

APPENDIX 7.1

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APPENDIX 7.1

Ecological Evaluation and Ecological Impact Assessment (EclA)

The significance of an ecological impact is directly correlated with the conservation importance of a particular area being affected. Evaluation of the conservation importance of an area (ecological evaluation) is therefore of critical importance in identifying the significance of an impact.

There are currently no standard guidelines for ecological/conservation evaluation within Ireland. Limosa Environmental has therefore adapted for use, evaluation criteria and techniques based on previously published guidelines (e.g. Ratcliffe 1977; Treweek, 1999; NRA, 2004) following best practice methodology (e.g. IEEM, 2005).

Evaluation methodology consists of evaluating each ecological resource (e.g. habitat, micro-habitat, population, species) within the zone of influence (area to be affected) using the criteria outlined in Table 7.1a. Each ecological resource is then given an evaluation value (ranking) as described in Table 7.1b. Table 7.1b allows for evaluation to be described in a more readily understandable way within the EIA document. As evaluation rankings of local value and below may be deemed to be subjective, these rankings if assigned will, in general, be discussed and explained more fully within the text.

Table 7.1 a Established criteria for ecological evaluation

Evaluation criteria	Definitions and Notes
Site designations	<p>Designated areas for conservation are areas that are designated under national and/or European laws in order to conserve habitats and species of national or international conservation importance. These include:</p> <ul style="list-style-type: none"> • Natural Heritage Areas (NHA): a national designation given legal status by the Wildlife Amendment (2000) Act. • Special Areas of Conservation (SAC): areas considered of European and national importance whose legal basis is the EU Habitats Directive (92/43/EEC), transposed into Irish law through the European Union (Natural Habitats) Regulations, 1997. • Special Protection Areas (SPA): sites of conservation importance for birds whose legal basis is the EU Birds Directive (79/409/EEC). • Wildfowl Sanctuary: designated under the 1976 Wildlife Act. • Ramsar Site: European designation based on the Ramsar Convention, 1984.
Species designations/criteria	<p>Certain legislation refers directly to species/populations (e.g. annexed species):</p> <ul style="list-style-type: none"> • Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora. • Council Directive 79/409/EEC on the Conservation of Wild Birds ('Birds Directive'). • Bern Convention on the Conservation of European Wildlife and Natural Habitats. • The Wildlife Act (1976) and The Wildlife (Amendment) Act (2000). • Birds of Conservation Concern in Ireland (Newton <i>et al.</i>, 1999). • Red Data Books of Britain and Ireland (e.g. Curtis & McGough, 1988). • Flora (Protection) Order, 1999.
Size	<p>Includes both size of habitats (area) and population size of individual species and is intrinsically linked to other criteria such as rarity and fragility (below). Habitats: considers minimum viable size of habitats, habitat heterogeneity, species/area relationships, home-range size. Populations: considers concept of minimum viable population size (population viability), national and local population trends, extinction risk...</p>
Diversity / Biodiversity	<p>At a minimum species richness (number of species). Biodiversity defined as 'the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part (Convention on Biological Diversity, 1993). Must be considered in terms of the habitat type - some habitats have low species diversity by nature. Keystone species deserve special attention – defined as a species whose removal would induce significant changes within the food web (Begon <i>et al.</i>, 1996).</p>
Rarity	<p>Applies to habitats and to species. The degree to which a habitat or community approximates a natural state. The degree to which the site is a good example of the habitat types. National, county, local scales e.g. within 10-km² squares.</p>
Naturalness	<p>The degree of modification by human intervention. Habitats that are least modified are generally regarded more highly (Treweek, 1999). Also considers the extent to which the habitat is free of alien species.</p>
Representativeness/	<p>How well the area represents habitats or vegetation types on a wider scale (Treweek, 1999);</p>

Typicalness	'degree of representativity of the natural habitat type on the area' (Council Directive 92/43/EEC; Habitats Directive).
Fragility	The degree of sensitivity of habitats, communities and species to environmental change.
Stability/Resistance/Resilience	Habitats and species. Stability refers to the ability of an ecosystem to maintain some form of equilibrium in the presence of a disturbance. Resilience is defined as the ability and speed with which a community returns to its former state following a disturbance. Resistance is defined as the ability of a community to avoid displacement by a disturbance (Begon <i>et al.</i> , 1996).
Other criteria include:	
Recorded history (scientific value), Potential value, Educational value, Amenity value.	

Table 7.1 b Value of resources

Ecological Value	Examples
A International	Sites designated as Special Protection Areas (SPA), Special Areas of Conservation (SAC), Ramsar Sites. Sites meeting criteria for international designation.
B National	Sites designated as Natural Heritage Areas (NHA) or sites qualifying for designation. Undesignated sites containing good examples of Annex I habitats. Undesignated sites containing significant numbers of resident or regularly occurring populations of Annex II species under the EU Habitats Directive or Annex I species under the EU Birds Directive or species protected under the Wildlife (Amendment) Act 2000. Sites supporting viable populations of Red Data Book species (nationally rare species).
C Regional	Undesignated sites that are prime examples of the habitat (natural or semi-natural) type, exhibit high biodiversity or support important communities/assemblages of species within the region. Sites exhibiting habitats that are scarce within the region. Sites that support nationally scarce plant species (recorded from less than 65 10-km ² squares, unless they are locally abundant). Sites that hold regionally scarce vertebrate species.
D High Local	Sites that are prime examples of the habitat type, exhibit high biodiversity or important communities/assemblages of species within the local area. Habitats that are important in a local context – e.g. semi-natural habitats within an urban setting, hedgerows and treelines that serve as important ecological corridors within an otherwise modified landscapes. Sites exhibiting habitats/species that are generally scarce within the local area.
E Moderate Local	Sites that exhibit good quality semi-natural habitats. Hedgerows and treelines.
F Low Local	Artificial or modified habitats considered of low value for wildlife.

Adapted from IEEM, 2005; NRA, 2004; Regini, 2000; RPS Group, 2001.

Impact Terminology

Impacts may be defined as per the EPA (2003):

Positive Impact: A change which improves the quality of the environment.
 Negative Impact: A change which reduces the quality of the environment.
 Neutral Impact: A change which does not affect the quality of the environment.

Cumulative Impact The addition of many small impacts to create one larger, more significant, impact.

Do-Nothing Impact: The environment as it would be in the future if no development was carried out.

Indeterminable Impact When the full consequences of a change in the environment cannot be described.

Irreversible Impact When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.

Residual Impact: The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

Synergistic Impact Where the resultant impact is of greater significance than the sum of its constituents.

Worst case Impact The impacts arising from a development in the case where mitigation measures substantially fail.

Impact magnitude refers to the 'size' or 'amount' of an impact (IEEM, 2005). Impact Assessment takes into account not only the impact magnitude, but also the extent

(e.g. proportion of the site to be affected), timing and frequency, duration (e.g. temporary or permanent), reversibility and cumulative effects of the impact(s) (IEEM, 2005).

The criteria for assessing impact magnitude are given in Table 7.1 c.

Table 7.1 c Criteria for assessing impact magnitude

Impact Magnitude	Definition
No change	No observable impact in either direction (negative or positive).
Imperceptible Impact	An impact without noticeable consequences in either direction (negative or positive).
Minor (Slight) Impact	An impact (negative or positive) that has noticeable ecological consequences that are not considered to significantly affect the distribution and/or abundance of species or habitats within the defined site.
Moderate Impact	An impact that has noticeable ecological consequences that are considered to significantly affect the distribution and/or abundance of species or habitats within the defined site.
Major (Significant) Impact	An impact that has noticeable ecological consequences that are considered to significantly affect species or habitats of high conservation importance and to potentially affect the overall viability of those species or habitats within the wider area.
Profound Impact	An impact considered to significantly affect species or habitats of high conservation importance to such a degree that their viability in the wider area is under a very high degree of threat (negative impact) or is likely to increase markedly (positive impact).

