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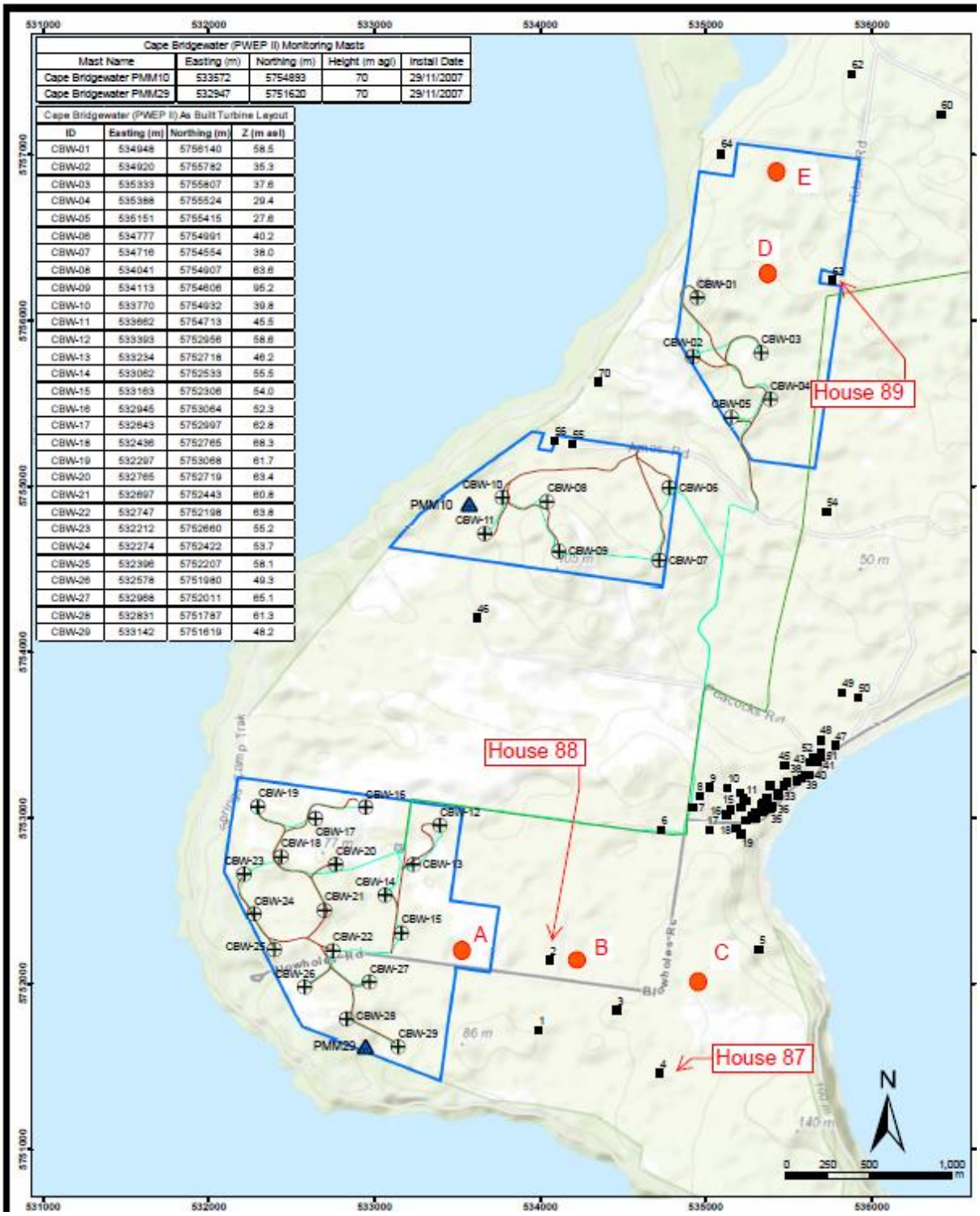
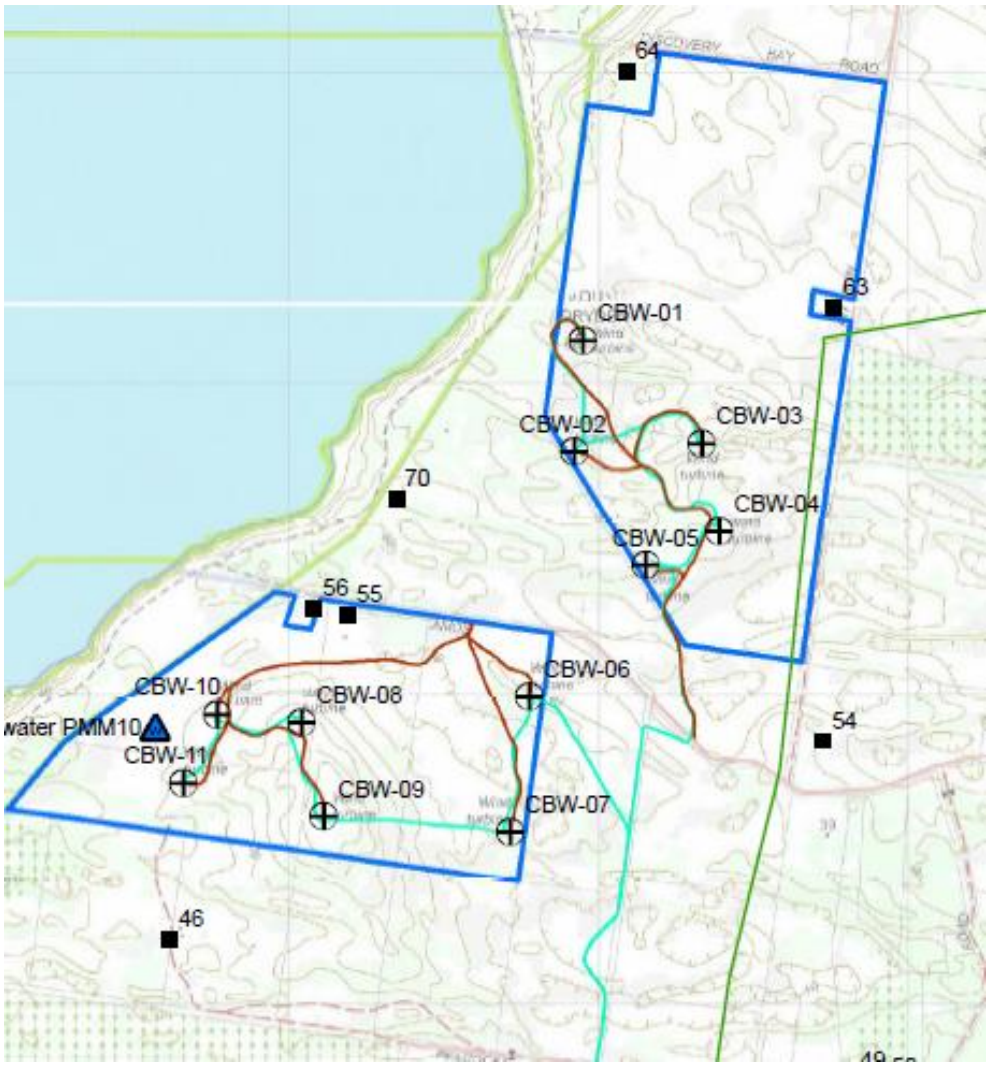
APPENDIX A: Cape Bridgewater Turbine Layout

Cape Bridgewater (PWEP II) Monitoring Masts				
Mast Name	Easting (m)	Northing (m)	Height (m agl)	Install Date
Cape Bridgewater PMM10	533572	5754893	70	29/11/2007
Cape Bridgewater PMM29	532947	5751620	70	29/11/2007

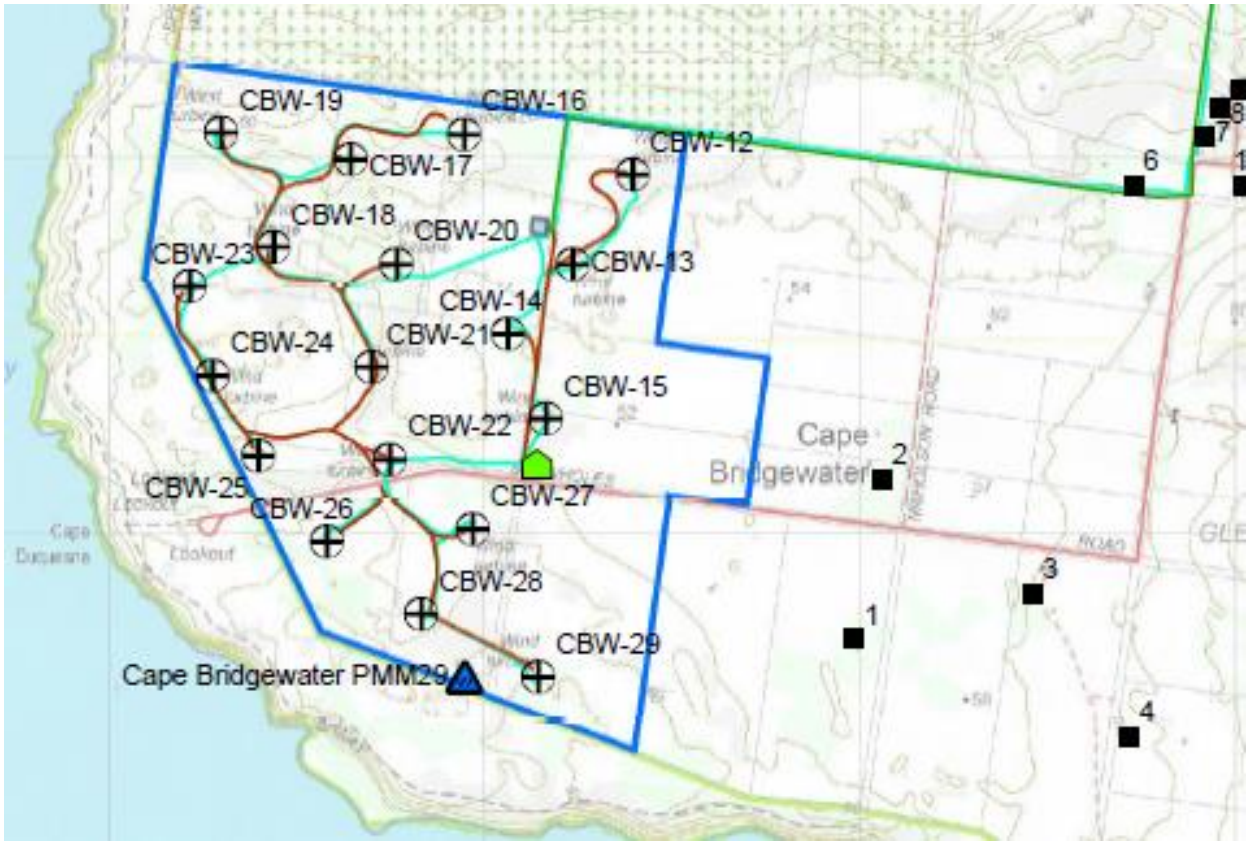
Cape Bridgewater (PWEP II) As Built Turbine Layout

ID	Easting (m)	Northing (m)	Z (m asl)
CBW-01	534948	5756140	58.5
CBW-02	534920	5755782	35.3
CBW-03	535333	5755807	37.8
CBW-04	535388	5755524	29.4
CBW-05	535151	5755415	27.8
CBW-06	534777	5754991	40.2
CBW-07	534716	5754654	38.0
CBW-08	534041	5754907	63.6
CBW-09	534113	5754606	95.2
CBW-10	533770	5754932	39.8
CBW-11	533662	5754713	45.5
CBW-12	533393	5752956	58.6
CBW-13	533234	5752718	46.2
CBW-14	533062	5752533	55.5
CBW-15	533163	5752306	54.0
CBW-16	532945	5753064	52.3
CBW-17	532843	5752997	62.8
CBW-18	532436	5752765	68.3
CBW-19	532297	5753068	61.7
CBW-20	532765	5752719	63.4
CBW-21	532697	5752443	60.8
CBW-22	532747	5752198	63.8
CBW-23	532212	5752660	55.2
CBW-24	532274	5752422	53.7
CBW-25	532396	5752207	58.1
CBW-26	532578	5751980	49.3
CBW-27	532958	5752011	65.1
CBW-28	532831	5751787	61.3
CBW-29	533142	5751619	48.2





Expanded view of northern section of wind farm



Expanded view of southern section of wind farm

APPENDIX B: Noise Conditions (Extract from Glenelg Planning Scheme May 2004)

NOISE

13. The operation of the wind energy facility must comply with the New Zealand Standard "Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators" (NZ 6808: 1998) the ("New Zealand Standard"), in relation to any dwelling existing or approved (by way of a planning permit or a building permit) at the date of approval of this document, to the satisfaction of the Minister for Planning.

Note: As a guide to acceptable limits consistent with the New Zealand Standard, the sound level from the wind energy facility, when measured outdoors within 10 metres of a dwelling at any relevant nominated wind speed, should not exceed the background level (L_{95}) by more than 5 dBA, or a level of 40 dBA L_{95}, whichever is the greater.

14. Condition 13 does not apply if an agreement has been reached with a specific landowner through which the landowner accepts predicted noise levels or otherwise agrees to implement appropriate acoustic attenuation measures to ensure a reasonable level of acoustic amenity in relation to the indoor habitable areas of any dwelling, and acknowledges that the operation of the wind energy facility may still generate noise in outdoor areas on the land which may from time to time exceed the New Zealand Standard.

15. Before the development of any wind generator, the noise level predictions for that generator must be modelled to demonstrate that the wind generator in its proposed location will comply with the requirements of Condition 13 and 14 (above).

16. A pre-construction monitoring program must be undertaken before the start of the development of the wind energy facility to the satisfaction of the Minister for Planning as follows:

    (a) measurements must be taken in accordance with the New Zealand Standard; and

    (b) the result of the pre-construction monitoring must be forwarded to the Minister for Planning.

17. An initial post construction noise monitoring program must be undertaken to the satisfaction of the Minister for Planning as follows:

    (a) post-construction monitoring must commence two months from the commissioning of the first generator and continue for a minimum of 12 months after the commissioning of the last generator;

    (b) measurement must be undertaken in accordance with the New Zealand Standard;

    (c) the results of the monitoring program of each calendar month must be forwarded to the Minister for Planning within 30 days of the end of that month; and

    (d) the Minister for Planning must make a copy of the monitoring program for each month available without delay at its office during office hours for any person to inspect free of charge.

18. Before the use commences, details of a noise complaint and evaluation process must be submitted to and approved by the Minister for Planning to address any breaches of Conditions 13 and 14 (above). This evaluation process should include, but not be limited to the following components:

    (a) a noise complaint telephone service;

    (b) details of validity requirements for noise complaints (that is date, time, noise description, and weather conditions receptor);

    (c) response protocol to valid noise complaints;

    (d) register of noise complaints, responses and rectifications which may be inspected by the Minister for Planning; and

    (e) provision for review

APPENDIX C: SA EPA Waterloo Noise Diary Format

Noise Diary Use *Note: any reference to noise means audible noise.*

The noise diary enclosed is for the purpose of developing a full and accurate recorded history and trend of noise from the wind farm. The noise diary records will be matched up with measured noise, therefore it is important that the diary is as accurate as possible.

You will note in the diary that there are factors to fill in for each noise event. These are: the date, time of the noise being noticed, time the noise was last detected, personal description of noise, noise strength, wind direction and strength and your comments. The level of detail, which will typically be required, is discussed below:

Noise Events: It is always difficult to exactly define when repeated noise events within the same day are part of the same event, or whether separate records are required. As a general rule, when the noise keeps occurring (ie is intermittently occurring over an extended period of time) and for the same wind conditions then this can be recorded as a single event with intermittent impacts. This avoids you having to make numerous diary entries for the same day.

However, you may experience a few different noise events throughout the same day where the noise was persistent (always present) for an hour or less and then disappeared for several hours before occurring again. These situations should be recorded as separate events.

Location: Because we need to quantify the extent of noise impact at your residential premises, we ask that you restrict your recorded observations to those experienced on your premises (inside or outside your home).

FILLING IN THE RECORD SHEET

Date & Time of Audible Noise Event: The date and time of day when the noise was first noticed and when it ceased must be recorded. If for example the noise was noticed first in the morning and it persisted for most of the day, then this can be recorded as a single event.

Continuity of Each Noise Event: It is important to consider whether or not the noise event was "continuous" or "intermittent" during the time period that you have recorded under the "time" column. Simply number the options that most resembles the specific noise event. The options to select from include:

- ♦ infrequently 1
- ♦ 50% of the time; or 2
- ♦ most of the time; or 3
- ♦ continuous; or 4

Character of Noise Character and Effects (if any) Experienced: You will need to distinguish between the various characters or type of noise that you experience. You could try to relate the noise to something commonly understood. If the noise is the same on each occasion, there is no need to describe the noise more than once.

Strength of Noise Event: This record relates to only the intensity or strength of the noise and should be rated as follows:

- ♦ faint or just detectable; or 1
- ♦ clearly audible; or 2
- ♦ annoying noise, preventing sleep; or 3
- ♦ very loud, interfering with lifestyle (cannot enjoy radio, television, conversation) 4

Wind Strength:

Please see indicator examples in brackets to help determine wind strength.

♦ still/calm	1
♦ light breeze (wind can be felt on face; leaves in trees rustle)	2
♦ medium breeze (leaves in constant motion)	3
♦ moderate wind (raises dust, loose paper will blow around)	4
♦ strong wind (large tree branches move, difficult to use umbrella)	5

Wind Direction:

Wind direction is always recorded as the direction the wind is coming **from**, i.e. direction you are looking in when the wind is directly on your face. General Wind Direction: e.g. blowing from the South West (SW), North (N), North East (NE).

Weather Conditions:

General weather conditions such as “overcast”; “rainy”; or “clear” conditions should be recorded in the comment column.

*Please **commence** the first diary on **Monday 8 April**. Record details on each diary for seven (7) days. At the end of each week post any ‘Noise Diary’ or ‘Notes’ pages that you have written on using one of the reply paid envelopes provided.*
*Record information in the noise diaries for eight (8) weeks, **finishing on Sunday 2 June**.*

For further information contact the EPA Waterloo windfarm community liaison person (Max Browne) by phoning 82042010 or emailing waterloowindfarm@epa.sa.gov.au .

APPENDIX D: Amended Cape Bridgewater Diary Instructions

Cape Bridgewater Wind Farm Noise Survey

(Pacific Hydro Pty Ltd and Cape Bridgewater Community Consultative Committee)

Residents in proximity to the Cape Bridgewater Wind Farm have lodged complaints with Pacific Hydro that the operation of the wind farm gives rise to noise and sleep disturbance that are not experienced when those residents are located at positions removed from the subject wind farm.

Pacific Hydro has identified that extensive acoustic monitoring external to residential receivers reveals compliance with the noise permit conditions that are expressed as an averaged A weighted noise level versus the hub height wind speed.

Pacific Hydro in conjunction with the Cape Bridgewater Community Consultation Committee have commenced noise monitoring at three residential dwellings where equipment is to be utilised to measure noise levels external to and inside the dwelling. Noise logging equipment records the A-weighted level and 1/3 octave bands.

The noise logging is to be conducted over an eight week period (subject to weather) that includes a two week period during which there may be potential shutdown or partial shutdown of the wind farm, as result of work being undertaken on the electrical cabling distribution system.

As part of the noise monitoring, the occupants have been requested to provide comments in a diary format as to any disturbance/perception that may be experienced during the monitoring program.

These diary comments are an essential component in an attempt to correlate the disturbances with respect to the operation of the wind farm in terms of general acoustic criteria, and/or any modification of such criteria that may arise from the monitoring results.

Separate to the overall noise logging and monitoring a more detailed acoustical analysis/instrumentation is to be used in the three houses to assist in identifying/qualifying the acoustic environment and the transmission loss of the building envelopes from outside to inside.

A daily journal concept was originally proposed to utilise the format prepared by the South Australian EPA with respect to the Waterloo wind farm study.

Prior to conducting the subject testing, initial use by residents of the SA EPA diary format found the diary notation to be confusing/difficult. This was particularly so with the description as to the occurrence of the noise, which in some respects becomes irrelevant if persons are not there all the time. The residents felt the SA EPA method would lead to some people abandoning the use of the diary.

A review and discussion of the preliminary noise diaries with the residents lead to a modified format to be used for the subject exercise.

In discussing the impacts from the wind farm perceived by residents it has been identified that for some residents there are three different types of impacts which now been nominated as occurring under a heading of “Noise”, “Vibration” and “Sensation”.

Providing a classification in the three groupings will overcome an issue in the SA EPA concept of only identifying in the noise diary matters relating to audible noise.

A review of the diary observations versus the noise measurements reveals **all** the residents (who have experienced wind farm “noise” over a number of years) were observing changes in the impact and not identifying the impact during the remainder of the time. The instructions for observations are to identify any changes in impact as well as providing observations of the impacts/perception on a regular basis (1 or 2 hourly if possible).

Noise monitoring diary

The diary filled in by the residents sets out the perception of disturbance and provides a record of all disturbance s perceived by the residents during the course of the noise monitoring.

As the diaries are to operate throughout the entire period it is noted that residents may not be present for the entire 24 hours and therefore the diary comments do not necessarily identify the entire impact that may occur during the survey period.

The intent of the diary is to provide a ranking of noise, vibration and sensation with respect to a simplified code that will then be correlated with the noise results and the analysis to determine if there are any repeatable patterns and/or disturbance relevant to the operation of the wind farm, prevailing weather conditions etc.

With the acknowledgement all the AECOM Wind Farm Noise Complaint Methodology (in NANR 277 Defra April 2011) the following severity rankings with respect to noise are set out below:

1. **No impact (No noise)**

2. **Slight impact (Non intrusive)** Noise can be heard, but does not cause any change in behaviour or attitude, e.g. turning up volume of television; speaking more loudly; closing windows. Can slightly effect character of the area but not such that there is a perceived change in the quality of life.

3. **Moderate Impact (Intrusive)** Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television: speaking more loudly; closing windows. Potential for non-awakening sleep disturbance. Affects the character of the area such as there is a perceived change in the quality of life.

4. **Substantial Impact (Disruptive)** Causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty getting back to sleep. Quality of life diminished due to change in character of the area.

5. **Severe Impact (Physically Harmful)** Significant changes in behaviour and/or inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening: loss of appetite, significant, medically definable harm, e.g. noise induced hearing loss.

NB In some case residents relate severity 5 to be equivalent to having to leave their premises and go somewhere else because of the noise.

In utilising the same ranking methodology for vibration one would substitute the word "noise" with "vibration", e.g. for slight impact " the vibration can be felt, but does not cause any change in behavioural attitude…"

Similarly in relation to sensation in the ranking table "noise" is substituted with sensation, e.g. for 1 slight impact (Non intrusive) "Sensation can be felt, but does not cause any change in behavioural attitude….

In dealing with sensation (as reported by residents) there is a wider range of effects than that associated with the general concept of noise.

Residents subject to operational wind farms have identified a range of sensations that can vary from individuals to individuals. Residents have in some cases attributed "sensation" to "noise" complaints where the sensations as felt by residents can include such things as:

- Headache
- Pulsating pressure in the head
- Pressure in the ears
- Ringing in the ears
- Drowsiness (or heaviness)
- Pressure in the chest
- Effect like heart racing

The critical component (noise assessment wise) for the diary entries involves the date, the time and the severity classification for noise, vibration and sensitivity with column for comments that may be an explanation for any of the three parameters being diarised. The residents have been requested where possible to provide diary entries on a continuous basis (on a 1 hour or 2 hourly basis) and not just on changes in impacts.

Additional comments provided as to weather, wind strength and direction and operation of the wind farm together with any supplementary comments such as the

resident's BP and pulse or any other observations that may be associated with the reporting may be of assistance with the study
Adopting the SA EPA classification for wind does not appear to be an issue:

1. still/calm
2. light breeze (wind can be felt on face, leaves in trees rustle)
3. medium breeze (leaves in constant motion)
4. moderate wind (raises dust, loose paper will blow around
5. strong wind (large tree branches move, difficult to use umbrella)

The attached handwritten sketch indicates the suggested format/columns in the diary. The first few columns are in relation to the severity and the comments on the left-hand page. The additional comments in relation to the weather turbines etc. are to be on the right-hand page

As the diary comments are to be electronically scanned and forwarded for correlation it is essential that the bottom of each page has a notation as to the page number and should include a reference letter/number allocated for the house for the purpose of a correlation of data but not in identifying the actual house.

APPENDIX E: Instrumentation Used

Instrumentation used for the purpose of obtaining general sound level measurements utilised Svan 957 and Svan 979 sound level meters.

For the pre-house testing Svan 957 sound level meters were used for locations A, C and D, with Svan 979 loggers used for at locations B and E.

The SVAN 957 sound level meters utilise ACO 7052H microphones supplied with the meter.

The SVAN 979 sound level meters were equipped with GRAS 40AZ microphones (not the standard microphone supplied with the meter) that are pre polarised microphones specified as having a flat response ± 1 dB down to 1 Hz.

The microphones for the SVAN 957 loggers and one SVAN 979 logger were for the pre-house testing installed in a Better Loggers outdoor microphone system that has the microphones positioned in a vertical orientation with a rain shield over the microphone and a double insulated 50 mm windscreen in an external wire cage. The 979 meter at location B utilised a SVAN SA203 outdoor microphone kit.

The loggers for the monitoring at houses used a combination of SVAN 957s and 979s.

For the external microphone locations at the houses the microphone was protected by an ACO 7 inch windscreen. The microphone was mounted in a rubber mount to a fixed arm to the support structure installed over a star post in the ground where the microphone was located at a height of 1.5 m above the ground. On top of the metal frame and enclosing the entire microphone installation was a cylindrical birdcage (400 mm x 800 mm) which was covered in a “fuzzy” cloth to provide a secondary windscreen.

For the internal loggers the microphone was located at 1.5 m above the floor level in a vertical orientation with 50 mm diameter rubber sponge windscreen.

With the exception of a SVAN 957 logger located in the living room of house 87 for the first week (which was then used to replace the external logger at house 88) the following logger installations were utilised for the entire monitoring period:

- House 87 external logger SVAN 979 (serial number 35808) with GRAS 40 AZ microphone
- House 87 master bedroom logger SVAN 979 (serial number 27184) with GRAS 40 AZ microphone
- House 88 living room (for 6 days) SVAN 957 (serial number 15364) with ACO microphone type 7052.
- House 88 external location SVAN 957 (serial number 21450) with microphone ACO 7052 for 4 days and replaced by SVAN 957 (serial number 15364) with ACO microphone type 7052
- House 88 internal location in master bedroom SVAN 979 (serial number 27164) with GRAS 40 AZ microphone
- House 89 external location SVAN 957 (serial number 23806) with ACO microphone type 7052
- House 89 internal bedroom SVAN 979 (serial number 35804) with GRAS 40 AZ microphone.

In addition to the standard noise logging units a separate multi-channel system was used to provide additional measurement data for post-processing looking at a finer resolution in the frequency domain.

The multi-channel system that was utilised at the houses for the attended measurements commenced at house 87 for three days, then to house 88 for two nights, then house 89 for two nights and then back to house 87 for the remainder of the monitoring period. The multi-channel system was based upon a Bruel & Kjaer Pulse 18 channel system (Type 3560D) to record both noise and vibration. The Pulse unit utilised a Brüel & Kjær Data Recorder Program Type 7708 to a dedicated computer, to record the PTI files in 10 minute intervals throughout the monitoring period.

Internal microphones in the bedroom and living areas of the houses for the multi-channel system used a combination of microphones including:

- Bruel and Kjaer Type 4147
- Bruel and Kjaer Type 4193 (without UC2011 adapter)
- Bruel and Kjaer Type 4165
- Bruel and Kjaer Type 4145
- Bruel and Kjaer Type 4179
- Gras Type 40AN

All the above microphones are 200 V polarity microphones and cannot be used in the external environment in view of potential issues of condensation in such a location.

The use of the multi-channel system for the attended measurements at houses involved two GRAS 40AZ pre-polarised microphones external to the dwelling where one microphone was set at the height of 1.5 m above ground and the other one located on a 1200mm diameter plywood board on the ground to operate as a ground plane.

Vibration accelerometers in a triaxial arrangement were used for determining vibration on the floor of the dwellings using Bruel & Kjaer DC Response Accelerometers Type 4373 and 4375 and Bruel & Kjaer Accelerometers Type 8306.

A second Pulse system using a LAN VXI Pulse Type 3050 unit or a Pulse Type 3560C onto a portable computer was used to ascertain individual components by monitoring directly using the Pulse software or the Data Recorder software. The LAN XI Pulse system utilised either GRAS 40AZ microphones, DC accelerometers Type 4373 or 4375 or Delta Shear Accelerometers Type 4370/4381.

Consistent with requirement for such monitoring the reference calibration of each channel was checked with either a Bruel & Kjaer Sound Level Calibrator Types 4320/4321 or a Bruel & Kjaer Vibration Calibrator Type 4294 prior to and after various measurement scenarios.

For noise and vibration monitoring conducted on the wind farm and at locations external to the wind farm, for the purpose of ascertaining ambient noise and vibration levels, such monitoring utilised the Bruel & Kjaer LAN XI Pulse unit with various combinations of microphones, the aforementioned DC response accelerometers and also conventional Bruel & Kjaer accelerometers Types 4370 and 4371.

At each of the houses there was a Rainwise wind data logger set to record the wind at a position approximately 5 m from the logger microphone and a height of 2 m above ground. For the external ambient monitoring locations where noise was being recorded a Rainwise wind data logger was used to identify the wind at the microphone height.

