Millbrook Power Project

Preliminary Environmental Information Report (2017) – Appendices

Volume E

Noise

On behalf of **Millbrook Power Ltd**

Project Ref: 40334 | Rev: 1.0 | Date: May 2017

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7.1 – Detailed Noise Survey Results

Noise

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Millbrook Power Project

Baseline Noise Survey Report (2015)

On behalf of **Millbrook Power Limited**

Project Ref: 31116/3005 | Rev: 00 | Date: February 2015

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Document Control Sheet

Project Name: **Millbrook Power Project**

Project Ref: **31116**

Report Title: **Baseline Noise Survey Report**

Doc Ref: **31116/3005/NV1**

Date: **February 2015**

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For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved

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1 Introduction

1.1 Background

1.1.1 Peter Brett Associates LLP (PBA) has been commissioned to prepare a noise and vibration assessment for the Millbrook Power Project 'the Project'.

1.1.2 The Project is for a 299MW gas fired peaking power generation plant within the Rookery South Pit, a former clay pit, which is located to the north of Millbrook in Central Bedfordshire.

1.1.3 In order to support the noise assessment, two noise surveys have been undertaken. This report presents the survey methodology and results of the surveys.

1.1.4 Whilst every effort has been made to ensure that this report is easy to understand, it is technical in nature. To assist the reader, an explanation of the terminology used in this report is contained within **Appendix A**.

1.2 Noise Sensitive Receptors

1.2.1 Five noise sensitive receptors (NSR) have been identified in the vicinity of the Project Site. These are the closest residential receptors to the Power Generation Plant Site and associated construction and decommissioning activities. The NSR's are summarised in **Table 1.1.**

Table 1.1: Description of noise sensitive receptors

Receptor	Description
South Pillinge Farm	This NSR is located to the west of the Project Site. It is the closest NSR to the Power Generation Plant Site and the Electrical Connection. It will be affected by the construction, operation and decommissioning of the Power Generation Plant, Electrical Connection and Gas Connection.
Pillinge Cottages	This NSR is located to the south west of the Project Site. Noise levels at South Pillinge Farm have been deemed representative of the noise levels at Pillinge Cottages due to their close proximity.
Moreteyne House	This NSR is located to the south west of the Project Site. Noise levels at South Pillinge Farm have been deemed representative of the noise levels at Moreteyne House due to their close proximity.
Lower Farm	This NSR is located to the south of the Project Site. It is the closest NSR to the Above Ground Installation associated with the Gas Connection to the National Transmission System. It will be affected by the construction and decommissioning of the Gas Connection.
Manor Farm	This NSR is located to the east of the Project Site. It is the closest NSR to an alternative Gas Connection option which is no longer under consideration.

1.3 Environmental Sound Sources

1.3.1 The Project Site is bound to the east and west by the Midland Main Line and Marston Vale Line railways which are a dominant noise source at the NSRs.

1.3.2 Additionally, Station Lane, Houghton Lane, Millbrook Road and the B530 dual carriageway pass the NSR locations and are deemed to be a dominant source of road traffic noise.

1.3.3 The wider road network includes the A421 dual carriageway which runs to the north west of the Project Site and the M1 motorway which runs to the south west of the Project Site.

1.3.4 **Figure 1** shows the indicative locations of the NSR, the railway lines, the existing overhead line, proposed Electrical Connection and the proposed Power Generation Plant and AGI.

2 Methodology

2.1 Consultation with Central Bedfordshire Council

2.1.1 The Public Protection Officer (PPO) at Central Bedfordshire Council (CBC) agreed (verbally) in August 2014 that one noise measurement location at South Pillinge Farm would be sufficient for the purposes of the 2014 Preliminary Environmental Information Report (2014 PEIR).

2.1.2 The PPO was contacted in November 2014 to confirm the noise survey locations in order to support the full noise and vibration assessment.

2.2 Baseline Noise Survey – August 2014

2.2.1 A baseline noise survey was undertaken between 14 and 18 August 2014 in order to determine the ambient and background noise levels at South Pillinge Farm and support the preliminary noise assessment included in the 2014 PEIR.

2.2.2 An unattended environmental noise measurement was undertaken in the garden of South Pillinge Farm. The sound level meter was located approximately 6 m to the north east of the farmhouse with the microphone positioned approximately 1.4 m above ground level. The approximate location of the sound level meter is shown in **Figure 2** and labelled LTA1.

2.2.3 A minimum sampling frequency (logging period) of 15 minutes was used for a continuous survey period of four days.

2.2.4 **Table 2.1** provides details of the instrumentation used during the August 2014 survey.

Table 2.1: Instrumentation used during August 2014 survey

Item	Manufacturer	Model	Serial Number	Laboratory Calibration Date
Sound Level Meter	Rion	NL-52	00542902	31 July 2014
Pre-Amplifier	Rion	UC59	42930	
Microphone	Rion	NH-25	06479	

2.2.5 Onsite calibration checks were undertaken before and after the survey with no significant drift in calibration observed.

2.2.6 A windshield was fitted over the microphone at all times during the survey period.

2.2.7 The weather conditions throughout the measurement period were considered to be suitable for environmental noise surveys (overcast with low wind speed).

2.3 Baseline Noise Survey – November 2014

2.3.1 A further baseline noise survey was undertaken between 21 and 26 November 2014 to determine the ambient and background noise levels at the nearest noise sensitive receptors to the proposed infrastructure and construction works.

2.3.2 Unattended environmental noise measurements were undertaken at the following locations:

- South Pillinge Farm (Location LTN1) – The sound level meter was located approximately 20 m to the east of the farmhouse with the microphone positioned 1.4 m above ground level. The approximate location of the sound level meter is shown in **Figure 2**.
- Lower Farm (Location LTN2) – The sound level meter was located approximately 20 m to the south east of the farmhouse with the microphone positioned 1.4 m above ground level. The approximate location of the sound level meter is shown in **Figure 3**.

2.3.3 A minimum sampling frequency (logging period) of 15 minutes was used for a continuous survey period of five days.

2.3.4 **Table 2.2** provides details of the instrumentation used during the survey.

Table 2.2: Instrumentation used during the November 2014 survey

Item	Manufacturer	Model	Serial Number	Laboratory Calibration Date
South Pillinge Farm				
Sound Level Meter	Rion	NL-52	00542901	31 July 2014
Pre-Amplifier	Rion	UC59	42929	
Microphone	Rion	NH-25	06478	
Lower Farm				
Sound Level Meter	Rion	NL-52	00542902	31 July 2014
Pre-Amplifier	Rion	UC59	42930	
Microphone	Rion	NH-25	06479	

2.3.5 Onsite calibration checks were undertaken before and after each of the measurement periods with no significant drift in calibration level observed.

