APPENDICES

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Appendix 2.3.1

Noise Calibration Certificates

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Certificate of Calibration

Cirrus Research plc

Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	Acoustic Calibrator
Model Number	CR:513A
Serial Number	032884

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 IEC standard Electroacoustics - Sound Calibrators IEC 60942:1997 and BS EN 60942:1998. 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 at Hunmanby UK YO14 0PH. These are traceable to UK national standards {A.0.6}. The standards are:

Microphone Type	B&K4192	Serial Number	1920791	Calibration Ref.	S 5170
Pistonphone Type	B&K4220	Serial Number	613843	Calibration Ref.	S 5169

Calibration Climatic Conditions

These 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 bank 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)

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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	93.96	dB	Permitted band 93.95 to 94.05 dB
104 dB Output	103.92	dB	Permitted band 103.80 to 104.30 dB
Frequency	1006.0	Hz	Permitted band 990 Hz to 1010 Hz

Uncertainty

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

Calibration Date 30 November 2005

Calibration Certificate Number 135377

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

Acoustic House Bridlington Road Hunmanby North Yorkshire YO14 0PH
Telephone 01723 891655 Fax 01723 891742

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Certificate of Calibration

Cirrus Research plc

Equipment Details

Instrument Manufacturer	Cirrus Research plc
Instrument Type	Sound Level Meter
Model Number	CR:831A
Serial Number	B16438FF

Calibration Procedure

The instrument detailed above has been calibrated to the published test and calibration data as detailed in the instrument handbook, 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 and ANSI S1.43-1997 where applicable.

Sound Level Meters: All Calibration procedures were carried out by substituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.

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Calibration Traceability

The equipment detailed above was calibrated against the calibration laboratory standards held by Cirrus Research plc. which are traceable to the appropriate National Standards.

The Cirrus Research plc calibration laboratory standards are:

Microphone Type	B&K4192	Serial Number	1920791	Calibration Ref.	S 5170
Pistonphone Type	B&K4220	Serial Number	613843	Calibration Ref.	S 5169

Calibrated By	T. A. Goodhill
Calibration Date	30 November 2005
Calibration Certificate Number	135376

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

Acoustic House Bridlington Road Hunmanby North Yorkshire YO14 0PH
Telephone 01723 891655 Fax 01723 891742

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Appendix 2.3.2

Noise Glossary

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GLOSSARY

Ambient Noise

Totally encompassing sound in a given situation at a given time usually composed of a sound from many sources near and far.

Background noise level

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90% of a given time interval,T measured using time weighting F, and quoted to the nearest whole number of decibels.

Day:	**Night:**
0800 hrs to 2200 hrs	2200 hrs to 0800 hrs

Decibel (dB)

The unit of sound pressure level, calculated as a logarithm of the intensity of sound. 0 dB is the threshold of hearing, 140 dB is the threshold of pain. A change of 1 dB is detectable only under laboratory conditions. A change of 10 dB corresponds approximately to halving or doubling the loudness of sound.

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dB(A)

Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sound of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with peoples assessment of loudness.

Hertz (Hz)

Unit of frequency (pitch) of a sound.

Impulsive Noise

A noise which is of short duration (typically less than one second), the sound pressure level of which is significantly higher than the background.

1/3 Octave band analysis

Frequency analysis of sound such that the frequency spectrum is sub divided into bands of one third of an octave each. An octave is taken to be the frequency interval, the upper limit of which is twice the lower limit (in Hertz).

$L(A)_{eq}$

Equivalent Continuous A-weighted Sound Level. The continuous steady noise level, which would have the same total A-weighted acoustic energy as the real fluctuating noise measured over the same period of time.

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$L(A)_{10}$

The noise level that is equaled or exceeded for 10% of the measurement period.

$L(A)_{90}$

The noise level that is equaled or exceeded for 90% of the measurement period.

Noise

Unwanted sound. Any sound which has the potential to cause disturbance, discomfort or psychological stress to a subject exposed to it, or any sound which has the potential to cause actual physiological harm to a subject exposed to it or physical damage to any structure exposed to it, is known as noise.

Noise Sensitive Receptor

A noise sensitive receptor is regarded as any dwelling house, hotel or hostel, health building, educational establishment, places of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.

Rating level L_{ArTr}

The specific noise level plus any adjustment for the characteristic features of the noise.

Residual Noise

The ambient noise remaining at a given position in a given situation when the specific noise source is suppressed to a degree such that it does not contribute to the ambient noise.

Sound Power

The energy output from a source. It is measured in Watts (W).

Specific Noise source

The noise source under investigation for assessing the likelihood of complaints.

Tone

A noise with a narrow frequency composition.

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Appendix 2.3.3

Noise Graphs

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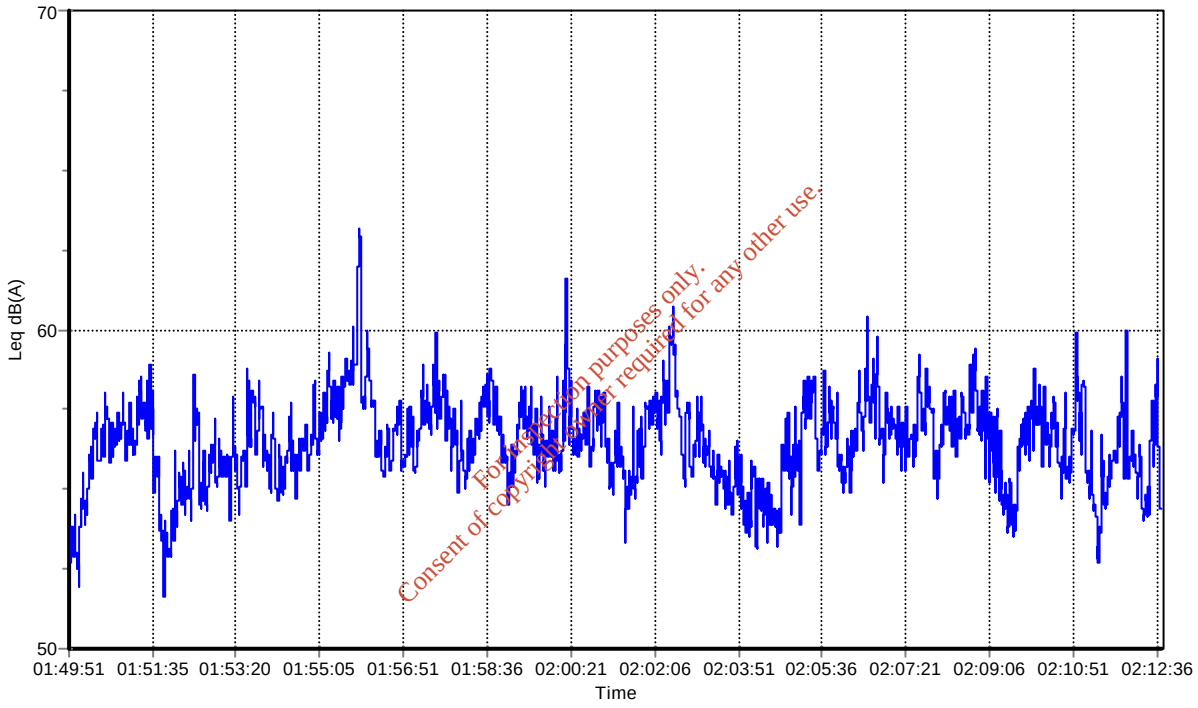
Noise Measurement Report

Date: 25/11/05 Time: 01:49:51

Run Time: 00:22:52
Range: 30-90 dB

Leq	56.7 dBA
Lepd	43.5 dBA
LAE	87.9 dBA
LAFmax	64.5 dBA
Peak	93.6 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
60.2 dBA	58.2 dBA	56.5 dBA	54.6 dBA	54.0 dBA	52.9 dBA



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Notes: N1 - Broadband Measurement