Based on RPS Group, 2001.

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cSAC Site Synopsis (National Parks and Wildlife Service)

SITE NAME: CLONAKILTY BAY

SITE CODE: 000091

Clonakilty Bay in west Cork is an inter-tidal expanse that stretches from Clonakilty to the open sea, and comprises two small estuaries separated by Inchydoney Island. The site also includes adjacent sand dunes and inland marshes, and therefore is a coastal complex with a good diversity of habitats including several habitats listed on Annex I of the EU Habitats Directive.

Sand flats dominate the inter-tidal area, although mud flats occur at the sheltered upper end of the inlets. The vegetation consists of algal mats (*Enteromorpha* spp.) with brown seaweeds (*Fucus* spp.) occurring where the coast is rocky. The invasive Cord-grass (*Spartina* sp.) occurs in places. The intertidal flats have a typical diversity of macro-invertebrates, including *Arenicola marina*, *Scrobicularia plana*, *Hediste diversicolor*, *Nephtys hombergii*, *N. cirrosa*, *Hydrobia ulvae* and *Cerastoderma edule*.

Sand dunes grade from a strandline, colonised by Frosted Orache (*Atriplex laciniata*), Sea Sandwort (*Honkenya peploides*) and Sea Rocket (*Cakile maritima*), through to fixed dunes vegetated by grasses, small herbs and several species of orchid. They also support an interesting array of introduced plants, amongst which Great Mullein (*Verbascum thapsus*), Viper's-bugloss (*Echium vulgare*) and Teasel (*Dipsacus fullonum*) are the most noticeable. Embryonic shifting dunes and white *Ammophila* dunes are also represented. Of particular interest is a small area of decalcified dune heath with some *Ulex europaeus*.

Inland of the western estuary, an extensive area of wetland occurs, which in itself contains a fine range of habitats from saline lagoons, to brackish grasslands, open freshwater marsh and Alder (*Alnus glutinosa*) scrub. Species found here are characteristic of marshy areas and include Creeping Bent (*Agrostis stolonifera*), Water Horsetail (*Equisetum fluviatile*), Marsh Cinquefoil (*Potentilla palustris*) and Marsh Willowherb (*Epilobium palustre*). The saline influence is evident by the occurrence of species such as Saltmarsh Rush (*Juncus gerardii*) and Sea Rush (*J. maritimus*).

The site contains a good diversity and density of waterfowl, with over 7,000 waders and wildfowl occurring regularly. Seven species have populations of national importance: Shelduck (168), Grey Plover (76), Lapwing (2,509), Dunlin (1,508) Curlew (1,231), Redshank (263) and Greenshank (27). The site is most noted, however, for its population of Black-tailed Godwit (866) which is of international importance and comprises over 10% of the national total. Amongst the other species which occur, there are notable populations of Golden Plover and Bar-tailed Godwit, both of which are listed on Annex I of the EU Birds Directive. All counts given are average winter peaks over either two or three seasons from 1994/95 to 1996/97. Herons commonly use the site and a heronry exists in the trees near Clonakilty.

Otter spraints were found frequently during a recent survey of the marsh area.

The site is under pressure from a number of sources, notably recreation and tourism developments and agricultural improvements, including drainage and fertiliser application.

This site is of considerable scientific interest because it contains a good diversity of coastal habitats. These habitats show a succession from salt to freshwater influences and include six which are listed on Annex I of the EU Habitats Directive. Its value is enhanced considerably by the birdlife it supports. The occurrence of Black-tailed Godwit in internationally important numbers is particularly significant. The site also supports nationally important numbers of seven other species of waterfowl as well as two species listed on Annex I of the EU Birds Directive.

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Table 7.3 a Results of the sediment chemical analysis

	Units	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6 (Control)	Dutch Target Values	Dutch Intervention Values	UK (MAFF) In-house	Norwegian Class 1 Classification
Natural Moisture Content	%	63.5	30.6	30.3	37.1	8.8	39.3	-	-	-	-
Total Organic Carbon	%	2.19	0.21	0.24	0.84	0.07	0.83	-	-	-	-
Ammoniacal Nitrogen as N	mg/kg	69.8	<5.5	8.8	12.6	25.3	12.7	-	-	-	-
Ortho Phosphate as P	mg/kg	2	<1	<1	2	<1	1	-	-	-	-
Kjeldahl Nitrogen	g/kg	0.3	<0.1	<0.1	0.9	<0.1	0.1	-	-	-	-
Volatile Organic Compounds	n/a	<1	<1	<1	1	<1	<1	-	-	-	-
Arsenic	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	29	55	10	<20
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	12	0.2	<0.25
Chromium	mg/kg	22	9	11	16	11	18	100	380	20	<70
Copper	mg/kg	20	<1	<1	5	4	4	35	190	20	<35
Lead	mg/kg	19	1	3	8	11	11	85	530	25	<30
Mercury	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.3	10	0.15	<0.15
Nickel	mg/kg	18	9	11	14	8	15	35	210	10	<30
Zinc	mg/kg	118	27	36	64	27	71	140	720	65	<150

Table 7.3 b Results of the sediment analysis for total and faecal coliforms.

Parameter	Units	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6 (Control)	EU Mandatory Limit*	EU Guideline Limit**
Total Coliform	MPN per 100mls	1,100	240	240	4.3	4.3	1,100	10,000	500
Faecal Coliform	MPN per 100 mls	460	150	46	4.3	1.3	150	2,000	100

* EU Mandatory Limit: limits which must be achieved under EU Directive (76/160/EEC) concerning the quality of bathing waters.

** EU Guideline limit: limits which member states should endeavor to achieve.

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Table 7.4 a Macroinvertebrate species/taxa recorded currently and previously within Clonakilty Estuary together with their maximum recorded densities (numbers per m²) and some notes on habitat preferences and characteristics.

Species/Taxa	Max densities recorded per m ²	Habitat/sediment preferences & other notes (after Pearson & Rosenberg, 1978 and Hayward & Ryland, 1998)
Annelid worms: Class Polychaeta		
<i>Arenicola marina</i>	127	Sand and muddy-sand sediments.
<i>Hediste diversicolor</i>	1604	Very tolerant of anoxic conditions, organic enrichment and a degree of algal cover. Typical of reduced salinity mud shores. Varied feeding methods including detritivore and carnivore.
<i>Nereis virens</i>	33	Muddy-sand
<i>Nephtys caeca</i>	100	Widespread muddy-sand, sandy-muds.
<i>Scoloplos armiger</i>	100	Muddy-sand, tolerant of organic rich sediments
<i>Spiophanes bombyx</i>	267	Sandy-mud
<i>Spionid indent.</i>	-	-
<i>Eteone longa</i>	318	Often prefers muddy areas. Tolerant of organic pollution.
<i>Malacoceros fuliginosus</i>	230	Tolerant of organic rich sediments
<i>Phyllodoce maculata</i>	153	Muddy-sand
<i>Pygospio elegans</i>	548	Widespread muddy-sand, sandy-muds.
Class Oligochaeta		
Oligochaete spp.	1939	e.g. tubifex spp. Detritivores. Organic pollution indicators, highly tolerant of anoxic conditions.
Molluscs: Class Bivalvia		
<i>Cerastoderma edule</i>	340	May be widespread but prefers sandier sediments e.g. muddy-sand. Filter feeder.
<i>Scrobicularia plana</i>	480	Typical of reduced salinity mud shores.
<i>Macoma balthica</i>	66	May be widespread but prefers sandier sediments e.g. muddy-sand. Tolerant of organic enrichment, anoxic conditions.
Molluscs: Class Gastropoda		
<i>Hydrobia ulvae</i>	6366	Widespread. muddy sand and mud sediments. grazer on e.g. algae, feeding on diatoms.
<i>Littorina littorea</i>	204	Widely distributed, usually associated with rocky shores but also found in estuaries. A grazer i.e. grazes on microorganisms and detritus.
Crustaceans: Order Amphipoda		
<i>Corophium volutator</i>	4953	Widely distributed within estuaries, muddy sediment. Detritivore, tolerant of organic rich sediments.
<i>Gammarus spp.</i>	356	Widespread, distribution linked to primarily to salinity
<i>Melita palmata</i>	535	Widespread, sandy and muddy sediments
<i>Socarnes erythrophthalmus</i>	500	Sandy sediments.
Crustaceans: Order Isopoda		
<i>Eurydice spp.</i>	167	Widespread but sandier sediments.
Crustaceans: Order Decapoda		
<i>Carcinus maenas</i>	535	Common and widespread within estuaries.
<i>Crangon crangon</i>		Common and widespread within estuaries.