2.3.6 Windshields were fitted over the microphones at all times during the survey period.

2.3.7 The weather conditions throughout the measurement period were suitable for environmental noise surveys with the exception of heavy rain fall during the daytime on Sunday 23 November.

2.3.8 This report refers to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

3 Noise Survey Results

3.1 Noise Climate

South Pillinge Farm – August 2014

3.1.1 During the site visits associated with the noise survey undertaken in August 2014, the dominant sound sources were deemed to be distant road traffic, and local wildlife and farm animals.

South Pillinge Farm – November 2014

3.1.2 Construction work associated with the low level restoration scheme was underway during the November 2014 noise survey at South Pillinge Farm.

3.1.3 On Friday 21 November, during commencement of the survey, construction activities were being undertaken immediately adjacent to the survey location. Activities included the extraction and transportation of materials from the permitted extraction area to the south of the Rookery South Pit. At the time of the survey, the northern half of the temporary earth bund had been constructed around the Rookery South Pit. The residents of South Pillinge Farm confirmed that construction activities are not undertaken over the weekend.

3.1.4 The survey was not abandoned due to untypical conditions as evening, night-time and weekend measurements were still considered to be recorded under typical conditions (with the exception of the heavy rainfall on Sunday 23 November). Historically, noise levels measured during these periods are the lowest noise levels. In order to inform the assessment of operational noise, the typical measured $L_{A90,15mins}$ background noise levels will be used.

3.1.5 In addition, the duration of the LLRS works were expected to extend beyond the timescales of the preparation of the ES.

3.1.6 As the noise survey results which were measured in August 2014 are considered to have been undertaken during typical conditions, these will also be used to inform the assessment of operational, construction and decommissioning noise for the ES.

3.1.7 On Wednesday 26 November, when the equipment was collected, construction activities were being undertaken in the pit areas. Construction noise was considerably quieter compared to the commencement of the noise survey. The types of activities being undertaken were unable to be identified without access onto the site.

3.1.8 During the site visit on Wednesday 26 November, other noise sources noted comprised distant road traffic including emergency sirens on local roads, aircraft, trains passing by on the Midland Main Line (which were also visible from the survey location), and natural noise sources including birdsong and running water from the nearby brook.

Lower Farm – November 2014

3.1.9 The dominant noise sources at Lower Farm were deemed to be road traffic on Houghton Lane and train pass bys on the Midland Main Line to the east of the survey location.

3.1.10 Additionally, distant road traffic was noted with natural noise sources including tree movements and birdsong. A number of local businesses operate out of the existing farm buildings to the north of the farmhouse which received a mix of HGV and LGV deliveries during site attendance.

3.2 Results

August 2014

3.2.1 **Table 3.1** presents the $L_{Aeq,16h}$, $L_{Aeq,8h}$ and typical $L_{A90,15mins}$ during the daytime and night-time periods measured during the August 2014 survey at South Pillinge Farm.

Table 3.1: Noise survey results at South Pillinge Farm, August 2014

Date	Daytime $L_{Aeq,16h}$ (dB)	Night-time $L_{Aeq,8h}$ (dB)	Typical Daytime $L_{A90,15mins}$ (dB)	Typical Night-time $L_{A90,15mins}$ (dB)
Thursday 14/08/2014 – Friday 15/08/2014	49	43	31	32
Friday 15/08/2014 – Saturday 16/08/2014	44	40	27	26
Saturday 16/08/2014 – Sunday17/08/2014	46	42	33	33
Sunday 17/08/2014 – Monday 18/08/2014	50	41	33	30

3.2.2 Time history graphs of the August 2014 survey results are provided in **Appendix B**.

November 2014

3.2.3 **Table 3.2** presents the results of the noise survey undertaken in November 2014 at South Pillinge Farm and **Table 3.3** presents the results of the noise survey undertaken simultaneously at Lower Farm.

Table 3.2: Noise survey results at South Pillinge Farm, November 2014

Date	Daytime $L_{Aeq,16h}$ (dB)	Night-time $L_{Aeq,8h}$ (dB)	Typical Daytime $L_{A90,15mins}$ (dB)	Typical Night-time $L_{A90,15mins}$ (dB)
Friday 21/11/2014 – Saturday 22/11/2014	52	41	37	31
Saturday 22/11/2014 – Sunday 23/11/2014	46	45	30	31
Sunday 23/11/2014 – Monday 24/11/2014	50	42	38	35
Monday 24/11/2014 – Tuesday 25/11/2014	53	44	37	34
Tuesday 25/11/2014 – Wednesday 26/11/2014	51	45	35	37

Table 3.3: Noise survey results at Lower Farm, November 2014

Date	Daytime $L_{Aeq,16h}$ (dB)	Night-time $L_{Aeq,8h}$ (dB)	Typical Daytime $L_{A90,15mins}$ (dB)	Typical Night-time $L_{A90,15mins}$ (dB)
Friday 21/11/2014 – Saturday 22/11/2014	53	46	37	30
Saturday 22/11/2014 – Sunday 23/11/2014	51	44	31	28
Sunday 23/11/2014 – Monday 24/11/2014	51	43	34	29
Monday 24/11/2014 – Tuesday 25/11/2014	53	45	34	27
Tuesday 25/11/2014 – Wednesday 26/11/2014	53	46	32	28

3.2.4 Time history graphs of the November 2014 survey data are provided in **Appendix B**.

4 Summary

4.1.1 Peter Brett Associates LLP (PBA) have been commissioned to undertake a noise and vinration assessment for the Millbrook Power Project.

4.1.2 The Project Site is centred within the Rookery South Pit, a former clay pit, which is located to the north of Millbrook in Central Bedfordshire.

4.1.3 In order to support the noise assessment, two noise surveys have been undertaken. This report presents the survey methodology and results.

4.1.4 The noise sensitive receptors in the vicinity of the Project Site have been identified.

4.1.5 Consultation with the Environmental Health Department at Central Bedfordshire Council has been undertaken in order to discuss survey methodology.

4.1.6 Two unattended, baseline, environmental noise surveys have been undertaken.

4.1.7 The first survey was undertaken in August 2014 at South Pillinge Farm in order to support the preliminary assessment included within the PEIR.

