

SOUTHERN HIGHLANDS REGIONAL SHOOTING COMPLEX

HILL TOP, NSW

NOISE COMPLIANCE REPORT MARCH 2021

RWDI # 2102378

11 March 2021

SUBMITTED TO

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1 INTRODUCTION

This report summarises the results of the attended compliance noise monitoring of the Southern Highlands Regional Shooting Complex (SHRSC), completed on 6 March 2021 between 10.00am and 11.15am.

As part of its Conditions of Approval (MP 06_0232 MOD 5), the SHRSC must complete attended noise monitoring quarterly in the first 12 months of operation and annually thereafter. This report has been prepared for the first annual compliance monitoring session of the 50m, 500m, and 800m ranges.

Noise compliance was determined based on the methodology outlined in the NSW EPA document "Target Shooting Ranges: Application Note for Assessing Noise Compliance" (EPA Application Note).

Condition A9 also stipulates the Firearm Noise Limits and states the following:

The noise from firearms or use of the site must not exceed LZpeak 75dB at the following locations:

- a) At the south-western end of Rocky Waterholes Road, Hill Top (representing residences at 1, 2 and 4 Rocky Waterholes Road); and*
- b) At Nattai Road, Hill Top, adjacent to the western entrance to the Wattle Ridge Farm (representing the existing residence).*

The assessment of noise compliance from the Southern Highlands Regional Complex shall be undertaken in accordance with the EPA's Target Shooting Ranges: Application Note for Assessing Noise Compliance (2015).

2 SITE DESCRIPTION

The SHRSC is located on Wattle Ridge Road, Hilltop, NSW. The complex is situated within the Nattai National Park. The complex currently consists of a 50m range, a 500m range, and an 800m range. The range currently operates on Friday, Saturday, and Sunday between 10.00am and 5.00pm.

The nearest residential receivers include Wattle Ridge Farm, located approximately 2.5km to the north-west, and Hilltop township located approximately 3km to the south-east. No notable topographical shielding is present between the range and receivers.

Figure 2-1 below presents the location of the three ranges relative to the nearest residential receivers.