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Table 7.5 a Latin names of bird species mentioned within the Ecology Section and bird listed on 'Birds of Conservation Concern' (Newton *et al.*, 1999) or on Annex I of the 'Birds Directive' (Council Directive 79/409/EEC).

SPECIES	Listed on Birds Of Conservation Concern (Newton <i>et al.</i> , 1999)	Annex I Species EU Directive 79/409/EEC 'Birds Directive'.
Great Northern Diver <i>Gavia immer</i>		*
Little Grebe <i>Tachybaptus ruficollis</i>		
Cormorant <i>Phalacrocorax carbo</i>	Amber List	
Little Egret <i>Egretta garzetta</i>	Amber List	*
Grey Heron <i>Ardea cinerea</i>		
Mute Swan <i>Cygnus olor</i>		
Light-bellied Brent Geese <i>Branta bernicla</i>	Amber List	
Shelduck <i>Tadorna tadorna</i>	Amber List	
Wigeon <i>Anas Penelope</i>	Amber List	
Teal <i>Anas crecca</i>	Amber List	
Mallard <i>Anas platyrhynchos</i>		
Shoveler <i>Anas clypeata</i>		
Red-breasted Merganser <i>Mergus serrator</i>	Amber List	
Moorhen <i>Gallinula chloropus</i>		
Oystercatcher <i>Haematopus ostralegus</i>		
Ringed Plover <i>Charadrius hiaticula</i>		
Golden Plover <i>Pluvialis apricaria</i>	Amber List	*
Grey Plover <i>Pluvialis squatarola</i>	Amber List	
Lapwing <i>Vanellus vanellus</i>	Red List	
Knot <i>Calidris canutus</i>	Amber List	
Turnstone <i>Arenaria interpres</i>		
Dunlin <i>Calidris alpina</i>	Amber List	
Curlew Sandpiper <i>Calidris ferruginea</i>		
Little Stint <i>Calidris minuta</i>		
Redshank <i>Tringa totanus</i>	Amber List	
Greenshank <i>Tringa nebularia</i>		
Black-Tailed Godwit <i>Limosa limosa</i>	Amber List	
Bar-tailed Godwit <i>Limosa lapponica</i>	Amber List	*
Curlew <i>Numenius arquata</i>	Red List	
Whimbrel <i>Numenius phaeopus</i>		
Woodcock <i>Scolopax rusticola</i>	Amber List	
Snipe <i>Gallinago gallinago</i>	Amber List	
Kingfisher <i>Alcedo atthis</i>	Amber List	*

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Clonakilty Bay: Results from the Irish Wetland Bird Survey (I-WeBS).

Table 7.6 a Shows the 1% National thresholds, 1% International thresholds and the most recent count data together with species peak numbers and average numbers. Note: No data is available for 1999/2000.



Clonakilty Bay

Species name	1% national	1% international	1998/99	2000/01	2001/02	2002/03	Peak	Mean
Great Northern Diver	20	50		1			1	0
Little Grebe	40	3,400	1				1	0
Cormorant	150	1,200	5	11	10	5	11	8
Grey Heron	105	2,700	10	7	8	7	10	8
Little Egret		1,300	7	9	5	5	9	7
Mute Swan	210	210	48	86		35	66	37
Light-bellied Brent Goose	200	200	5	20			20	6
Shelduck	150	3,000	127	189	91	78	189	121
Wigeon	900	15,000	467	467	240	195	467	342
American Wigeon				1			1	0
Gadwall	20	600	1				1	0
Teal	570	4,000	420	235	178	6	420	210
Mallard	840	20,000	108	113	74	24	113	80
Shoveler	40	400	1				1	0
Red-breasted Merganser	40	1,700	7	8		6	8	5
Moorhen	20	20,000	5				5	1
Oystercatcher	700	10,200	332	368	163	89	368	238
Ringed Plover	150	730	143	75	58		143	69
Golden Plover	1,500	9,300	1,129	205	550		1,129	471
Grey Plover	75	2,500	53		25	3	53	33
Lapwing	2,000	20,000	1,521	2,108	440	70	2,108	1,035
Knot	340	4,500	134	100	3		131	59
Little Stint		2,100	2				2	1
Curlew Sandpiper		4,500	18	1			18	5
Dunlin	1,400	13,300	840	807	761	118	940	657
Ruff			2				2	1
Snipe		20,000	30				30	8
Black-tailed Godwit	180	350	1,182	985	1,600	65	1,600	958
Bar-tailed Godwit	180	1,200	70	59	25		70	39
Whimbrel		8,400	1				1	0
Curlew	660	4,200	1,100	967	304	92	1,100	616
Spotted Redshank		1,000	1	1			1	1
Redshank	330	1,900	328	262	208	60	328	215
Greenshank	20	3,100	42	40	13	4	42	25
Turnstone	140	1,000	57	44	12	15	57	32
Kingfisher				1			1	0

Clonakilty Estuary: Recent results from the Irish Wetland Bird Survey (I-WeBS) 2004/05 season.

Table 7.6 b Shows preliminary data for Clonakilty Estuary for the most recent winter season September 2004 – March 2005 (data kindly provided by the Clonakilty I-WeBS Coordinator (M Cobley) and BirdWatch Ireland).