4.1.8 A second survey was undertaken in November 2014 at South Pillinge Farm and Lower Farm in order to support the full assessment included as part of the Environmental Statement.

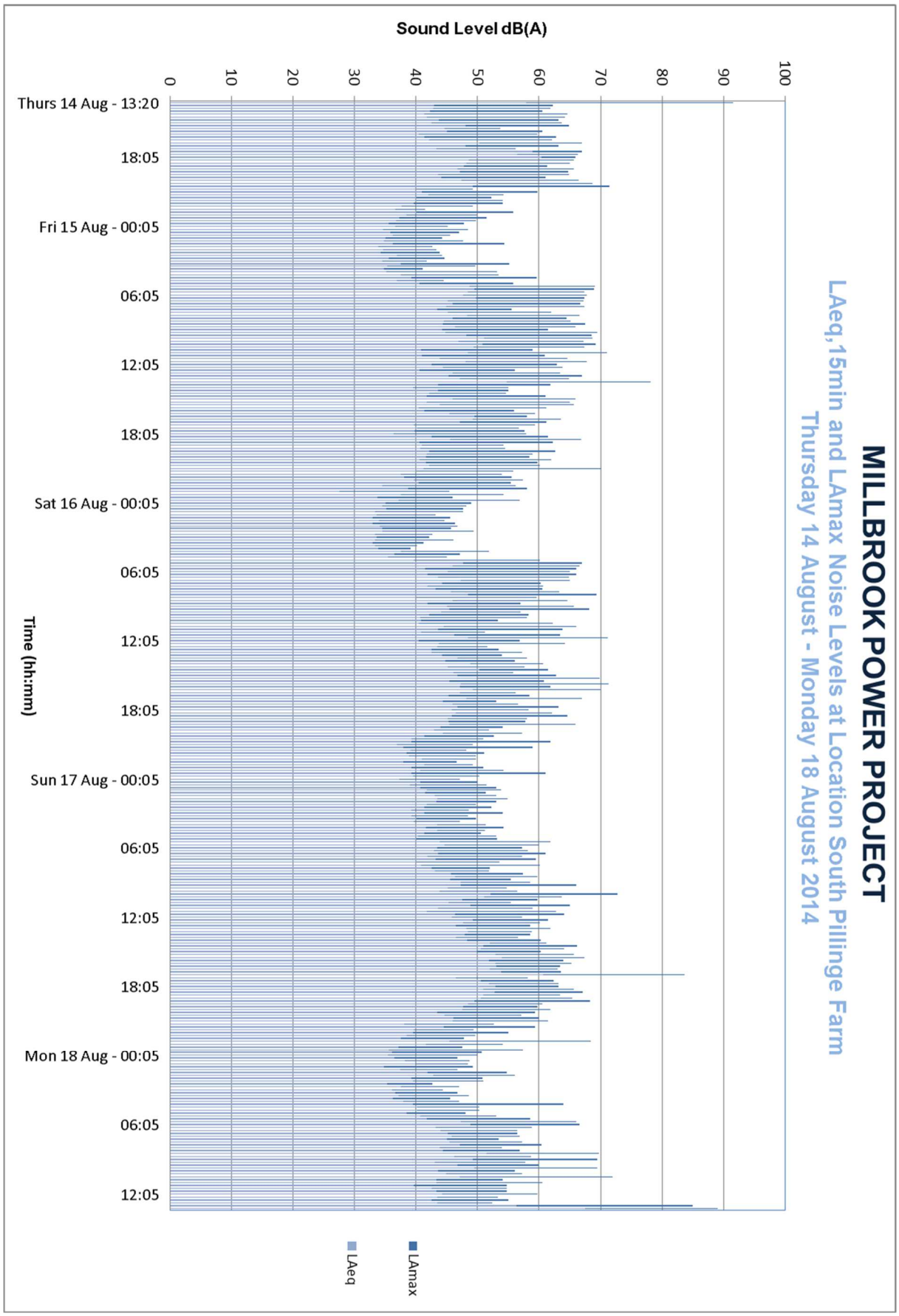
4.1.9 This report has presented the methodology and results of the two noise surveys.

Appendix A Acoustics Terminology

Noise

Ambient Noise	Total encompassing sound in a given situation at a given time, usually composed of sound from many sources far and near.
Background Noise	In BS 4142 this is defined as the A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T ($L_{A90,T}$)
Daytime	Extrapolated from BS 8233 as the period 07:00-23:00 hours (as night-time is 23:00-07:00 hours) or defined in BS 5228-1 as the period 07:00-19:00 hours.
Decibel (dB)	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure levels the reference quantity is 20 uPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
L_{Ax}	Denotes use of frequency weighting 'A' which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. A weighted measurements broadly agree with people's assessment of loudness.
Evening	Defined in BS 5228-1 as the period 19:00-23:00 hours.
$L_{A10,T}$	The A-weighted noise level exceeded for 10% of the measurement period, T. It gives an indication of the upper limit of fluctuating noise such as that from road traffic. $L_{A10,18h}$ is the arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{A90,T}$	The A-weighted noise level exceeded for 90% of the measurement period, T. This is defined in BS 4142 as the background noise level.
$L_{Aeq,T}$	The equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,\ T}$ is used to describe many noises and can be measured directly with an integrating sound level meter.
$L_{Amax,}$	The highest A-weighted noise level recorded during a noise event. The time weighting (slow or fast) should be stated.
Night-time	Defined in BS 8233 and BS 5228-1 as the period 23:00-07:00 hours.
LOAEL	Lowest Observed Adverse Effect Level
SOAEL	Significant Observed Adverse Effect Level