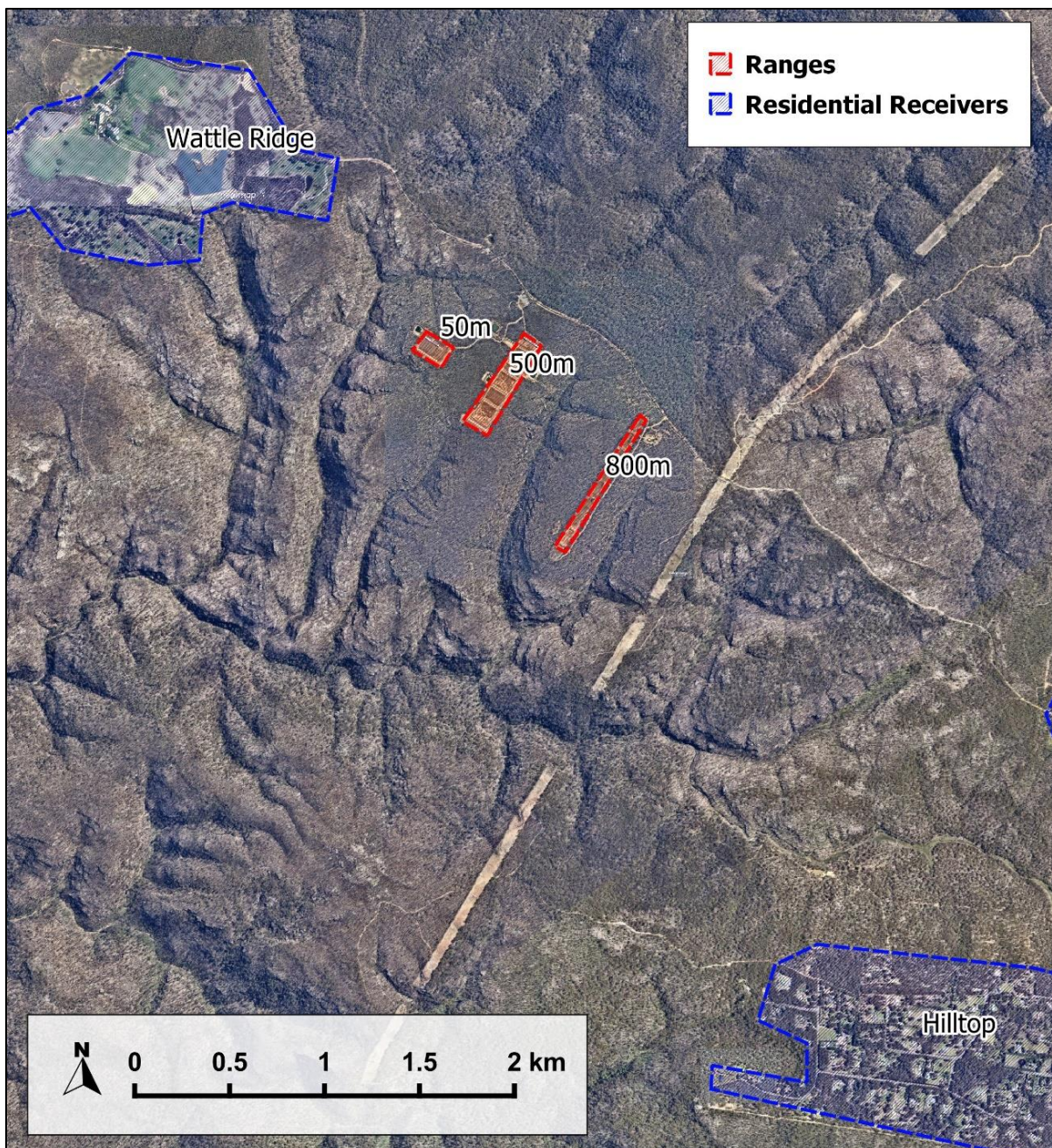


Figure 2-1 Site Overview and Nearest Receivers

3 NOISE ASSESSMENT

3.1 Methodology

Attended monitoring was completed on 6 March 2021 between 10.00am and 11.15am. On the day of monitoring all three ranges were scheduled for use. **Appendix A** provides information relating to the calibre and number of rounds used on the day of monitoring (10.00am – 5.00pm). This information was collected by and provided by the Office of Sport.

Measurements were conducted using two NTI XL2 sound level meters. These meters conform to Australian Standard 1259 Acoustics – Sound Level Meters as a Type 1 Precision Sound Level Meter which has an accuracy suitable for field and laboratory use. The calibration of the meters was checked before and after the measurements with a Brüel & Kjær Type 4231 sound level calibrator and no significant drift was noted.

All equipment has been laboratory calibrated within the previous two years in accordance with our in-house Quality Assurance Procedures.

Both meters were set to measure LzPeak levels in accordance with EPA's Application. Noise compliance was determined by the manual method described in the Application note. These meters were capable of logging noise level at 100 millisecond increments with audio in case further post processing is required.

Noise monitoring locations were selected to be consistent with Condition A9 of the Consent Conditions. ARL NGARAs were also installed at the rear of the three ranges to allow for confirmation of the timing and number of shots fired from each range during the monitoring period.

A Davis Vantage Pro2 weather station was installed on the 800m range (L5).

Figure 3-1 presents monitoring locations relative to the site and receivers and **Table 3-1** summarises the attended monitoring information. Photos of the monitoring set up are shown in **Appendix C**.

