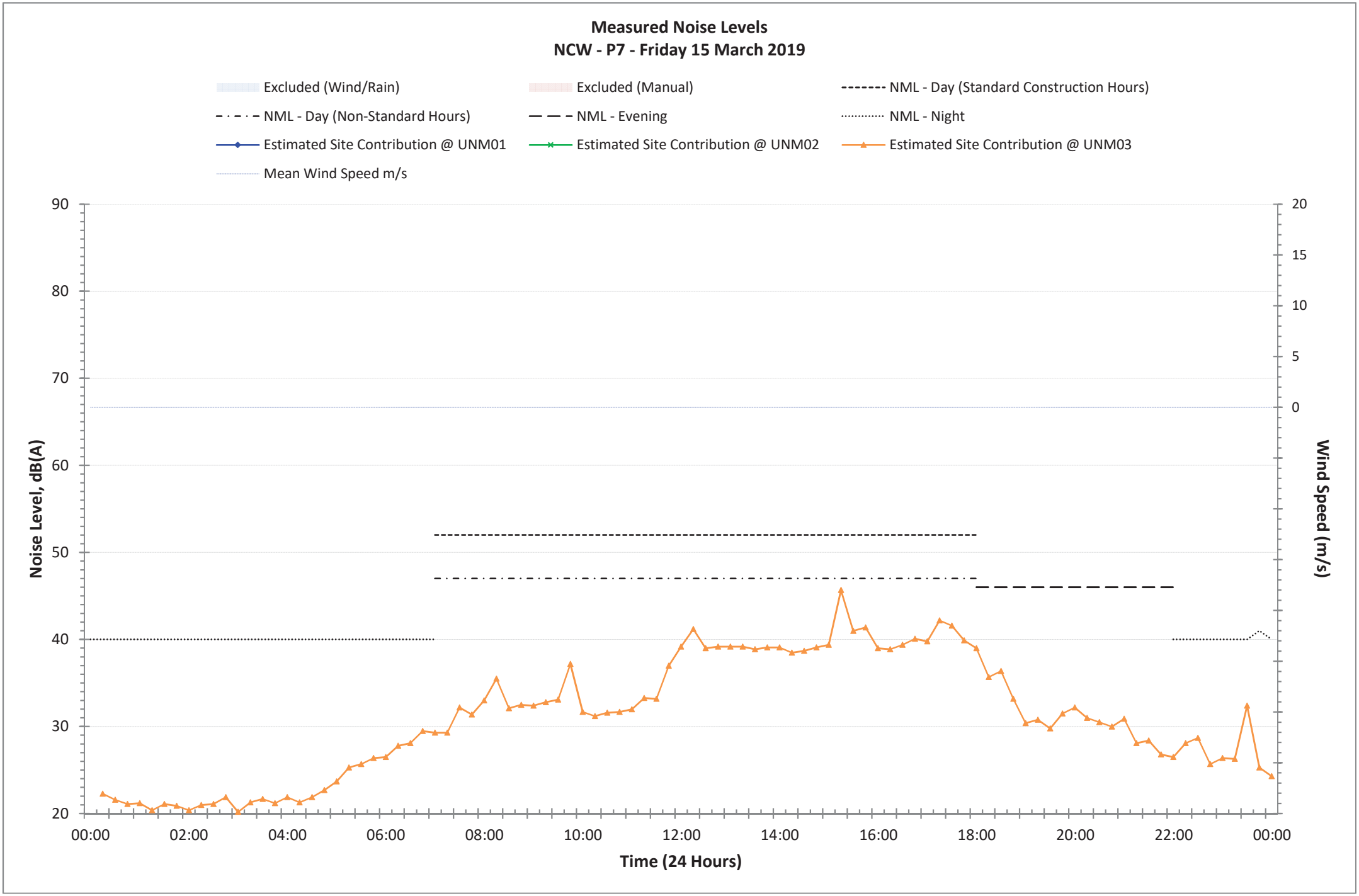
Measured Noise Levels
NCW - P7 - Friday 15 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
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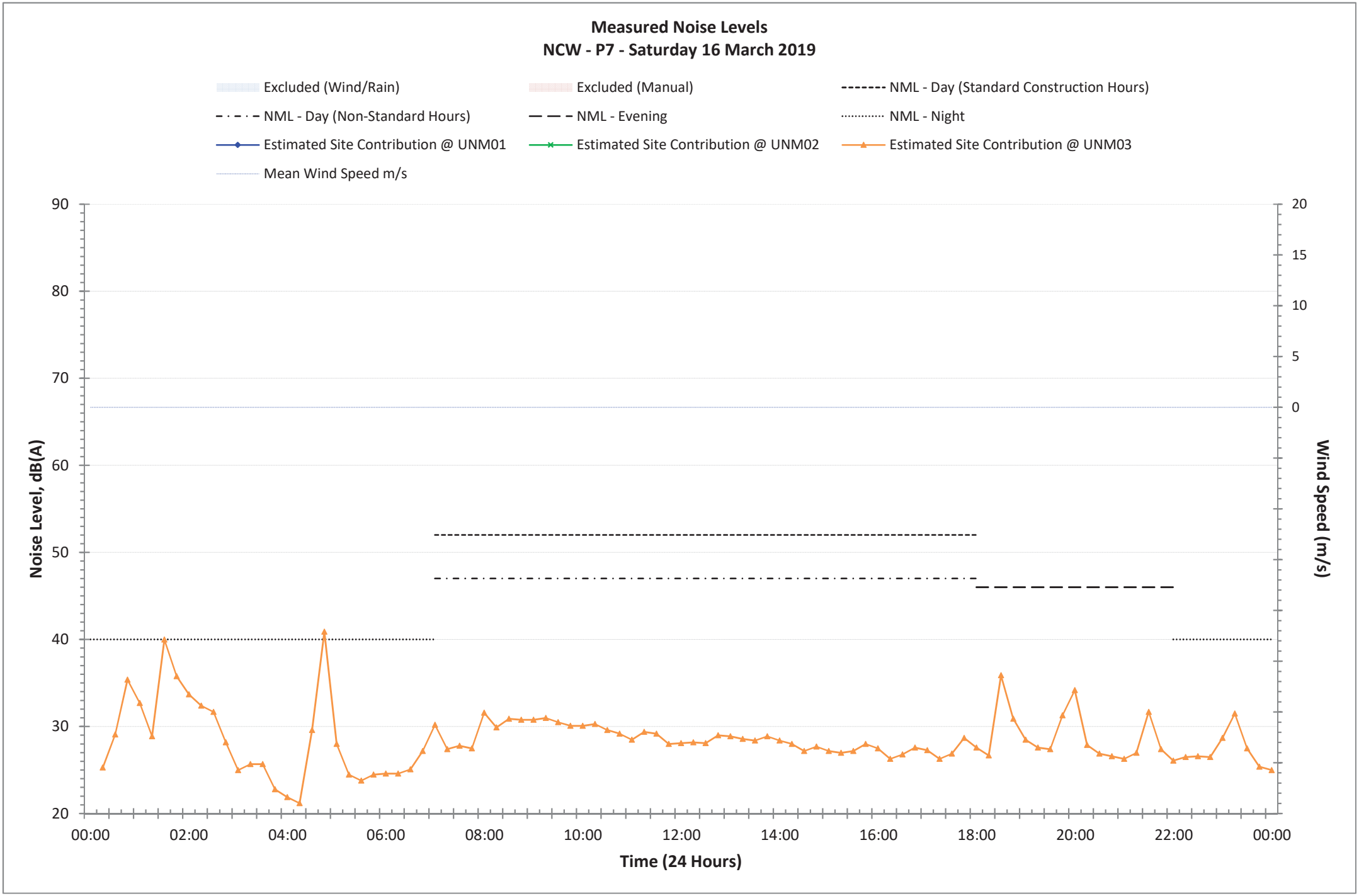
Measured Noise Levels
NCW - P7 - Saturday 16 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
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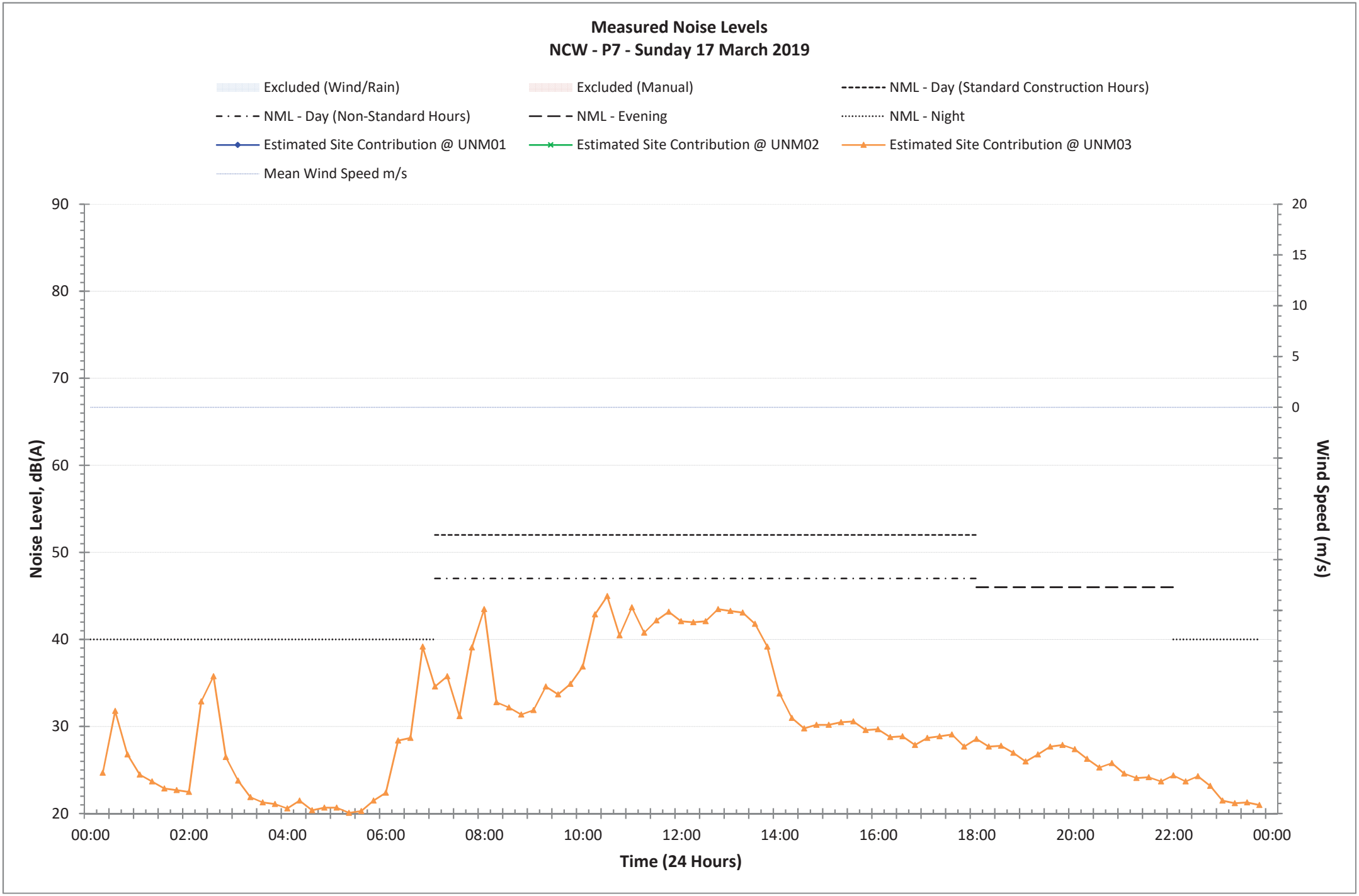
Measured Noise Levels
NCW - P7 - Sunday 17 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
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60
50
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30
20
20
15
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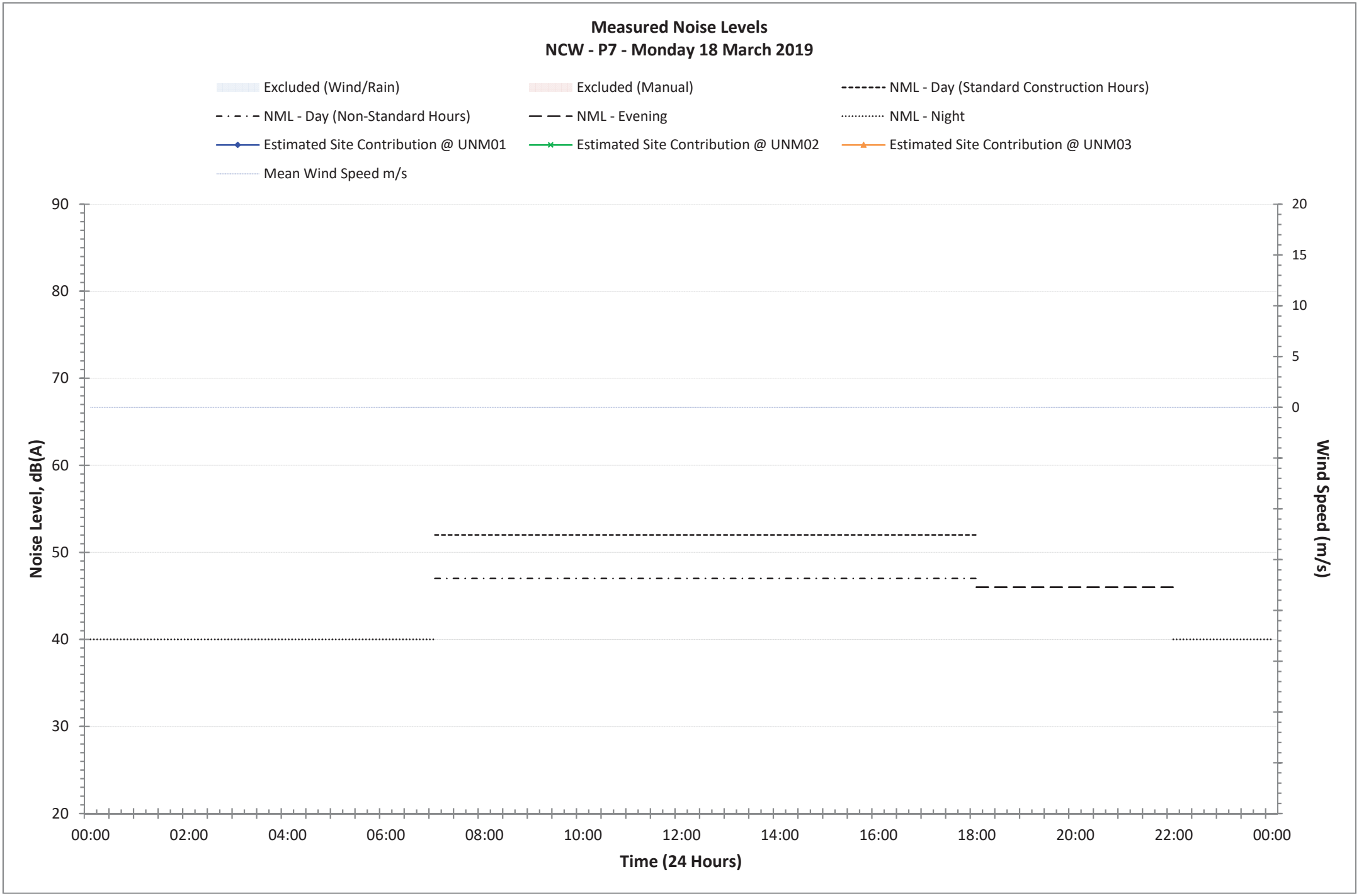
Measured Noise Levels
NCW - P7 - Monday 18 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
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02:00
04:00
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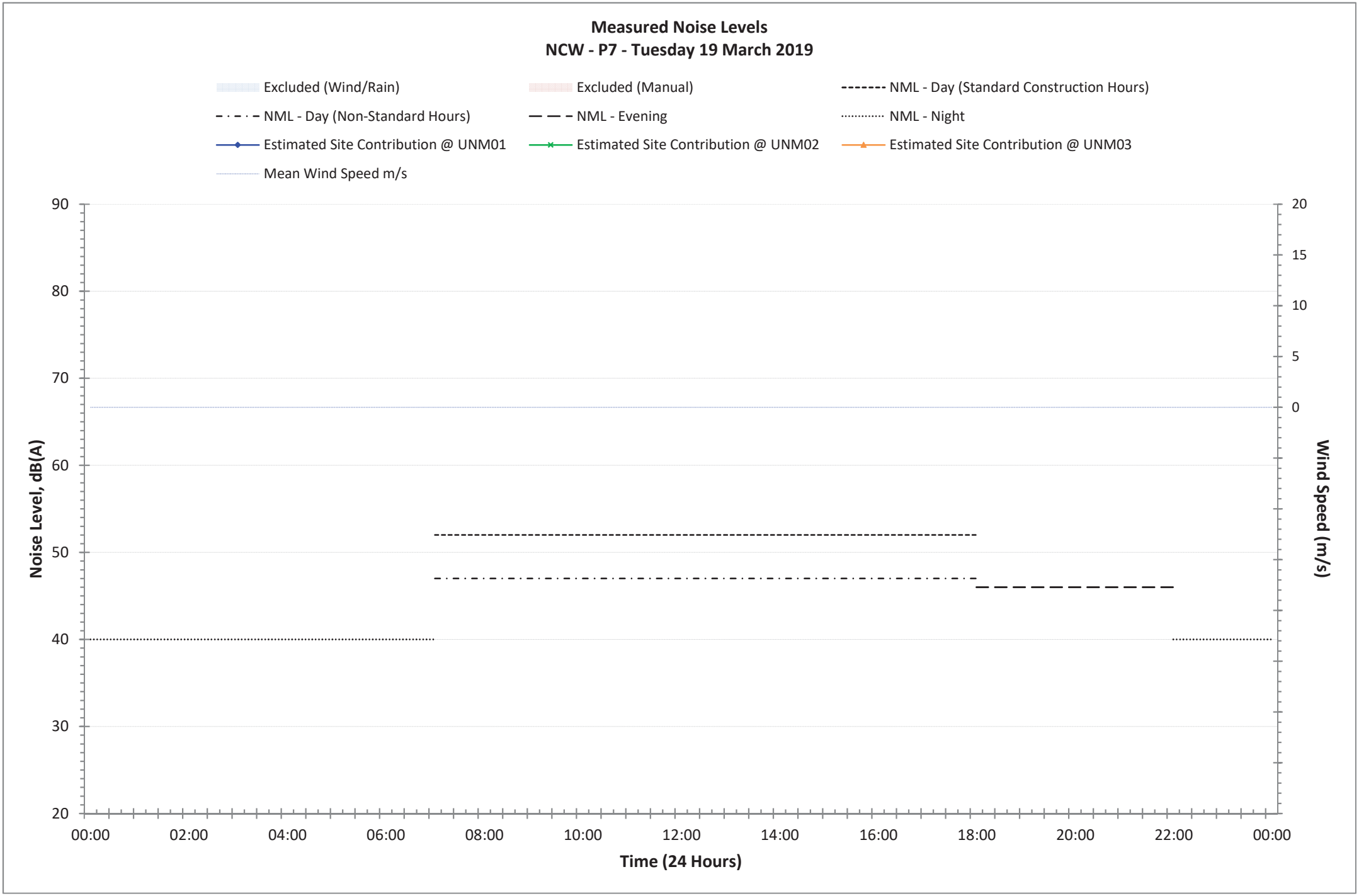
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Tuesday 19 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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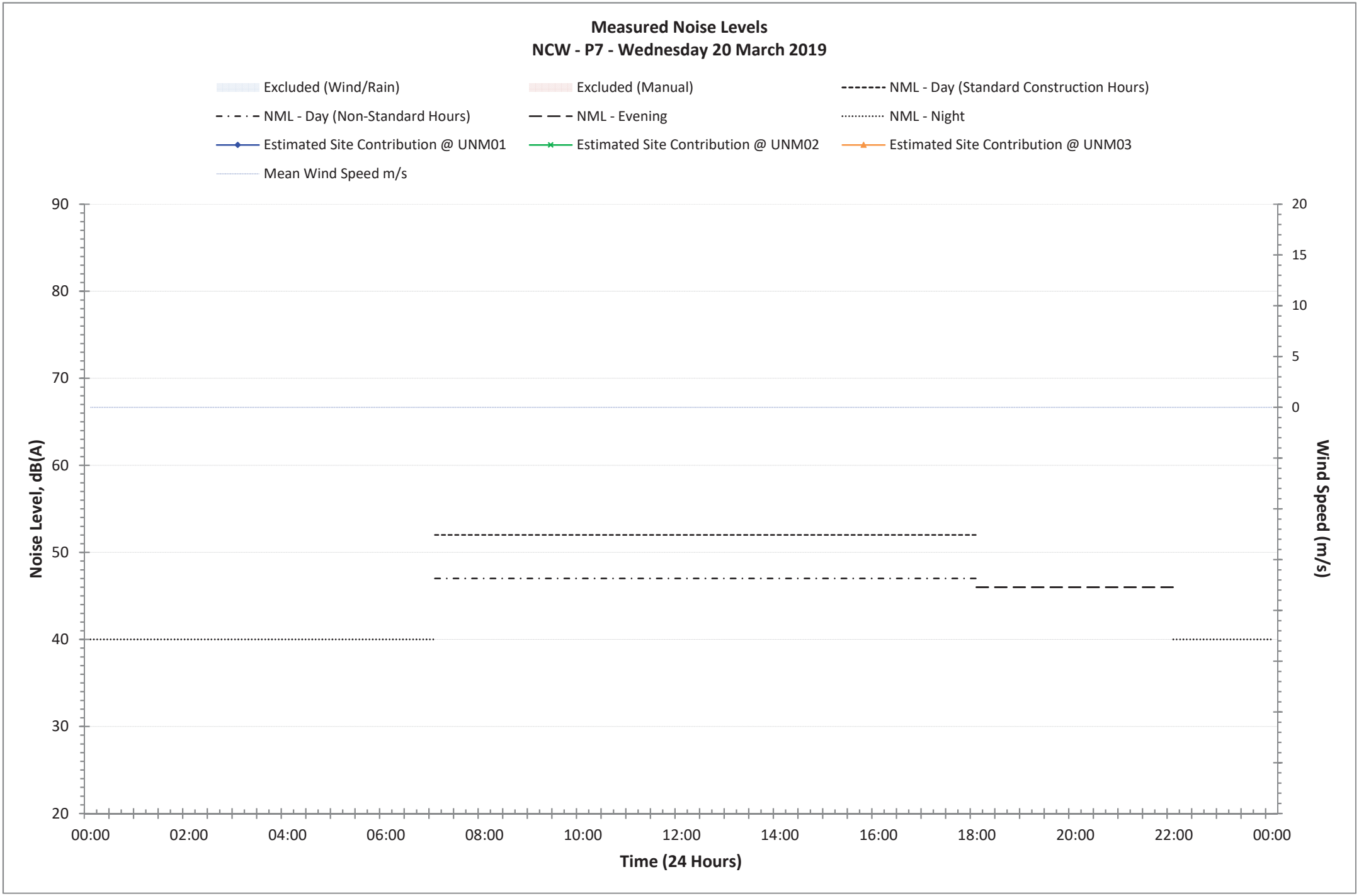
Measured Noise Levels
NCW - P7 - Wednesday 20 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
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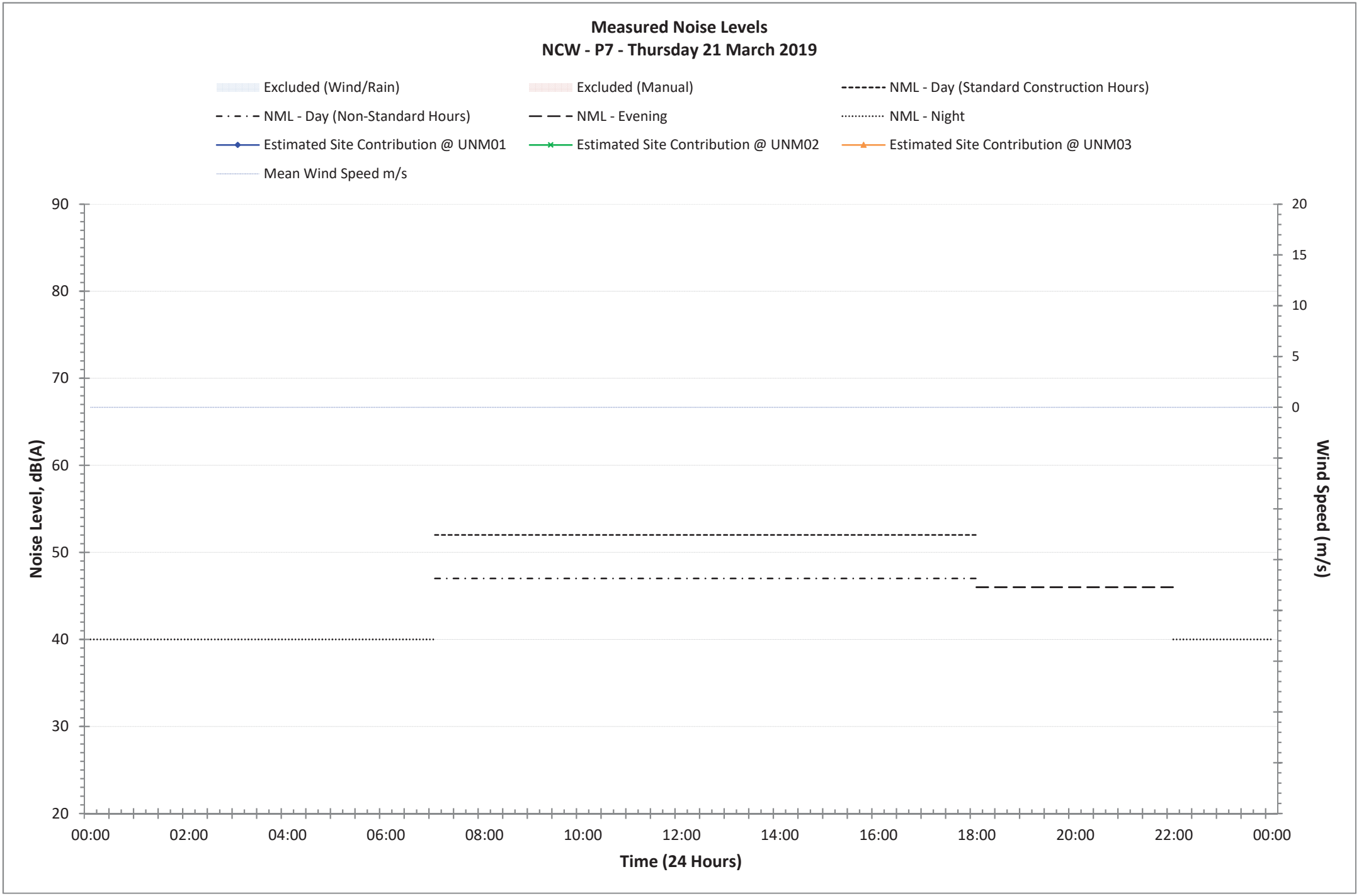