Appendix B Time History Graphs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LAeq,15min and LAmax Noise Levels at Location South Pillinge Farm
Thursday 14 August - Monday 18 August 2014
Sound Level dB(A)
0
10
20
30
40
50
60
70
80
90
100
Time (hh:mm)
Thurs 14 Aug - 13:20
18:05
Fri 15 Aug - 00:05
06:05
12:05
18:05
Sat 16 Aug - 00:05
06:05
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Mon 18 Aug - 00:05
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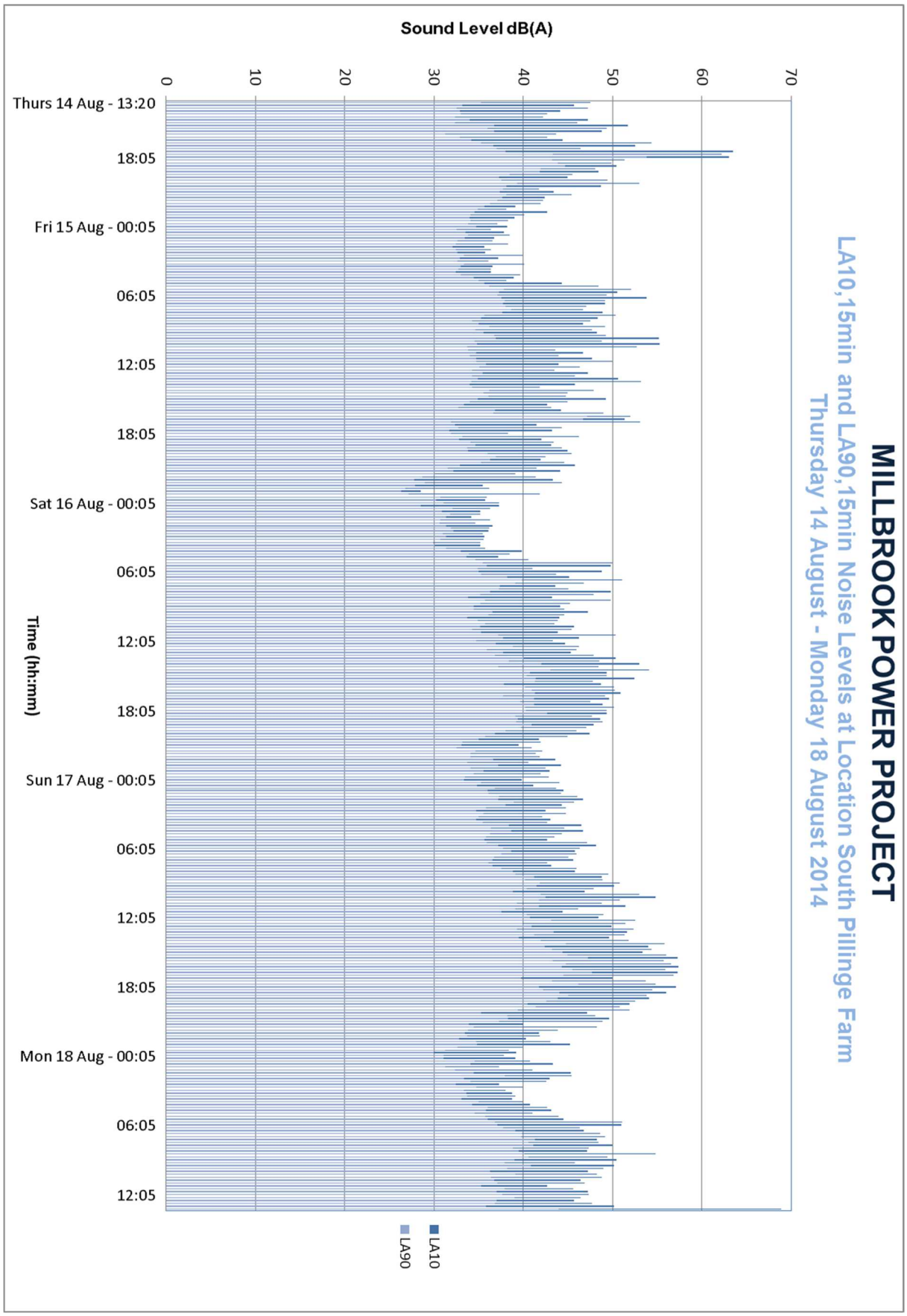
LAeq