Table 3-1 Summary of Monitoring Setup

Location No.	Location	Equipment	Serial No.
L1	Wattle Ridge Farm	NTI XL2	A2A-08006-E0
L2	Rocky Waterhole	NTI XL2	A2A-16735-E0
L3	50m	ARL NGARA	87807C
L4	500m	ARL NGARA	8780F2
L5	800m	ARL NGARA	878092

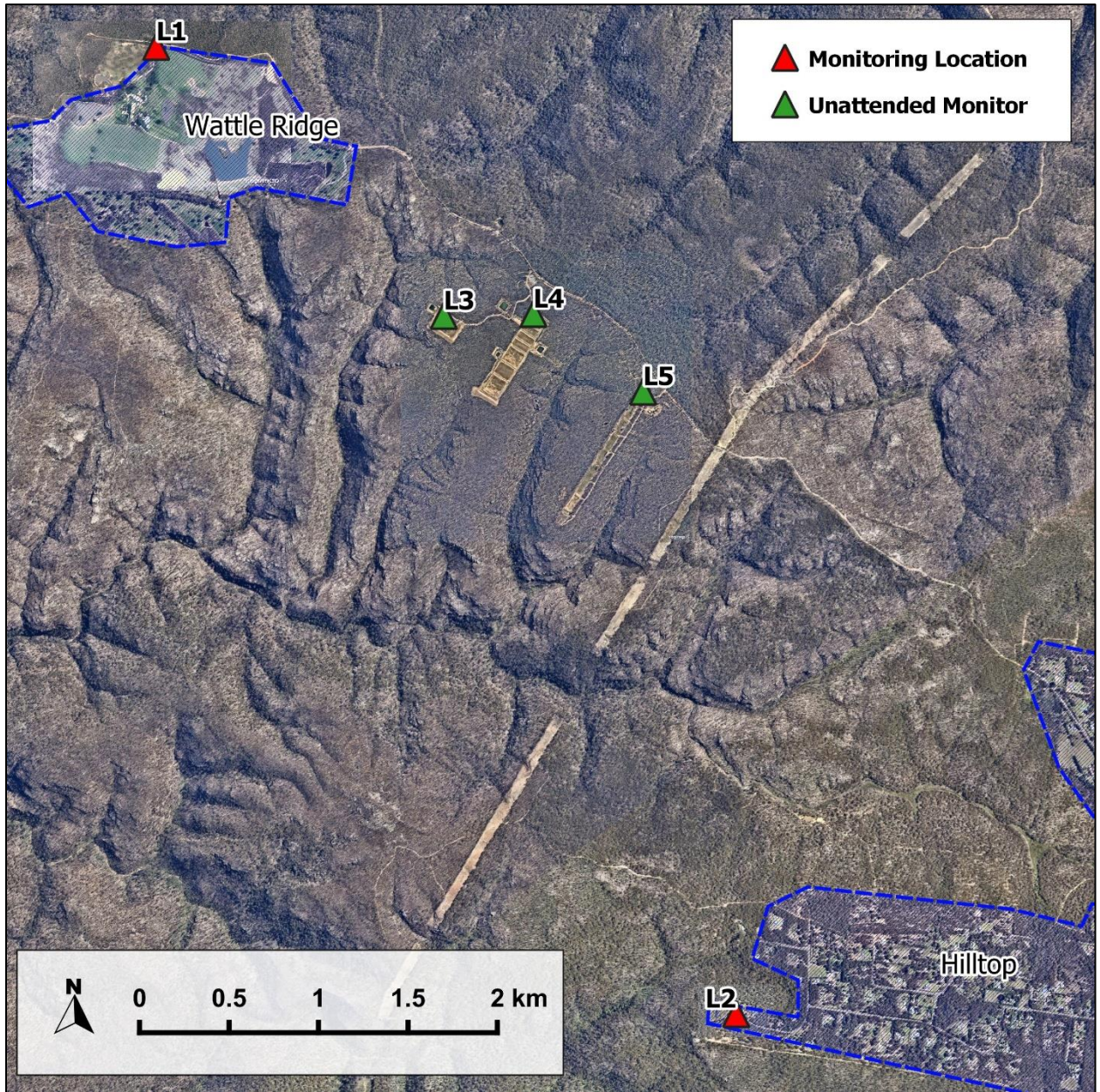


Figure 3-1 Noise Monitoring Locations

3.2 Noise Monitoring Results and Discussion

Table 3-2 summarises monitoring results from both monitoring sessions. **Table 3-3** summarises the number of shots fired on range during the monitoring period, these were estimated by reviewing the data from the noise loggers installed on each of the ranges. The recorded noise levels at the assessment locations are presented in **Appendix B**.