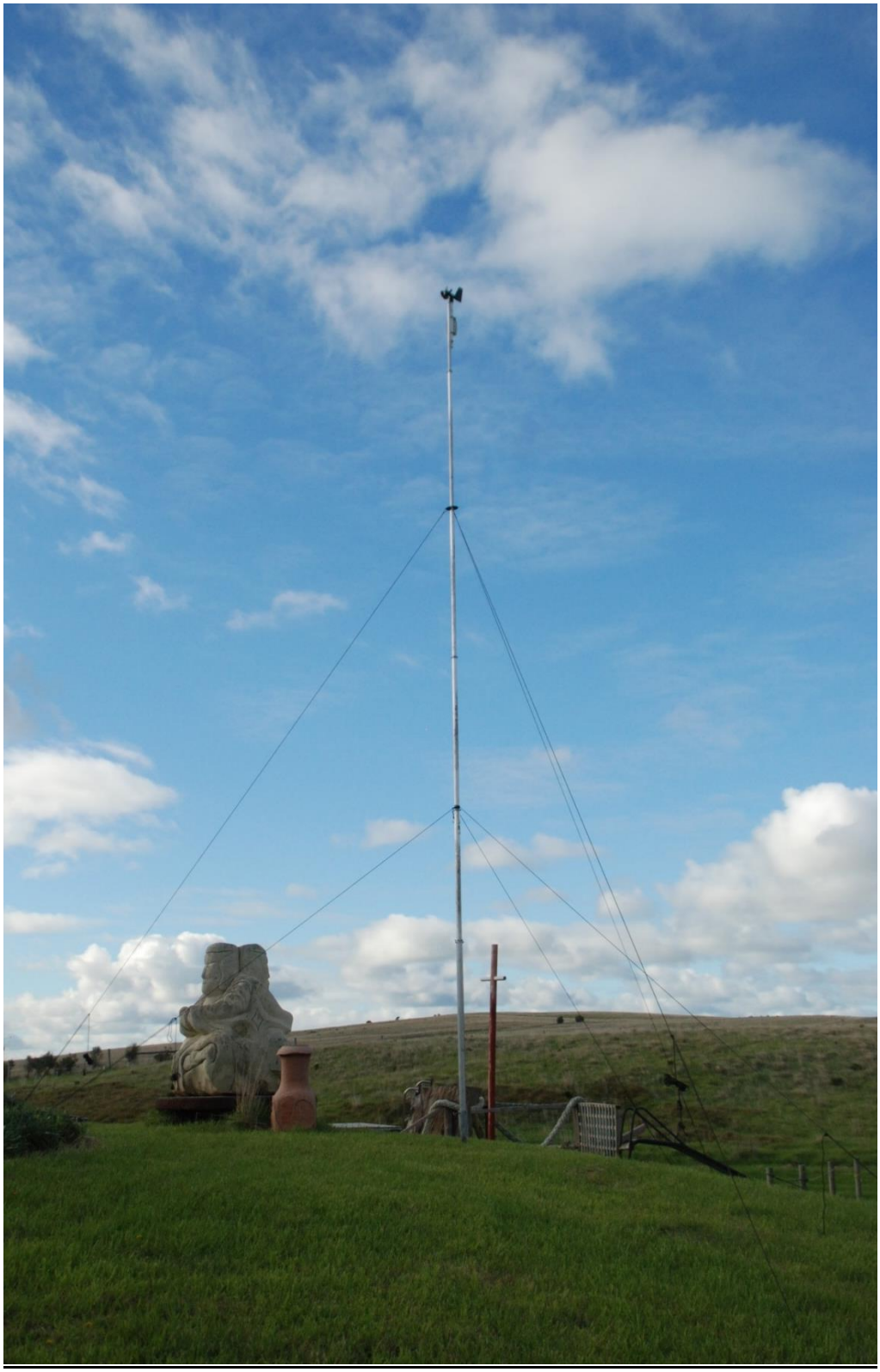
At house 88 a Rainwise wind logger was positioned on a weather mast having the anemometer at a height of 10 m above the ground level surrounding house 88. That wind logger remained in operation for the entire survey period and recorded a maximum wind speed on one occasion of 127 km/h.

In the living room of house 88 an Infiltec infrasound pressure detector was set up to record on a continuous basis on a Toughbook CF28 laptop for the purpose of identifying infrasound below 20 Hz.

However during the course of the monitoring, fluctuations in the mains power and surges caused at times the Infiltec program to cease operating, thereby providing limited data although it is noted that the micro-barometer system was not originally intended to be part of the survey but was added as part of the investigation.

APPENDIX F: Monitoring Installations

External monitoring at house 87

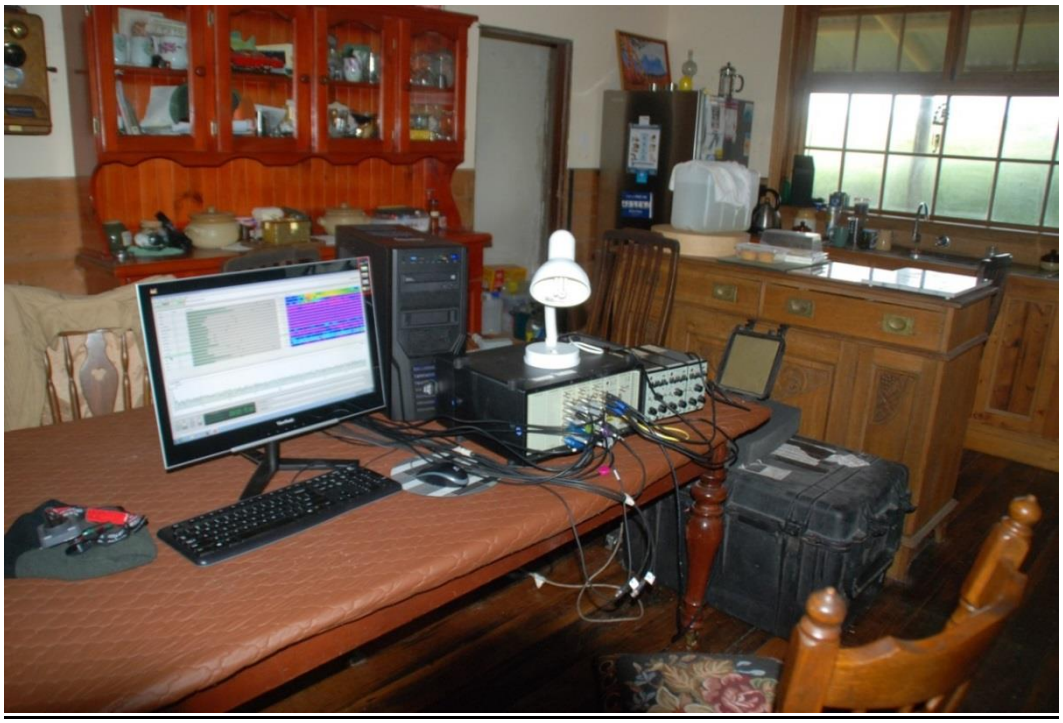


Weather mast at house 87

Living Room – house 87

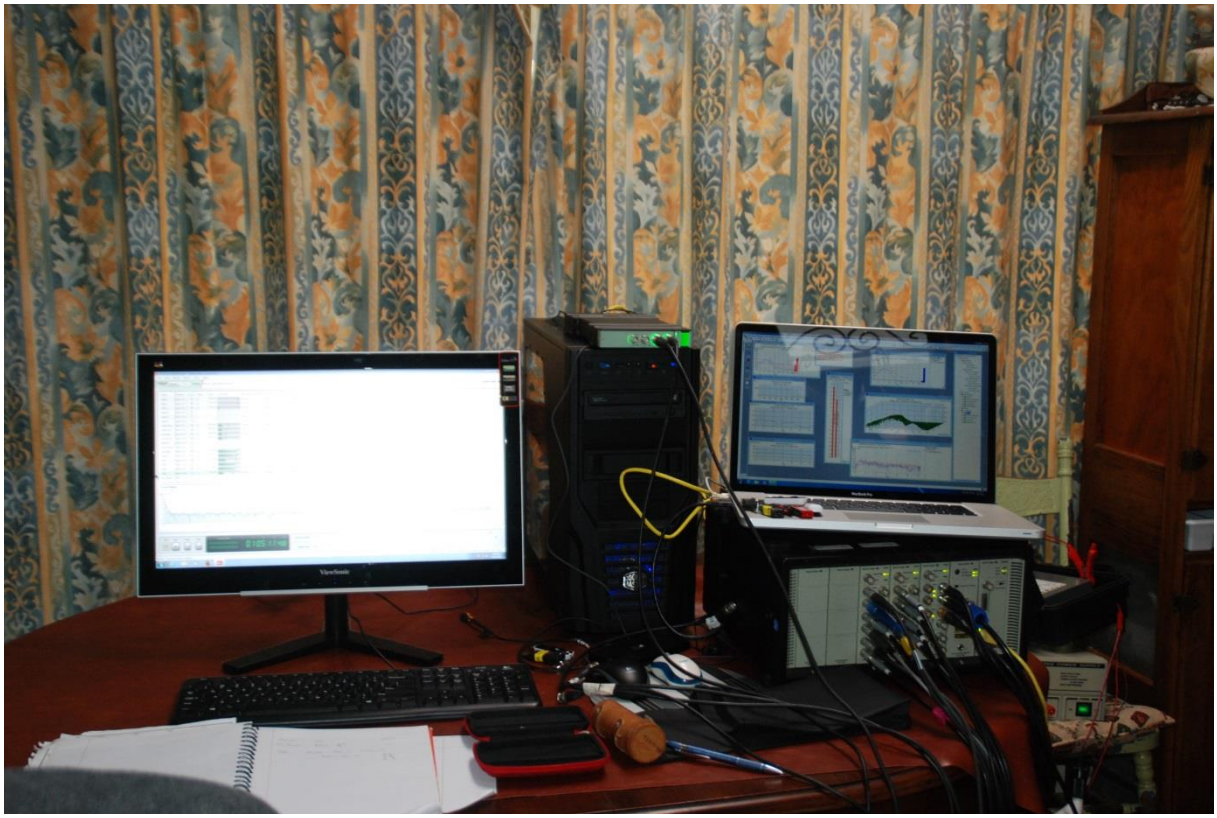
Living Room house 87

Attended instrumentation setup house 87



Unattended instrumentation setup house 87

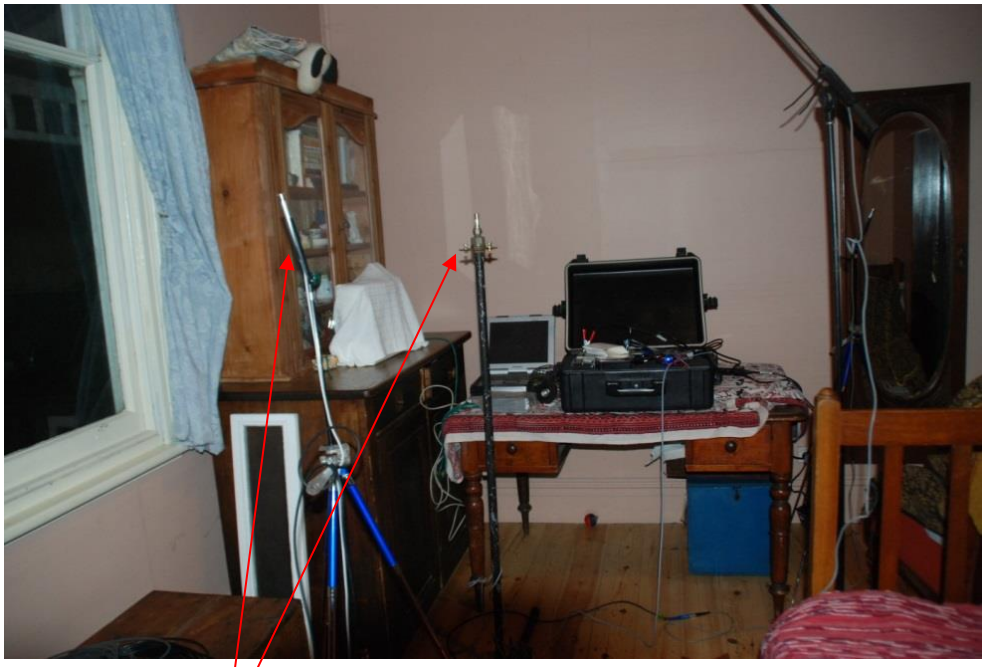
External monitoring house 88



Internal attended monitoring – house 88

External monitoring house 89

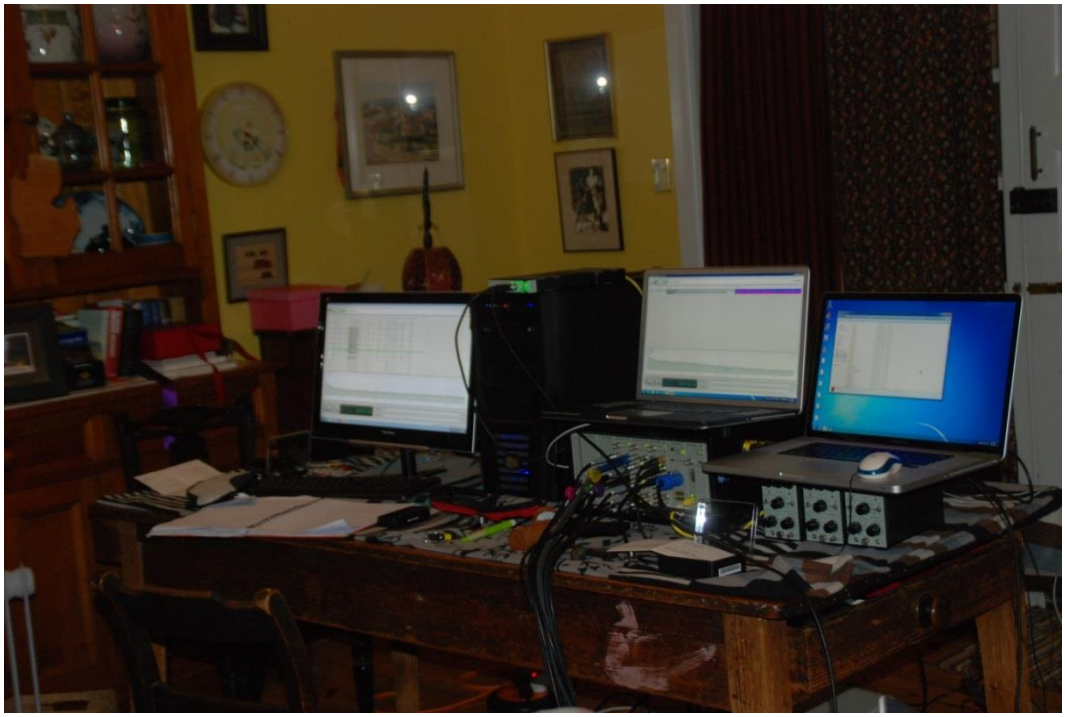
View of external monitoring back to house 89



Microphones

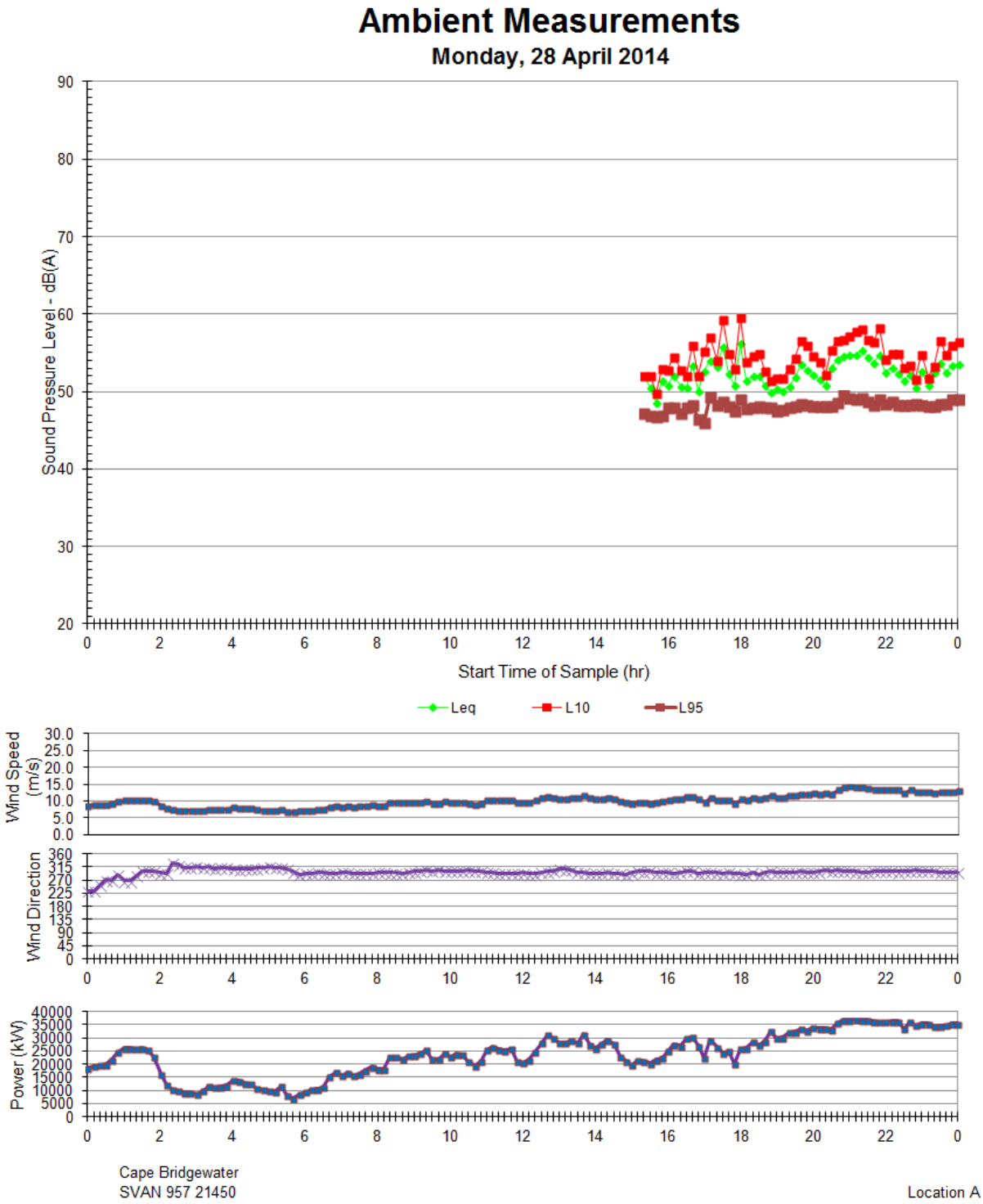
Attended Monitoring Bedroom house 89

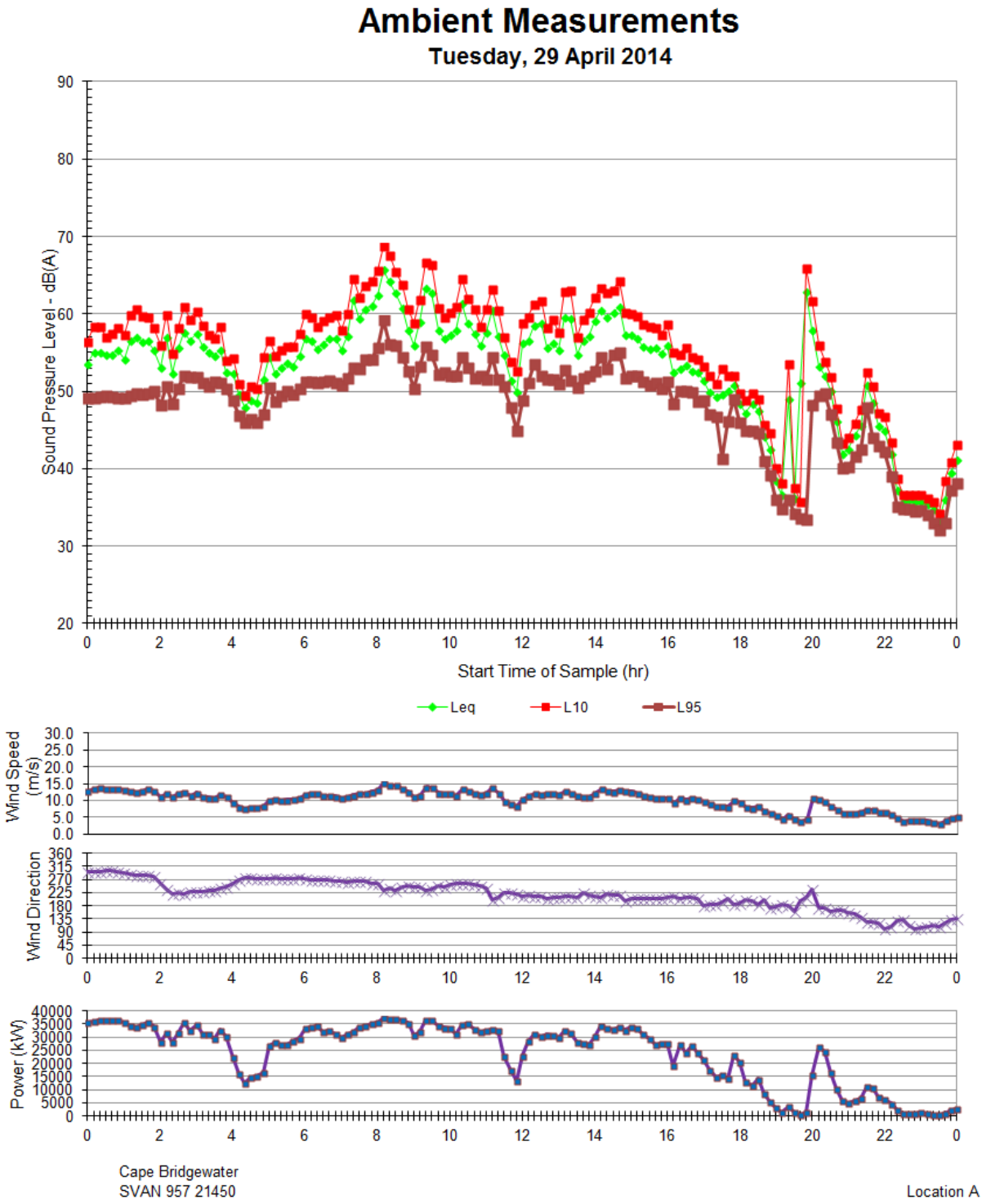
Unattended logger monitoring in spare bedroom - house 89