SPECIES	Peak Numbers recorded during any one count during the period Sep 04 – Mar 05.	Listed on Birds Of Conservation Concern (Newton et al., 1999)	Annex I Species EU Directive 79/409/EEC 'Birds Directive'.
Great Northern Diver <i>Gavia immer</i>	2		*
Cormorant <i>Phalacrocorax carbo</i>	15	Amber List	
Little Egret <i>Egretta garzetta</i>	16	Amber List	*
Grey Heron <i>Ardea cinerea</i>	5		
Mute Swan <i>Cygnus olor</i>	57		
Shelduck <i>Tadorna tadorna</i>	20	Amber List	
Wigeon <i>Anas Penelope</i>	155	Amber List	
Teal <i>Anas crecca</i>	25	Amber List	
Mallard <i>Anas platyrhynchos</i>	55		
Pintail <i>Anas acuta</i>	1	Amber List	
Red-breasted Merganser <i>Mergus serrator</i>	9	Amber List	
Moorhen <i>Gallinula chloropus</i>	1		
Oystercatcher <i>Haematopus ostralegus</i>	623		
Ringed Plover <i>Charadrius hiaticula</i>	138		
Golden Plover <i>Pluvialis apricaria</i>	82	Amber List	*
Grey Plover <i>Pluvialis squatarola</i>	50	Amber List	
Lapwing <i>Vanellus vanellus</i>	501	Red List	
Knot <i>Calidris canutus</i>	9	Amber List	
Turnstone <i>Arenaria interpres</i>	21		
Dunlin <i>Calidris alpina</i>	697	Amber List	
Redshank <i>Tringa totanus</i>	363	Amber List	
Greenshank <i>Tringa nebularia</i>	19		
Black-Tailed Godwit <i>Limosa limosa</i>	874	Amber List	
Curlew <i>Numenius arquata</i>	397	Red List	
Snipe <i>Gallinago gallinago</i>	2	Amber List	
Kingfisher <i>Alcedo atthis</i>	1	Amber List	*
Black-headed Gull <i>Larus ridibundus</i>	44	Amber List	
Common Gull <i>Larus canus</i>	730	Amber List	
Lesser Black-backed Gull <i>Larus fuscus</i>	132		
Herring Gull <i>Larus argentatus</i>	60		
Great Black-backed gull <i>Larus marinus</i>	64		

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Flora Species List

Amenity grassland (GA2)

Species List:

Latin Name	Common Name	Frequency of occurrence in Ireland
<i>Agrostis stolonifera</i>	Creeping Bent	Abundant
<i>Bellis perennis</i>	Daisy	Abundant
<i>Leontodon autumnalis</i>	Autumn Hawkbit	Frequent
<i>Lolium perenne</i>	Perennial Rye-grass	Abundant
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Poa annua</i>	Annual Meadow-grass	Abundant
<i>Potentilla anserina</i>	Silverweed	Abundant
<i>Prunella vulgaris</i>	Self Heal	Abundant
<i>Ranunculus repens</i>	Creeping Buttercup	Abundant
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Abundant
<i>Senecio jacobaea</i>	Common Ragwort	Abundant
<i>Stellaria media</i>	Common Chickweed	Abundant
<i>Taraxacum officinale</i>	Dandelion	Abundant
<i>Trifolium pratense</i>	Red Clover	Abundant

Recolonising Bare Ground (ED3)

Species List:

Latin Name	Common Name	Frequency of occurrence in Ireland
<i>Achillea millefolium</i>	Yarrow	Abundant
<i>Agrostis stolonifera</i>	Creeping Bent	Abundant
<i>Alopecurus pratensis</i>	Meadow Foxtail	Frequent
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Abundant
<i>Bellis perennis</i>	Daisy	Abundant
<i>Calystegia sepium</i>	Hedge Bindweed	Frequent
<i>Capsella bursa-pastoris</i>	Shepherd's-purse	Abundant
<i>Cardamine hirsuta</i>	Hairy Bitter-cress	Frequent
<i>Chamaerion angustifolium</i>	Rosebay Willowherb	Locally frequent
<i>Chenopodium album</i> agg.	Fat-hen	Frequent
<i>Cirsium arvense</i>	Creeping Thistle	Abundant
<i>Crocsmia aurea</i> x <i>C. pottsii</i>	Montbretia	Locally abundant in south and west
<i>Elytrigia repens</i>	Common Couch	Abundant
<i>Euphorbia helioscopia</i>	Sun Spurge	Very frequent
<i>Lolium perenne</i>	Perennial Rye-grass	Abundant
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Abundant
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Plantago major</i>	Greater Plantain	Abundant
<i>Polygonum aviculare</i> agg.	Knotgrass	Abundant
<i>Potentilla anserina</i>	Silverweed	Abundant

<i>Prunella vulgaris</i>	Self Heal	Abundant
<i>Ranunculus repens</i>	Creeping Buttercup	Abundant
<i>Rubus fruticosus</i> agg.	Bramble	Abundant
<i>Rumex crispus</i>	Curled Dock	Abundant
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Abundant
<i>Salix</i> sp.	Willow	Frequent
<i>Senecio jacobaea</i>	Common Ragwort	Abundant
<i>Senecio vulgaris</i>	Groundsel	Abundant
<i>Sonchus asper</i>	Prickly Sow-thistle	Very frequent
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	Frequent
<i>Taraxacum officinale</i>	Dandelion	Abundant
<i>Urtica dioica</i>	Common Nettle	Abundant
<i>Vicia cracca</i>	Tufted Vetch	Abundant
<i>Ulex europaeus</i>	Orse	Abundant

Recolonising bare ground (ED3)/wet grassland (GS4)

Species List:

Latin Name	Common Name	Frequency of occurrence in Ireland
<i>Acer pseudoplatanus</i>	Sycamore	Abundant
<i>Agrostis stolonifera</i>	Creeping Bent	Abundant
<i>Anagallis arvensis</i>	Scarlet Pimpernel	Occasional to frequent
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	Abundant
<i>Cardamine flexuosa</i>	Way Bitter-ress	Very frequent
<i>Centaurea nigra</i>	Common Knapweed	Abundant
<i>Chamaerion angustifolium</i>	Rosebay Willowherb	Locally frequent
<i>Epilobium hirsutum</i>	Great Willowherb	Very frequent
<i>Euphorbia helioscopia</i>	Sun Spurge	Very frequent
<i>Holcus lanatus</i>	Yorkshire Fog	Abundant
<i>Holcus mollis</i>	Creeping Soft-grass	Locally frequent
<i>Juncus effusus</i>	Soft Rush	Locally abundant
<i>Leontodon autumnalis</i>	Autumn Hawkbit	Frequent
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Abundant
<i>Medicago lupulina</i>	Black Medick	Abundant
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Plantago major</i>	Greater Plantain	Abundant
<i>Poa annua</i>	Annual Meadow-grass	Abundant
<i>Potentilla anserina</i>	Silverweed	Abundant
<i>Potentilla reptans</i>	Creeping Cinquefoil	Frequent in south and centre
<i>Prunella vulgaris</i>	Self Heal	Abundant
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Abundant
<i>Taraxacum officinale</i>	Dandelion	Abundant
<i>Trifolium repens</i>	White Clover	Abundant
<i>Urtica dioica</i>	Common Nettle	Abundant
<i>Veronica persica</i>	Common Field-speedwell	Abundant

Hedgerows (WL1) and treelines (WL2)

Species List:

Latin Name	Common Name	Frequency of occurrence in Ireland
<i>Acer pseudoplatanus</i>	Sycamore	Abundant
<i>Calystegia sepium</i>	Hedge Bindweed	Frequent
<i>Centaurea nigra</i>	Common Knapweed	Abundant
<i>Fallopia japonica</i>	Japanese Knotweed	Frequent and increasing
<i>Hedera helix</i>	Ivy	Widespread and abundant
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Abundant
<i>Myrtus</i> sp.	Myrtus	-
<i>Osmanthus</i> sp.	Osmanthus species	-
<i>Papaver rhoeas</i>	Common Poppy	Occasional/frequent
<i>Petasites hybridus</i>	Butterbur	Frequent but local
<i>Picea</i> sp.	Spruce	Widely planted
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Rhododendron ponticum</i>	Rhododendron	Extensively naturalised and widely planted
<i>Rosa canina</i>	Dog-rose	Very frequent
<i>Rosa</i> sp.	Rose species	-
<i>Rubus fruticosus</i> agg.	Bramble	Abundant
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Abundant
<i>Salix</i> sp.	Willow	Frequent
<i>Salix alba</i> x <i>S. babylonica</i>	Weeping Willow	-
<i>Senecio jacobaea</i>	Common Ragwort	Abundant
<i>Ulex europaeus</i>	Gorse	Abundant