Measured Noise Levels
NCW - P7 - Thursday 21 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
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06:00
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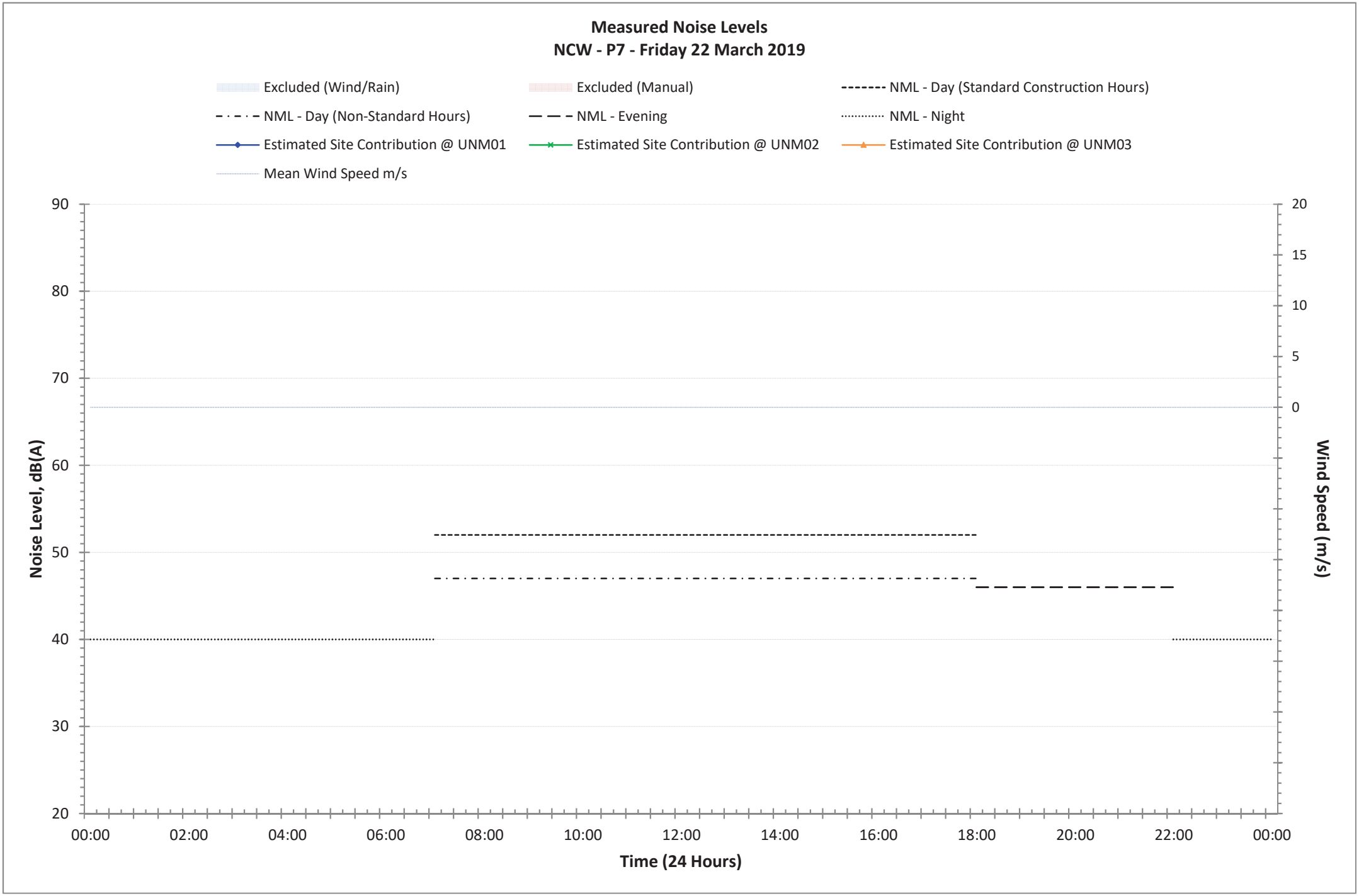
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Friday 22 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
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00:00
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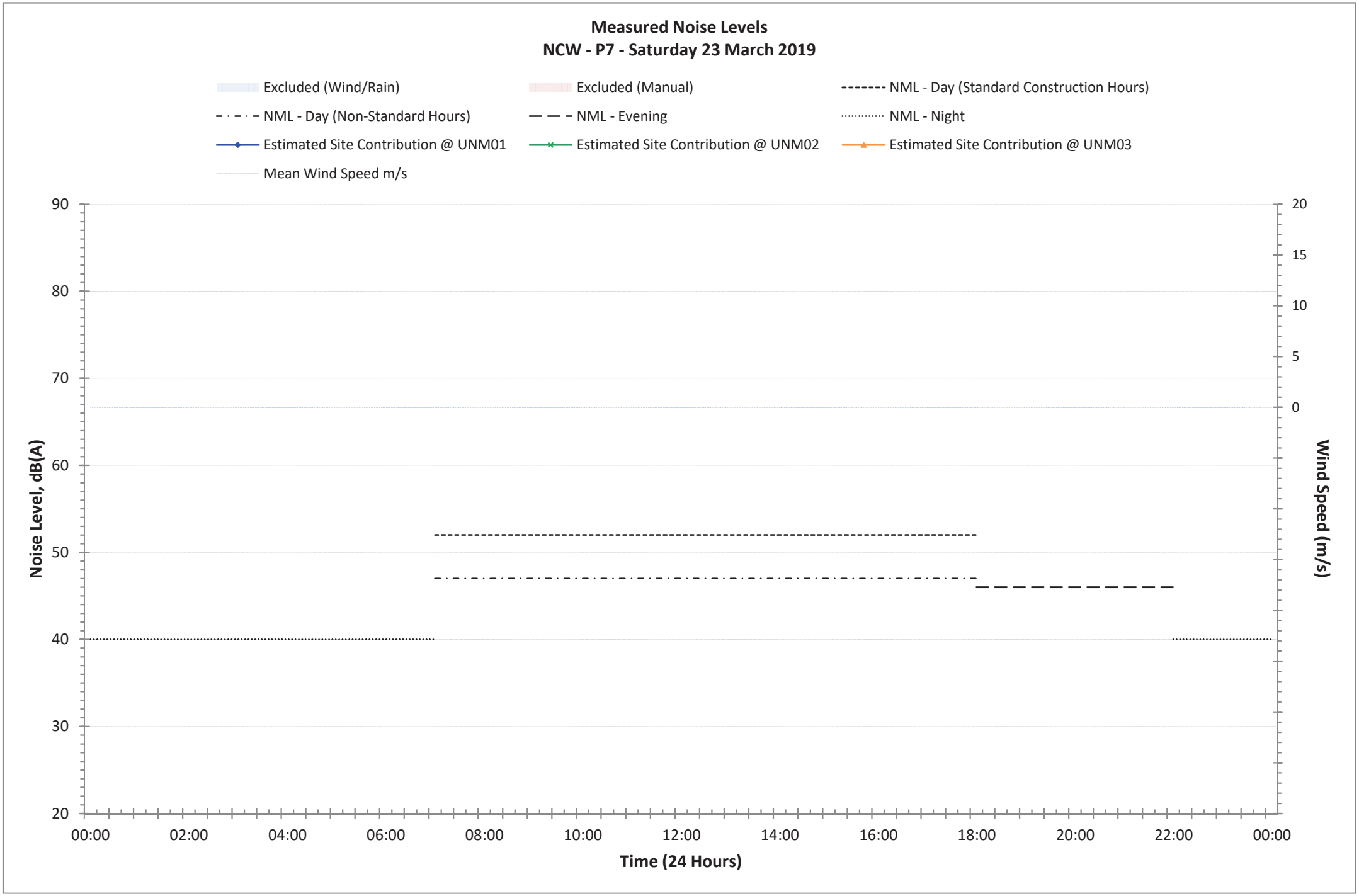
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Saturday 23 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
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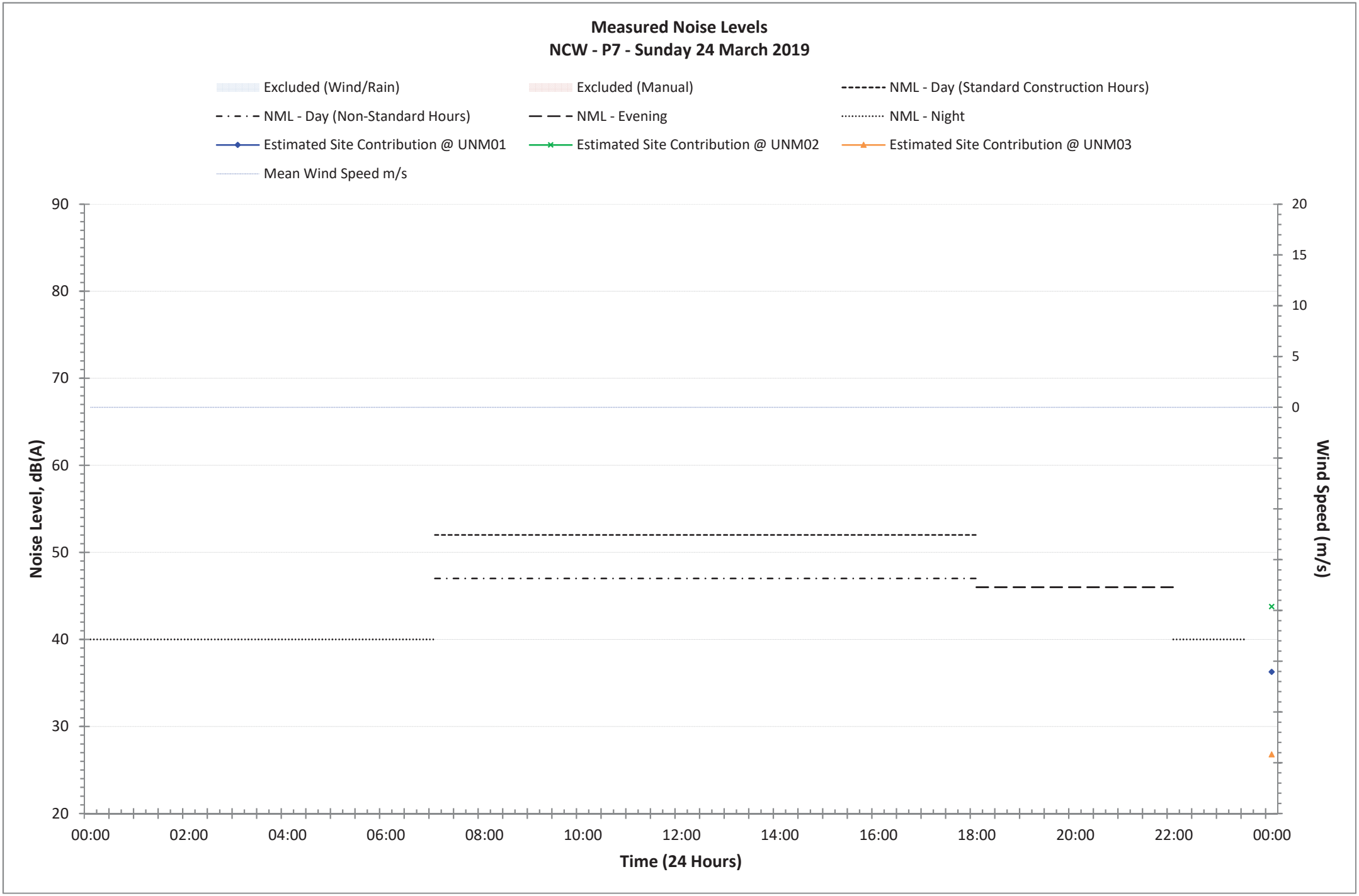
Measured Noise Levels
NCW - P7 - Sunday 24 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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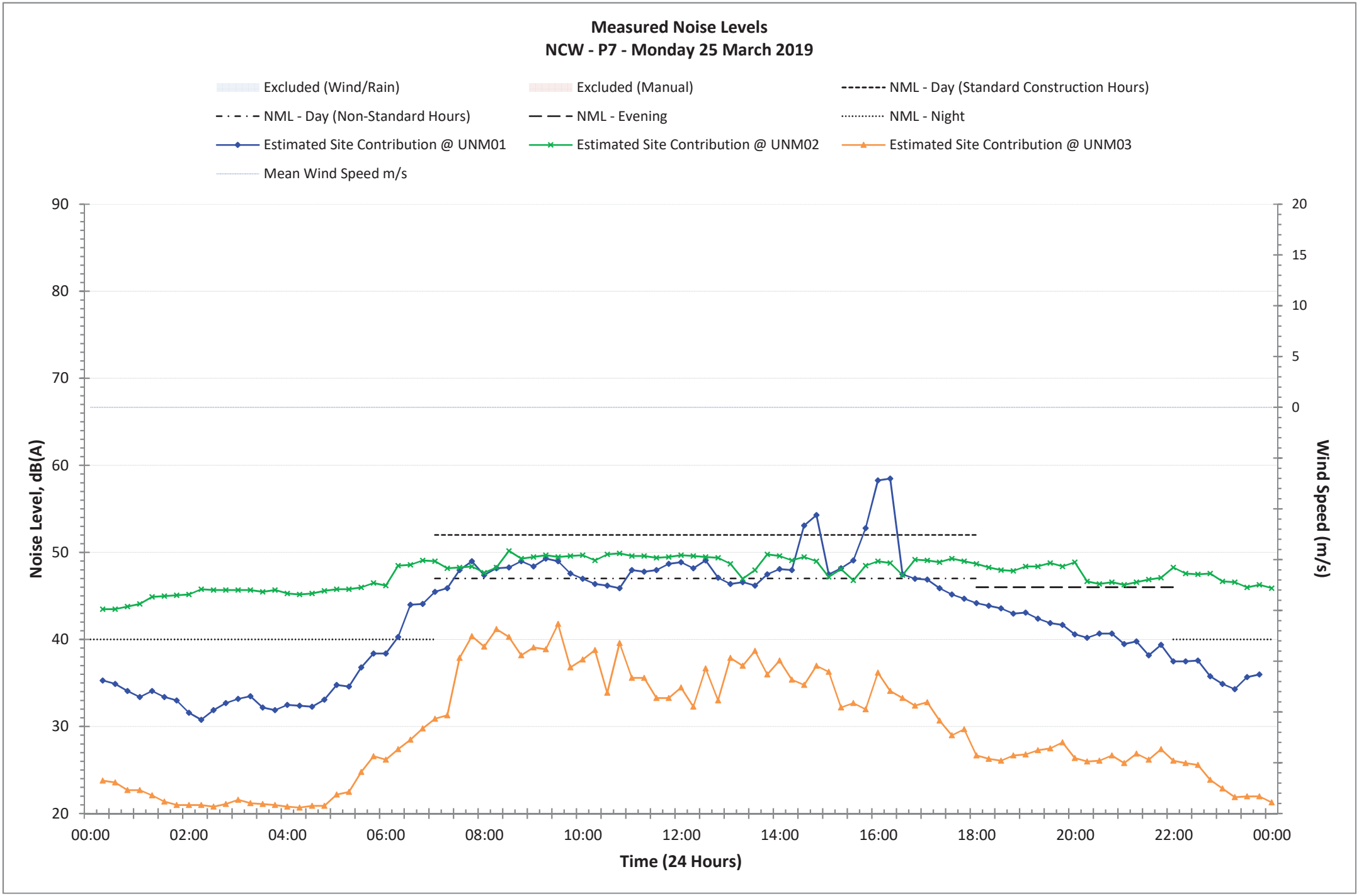
Measured Noise Levels
NCW - P7 - Monday 25 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
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00:00
02:00
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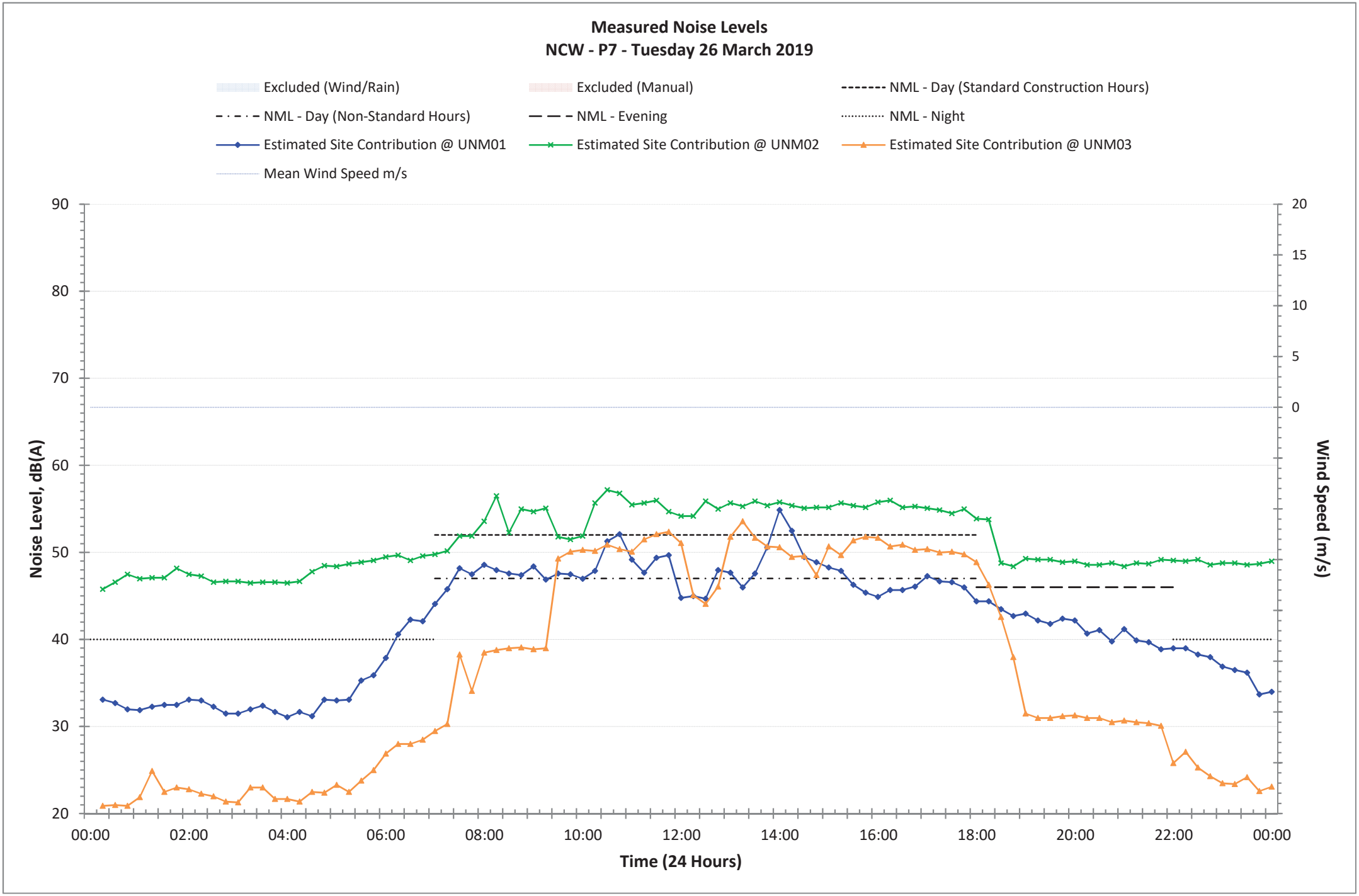
Measured Noise Levels
NCW - P7 - Tuesday 26 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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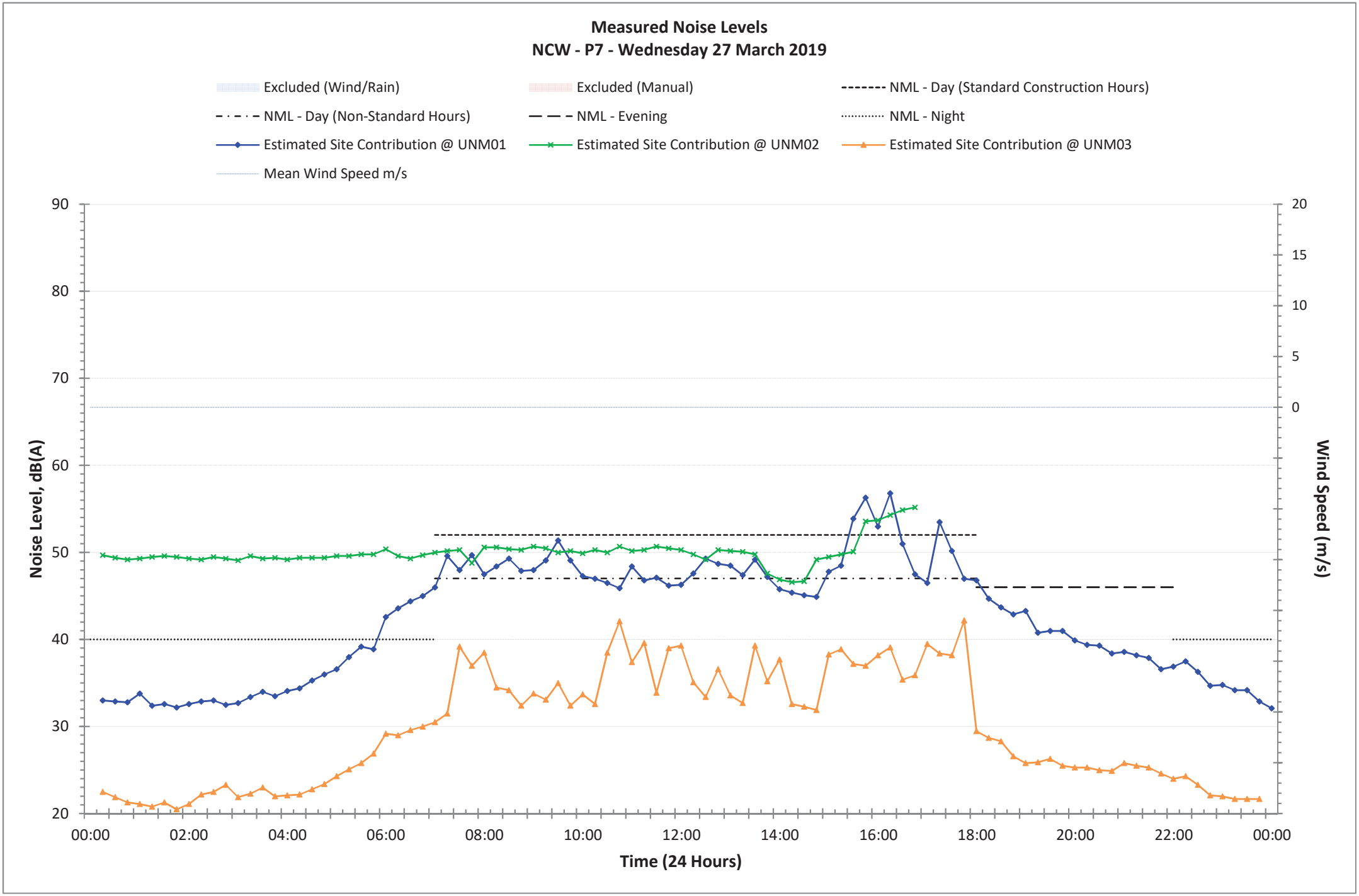
Measured Noise Levels