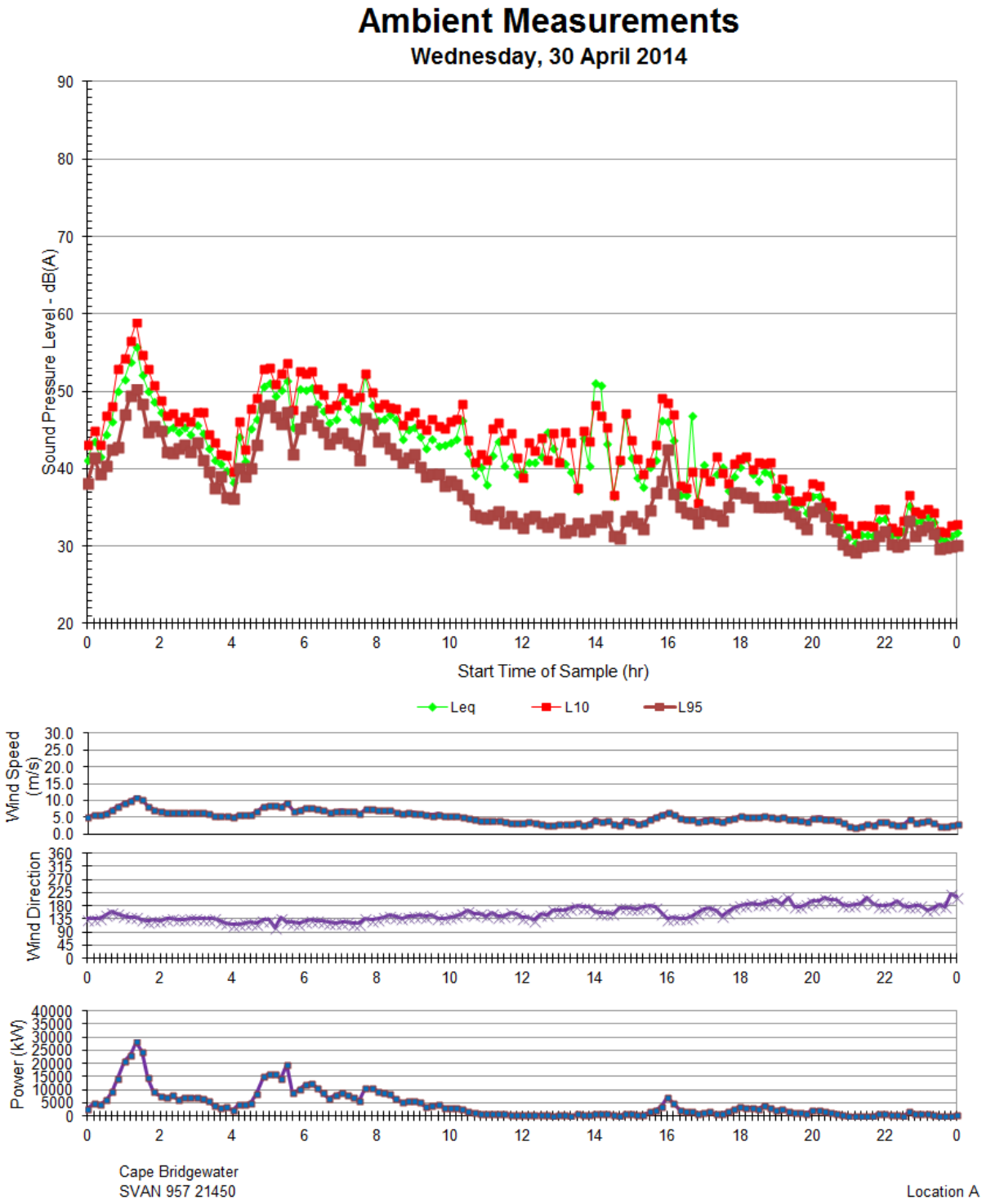


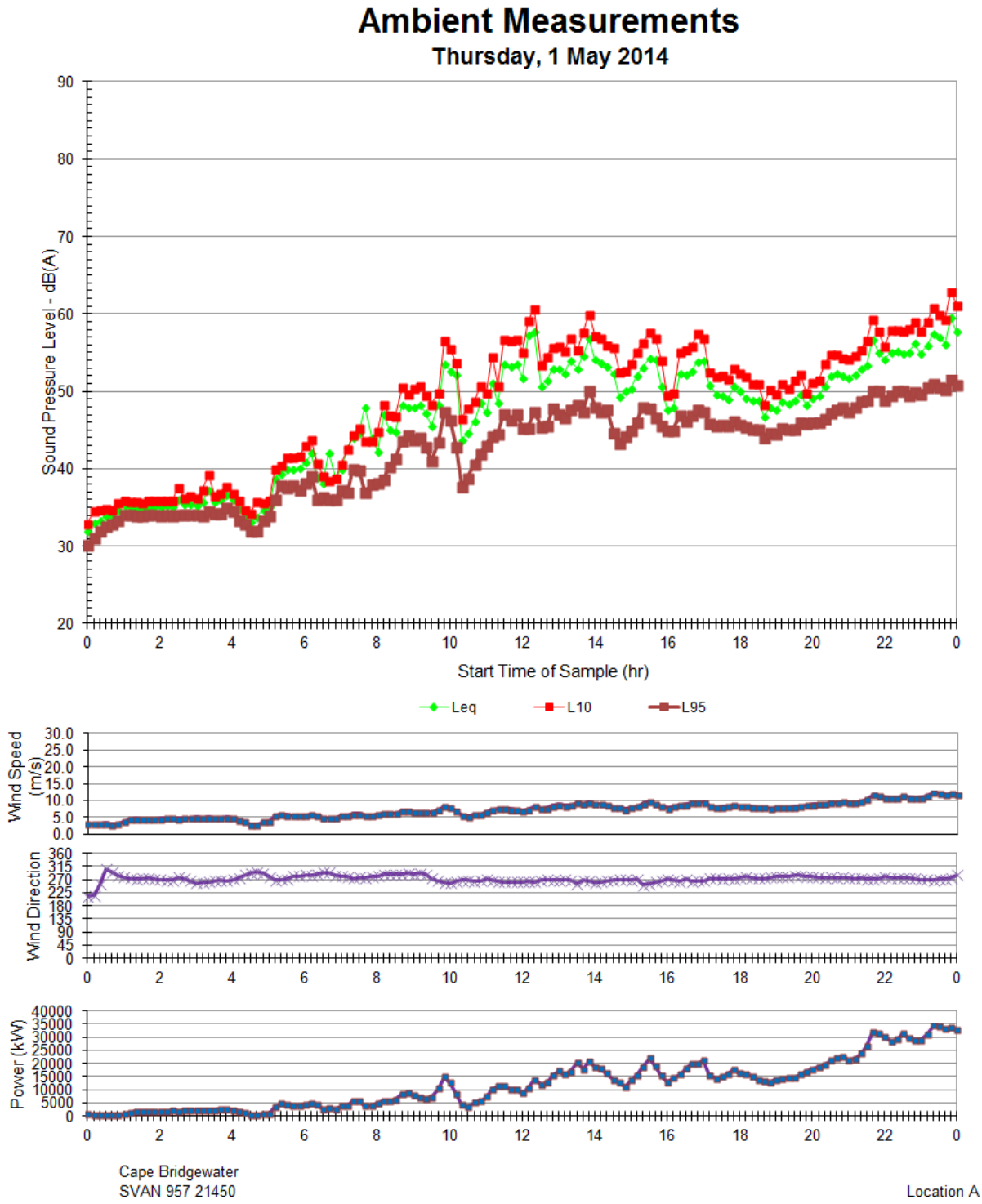
Attended monitoring setup in house 89

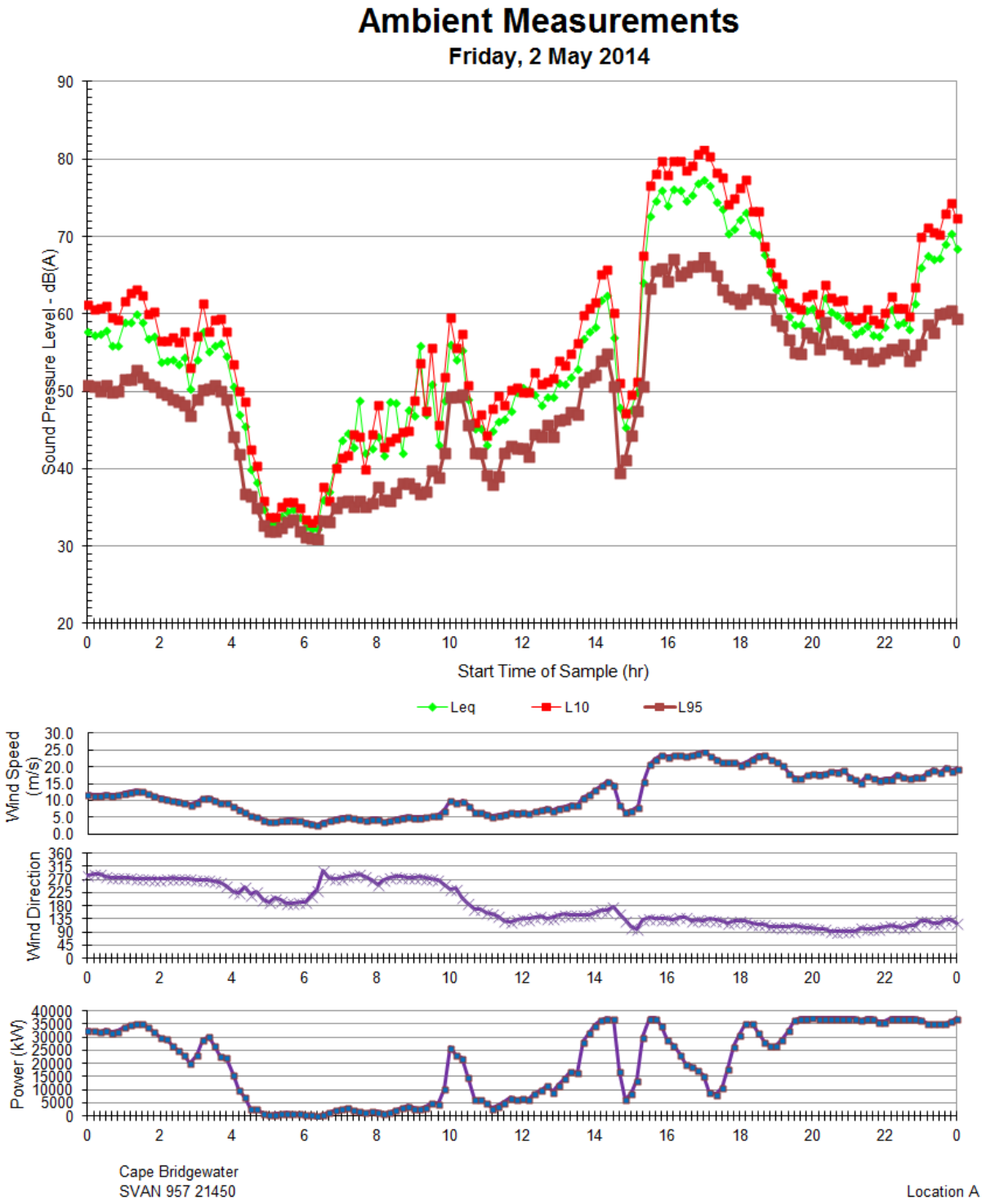
APPENDIX G: Pre-test Results

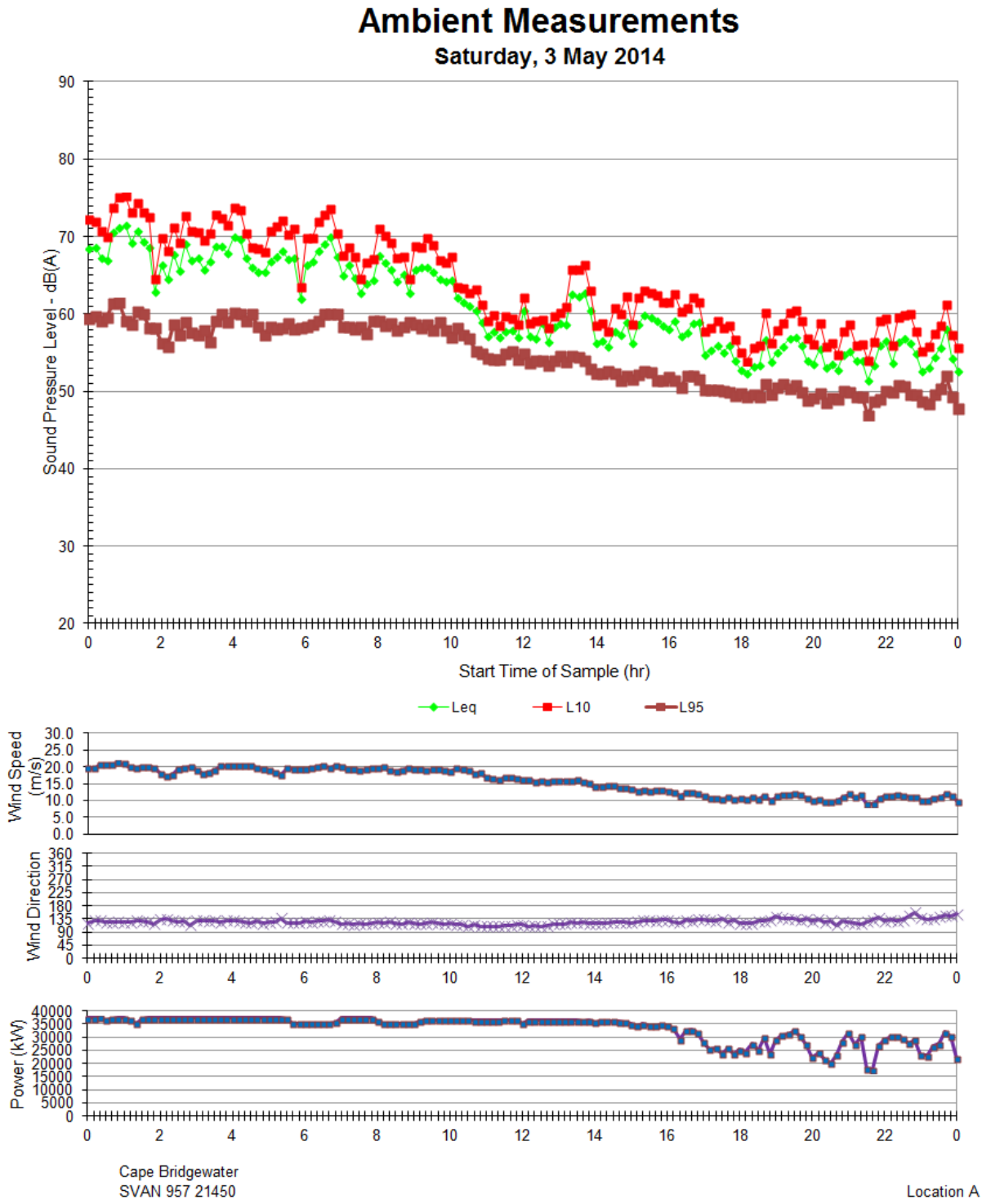


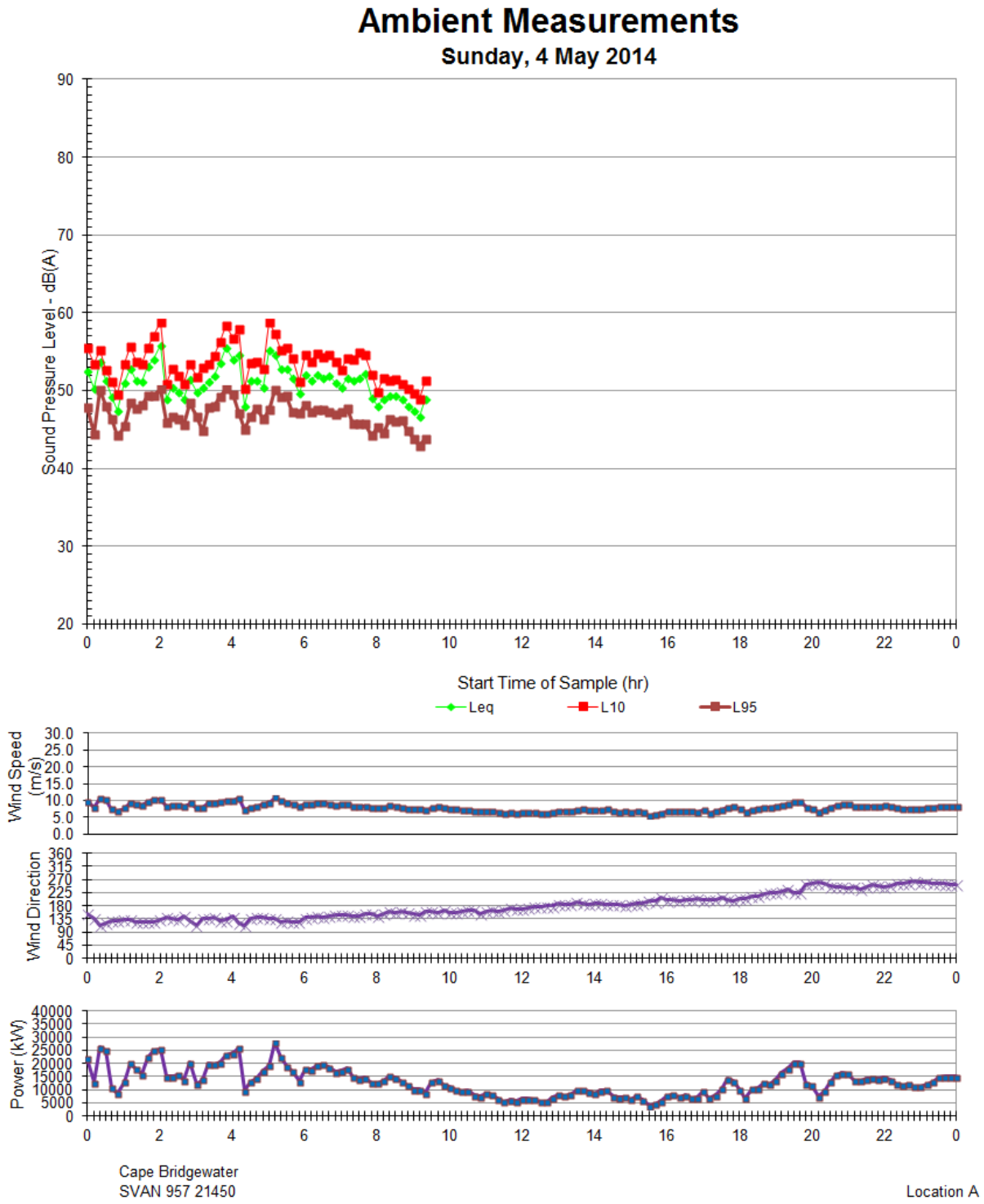

Ambient Measurements
Tuesday, 29 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 21450
Location A

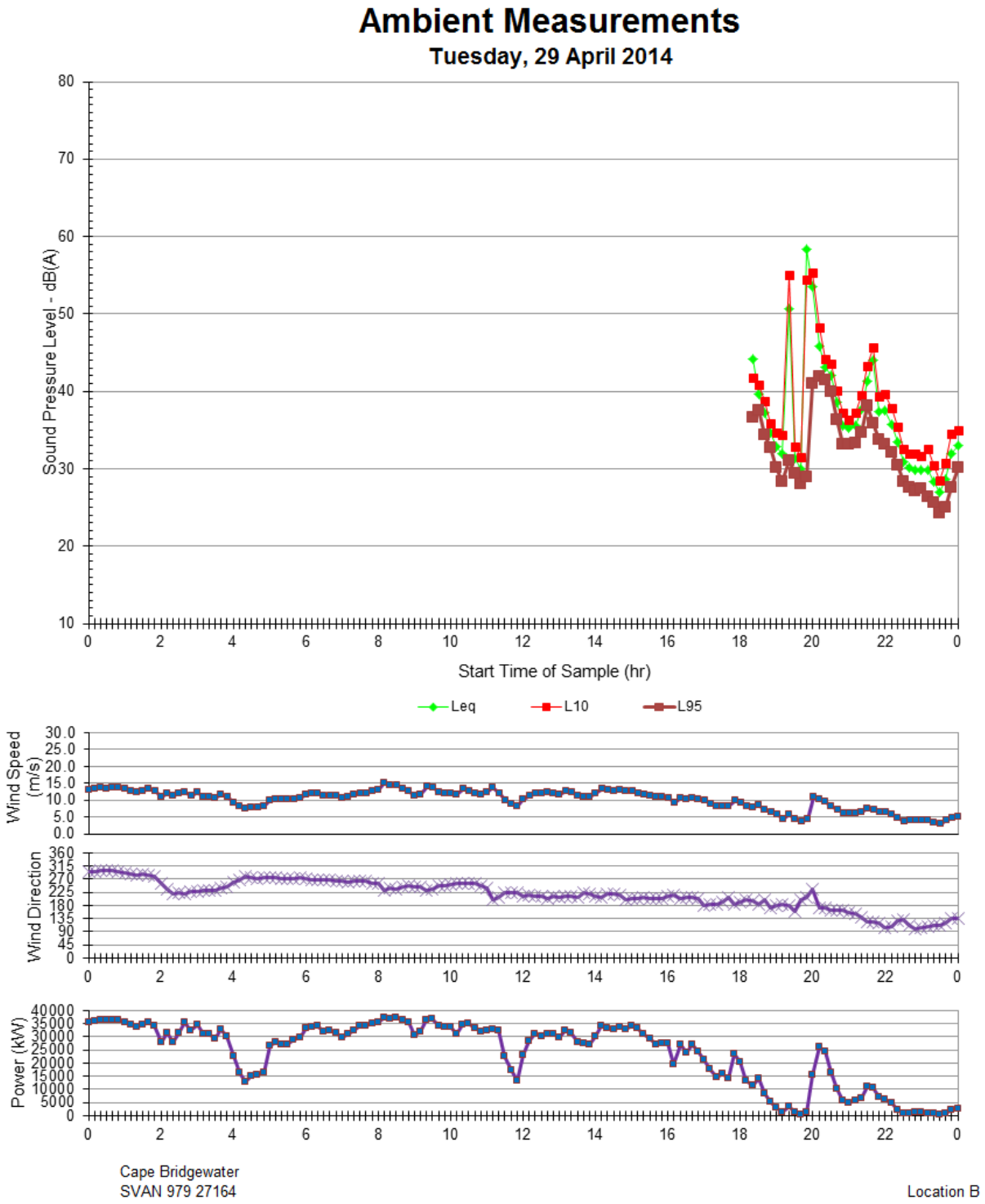

Ambient Measurements
Wednesday, 30 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 21450
Location A

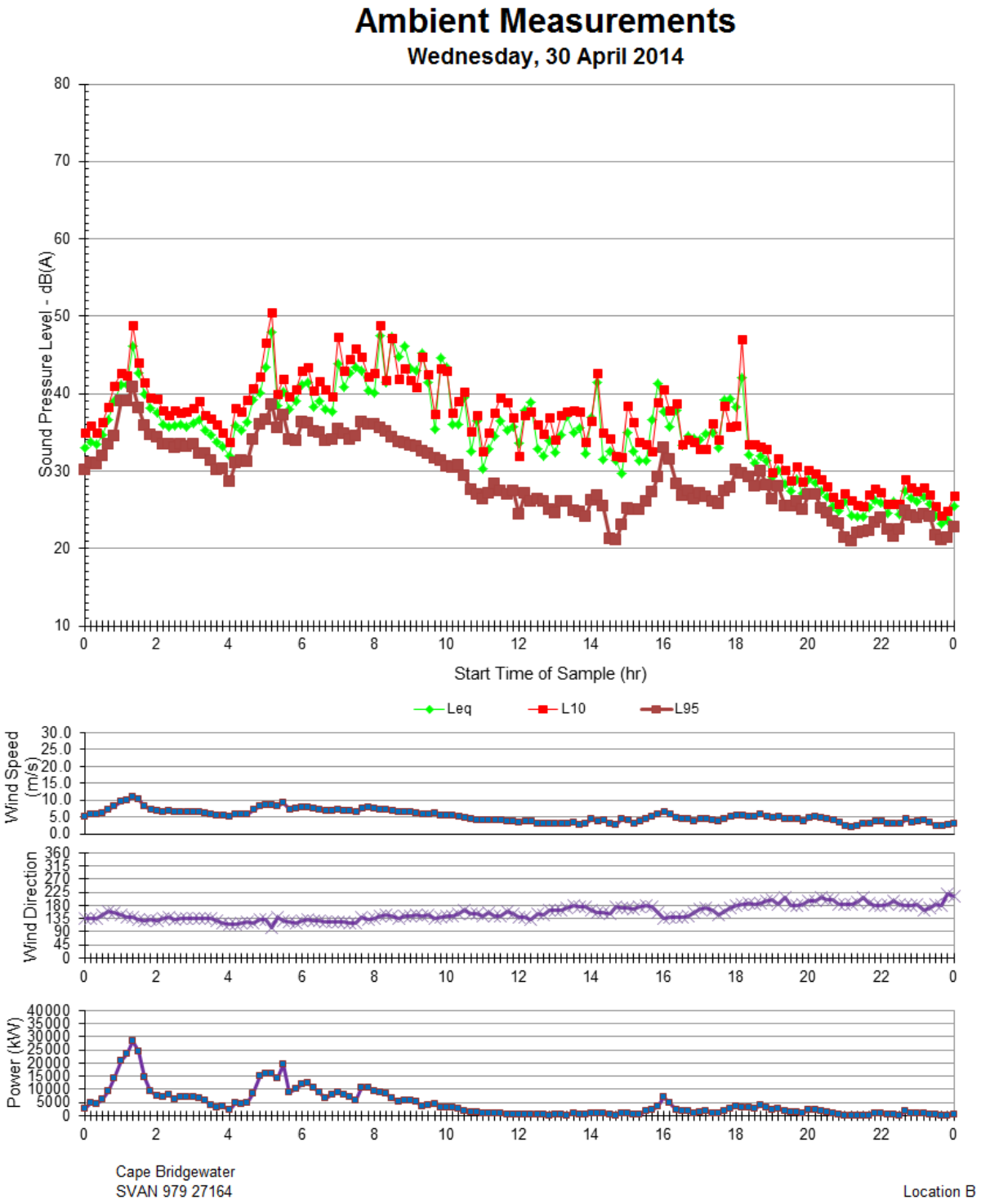

Ambient Measurements
Thursday, 1 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 21450
Location A

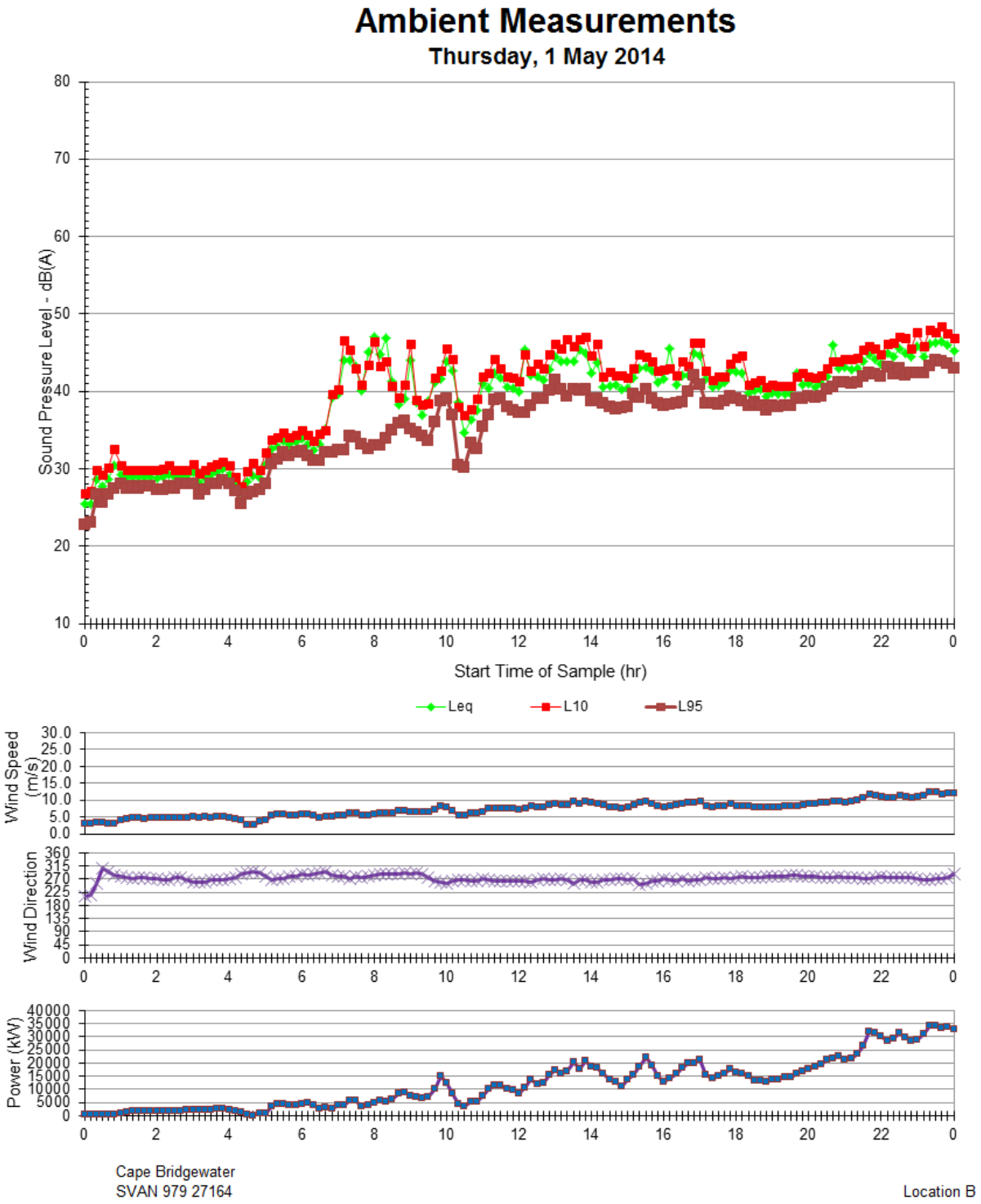

Ambient Measurements
Friday, 2 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 21450
Location A

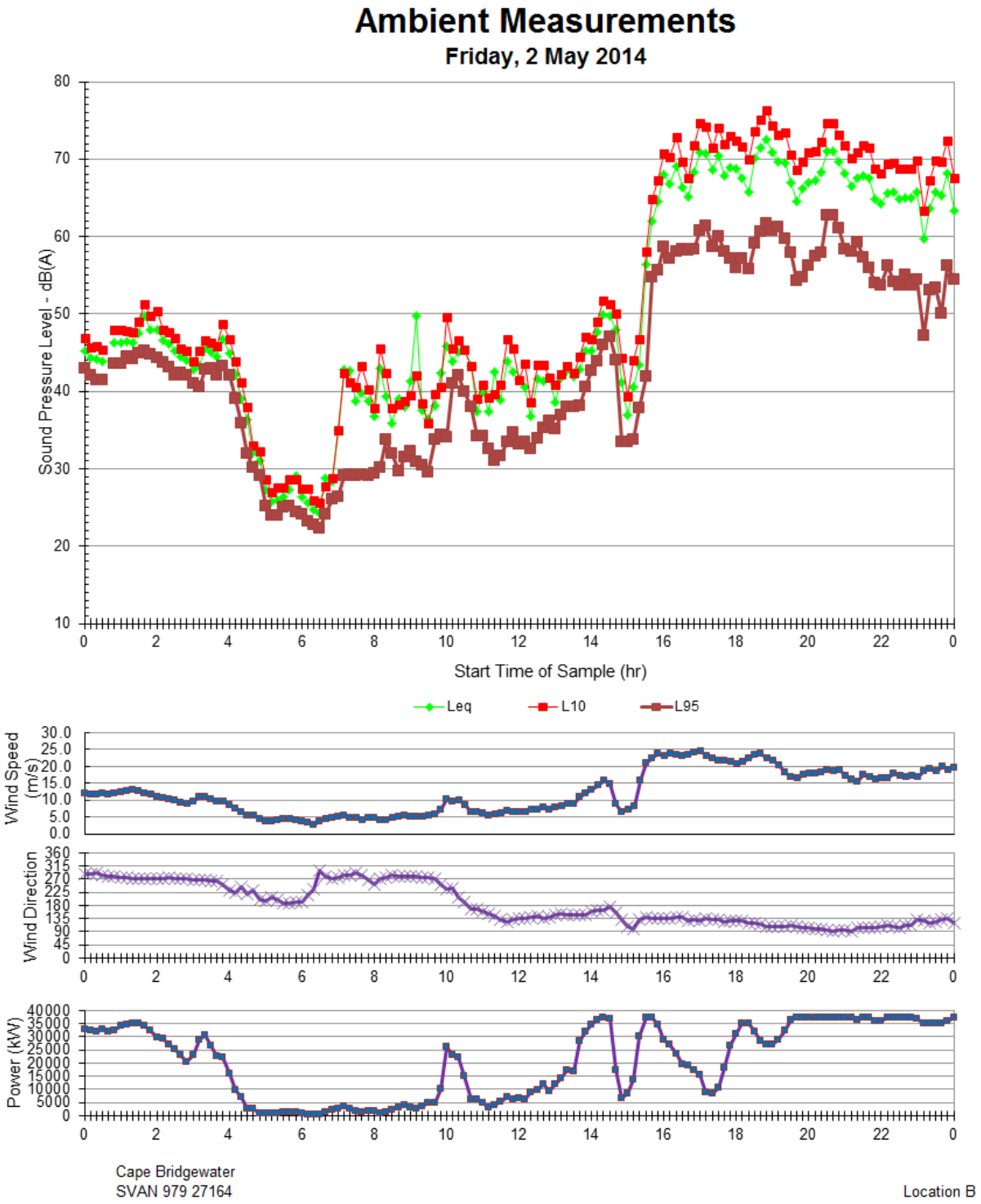

Ambient Measurements
Saturday, 3 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 21450
Location A

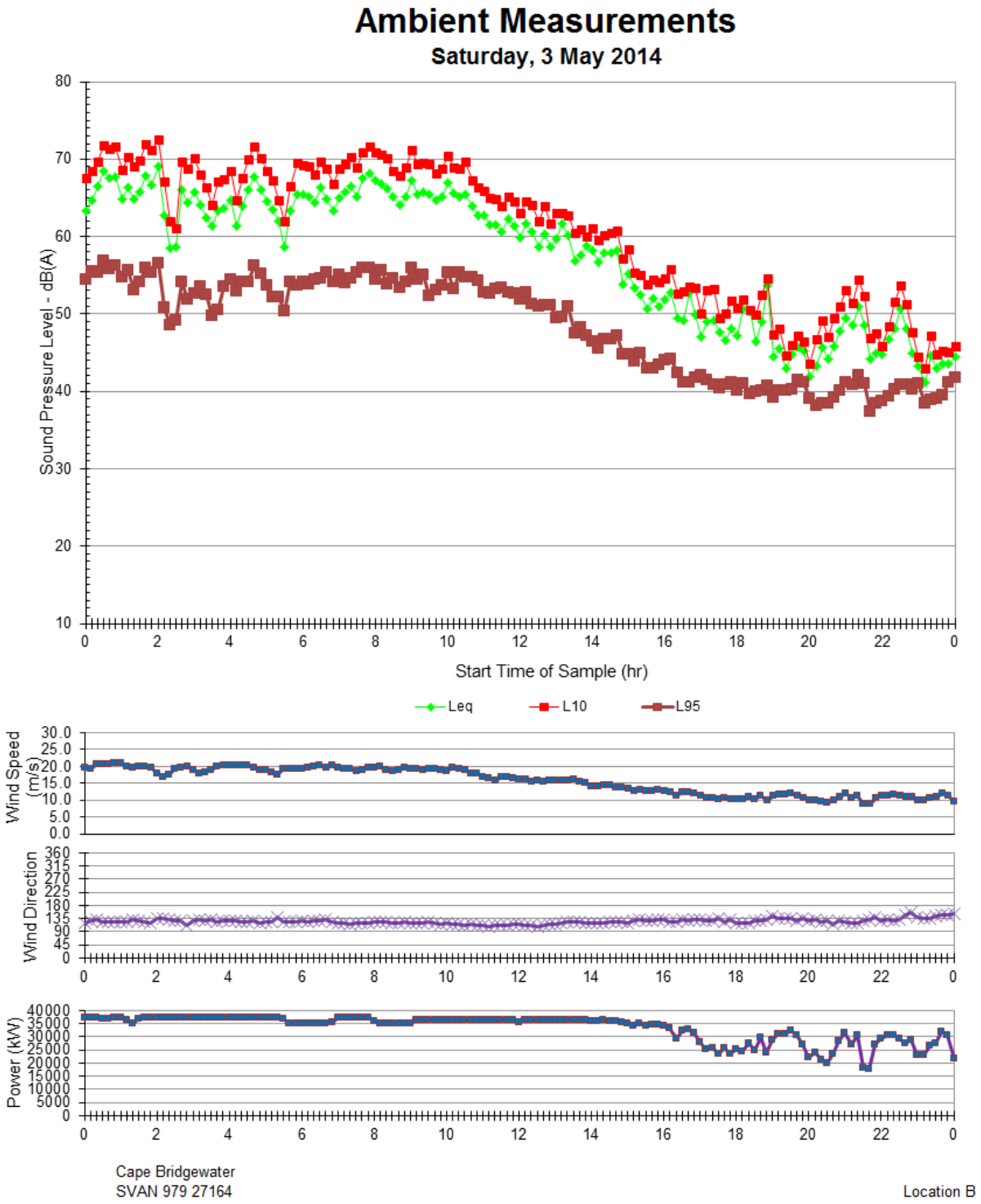

Ambient Measurements
Sunday, 4 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 21450
Location A

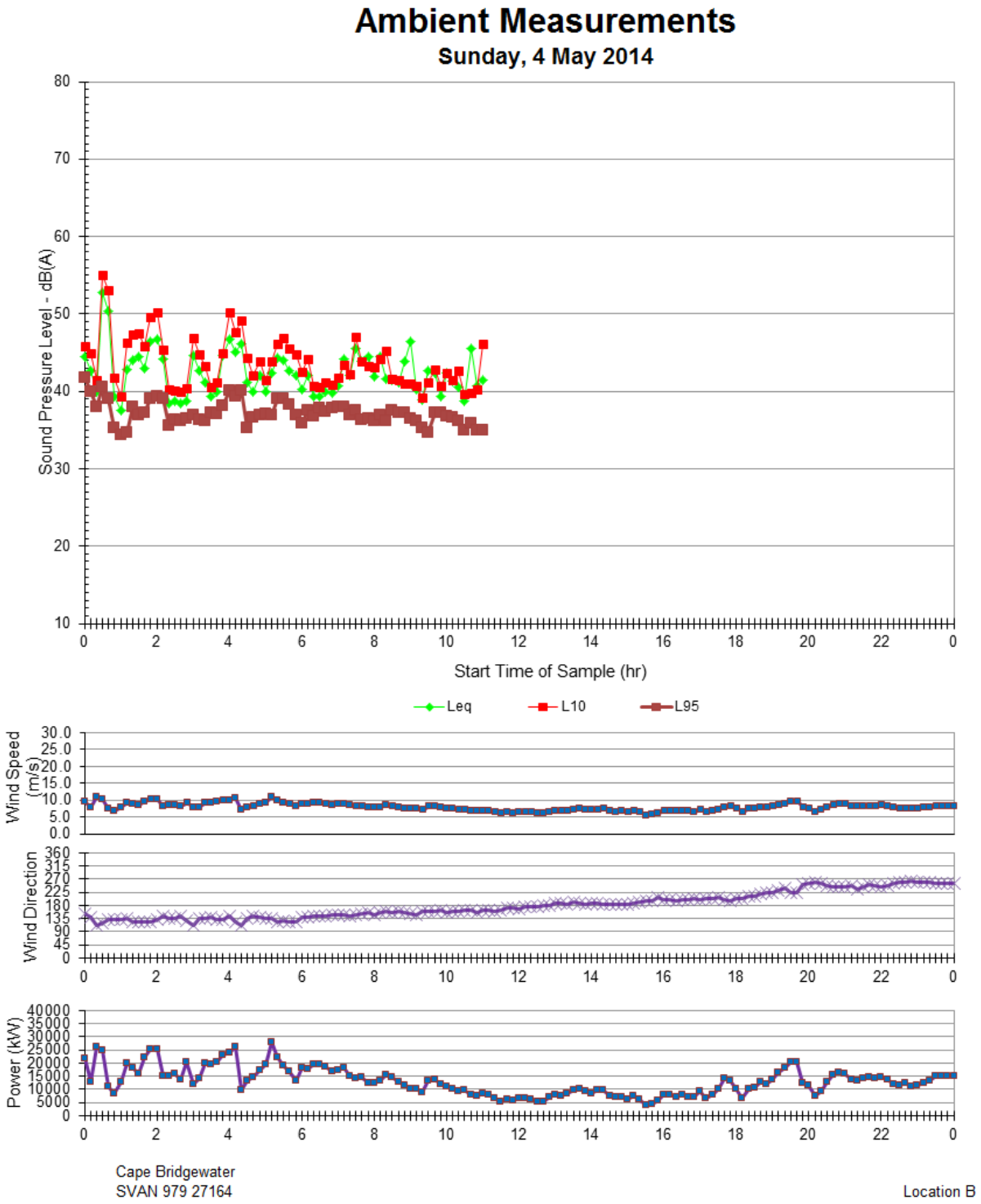

Ambient Measurements
Tuesday, 29 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 27164
Location B

