APPENDIX 11 - Noise Baseline Report

Technical Details

APPENDIX 11-1 - Photographs of Monitoring Locations

Figure 1(a) Allahou-Bazi - Noise Monitoring Location

Figure 1(b) Allahou-Bazi – Blacksmiths Workshop

Figure 1(c) **Allahou-Bazi – Mechanics Workshop**

Figure 1(d) **Allahou-Bazi – Church**

Figure 2(a) **Angovia - Noise Monitoring Location**

Figure 2(b) **Angovia – Activities near monitoring location**

Figure 3 The Mine Site - Noise Monitoring Location

Figure 4(a) Akakro - Noise Monitoring Location

Figure 4(b) **Akakro – Village Well**

Figure 5 **Allahou Port - Noise Monitoring Location & moto-taxi on road**

Figure 6(a) **Kouakougnanou - Noise Monitoring Location**

Figure 6 (b) **Kouakougnanou – Village water pump**

Figure 7 (a) Kossou - Noise Monitoring Location

Figure 7 (b) Kossou – football pitch of Kossou 1 & 2 school group

APPENDIX 11-2 - Instrumentation Details

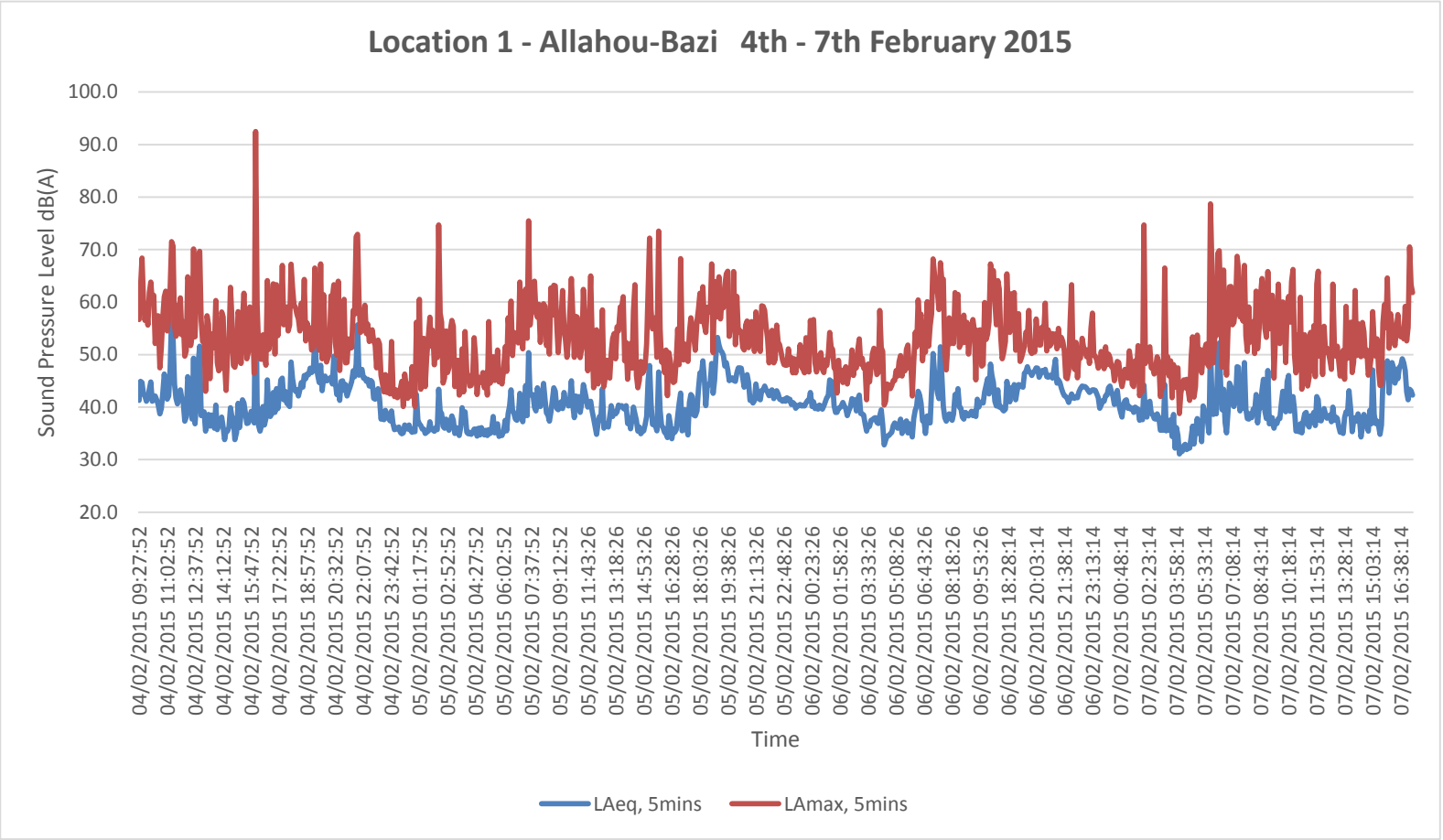
Kit 1 (2D Consulting Afrique)