NCW - P7 - Wednesday 27 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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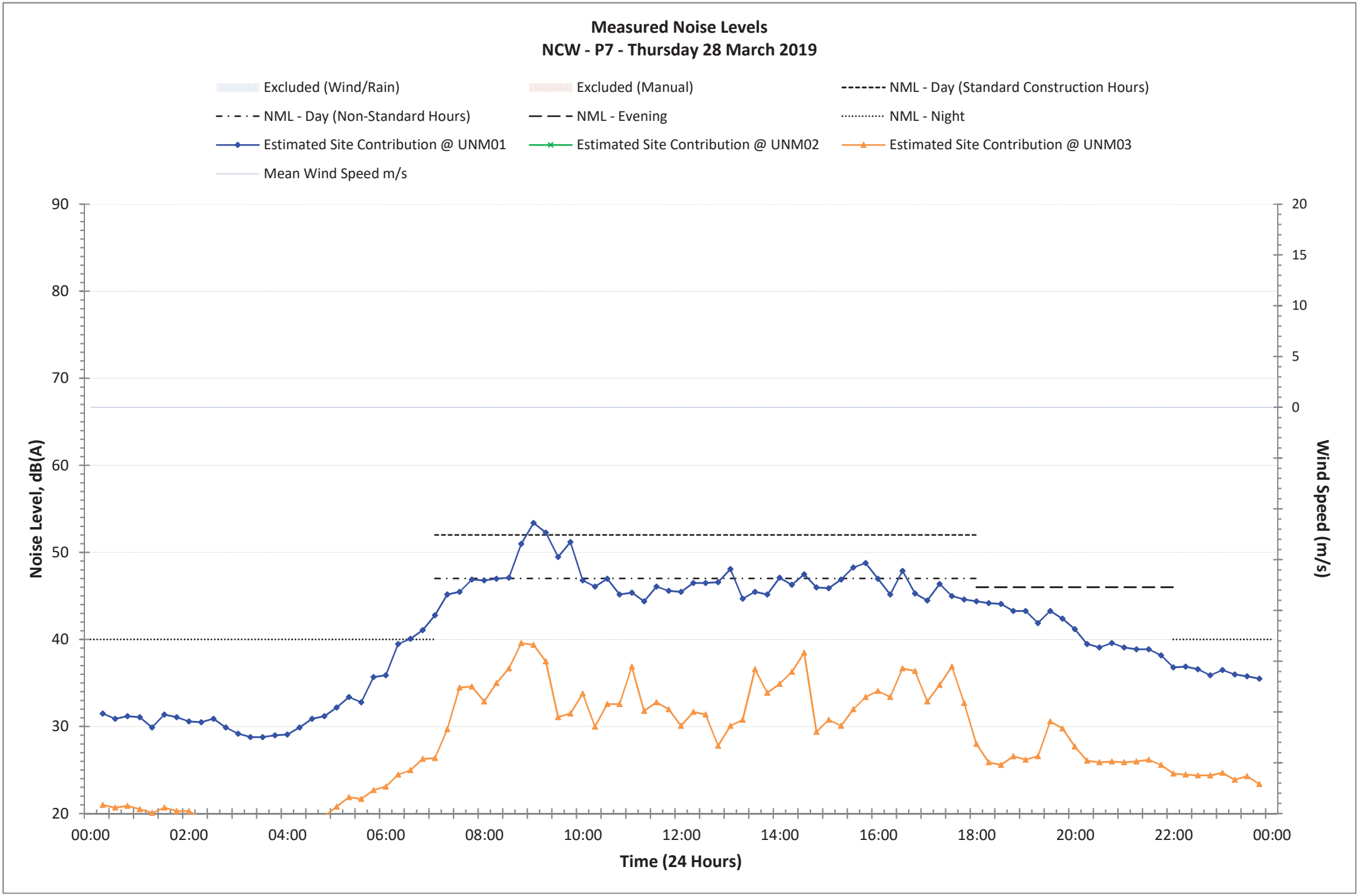
Measured Noise Levels
NCW - P7 - Thursday 28 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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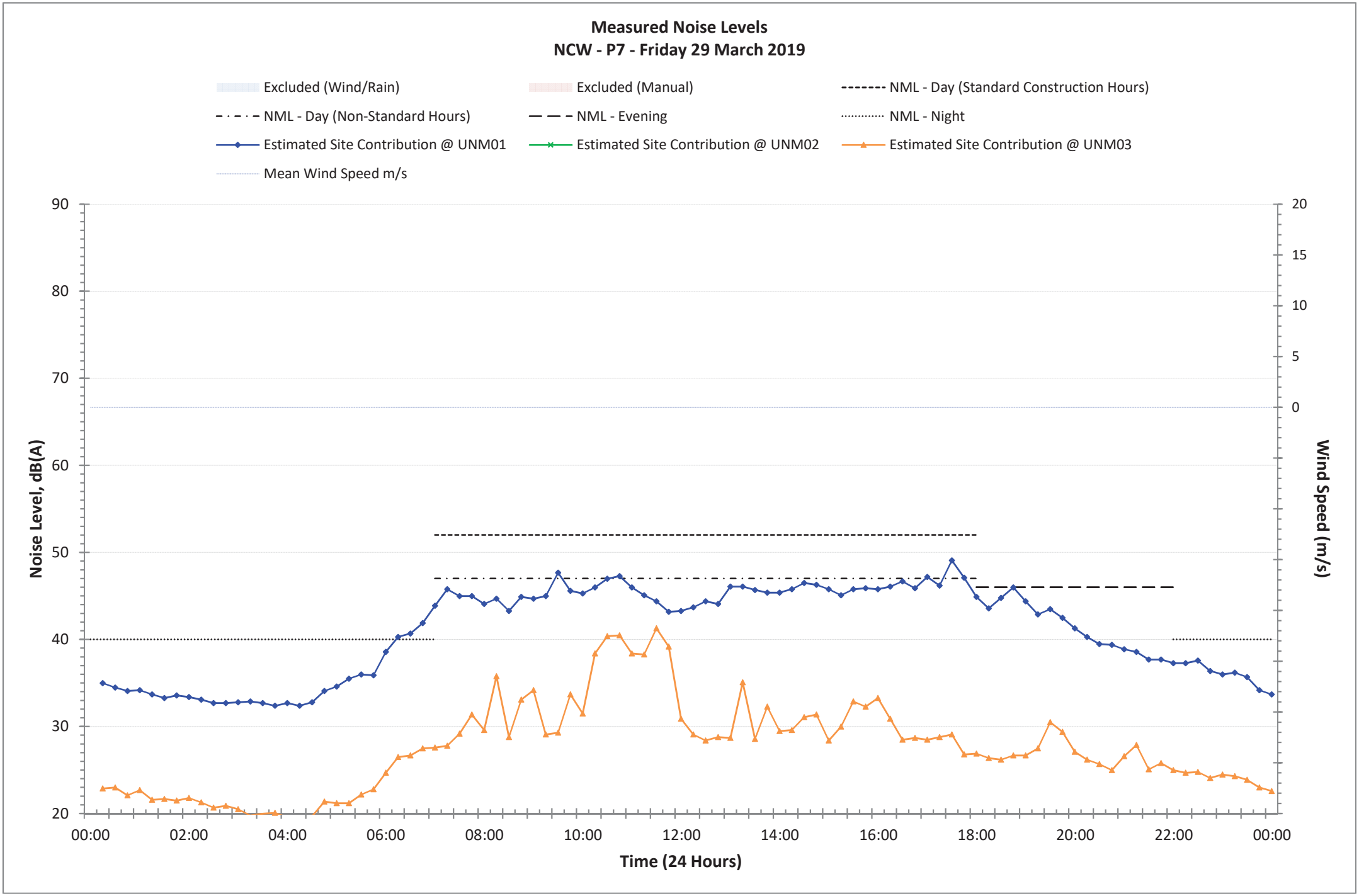
Measured Noise Levels
NCW - P7 - Friday 29 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
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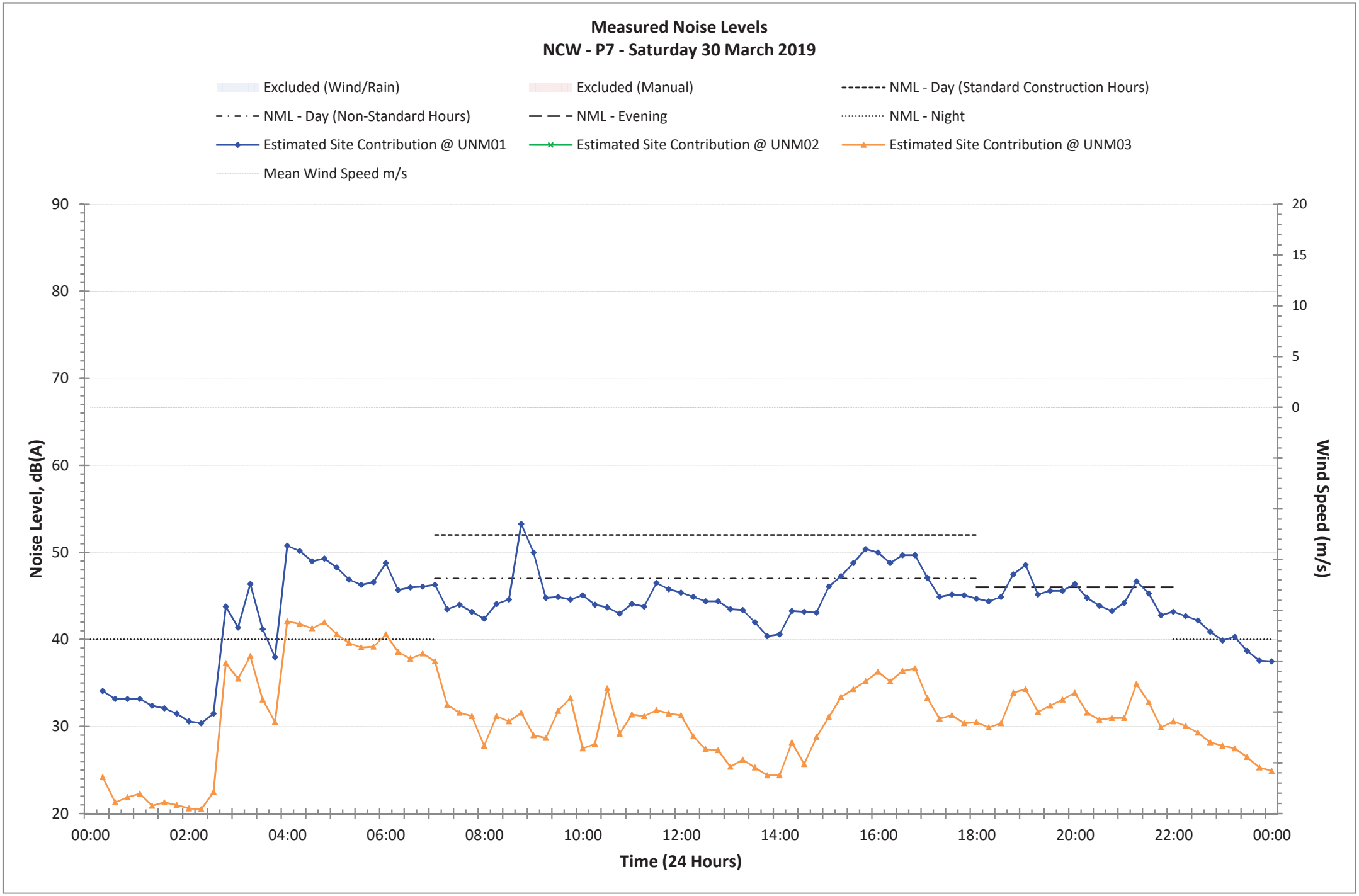
Measured Noise Levels
NCW - P7 - Saturday 30 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
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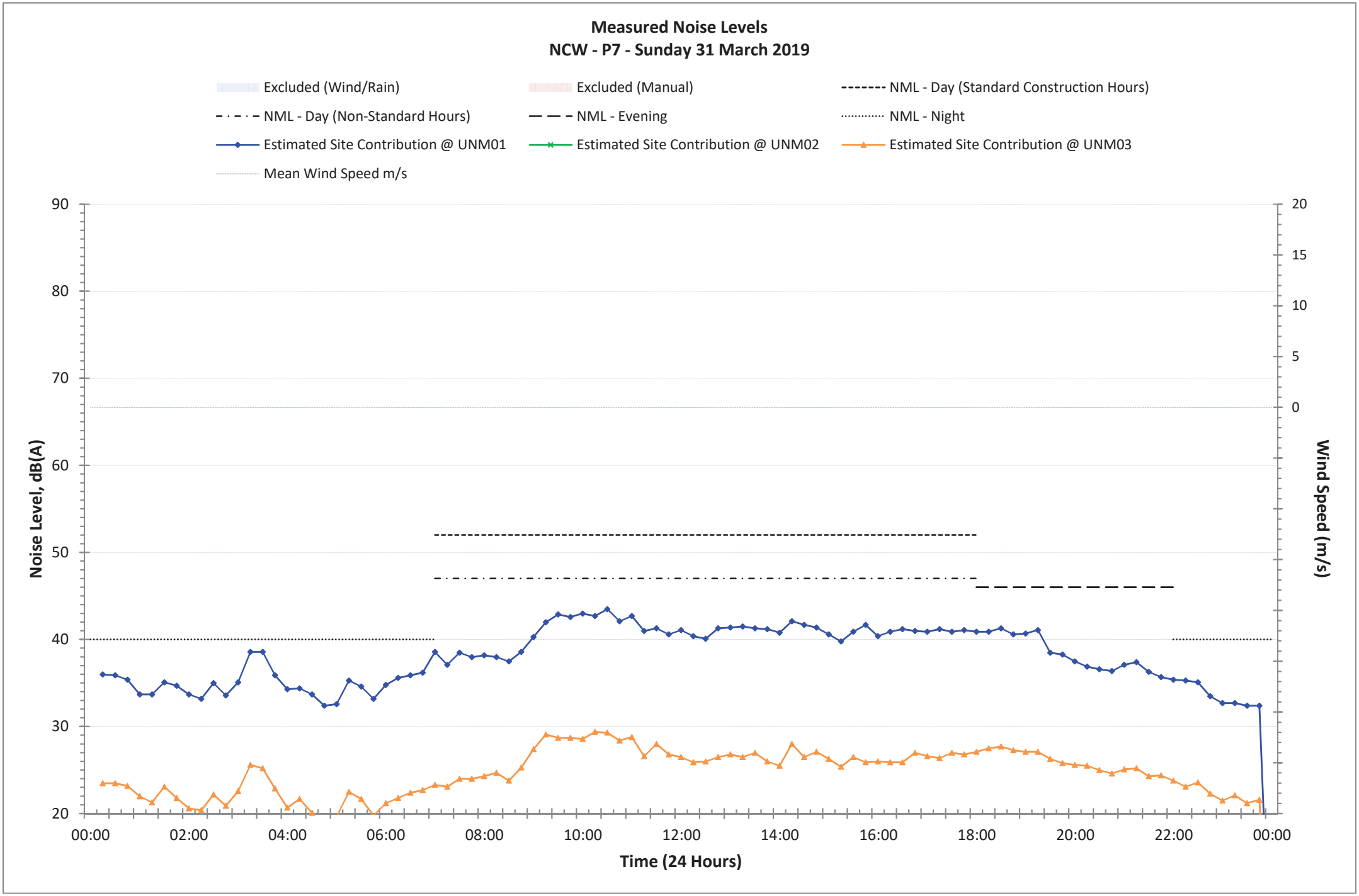
Measured Noise Levels
NCW - P7 - Sunday 31 March 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM01
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
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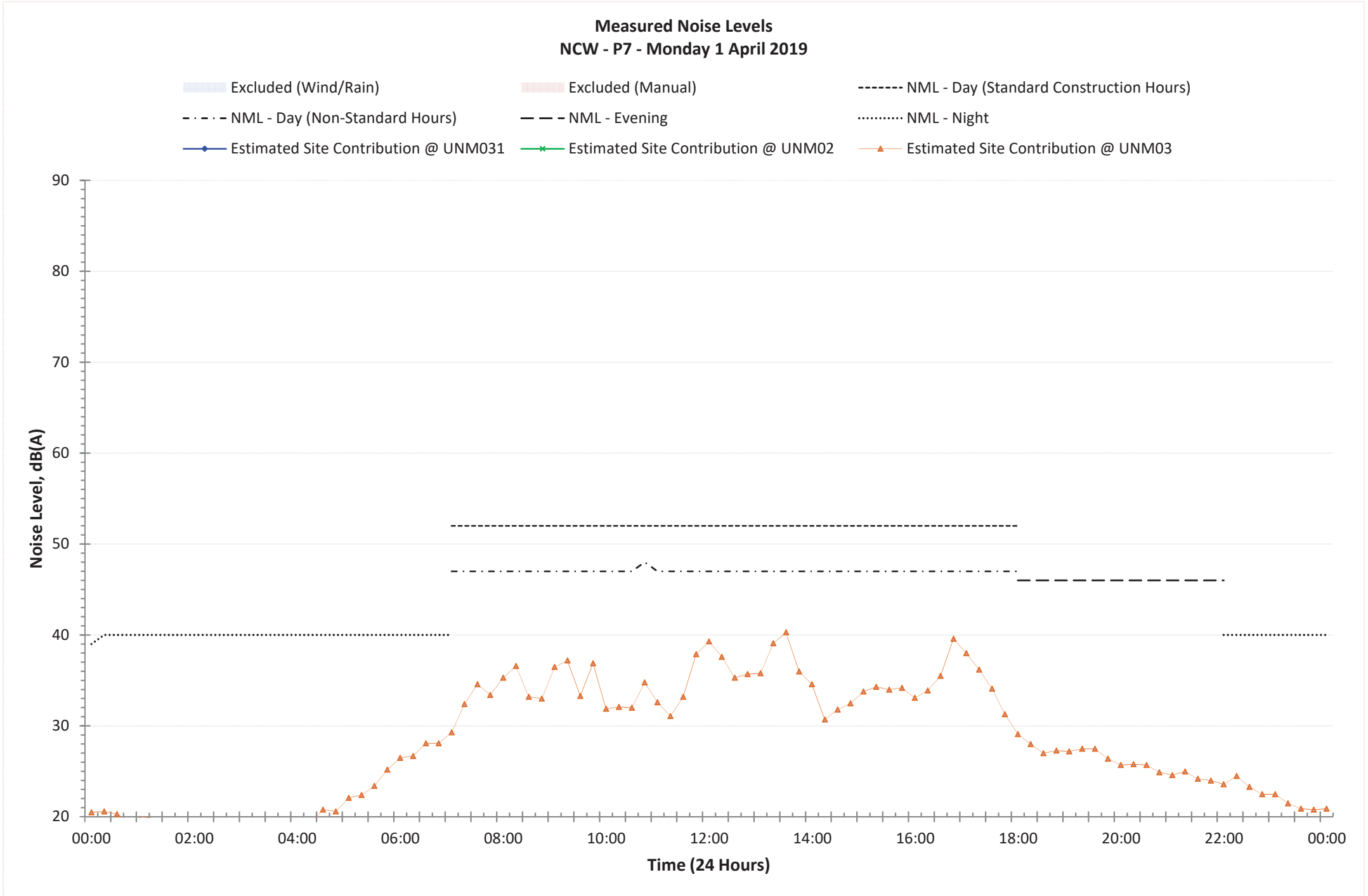
Measured Noise Levels
NCW - P7 - Monday 1 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
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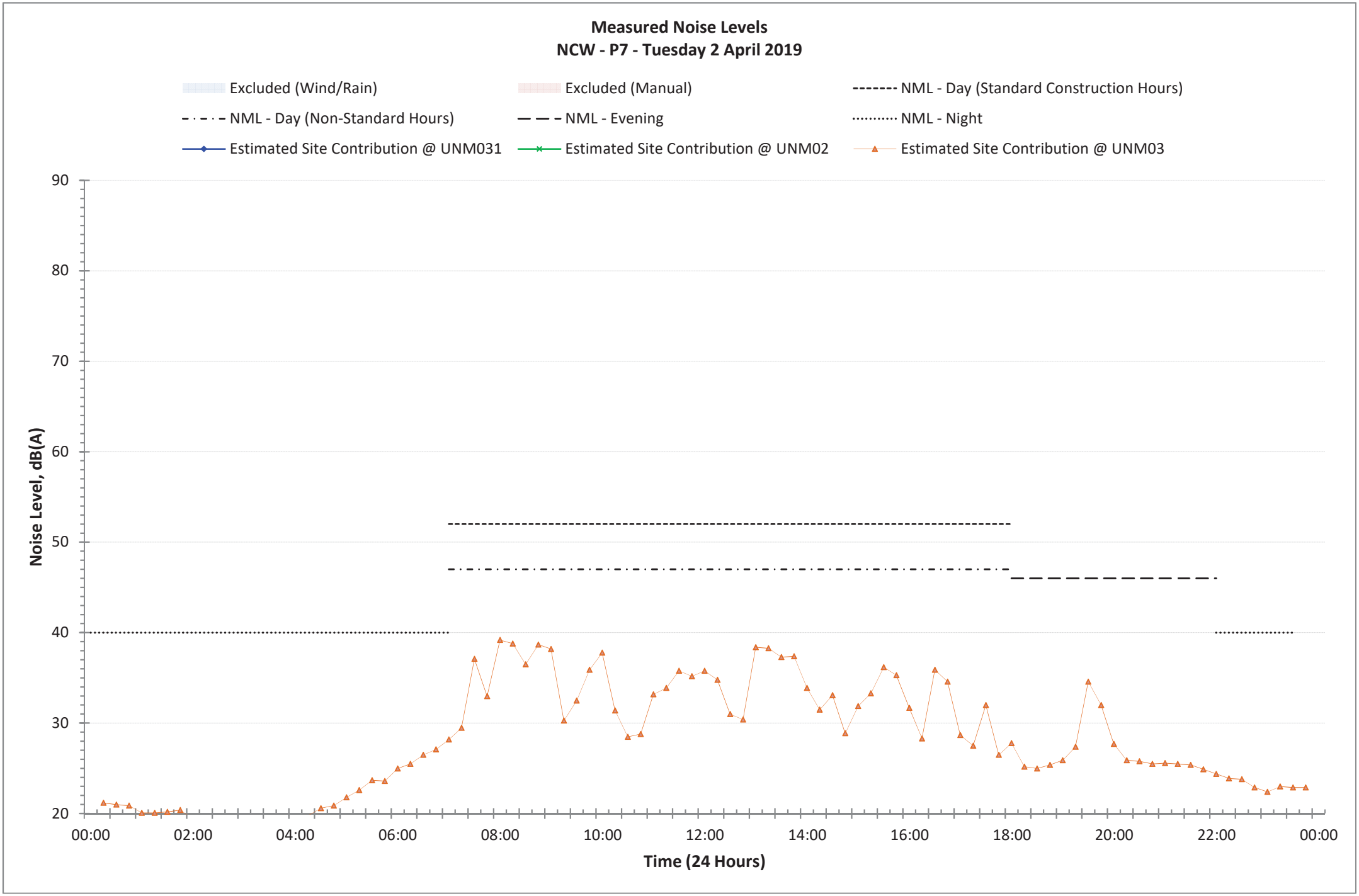
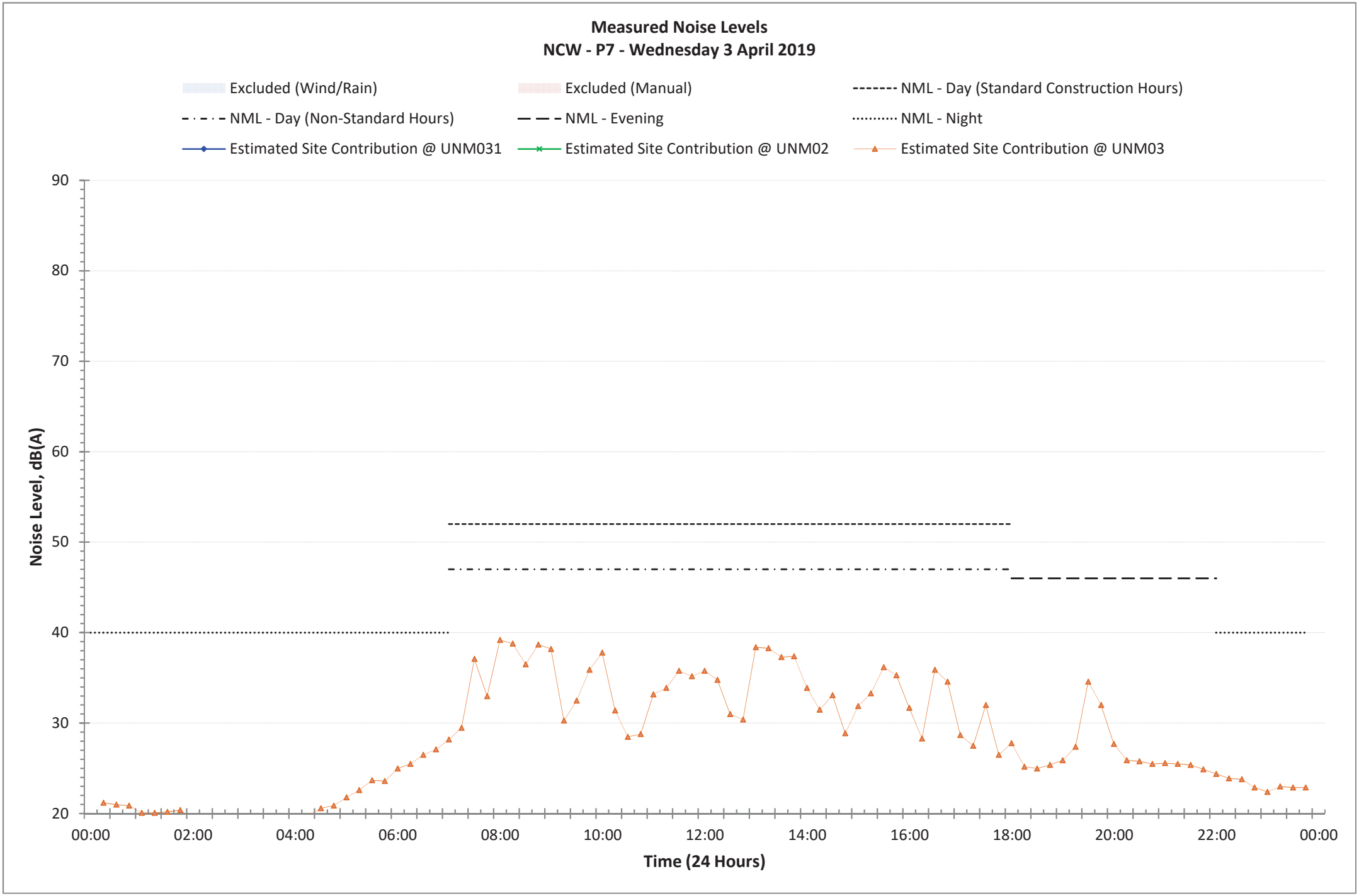
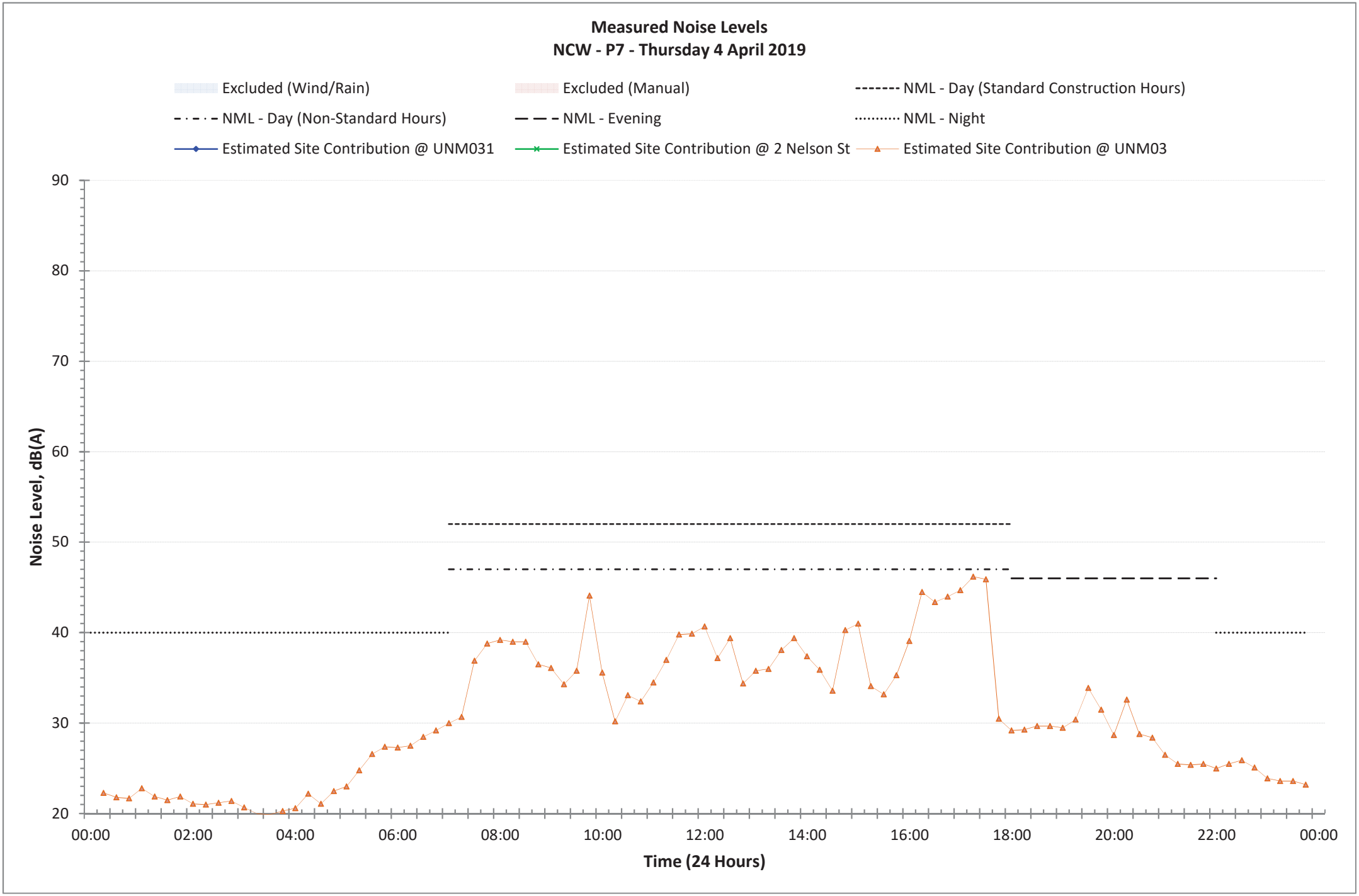
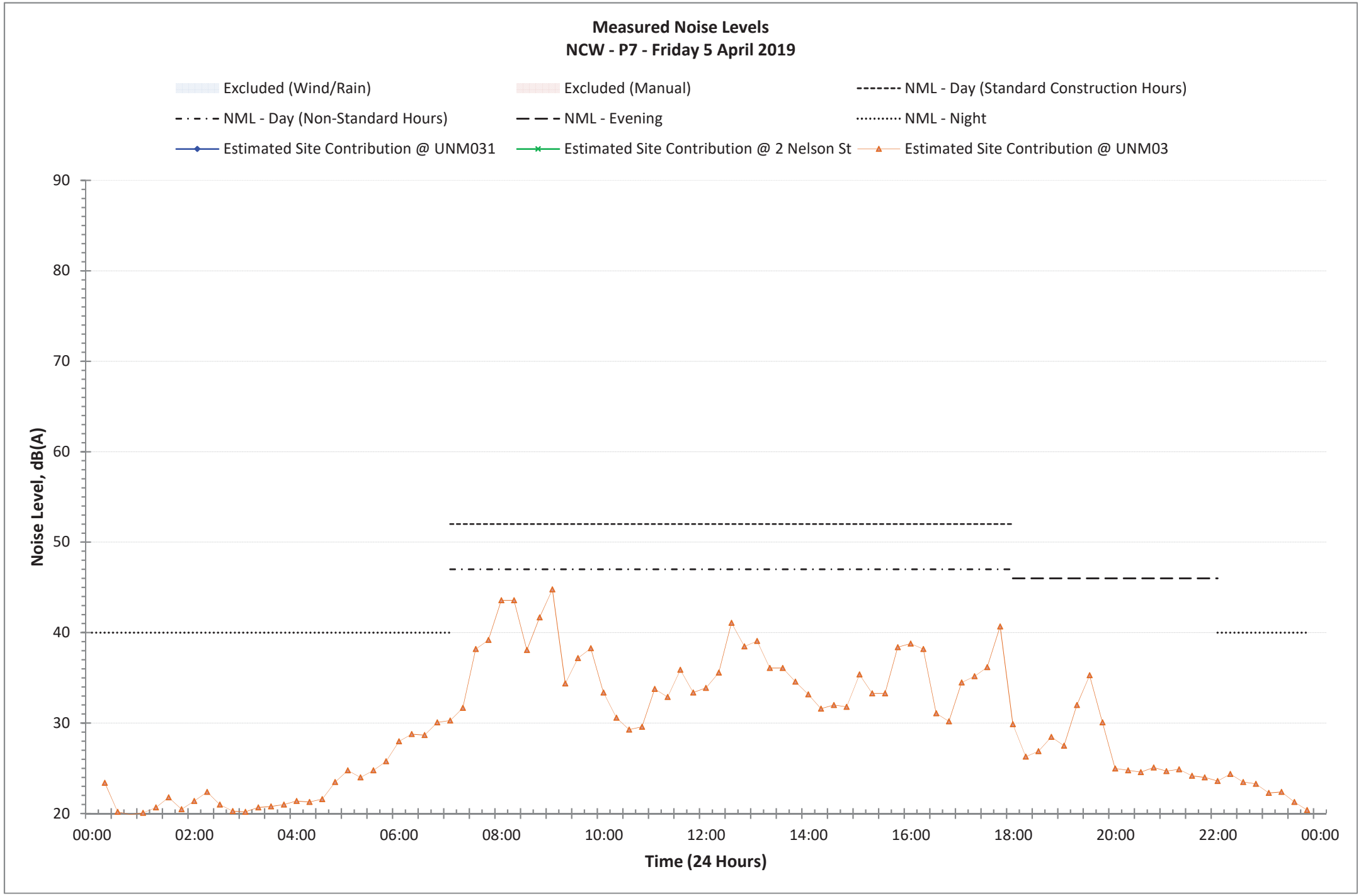
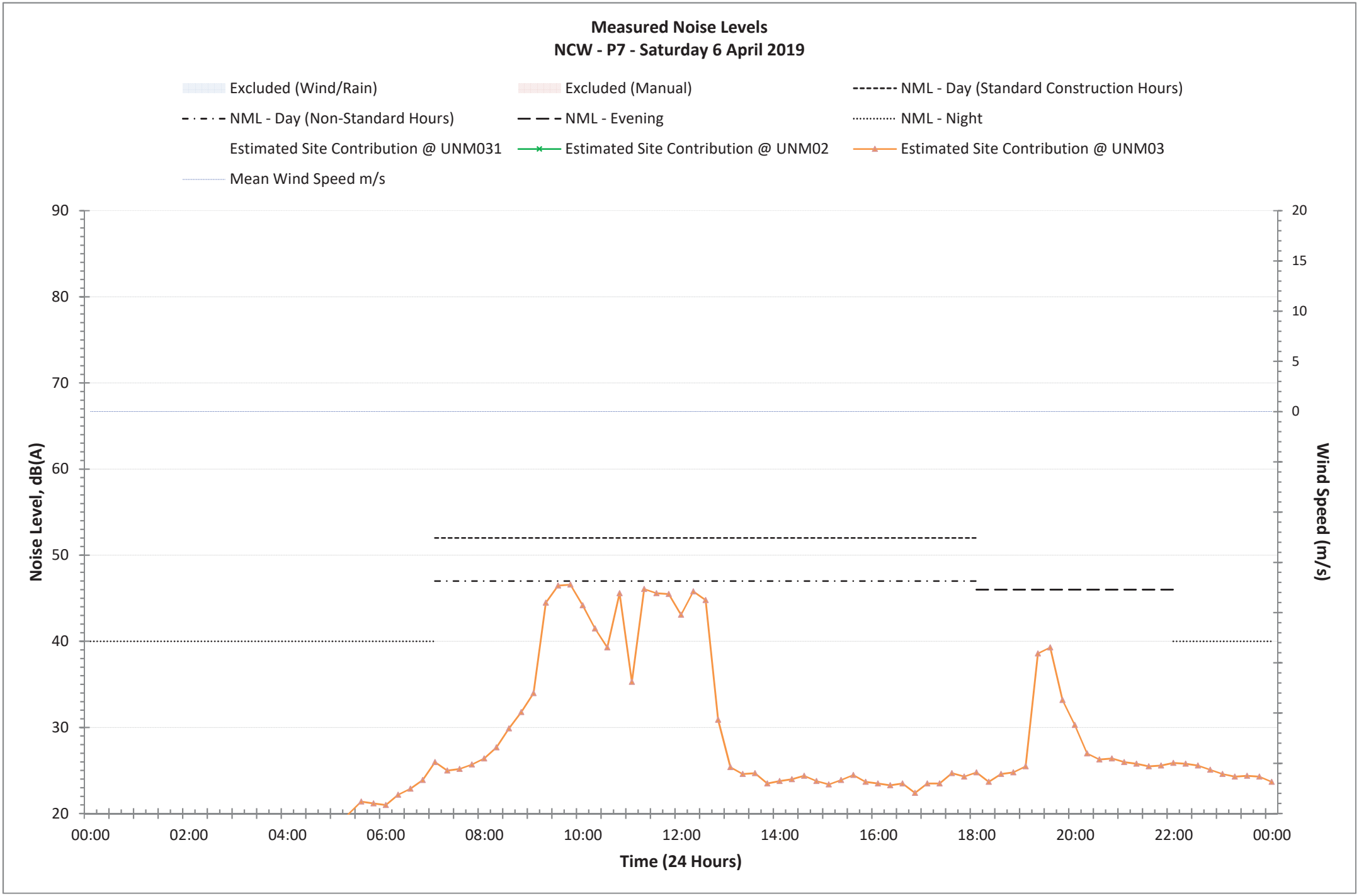
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