Printed: 15/12/05 13:50:54

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Noise Measurement Report

Date: 25/11/05 Time: 02:37:23

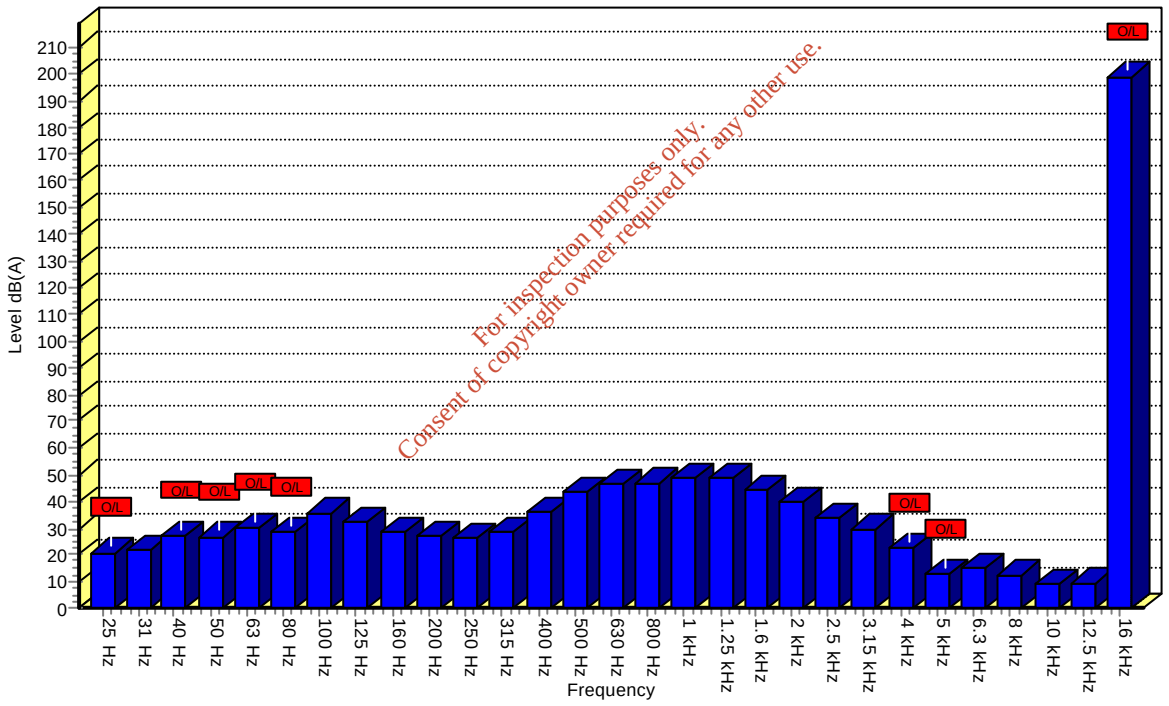
Run Time: 00:04:48
Range: 30-90 dB
Spectrum 'A' weighted

Measurement	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Level (dB)	20.8^	21.9	27.2^	26.7^	30.2^	28.4^	35.4	32.1	28.7	27.4	26.3
Duration (s)	9	9	9	9	9	9	9	9	9	9	9

Measurement	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz
Level (dB)	28.7	36.0	43.7	46.7	47.3	48.6	48.6	44.3	39.9	33.9	29.7
	9	9	9	9	9	9	9	9	9	9	9

Measurement	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq
Level (dB)	22.6^	12.8^	15.4	12.3	9.1	9.5	198.6	53.3	65.6	75.7^
Duration (s)	9	9	9	9	9	9	9	9	9	9

^ indicates overload



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Notes: N1 - 1/3 Octave Frequency Anaysis

Printed: 15/12/05 13:52:17

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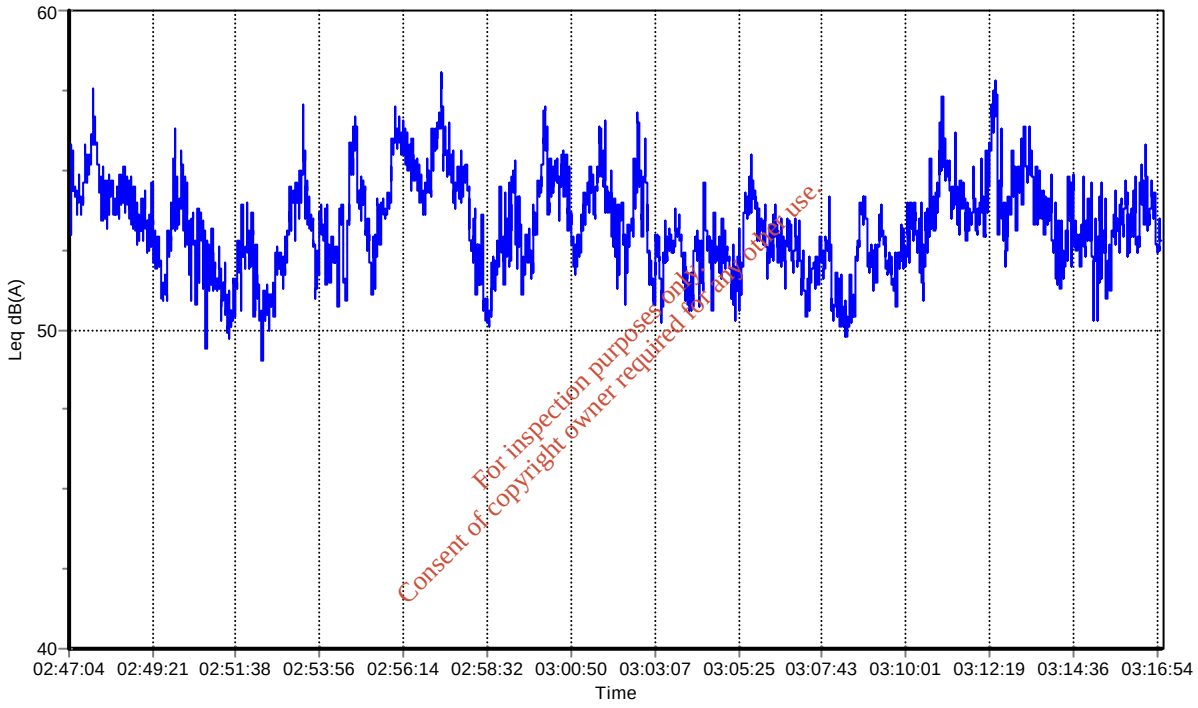
Noise Measurement Report

Date: 25/11/05 Time: 02:47:04

Run Time: 00:30:00
Range: 30-90 dB

Leq	53.5 dBA
Lepd	41.5 dBA
LAE	85.9 dBA
LAFmax	59.5 dBA
Peak	83.7 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	61.3 dBA	53.5 dBA	51.2 dBA	50.6 dBA	49.1 dBA



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Notes: N2 - Broadband Measurement

Printed: 15/12/05 13:53:03

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Noise Measurement Report

Date: 25/11/05 Time: 03:17:26

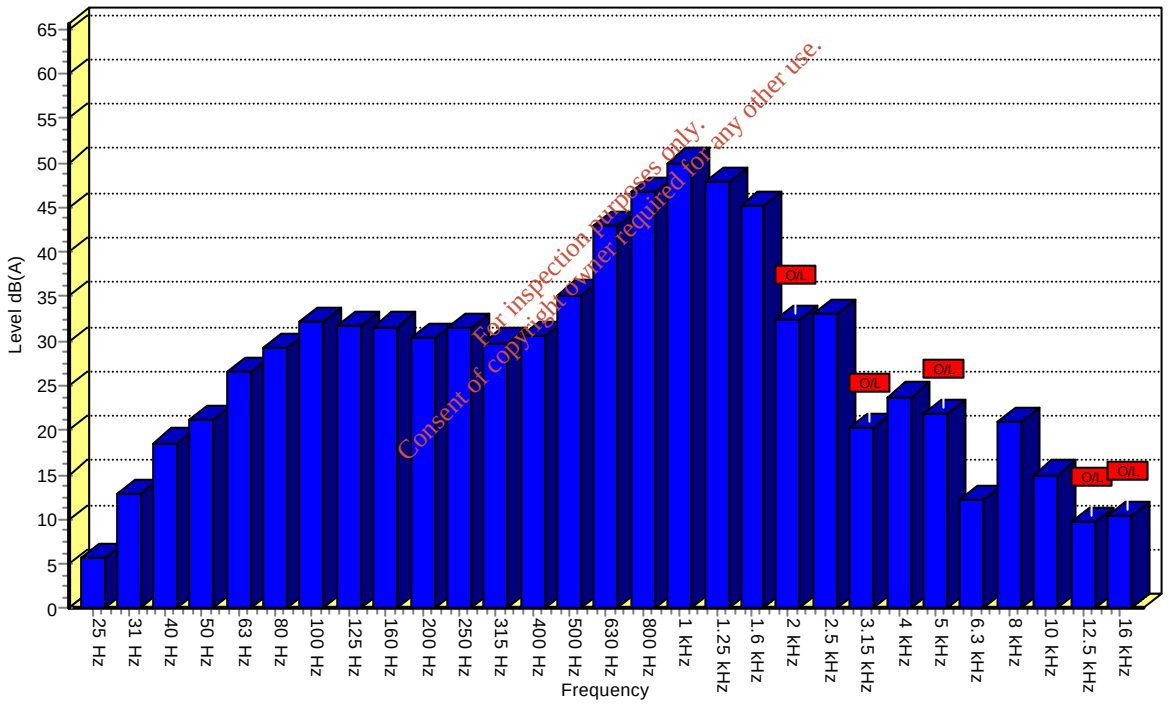
Run Time: 00:04:48
Range: 30-90 dB
Spectrum 'A' weighted

Measurement	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Level (dB)	5.7	12.8	18.5	21.2	26.6	29.3	32.2	31.7	31.7	30.4	31.4
Duration (s)	9	9	9	9	9	9	9	9	9	9	9