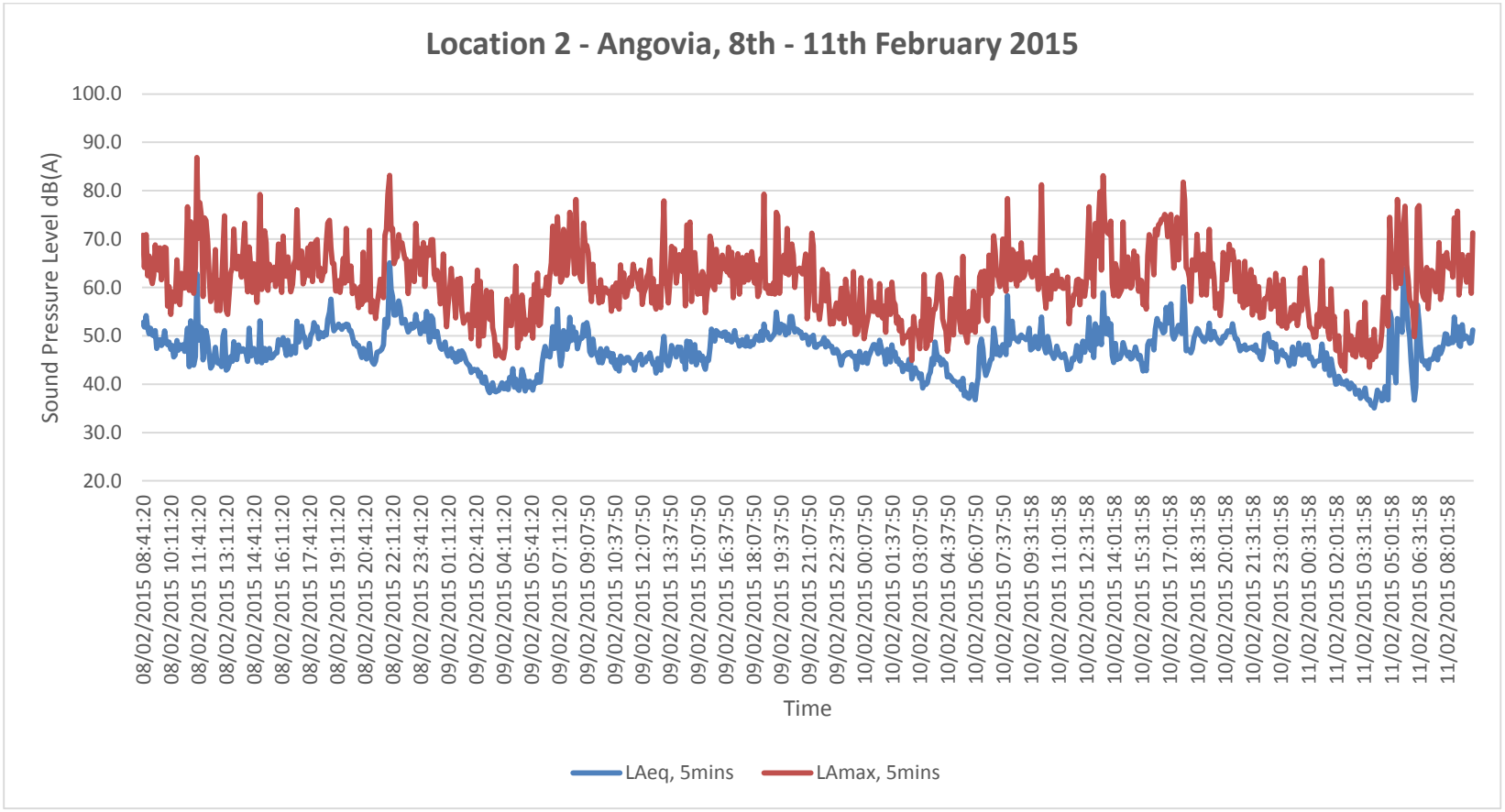
Sound Level Meter	Svan 595 Sound Level Meter Serial Number 15685 Calibration Date ?
Calibrator:	Svan 30A Calibrator Serial Number: 19389 Calibration Date: 2 October 2014

Kit 2 (2D Consulting Afrique)

Sound Level Meter	Cirrus Optimus Green Sound Level Meter Serial Number G056226 Calibration Date: 10 February 2015
Calibrator:	See above