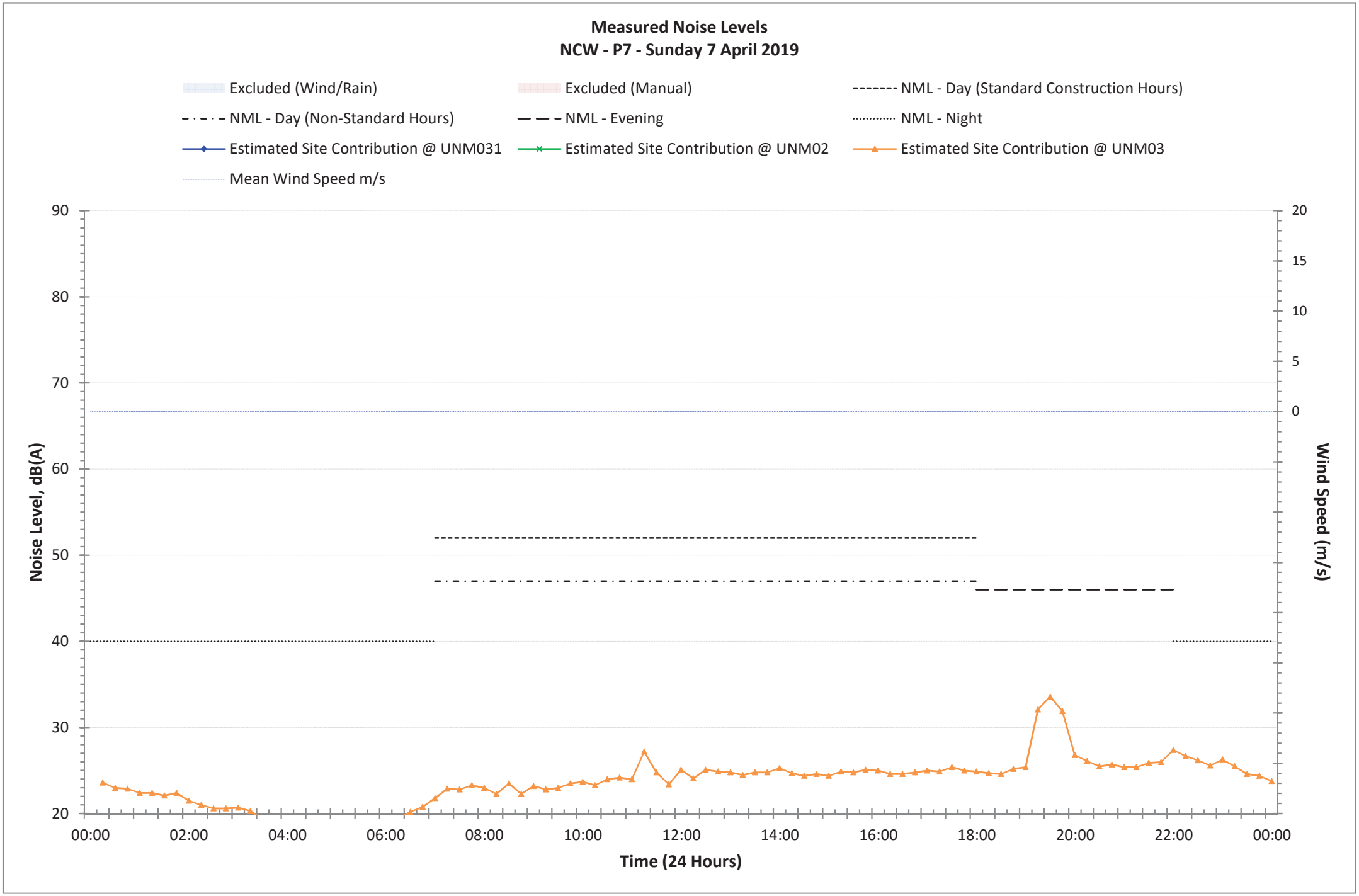

Measured Noise Levels
NCW - P7 - Tuesday 2 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)