Measurement	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz
Level (dB)	29.8	30.4	35.1	42.9	46.8	50.0	47.9	45.1	32.4^	33.0	20.3^
	9	9	9	9	9	9	9	9	9	9	9

Measurement	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq
Level (dB)	23.8	21.8^	12.1	21.0	15.1	9.7^	10.3^	53.6	65.2	74.8
Duration (s)	9	9	9	9	9	9	9	9	9	9

^ indicates overload



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Notes: N2 - 1/3 Octave Frequency Analysis

Printed: 15/12/05 13:54:00

EPA Export 26-07-2013:03:19:04

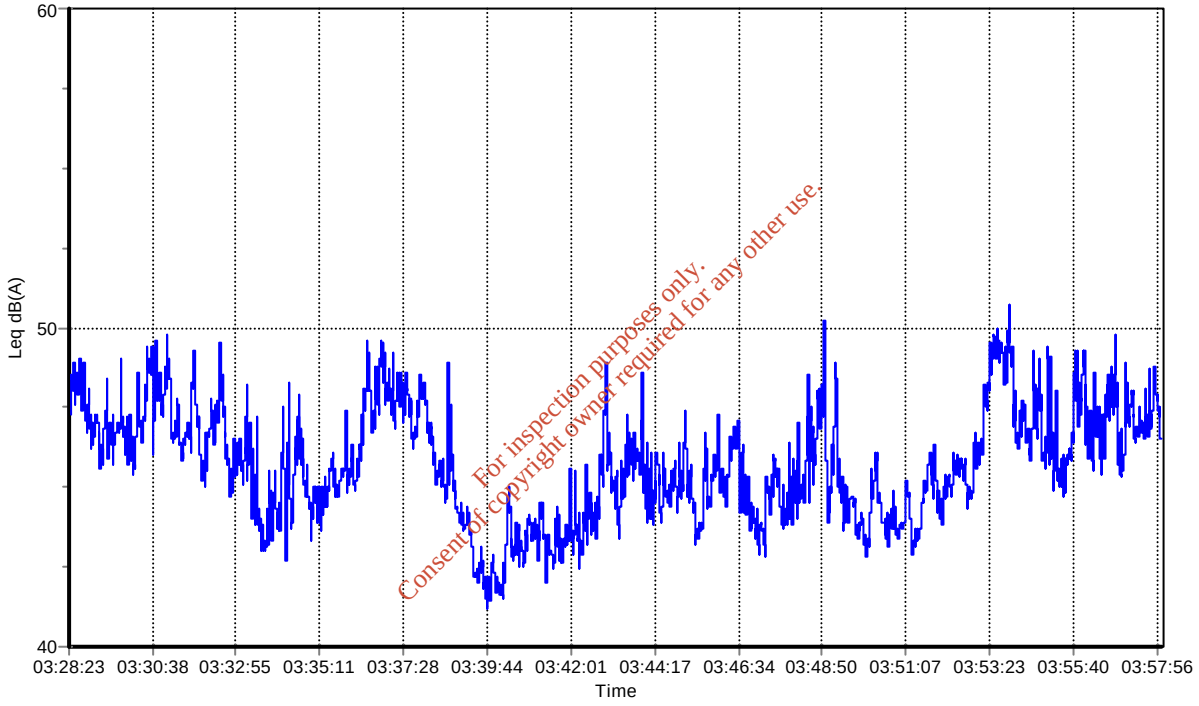
Noise Measurement Report

Date: 25/11/05 Time: 03:28:23

Run Time: 00:29:43
Range: 30-90 dB

Leq	46.1 dBA
Lepd	34.0 dBA
LAE	78.4 dBA
LAFmax	53.6 dBA
Peak	77.4 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	49.3 dBA	45.8 dBA	43.2 dBA	42.6 dBA	41.5 dBA



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Notes: N3 - Broadband Measurement

Printed: 15/12/05 13:54:43

EPA Export 26-07-2013:03:19:05

Noise Measurement Report

Date: 25/11/05 Time: 03:58:23

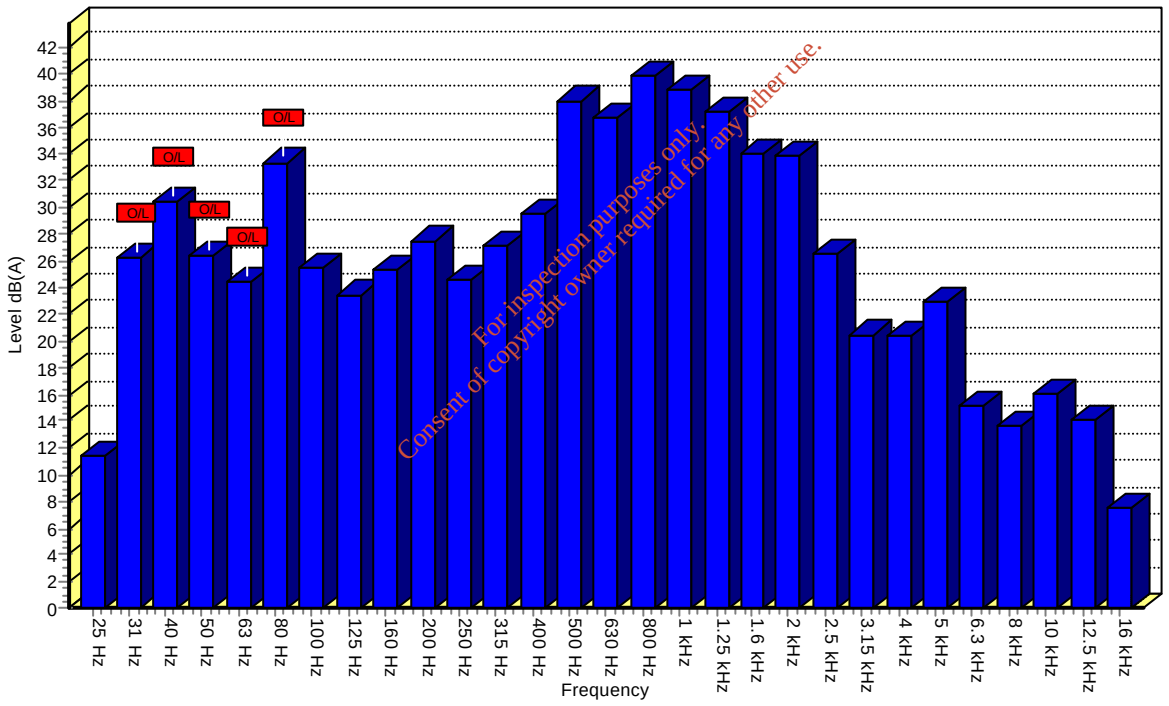
Run Time: 00:04:48
Range: 30-90 dB
Spectrum 'A' weighted

Measurement	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Level (dB)	11.4	26.2^	30.4^	26.4^	24.3^	33.3^	25.5	23.5	25.3	27.6	24.5
Duration (s)	9	9	9	9	9	9	9	9	9	9	9

Measurement	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz
Level (dB)	27.2	29.5	38.0	36.7	39.9	38.8	37.1	34.0	33.9	26.6	20.4
	9	9	9	9	9	9	9	9	9	9	9

Measurement	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq
Level (dB)	20.4	23.0	15.2	13.6	16.1	14.1	7.5	50.7	59.7	67.0
Duration (s)	9	9	9	9	9	9	9	9	9	9

^ indicates overload



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Notes: N3 - 1/3 Octave Frequency