LAmax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LA10,15min and LA90,15min Noise Levels at Location South Pillinge Farm
Thursday 14 August - Monday 18 August 2014
Sound Level dB(A)
0
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40
50
60
70
Time (hh:mm)
Thurs 14 Aug - 13:20
18:05
Fri 15 Aug - 00:05
06:05
12:05
18:05
Sat 16 Aug - 00:05
06:05
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Mon 18 Aug - 00:05
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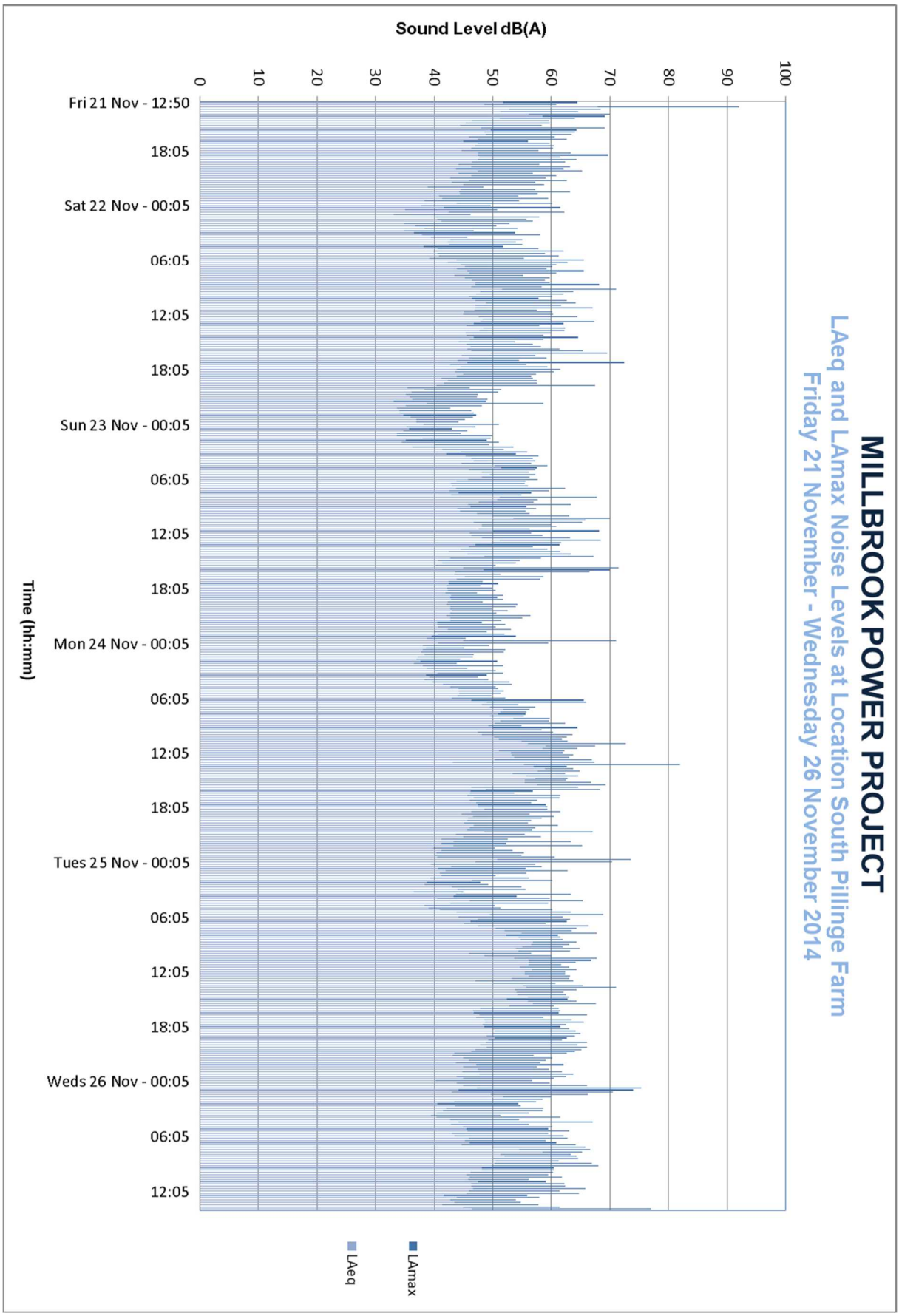
12:05
LA90
LA10