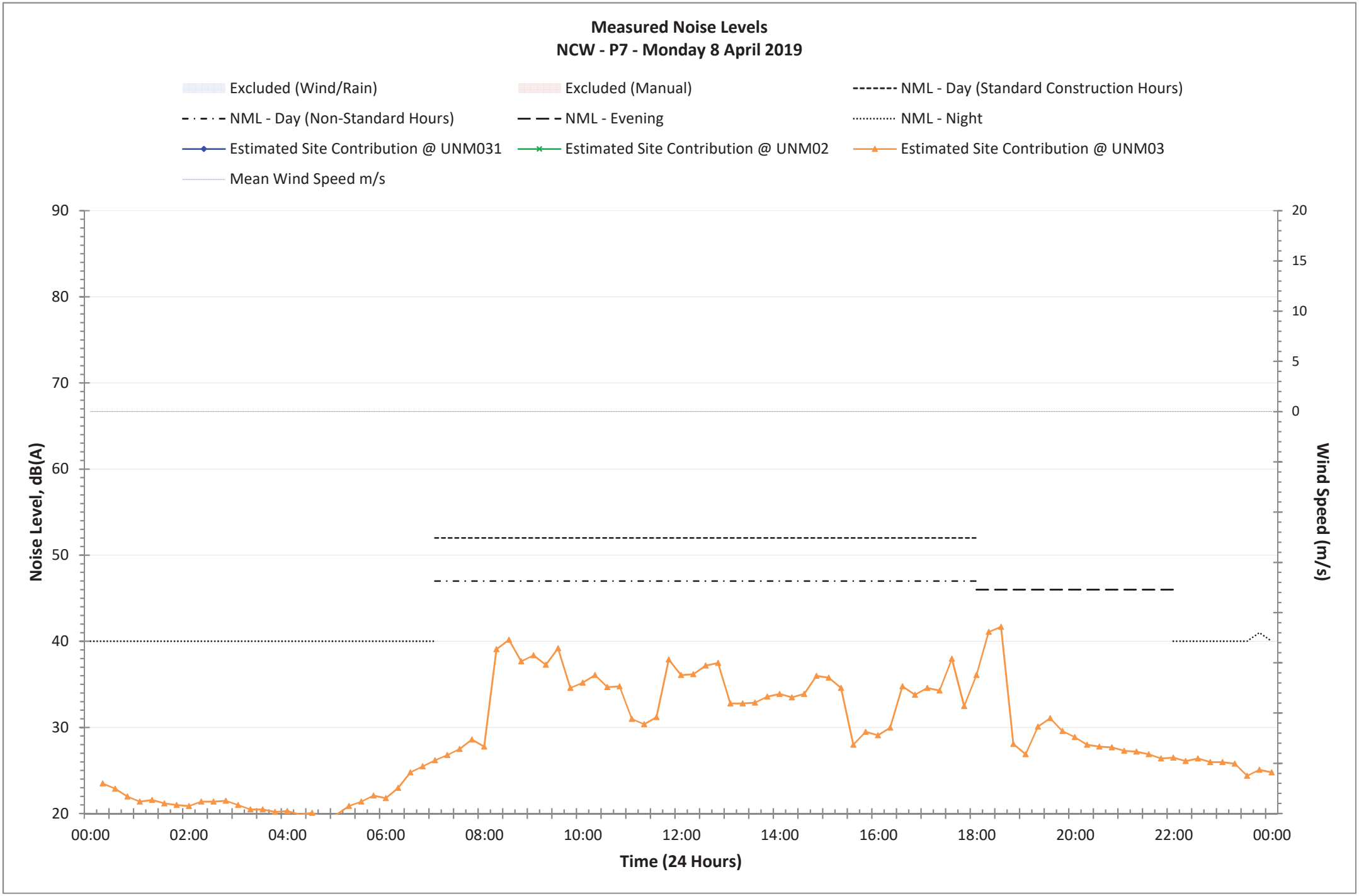

Measured Noise Levels
NCW - P7 - Wednesday 3 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Thursday 4 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Friday 5 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ 2 Nelson St
Estimated Site Contribution @ UNM03
Noise Level, dB(A)
90
80
70
60
50
40
30
20
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Saturday 6 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Sunday 7 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Monday 8 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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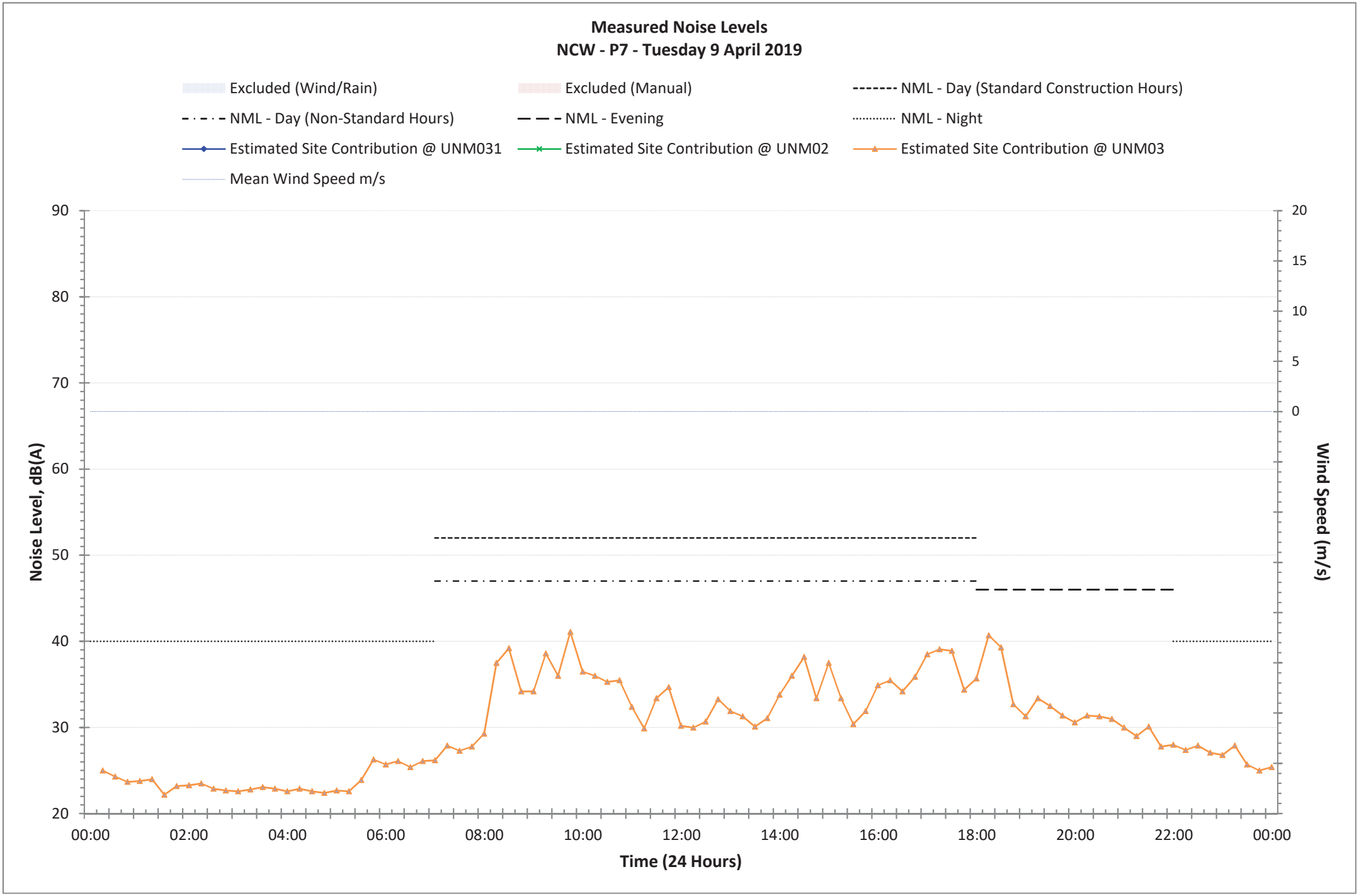
Measured Noise Levels
NCW - P7 - Tuesday 9 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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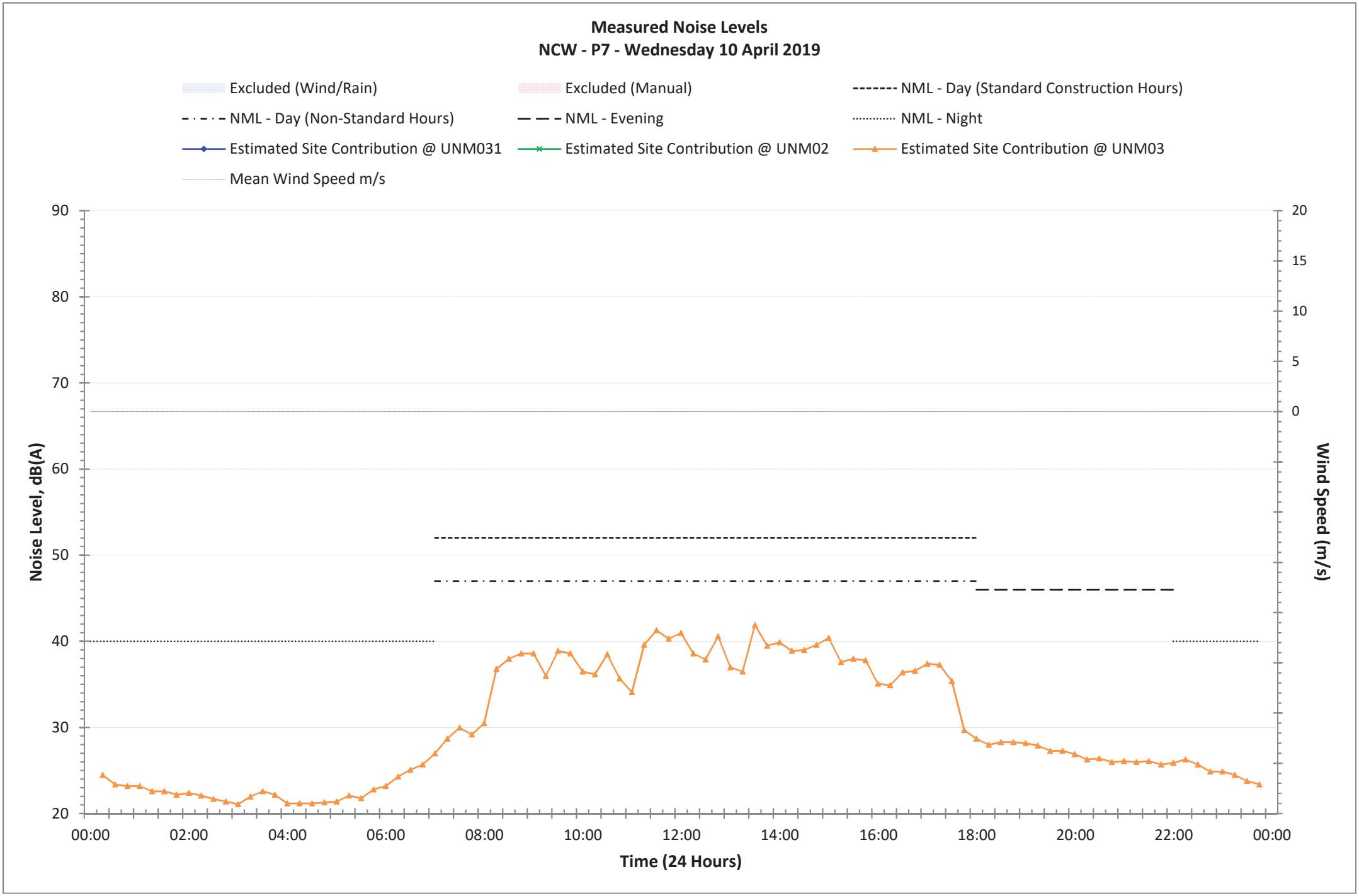
Measured Noise Levels
NCW - P7 - Wednesday 10 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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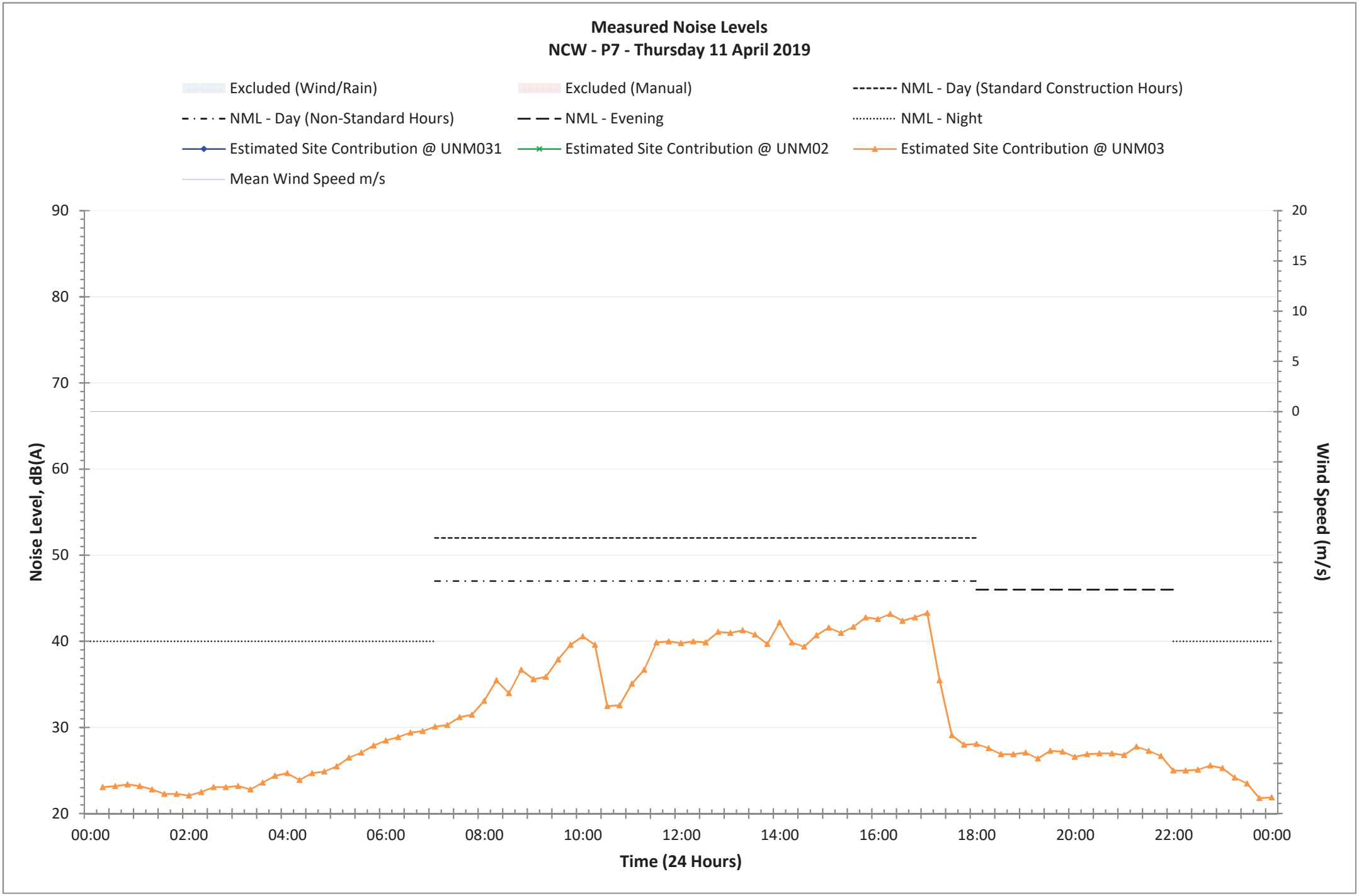
Measured Noise Levels
NCW - P7 - Thursday 11 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
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22:00
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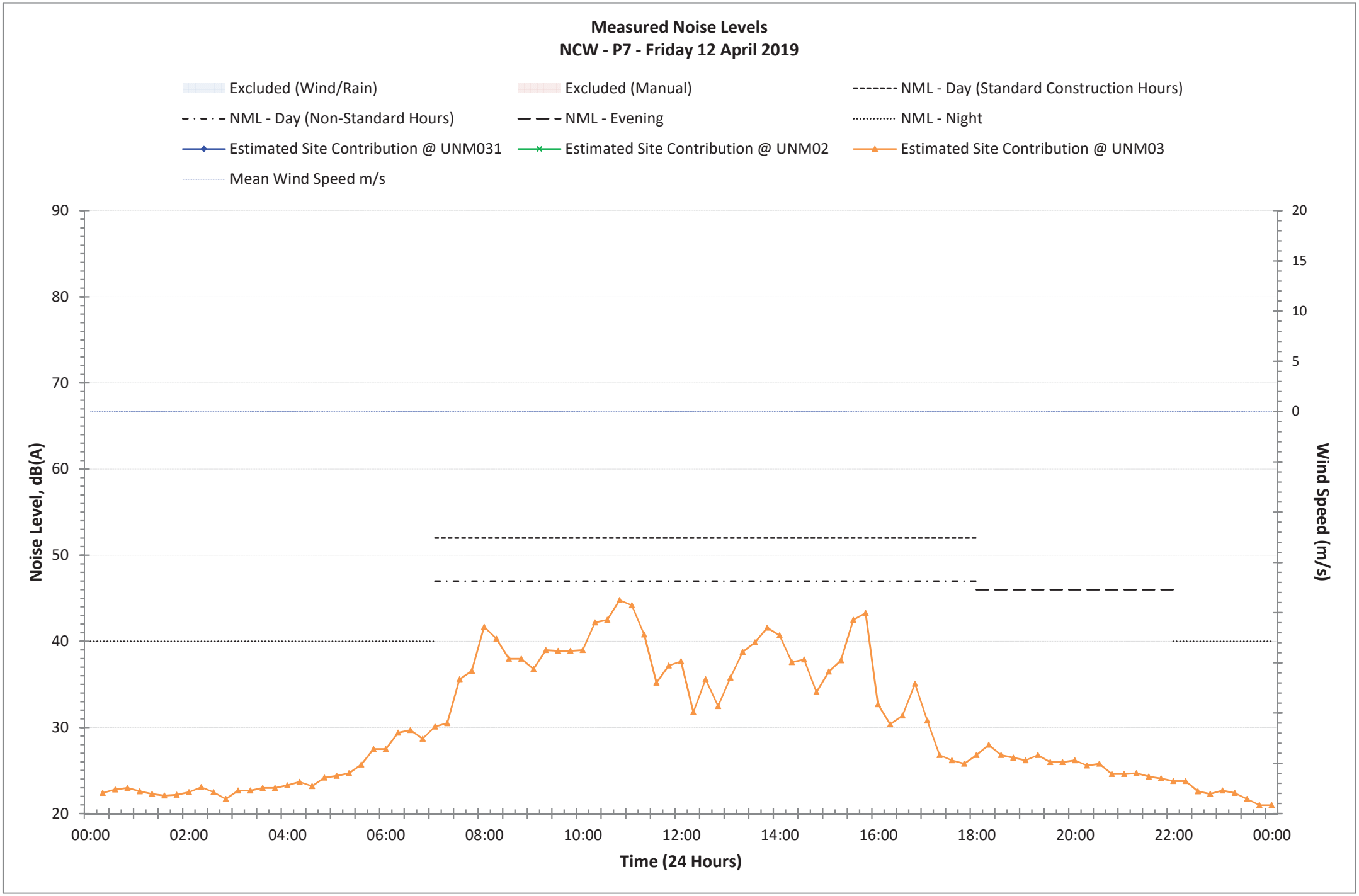
Measured Noise Levels
NCW - P7 - Friday 12 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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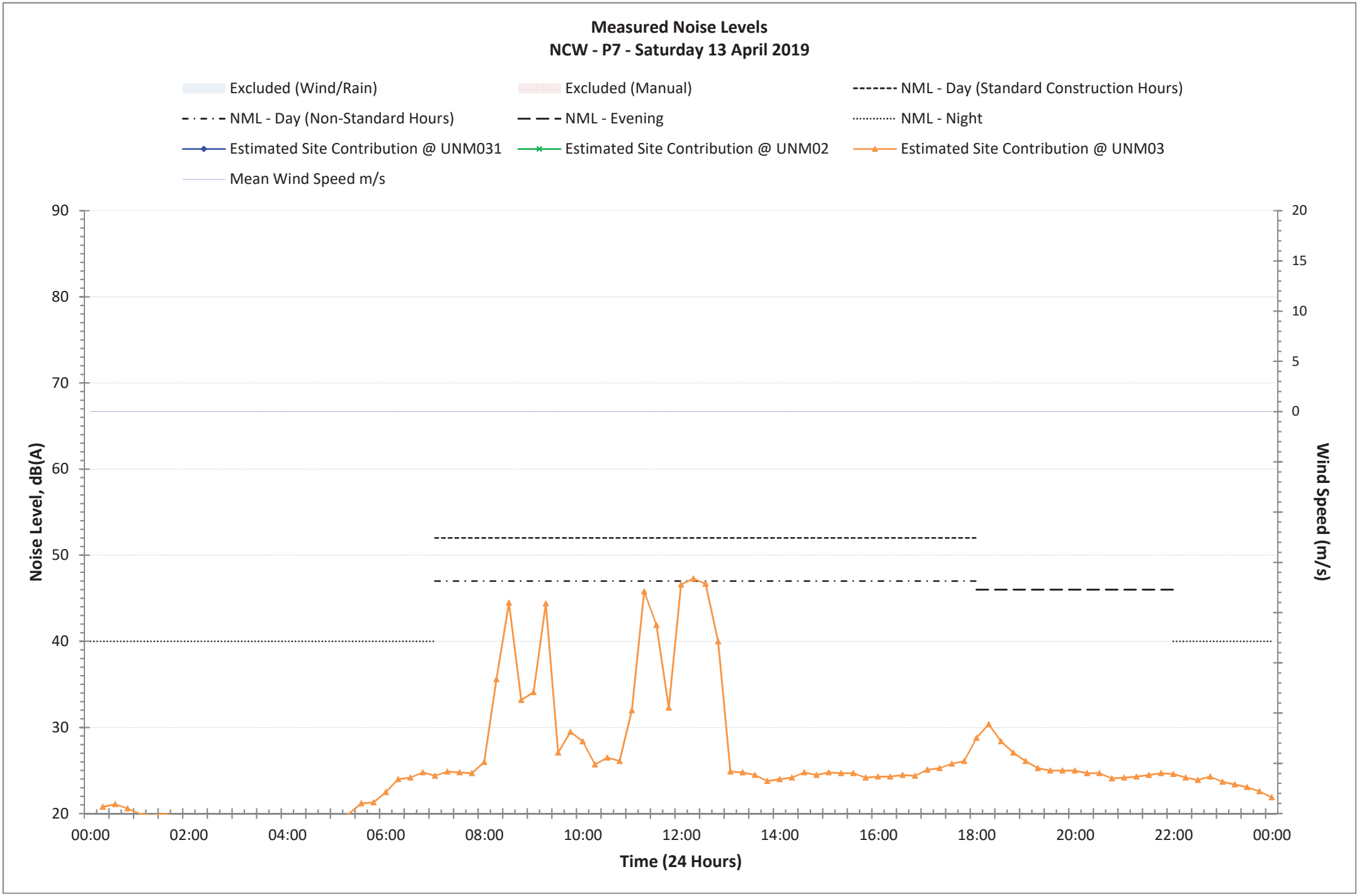
Measured Noise Levels
NCW - P7 - Saturday 13 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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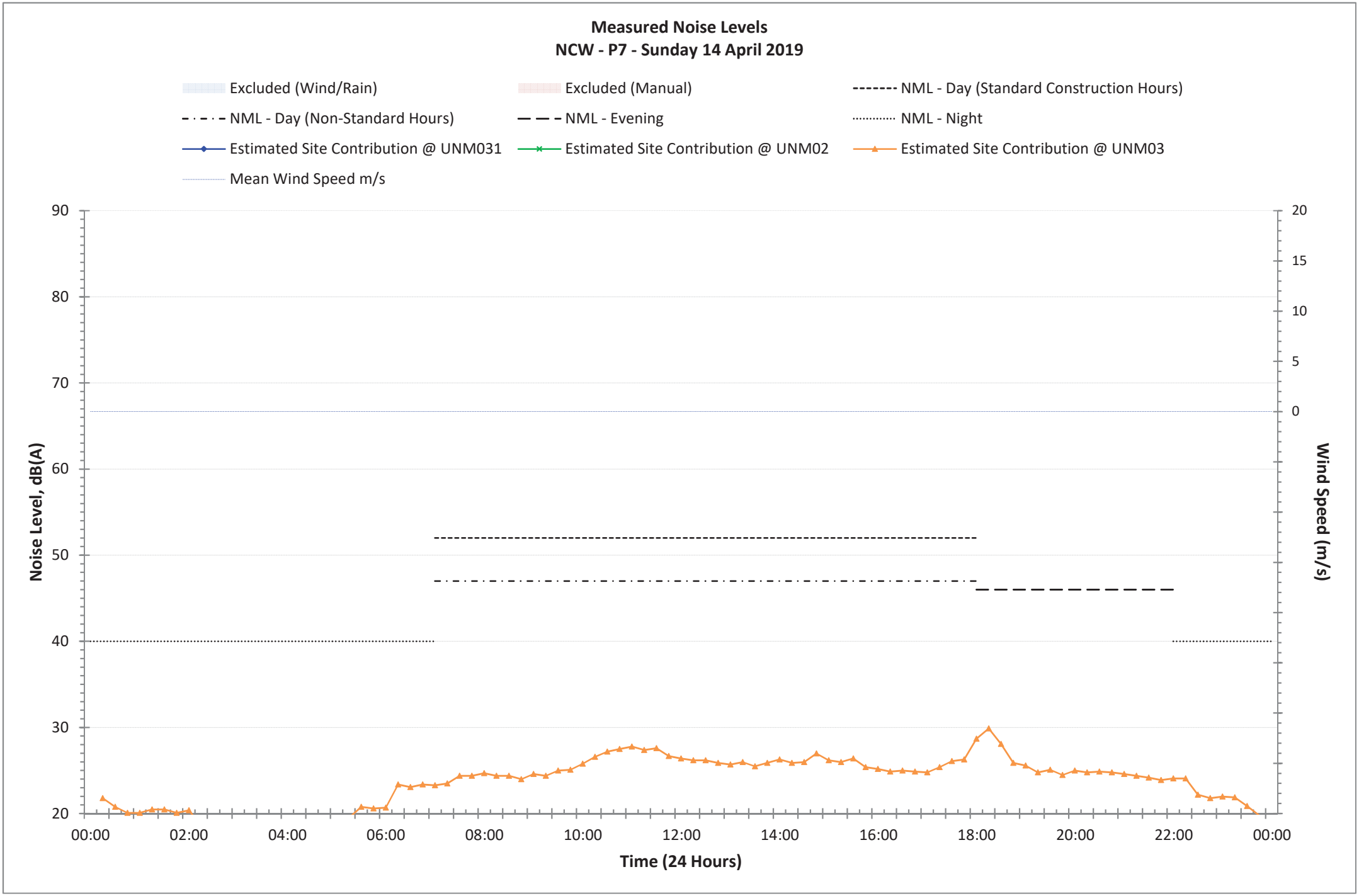
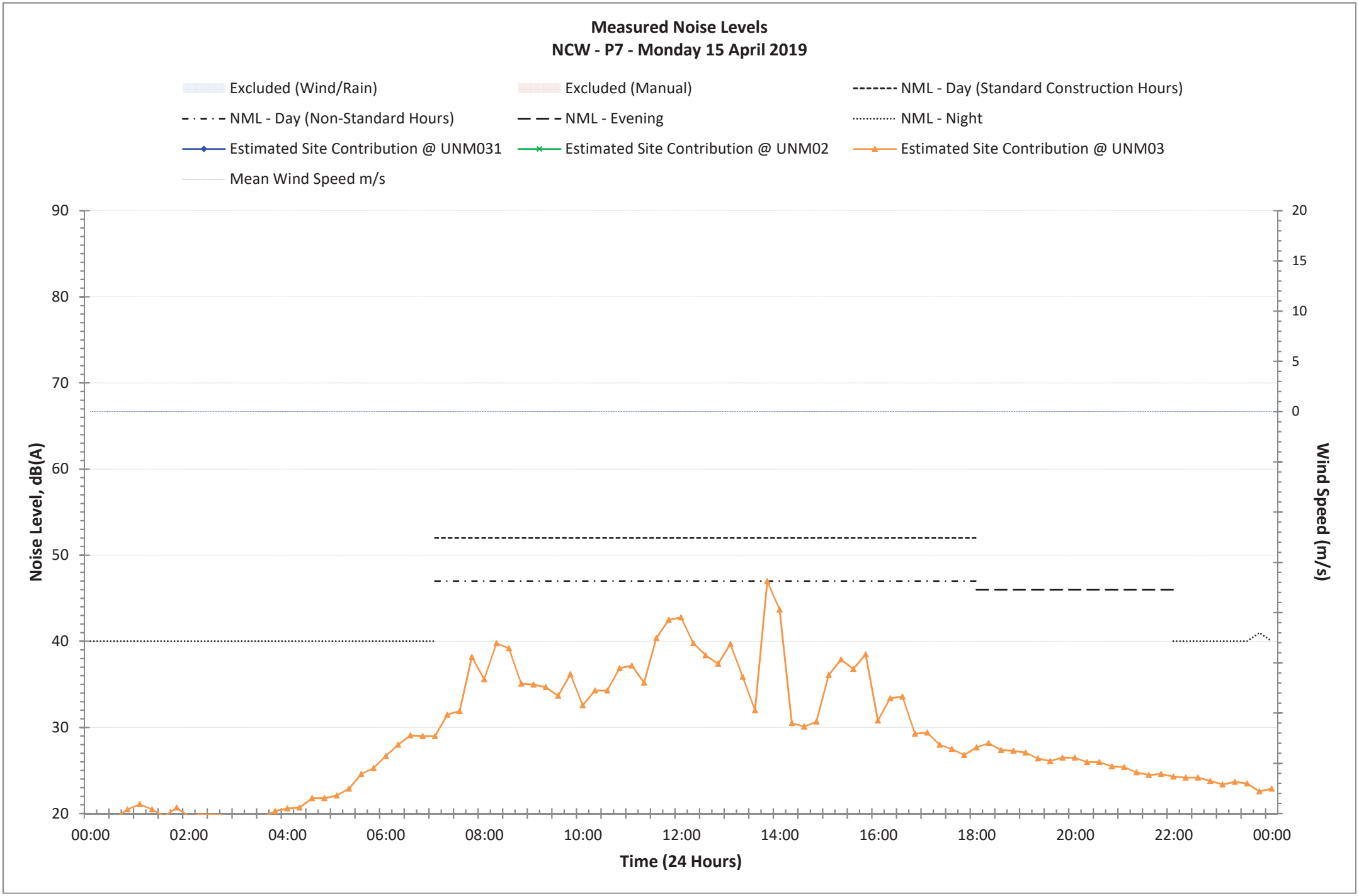
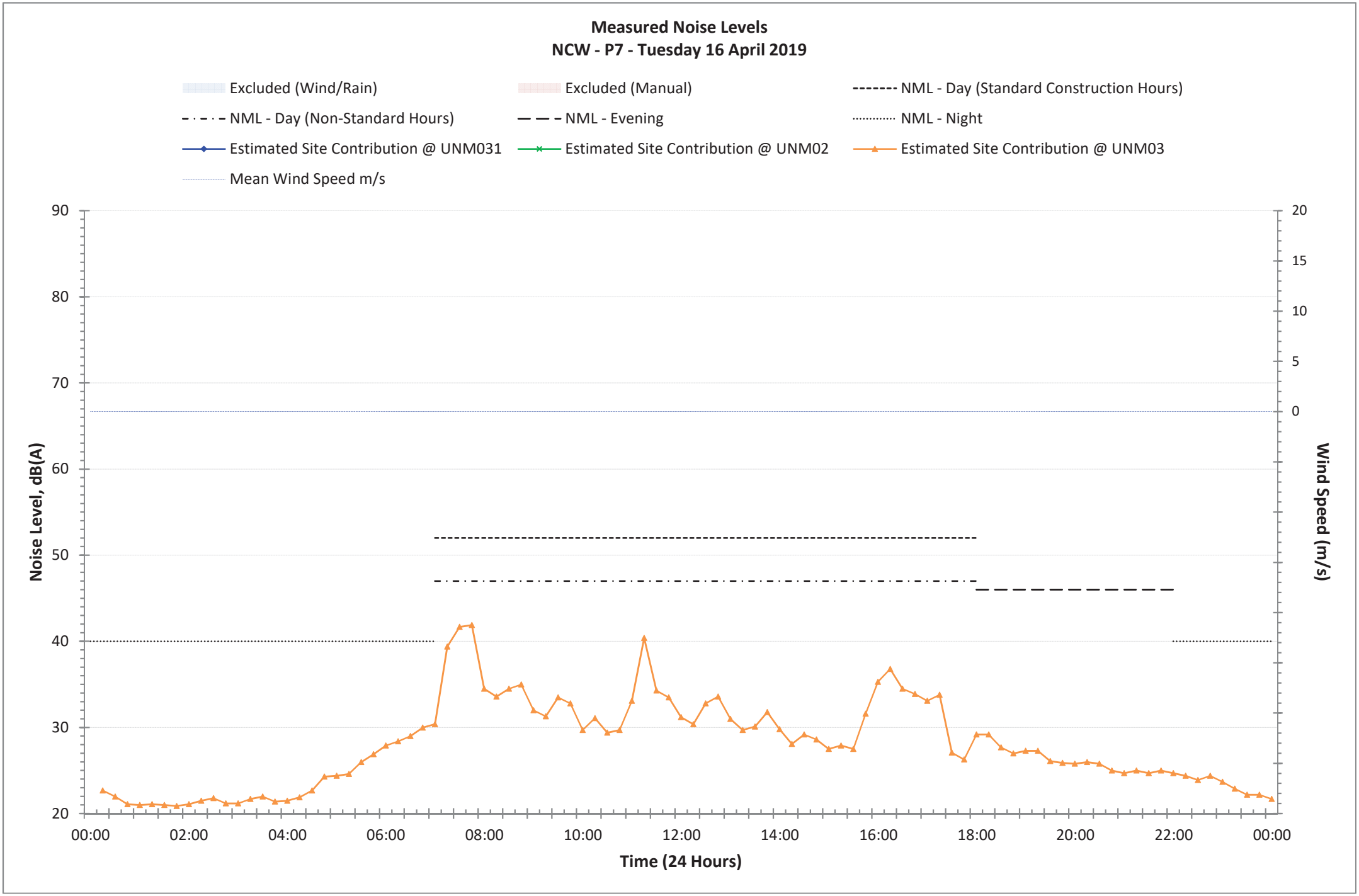
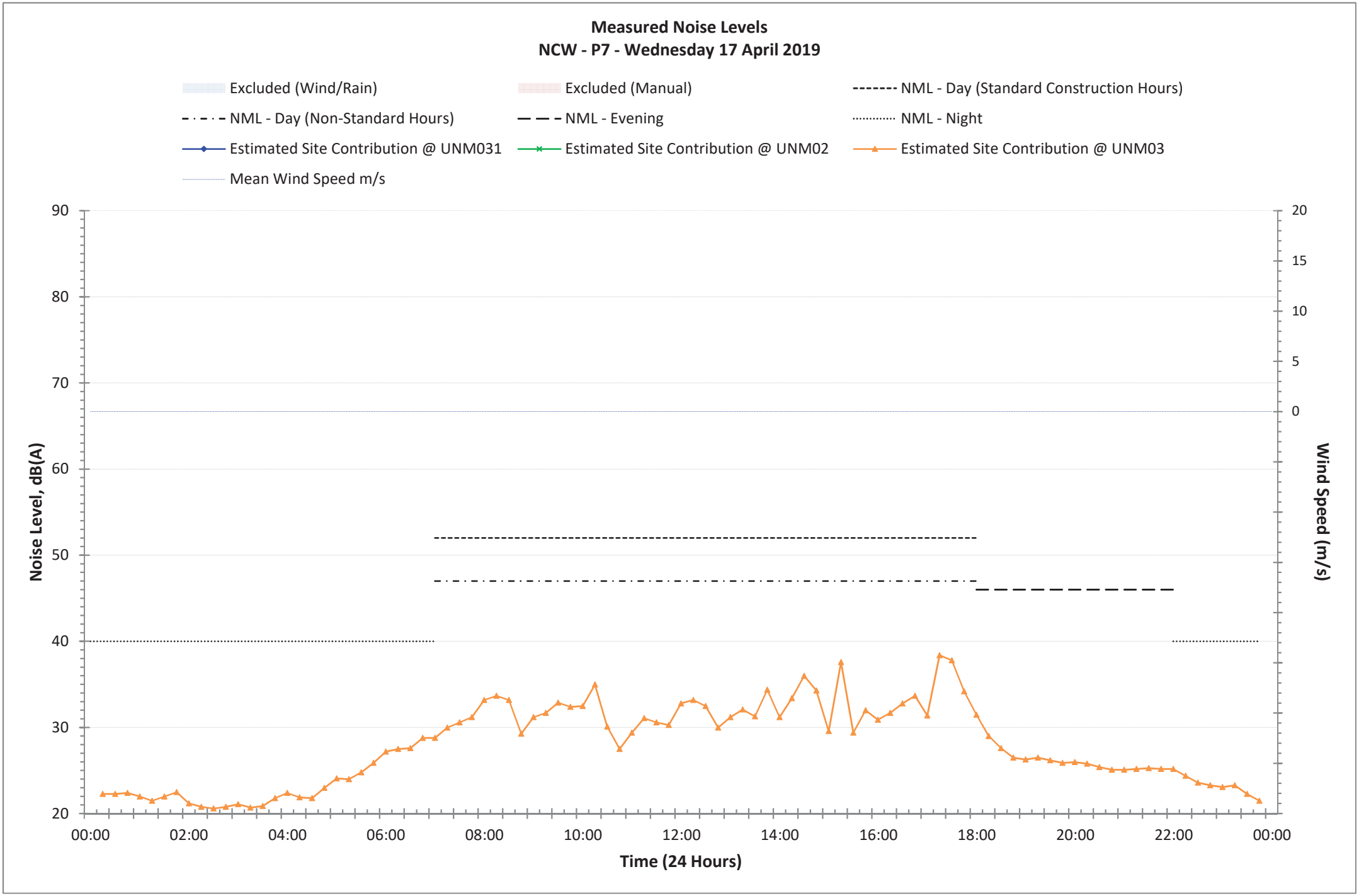

Measured Noise Levels
NCW - P7 - Sunday 14 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Monday 15 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Tuesday 16 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Wednesday 17 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
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12:00
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20:00
22:00
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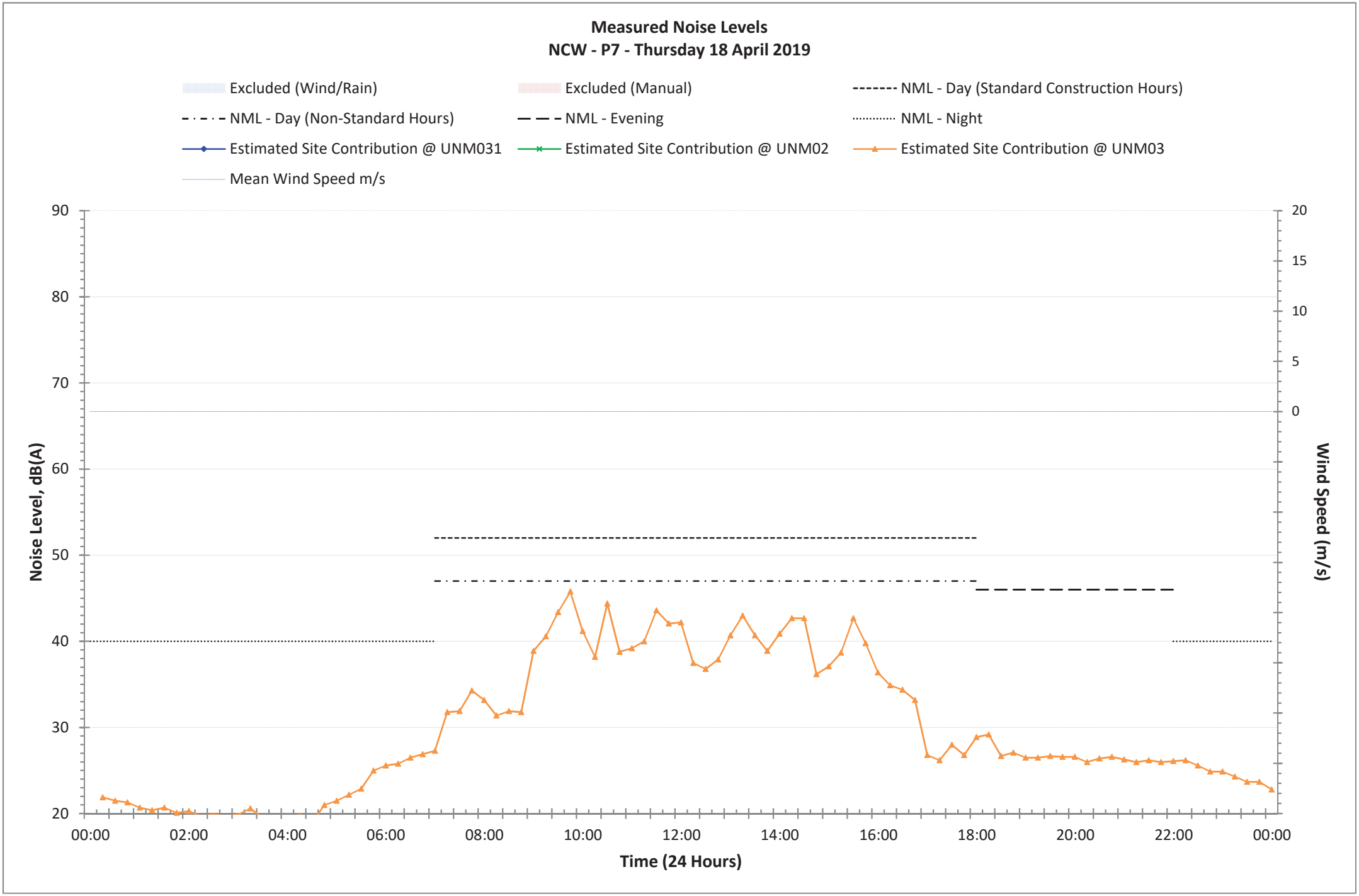
Measured Noise Levels
NCW - P7 - Thursday 18 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
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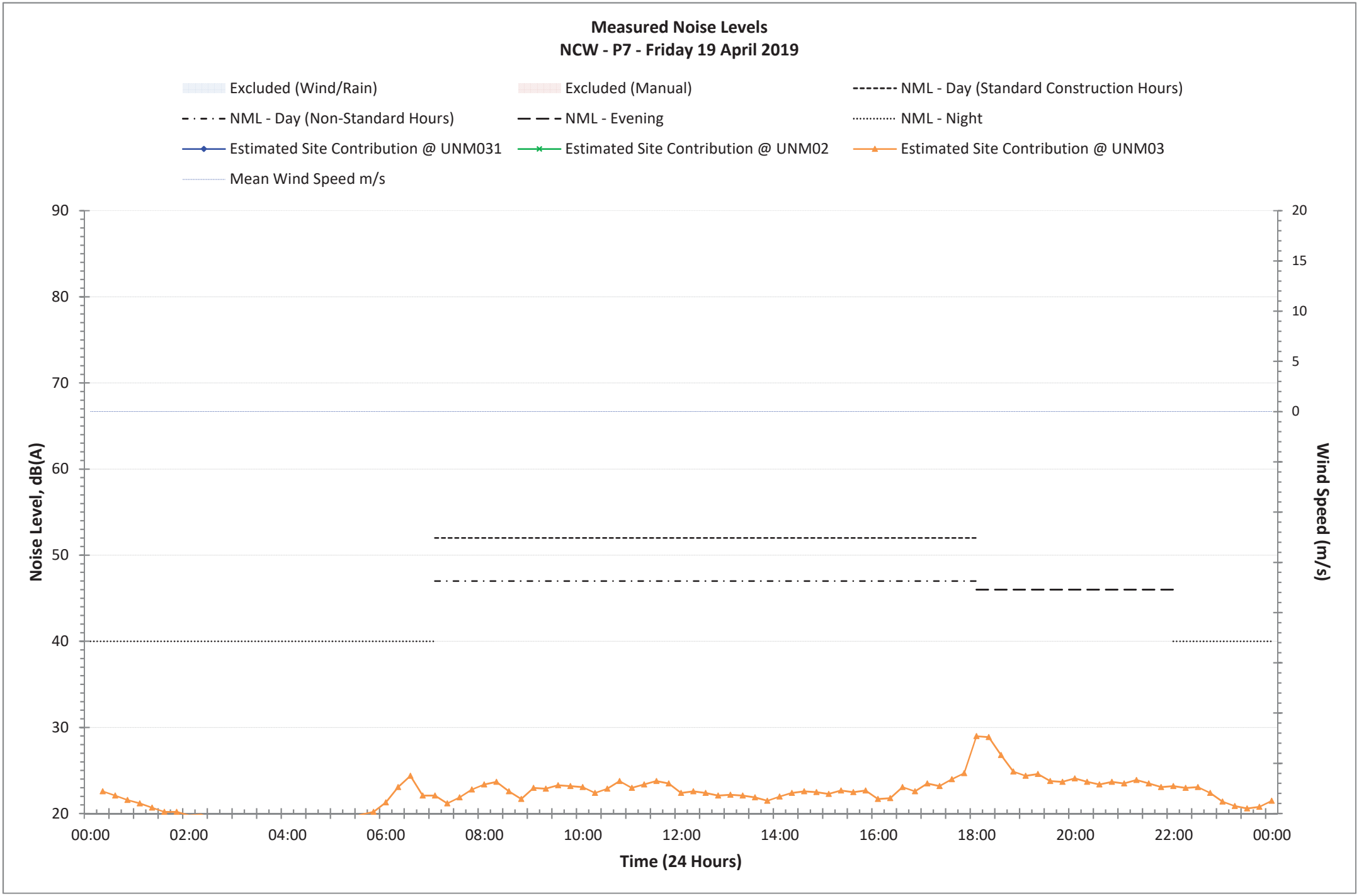
Measured Noise Levels
NCW - P7 - Friday 19 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
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10:00
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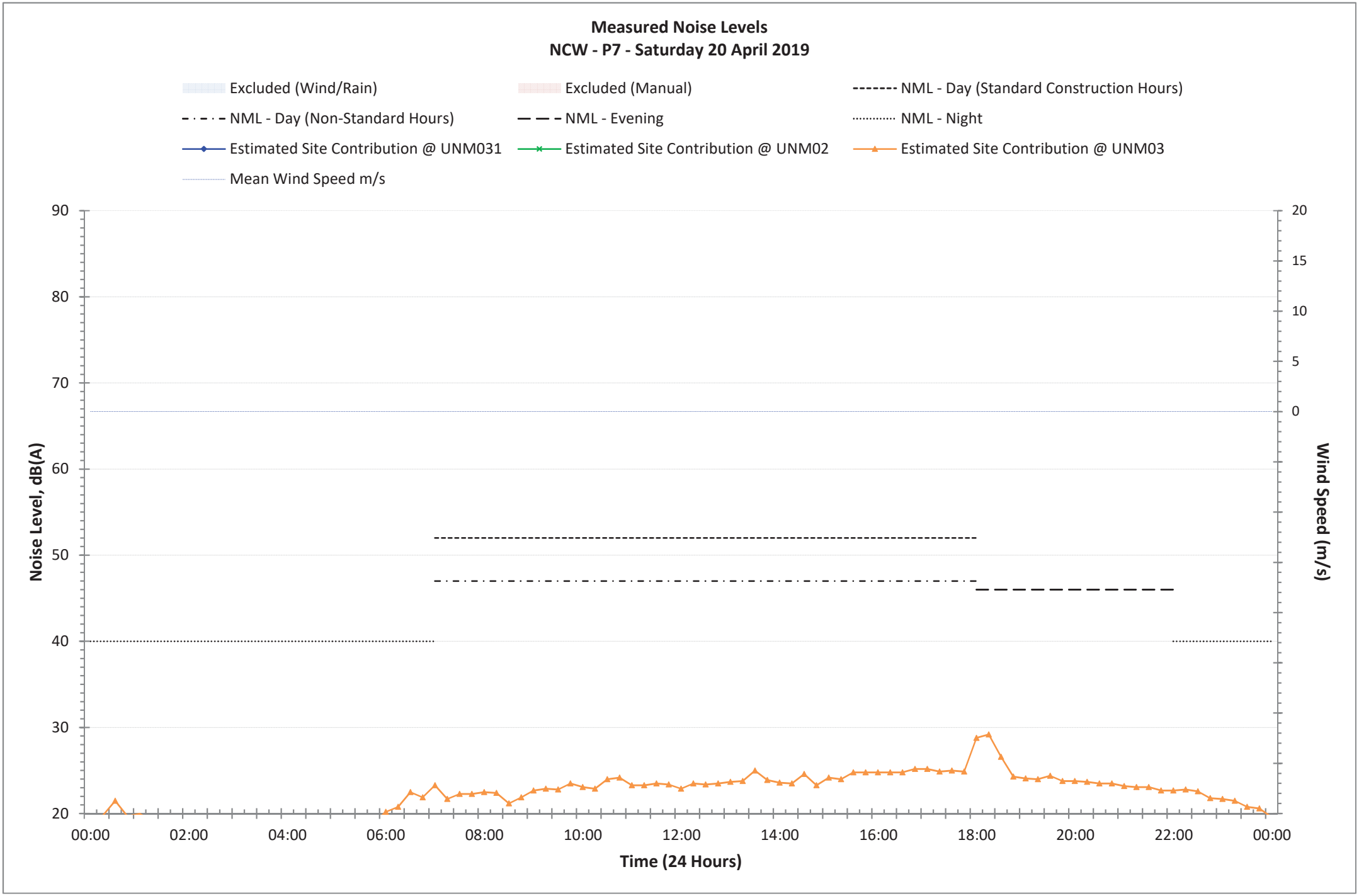
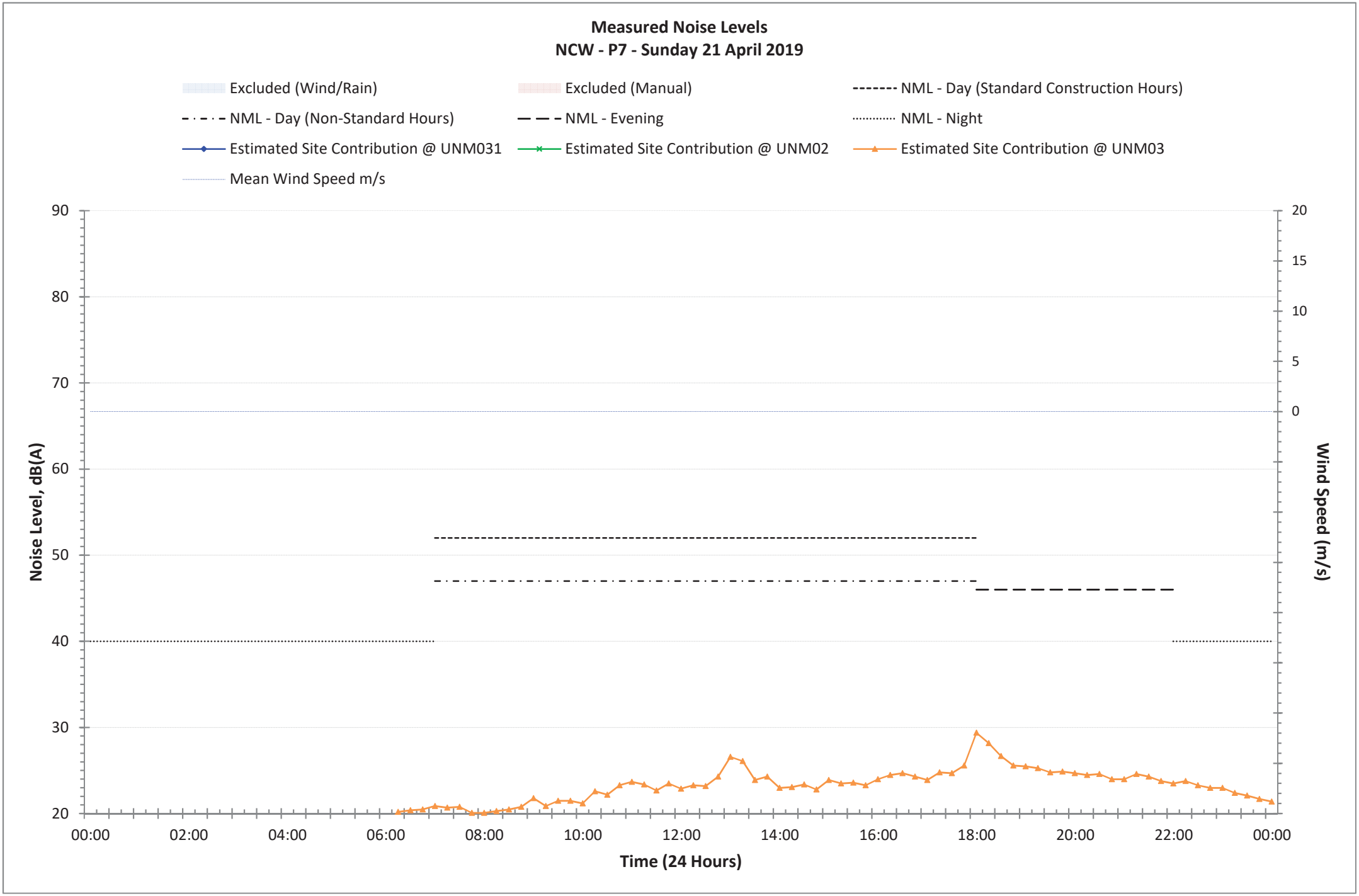