Printed: 15/12/05 13:55:47

EPA Export 26-07-2013:03:19:05

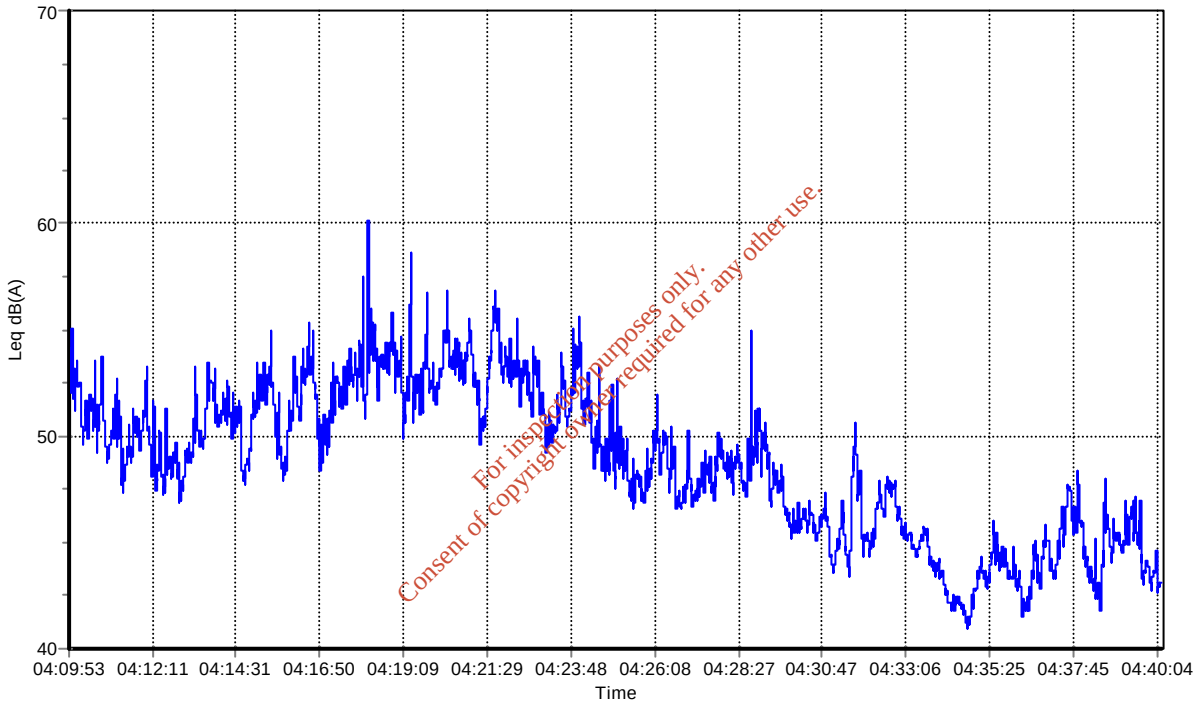
Noise Measurement Report

Date: 25/11/05 Time: 04:09:53

Run Time: 00:30:00
Range: 30-90 dB

Leq	50.1 dBA
Lepd	38.1 dBA
LAE	82.5 dBA
LAFmax	62.1 dBA
Peak	86.7 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	59.9 dBA	49.5 dBA	43.6 dBA	42.8 dBA	41.4 dBA



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Notes: N4 - Broadband Measurement

Printed: 15/12/05 13:57:17

EPA Export 26-07-2013:03:19:05

Noise Measurement Report

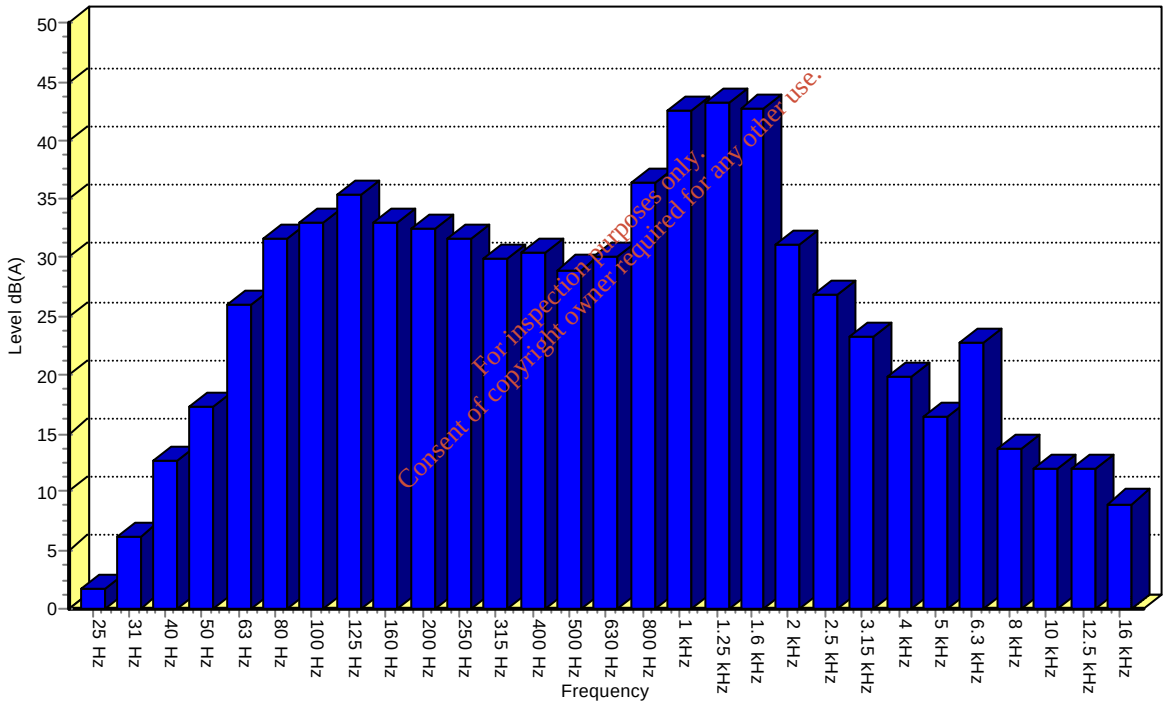
Date: 25/11/05 Time: 04:40:34

Run Time: 00:04:48
Range: 30-90 dB
Spectrum 'A' weighted

Measurement	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Level (dB)	1.6	6.1	12.7	17.3	26.0	31.5	33.1	35.3	33.0	32.5	31.7
Duration (s)	9	9	9	9	9	9	9	9	9	9	9

Measurement	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz
Level (dB)	30.0	30.4	29.0	30.1	36.4	42.5	43.2	42.6	31.1	26.8	23.3
	9	9	9	9	9	9	9	9	9	9	9

Measurement	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq
Level (dB)	19.9	16.4	22.7	13.7	11.9	12.0	9.0	47.0	60.7	65.4
Duration (s)	9	9	9	9	9	9	9	9	9	9



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Notes: N4 - 1/3 Octave Frequency Analysis

Printed: 15/12/05 13:58:39

EPA Export 26-07-2013:03:19:05

Noise Measurement Report

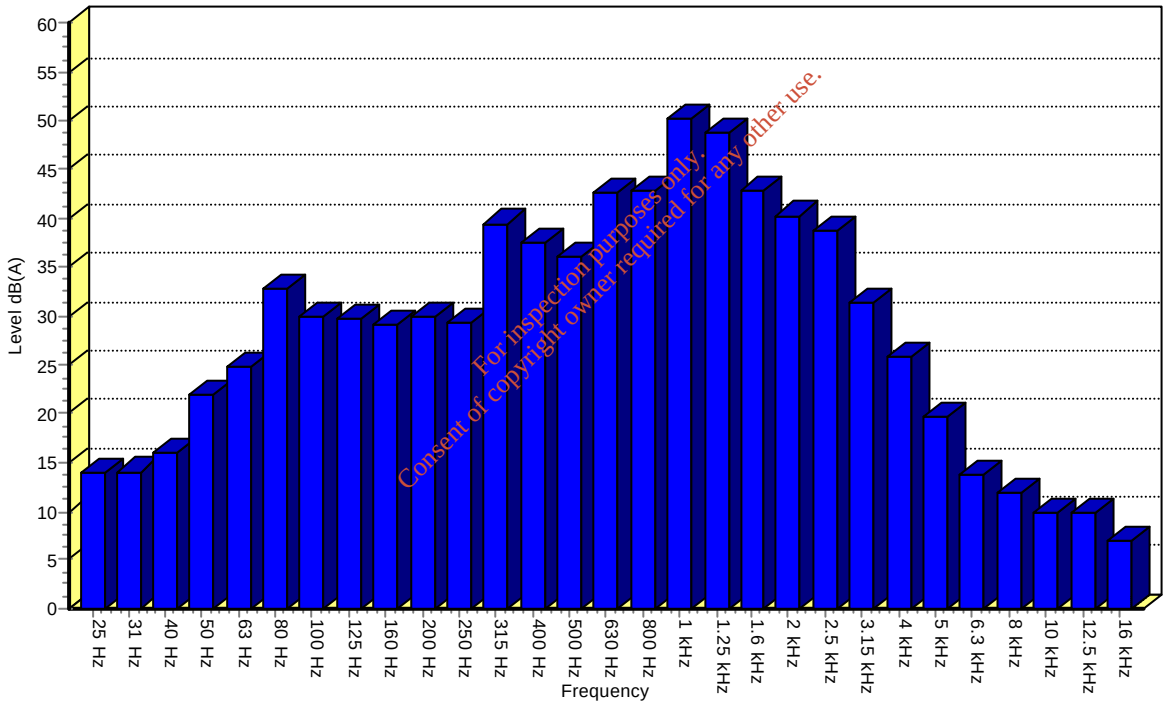
Date: 25/11/05 Time: 05:22:06

Run Time: 00:04:48
Range: 30-90 dB
Spectrum 'A' weighted

Measurement	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Level (dB)	13.8	14.1	16.0	21.8	24.8	32.8	29.8	29.6	29.0	29.8	29.4
Duration (s)	9	9	9	9	9	9	9	9	9	9	9