Scrub (WS1)

Species List:

Latin Name	Common Name	Frequency of occurrence in Ireland
<i>Calystegia sepium</i>	Hedge Bindweed	Frequent
<i>Rubus fruticosus</i> agg.	Bramble	Abundant
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Abundant
<i>Senecio jacobaea</i>	Common Ragwort	Abundant
<i>Ulex europaeus</i>	Gorse	Abundant

Wet Grassland (GS4)

Species List:

Latin Name	Common Name	Frequency of occurrence in Ireland
<i>Achillea millefolium</i>	Yarrow	Abundant
<i>Agrostis stolonifera</i>	Creeping Bent	Abundant
<i>Armeria maritima</i>	Thrift	Frequent
<i>Berula erecta</i>	Lesser Water-parsnip	Frequent in east and centre, occasional elsewhere
<i>Beta vulgaris</i> subsp. <i>Maritima</i>	Sea Beet	Widespread but occasional

<i>Centaura nigra</i>	Common Knapweed	Abundant
<i>Cerastium fontanum</i>	Common Mouse-ear	Abundant
<i>Chenopodium album</i> agg.	Fat-hen	Frequent
<i>Dactylis glomerata</i>	Cock's-foot	Abundant
<i>Daucus carota</i>	Wild Carrot	Frequent near the sea
<i>Deschampsia cespitosa</i>	Tufted Hair-grass	Very frequent
<i>Festuca</i> spp.	Fescues	Abundant
<i>Heracleum sphondylium</i>	Hogweed	Abundant
<i>Holcus lanatus</i>	Yorkshire Fog	Abundant
<i>Holcus mollis</i>	Creeping soft-grass	Locally frequent
<i>Leontodon autumnalis</i>	Autumn Hawkbit	Frequent
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Abundant
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil	Abundant in many districts but rare in centre and parts of the west
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Poa trivialis</i>	Rough Meadow-grass	Abundant
<i>Potentilla anserina</i>	Silverweed	Abundant
<i>Ranunculus repens</i>	Creeping Buttercup	Abundant
<i>Rumex crispus</i>	Curled Dock	Abundant
<i>Scrophularia auriculata</i>	Water Figwort	Frequent in south and west, occasional elsewhere
<i>Senecio aquaticus</i>	Marsh Ragwort	Common
<i>Taraxacum officinale</i>	Dandelion	Abundant
<i>Trifolium pratense</i>	Red Clover	Abundant
<i>Tripleurospermum inodorum</i>	Scentless Mayweed	Disturbed ground, occasional
<i>Veronica persica</i>	Common Field-speedwell	Abundant

Recolonising Bare Ground (ED3)

Species List:

Latin Name	Common Name	Frequency of occurrence in Ireland
<i>Anagallis arvensis</i>	Scarlet Pimpernel	Occasional to frequent
<i>Artemisia vulgaris</i>	Mugwort	Rare and declining
<i>Bellis perennis</i>	Daisy	Abundant
<i>Cardamine flexuosa</i>	Wavy Bitter-cress	Very frequent
<i>Centaura nigra</i>	Common Knapweed	Abundant
<i>Cerastium fontanum</i>	Common Mouse-ear	Abundant
<i>Chenopodium album</i> agg.	Fat-hen	Frequent
<i>Cirsium arvense</i>	Creeping Thistle	Abundant
<i>Calystegia sepium</i>	Hedge Bindweed	Frequent throughout
<i>Dactylis glomerata</i>	Cock's-foot	Abundant
<i>Elytrigia repens</i>	Common Couch	Abundant
<i>Euphorbia helioscopia</i>	Sun Spurge	Very frequent
<i>Fallopia japonica</i>	Japanese Knotweed	Alien species
<i>Fumaria officinalis</i>	Common Fumitory	Frequent near the east coast, rarer elsewhere
<i>Gnaphalium uliginosum</i>	Marsh Cudweed	Frequent, except in centre
<i>Lotus corniculatus</i>	Bird's-foot trefoil	Abundant
<i>Lotus pedunculatus</i>	Greater Bird's-foot-trefoil	Abundant in many districts but rare in

		centre and parts of the west
<i>Matricaria discoidea</i>	Pineappleweed	Abundant
<i>Mentha pulegium</i>	Pennyroyal	Occasional in Kerry, rare elsewhere
<i>Papaver rhoeas</i>	Common Poppy	Occasional/frequent
<i>Persicaria maculosa</i>	Redshank	Abundant
<i>Petasites hybridus</i>	Butterbur	Frequent but local
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Plantago major</i>	Greater Plantain	Abundant
<i>Polygonum aviculare</i> agg.	Knotgrass	Abundant
<i>Potentilla anserina</i>	Silverweed	Abundant
<i>Ranunculus repens</i>	Creeping Buttercup	Abundant
<i>Rorippa nasturtium-aquaticum</i> agg.	Water-cress	Very frequent
<i>Rubus fruticosus</i> agg.	Bramble	Abundant
<i>Rumex acetosa</i>	Common Sorrel	Abundant
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Abundant
<i>Scrophularia auriculata</i>	Water Figwort	Frequent in south and west, occasional elsewhere
<i>Senecio aquaticus</i>	Marsh Ragwort	Common
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	Frequent
<i>Stachys palustris</i>	Marsh Woundwort	Frequent
<i>Stellaria media</i>	Common Chickweed	Abundant
<i>Taraxacum officinale</i>	Dandelion	Abundant
<i>Trifolium pratense</i>	Red Clover	Abundant
<i>Trifolium repens</i>	White Clover	Abundant
<i>Tripleurospermum inodorum</i>	Scentsless Mayweed	Disturbed ground, occasional
<i>Urtica dioica</i>	Common Nettle	Abundant
<i>Vicia cracca</i>	Tufted Vetch	Abundant

Long Quay Pumping Station

Species List:

Latin Name	Common Name	Frequency of occurrence in Ireland
<i>Acer pseudoplatanus</i>	Sycamore	Abundant
<i>Aesculus hippocastanum</i>	Horse-chestnut	Native of Europe.
<i>Asplenium trichomanes</i>	Maidenhair Spleenwort	Very frequent
<i>Bellis perennis</i>	Daisy	Abundant
<i>Buddleja davidii</i>	Butterfly-bush	Frequent in Cork, non-native
<i>Leontodon autumnalis</i>	Autumn Hawkbit	Frequent
<i>Medicago lupulina</i>	Black Medick	Abundant
<i>Plantago lanceolata</i>	Ribwort Plantain	Abundant
<i>Prunella vulgaris</i>	Self Heal	Abundant
<i>Rumex obtusifolius</i>	Broad-leaved Dock	Abundant
<i>Salix</i> sp.	Willow	Frequent
<i>Taraxacum officinale</i>	Dandelion	Abundant
<i>Ulex europaeus</i>	Gorse	Abundant

APPENDIX 10.1

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Certificate of Calibration



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.

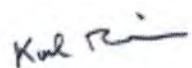
Sound Level Meters: All Calibration procedures were carried out by substituting the microphone capsule with a suitable electrical signal, apart from the final acoustic calibration.

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	
Calibration Date	10 December 2004
Calibration Certificate Number	130533

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

Certificate of Calibration



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

Measurement Results

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

94 dB Output	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

Calibration Date

10 December 2004

Calibration Certificate Number

130534

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

APPENDIX 10.2

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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:

0800 hrs to 2200 hrs

Night:

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.