Measured Noise Levels
NCW - P7 - Saturday 20 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Sunday 21 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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22:00
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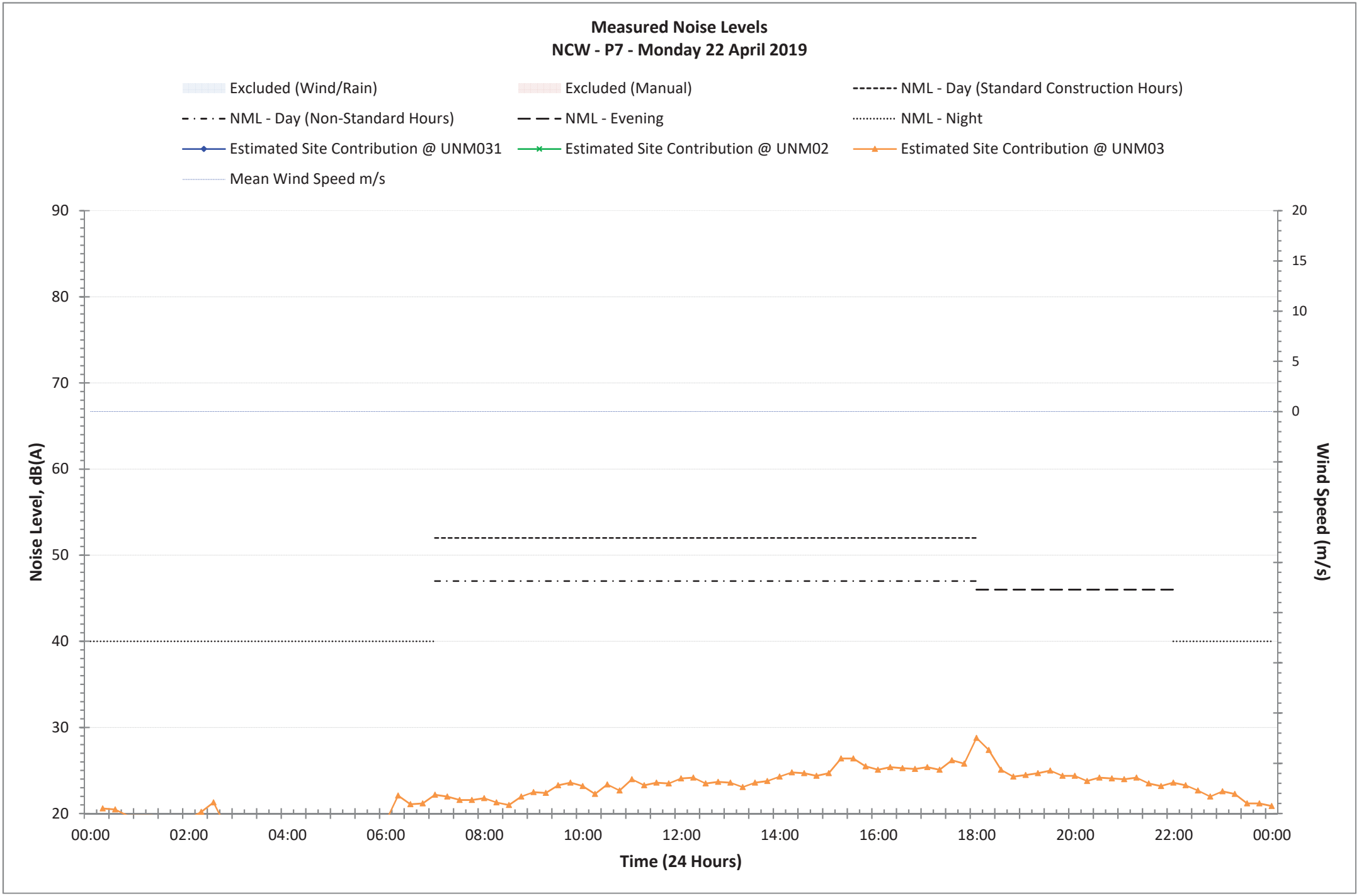
Measured Noise Levels
NCW - P7 - Monday 22 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
90
80
70
60
50
40
30
20
20
15
10
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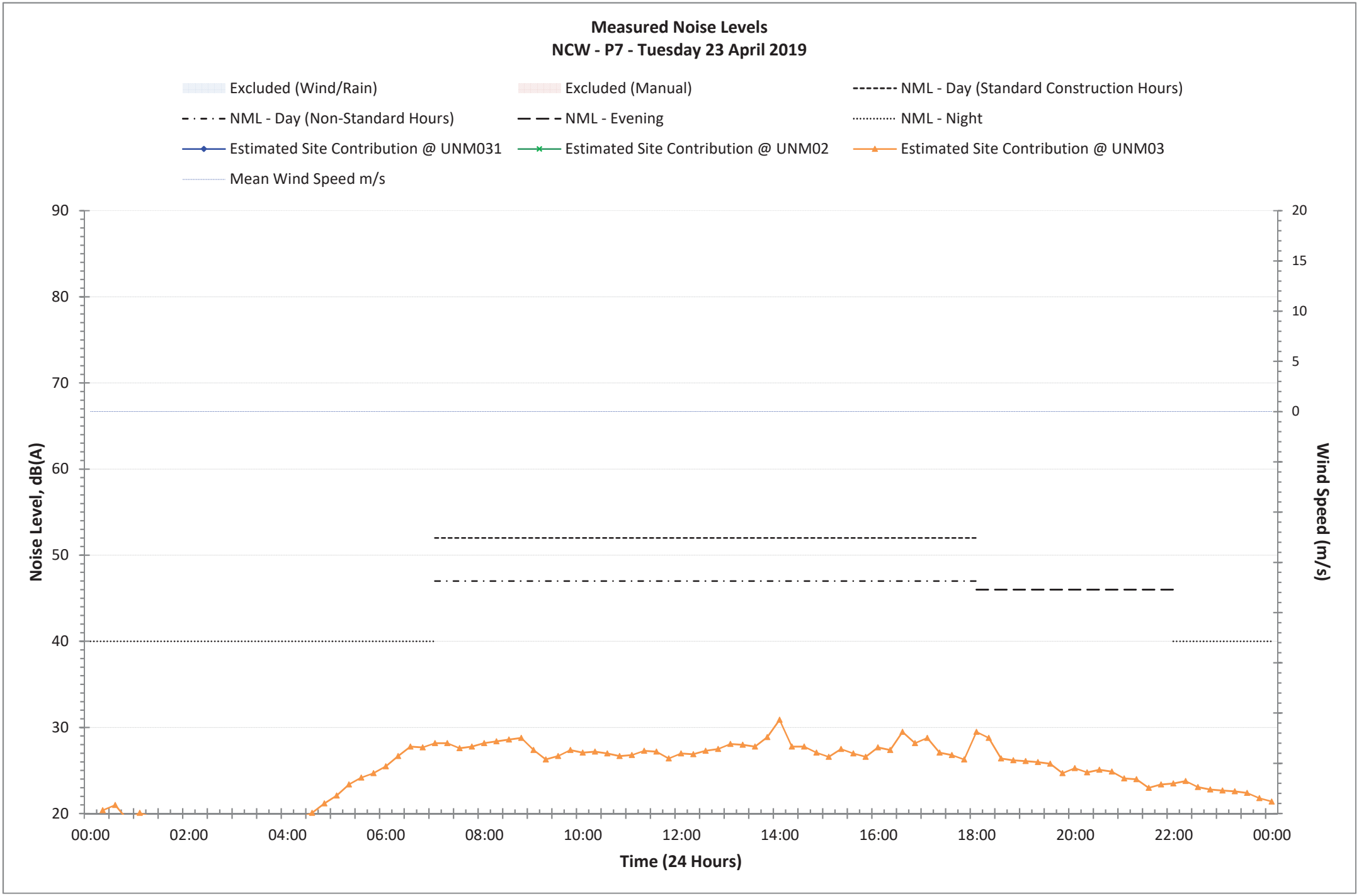
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00
Time (24 Hours)


Measured Noise Levels
NCW - P7 - Tuesday 23 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
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02:00
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16:00
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22:00
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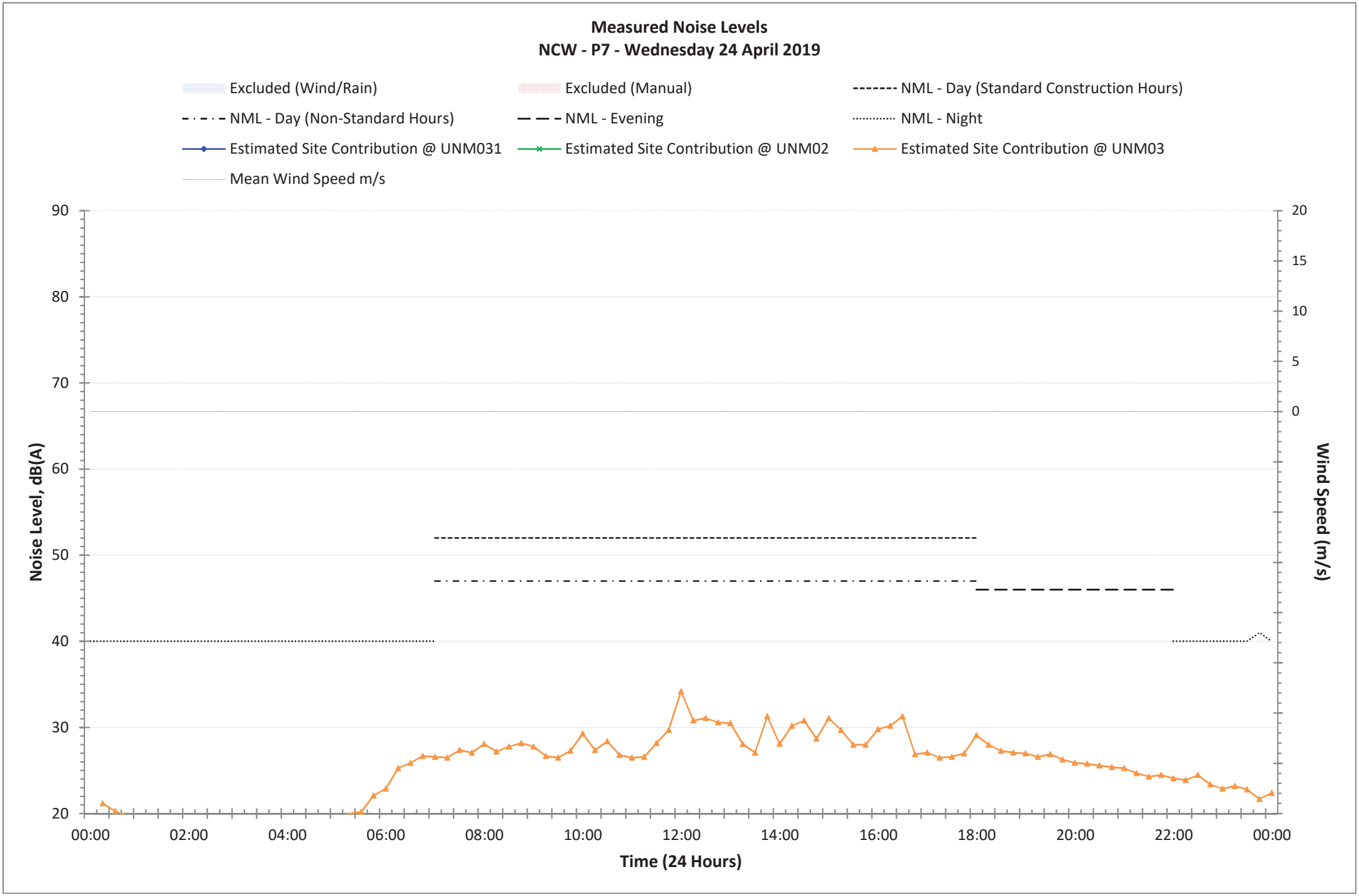
Measured Noise Levels
NCW - P7 - Wednesday 24 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
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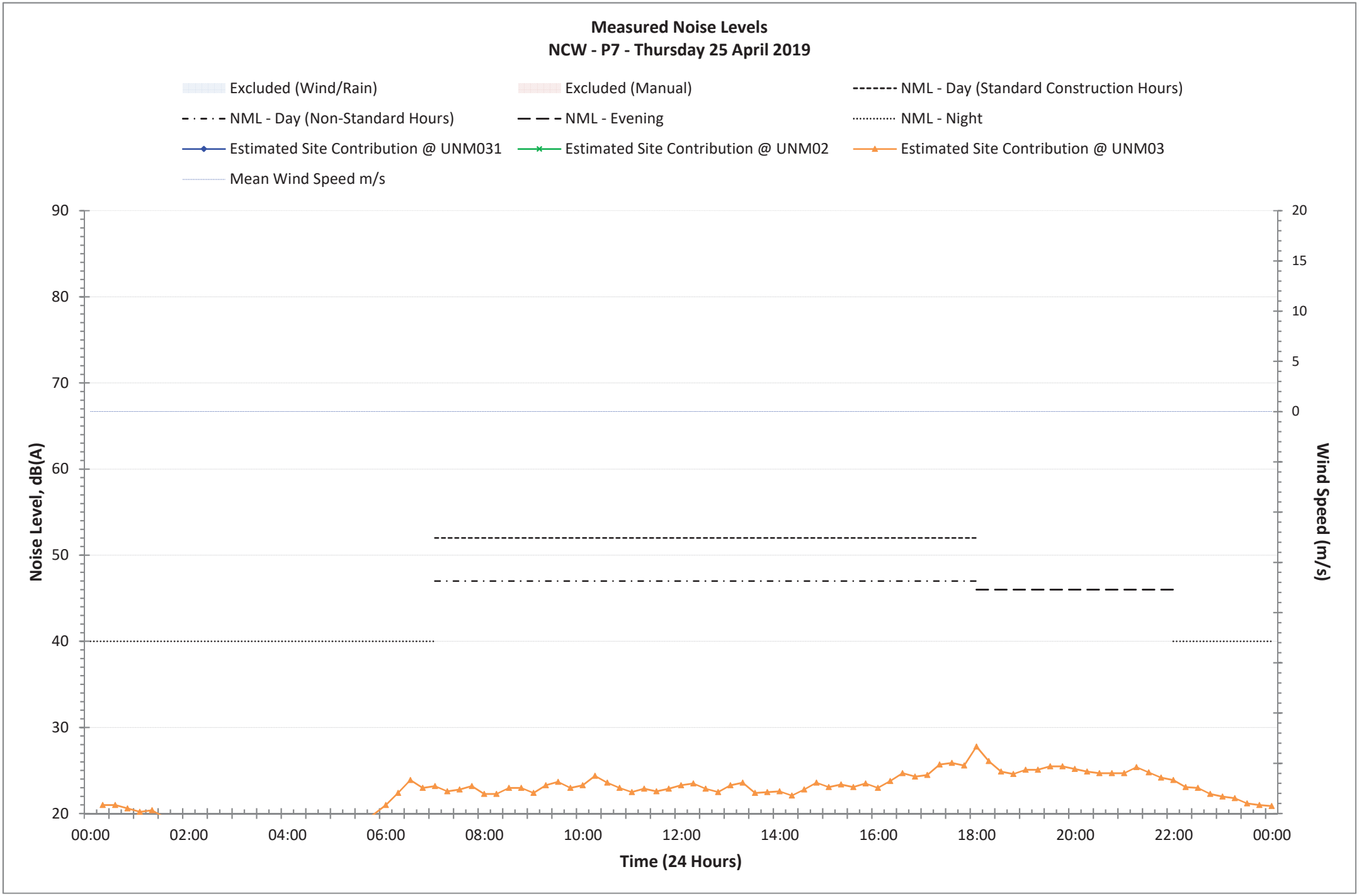
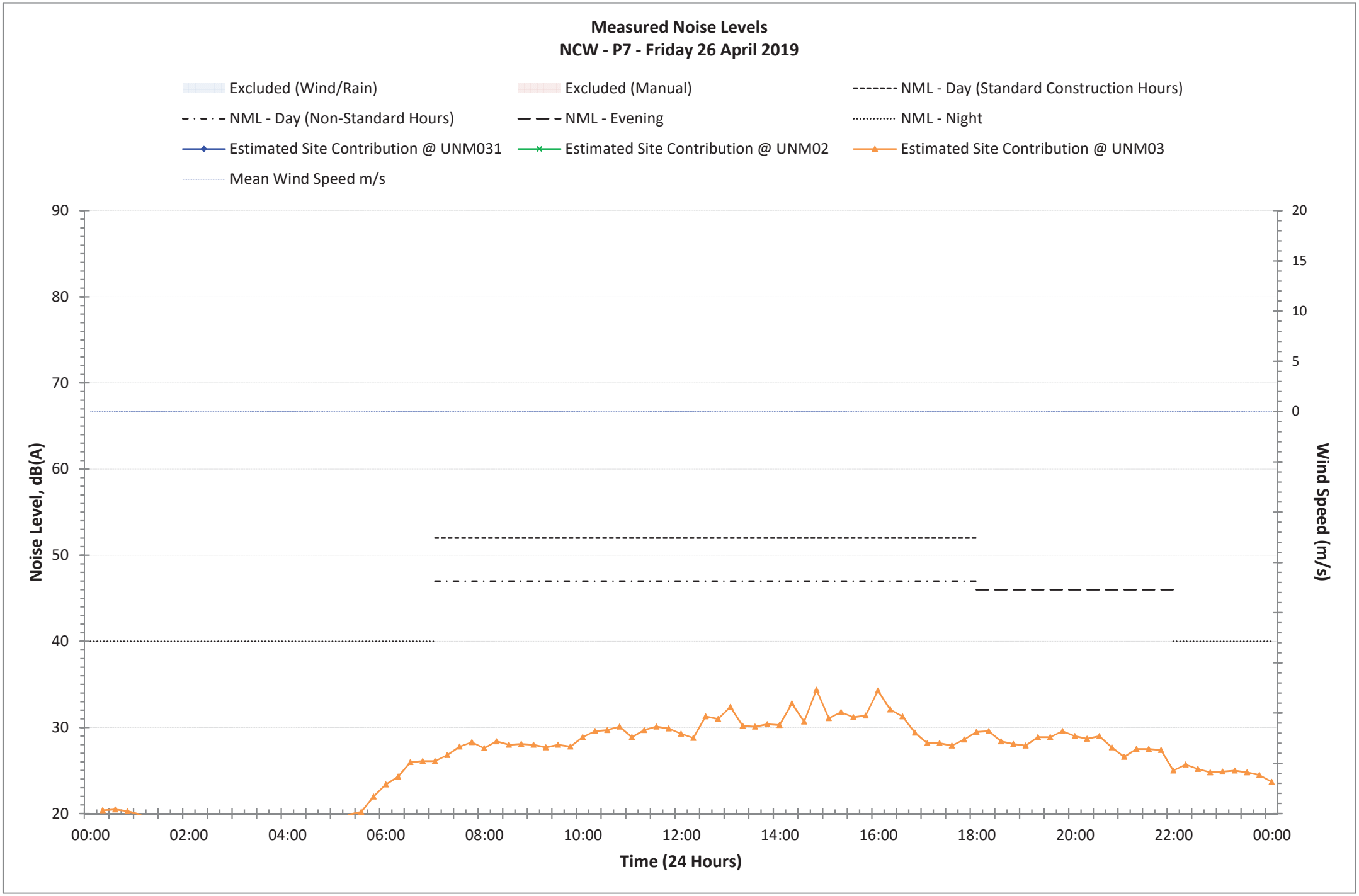
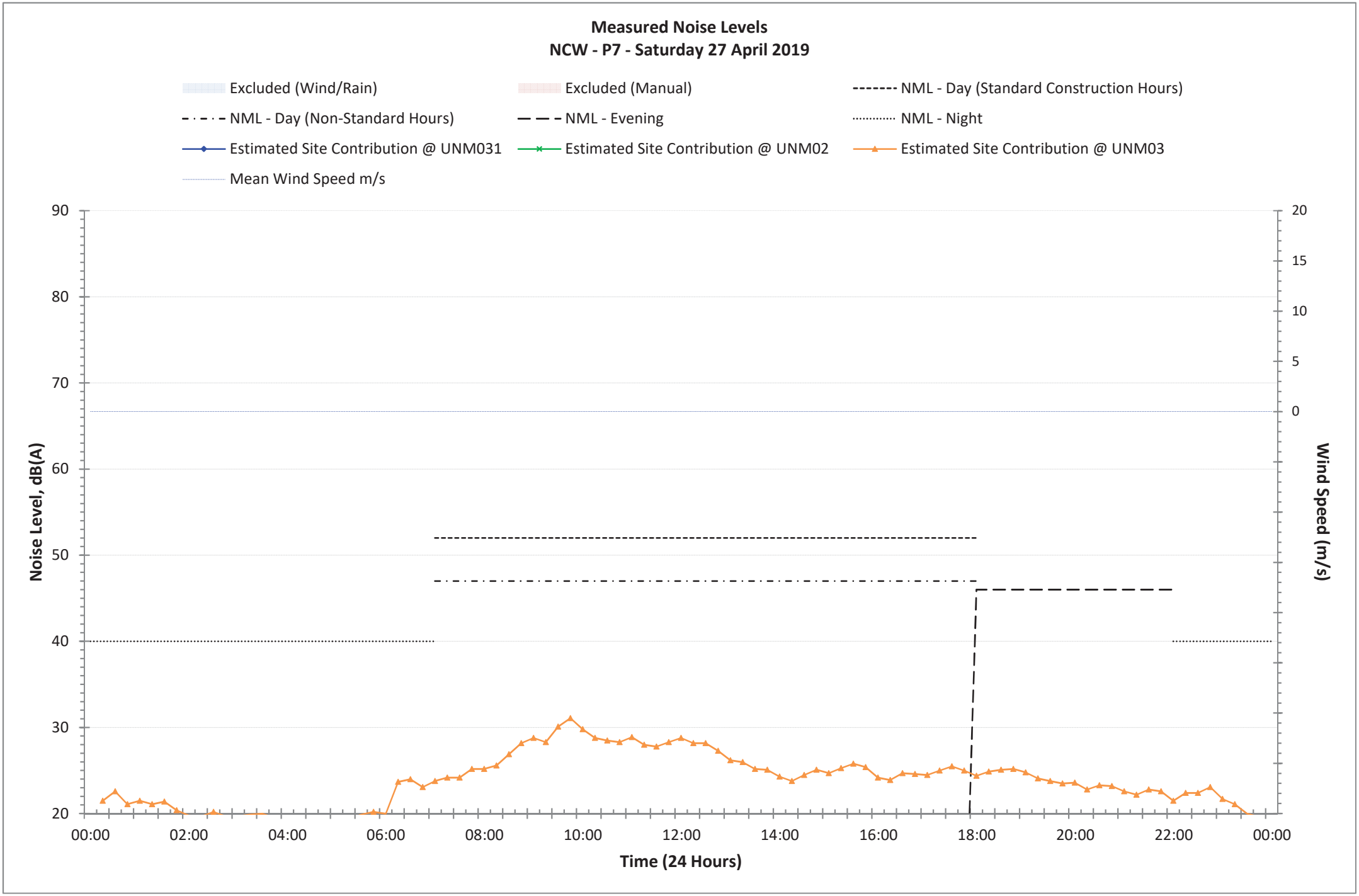
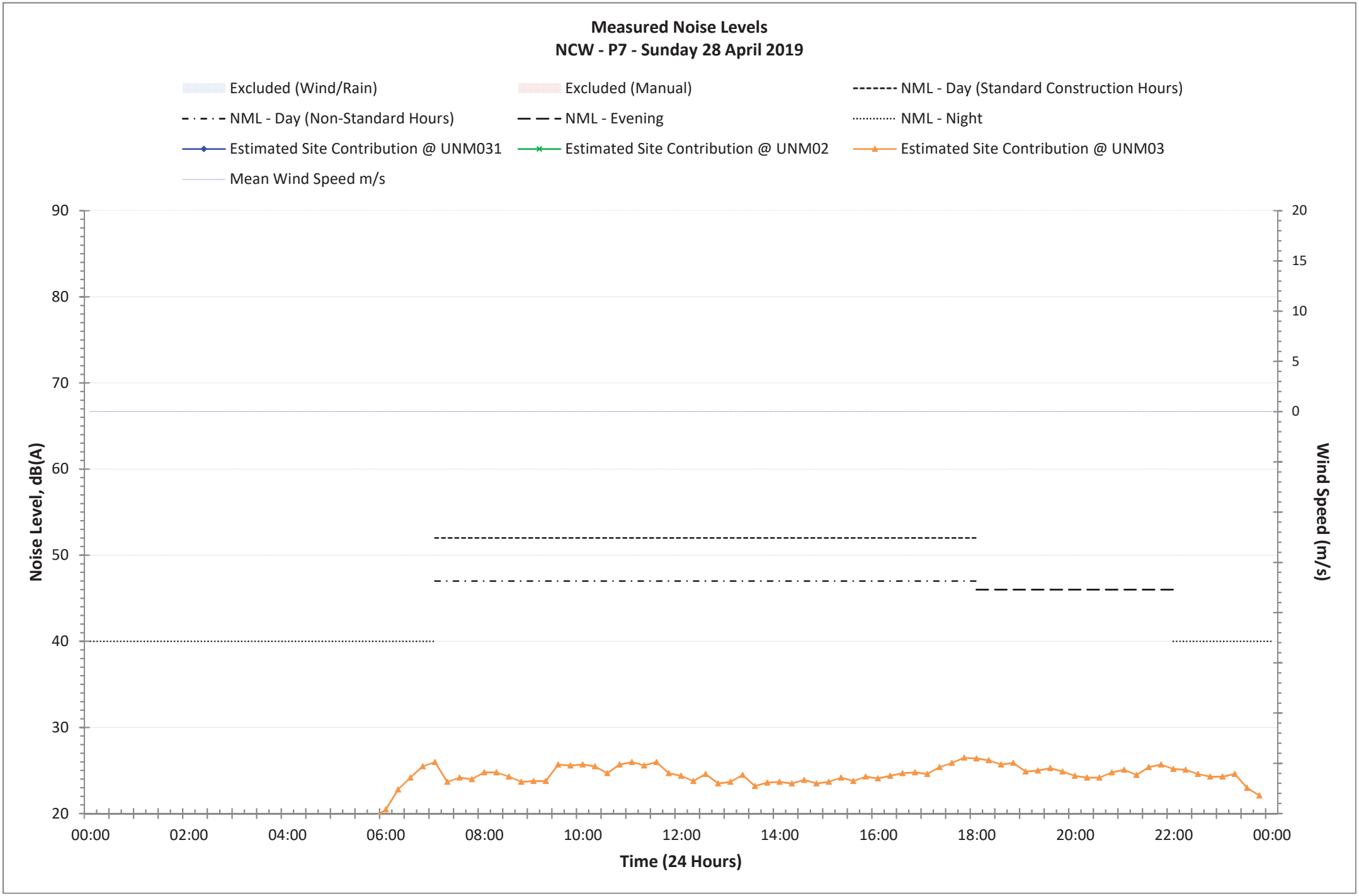
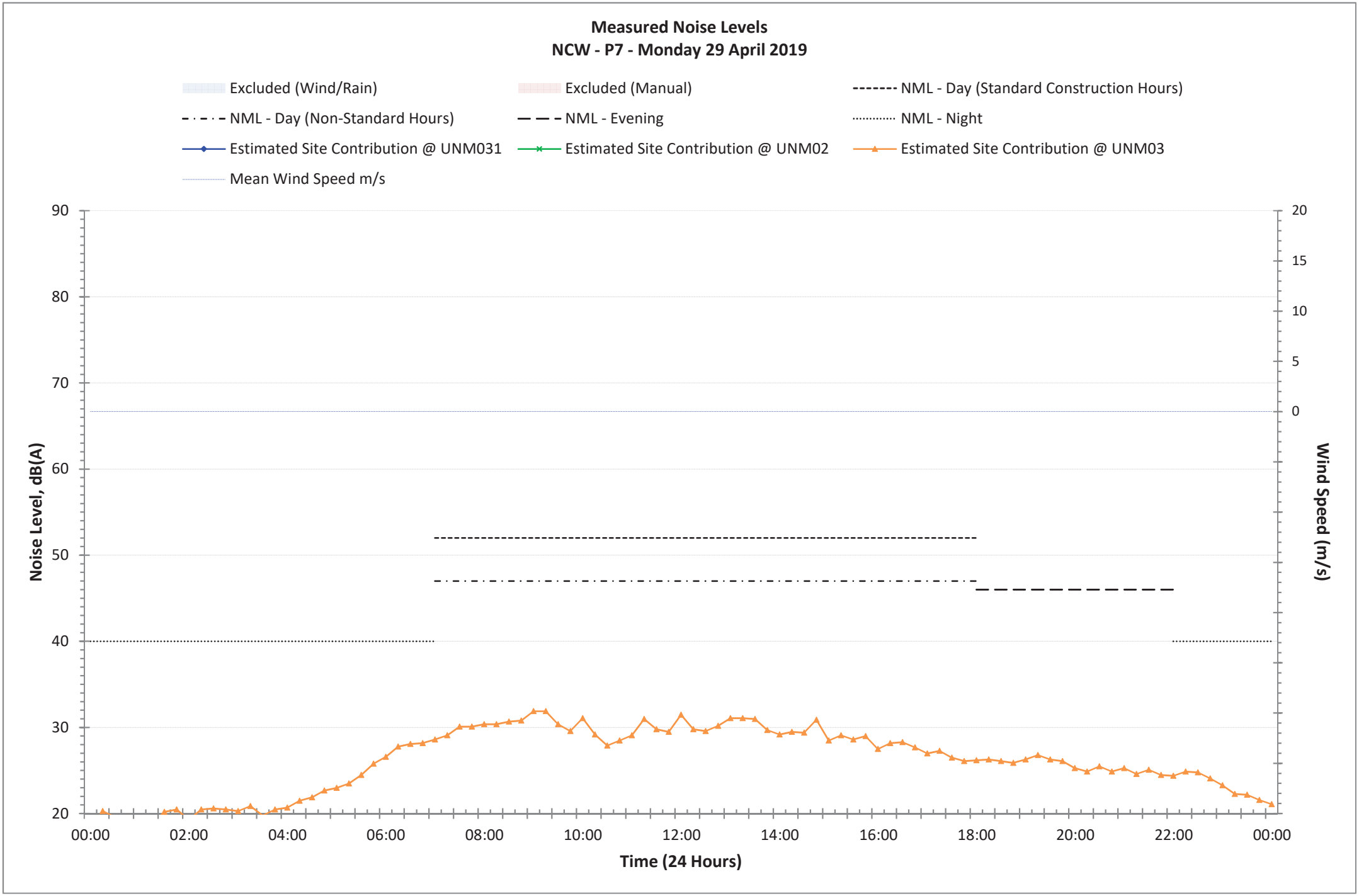
22:00
00:00