APPENDIX 11-3 - Noise Monitoring Results – Time Histories


Location 1 - Allahou-Bazi 4th - 7th February 2015
Sound Pressure Level dB(A)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
04/02/2015 09:27:52
04/02/2015 11:02:52
04/02/2015 12:37:52
04/02/2015 14:12:52
04/02/2015 15:47:52
04/02/2015 17:22:52
04/02/2015 18:57:52
04/02/2015 20:32:52
04/02/2015 22:07:52
04/02/2015 23:42:52
05/02/2015 01:17:52
05/02/2015 02:52:52
05/02/2015 04:27:52
05/02/2015 06:02:52
05/02/2015 07:37:52
05/02/2015 09:12:52
05/02/2015 11:43:26
05/02/2015 13:18:26
05/02/2015 14:53:26
05/02/2015 16:28:26
05/02/2015 18:03:26
05/02/2015 19:38:26
05/02/2015 21:13:26
05/02/2015 22:48:26
06/02/2015 00:23:26
06/02/2015 01:58:26
06/02/2015 03:33:26
06/02/2015 05:08:26
06/02/2015 06:43:26
06/02/2015 08:18:26
06/02/2015 09:53:26
06/02/2015 18:28:14
06/02/2015 20:03:14
06/02/2015 21:38:14
06/02/2015 23:13:14
07/02/2015 00:48:14
07/02/2015 02:23:14
07/02/2015 03:58:14
07/02/2015 05:33:14
07/02/2015 07:08:14
07/02/2015 08:43:14
07/02/2015 10:18:14
07/02/2015 11:53:14
07/02/2015 13:28:14
07/02/2015 15:03:14
07/02/2015 16:38:14
Time
LAeq, 5mins
LAmax, 5mins