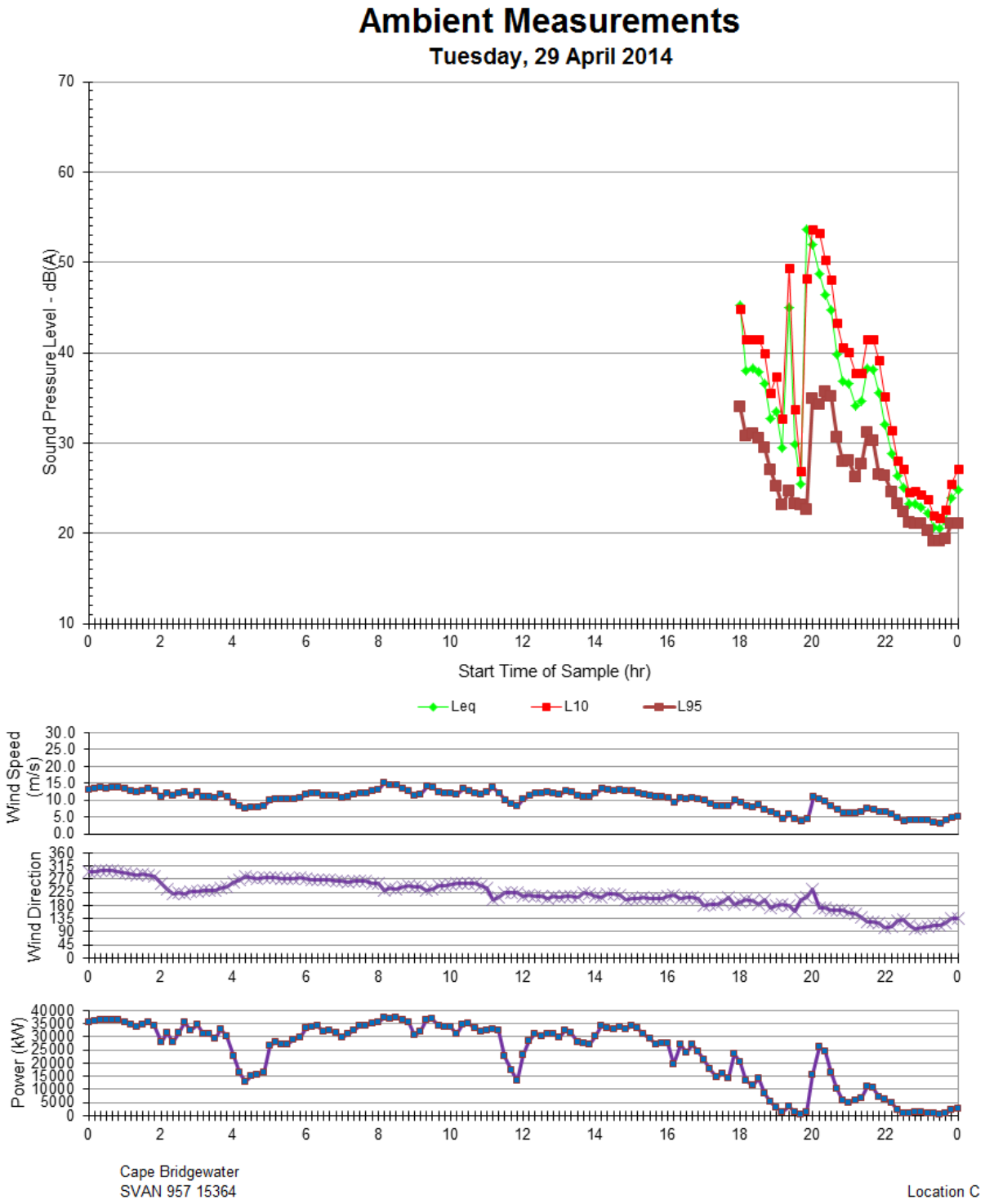

Ambient Measurements
Wednesday, 30 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 27164
Location B

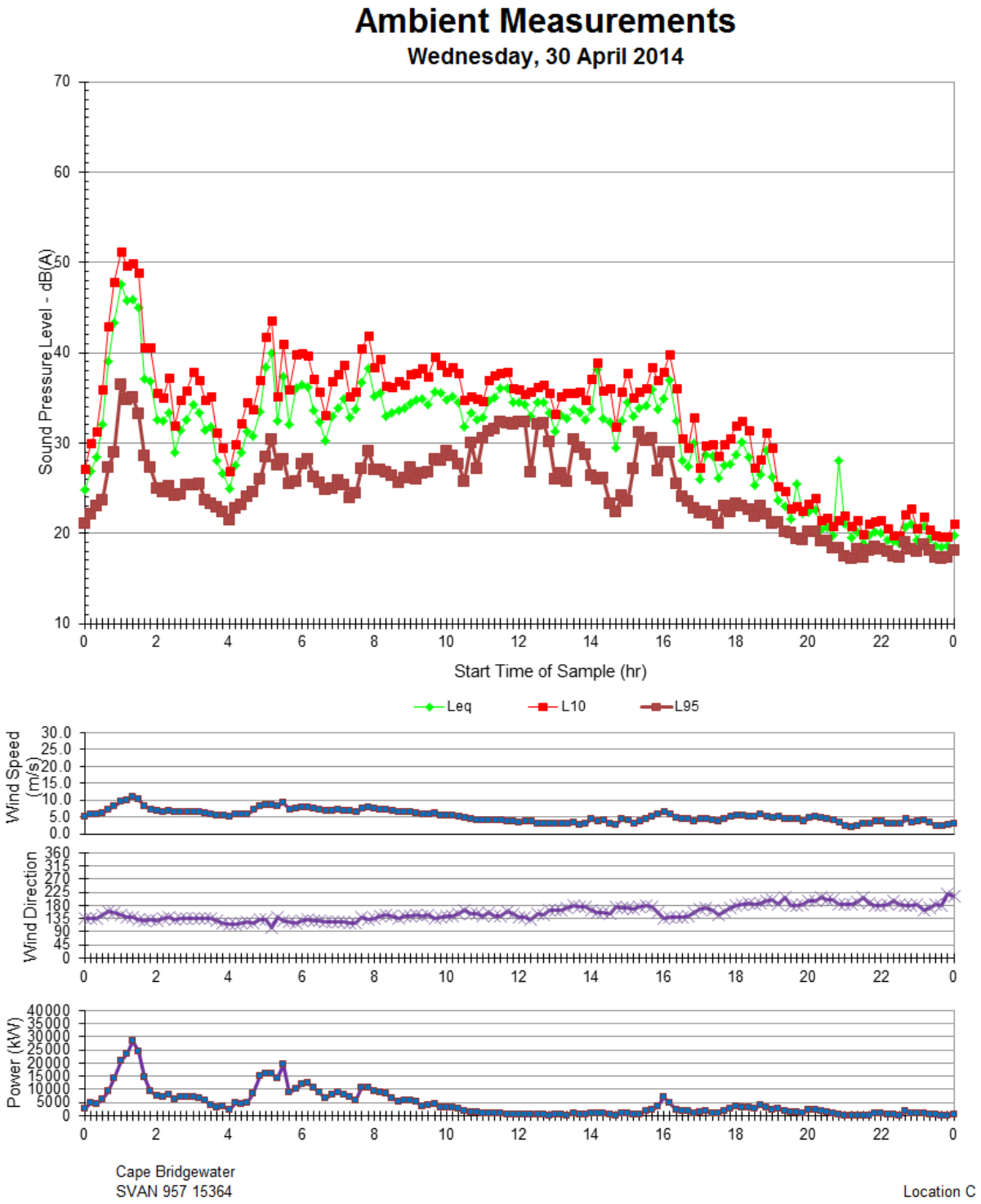

Ambient Measurements
Thursday, 1 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 27164
Location B

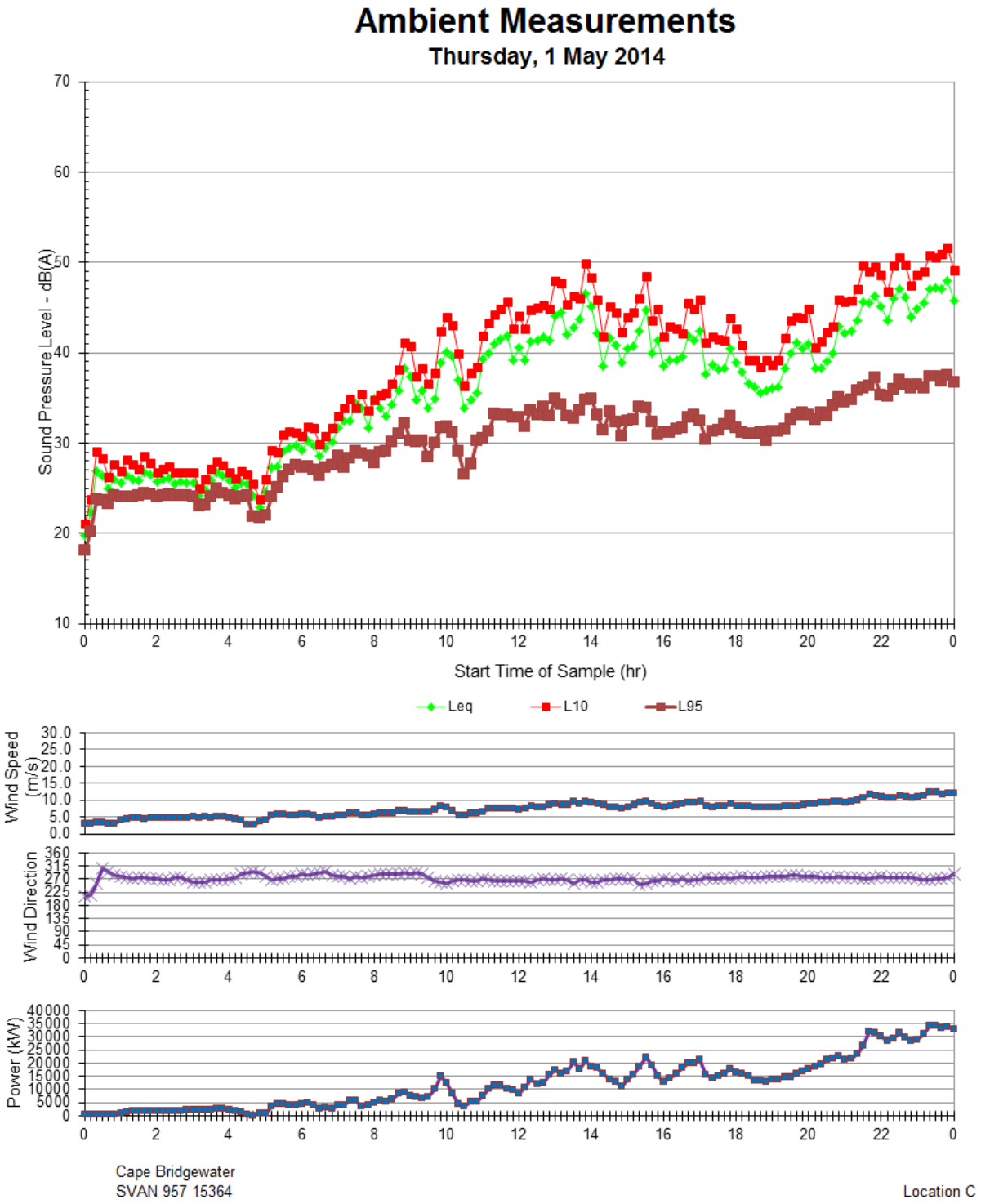

Ambient Measurements
Friday, 2 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 27164
Location B

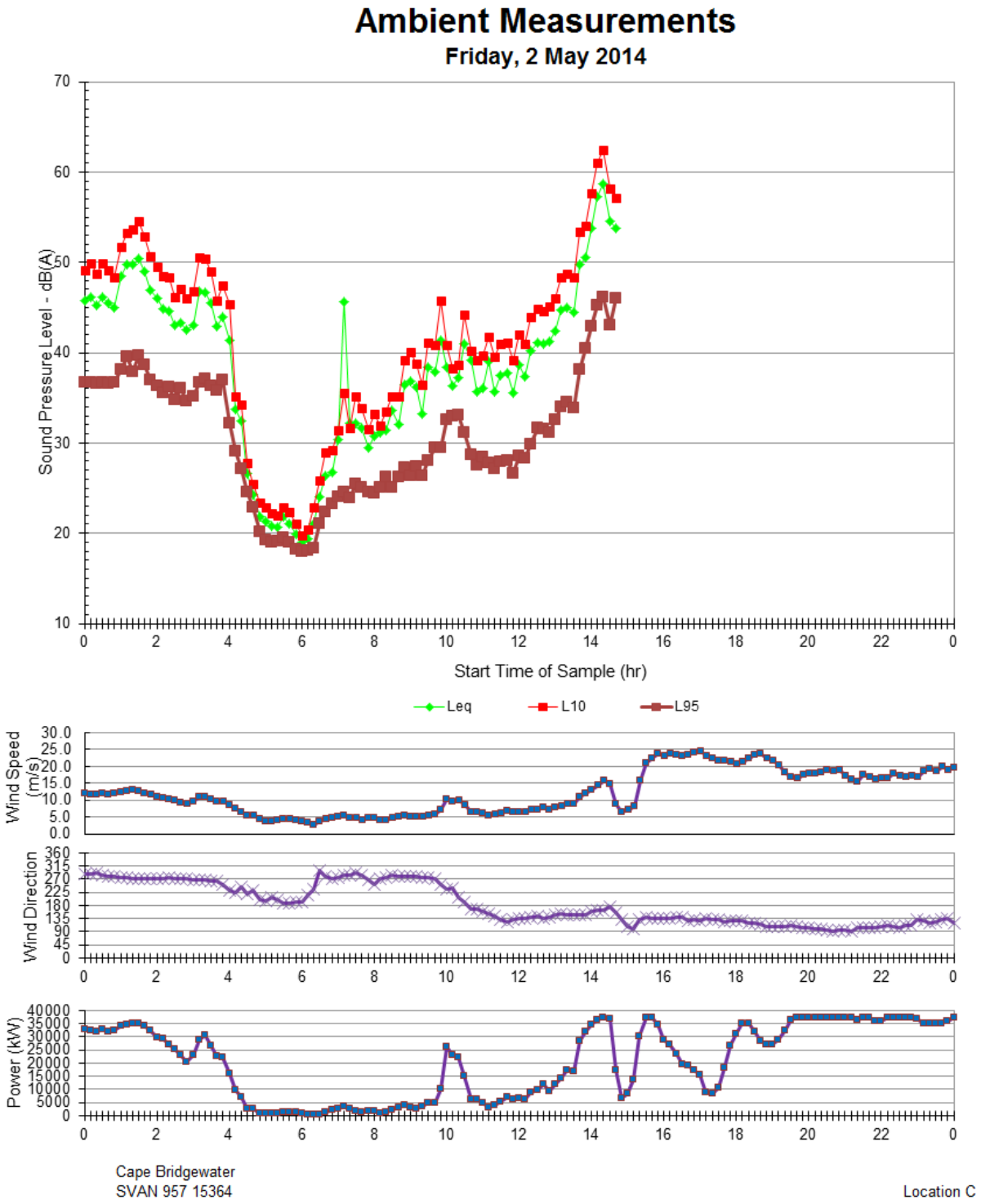

Ambient Measurements
Saturday, 3 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 27164
Location B

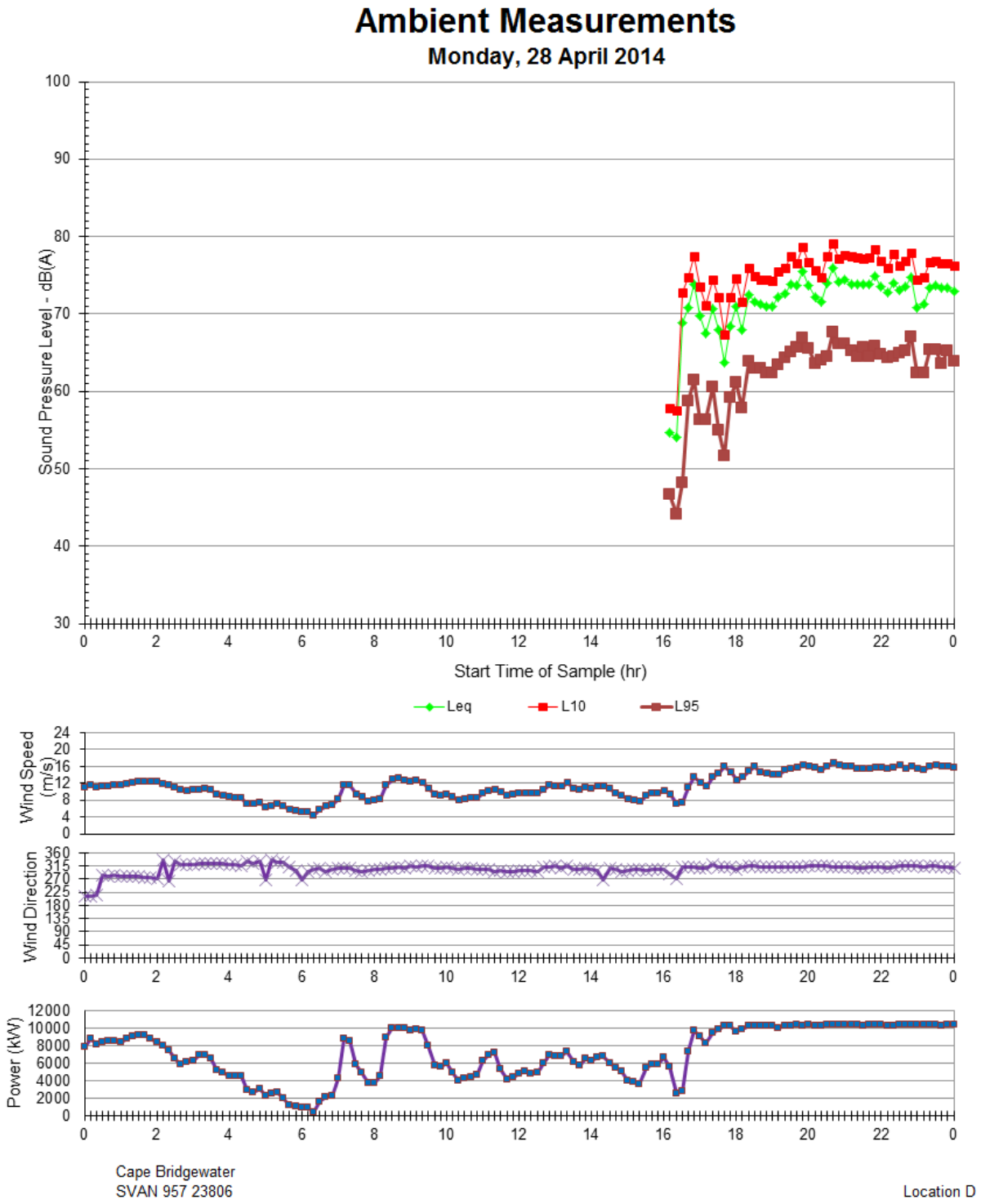

Ambient Measurements
Sunday, 4 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 27164
Location B

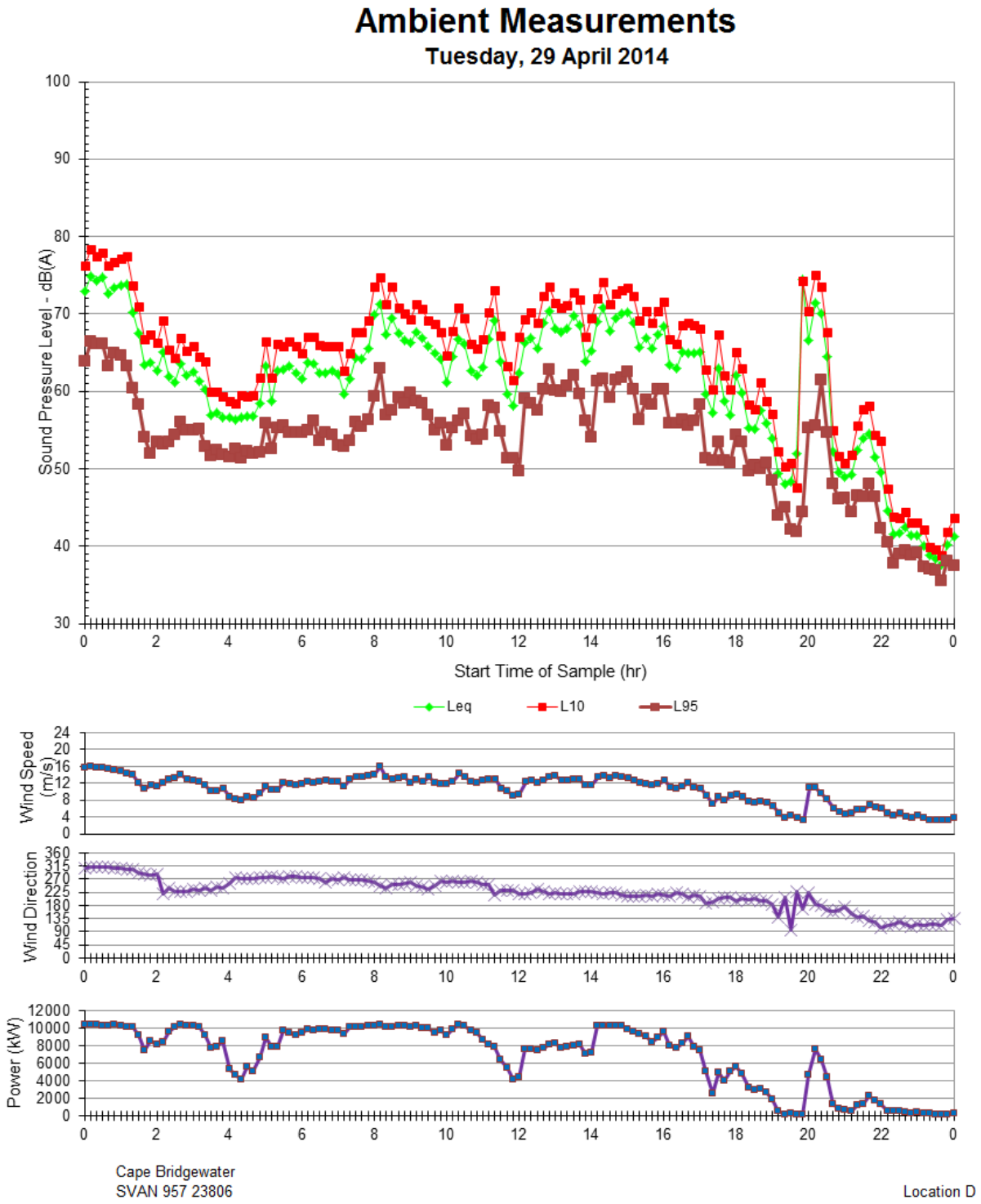

Ambient Measurements
Tuesday, 29 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 15364
Location C

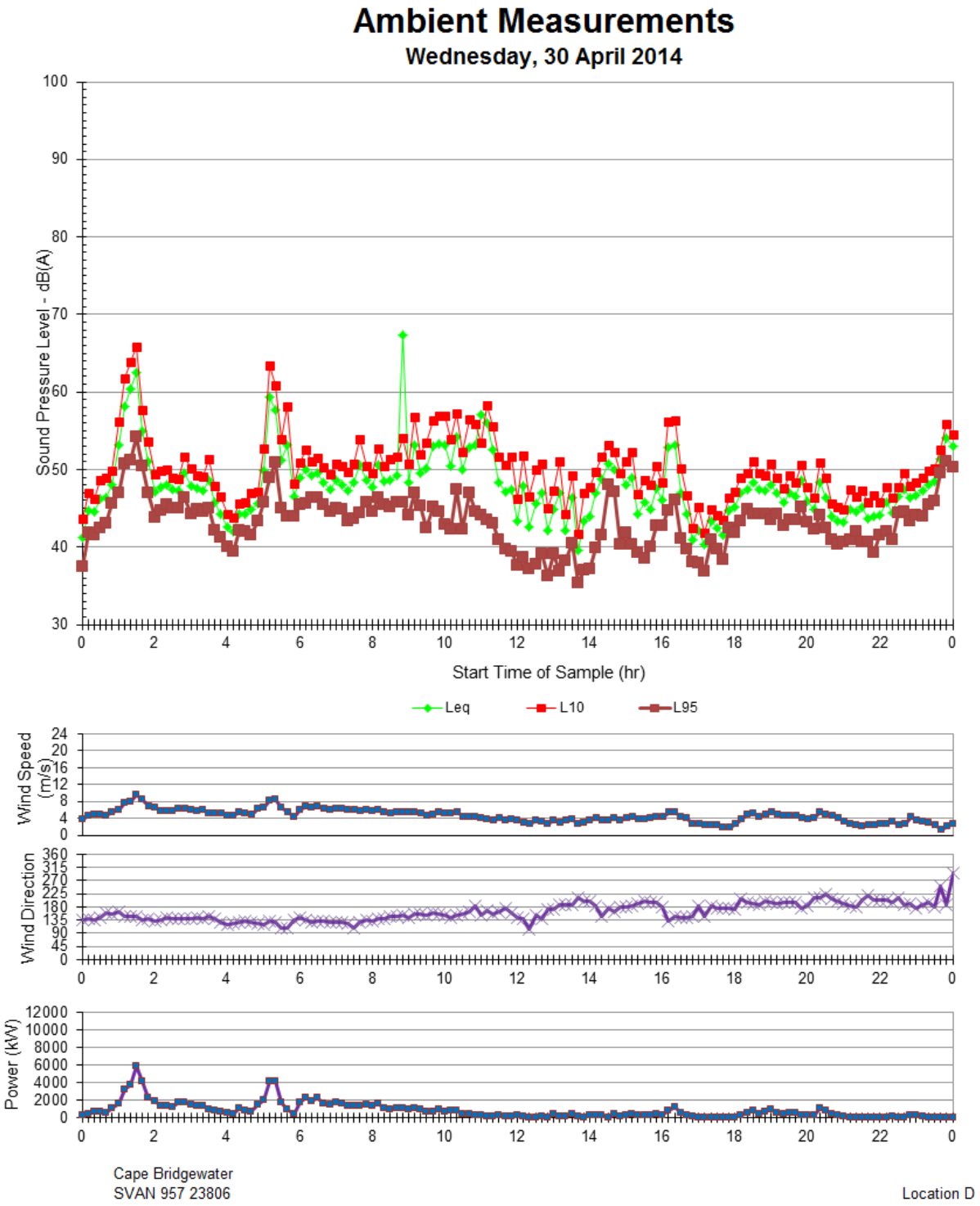

Ambient Measurements
Wednesday, 30 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 15364
Location C

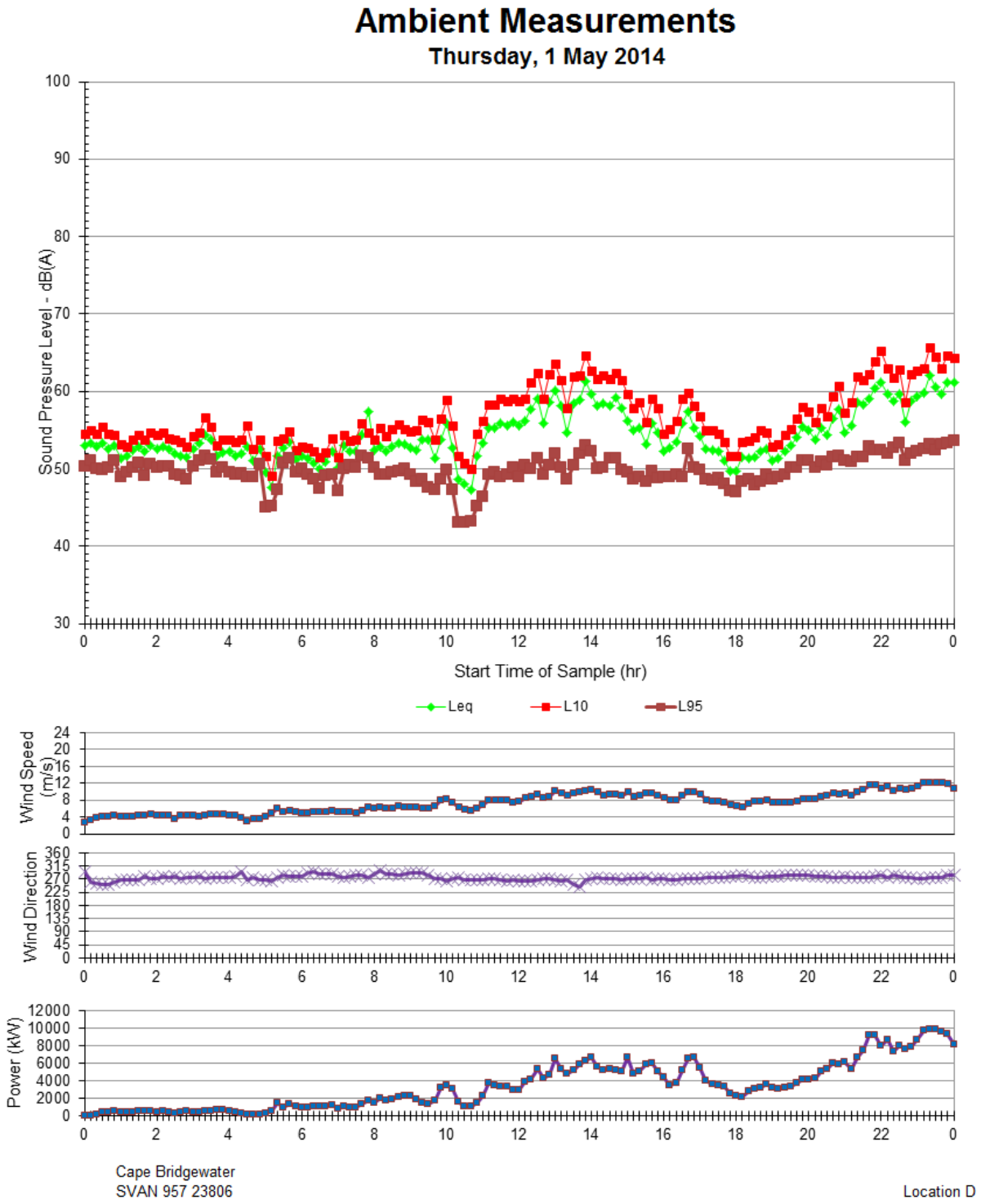

Ambient Measurements
Thursday, 1 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 15364
Location C