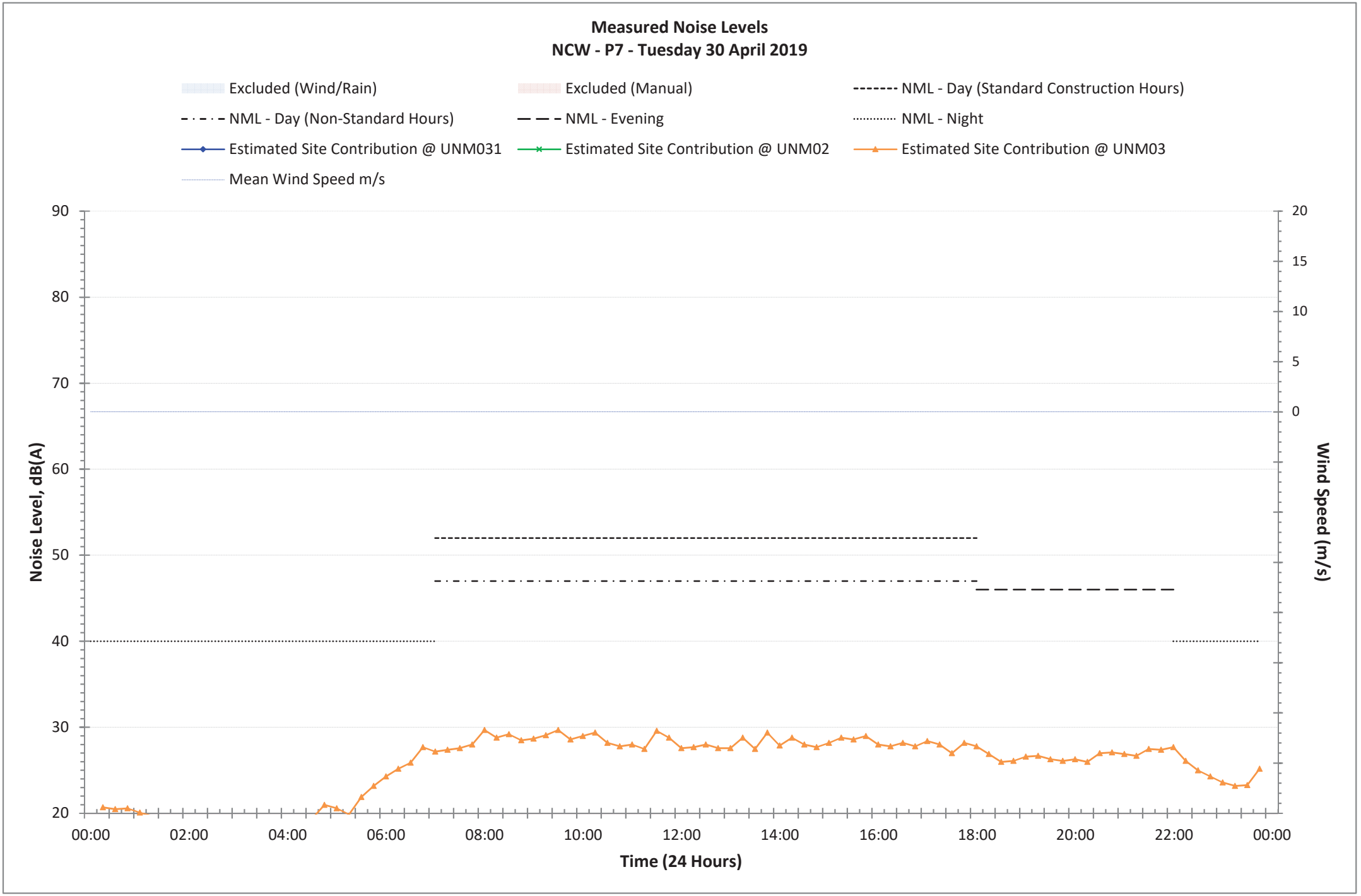

Measured Noise Levels
NCW - P7 - Thursday 25 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Friday 26 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Saturday 27 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Sunday 28 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Monday 29 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00


Measured Noise Levels
NCW - P7 - Tuesday 30 April 2019
Excluded (Wind/Rain)
Excluded (Manual)
NML - Day (Standard Construction Hours)
NML - Day (Non-Standard Hours)
NML - Evening
NML - Night
Estimated Site Contribution @ UNM031
Estimated Site Contribution @ UNM02
Estimated Site Contribution @ UNM03
Mean Wind Speed m/s
Noise Level, dB(A)
Wind Speed (m/s)
Time (24 Hours)
90
80
70
60
50
40
30
20
20
15
10
5
0
00:00
02:00
04:00
06:00
08:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
00:00

Appendix F – Complete 2018 Vibration Data Set

NCW MW18

Rail Corridor

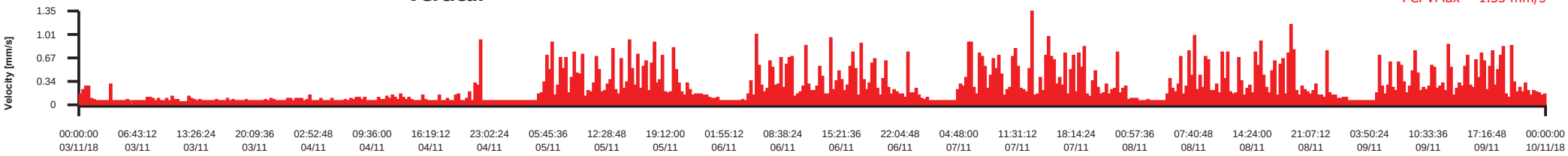
Start	3/11/2018
End	10/11/2018
Monitoring Location	UVM01

Monitoring Results

PPVmax	2.71 mm/s
PPVmax (99.9%)	1.49 mm/s
PPVmax (99.8%)	1.41 mm/s
PPVmax (99.5%)	1.18 mm/s
PPVmax (99.0%)	0.94 mm/s

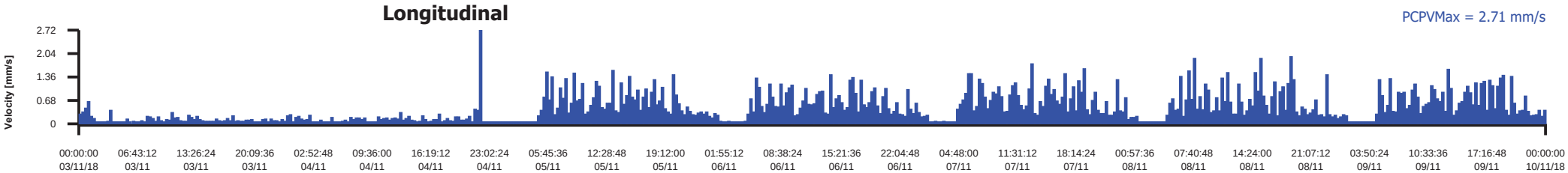
Vertical

PCPVMax = 1.35 mm/s



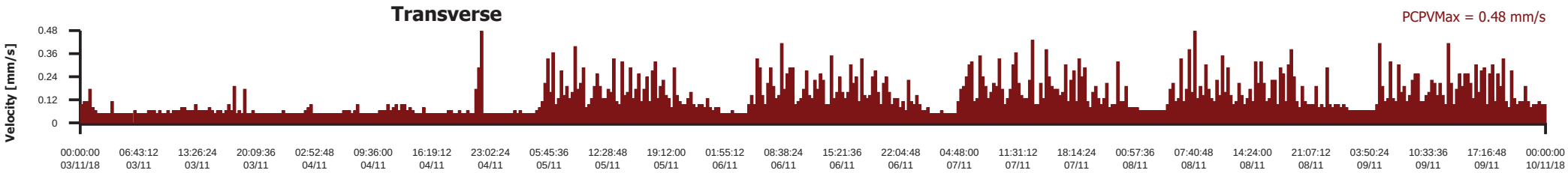
Longitudinal

PCPVMax = 2.71 mm/s



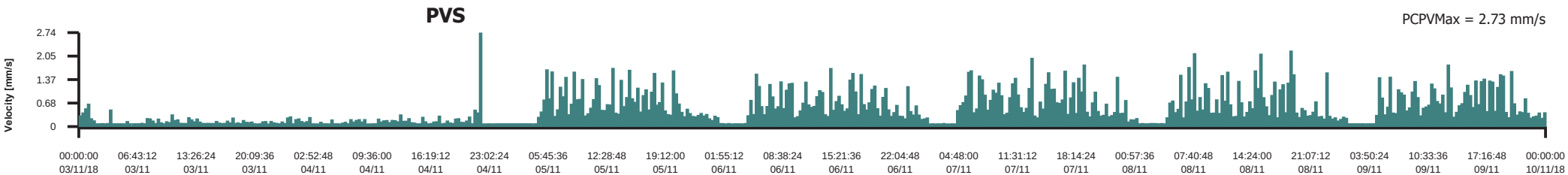
Transverse

PCPVMax = 0.48 mm/s



PVS

PCPVMax = 2.73 mm/s



Printed : 20/11/2018 10:43:19

NCW WE20

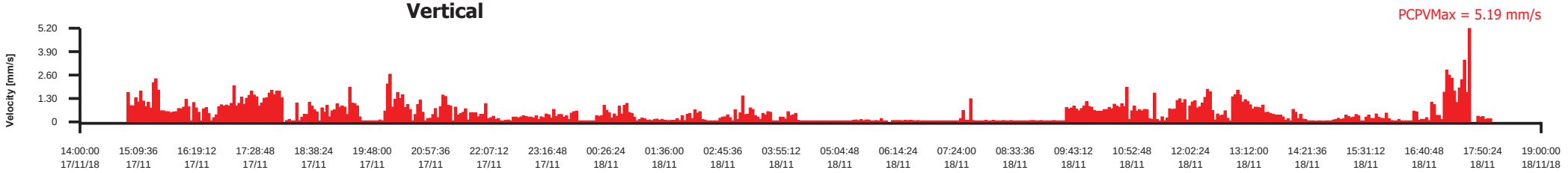
Rail Corridor

Start	17/11/2018 2:00:00 PM
End	18/11/2018 7:00:00 PM
Monitoring Location	UVM01

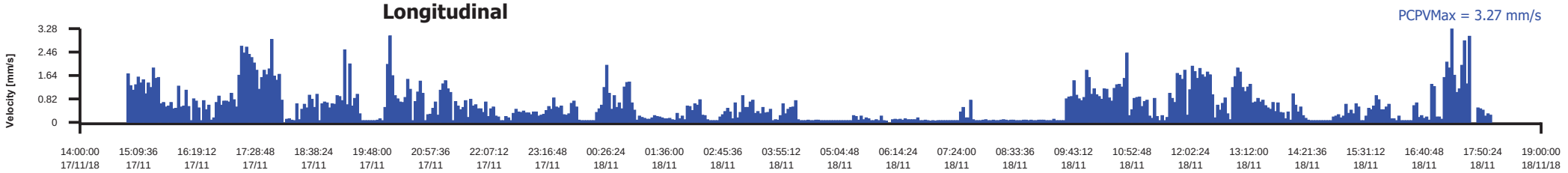
Monitoring Results

PPVmax	5.19 mm/s
PPVmax (99.9%)	3.43 mm/s
PPVmax (99.8%)	3.03 mm/s
PPVmax (99.5%)	2.65 mm/s
PPVmax (99.0%)	2.43 mm/s

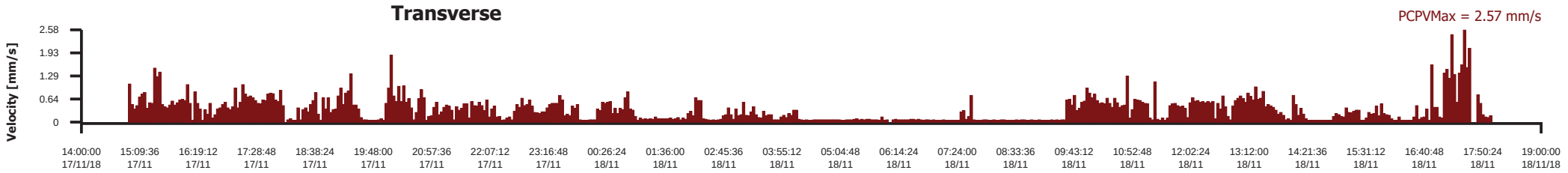
Vertical



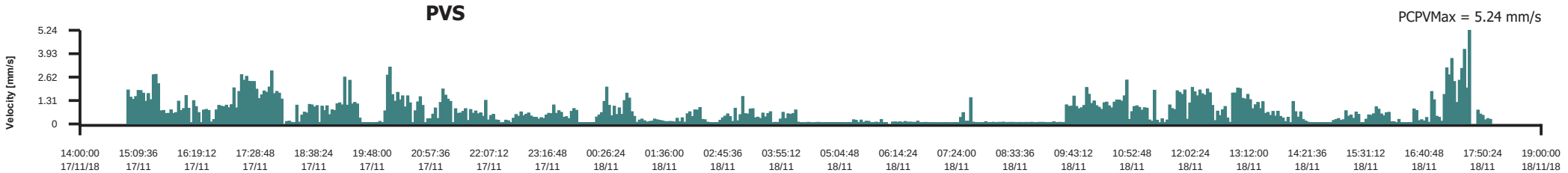
Longitudinal



Transverse



PVS



Printed : 20/11/2018 10:46:06

NCW WE20

Rail Corridor

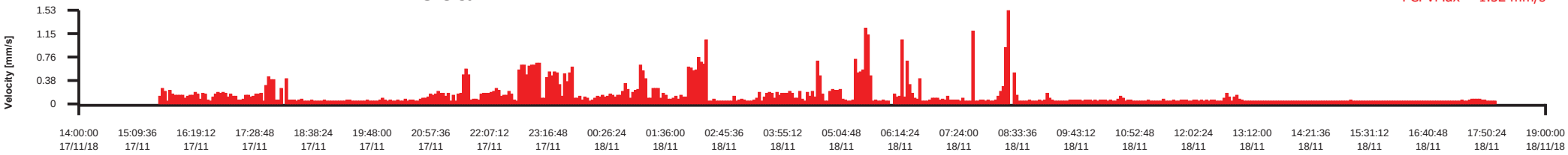
Start	17/11/2018 2:00:00 PM
End	18/11/2018 7:00:00 PM
Monitoring Location	UVM02

Monitoring Results

PPVmax	5.17 mm/s
PPVmax (99.9%)	3.71 mm/s
PPVmax (99.8%)	2.35 mm/s
PPVmax (99.5%)	1.56 mm/s
PPVmax (99.0%)	1.30 mm/s

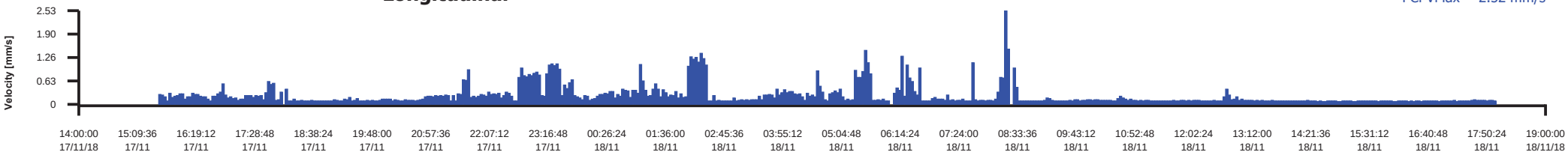
Vertical

PCPVMax = 1.52 mm/s



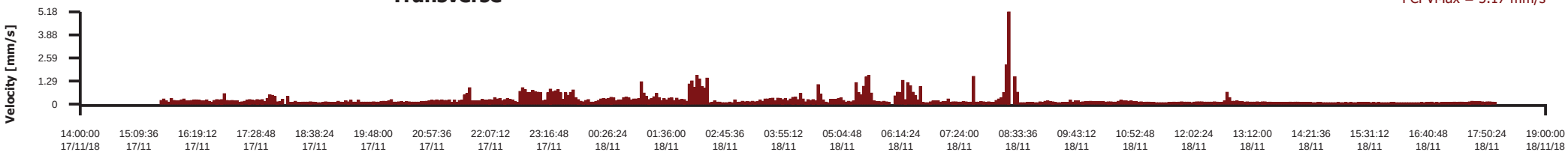
Longitudinal

PCPVMax = 2.52 mm/s



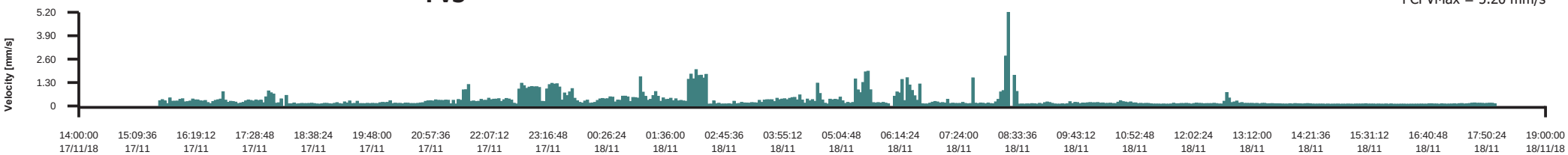
Transverse

PCPVMax = 5.17 mm/s



PVS

PCPVMax = 5.20 mm/s



Printed : 20/11/2018 10:46:07

NCW WE25

Rail Corridor

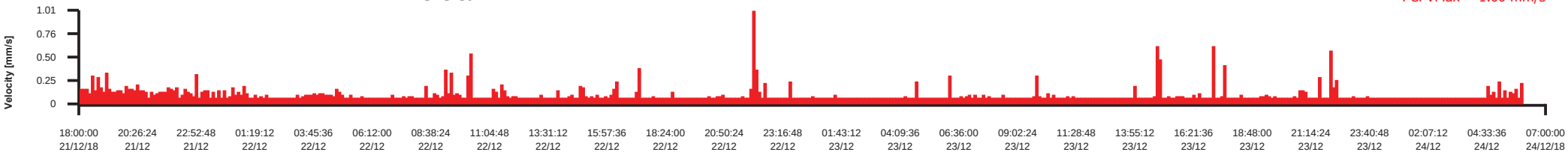
Start	21/12/2018 6:00:00 PM
End	24/12/2018 7:00:00 AM
Monitoring Location	UVM01