Measurement	315 Hz	400 Hz	500 Hz	630 Hz	800 Hz	1 kHz	1.25 kHz	1.6 kHz	2 kHz	2.5 kHz	3.15 kHz
Level (dB)	39.5	37.5	36.0	42.6	42.9	50.2	48.8	43.0	40.3	38.6	31.3
	9	9	9	9	9	9	9	9	9	9	9

Measurement	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq
Level (dB)	25.8	19.6	13.7	11.9	9.8	9.8	7.1	53.4	68.8	65.9
Duration (s)	9	9	9	9	9	9	9	9	9	9



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Notes: NSL 1 - 1/3 Octave Frequency Analysis

Printed: 15/12/05 14:00:38

EPA Export 26-07-2013:03:19:05

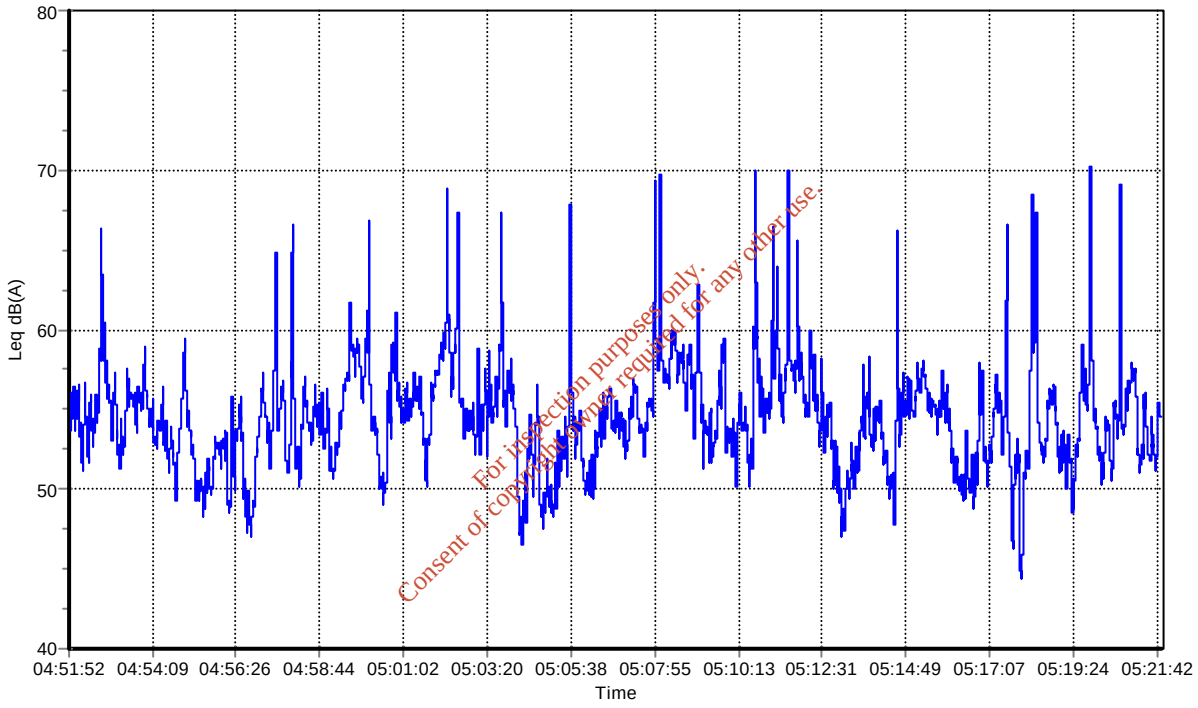
Noise Measurement Report

Date: 25/11/05 Time: 04:51:52

Run Time: 00:30:00
Range: 30-90 dB

Leq	56.2 dBA
Lepd	44.2 dBA
LAE	88.5 dBA
LAFmax	73.9 dBA
Peak	88.9 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	64.2 dBA	54.6 dBA	50.0 dBA	48.7 dBA	45.6 dBA



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Notes: NSL 1 - Broadband Measurement

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Appendix 2.4.1

Trial Pit Logs

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Trial Pit Records

Project No.: CE04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB **Supervisor:** NMu

TRIAL PIT NO.

TP1

Geology:	Depth (m):	Description:
Top Soil	0-0.3	Medium brown soil. slightly loose in content
Slity /clay	0.3 - 1.9	Light brown with slighly orange tint. loose sandy clay

Dominant Matrix: Silt/Clay

Dominant Clasts: Loose fine gravel

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Depth to Rock: unknown

Rock Type: unknown

Static Water Level: unknown

Water Entry: N/A

Total Depth: 1.9m

Comments:

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Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.5 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP2

Geology:	Depth (m):	Description:
Top soil	0.0-0.2	Medium brown top soil slighty loose in content
Slit/Clay	0.2-2.1	Light brown sandy slit/clay

Dominant Matrix: Slit/clay

Dominant Clasts: loose fine gravel

Depth to Rock: Unknown

Rock Type: Unknown

Static Water Level: Unknown

Water Entry: N/A

Total Depth: 2.1m

Comments:

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Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.5 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP3

Geology:	Depth (m):	Description:
Top soil	0.0-0.9	Nedium to light brown in colour, slightly loose in content
Silt/clay	0.9-2.25	Light brown, sandy clay

Dominant Matrix: Silt/clay

Dominant Clasts: fine gravel

Depth to Rock: unknown

Rock Type: unknown

Static Water Level: unknown

Water Entry: N/A

Total Depth: 2.25

Comments:

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Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.5 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP4

Geology:	Depth (m):	Description:
top soil	0.0-0.05	Dark brown thick clay
Clay	0.005-2.2	Medium brown loose clay

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Dominant Matrix: Clay

Dominant Clasts: Fine gravel

Depth to Rock: unknown

Rock Type: unknown

Static Water Level: unknown

Water Entry: N/A

Total Depth: 2.2m

Comments: Top soil has been turned for agricultual use - small crop located in the area

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Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP5

Geology:	Depth (m):	Description:
Top soil	0.0-0.20	Medium brown loose sandy silt clay
Silty clay	0.2 - 2.2	Light brown sandy silty clay

Dominant Matrix: Silty Clay

Dominant Clasts: Coarse sand/Fine gravel

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Depth to Rock: unknown

Rock Type: unknown

Static Water Level: unknown

Water Entry: slight entry at bottom of trail pit

Total Depth: 2.2m

Comments: water entry fron bottom of trail pit

EPA Export 26-07-2013:03:19:05

Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP6

Geology:	Depth (m):	Description:
Top soil	0.0-0.2	Medium brown loose clay
Silt/Clay	0.2-2.1	Medium to light brown sandy silty clay

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Dominant Matrix: Slit/clay

Dominant Clasts: Coarse sand/fine gravel

Depth to Rock: Unknown

Rock Type: Unknown

Static Water Level: Unknown

Water Entry: N/A

Total Depth: 2.1

Comments: Some small stones throuhgout the trail pit

EPA Export 26-07-2013:03:19:05

Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.5 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP7

Geology:	Depth (m):	Description:
top soil	2 inches	Very little top soil
Clay	2.4	Heavy medium brown slightly loose clay

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Dominant Matrix: Clay

Dominant Clasts: Fine gravel

Depth to Rock: Unknown

Rock Type: Unknown

Static Water Level: unknown

Water Entry: N/A

Total Depth: 2.4m

Comments: Area used for small agricultural purposes. Soil looks as if it has been turned

EPA Export 26-07-2013:03:19:05

Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP8

Geology:	Depth (m):	Description:
Clay	unknown	Heavy thick gray dense clay

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Dominant Matrix: Clay

Dominant Clasts: Heavey soft clay

Depth to Rock: Unknown

Rock Type: Unknown

Static Water Level: unknown

Water Entry: Ground level

Total Depth: 1’6 feet into dig

Comments: Swampy area

Broken ceramic water drainage pipe

EPA Export 26-07-2013:03:19:05

Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP9

Geology:	Depth (m):	Description:
Clay	2.15	Lgith to medium brown sandy clay

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Dominant Matrix: Clay

Dominant Clasts: Coarse sand/fine gravel

Depth to Rock: Unknown

Rock Type: Unknown

Static Water Level: Unknown

Water Entry: N/A

Total Depth: 2.15

Comments: No change in soil Horizon throughtout the trail-pit

EPA Export 26-07-2013:03:19:05

Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP10

Geology:	Depth (m):	Description:
Clay	2.4	Light to medium loose brown clay

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Dominant Matrix: Clay

Dominant Clasts: Fine gravel

Depth to Rock: Unknown

Rock Type: Unknown

Static Water Level: Unknown

Water Entry: N/A

Total Depth: 2.4m

Comments: Just a layer of grass - no top soil present

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Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP11

Geology:	Depth (m):	Description:
Clay	0.0-2.3	Medium brown loose sandy clay

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Dominant Matrix: Clay

Dominant Clasts: Coarse sand, fone gravel

Depth to Rock: unknown

Rock Type: unknown

Static Water Level: unknown

Water Entry: N/A

Total Depth: 2.3

Comments: Some large boulders throughout

EPA Export 26-07-2013:03:19:05

Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP12

Geology:	Depth (m):	Description:
Top soil	0.0-0.14	Medium brown loose top soil
Silt/clay	0.14-2.12	Light brown sandy silty clay

Dominant Matrix: silty clay

Dominant Clasts: Coarse sand, fine gravel

Depth to Rock: unknown

Rock Type: unknown

Static Water Level: unknown

Water Entry: N/A

Total Depth: 2.12

Comments:

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Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP13

Geology:	Depth (m):	Description:
Slit/Clay	2.3	Medium to light brown throughout, sandy slitty clay

Dominant Matrix: Slit/clay

Dominant Clasts: Fine gravel with some large boulders

Depth to Rock: Unknown

Rock Type: Unknown

Static Water Level: Unknown

Water Entry: N/A

Total Depth: 2.3m

Comments: Although loose, was heavy to dig out

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Trial Pit Records

Project No.: ce04561 **Location:** Kilmartin **Date:** 14/2/2006

Excavation Method: JCB (reach 2.3 approx) **Supervisor:** NMu

TRIAL PIT NO.