Table 3-2 Receiver Noise Monitoring Results - L_{zPeak} dB

Location	No. of Shots Measured	Category		Final Noise Level dBZ
		A	B	
L1 Wattle Ridge	184	71	113	63
L2 Rocky Waterhole	81	34	47	59

Note: Final Noise Level determined as per the EPA Application Note, where:
if there are greater than 50 Category A shots, the final noise level is the arithmetic average of Category A shots.
if there are less than 50 Category A shots, the final noise level is the arithmetic average of all Category A and B shots.

Table 3-3 Estimated Number of Shots on Range (10.00am – 11.15am)

Range	Number of Shots
50m	50
500m	332
800m	81

Note: **Appendix D** presents time splices for each of the on-range noise monitors.

The on-range weather station recorded average wind speeds of 0.4 – 2.4 m/s in a predominantly westerly direction. These wind speeds are suitable for noise monitoring as they were less than the 5 m/s recommended in the NSW EPA's Noise Policy for Industry.

At the Rocky Waterhole monitoring location, the general noise environment consisted of noise from rustling of nearby trees from occasional gusts with some intermittent noise from birds, insects, nearby vehicles, and aircraft. Noise from nearby residents were intermittent throughout the monitoring period. Towards the end of the monitoring period the local noise environment was dominated by a motocross bike at one of the residences. At this stage there were sufficient measured shots to determine compliance.

At the Wattle Ridge monitoring location, the ambient noise environment generally consisted of noise from rustling of nearby trees from occasional gusts with some intermittent noise from birds, insects, and aircraft. There were brief periods where the resident came by to observe the noise monitoring.



At both monitoring locations, shots from SHRSC were audible and measurable however a significant number of shots were audible and below the ambient noise level or affected by extraneous noise and therefore not measurable. Recorded shots were measured in periods where there was no extraneous noise from wind or nearby residents. It is to be noted that for both monitoring locations, where shots were audible but not measurable due to extraneous noise, the LzPeak level did not rise above the ambient level and seldom above 75dBZ.

The arithmetic average of the received shot levels is below the LzPeak 75dBZ criteria when measured at both monitoring locations. On this basis, noise from firearms from the SHRSC complies with relevant noise limits when assessed at locations stipulated in Condition A9 of the consent conditions.

4 CONCLUSION

RWDI has conducted noise monitoring of the operation of 50m, 500m, and 800m ranges at the Southern Highlands Regional Shooting Complex. Monitoring was conducted on 6 March 2021 between 10.00am and 11.15am. The results of the noise monitoring determined that the operation of the three ranges complies with relevant criteria when assessed at residential receivers and satisfies all conditions of consent relating to noise.

The background features a large, light grey circular shape on the right side, partially overlapping a blue triangular shape on the left. A white curved line separates the two shapes.

APPENDIX A

FIREARM CALIBRE RECORDS

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Calibre	Rounds												Total
6.5	24	40	50	24	30	40	40						248
1.62	24	24											48
22.25	20	20											40
206	24												24
223	50	30	24	30	30	60	20						244
225	30												30
243	40	24	30										94
284	30												30
303	40	30	30	30	30								160
305	25												25
308	29	24	24	40	30	40	50	40	20	30			327
357	48	30	50										128
30-06	20	20	30	30									100
300BLK	20												20
38 special	25												25
38 super	25												25
45-70	20	20											40
6mm	40												40
7mm	50	24											74
9mm	60	60	25	50	60	60	50	50	48	48	40	50	601
Total												2323	

The background features a large, light beige circular shape on the right side, partially overlapping a blue triangular shape on the left. A white curved line separates the two shapes.