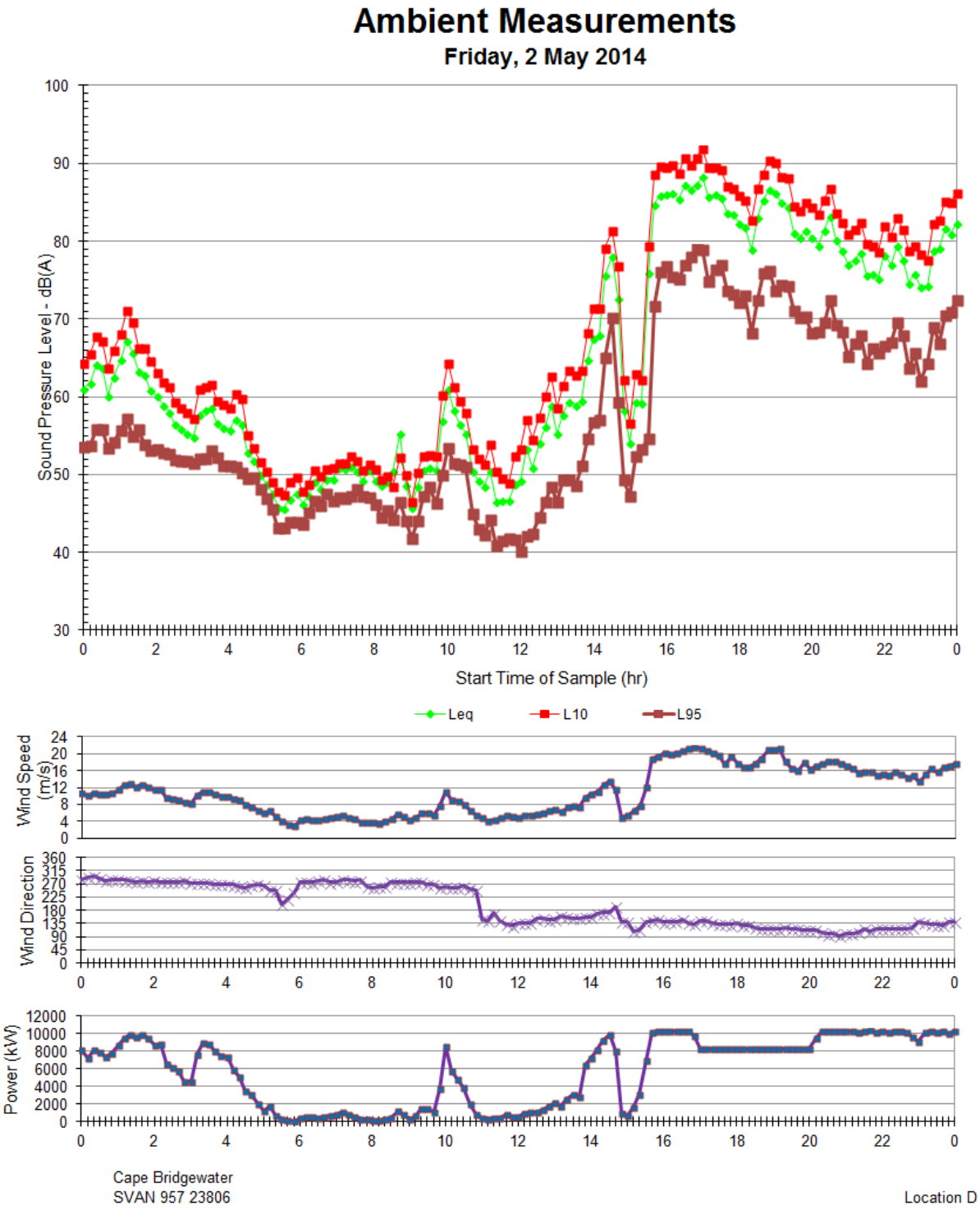

Ambient Measurements
Friday, 2 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 15364
Location C

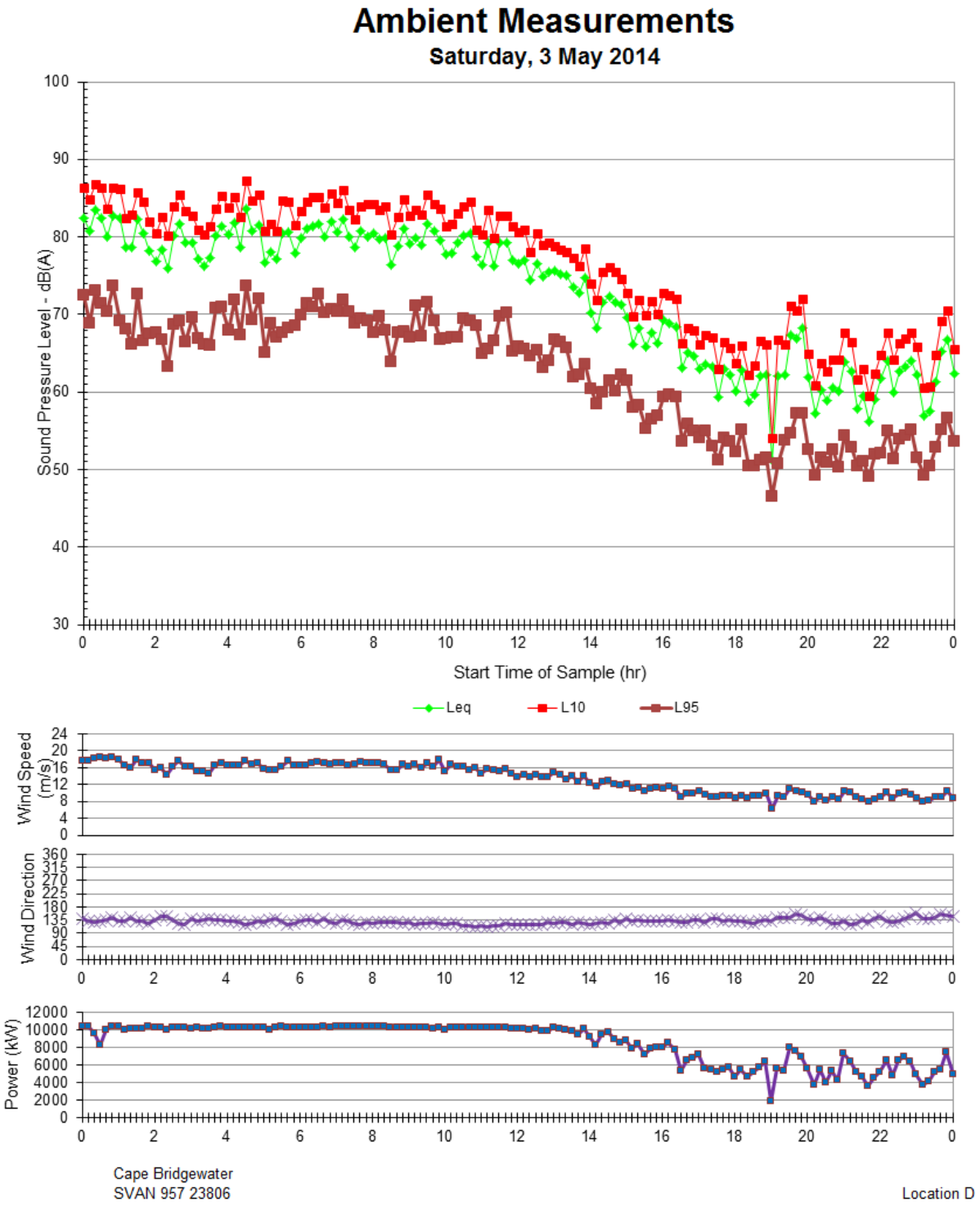

Ambient Measurements
Monday, 28 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

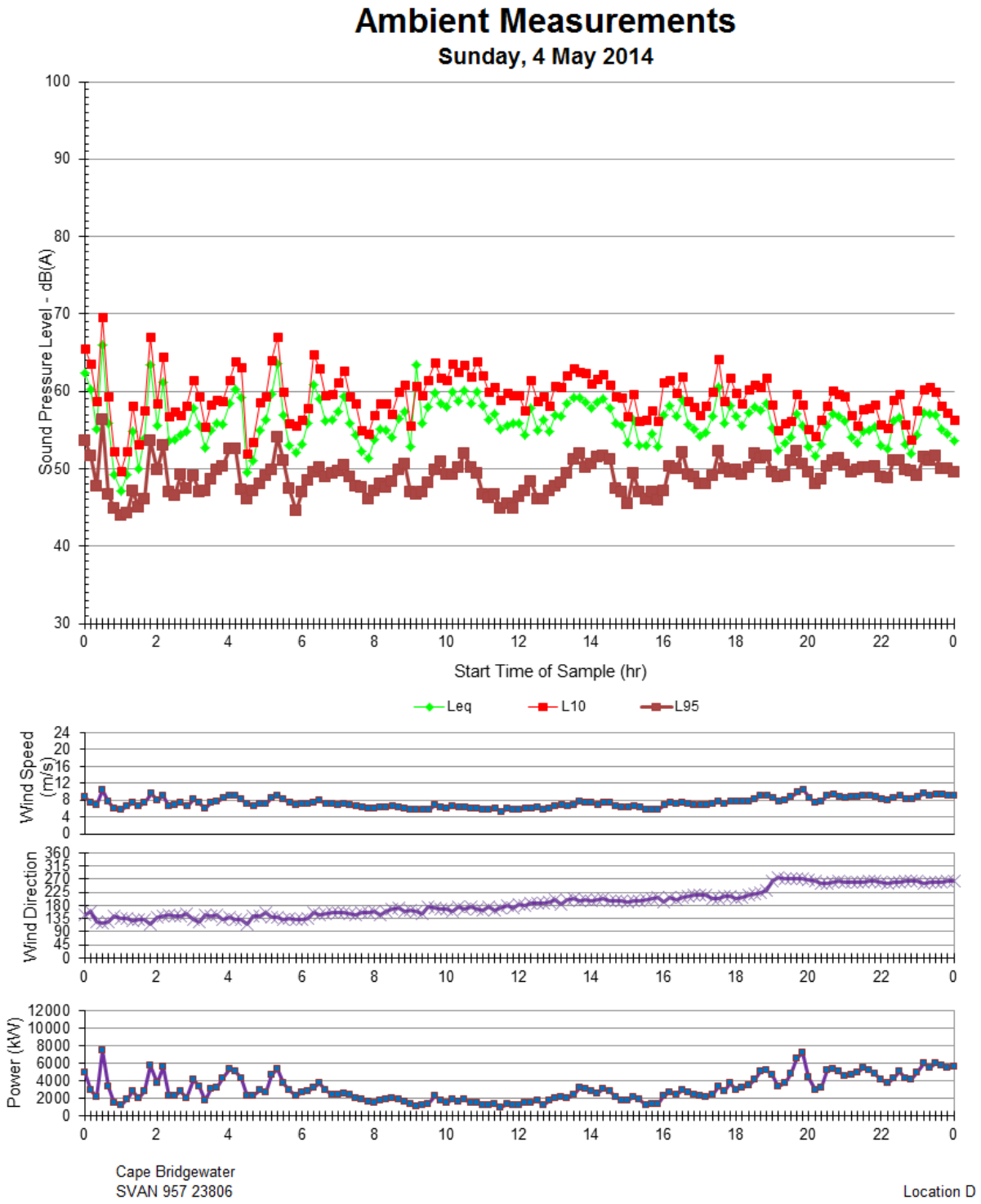

Ambient Measurements
Tuesday, 29 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

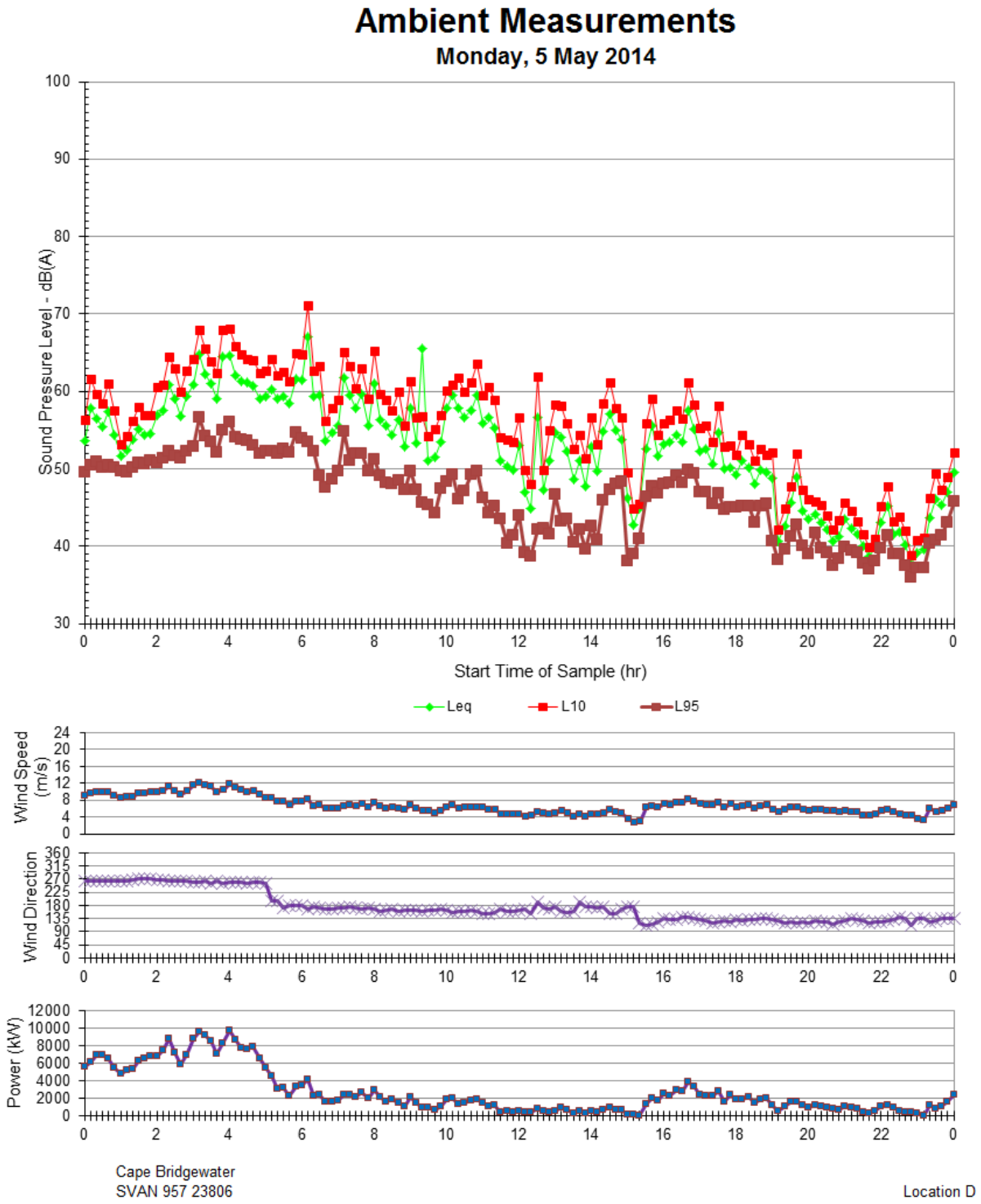

Ambient Measurements
Wednesday, 30 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

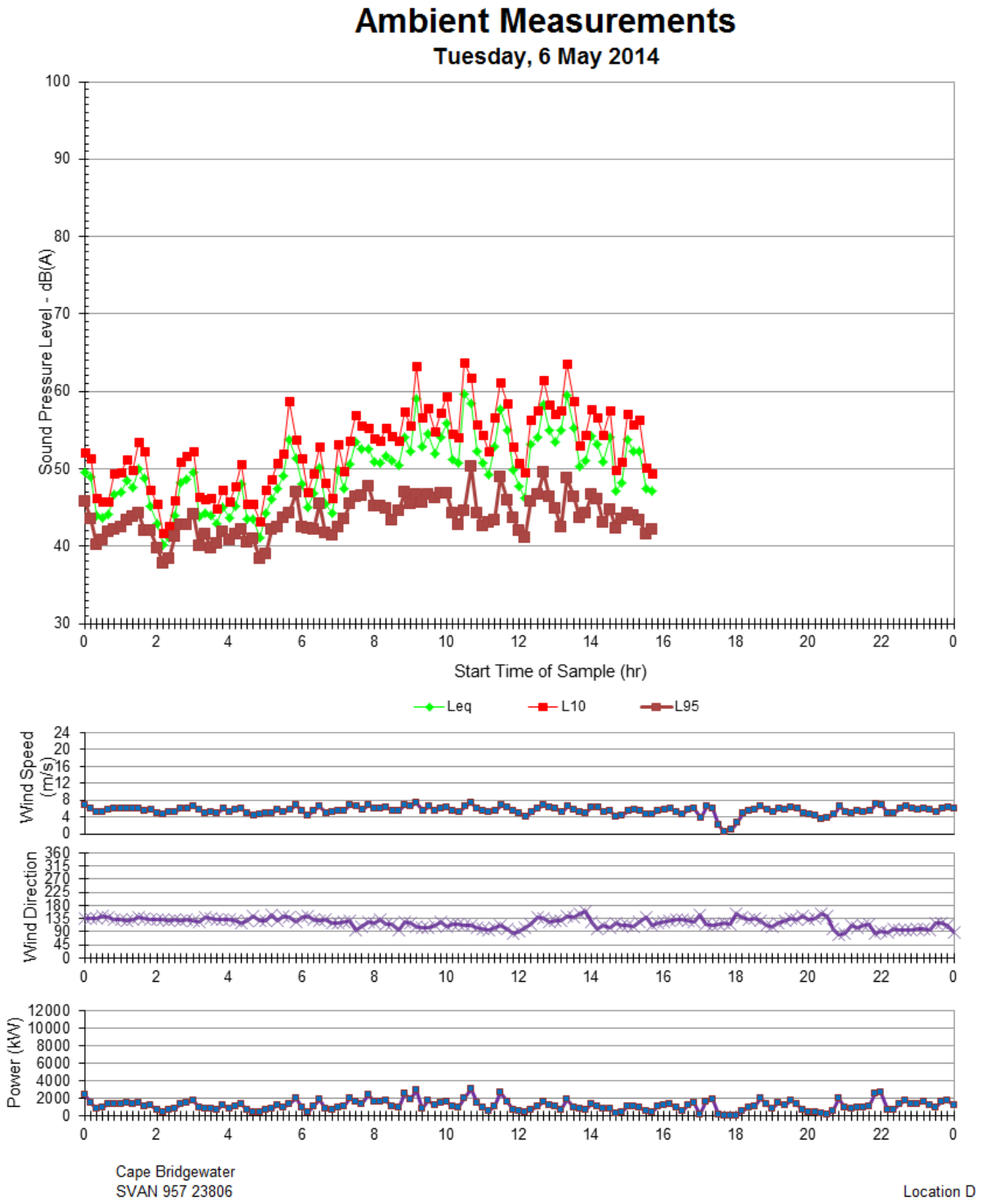

Ambient Measurements
Thursday, 1 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

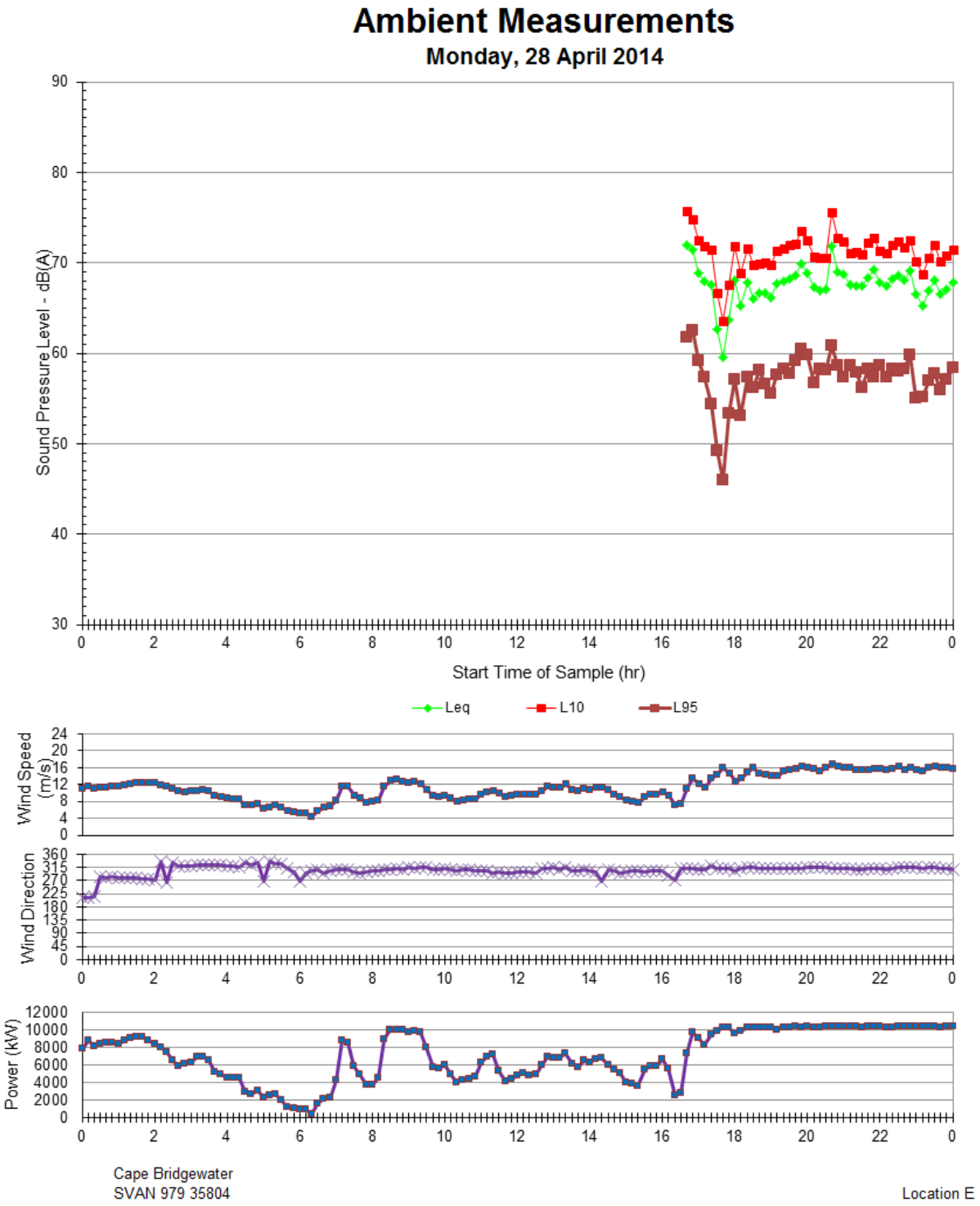

Ambient Measurements
Friday, 2 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

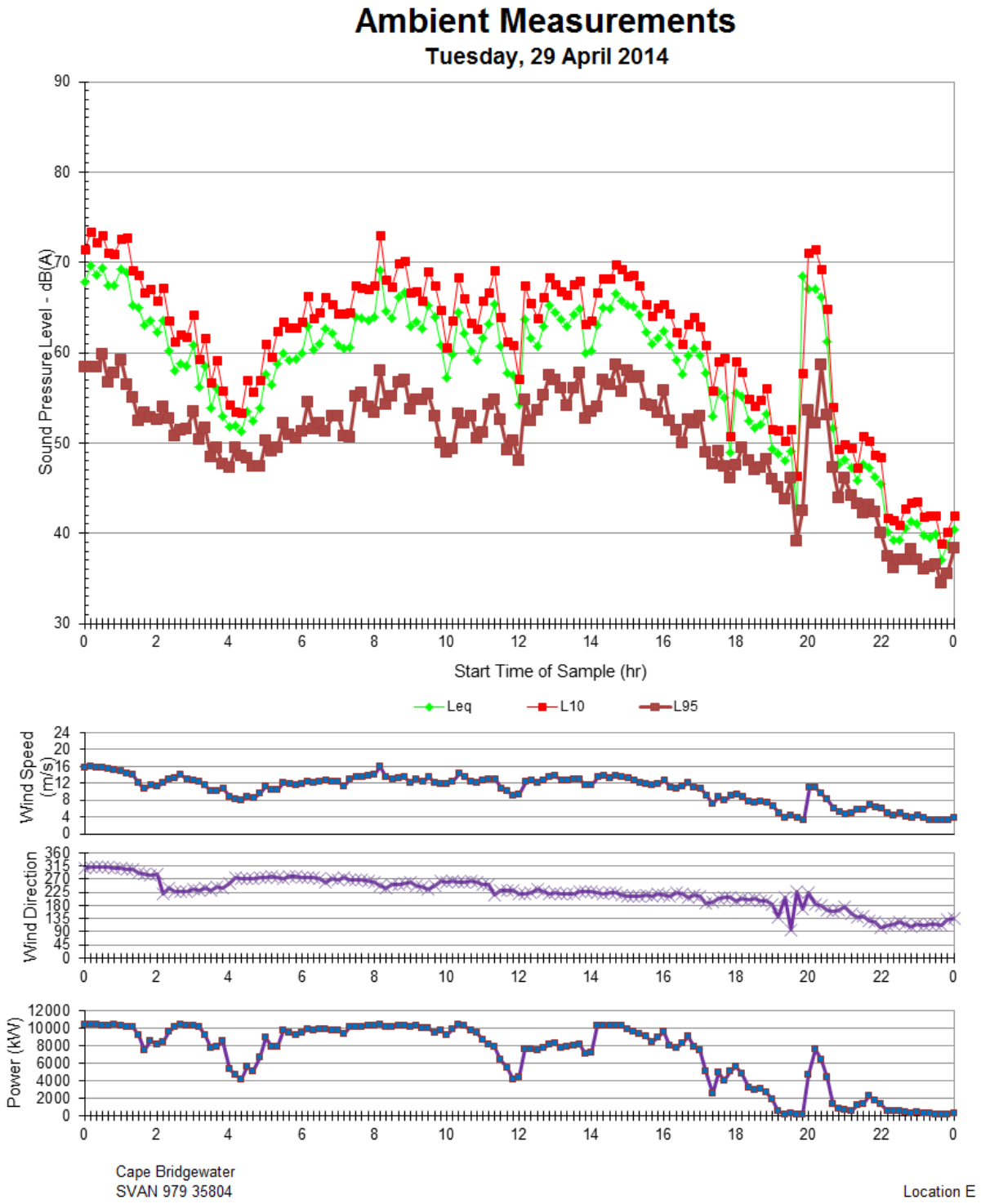

Ambient Measurements
Saturday, 3 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

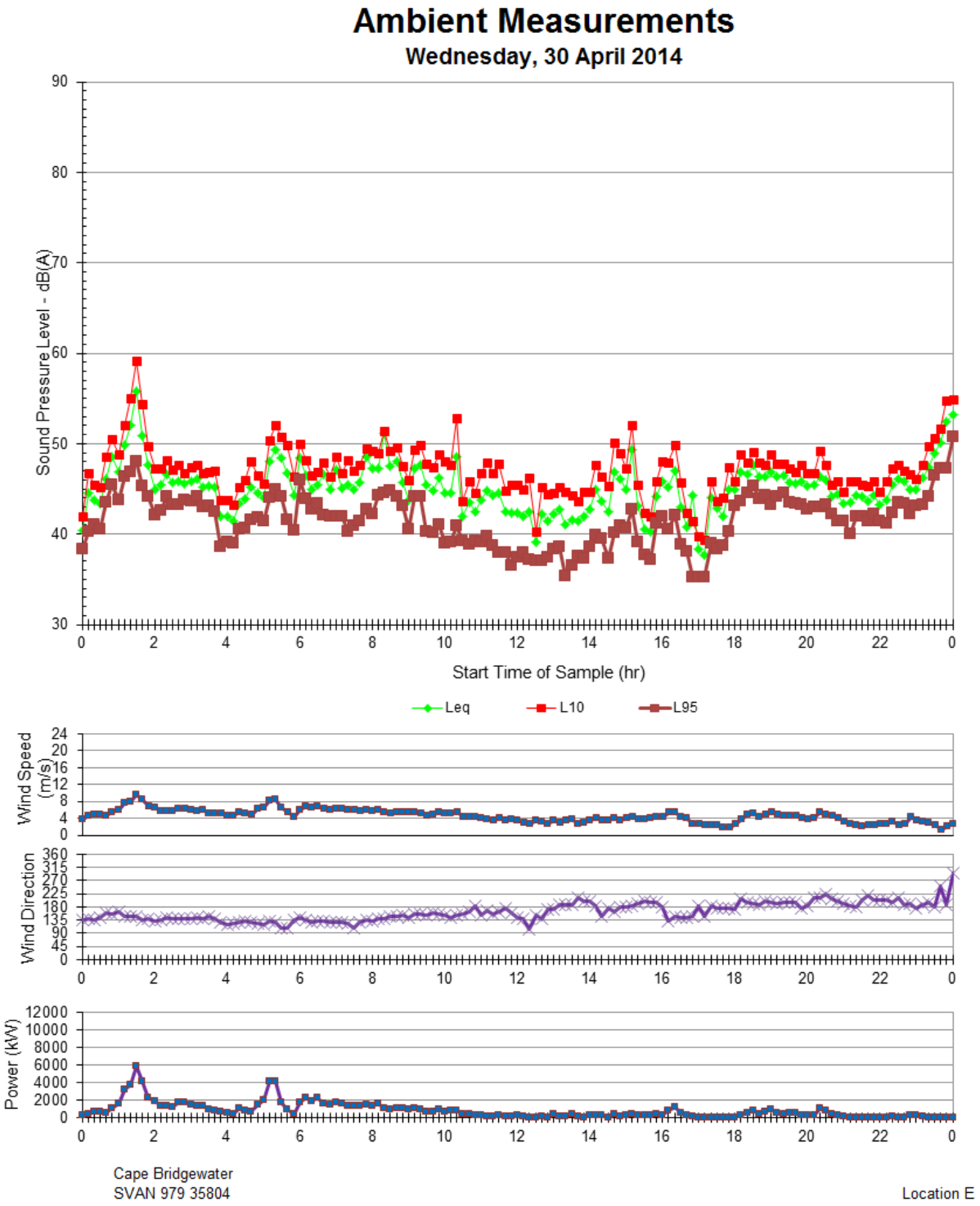

Ambient Measurements
Sunday, 4 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