TP14

Geology:	Depth (m):	Description:
Clay	0.0-0.17	dark brown heavy wet clay
Clay	0.17-1.2	Gray heavy wet clay
Clay/peat	1.2-2.42	Dark brown/black heavy wet clay

Dominant Matrix: Clay

Dominant Clasts: Heavey clay/silt

Depth to Rock: Unknown

Rock Type: unknown

Static Water Level: unknown

Water Entry: N/A

Total Depth: 2.42

Comments: Not water entry occured but the soil throughout was very wet in nature

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Appendix 2.5.1

Borehole Logs

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Project No: CE04561

Project: Kilmartin

Client: Buchpa Ltd.

Location: Coynes Cross, Co. Wicklow

Log of Borehole: BH1

Supervised By: NM

SUBSURFACE PROFILE

Depth (metres)	Symbol	Description	Depth sampled	Well Completion Details
0		Ground Surface		
0		Top soil		
1		***CLAY***		
1–3		Soft, medium brown sandy CLAY		
3		***CLAY***		
4–6		Firm, brown/orange CLAY Waterentry at 4m		
7		***CLAY***		
7–11		Fine, brown gravelly CLAY		
11		***Bedrock***		
11–18		Shale Two wells per borehole (overburden and bedrock)		
19		End of Borehole		

Bentonite seal

Gravel fill

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Drill Method: Air rotary

Drill Date: 12/07/06

Hole Size: 6'

TOP (top of piping): N/A

Checked by: NM

Standpipe Size: 2'

EPA Export 26-07-2013:03:19:05

Project No: CE04561

Project: Kilmartin

Client: Buchpa Ltd.

Location: Coynes Cross, Co. Wicklow

Log of Borehole: BH2

Supervised By: NMu

SUBSURFACE PROFILE

Depth (metres)	Symbol	Description	Depth sampled	Well Completion Details
0		Ground Surface		
0		Top soil		
1		***SAND***		
1		Fine, loose brown sandy soil		
2		***CLAY***		
2		Soft brown CLAY with much sands and gravels throughout		
5		***CLAY***		
5		Firm brown CLAY		
7		***CLAY***		
7		Firm brown/organge CLAY		
8		***CLAY***		
8		Firm wet brown CLAY		
10		***CLAY***		
10		Firmbrown CLAYwith some gravel throughout		
12		Water entry at 10.5m		
14		***Bedrock***		
14		Shale		
18		Two wells per borehole (overburden and bedrock)		
19		End of Borehole		
20				

Bentonite seal

Gravel fill

For inspection purposes only.
Consent of copyright owner required for any other use.

Drill Method: Air rotary

Drill Date: 12/07/06

Hole Size: 6'

TOP (top of piping): N/A

Checked by: NM

Standpipe Size: 2'

EPA Export 26-07-2013:03:19:06

Project No: CE04561

Project: Kilmartin

Client: Buchpa Ltd.

Location: Coynes Cross, Co. Wicklow

Log of Borehole: BH3

Supervised By: NMu

SUBSURFACE PROFILE

Depth (metres)	Symbol	Description	Depth sampled	Well Completion Details
0		Ground Surface		
0		Top soil		
1		***CLAY***		
1		Soft brown sandy CLAY		
3		***CLAY***		
4		Soft brown CLAY with fine to medium gravel throughout		
7		***CLAY***		
8		Grey brown BOULDER CLAY		
10		***CLAY***		
11		Firm to stiff brown CLAY with some BOULDER CLAY mixed throughout		
13		Water entry at 10.5m		
14		***Bedrock***		
14		Shale and weathered rock		
17		Two wells per borehole (overburden and bedrock)		
20		End of Borehole		

Bentonite Seal

Gravel fill

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Drill Method: Air rotary

Drill Date: 13/07/06

Hole Size: 6'

TOP (top of piping): N/A

Checked by: NM

Standpipe Size: 2'

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Appendix 2.5.2

Groundwater and Domestic Well Monitoring Results

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Groundwater Results

PARAMETER	UNIT	I.G.V.	BH1-S 19/07/2007	BH1-D 19/07/2007	BH2-S 19/07/2007	BH2-D 19/07/2007	BH3-S 19/07/2007	BH3-D 19/07/2007	BH1-S 22/02/2008	BH1-D 22/02/2008	Bh2-S 22/02/2008	BH2-D 22/02/2008	BH3-S 22/02/2008	BH3-D 22/02/2008
pH Value	units	6.5 - 9.5	7.54	7.31	6.98	7.05	7.27	7.36	6.83	6.9	6.5	6.68	6.78	6.79
Conductivity	mS/cm	1	0.424	0.297	0.296	0.299	0.349	0.084	0.348	0.358	0.282	0.317	0.252	0.32
Ammonical Nitrogen as NH4-N	N mg/l	0.15	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dissolved Oxygen (O2)	O2 mg/l	N-A-C	5.5	6.3	6	5.6	6.5	5.9	4.9	5.3	5.2	5.5	5.2	5.4
Chloride (Cl)	Cl mg/l	30	23	22	30	28	16	25	18	19	28	27	12	23
Potassium (K)	K mg/l	5	1.4	0.8	1.2	0.9	1.2	1.2	0.9	0.6	1	1.1	0.2	0.8
Sodium (Na)	Na mg/l	150	20.5	16.5	18	17	18.5	19	22.3	20.8	20.9	22	15.4	21.5
Total Organic Carbon	C mg/l	N-A-C	5	3	2	2	3	2	<2	<2	<2	<2	5	<2
Total Oxidised Nitrogen (water)	N mg/l	N-A-C	5.1	6	7.5	6.3	2.1	6.8	4.6	5.7	6.9	6.5	1.4	6.3
Calcium (Ca)	Ca mg/l	200	57.74	37.45	29.48	32.4	41.42	40.46	47.23	41.85	23.14	40.25	33.82	42.23
Cadmium (Cd)	Cd mg/l	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chromium (Cr)	Cr mg/l	0.03	0.006	0.004	0.003	0.003	0.006	0.004	0.004	0.04	<0.001	0.003	0.005	0.012
Copper (Cu)	Cu mg/l	0.03	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
Total Cyanide (Cn)*	Cn mg/l	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron (Fe)	Fe mg/l	0.2	0.014	0.028	0.003	0.02	0.015	0.025	0.033	0.016	0.043	0.017	0.033	0.068
Lead (Pb)	Pb mg/l	0.01	<0.001	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium (Mg)	Mg mg/l	50	4.765	4.715	3.677	3.897	5.655	4.419	4.187	4.625	3.43	4.793	5.627	4.624
Manganese (Mn)	Mn mg/l	0.05	0.011	0.003	0.021	0.005	0.004	0.003	<0.001	<0.001	0.006	<0.001	<0.001	0.005
Nickel (Ni)	Ni mg/l	0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.014
Mercury (Hg)	Hg mg/l	0.001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Sulphate (soluble) (SO4)	SO4 mg/l	200	19	11	10	15	20	19	12	10	14	14	10	12
Zinc (Zn)	Zn mg/l	0.1	0.017	0.021	0.015	0.015	0.012	0.015	0.007	0.046	0.023	0.006	0.008	0.168
Boron (B)	B mg/l	1	0.028	0.023	0.023	0.023	0.023	0.023	0.021	<0.003	<0.003	<0.003	<0.003	<0.003
Total Phenols	mg/l	N-A-C	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Solids	mg/l	N-A-C	259	214	159	146	193	200	248	254	182	304	999	234
Faecal Coliforms	cfu/a00ml	0	3600	5	1000	206	1700	70	~	~	~	~	~	~
Total Coliforms	cfu/a00ml	0	3600	21	1550000	2100	16000	320	~	~	~	~	~	~

I.G.V.=Interim Guideline Values from Table 3.1 of EPA document "Towards Setting Guideline Values for the protection of Groundwater in Ireland"