MILLBROOK POWER PROJECT
LAeq and LAmax Noise Levels at Location South Pillinge Farm
Friday 21 November - Wednesday 26 November 2014
Sound Level dB(A)
0
10
20
30
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50
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80
90
100
Time (hh:mm)
Fri 21 Nov - 12:50
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Sat 22 Nov - 00:05
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Sun 23 Nov - 00:05
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Mon 24 Nov - 00:05
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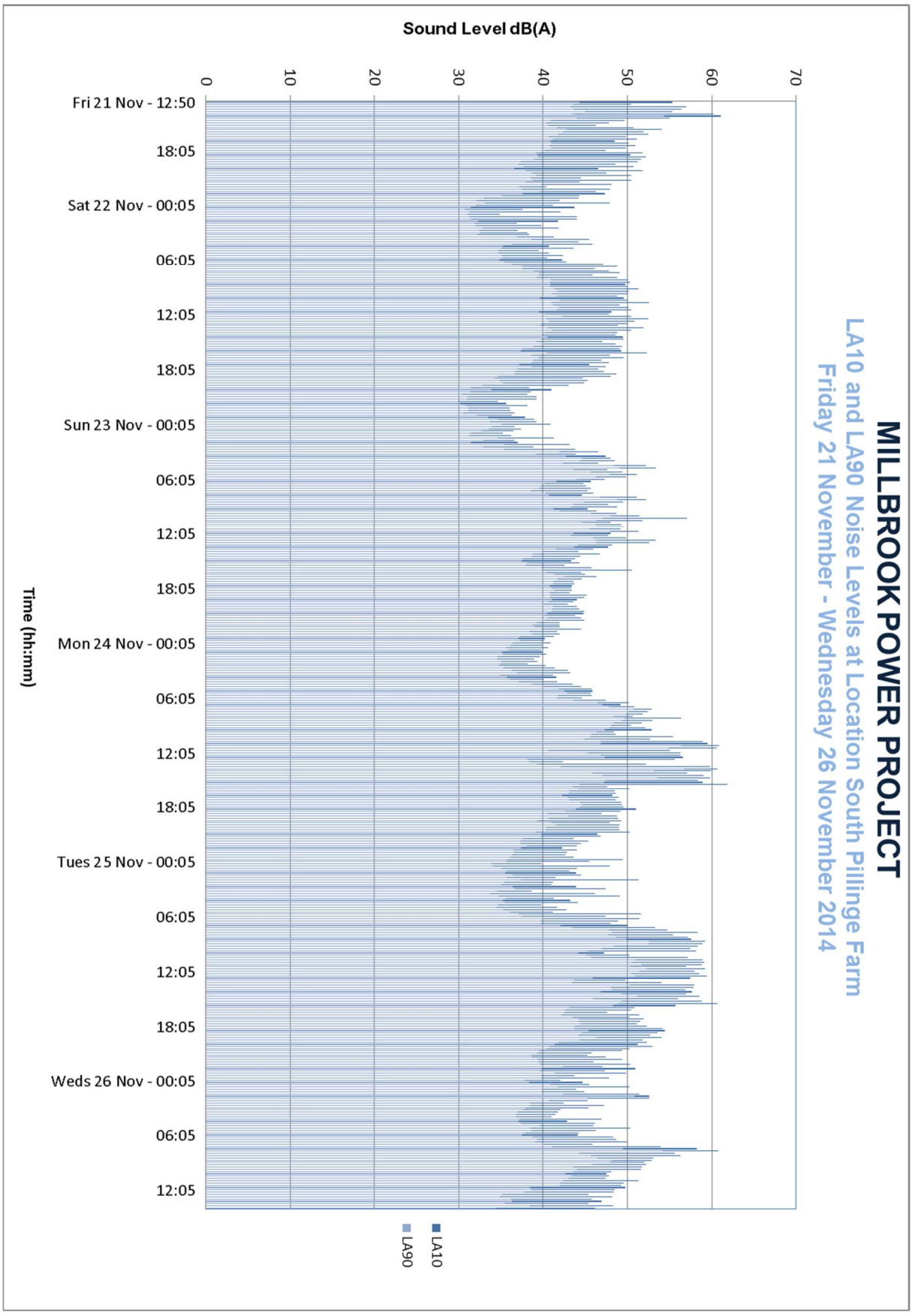
LAeq
LAmax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LA10 and LA90 Noise Levels at Location South Pillinge Farm
Friday 21 November - Wednesday 26 November 2014
Sound Level dB(A)
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Time (hh:mm)
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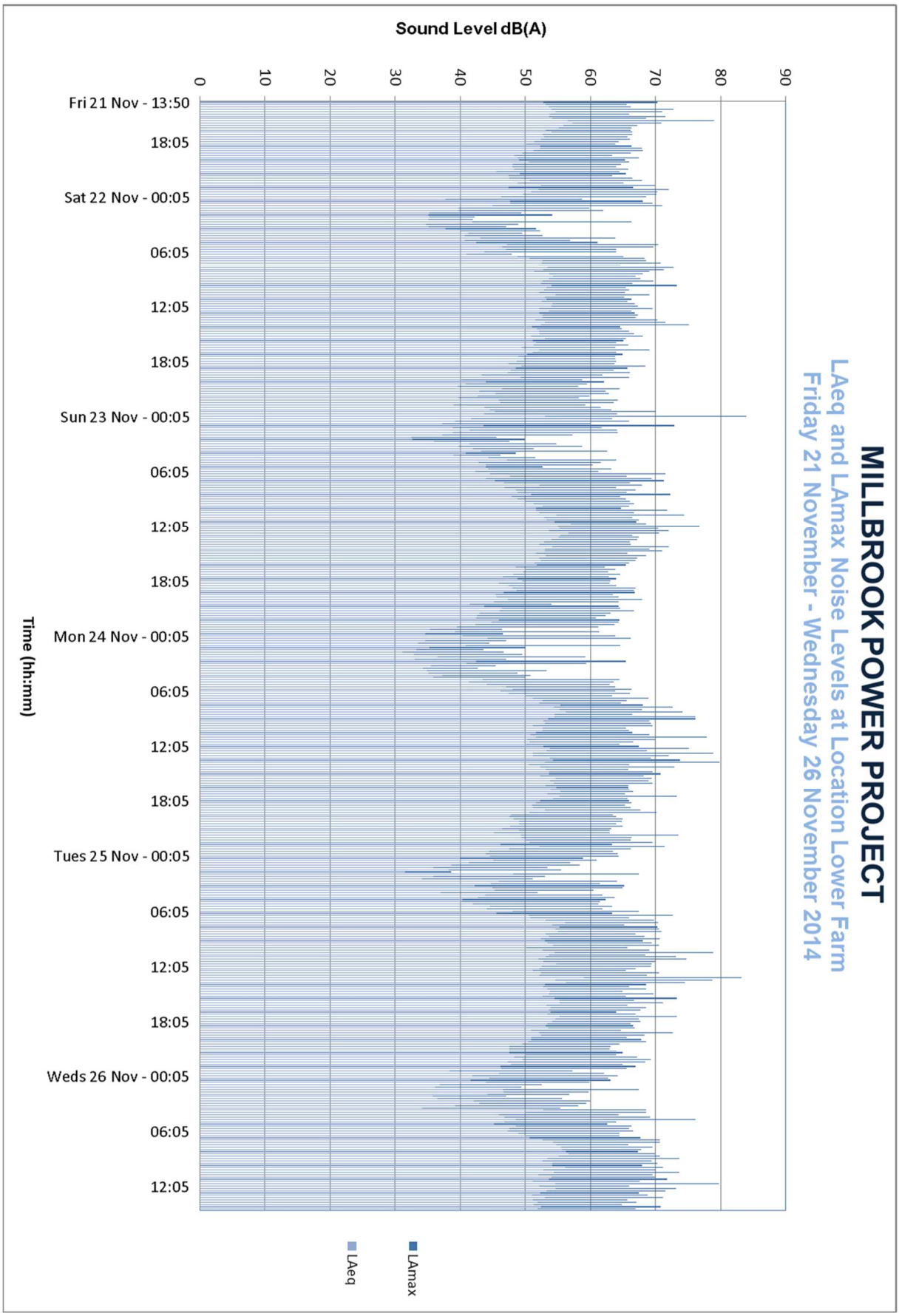
LA90
LA10