APPENDIX B

NOISE MEASUREMENTS RESULTS



Wattle Ridge Farm Noise Monitoring Data

No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
1	56	64	8	A
2	58	59	1	B
3	58	61	3	B
4	56	58	2	B
5	58	61	3	B
6	63	70	7	A
7	58	64	6	A
8	61	63	2	B
9	60	65	5	A
10	60	63	3	B
11	60	68	8	A
12	64	69	5	A
13	61	63	2	B
14	60	65	5	A
15	57	65	8	A
16	58	59	1	B
17	56	58	2	B
18	60	61	1	B
19	60	63	3	B
20	59	61	2	B
21	60	61	1	B
22	61	62	1	B
23	62	65	3	A
24	60	62	2	B
25	59	61	2	B
26	57	59	2	B
27	62	63	1	B
28	59	65	6	A
29	60	67	7	A
30	59	66	7	A
31	62	63	1	B
32	62	65	3	A
33	58	61	3	B
34	58	61	3	B

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No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
35	56	64	8	A
36	57	59	2	B
37	63	69	6	A
38	61	66	5	A
39	59	61	2	B
40	60	63	3	A
41	58	61	3	B
42	57	65	8	A
43	60	61	1	B
44	58	61	3	B
45	60	61	1	B
46	61	62	1	B
47	60	64	4	A
48	59	66	7	A
49	59	64	5	A
50	59	62	3	B
51	61	63	2	B
52	60	61	1	B
53	58	64	6	A
54	60	61	1	B
55	60	64	4	A
56	59	60	1	B
57	59	66	7	A
58	61	64	3	A
59	56	59	3	B
60	56	58	2	B
61	61	64	3	A
62	57	60	3	B
63	58	59	1	B
64	57	58	1	B
65	57	65	8	A
66	65	68	3	A
67	58	65	7	A
68	62	65	3	A
69	59	65	6	A
70	60	63	3	B

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No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
71	60	63	3	B
72	59	60	1	B
73	57	60	3	B
74	58	61	3	B
75	57	60	3	B
76	57	60	3	B
77	55	58	3	B
78	55	57	2	B
79	55	56	1	B
80	54	55	1	B
81	54	56	2	B
82	58	60	2	B
83	56	58	2	B
84	58	61	3	A
85	53	56	3	B
86	57	60	3	B
87	57	63	6	A
88	56	59	3	B
89	57	63	6	A
90	60	61	1	B
91	59	63	4	A
92	55	58	3	B
93	53	56	3	B
94	56	58	2	B
95	55	56	1	B
96	55	62	7	A
97	57	58	1	B
98	54	57	3	B
99	55	58	3	B
100	57	58	1	B
101	54	57	3	B
102	54	56	2	B
103	52	59	7	A
104	56	61	5	A
105	57	59	2	B
106	55	61	6	A

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No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
107	55	58	3	B
108	57	58	1	B
109	54	59	5	A
110	52	59	7	A
111	58	63	5	A
112	56	59	3	B
113	57	60	3	B
114	56	61	5	A
115	52	59	7	A
116	53	59	6	A
117	55	58	3	B
118	55	58	3	B
119	58	59	1	B
120	55	58	3	B
121	58	63	5	A
122	56	64	8	A
123	59	63	4	A
124	55	62	7	A
125	61	65	4	A
126	63	64	1	B
127	60	65	5	A
128	61	62	1	B
129	56	59	3	B
130	57	58	1	B
131	53	60	7	A
132	57	65	8	A
133	58	61	3	A
134	56	58	2	B
135	54	62	8	A
136	57	60	3	B
137	58	60	2	B
138	57	60	3	B
139	55	56	1	B
140	55	57	2	B
141	56	58	2	B
142	56	58	2	B