Location 2 - Angovia, 8th - 11th February 2015
Sound Pressure Level dB(A)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
08/02/2015 08:41:20
08/02/2015 10:11:20
08/02/2015 11:41:20
08/02/2015 13:11:20
08/02/2015 14:41:20
08/02/2015 16:11:20
08/02/2015 17:41:20
08/02/2015 19:11:20
08/02/2015 20:41:20
08/02/2015 22:11:20
08/02/2015 23:41:20
09/02/2015 01:11:20
09/02/2015 02:41:20
09/02/2015 04:11:20
09/02/2015 05:41:20
09/02/2015 07:11:20
09/02/2015 09:07:50
09/02/2015 10:37:50
09/02/2015 12:07:50
09/02/2015 13:37:50
09/02/2015 15:07:50
09/02/2015 16:37:50
09/02/2015 18:07:50
09/02/2015 19:37:50
09/02/2015 21:07:50
09/02/2015 22:37:50
10/02/2015 00:07:50
10/02/2015 01:37:50
10/02/2015 03:07:50
10/02/2015 04:37:50
10/02/2015 06:07:50
10/02/2015 07:37:50
10/02/2015 09:31:58
10/02/2015 11:01:58
10/02/2015 12:31:58
10/02/2015 14:01:58
10/02/2015 15:31:58
10/02/2015 17:01:58
10/02/2015 18:31:58