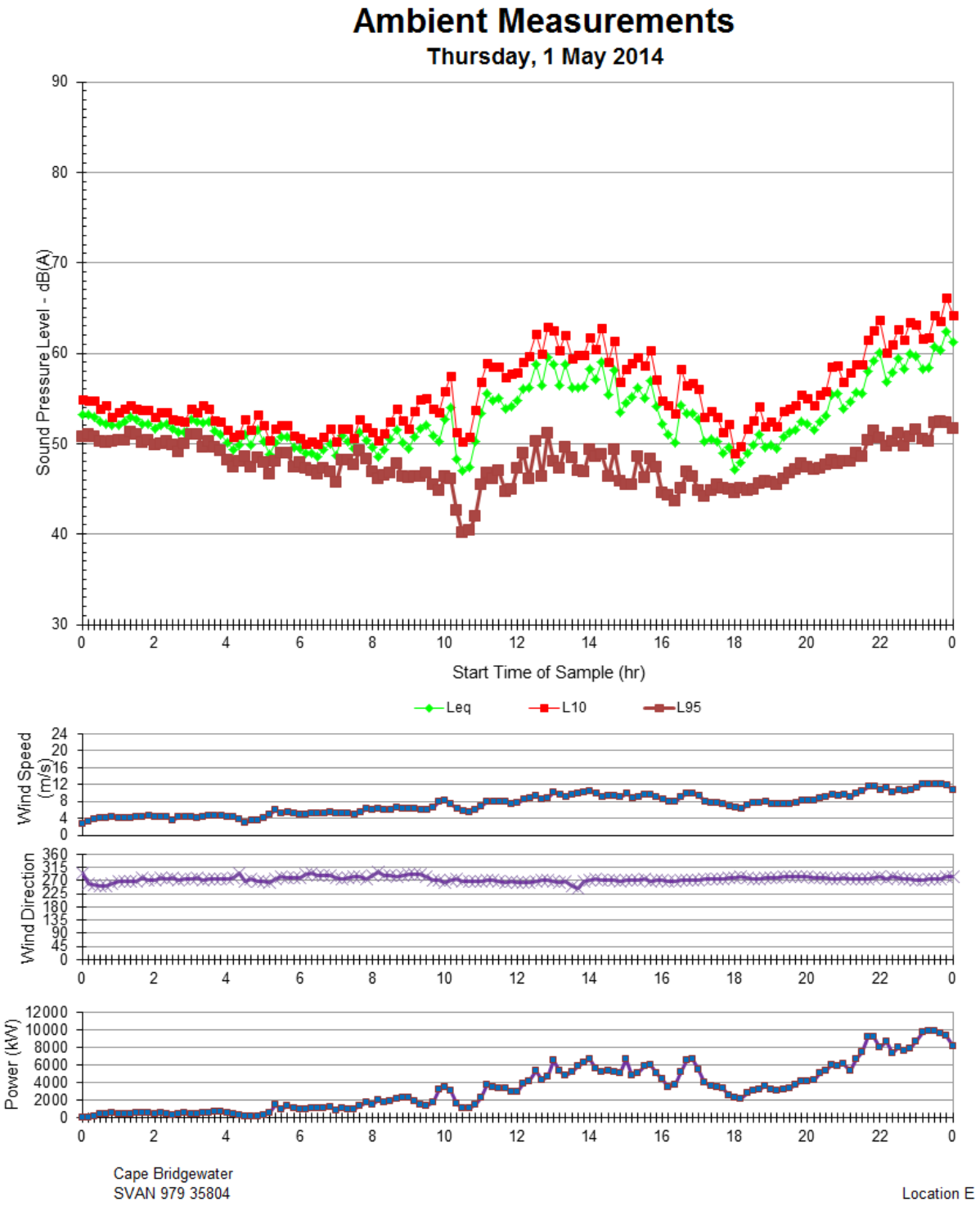

Ambient Measurements
Monday, 5 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

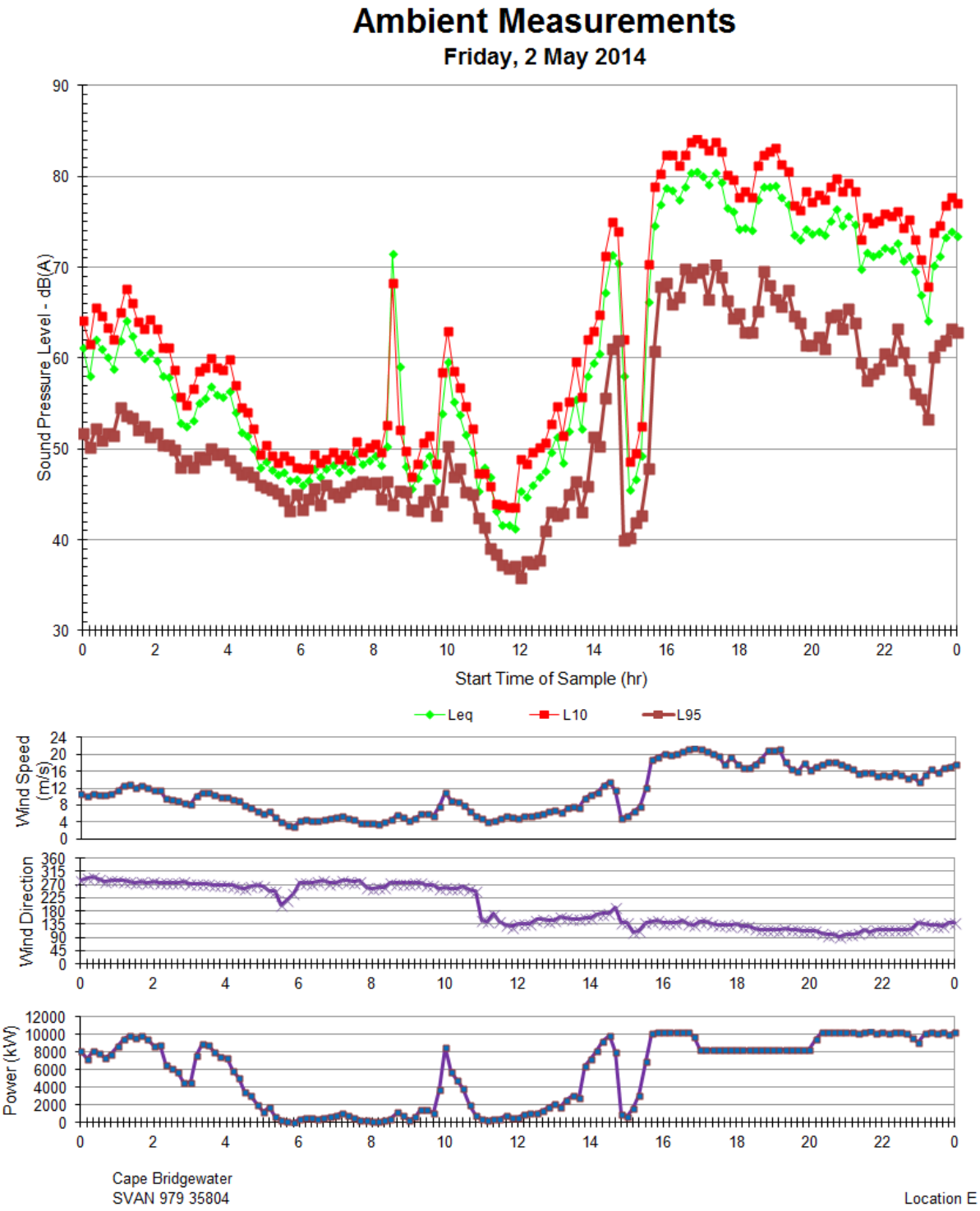

Ambient Measurements
Tuesday, 6 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 957 23806
Location D

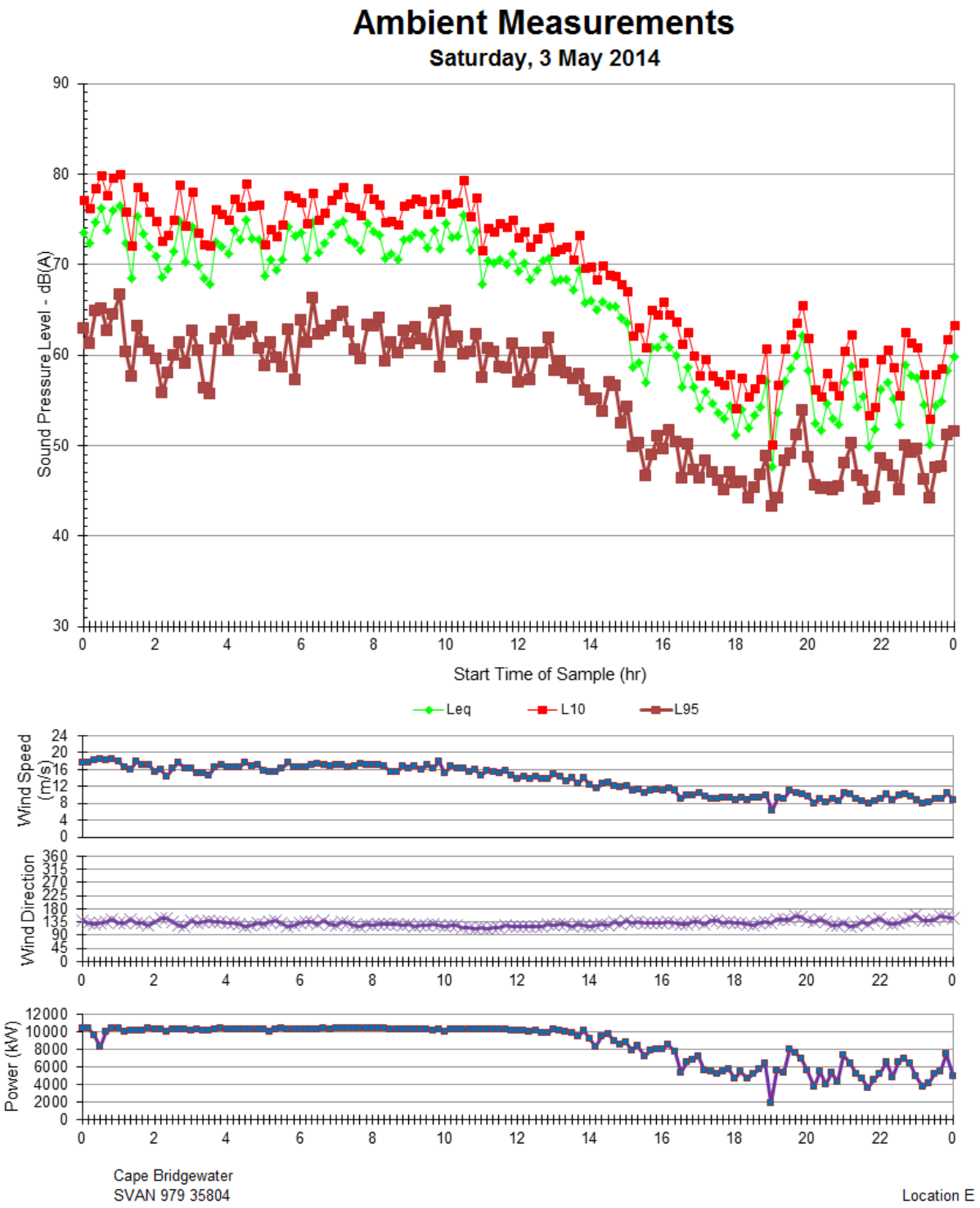

Ambient Measurements
Monday, 28 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E

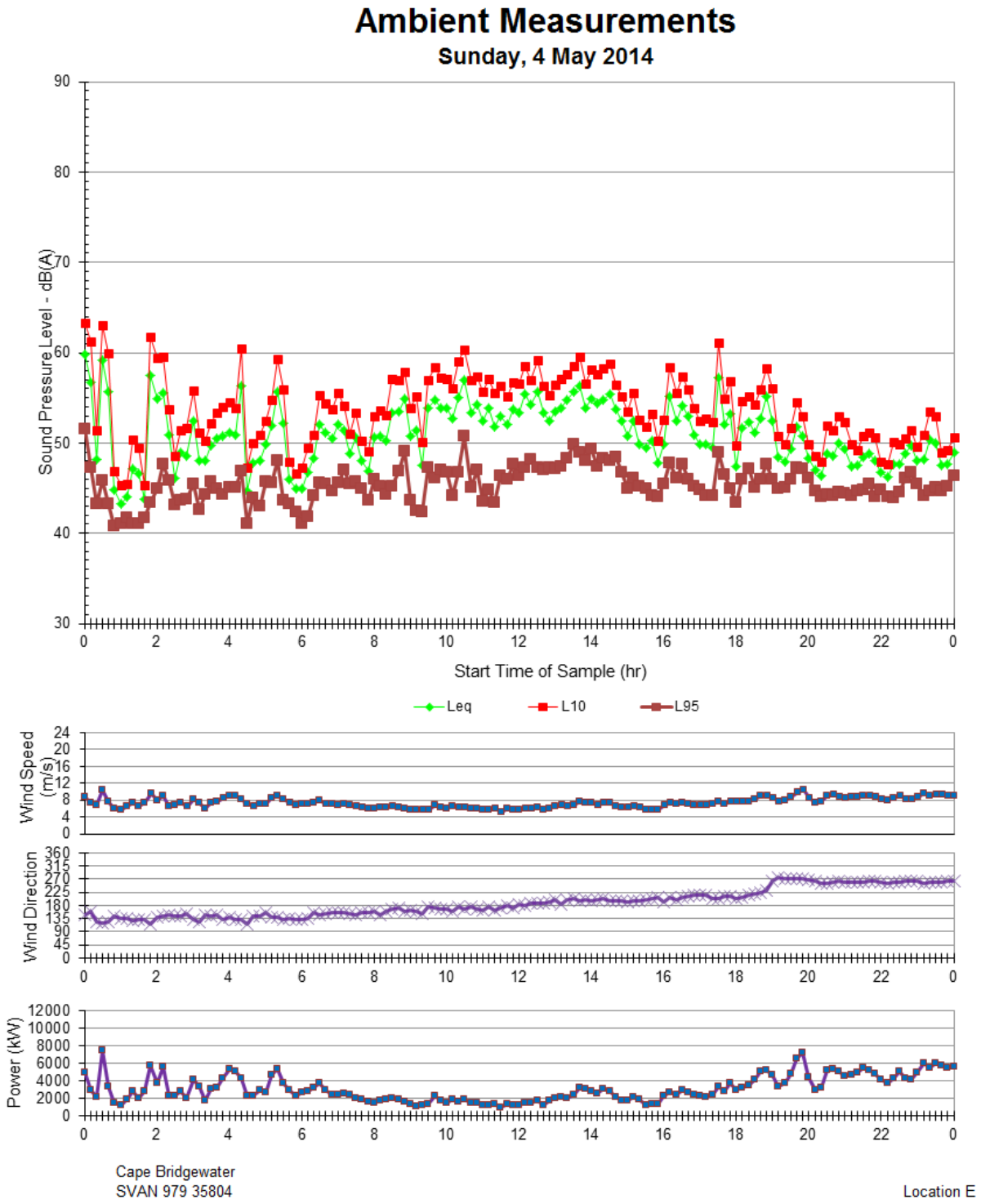

Ambient Measurements
Tuesday, 29 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E

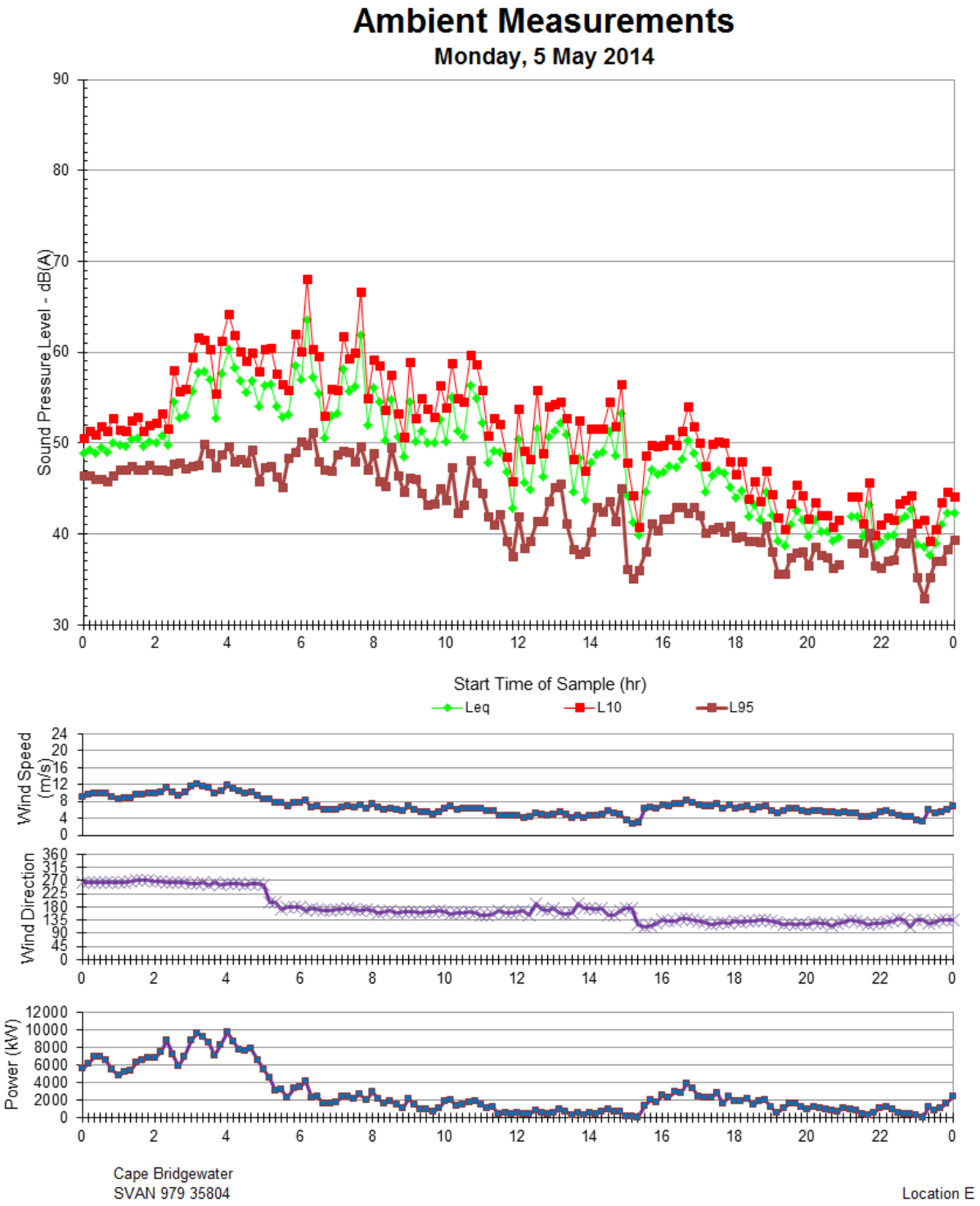

Ambient Measurements
Wednesday, 30 April 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E

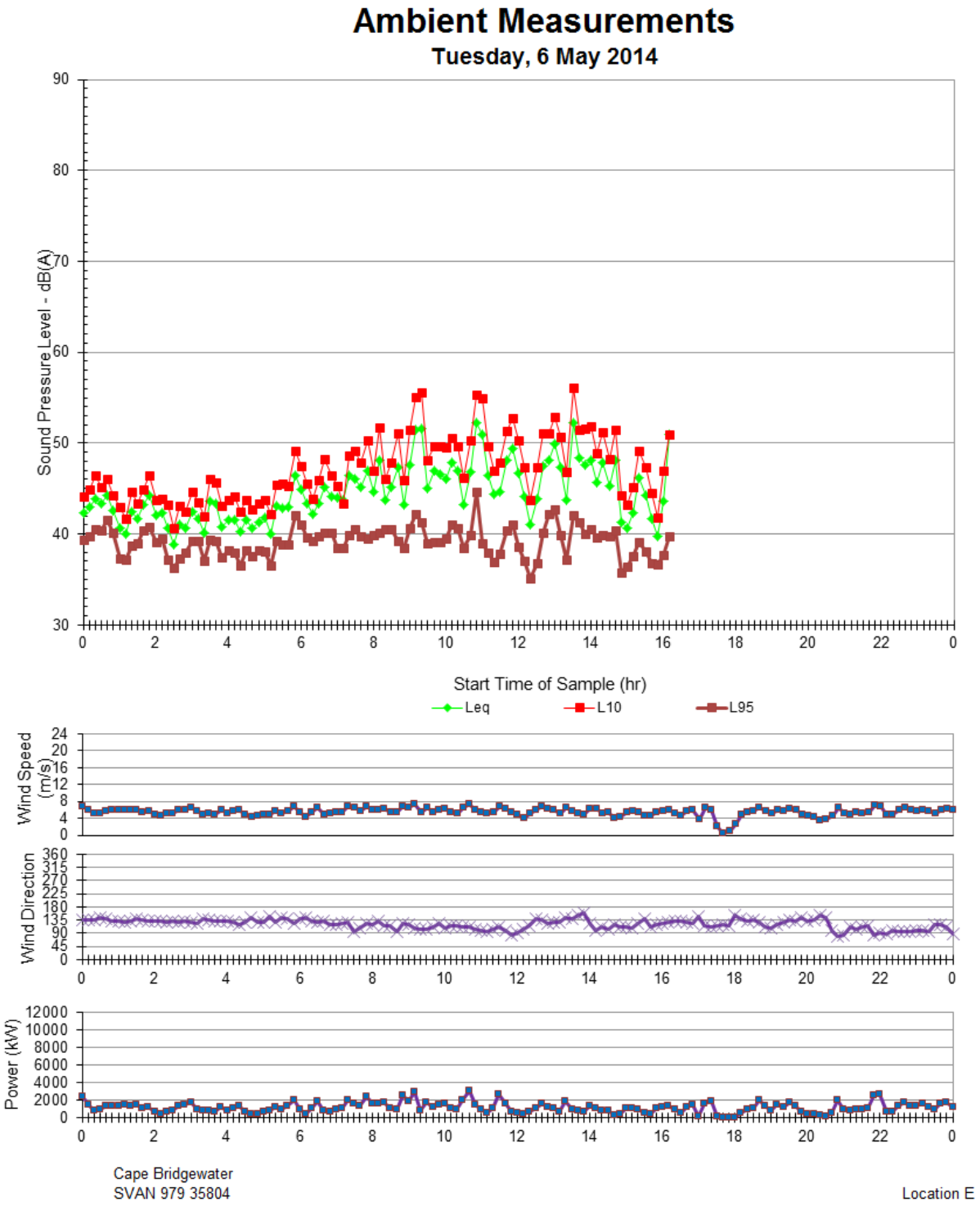

Ambient Measurements
Thursday, 1 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E


Ambient Measurements
Friday, 2 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E

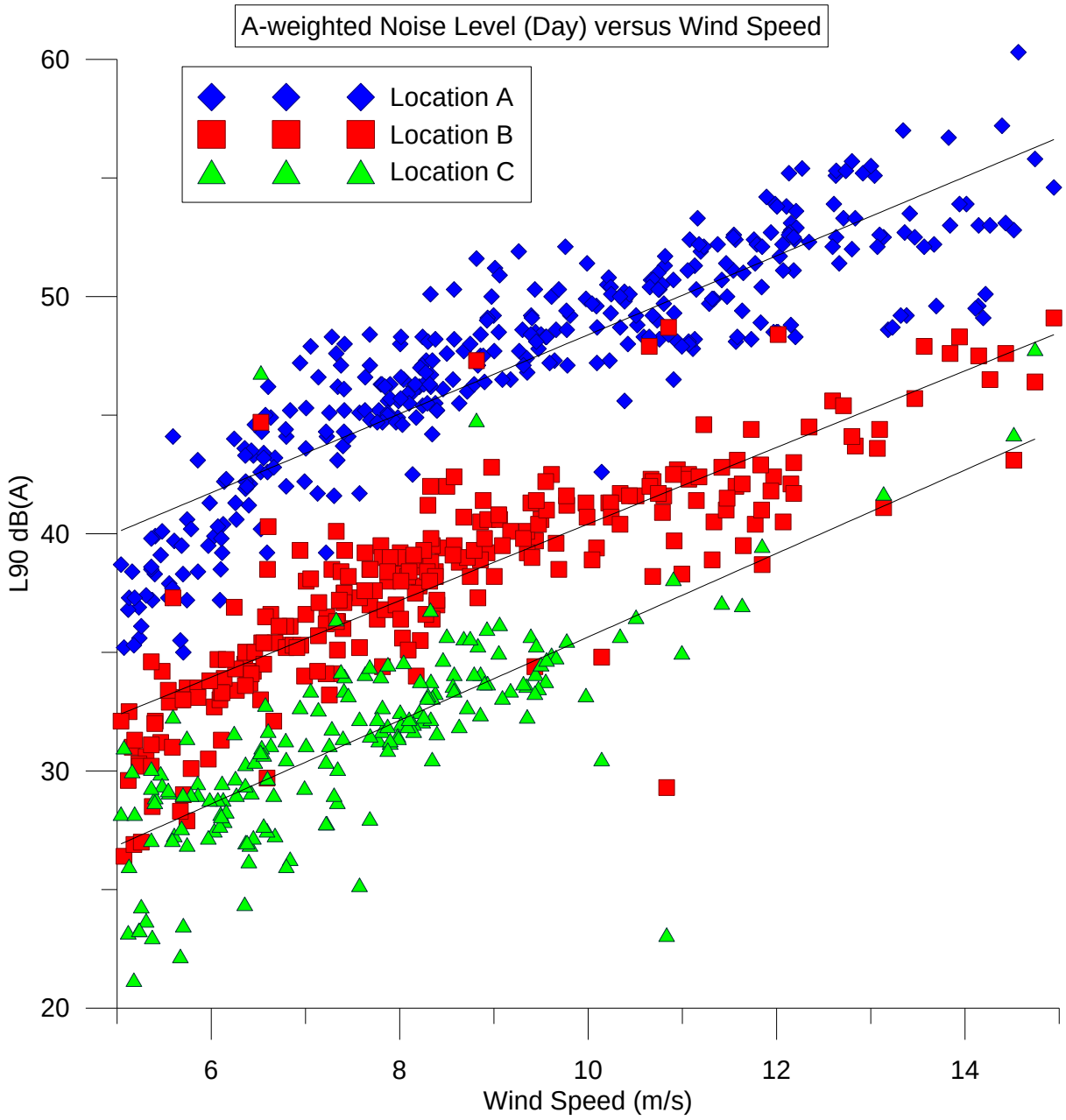

Ambient Measurements
Saturday, 3 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E

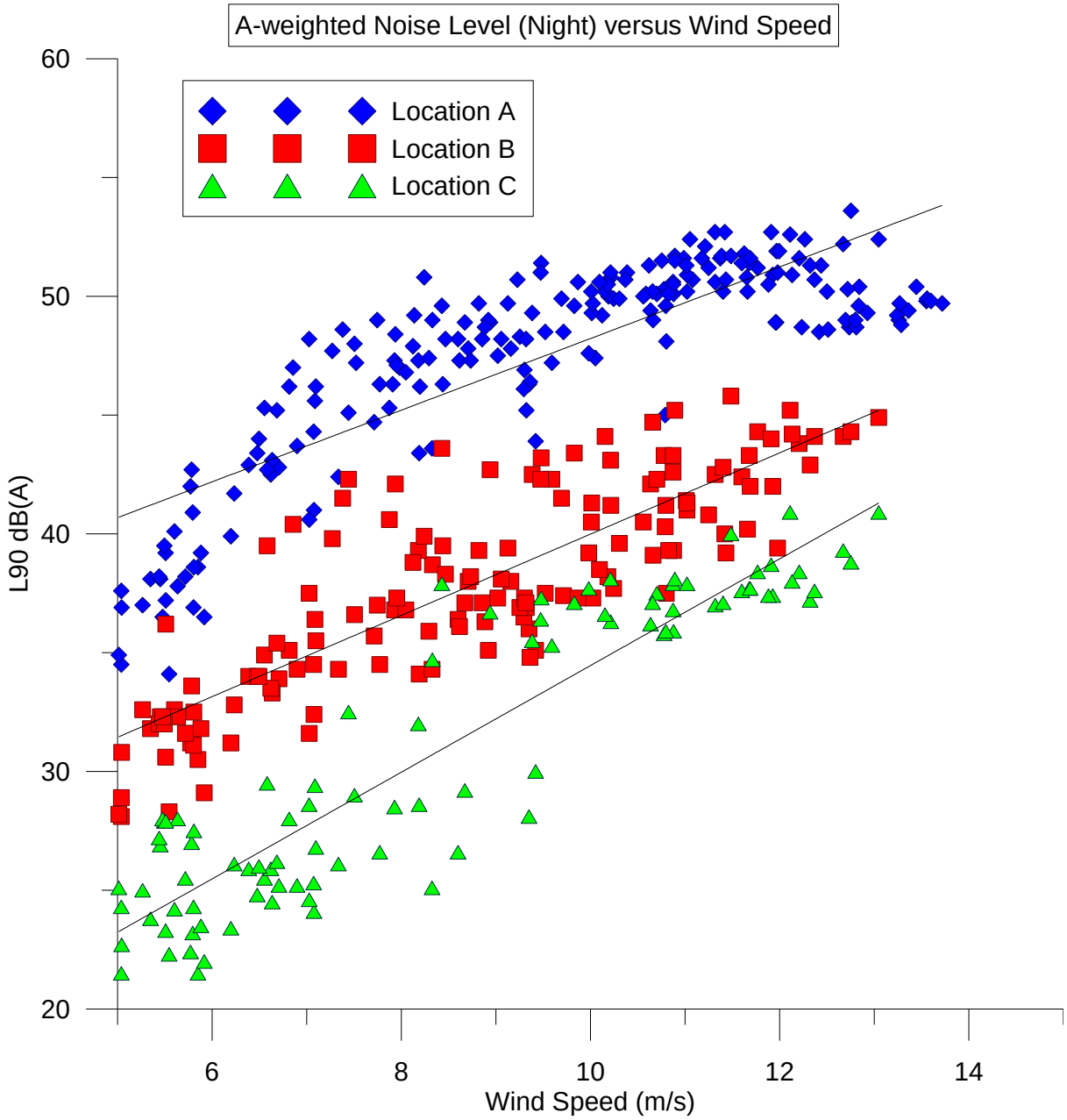

Ambient Measurements
Sunday, 4 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E