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_{Aeq}

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.

$L(A)_{10}$

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 10.3

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Noise Measurement Report

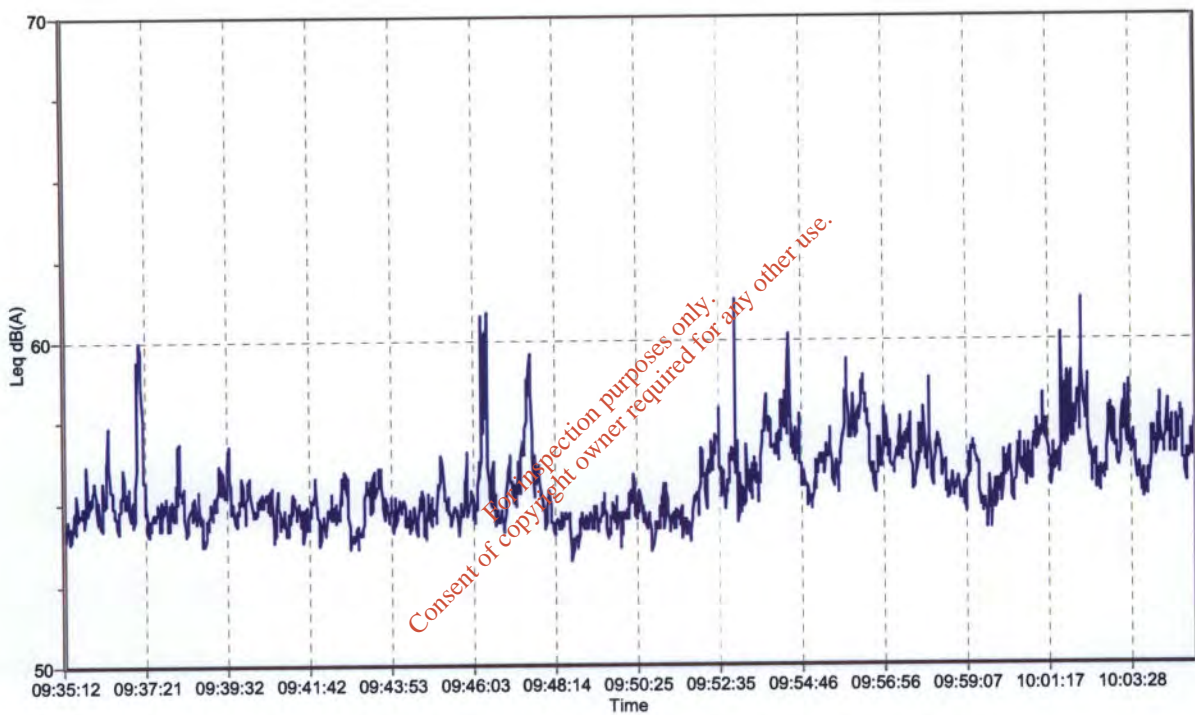
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 09:35:12

Run Time: 00:30:00
Range: 40-100 dB

Leq 55.9 dBA
Lepd 43.8 dBA
LAE 88.2 dBA
LAFmax 67.6 dBA
Peak 91.8 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
59.2 dBA	57.3 dBA	55.3 dBA	54.2 dBA	54.0 dBA	53.6 dBA



Notes: Daytime Survey, Noise Measurement Location N1, Broadband

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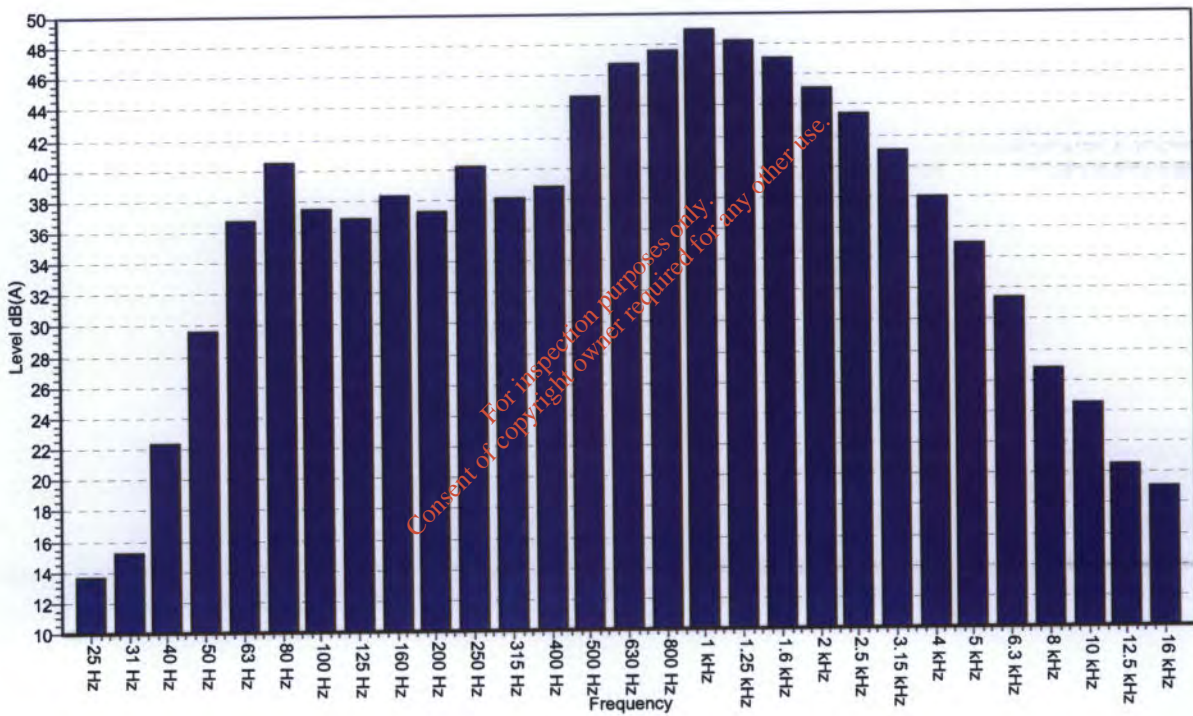
Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 10:06:16

Run Time: 00:04:48
 Range: 40-100 dB
 Spectrum: 'A' weighted

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	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
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq	
Duration (s)	9	9	9	9	9	9	9	9	9	9	



Notes: Daytime Survey, Noise Measurement Location N1, 1/3 Octave Frequency Analysis