Shading = Value has exceeded IGV

* Labortary level of Detection is above IGV recommended level

N-A-C= No abnormal change

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Domestic Well Results

PARAMETER	UNIT	I.G.V.	DW1 13/07/2007	DW2 13/07/2007	DW3 13/07/2007	DW1 21/02/2008	DW2 21/02/2008	DW3 21/02/2008
pH Value	units	6.5 - 9.5	7.17	7.36	7.07	6.77	7.06	6.9
Conductivity	mS/cm	1	0.291	0.314	0.268	0.265	0.315	0.294
Ammonical Nitrogen as NH4-N	N mg/l	0.15	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dissolved Oxygen (O2)	O2 mg/l	N-A-C	8.1	7.4	7.4	6.5	4.7	5.7
Chloride (Cl)	Cl mg/l	30	23	20	21	19	20	23
Potassium (K)	K mg/l	5	0.6	0.9	0.7	0.9	1.2	0.6
Sodium (Na)	Na mg/l	150	20	18.5	18.5	20.6	20.7	23
Total Organic Carbon	C mg/l	N-A-C	4	4	4	<2	<2	<2
Total Oxidised Nitrogen (water	N mg/l	N-A-C	7.3	5	6.1	6.1	5.1	7.5
Calcium (Ca)	Ca mg/l	200	32.83	43.42	31.29	31.22	42.45	31.08
Cadmium (Cd)	Cd mg/l	0.005	<0.001	<0.001	<0.001	<0.0004	<0.0004	<0.0004
Chromium (Cr)	Cr mg/l	0.03	0.005	0.006	0.005	0.003	0.003	0.002
Copper (Cu)	Cu mg/l	0.03	0.009	0.014	0.011	0.03	0.011	0.012
Total Cyanide (Cn)*	Cn mg/l	0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron (Fe)	Fe mg/l	0.2	0.018	0.023	0.021	0.024	0.017	0.023
Lead (Pb)	Pb mg/l	0.01	0.001	0.001	<0.001	0.001	<0.001	<0.001
Magnesium (Mg)	Mg mg/l	50	4.205	4.82	4.298	4.589	4.858	4.237
Manganese (Mn)	Mn mg/l	0.05	0.002	0.005	0.002	<0.001	0.001	<0.001
Nickel (Ni)	Ni mg/l	0.02	0.006	0.007	0.006	<0.001	<0.001	<0.001
Mercury (Hg)	Hg mg/l	0.001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Sulphate (soluble) (SO4)	SO4 mg/l	200	10	10	10	9	10	10
Zinc (Zn)	Zn mg/l	0.1	0.038	0.046	0.043	0.049	0.023	0.016
Boron (B)	B mg/l	1	0.089	0.088	0.08	<0.003	<0.003	<0.003
Total Phenols	mg/l	N-A-C	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Solids	mg/l	N-A-C	87	58	27	207	257	225
Faecal Coliforms	cfu/100ml	0	~	~	<1	~	~	~
Total Coliforms	cfu/100ml	0	~	~	<1	~	~	~

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I.G.V.=Interim Guideline Values from Table 3.1 of EPA document "Towards Setting Guideline Values for the protection of Groundwater in Ireland"

Shading = Value has exceeded Salmonid Water Quality Standard

N-A-C= No abnormal change

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Appendix 2.6.1

Surface Water Monitoring Results

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Surface Water Results

PARAMETER	UNIT	EQS	SW1	SW2	SW3	SW4	SW1	SW2	SW3	SW4
			12/01/2006	12/01/2006	17/07/2006	17/07/2006	21/02/2008	21/02/2008	21/02/2008	21/02/2008
pH Value	units	06-Sep	7.08	6.96	7.54	7.89	~	7.46	7.19	7.45
Conductivity	mS/cm	1	0.42	0.471	0.386	0.336	~	0.282	0.208	0.229
Ammonical Nitrogen as NH4-N	N mg/l	0.02 NH3	<0.2	<0.2	<0.2	<0.2	~	<0.2	<0.2	<0.2
Dissolved Oxygen (O2)	O2 mg/l	N-A-C	7.9	6.8	5.7	7.7	~	5.0	5.4	6
Chloride (Cl)	Cl mg/l	250	69	86	31	25	~	31	22	22
Potassium (K)	K mg/l	-	1.6	1.6	2.3	1.3	~	1.3	0.7	1.1
Sodium (Na)	Na mg/l	-	49	51.5	24	18.5	~	24.4	18.9	18.6
COD	02 mg/l	-	<15	<15	<15	<15	~	<15	<15	<15
BOD	02 mg/l	-	<2	<2	3	4	~	~	~	~
Total Oxidised Nitrogen (water)	N mg/l	N-A-C	1.9	4.1	7.6	5.5	~	4.2	3.6	3.9
Calcium (Ca)	Ca mg/l	-	31.11	32.99	45	49.63	~	25.62	17.33	20.53
Cadmium (Cd)	Cd mg/l	0.005	<0.001	<0.001	<0.001	<0.001	~	<0.0004	<0.0004	<0.0004
Chromium (Cr)	Cr mg/l	0.03	0.005	0.002	0.004	0.004	~	<0.0001	<0.0001	0.0001
Copper (Cu)	Cu mg/l	0.03	<0.001	<0.001	<0.001	<0.001	~	<0.0001	<0.0001	<0.0001
Iron (Fe)	Fe mg/l	1	0.019	0.014	0.02	0.028	~	0.004	0.023	0.019
Lead (Pb)	Pb mg/l	0.01	<0.001	<0.001	<0.001	<0.001	~	<0.0001	<0.0001	<0.0001
Magnesium (Mg)	Mg mg/l	-	48.85	65.33	7.615	6.45	~	5.048	3.949	3.968
Manganese (Mn)	Mn mg/l	0.3	0.003	0.003	<0.001	<0.001	~	<0.0001	<0.0001	<0.0001
Nickel (Ni)	Ni mg/l	0.05	<0.001	<0.001	<0.001	0.001	~	<0.0001	<0.0001	<0.0001
Mercury (Hg)	Hg mg/l	0.001	0.00006	0.0001	<0.00005	<0.00005	~	<0.00005	<0.00005	<0.00005
Sulphate (soluble) (SO4)	SO4 mg/l	200	35	23	107	18	~	18	10	12
Zinc (Zn)	Zn mg/l	0.1	0.02	0.038	0.019	0.014	~	0.023	0.003	0.006
Alkalinity (as CaCO3)	CaCO3 mg/l	N-A-C	60	60	160	130	~	60	60	50
Total Organic Carbon	TOC mg/l	-	4	5	4	3	~	<2	<2	<2
Faecal Coliforms	cfu/100ml	-	-	-	34	31	~	~	~	~
Total Coliforms	cfu/100ml	-	-	-	2200	430	~	~	~	~

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EQS = Environmental Quality Standard for Surface Waters

Shading = Value has exceeded Salmonid Water Quality Standard

N-A-C= No abnormal change

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Appendix 2.7.1

Site Synopsis

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SITE SYNOPSIS

SITE NAME: DEVIL'S GLEN

SITE CODE: 000718

Devil's Glen is located about 2.5 km north-west of Ashford. It is a rocky gorge up to 100 metres deep, through which the Vartry river flows in an easterly direction. Exposed rock-faces occur on both the northern and southern slopes of the gorge - the soils covering most of the slopes are thin acid brown earths.

The steep slopes on the northern side of the gorge are covered with broadleaved woodland dominated by Oak (*Quercus petraea*), with occasional Ash (*Fraxinus excelsior*) and Birch (*Betula pubescens*) on the lower slopes. The oaks are fairly even-aged at about 100 years. The shrub layer is generally sparse with Holly (Ilex aquilinum) and Hazel (*Corylus avellana*) being the main species. The ground flora is typical of an oak wood on thin acid soil. The main species is Wood Rush (*Luzula sylvatica*), which carpets the ground in most places. Also present are occasional clumps of Heather (*Calluna vulgaris*) and Bilberry (*Vaccinium myrtillus*), both of which are indicative of acidic soils. Ferns are locally common and include mainly Broad Buckler Fern (*Dryopteris dilatata*) and Hard Fern (*Blechnum spicant*). The moss cover is extensive in shaded damp areas - the main species are *Thuidium tamariscinum* and *Polytrichum commune*. Several rare bryophytes (mosses and liverworts) have been recorded from The Devil's Glen, namely *Diplophyllum obtusifolium, Grimmia hartmanii, Rhynchostegium lusitanicum* and *Zygodon baumgartneri*,

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The slopes on the southern side of the gorge have a mixed woodland cover with conifers and deciduous trees. The ground flora is variable, often similar to that described above. In shaded areas, other woodland species are found, these include Wood Sorrel (*Oxalis acetosella*), Lords-and-ladies (*Arum maculatum*), Lesser Celandine (*Ranunculus ficaria*) and the ferns *Polystichum setiferum* and *Polypodium vulgare*.