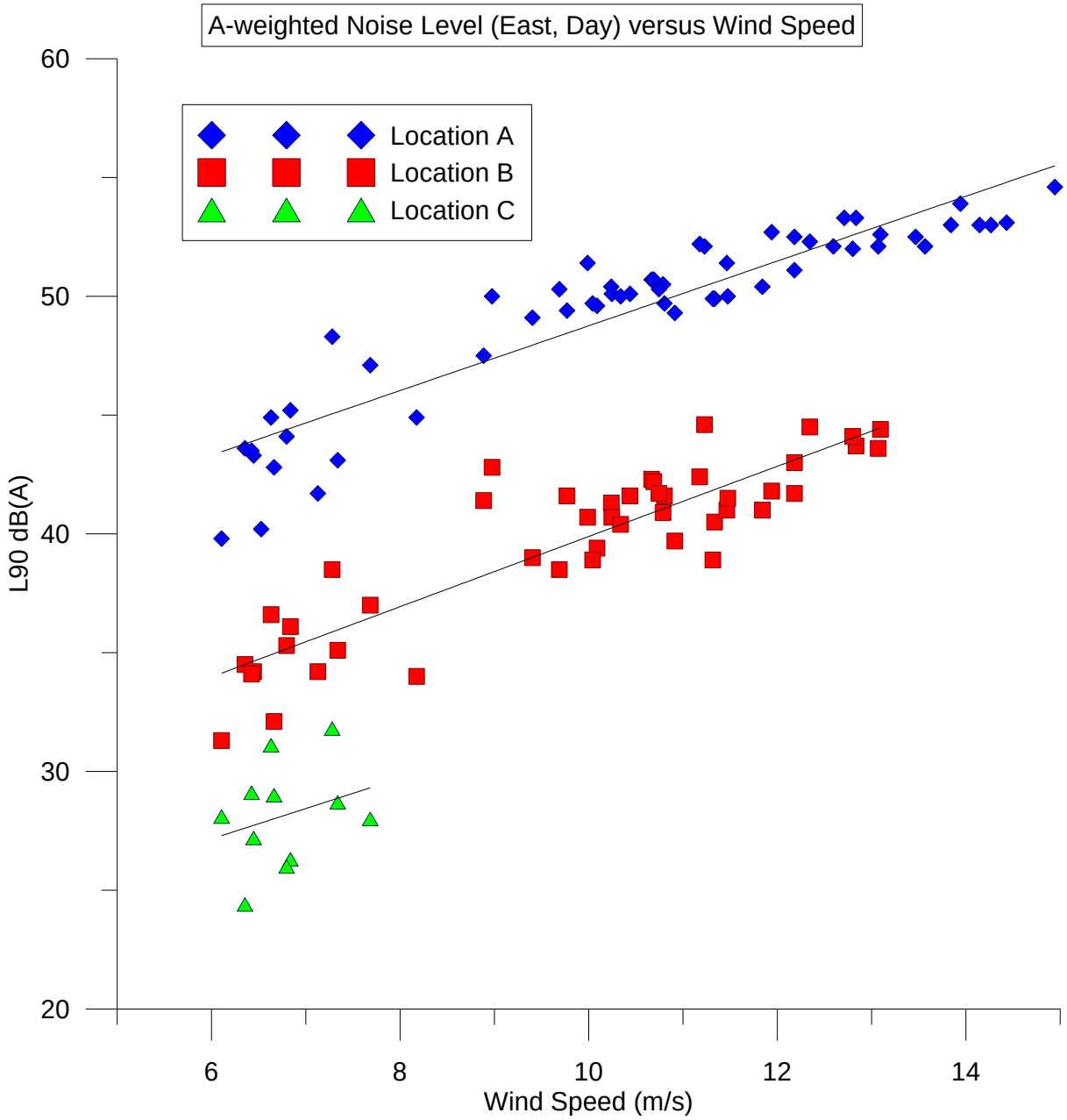

Ambient Measurements
Monday, 5 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E

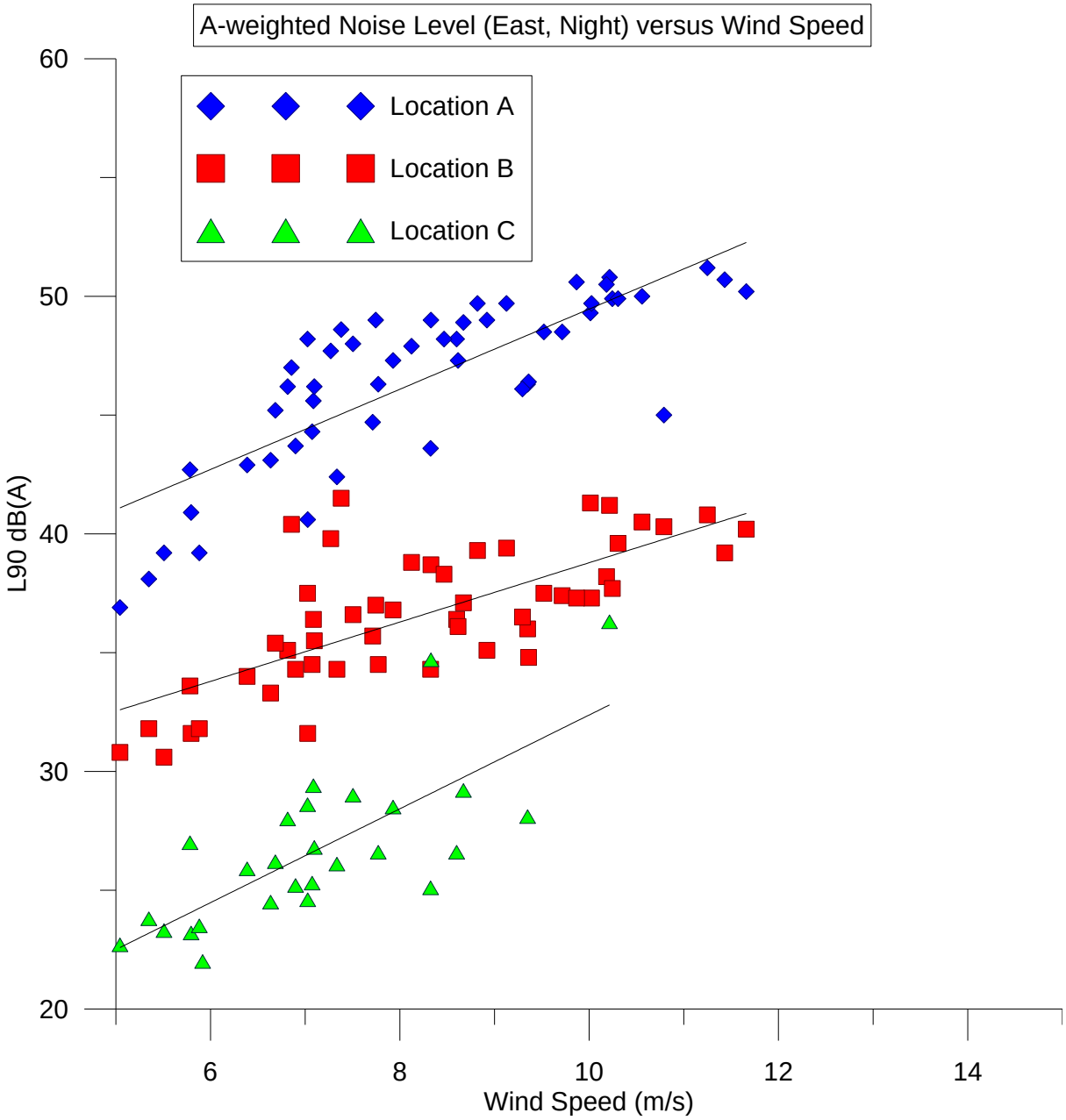

Ambient Measurements
Tuesday, 6 May 2014
Sound Pressure Level - dB(A)
Start Time of Sample (hr)
Leq
L10
L95
Wind Speed (m/s)
Wind Direction
Power (kW)
Cape Bridgewater
SVAN 979 35804
Location E

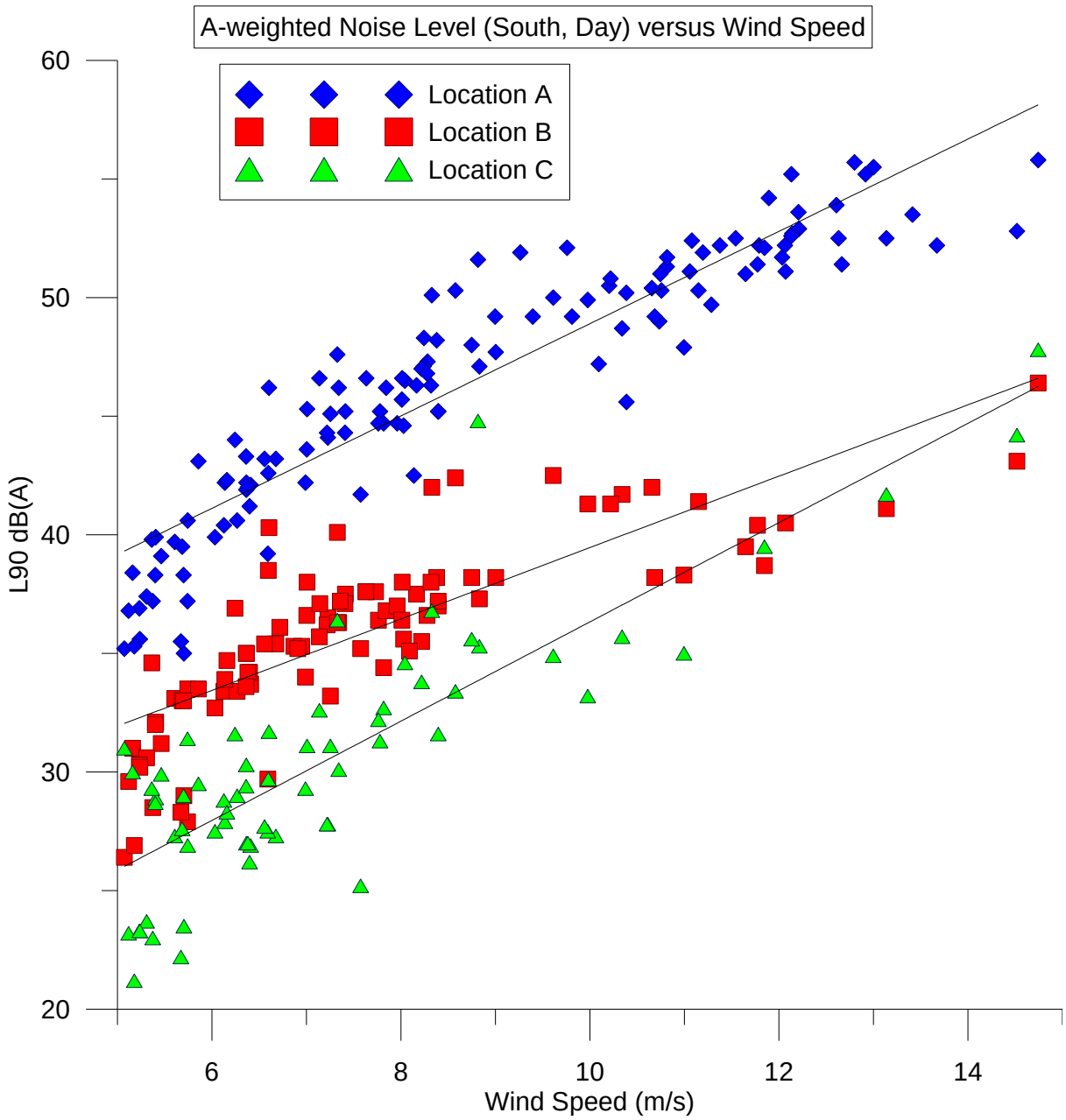
APPENDIX H: Pre-test Analysis

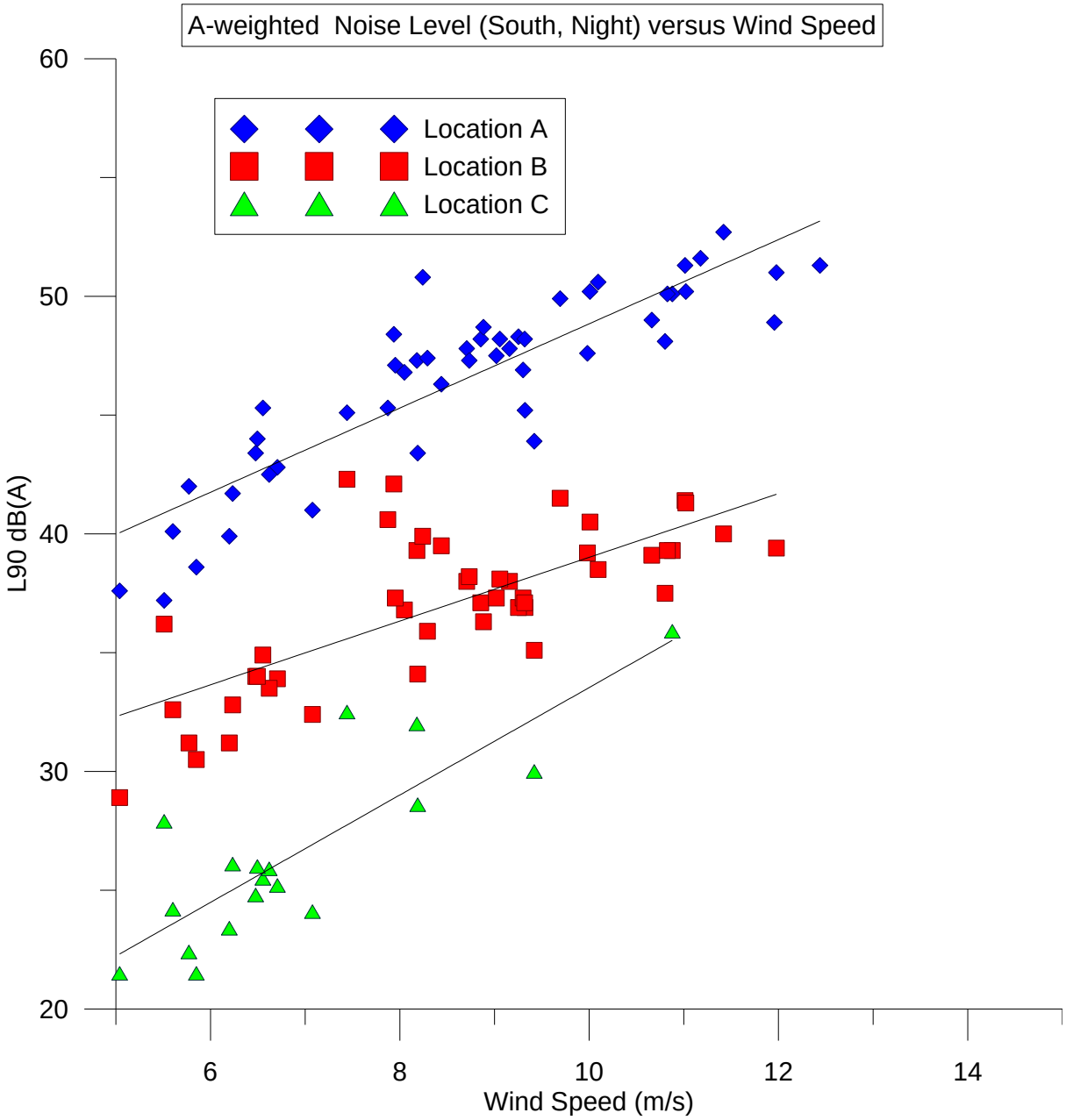


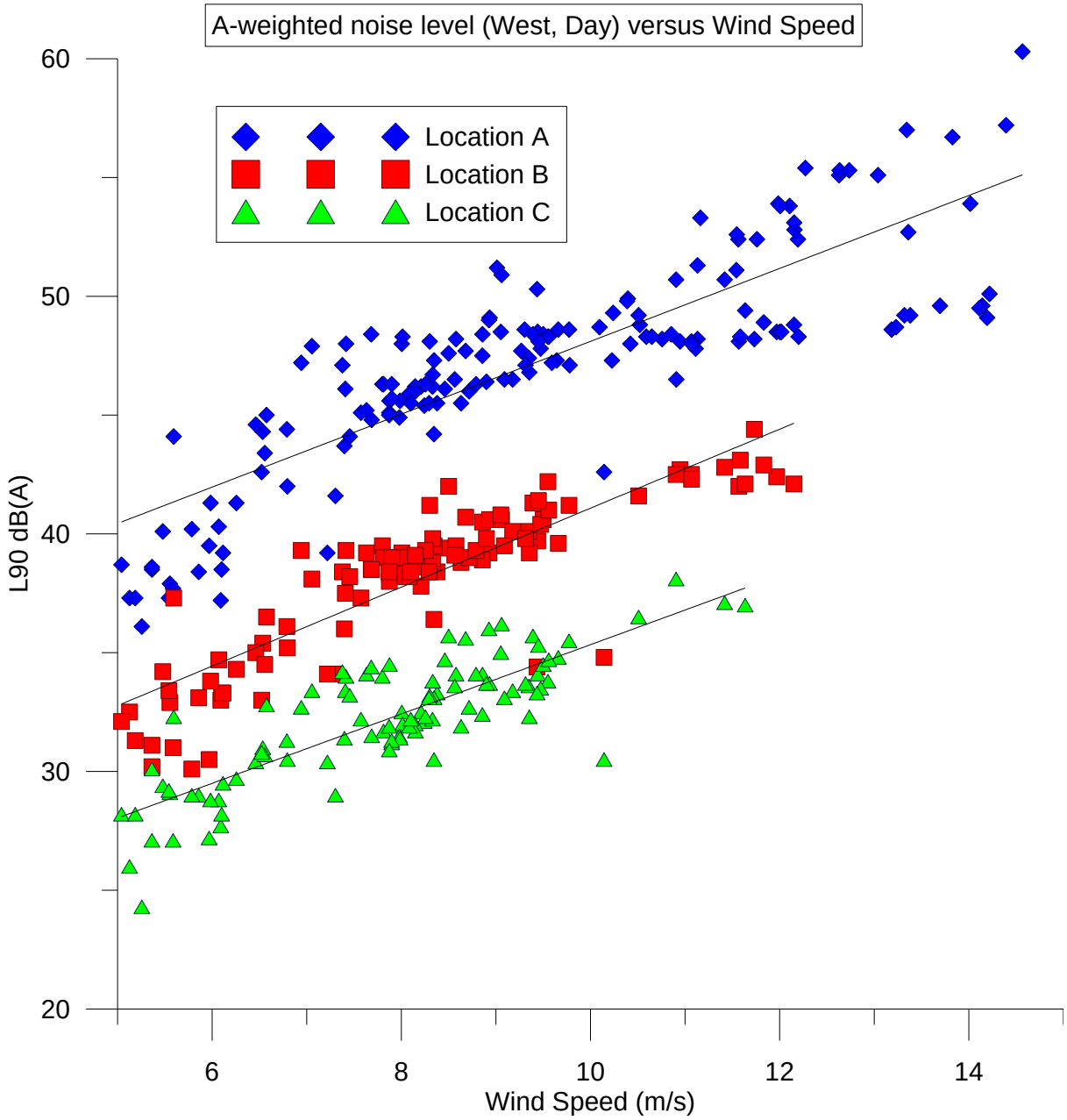

A-weighted Noise Level (Night) versus Wind Speed
Location A
Location B
Location C
L90 dB(A)
60
50
40
30
20
6
8
10
12
14
Wind Speed (m/s)

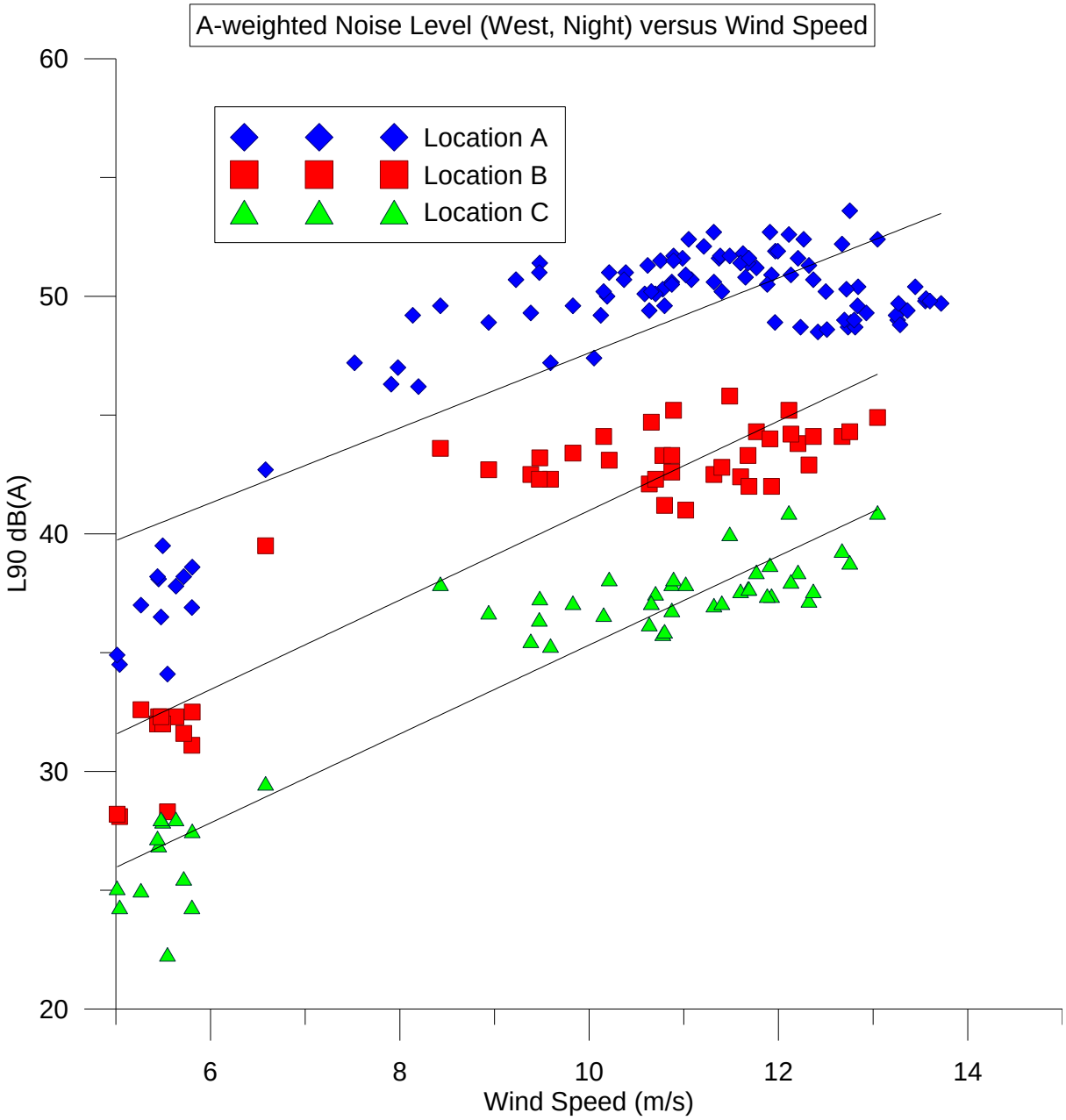

A-weighted Noise Level (East, Day) versus Wind Speed
Location A
Location B
Location C
L90 dB(A)
60
50
40
30
20
6
8
10
12
14
Wind Speed (m/s)

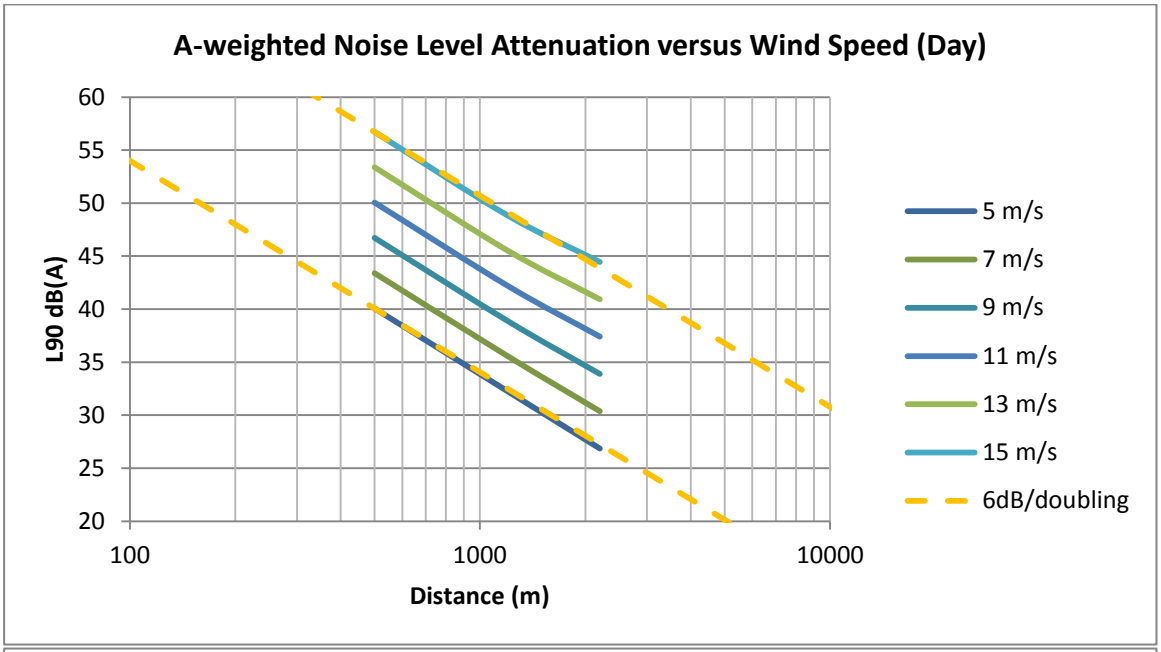

A-weighted Noise Level (East, Night) versus Wind Speed
Location A
Location B
Location C
L90 dB(A)
60
50
40
30
20
6
8
10
12
14
Wind Speed (m/s)

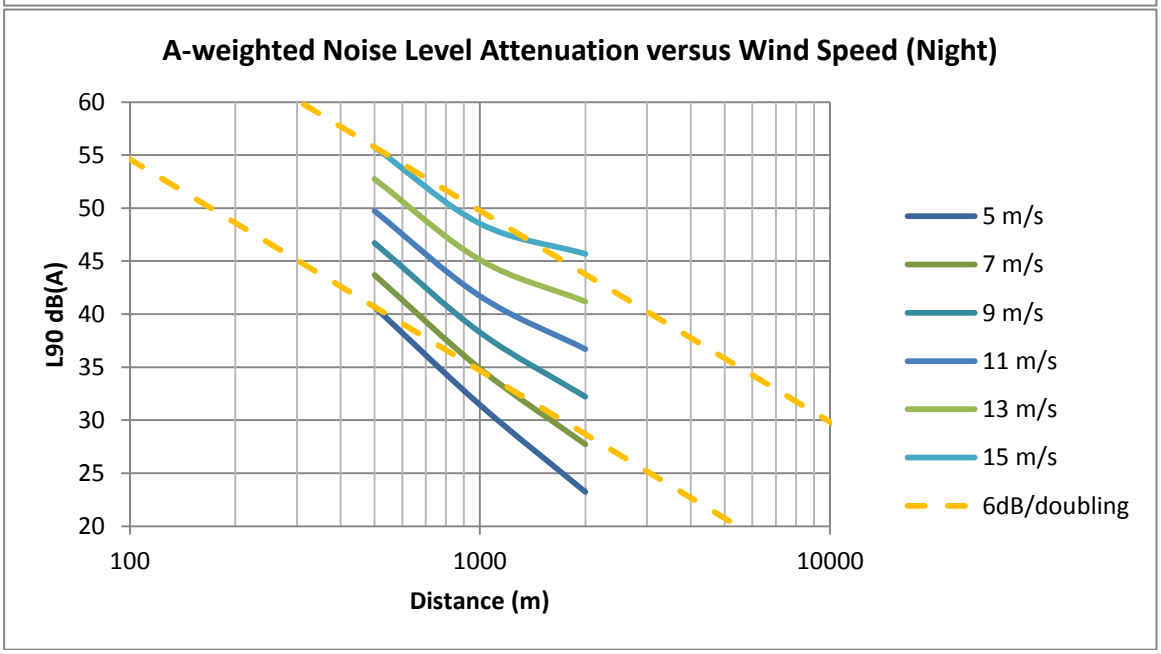

A-weighted Noise Level (South, Day) versus Wind Speed
Location A
Location B
Location C
L90 dB(A)
60
50
40
30
20
6
8
10
12
14
Wind Speed (m/s)

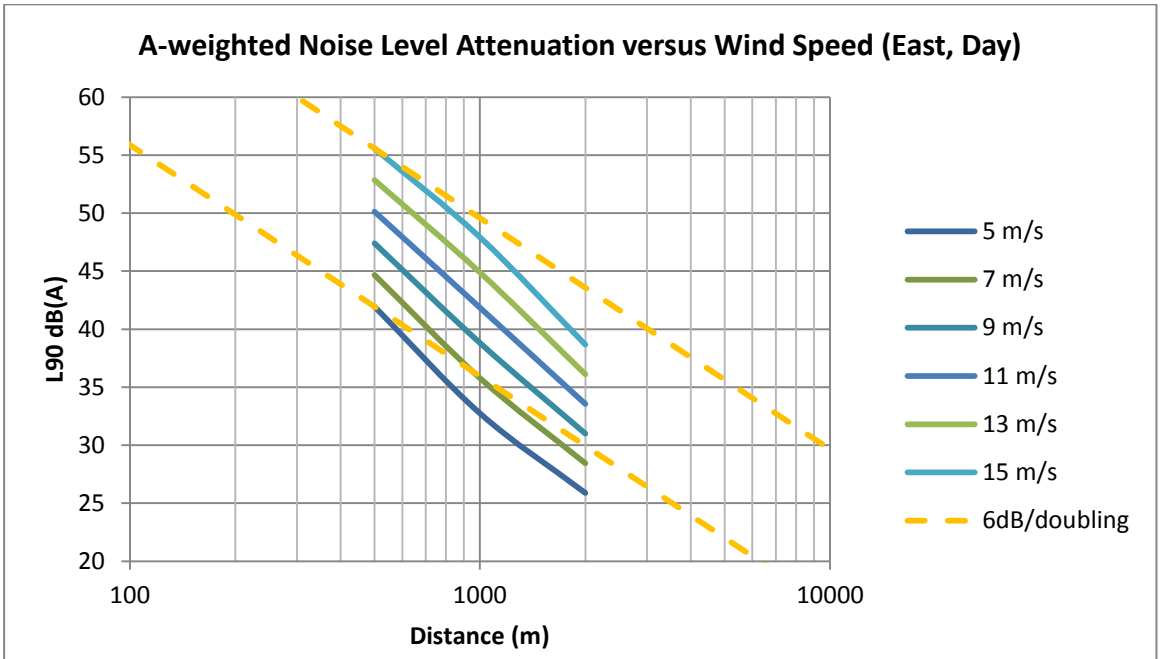

A-weighted Noise Level (South, Night) versus Wind Speed
Location A
Location B
Location C
L90 dB(A)
60
50
40
30
20
6
8
10
12
14
Wind Speed (m/s)