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Noise Measurement Report

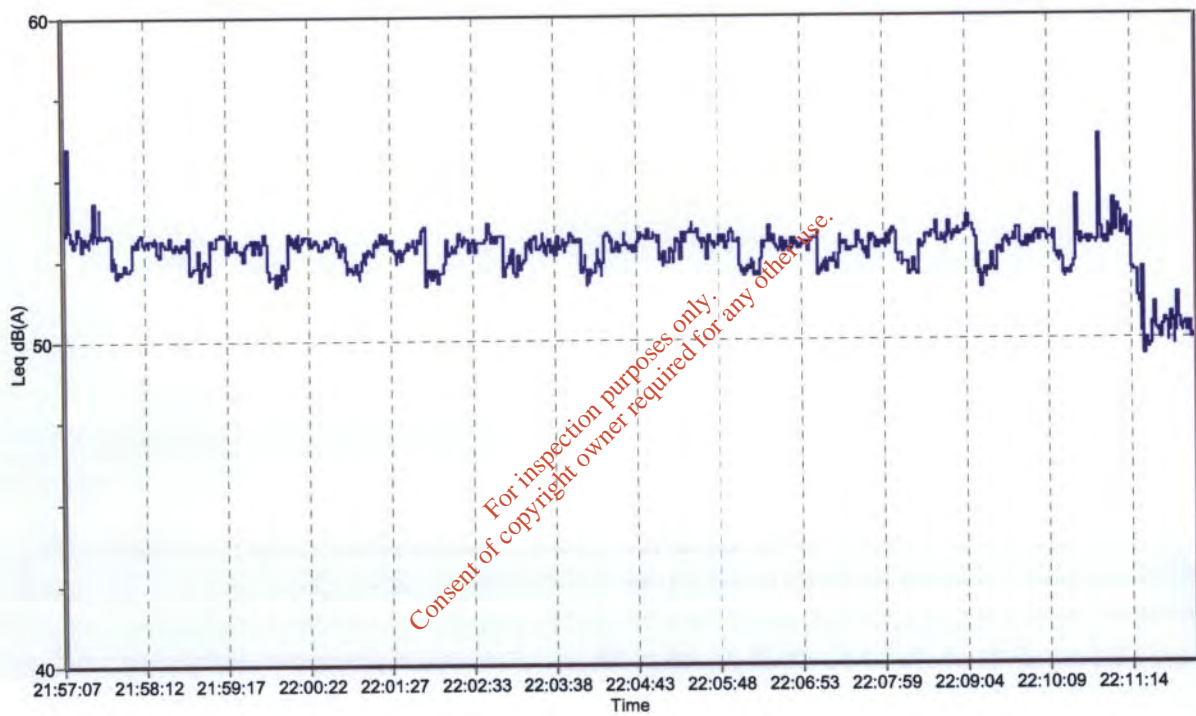
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 21:57:07

Run Time: 00:15:00
Range: 40-100 dB

Leq 52.8 dBA
Lepd 37.7 dBA
LAE 82.2 dBA
LAFmax 61.8 dBA
Peak 88.4 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
53.7 dBA	53.3 dBA	52.8 dBA	51.9 dBA	51.3 dBA	49.8 dBA



Notes: Night-time Survey, Noise Measurement Location N1, Broadband

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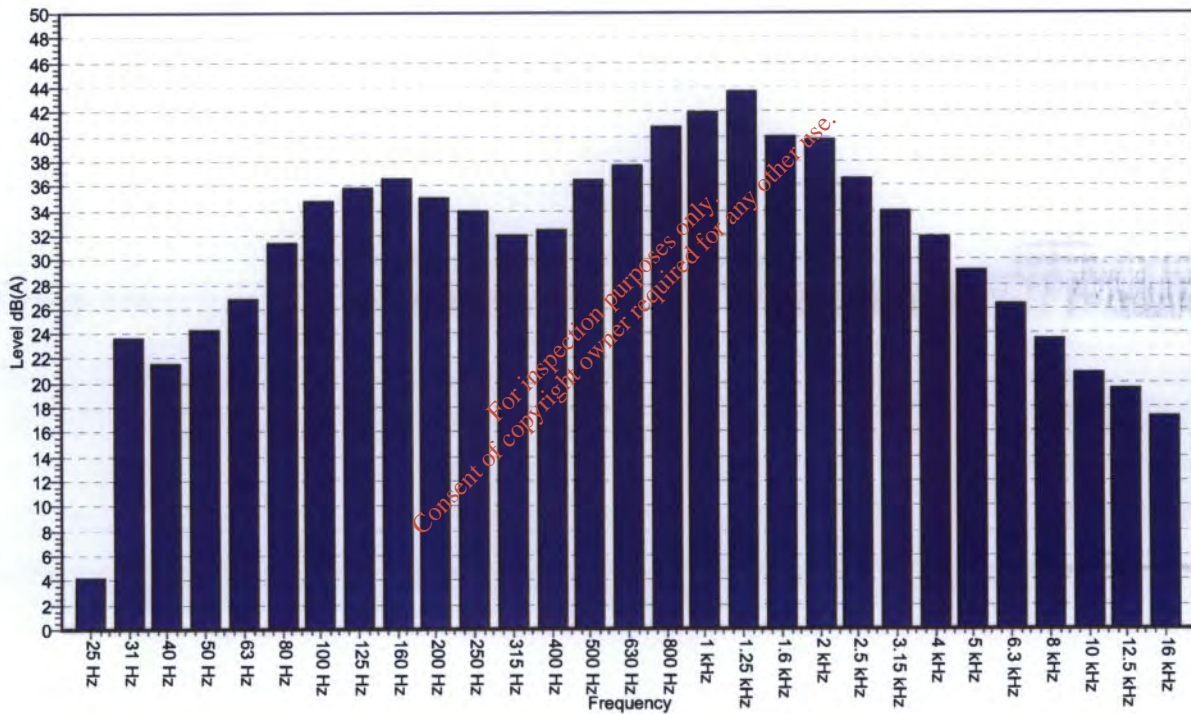
Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 22:12:55

Run Time: 00:04:48
 Range: 40-100 dB
 Spectrum: 'A' weighted

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	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
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq	
Duration (s)	9	9	9	9	9	9	9	9	9	9	



Notes: Night-time Survey, Noise Measurement Location N1, 1/3 Octave Frequency Analysis

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Noise Measurement Report

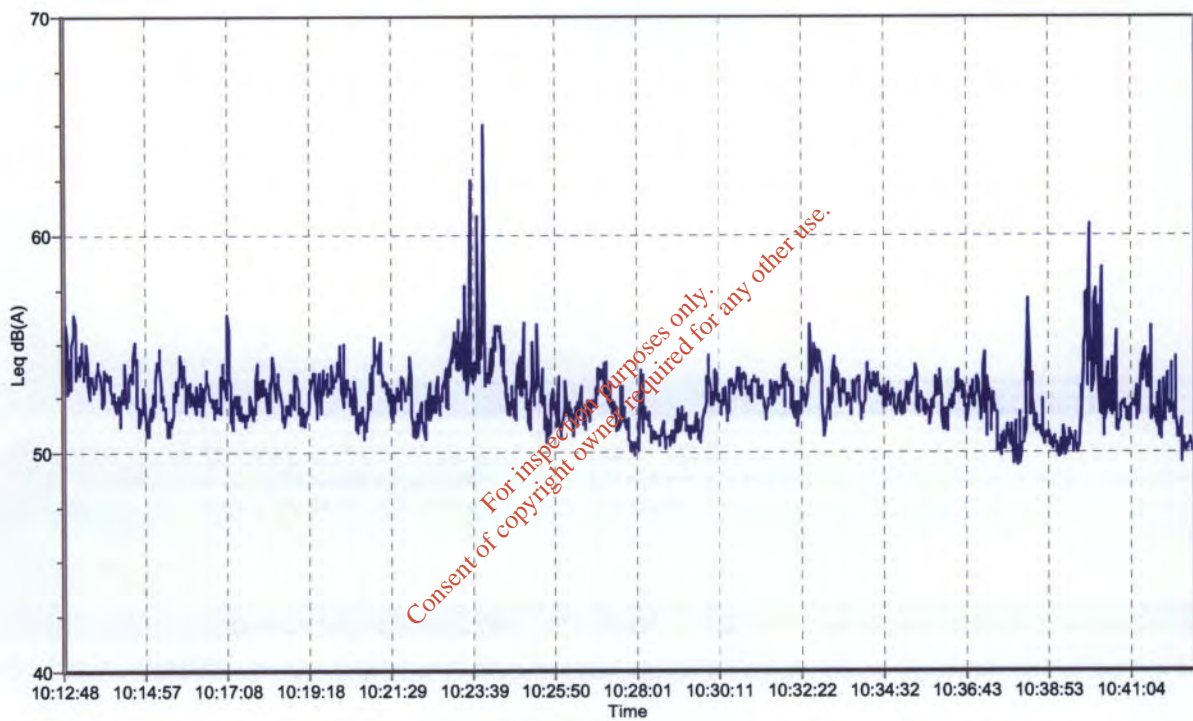
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 10:12:48