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No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
143	51	58	7	A
144	52	60	8	A
145	56	60	4	A
146	57	58	1	B
147	57	58	1	B
148	56	61	5	A
149	62	65	3	A
150	57	63	6	A
151	59	63	4	A
152	60	61	1	B
153	58	60	2	B
154	55	63	8	A
155	58	59	1	B
156	56	58	2	B
157	55	56	1	B
158	53	56	3	B
159	55	57	2	B
160	51	59	8	A
161	56	57	1	B
162	57	58	1	B
163	52	59	7	A
164	58	61	3	A
165	55	57	2	B
166	55	58	3	A
167	53	56	3	B
168	53	61	8	A
169	57	58	1	B
170	55	56	1	B
171	54	55	1	B
172	54	56	2	B
173	54	56	2	B
174	59	63	4	A
175	55	56	1	B
176	56	63	7	A
177	54	57	3	B
178	55	56	1	B

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No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
179	55	56	1	B
180	53	56	3	B
181	55	56	1	B
182	54	56	2	B
183	54	61	7	A
184	54	56	2	B
Total no. of Category A Shots				71
Total no. of Category B Shots				113
Average of Category A Shots				63 dBZ
Average of Category A Shots and Category b Shots				61 dBZ
Final Noise Level				63 dBZ



Rocky Waterhole Noise Monitoring Data

No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
1	61	63	2	B
2	58	61	3	B
3	62	67	5	A
4	57	61	4	A
5	54	58	4	A
6	58	60	2	B
7	57	59	2	B
8	54	59	5	A
9	61	69	8	A
10	57	61	4	A
11	52	53	1	B
12	60	61	1	B
13	54	57	3	B
14	54	58	4	A
15	59	62	3	B
16	65	67	2	B
17	66	71	5	A
18	60	64	4	A
19	58	61	3	B
20	55	58	3	B
21	51	58	7	A
22	55	59	4	A
23	54	60	6	A
24	57	58	1	B
25	62	66	4	A
26	60	63	3	B
27	59	64	5	A
28	53	58	5	A
29	58	60	2	B
30	58	64	6	A
31	61	67	6	A
32	59	63	4	A
33	61	63	2	B
34	51	53	2	B

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No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
35	63	65	2	B
36	58	65	7	A
37	50	56	6	A
38	51	55	4	A
39	53	55	2	B
40	50	61	11	A
41	55	62	7	A
42	53	58	5	A
43	55	58	3	B
44	54	57	3	B
45	56	59	3	B
46	52	53	1	B
47	55	60	5	A
48	53	55	2	B
49	52	54	2	B
50	53	55	2	B
51	54	56	2	B
52	53	57	4	A
53	58	60	2	B
54	59	61	2	B
55	55	58	3	B
56	52	54	2	B
57	54	56	2	B
58	54	58	4	A
59	60	62	2	B
60	53	56	3	B
61	55	57	2	B
62	60	61	1	B
63	60	61	1	B
64	55	58	3	B
65	51	54	3	B
66	55	58	3	B
67	55	58	3	B
68	53	54	1	B
69	54	55	1	B
70	53	57	4	A

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No.	Pre-Shot L _{zPeak}	Shot L _{zPeak}	Difference	Category
71	54	58	4	A
72	55	56	1	B
73	58	61	3	B
74	54	58	4	A
75	54	58	4	A
76	55	58	3	B
77	54	55	1	B
78	55	59	4	A
79	55	59	4	A
80	54	60	6	A
81	54	56	2	B
Total no. of Category A Shots				34
Total no. of Category B Shots				47
Average of Category A Shots				61 dBZ
Average of Category A Shots and Category B Shots				59 dBZ
Final Noise Level				59 dBZ