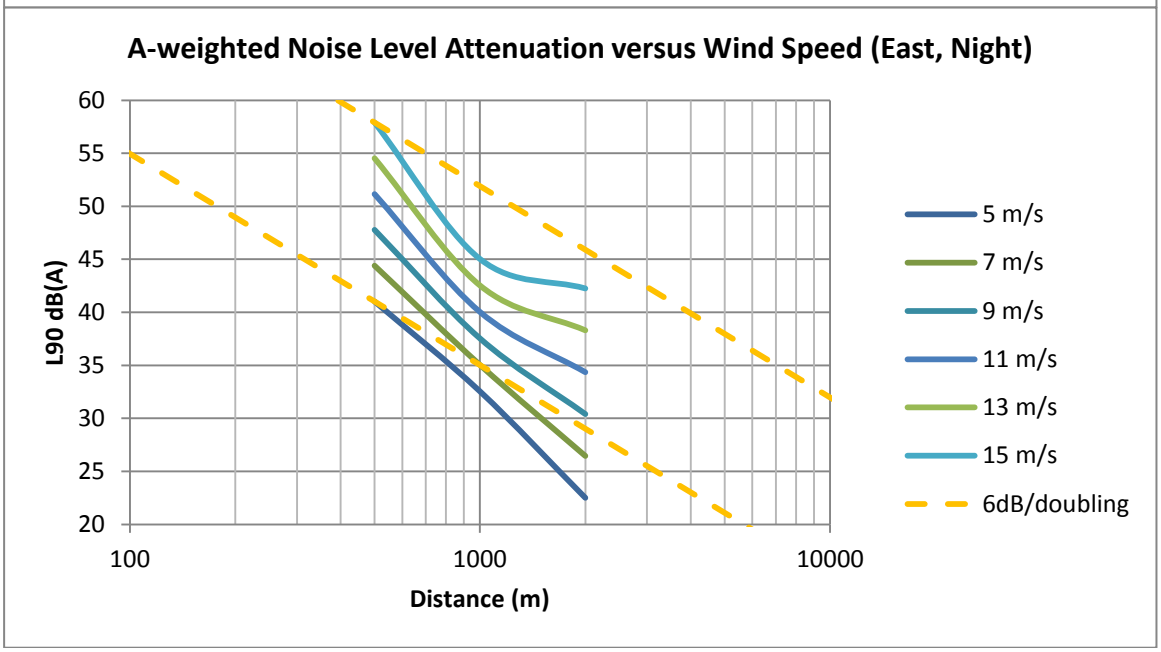

A-weighted noise level (West, Day) versus Wind Speed
Location A
Location B
Location C
L90 dB(A)
60
50
40
30
20
6
8
10
12
14
Wind Speed (m/s)

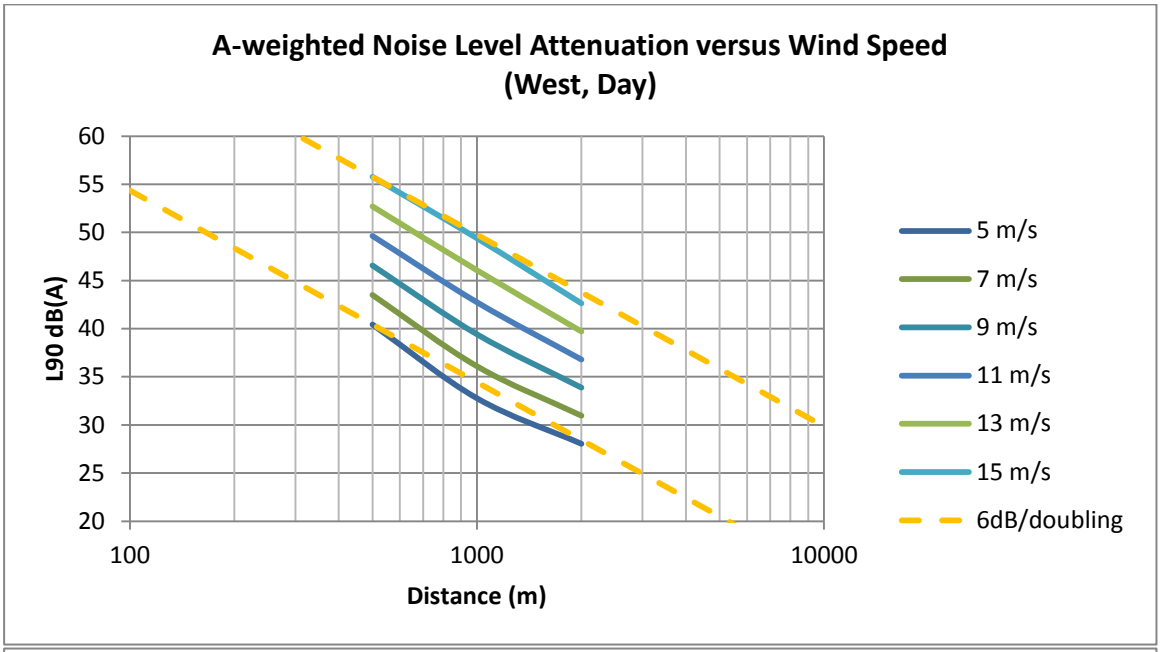

A-weighted Noise Level (West, Night) versus Wind Speed
Location A
Location B
Location C
L90 dB(A)
60
50
40
30
20
6
8
10
12
14
Wind Speed (m/s)

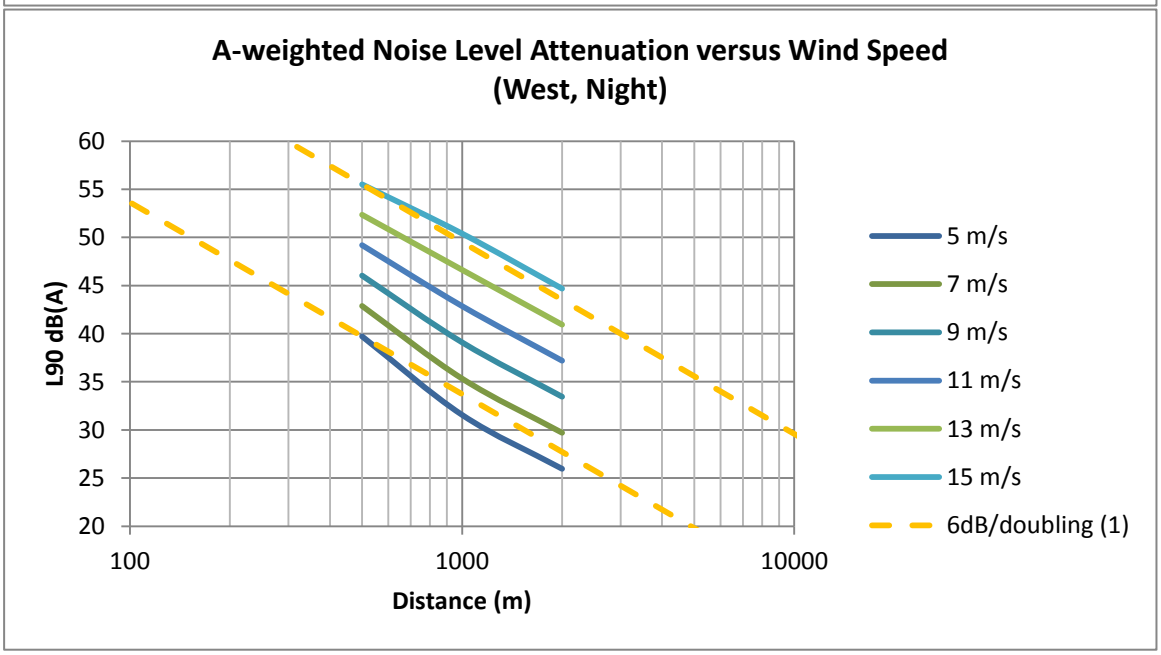

A-weighted Noise Level Attenuation versus Wind Speed (Day)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling

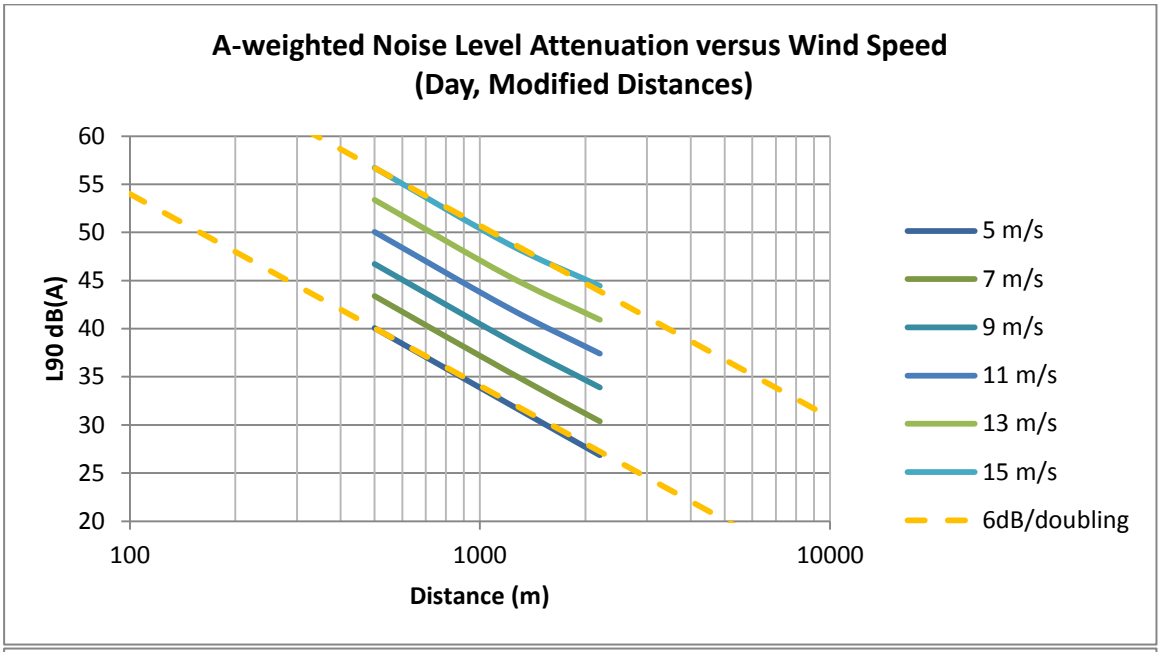

A-weighted Noise Level Attenuation versus Wind Speed (Night)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling

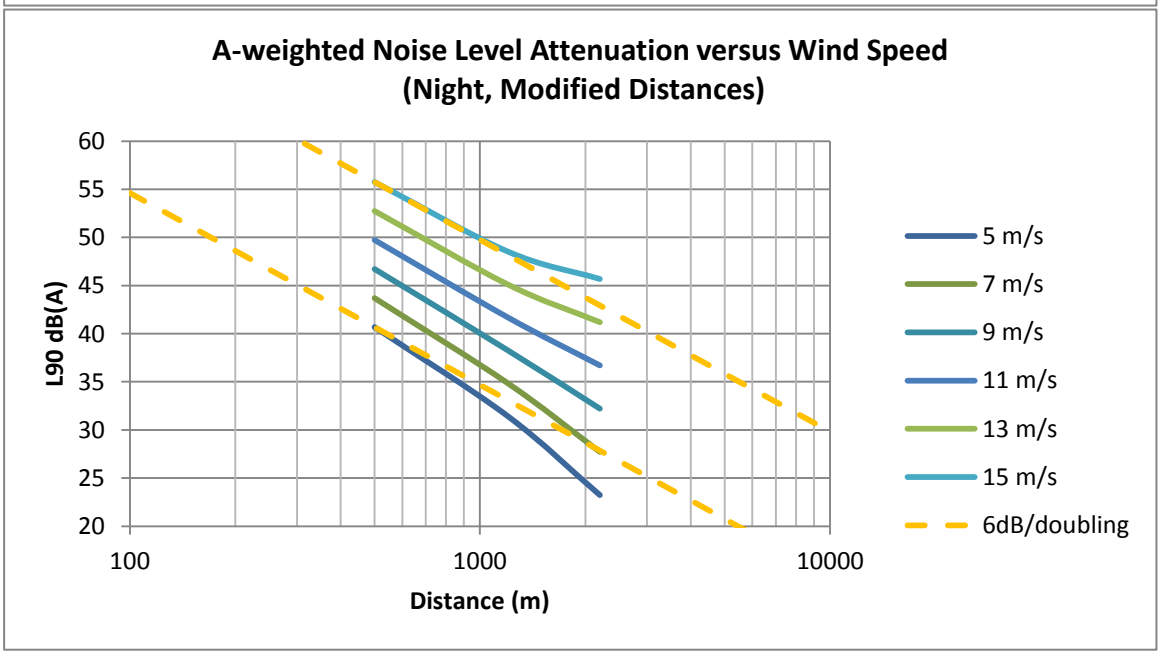

A-weighted Noise Level Attenuation versus Wind Speed (East, Day)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling

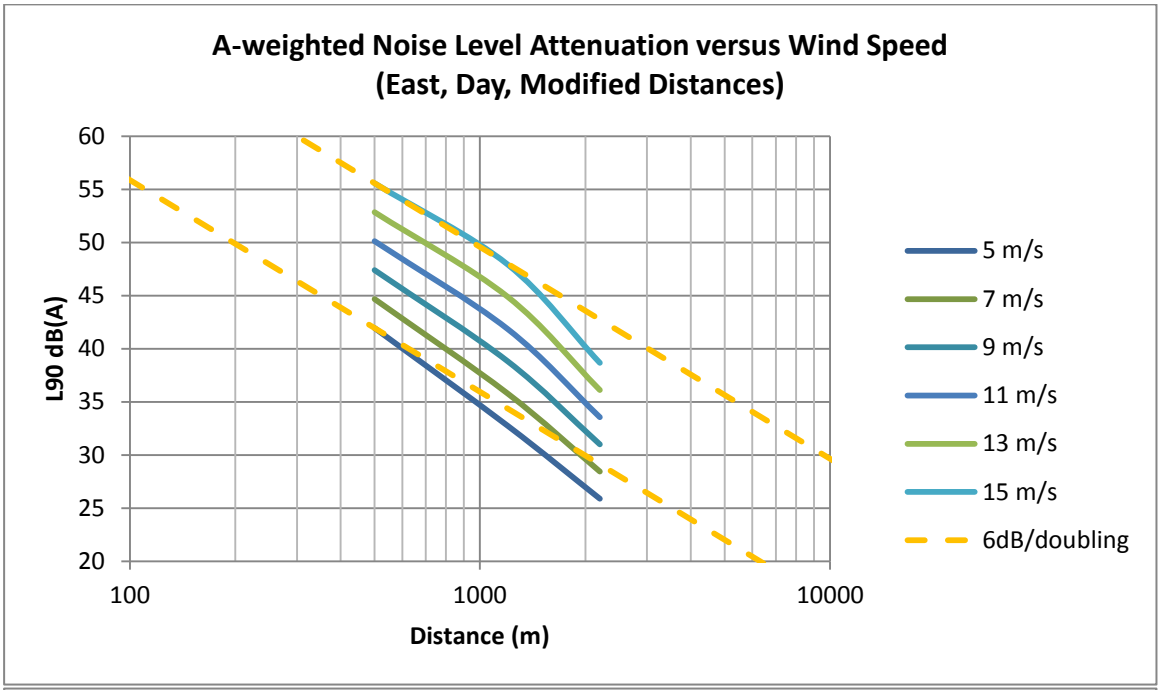

A-weighted Noise Level Attenuation versus Wind Speed (East, Night)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling

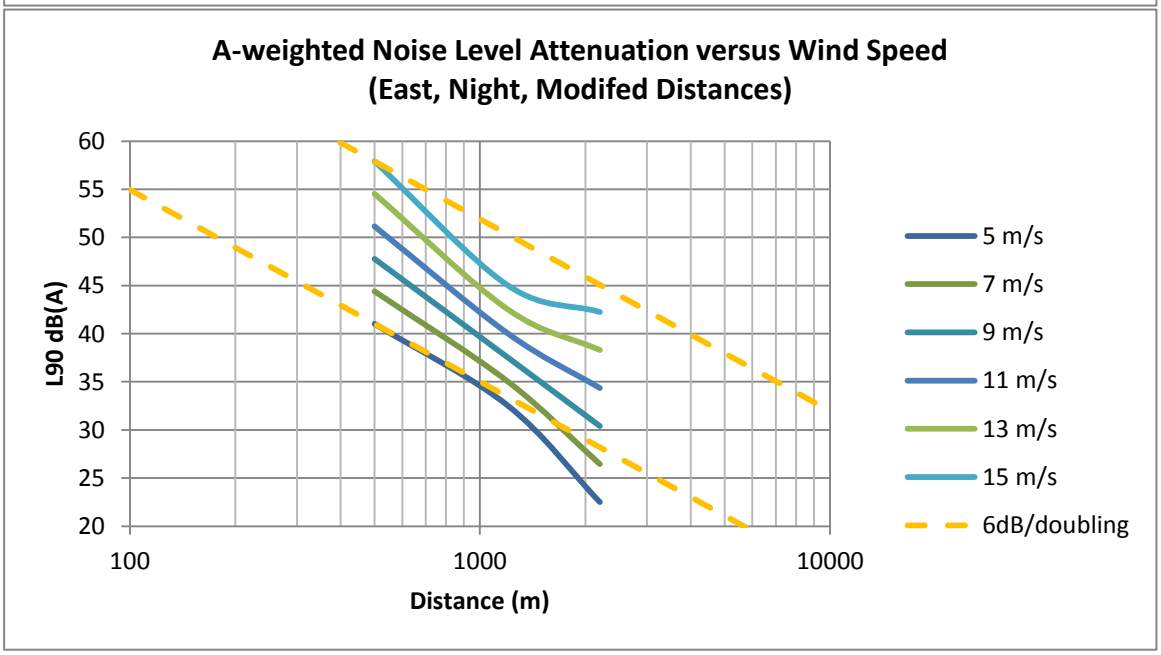

A-weighted Noise Level Attenuation versus Wind Speed
(West, Day)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling

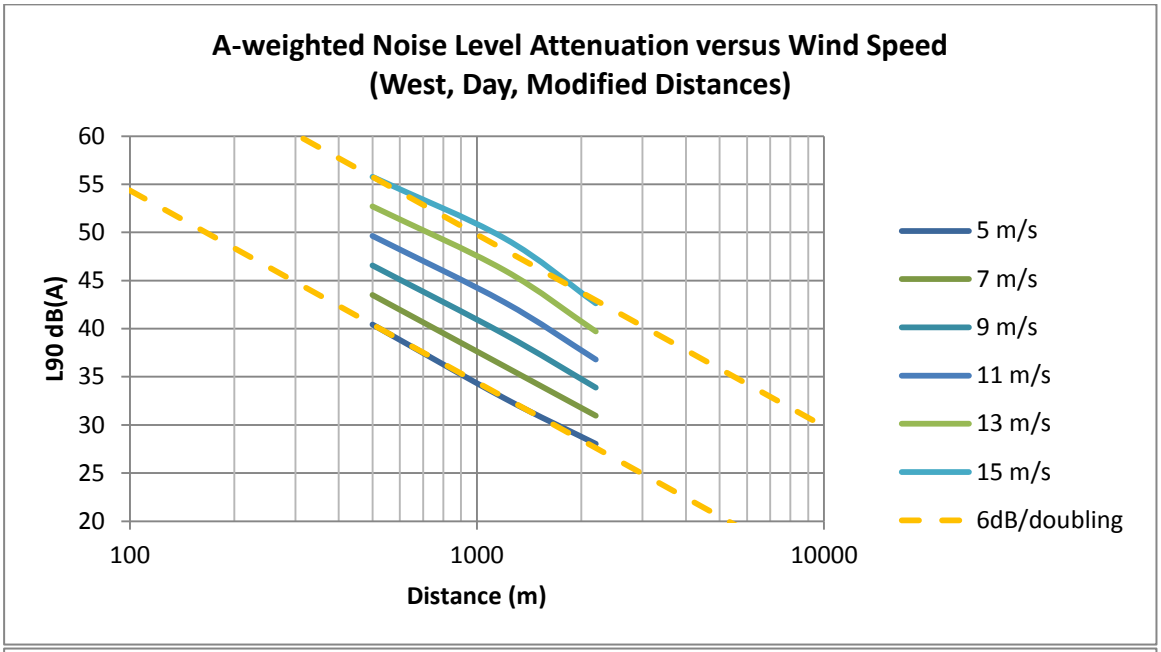

A-weighted Noise Level Attenuation versus Wind Speed
(West, Night)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling (1)

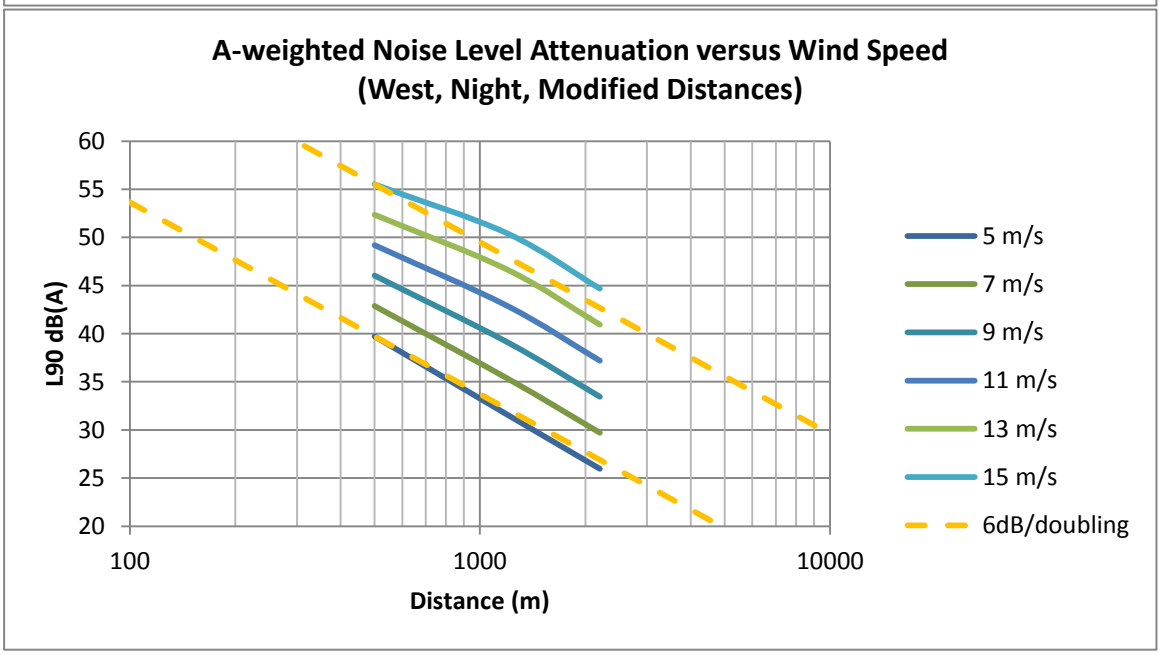

A-weighted Noise Level Attenuation versus Wind Speed
(Day, Modified Distances)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling

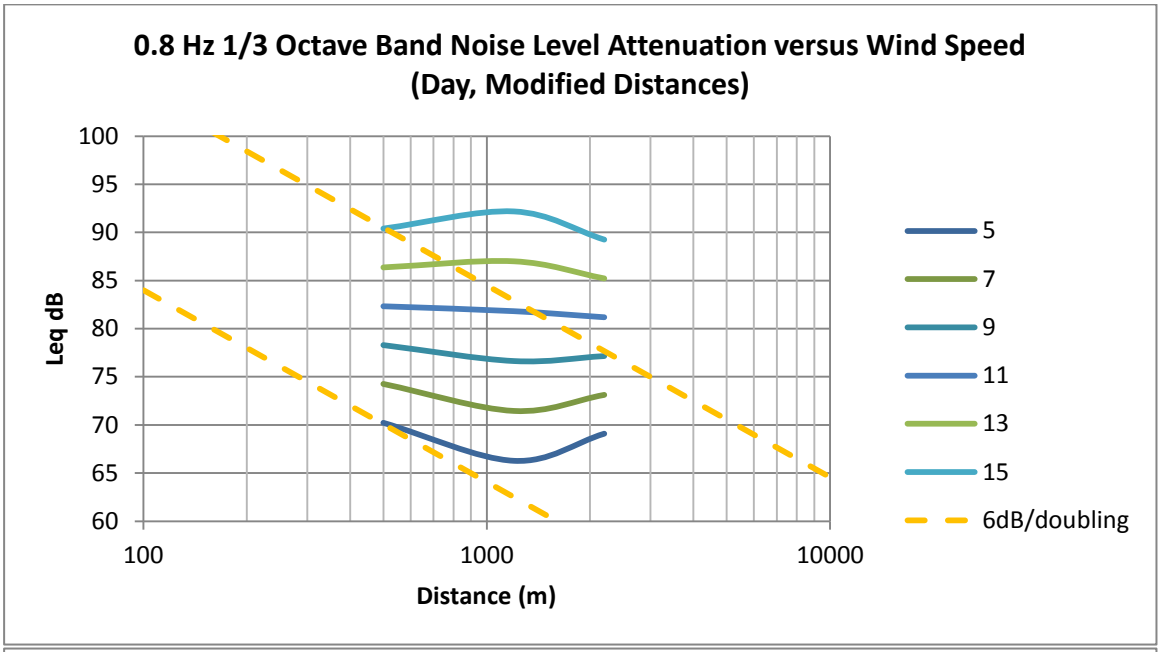

A-weighted Noise Level Attenuation versus Wind Speed
(Night, Modified Distances)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling

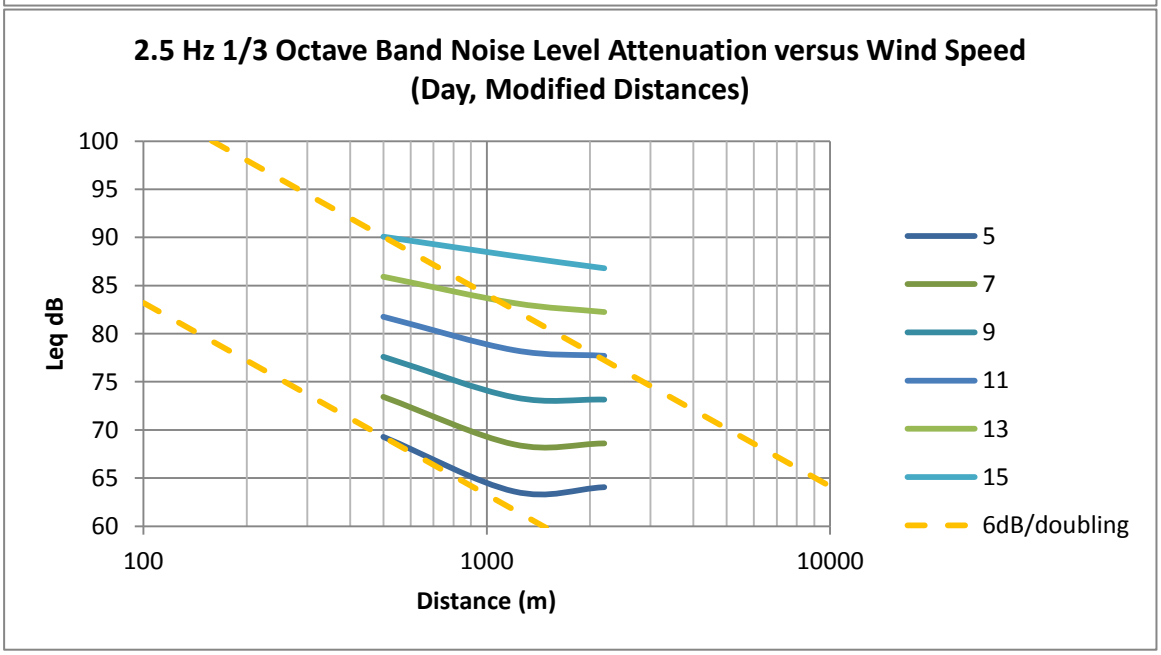

A-weighted Noise Level Attenuation versus Wind Speed
(East, Day, Modified Distances)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling

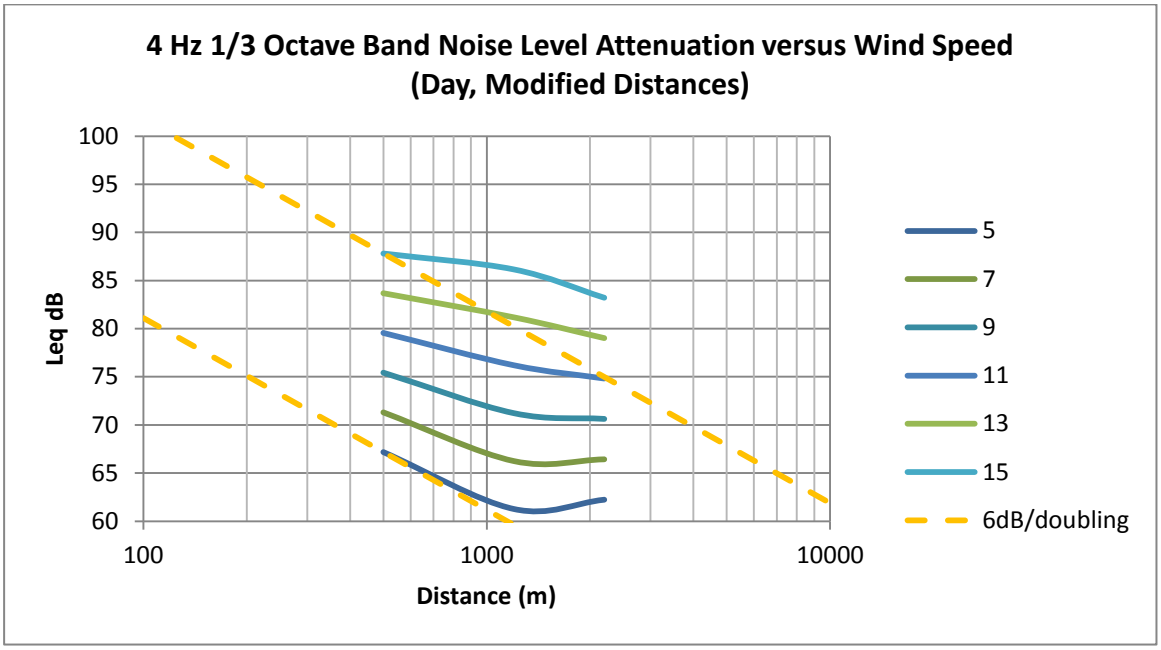

A-weighted Noise Level Attenuation versus Wind Speed
(East, Night, Modifed Distances)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling


A-weighted Noise Level Attenuation versus Wind Speed
(West, Day, Modified Distances)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling


A-weighted Noise Level Attenuation versus Wind Speed
(West, Night, Modified Distances)
L90 dB(A)
60
55
50
45
40
35
30
25
20
100
1000
10000
Distance (m)
5 m/s
7 m/s
9 m/s
11 m/s
13 m/s
15 m/s
6dB/doubling


0.8 Hz 1/3 Octave Band Noise Level Attenuation versus Wind Speed
(Day, Modified Distances)
Leq dB
100
95
90
85
80
75
70
65
60
100
1000
10000
Distance (m)
5
7
9
11
13
15
6dB/doubling


2.5 Hz 1/3 Octave Band Noise Level Attenuation versus Wind Speed
(Day, Modified Distances)
Leq dB
100
95
90
85
80
75
70
65
60
100
1000
10000
Distance (m)
5
7
9
11
13
15
6dB/doubling


4 Hz 1/3 Octave Band Noise Level Attenuation versus Wind Speed
(Day, Modified Distances)
Leq dB
100
95
90
85
80
75
70
65
60
100
1000
10000
Distance (m)
5
7
9
11
13
15
6dB/doubling