MILLBROOK POWER PROJECT
LAeq and LAmax Noise Levels at Location Lower Farm
Friday 21 November - Wednesday 26 November 2014
Sound Level dB(A)
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Time (hh:mm)
Fri 21 Nov - 13:50
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LAeq
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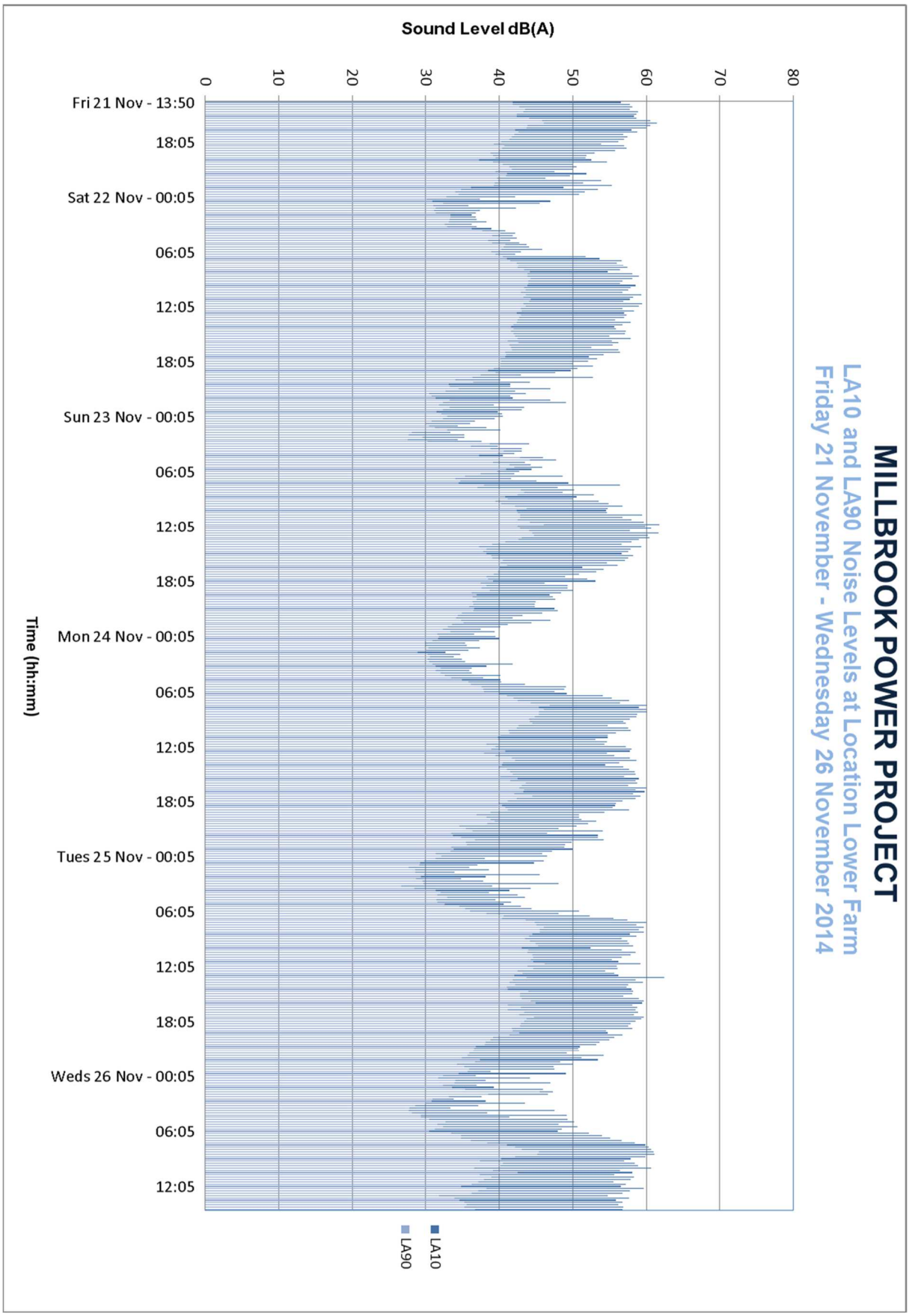
MILLBROOK POWER PROJECT
LA10 and LA90 Noise Levels at Location Lower Farm
Friday 21 November - Wednesday 26 November 2014
Sound Level dB(A)
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Time (hh:mm)
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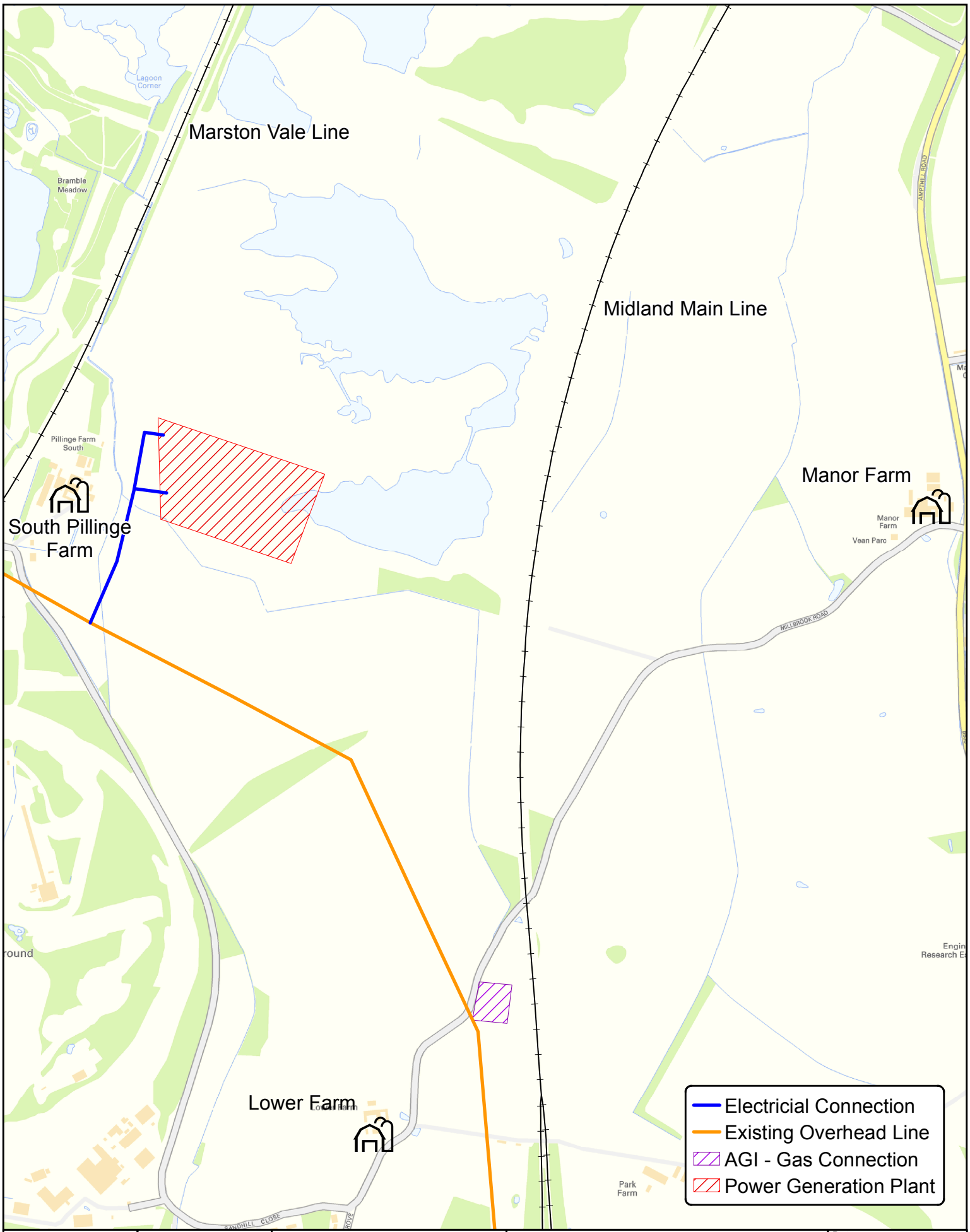
Appendix C Figures