10/02/2015 20:01:58
10/02/2015 21:31:58
10/02/2015 23:01:58
11/02/2015 00:31:58
11/02/2015 02:01:58
11/02/2015 03:31:58
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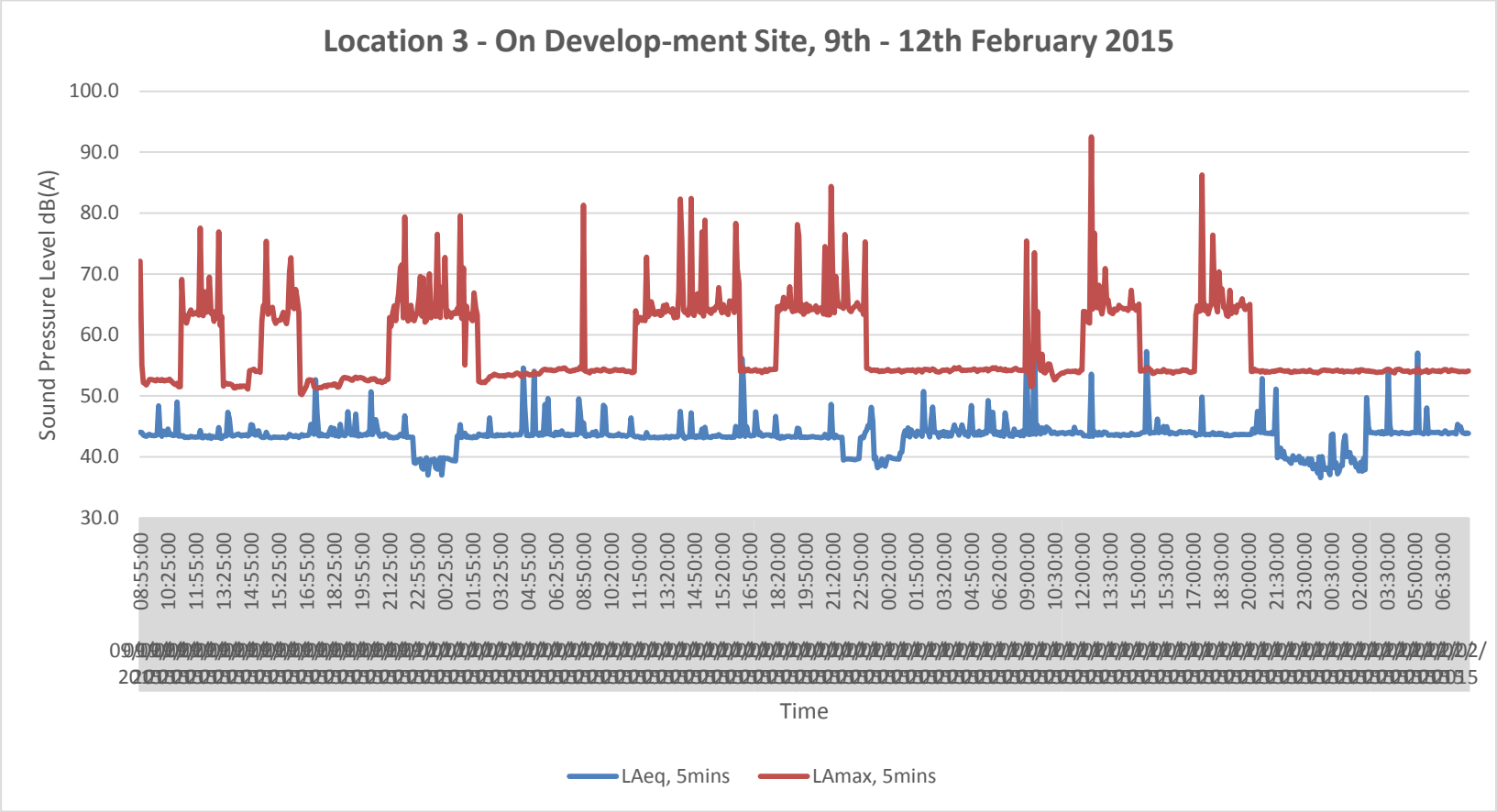
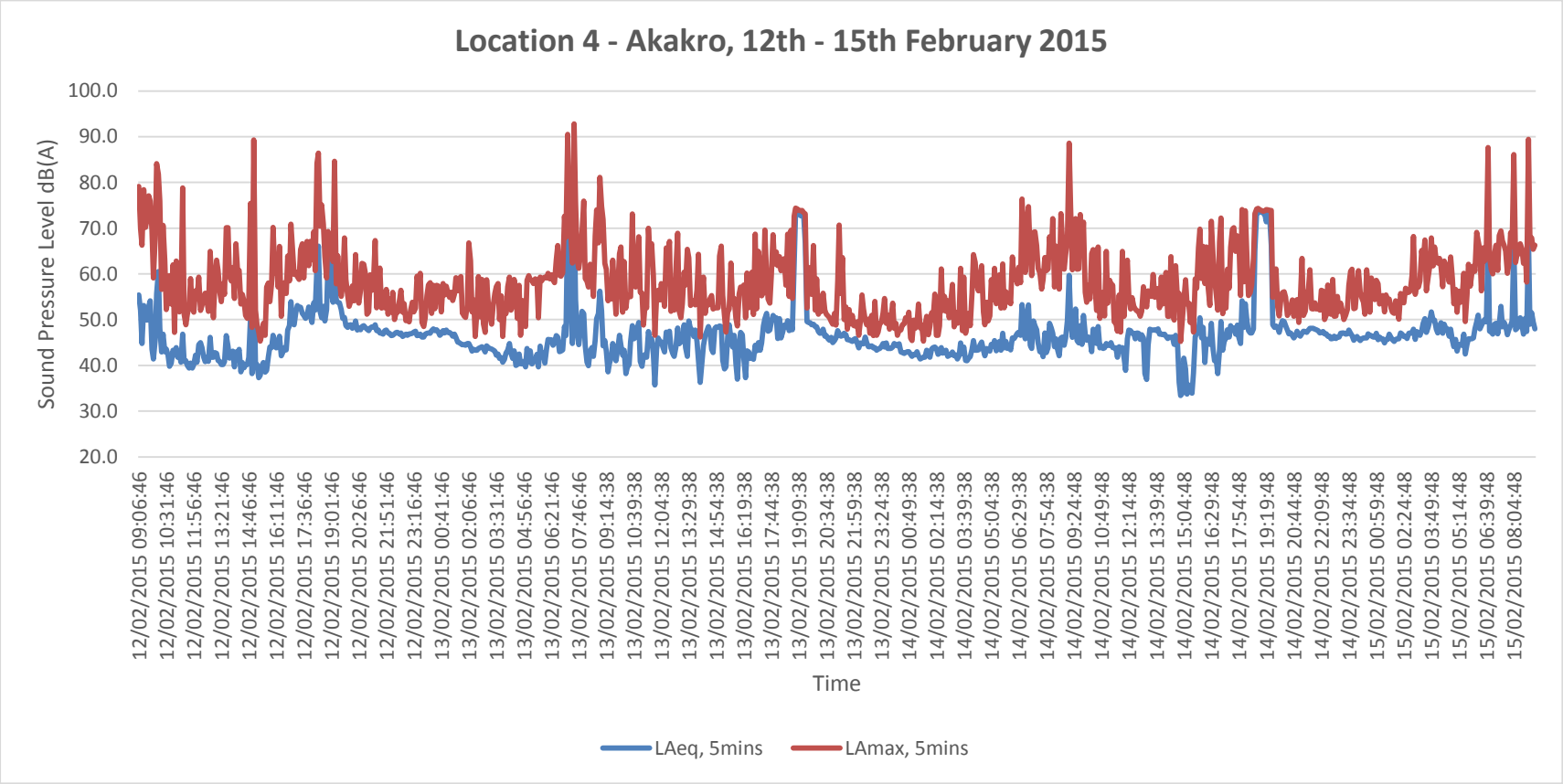
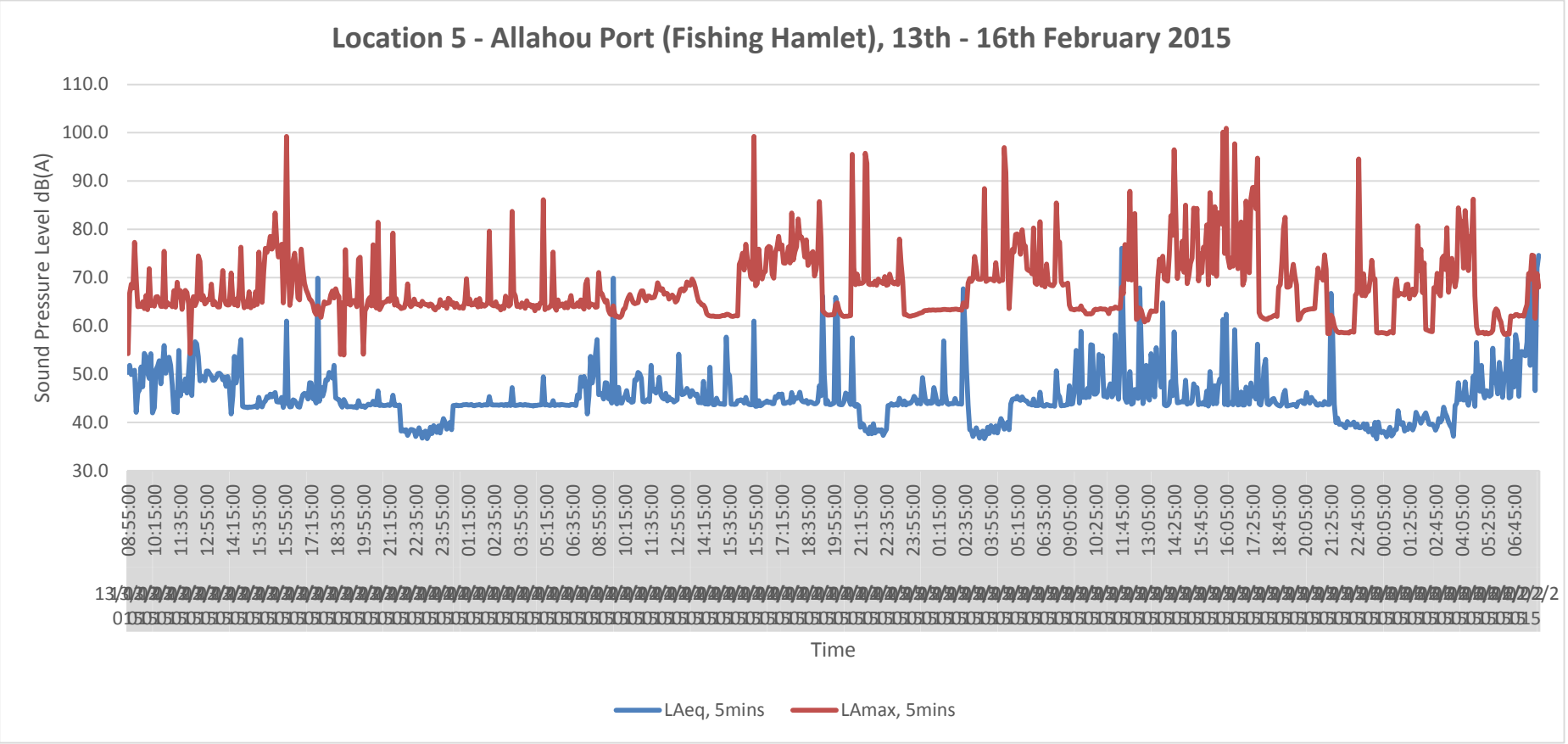
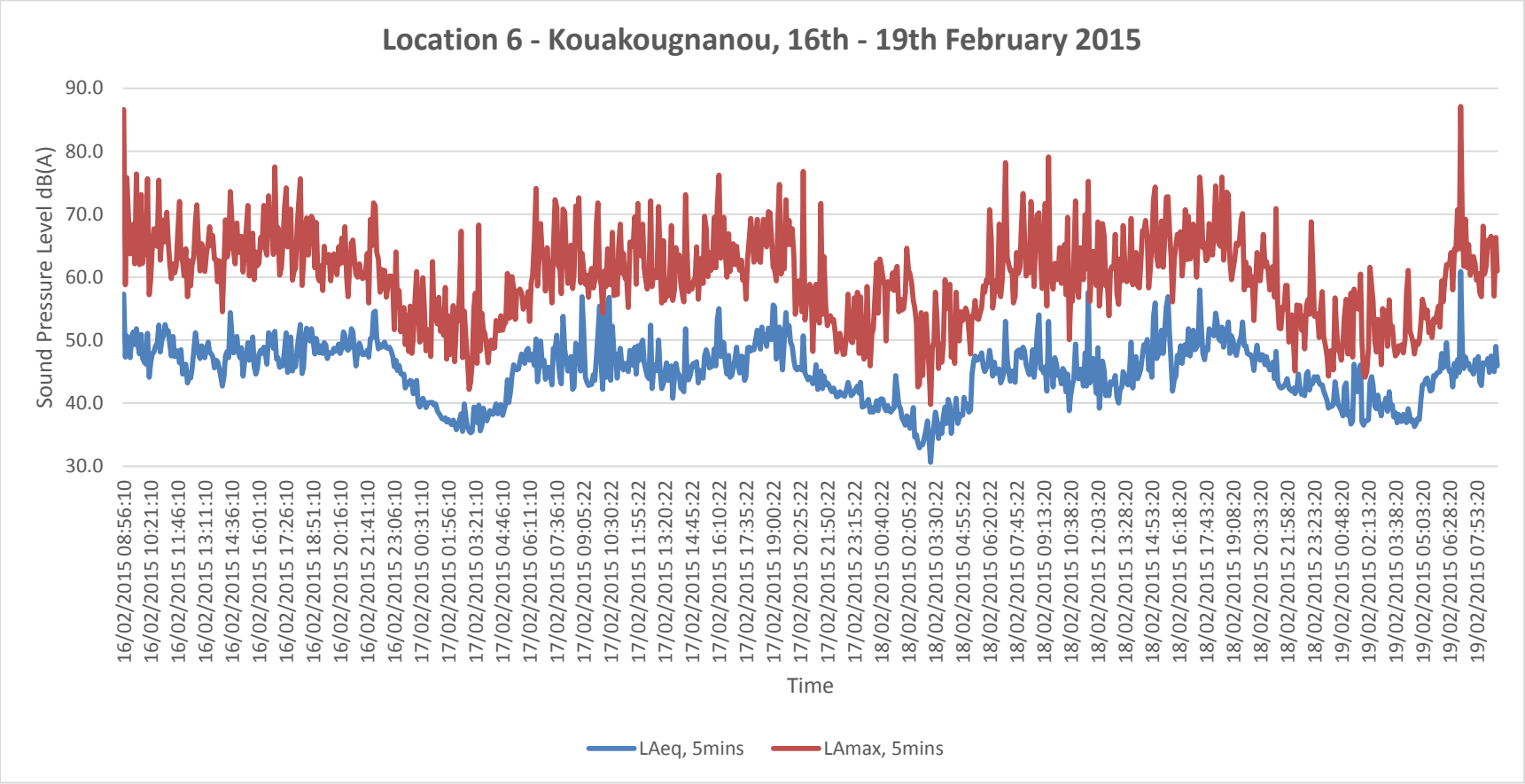
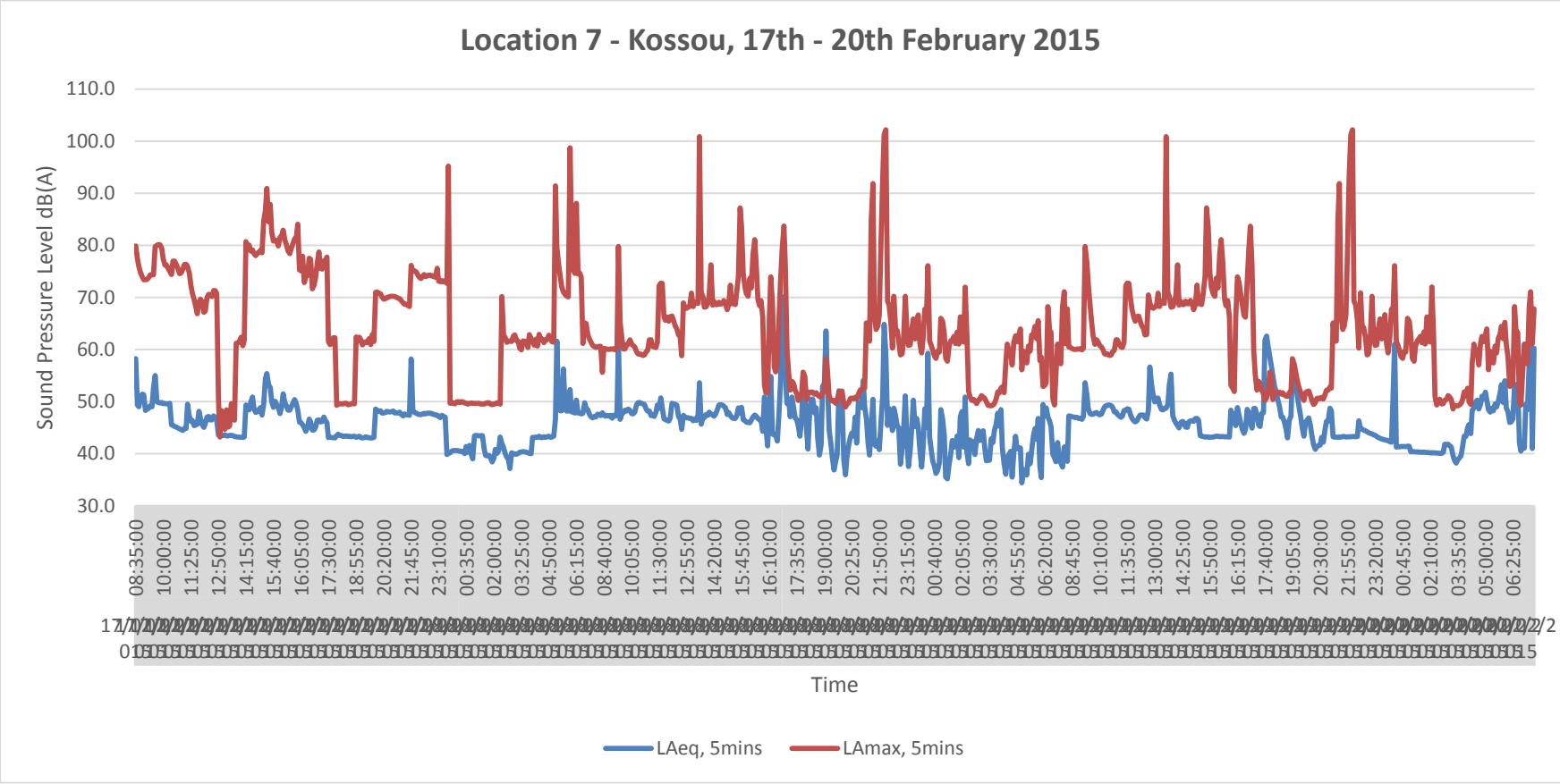
11/02/2015 06:31:58
11/02/2015 08:01:58
Time
LAeq, 5mins
LAmax, 5mins