Monitoring Results

PPVmax	1.00 mm/s
PPVmax (99.9%)	0.73 mm/s
PPVmax (99.8%)	0.62 mm/s
PPVmax (99.5%)	0.41 mm/s
PPVmax (99.0%)	0.27 mm/s

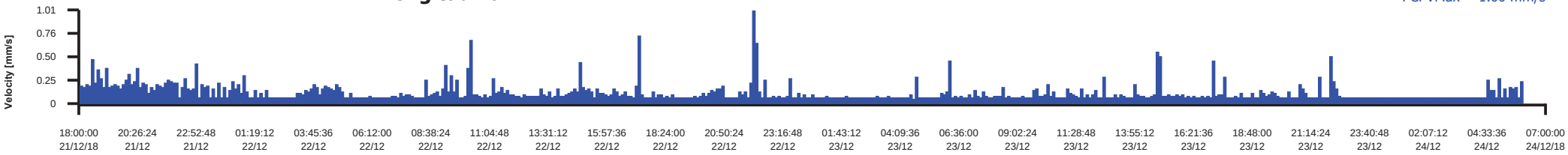
Vertical

PCPVMax = 1.00 mm/s



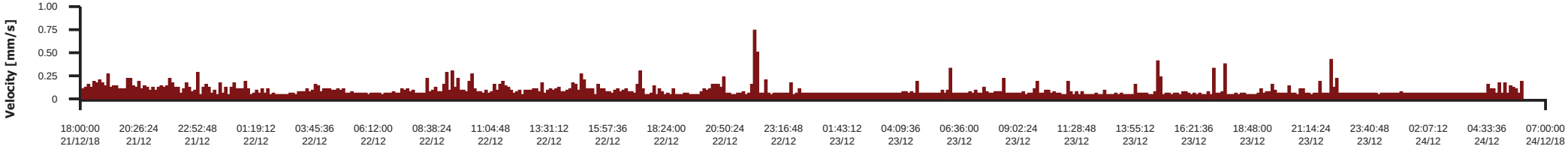
Longitudinal

PCPVMax = 1.00 mm/s



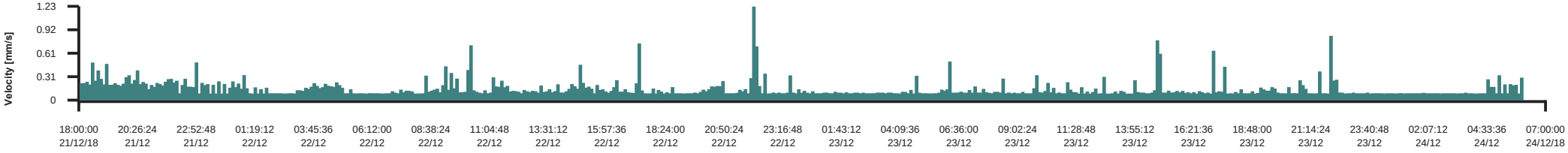
Transverse

PCPVMax = 0.75 mm/s



PVS*

PCPVMax = 1.22 mm/s



Printed : 24/12/2018 08:09:20

NCW WE25

Rail Corridor

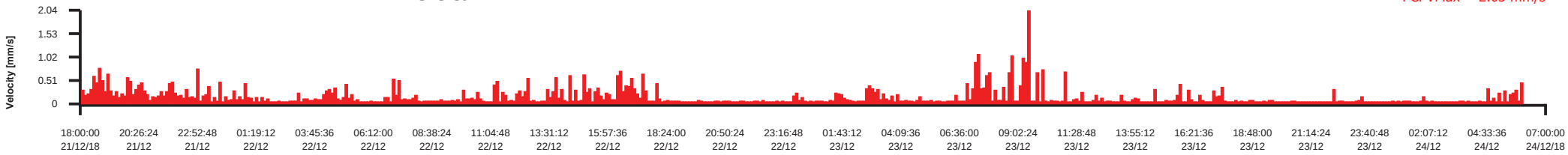
Start	21/12/2018 6:00:00 PM
End	24/12/2018 7:00:00 AM
Monitoring Location	UVM02

Monitoring Results

PPVmax	2.52 mm/s
PPVmax (99.9%)	1.16 mm/s
PPVmax (99.8%)	0.91 mm/s
PPVmax (99.5%)	0.73 mm/s
PPVmax (99.0%)	0.62 mm/s

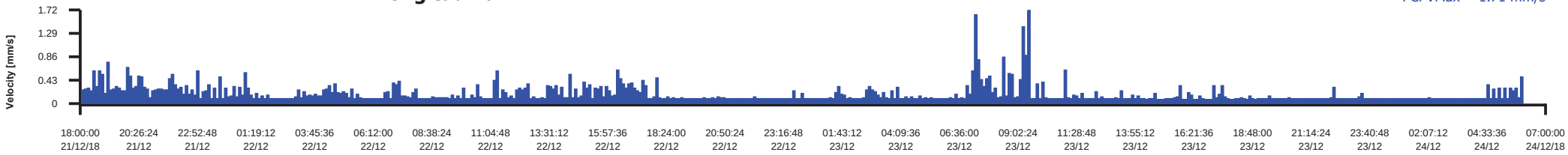
Vertical*

PCPVMax = 2.03 mm/s



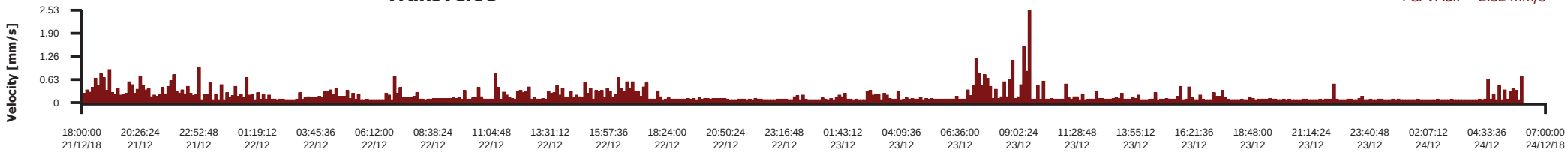
Longitudinal*

PCPVMax = 1.71 mm/s



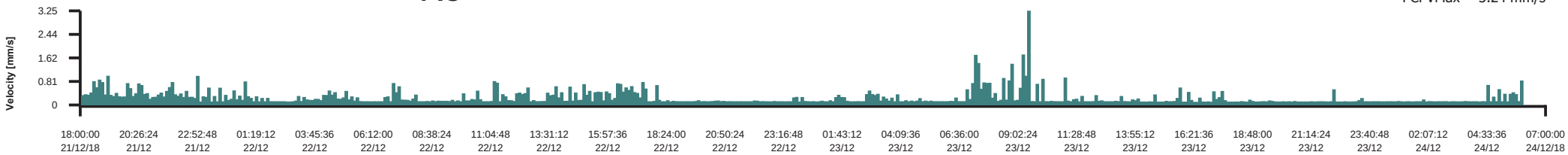
Transverse*

PCPVMax = 2.52 mm/s



PVS*

PCPVMax = 3.24 mm/s



Printed : 24/12/2018 08:09:20

NCW MW34

Rail Corridor

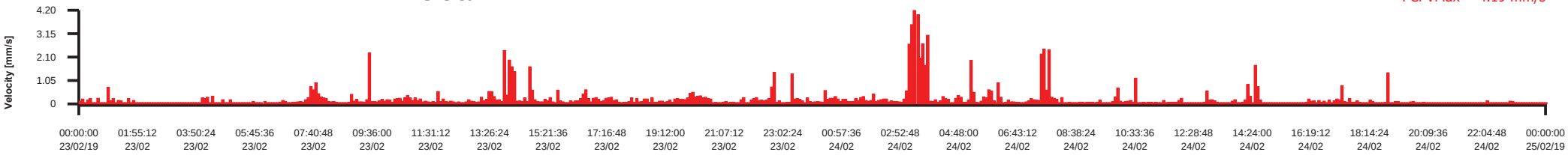
Start	23/02/2019
End	25/02/2019
Monitoring Location	UVM01

Monitoring Results

PPVmax	5.46 mm/s
PPVmax (99.9%)	4.19 mm/s
PPVmax (99.8%)	3.68 mm/s
PPVmax (99.5%)	3.02 mm/s
PPVmax (99.0%)	1.92 mm/s

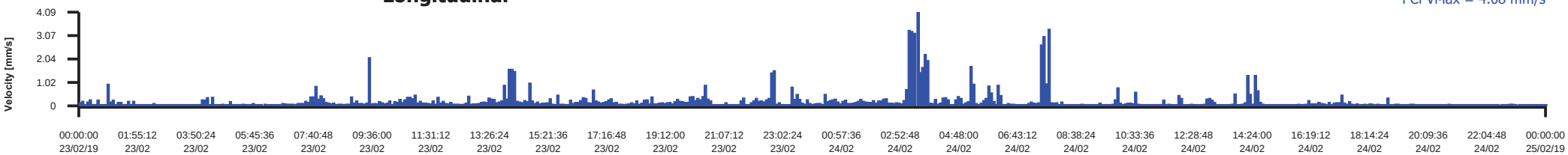
Vertical

PCPVMax = 4.19 mm/s



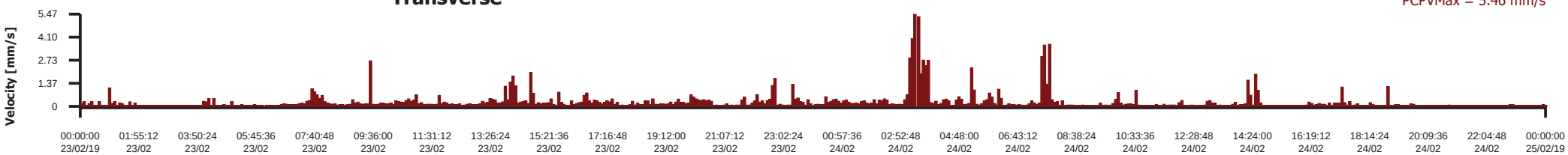
Longitudinal

PCPVMax = 4.08 mm/s



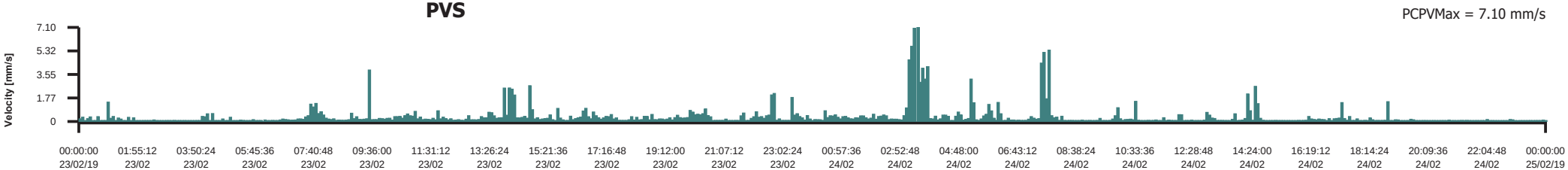
Transverse

PCPVMax = 5.46 mm/s



PVS

PCPVMax = 7.10 mm/s



Printed : 27/02/2019 10:09:38

NCW WE38

Rail Corridor

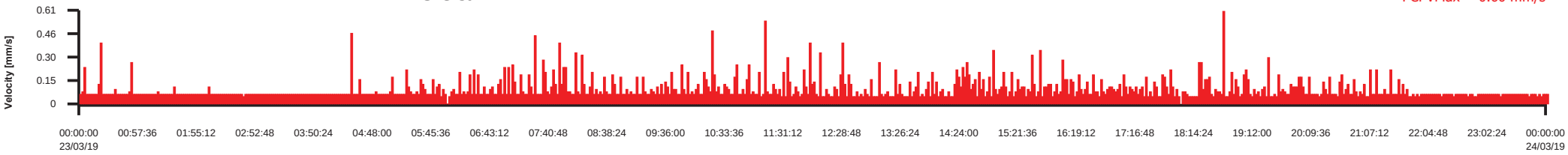
Start	23/03/2019
End	24/03/2019
Monitoring Location	UVM01

Monitoring Results

PPVmax	1.21 mm/s
PPVmax (99.9%)	1.05 mm/s
PPVmax (99.8%)	0.64 mm/s
PPVmax (99.5%)	0.51 mm/s
PPVmax (99.0%)	0.36 mm/s

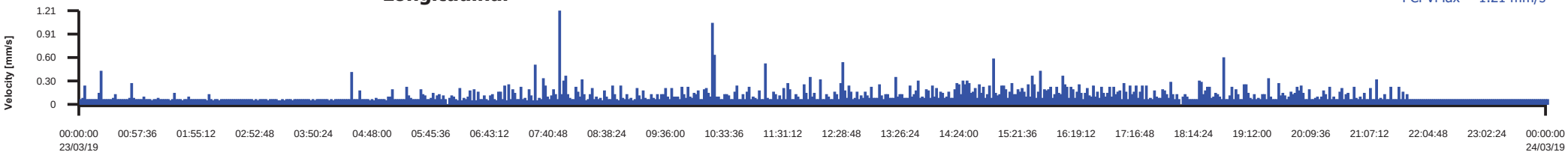
Vertical

PCPVMax = 0.60 mm/s



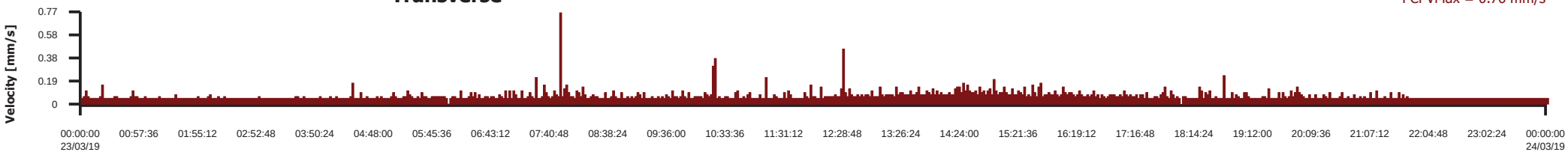
Longitudinal

PCPVMax = 1.21 mm/s



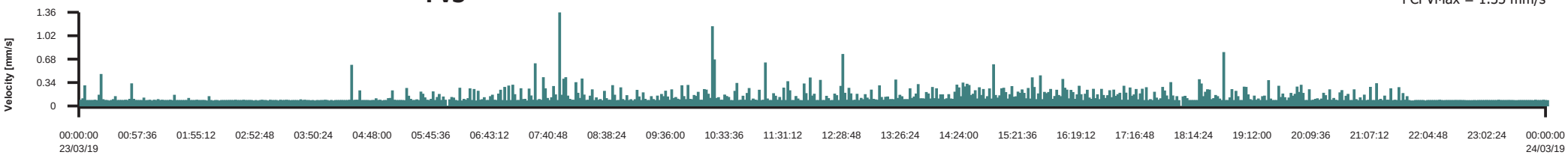
Transverse

PCPVMax = 0.76 mm/s



PVS

PCPVMax = 1.35 mm/s



Printed : 29/03/2019 08:35:34

NCW WE38

Rail Corridor

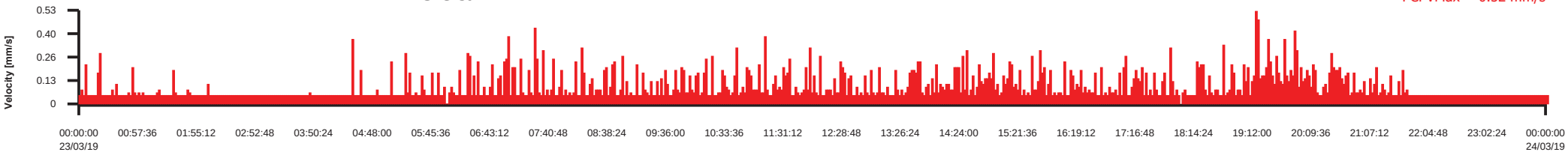
Start	23/03/2019
End	24/03/2019
Monitoring Location	UVM02

Monitoring Results

PPVmax	1.03 mm/s
PPVmax (99.9%)	0.91 mm/s
PPVmax (99.8%)	0.91 mm/s
PPVmax (99.5%)	0.64 mm/s
PPVmax (99.0%)	0.60 mm/s

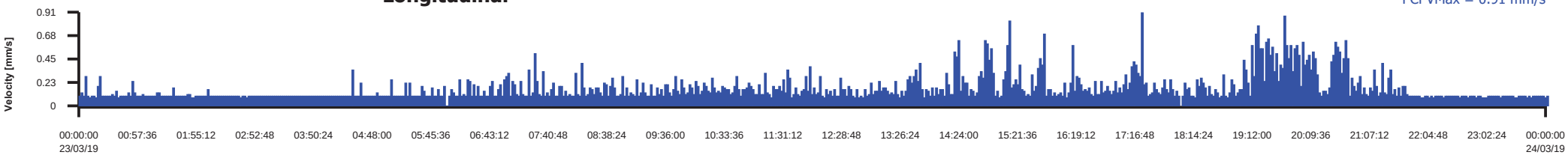
Vertical

PCPVMax = 0.52 mm/s



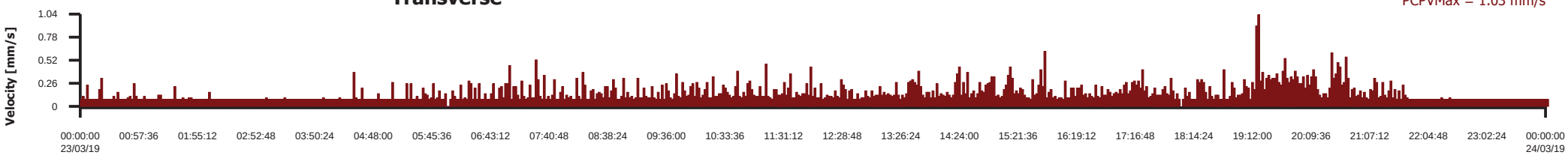
Longitudinal

PCPVMax = 0.91 mm/s



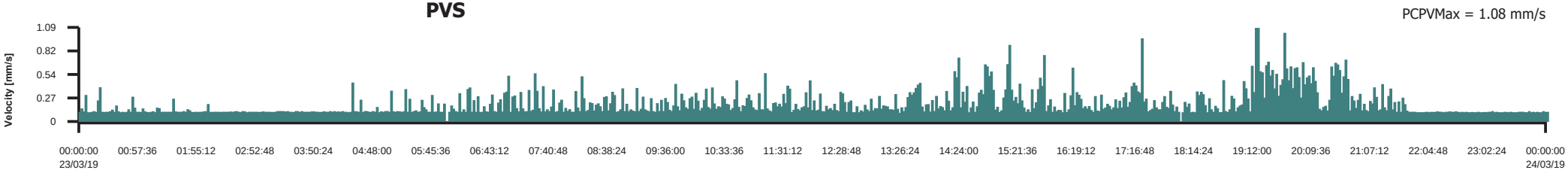
Transverse

PCPVMax = 1.03 mm/s



PVS

PCPVMax = 1.08 mm/s



Printed : 29/03/2019 08:35:34

Unattended Vibration Monitoring

NCW - March 2019

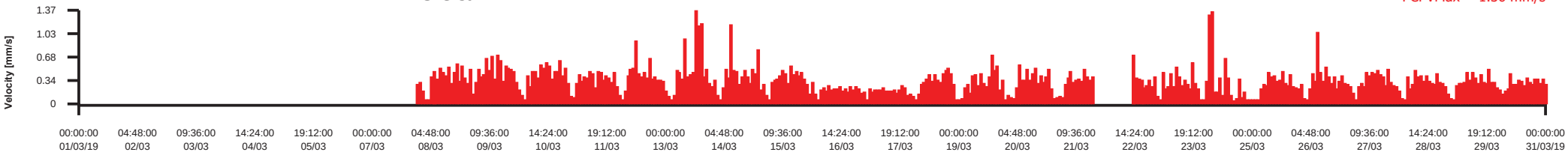
Start	1/03/2019
End	31/03/2019
Monitoring Location	UVM01

Monitoring Results

PPVmax	9.45 mm/s
PPVmax (99.9%)	1.00 mm/s
PPVmax (99.8%)	0.65 mm/s
PPVmax (99.5%)	0.49 mm/s
PPVmax (99.0%)	0.41 mm/s

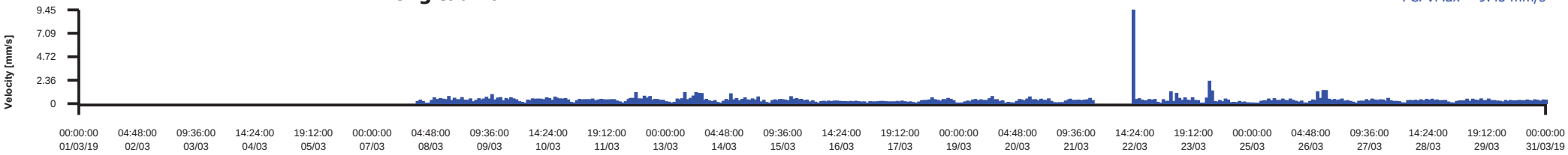
Vertical

PCPVMax = 1.36 mm/s



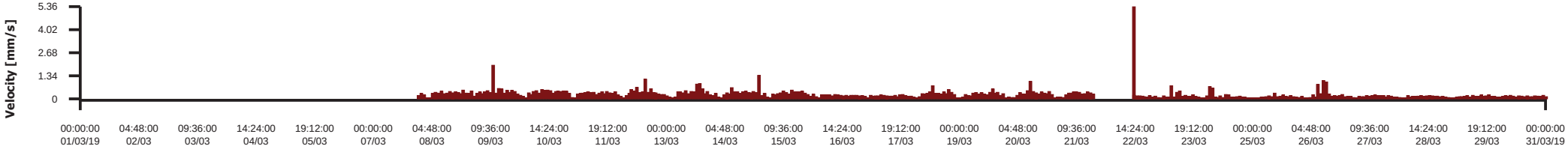
Longitudinal

PCPVMax = 9.45 mm/s



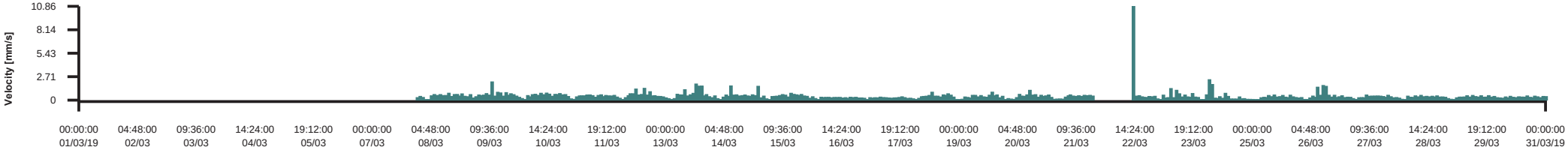
Transverse

PCPVMax = 5.35 mm/s



PVS

PCPVMax = 10.85 mm/s



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Unattended Vibration Monitoring

NCW - April 2019

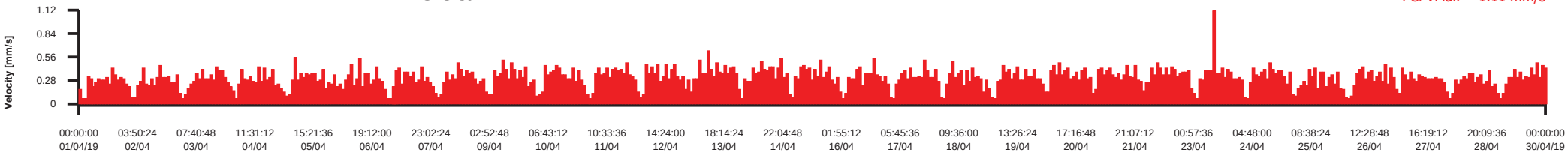
Start	1/04/2019
End	30/04/2019
Monitoring Location	UVM01

Monitoring Results

PPVmax	1.11 mm/s
PPVmax (99.9%)	0.49 mm/s
PPVmax (99.8%)	0.44 mm/s
PPVmax (99.5%)	0.40 mm/s
PPVmax (99.0%)	0.35 mm/s

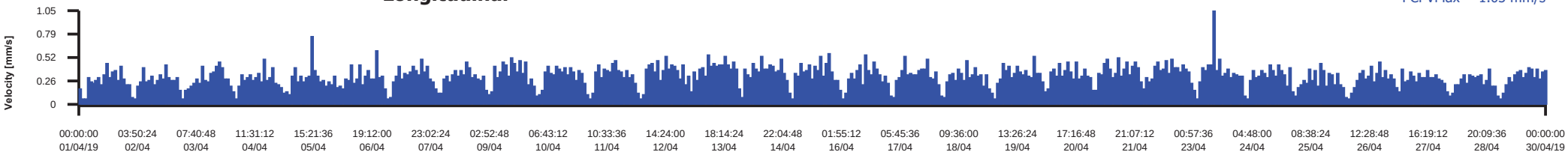
Vertical

PCPVMax = 1.11 mm/s



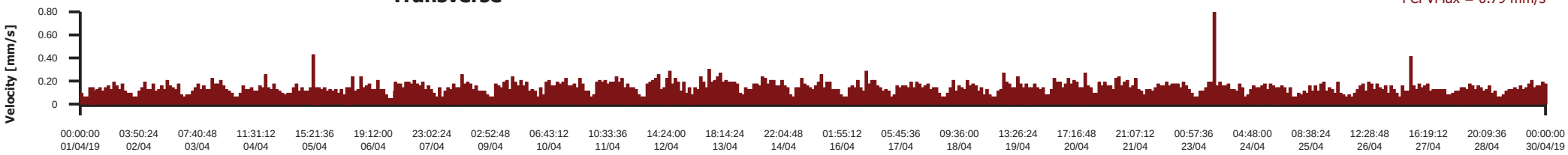
Longitudinal

PCPVMax = 1.05 mm/s



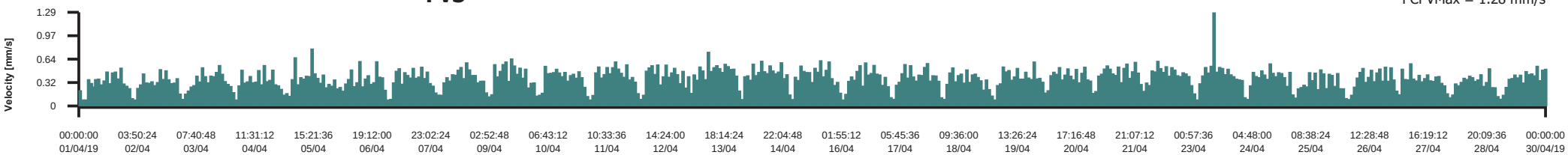
Transverse

PCPVMax = 0.79 mm/s



PVS

PCPVMax = 1.28 mm/s



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ENDORSEMENT

CITY & SOUTHWEST ACOUSTIC ADVISOR

Review of	**Laing O'Rourke North Corridor Works Noise and Vibration Monitoring Report November 2018 – April 2019**	**Document reference:**	LOR-NCW-Noise and Vibration Monitoring-Nov18-Apr19 Summary Report.V0.2 Dated 10 July 2020
Prepared by:	Larry Clark, Alternate Acoustic Advisor		
Date of issue:	24 July 2020		

As approved Alternate Acoustics Advisor for the Sydney Metro City & Southwest project, I have reviewed and provided comment on the Noise and Vibration Monitoring Report November 2018 – April 2019 for the North Corridor Works (NCW), as required under A27 (d) of the project approval conditions.

I previously reviewed and commented on Version 1 of the Report. Version 2 has been updated to satisfactorily address my comments.

The NCW Noise and Vibration Monitoring Report is to be submitted to the Department of Planning and Environment in accordance with Condition of Approval C16 and the LOR Construction Noise and Vibration Monitoring Plan (CNVMP).

I have reviewed the monitoring report and am satisfied that it meets the requirements for construction noise and vibration monitoring for NCW, as outlined in the NCW CNVMP. I endorse the report.

Larry Clark, City & Southwest Alternate Acoustics Advisor