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Site Location Plan

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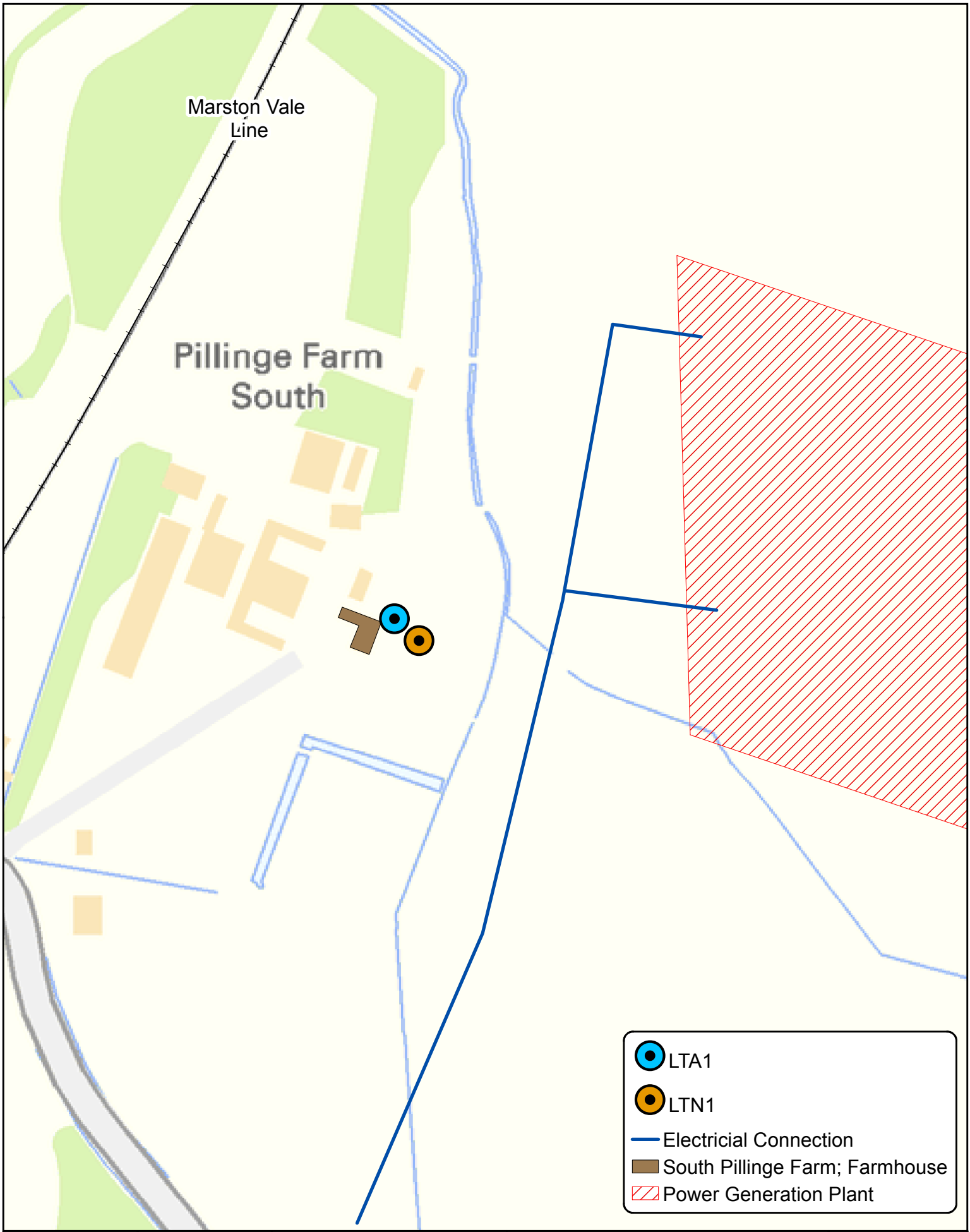
Checked By	RE
Revision Number	01
Figure Number	**Figure 1**



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South Pillinge Farm Survey Location

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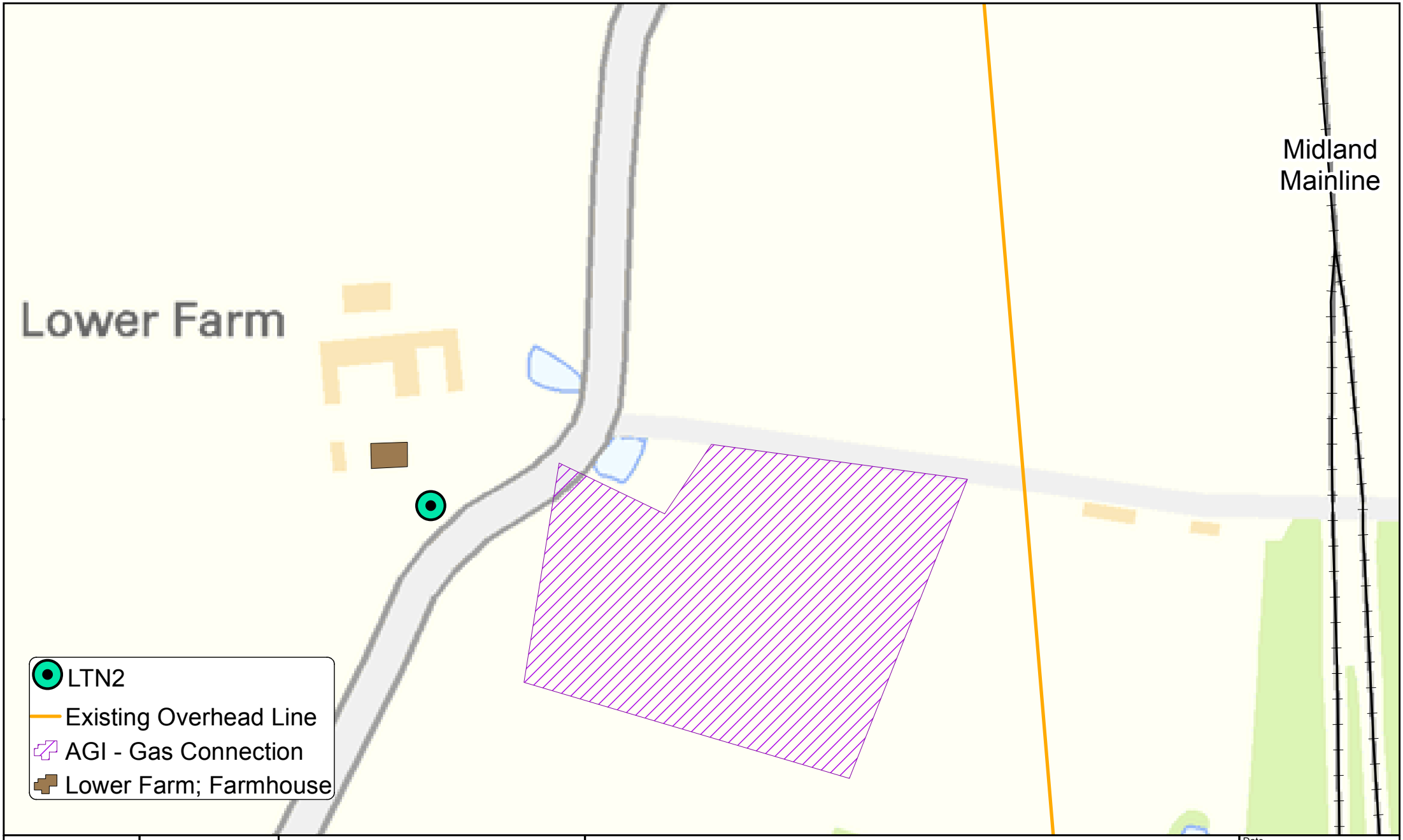
Figure Number	**Figure 2**



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Lower Farm Survey Location

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Figure Number	**Figure 3**