Location 3 - On Develop-ment Site, 9th - 12th February 2015
Sound Pressure Level dB(A)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
Time
LAeq, 5mins
LAmax, 5mins


Location 4 - Akakro, 12th - 15th February 2015
Sound Pressure Level dB(A)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
12/02/2015 09:06:46
12/02/2015 10:31:46
12/02/2015 11:56:46
12/02/2015 13:21:46
12/02/2015 14:46:46
12/02/2015 16:11:46
12/02/2015 17:36:46
12/02/2015 19:01:46
12/02/2015 20:26:46
12/02/2015 21:51:46
12/02/2015 23:16:46
13/02/2015 00:41:46
13/02/2015 02:06:46
13/02/2015 03:31:46
13/02/2015 04:56:46
13/02/2015 06:21:46
13/02/2015 07:46:46
13/02/2015 09:14:38
13/02/2015 10:39:38
13/02/2015 12:04:38
13/02/2015 13:29:38
13/02/2015 14:54:38
13/02/2015 16:19:38
13/02/2015 17:44:38
13/02/2015 19:09:38
13/02/2015 20:34:38
13/02/2015 21:59:38
13/02/2015 23:24:38
14/02/2015 00:49:38
14/02/2015 02:14:38
14/02/2015 03:39:38
14/02/2015 05:04:38
14/02/2015 06:29:38
14/02/2015 07:54:38
14/02/2015 09:24:48
14/02/2015 10:49:48
14/02/2015 12:14:48
14/02/2015 13:39:48
14/02/2015 15:04:48
14/02/2015 16:29:48
14/02/2015 17:54:48
14/02/2015 19:19:48
14/02/2015 20:44:48
14/02/2015 22:09:48
14/02/2015 23:34:48
15/02/2015 00:59:48
15/02/2015 02:24:48
15/02/2015 03:49:48
15/02/2015 05:14:48
15/02/2015 06:39:48
15/02/2015 08:04:48
Time
LAeq, 5mins
LAmax, 5mins