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APPENDIX C

TYPICAL NOISE MONITORING SETUP

Typical Noise Monitoring Setup – Wattle Ridge



Typical Noise Monitoring Setup – Rocky Waterhole



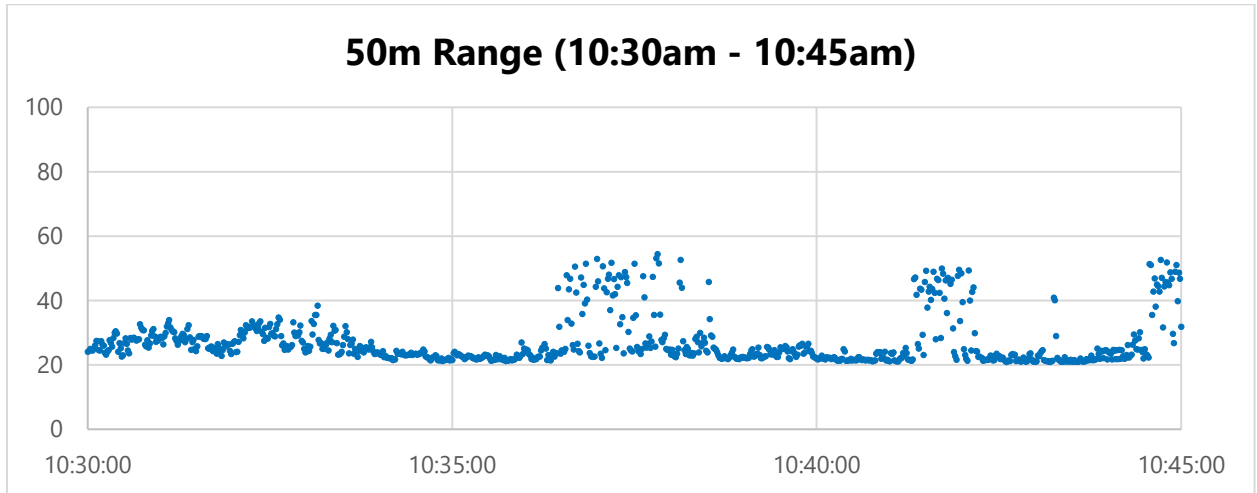
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APPENDIX D

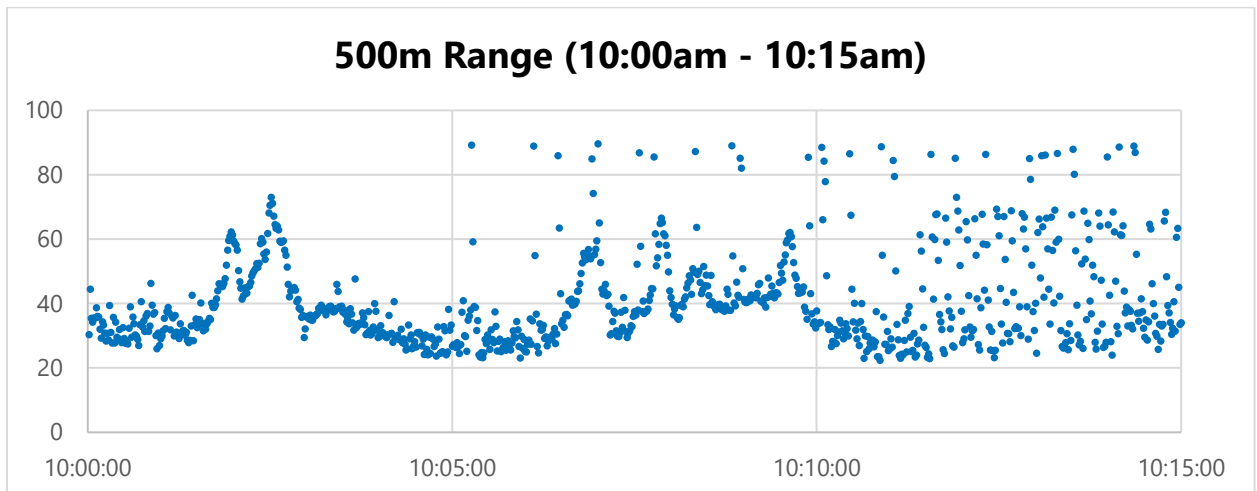
ON-RANGE NOISE PROFILES



50m Range



500m Range



800m Range