The Vartry river and the streams flowing into the gorge add to the habitat diversity of the site - the waterfall is of particular note as Royal Fern (*Osmunda regalis*) has been found growing abundantly just above it. A number of scarce plants have been recorded on this site, including the grasses *Milium effusum* and *Festuca altissima*.

South of the Devil's Glen is another area of mixed woodland consisting mainly of Sycamore (*Acer pseudoplatanus*), Beech (*Fagus sylvatica*), Oak (*Quercus petraea*), Scots Pine (*Pinus sylvestris*), Larch (*Larix decidua*) and other conifers. This area is less important on ecological grounds, but as it is a continuation of the woodland it provides a habitat for the fauna of the area.

The Devil's Glen woodland supports a range of passerine birds species.

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The site is important as a fine example of a mostly wooded, steep-sided rocky gorge. The presence of a number of rare or scarce plants and birds adds interest to the site. Devil's Glen is also scenically very attractive and is an important amenity area.

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SITE SYNOPSIS

SITE NAME: THE MURROUGH

SITE CODE: 000730

The Murrough is a coastal wetland complex which stretches for 15 km from Ballygannon to north of Wicklow town, and in parts, extends inland for up to 1 km. A shingle ridge stretches the length of the site and carries the mainline Dublin-Wexford railway.

The site is important as it supports a number of habitats listed on Annex I of the EU Habitats Directive, a number of bird species listed on Annex I of the EU Birds Directive as well as a wide range of migratory birds not listed on Annex I of this directive.

On the seaward side, shingle colonising species such as Sea Rocket (*Cacile maritima*), Sea Sandwort (*Honkenya peploides*), Sea Holly (*Eryngium maritimum*) and Yellow-horned Poppy (*Glaucium flavum*) are found in the habitat called driftline vegetation. The rare and legally protected Oyster Plant (*Mertensia maritima*) (Flora Protection Order, 1987) has been recorded on the gravelly shore in the past but is now considered to be extinct from this locality.

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Beside the shingle shore is a stony ridge of perennial vegetation. Low sand hills occur at Kilcoole, with Marram (*Ammophila arenaria*) and Lyme Grass (*Leymus arearius*). In other areas and further inland, a rich grassy sward which is most extensive in the south end of the site, has developed. Typical species include Sweet vernal-grass (*Anthoxanthum odoratum*), Crested Dog's-tail (*Cynosurus cristatus*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Burnet Rose (*Rosa pimpinellifolia*) and Pyramidal Orchid (*Anacamptis pyramidalis*). A community dominated by Silverweed (*Potentilla anserina*) and Strawberry Clover (*Trifolium fragiferum*) occurs in some of the wetter, grassy areas. In some areas, particularly at the south of the site a Gorse (*Ulex*) heath has developed on the stony ridge.

Saltmarsh is present within the site in two distinct areas. At the southern end of the site, a brackish, partly tidal lake, Broad Lough, has developed. This lake has a well developed saltmarsh community which includes Sea Rush (*Juncus gerardii*), Common saltmarsh-grass (*Puccinellia maritima*), Sea Aster (*Aster tripolium*), Sea Purslane (*Hamilione portulacoides*) and Common Scurvy Grass (*Cochlearia officinalis*). Common Reed (*Phragmites australis*) is abundant along the western shore, along with some Sea Club-rush (*Scirpus maritimus*).

Saltmarsh is also present in the northern end of the site in the vicinity of the Breaches though this has been greatly affected by drainage in the late 1980s early 1990s. The grassland which was improved as a result of the drainage is now influenced by seepage and flooding of saline waters.

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An area of fen occurs at Five Mile Point. Here Black Bog-rush (*Schoenus nigricans*) is dominant, with Marsh Pennywort (*Hydrocotyle vulgaris*), Purple Moor-grass (*Molinia caerulea*), heather (*Calluna vulgaris*), Cross-leaved heath (*Erica tetralix*), Devil's-bit Scabious (*Succisa pratensis*) and a wide variety of orchids also present. The rare, Narrow-leaved Marsh Orchid (*Dactylorhiza traunsteineri*) has been recorded at Five Mile Point. Fen Sedge (*Cladium mariscus*) is present where the ground is wetter. This in turn, merges into areas dominated by Common Reed. Fen is found in mosaic with reed bed, and wet woodland in the townland of Blackditch.

A fine wet woodland occurs at Blackditch. Birch (*Betula pubescens*) is the dominant species with some Alder (*Alnus glutinosa*), Willow (*Salix* spp.) and Ash (*Fraxinus excelsior*) also present. The ground flora of this wooded area is often quite dense. This wood also contains a rich invertebrate community with at least eight rare or notable species of fly (order Diptera) occurring, including *Syntormon setosus*, a species unknown elsewhere in Britain or Ireland.

A wide range of freshwater and brackish marsh habitats occur within the site. These vary from reed-marsh dominated by reeds and Rushes (*Juncus* spp.), to those of Sedges (*Carex* spp.) with other areas supporting a mixture of Sedges and Yellow Iris (*Iris pseudacorus*) also occurring. A wide variety of grasses and herbs are also found. These include Meadowsweet (*Filipendula ulmaria*), Silverweed and Common Spike-rush (*Eleocharis palustris*). The scarce, Marsh Pea (*Lathyrus palustris*) occurs in one area.

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The marshes merge into wet grassland in many areas. Where grazing pressure is low, a herb-rich sward occurs with species such as Ragged Robin (*Lychnis flos-cuculi*), Cuckoo Flower (*Cardamine pratensis*), Meadowsweet and Spotted Orchid (*Dactylorhiza maculata*) occurring. Sedges are abundant in the wetter areas.

Where drains have been cut, there are many other species such as Greater Spearwort (*Ranunculus lingua*), Bogbean (*Menyanthes trifoliata*) and the scarce Reed Sweet-grass (*Glyceria maxima*). An area of saltmarsh at the Breaches has been largely drained but the localised Sea Couch (*Elymus pycnanthus*) still occurs.

The Murrough is an important site for wintering waterfowl and breeding birds. A number of EU Birds Directive Annex I bird species are found on the site including Red-throated Diver, Little Egret, Bewick's Swan, Whooper Swan, Greenland White-fronted Goose, Golden Plover, Kingfisher, Sandwich Tern and Little Tern.

Winter bird counts in 1994/95 - 1997/98 showed the site to have an internationally important population of Brent Geese (average peak 1,318, which is much higher than it was in the early 90s), nationally important populations of Wigeon (average peak 1,518), Teal (average peak 772), Common Scoter (average peak 103) and Lapwing (average peak 3,140) and regionally or locally important populations of Whooper Swan (average peak 80), Little Grebe (average peak 22), Shelduck (average peak 95), Gadwall (average peak 9), Mallard (average peak 391), Shoveler (average peak 22), Golden Plover (average peak 615), Curlew (average peak 605) and Redshank (average peak 181). Greylag Geese numbers were nationally important in the early 90s but these numbers have dropped off. The average peak is now 213.

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Little Tern breed on the shingle beach near The Breaches and this is the largest colony on the east coast (31 pairs in 1992, c. 50 pairs in 1993, an average of 37 pairs over the ten year period 1988-1998 (I-WeBS data)). Redshank, Oystercatcher, Ringed Plover and Water Rail also breed. The reedbeds at Broad Lough provide habitat for Reed Warbler and the rare Bearded Tit has bred here. Otter has been reported regularly from the Murrough.

Recent farming and drainage practices, the development of an airstrip and afforestation have greatly reduced the area and quality of the wetlands habitats - the area between Kilcoole and Newcastle is particularly affected. In 1997 there has been some levelling of the sand hills below Killoughter station. Pollution, reclamation and further drainage would adversely affect this site.

This site is of importance as it is the largest coastal wetland complex on the east coast of Ireland. Although much affected by drainage, it still contains a wide range of coastal and freshwater habitats, some of which contain threatened plants. Areas on the site contain a rich invertebrate fauna, including several rarities. It is an important site for both wintering and breeding birds and supports a wide variety of EU Birds Directive Annex I bird species.

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Appendix 2.10.1

Photo Plates

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Photo Plates
Kilmartin Land Recovery Project

#1 – Coynes Cross road running north/south along the western side of the site

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#2 –Taken from the south western corner of the site

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#3 – Looking down into the site from the south west corner

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#4 – Looking eastwards from the western site of the site

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#5 – Taken from the western side facing southwards

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#6 – Taken along the Coynes Cross road facing southwards

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#7- Looking down field facing north

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#8 – Southern centre end of the site facing northeast

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#9 – North-eastern corner of the site facing south-westerly

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#10 – Centre of the site facing the south-western corner

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#11 – Pictures taken from centre site facing south

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#12 – North-western corner of the site facing east

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#13 – Centre of the site by hedgerow facing east

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#14 – Picture taken from the north western corner of site facing south east

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