Location 5 - Allahou Port (Fishing Hamlet), 13th - 16th February 2015
Sound Pressure Level dB(A)
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
Time
LAeq, 5mins
LAmax, 5mins


Location 6 - Kouakougnanou, 16th - 19th February 2015
Sound Pressure Level dB(A)
90.0
80.0
70.0
60.0
50.0
40.0
30.0
16/02/2015 08:56:10
16/02/2015 10:21:10
16/02/2015 11:46:10
16/02/2015 13:11:10
16/02/2015 14:36:10
16/02/2015 16:01:10
16/02/2015 17:26:10
16/02/2015 18:51:10
16/02/2015 20:16:10
16/02/2015 21:41:10
16/02/2015 23:06:10
17/02/2015 00:31:10
17/02/2015 01:56:10
17/02/2015 03:21:10
17/02/2015 04:46:10
17/02/2015 06:11:10
17/02/2015 07:36:10
17/02/2015 09:05:22
17/02/2015 10:30:22
17/02/2015 11:55:22
17/02/2015 13:20:22
17/02/2015 14:45:22
17/02/2015 16:10:22
17/02/2015 17:35:22
17/02/2015 19:00:22
17/02/2015 20:25:22
17/02/2015 21:50:22
17/02/2015 23:15:22
18/02/2015 00:40:22
18/02/2015 02:05:22
18/02/2015 03:30:22
18/02/2015 04:55:22
18/02/2015 06:20:22
18/02/2015 07:45:22
18/02/2015 09:13:20
18/02/2015 10:38:20
18/02/2015 12:03:20
18/02/2015 13:28:20
18/02/2015 14:53:20
18/02/2015 16:18:20
18/02/2015 17:43:20
18/02/2015 19:08:20
18/02/2015 20:33:20
18/02/2015 21:58:20
18/02/2015 23:23:20
19/02/2015 00:48:20
19/02/2015 02:13:20
19/02/2015 03:38:20
19/02/2015 05:03:20
19/02/2015 06:28:20
19/02/2015 07:53:20
Time
LAeq, 5mins
LAmax, 5mins


Location 7 - Kossou, 17th - 20th February 2015
Sound Pressure Level dB(A)
110.0
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
Time
LAeq, 5mins
LAmax, 5mins

Certificate of Calibration

Cirrus Research plc
dedicated to noise measurement

Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	CR:515
Description	Acoustic Calibrator
Serial Number	55759

Calibration Procedure

The acoustic calibrator detailed above has been calibrated to the published data as described in the operating manual. The procedures and techniques used to follow the recommendations of the IEC standard Electroacoustics – Sound Calibrators IEC 60942:2003, IEC 60942:1997, BS EN 60942:1998 and BS EN 60942:2003 where applicable.. The calibrator's main output is 94.00 dB (1 Pa) and this was set within the 0.01 dB resolution of the test system, i.e. one hundredth of a decibel. Numbers in {parenthesis} refer to the paragraph in IEC 60942.

Calibration Traceability

The calibrator above was calibrated against the calibration laboratory standards held by Cirrus Research plc. These are traceable to International Standards {A.0.6}. The standards are:

Microphone Type	B&K4180	Serial Number	1893453	Calibration Ref.	S 6009
Pistonphone Type	B&K4220	Serial Number	613843	Calibration Ref.	S 5964

Calibration Climate Conditions

The climatic test conditions were all maintained within the permitted limits of IEC 60942:1997.

Temperature	{B.3.2}	Permitted band 15°C to 25°C
Humidity	{B.3.2}	Permitted band 30% to 90% RH
Static Pressure	{B.3.2}	Permitted band 85 kPa to 105 kPa
Ambient Noise Level	{B.3.3.6}	Max permitted level 64 dB(Z)

Measurement Results

The figures below are the Calibration Laboratory test limits for this model calibrator and have a smaller tolerance than those permitted in IEC 60942.

94 dB Output	94.01 dB	Permitted band	93.95 to 94.05dB
104 dB Output	dB	Permitted band	103.80 to 104.30dB
Frequency	1000 Hz	Permitted band	990 to 1010Hz

Uncertainty

With an uncertainty coefficient of k=2, i.e. a 95% confidence level, the uncertainty of each measure is

94 dB Output	± 0.13 dB	104 dB Output	± 0.14 dB
Frequency	± 0.1 Hz	Level Stability	± 0.04 dB

Calibrated by T. A. Goodrich

Calibration Date 10 February 2014

Calibration Certificate Number 214947

This Calibration Certificate is valid for 12 months from the date above.

Cirrus Research plc, Acoustic House, Bridlington Road, Hunmanby, North Yorkshire, YO14 0PH
Telephone: +44 (0) 1723 891655 Fax: +44 (0) 1723 891742
Email: sales@cirrusresearch.co.uk

Certificate of Calibration

Cirrus Research plc
dedicated to noise measurement

Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	CR:171B
Description	Sound Level Meter
Serial Number	G056226

Calibration Procedure

The instrument detailed above has been calibrated to the publish test and calibration data as detailed in the instrument hand book, using the techniques recommended in the latest revisions of the International Standards IEC 61672-1:2002, IEC 60651:1979, IEC 60804:2001,IEC 61260:1995, IEC 60942:1997, IEC 61252:1993, ANSI S1.4-1983, ANSI S1.11-1986 and ANSI S1.43-1997 where applicable.
Sound Level Meters: All Calibration procedures were carried out by subsitituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.

Calibration Traceability

The equipment detailed above was calibrated against the calibration laboratory standards held by Cirrus Research plc. These are traceable to International Standards {A.0.6}. The standards are:

Microphone Type	B&K4180	Serial Number	1893453	Calibration Ref.	S 6009
Pistonphone Type	B&K4220	Serial Number	613843	Calibration Ref.	S 5964

Calibrated by T. A. Goodhill

Calibration Date	10 February 2014
Calibration Certificate Number	214948

This Calibration Certificate is valid for 12 months from the date above.

Cirrus Research plc, Acoustic House, Bridlington Road, Hunmanby, North Yorkshire, YO14 0PH
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Email: sales@cirrusresearch.co.uk