Run Time: 00:30:00
Range: 40-100 dB

Leq 52.8 dBA
Lepd 40.8 dBA
LAE 85.2 dBA
LAFmax 72.8 dBA
Peak 88.3 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	60.1 dBA	52.5 dBA	50.8 dBA	50.3 dBA	49.6 dBA



Notes: Daytime Survey, Noise Measurement Location N2, Broadband

Printed: 23/08/05 12:13:02

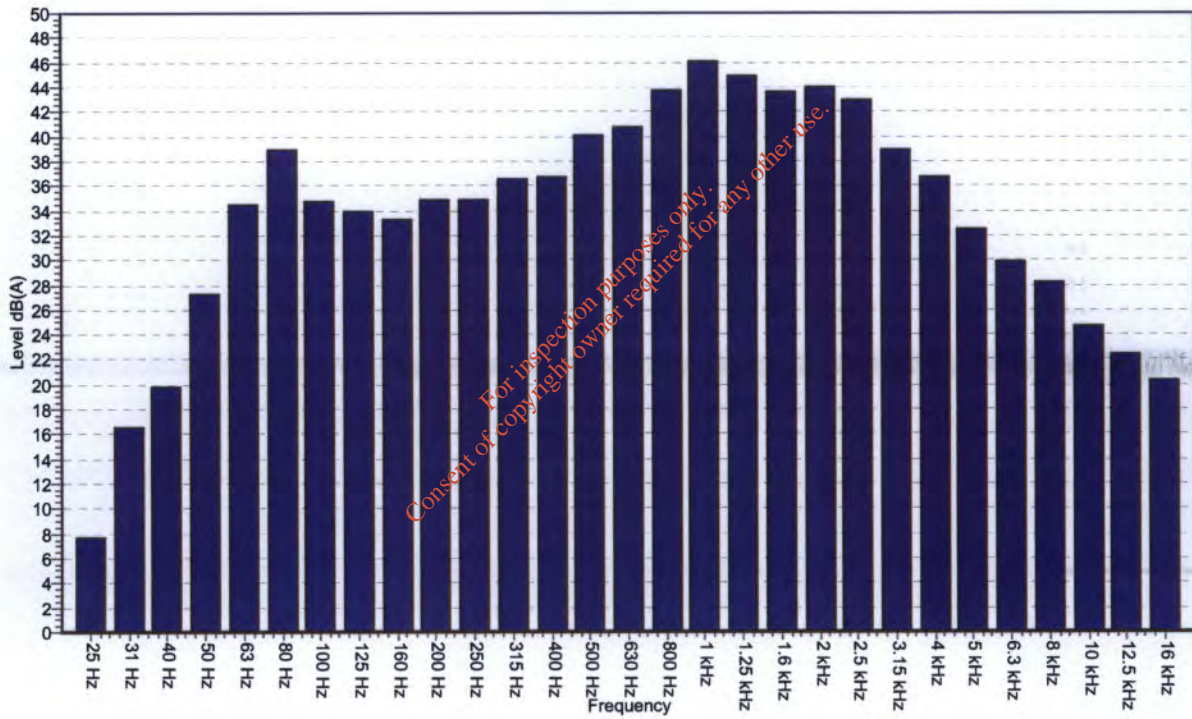
Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 10:51:52

Run Time: 00:04:48
 Range: 40-100 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)	7.7	16.6	19.9	27.2	34.5	38.9	34.7	34.0	33.3	34.9	34.8
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)	36.6	36.6	40.1	40.7	43.8	46.0	44.9	43.6	44.0	42.9	38.9
Duration (s)	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)	36.7	32.4	29.9	28.2	24.6	22.4	20.4	52.4	65.5	77.0	
Duration (s)	9	9	9	9	9	9	9	9	9	9	



Notes: Daytime Survey, Noise Measurement Location N2, 1/3 Octave Frequency Analysis

Printed: 23/08/05 12:18:34

Noise Measurement Report

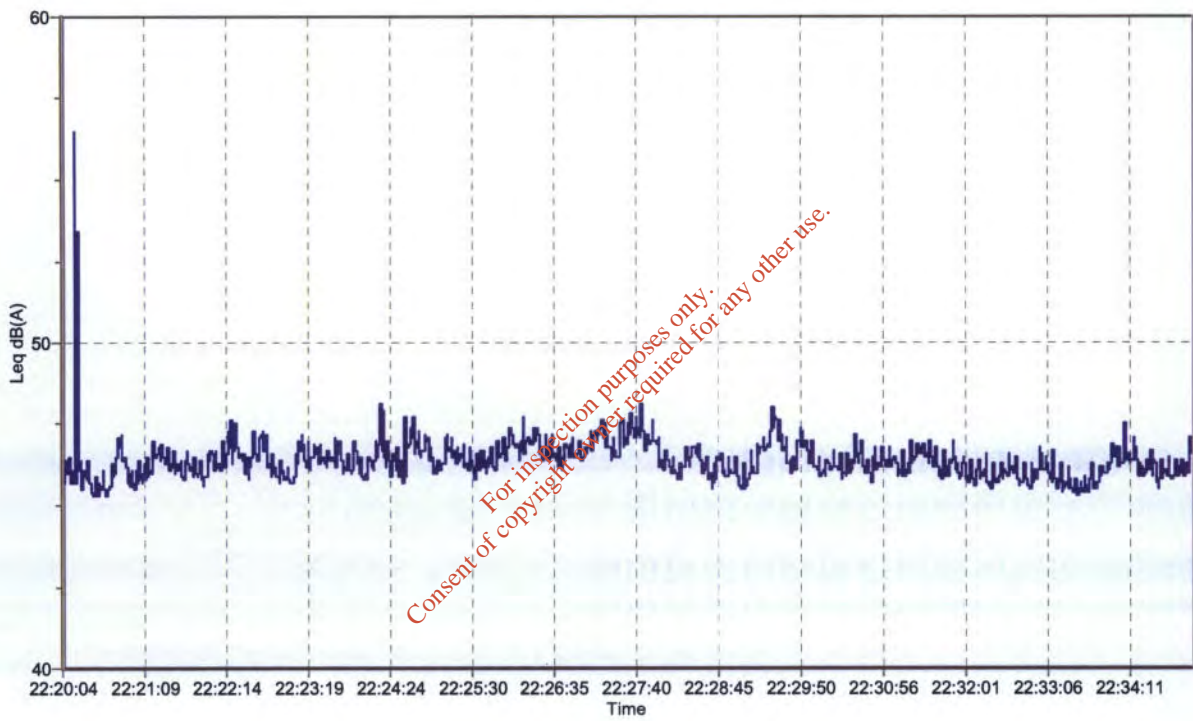
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 22:20:04

Run Time: 00:15:00
Range: 40-100 dB

Leq 46.5 dBA
Lepd 31.4 dBA
LAE 75.8 dBA
LAFmax 64.4 dBA
Peak 90.5 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	150.0 dBA	46.2 dBA	45.5 dBA	45.3 dBA	45.0 dBA



Notes: Night-time Survey, Noise Measurement Location N2, Broadband

Printed: 23/08/05 14:16:24

Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

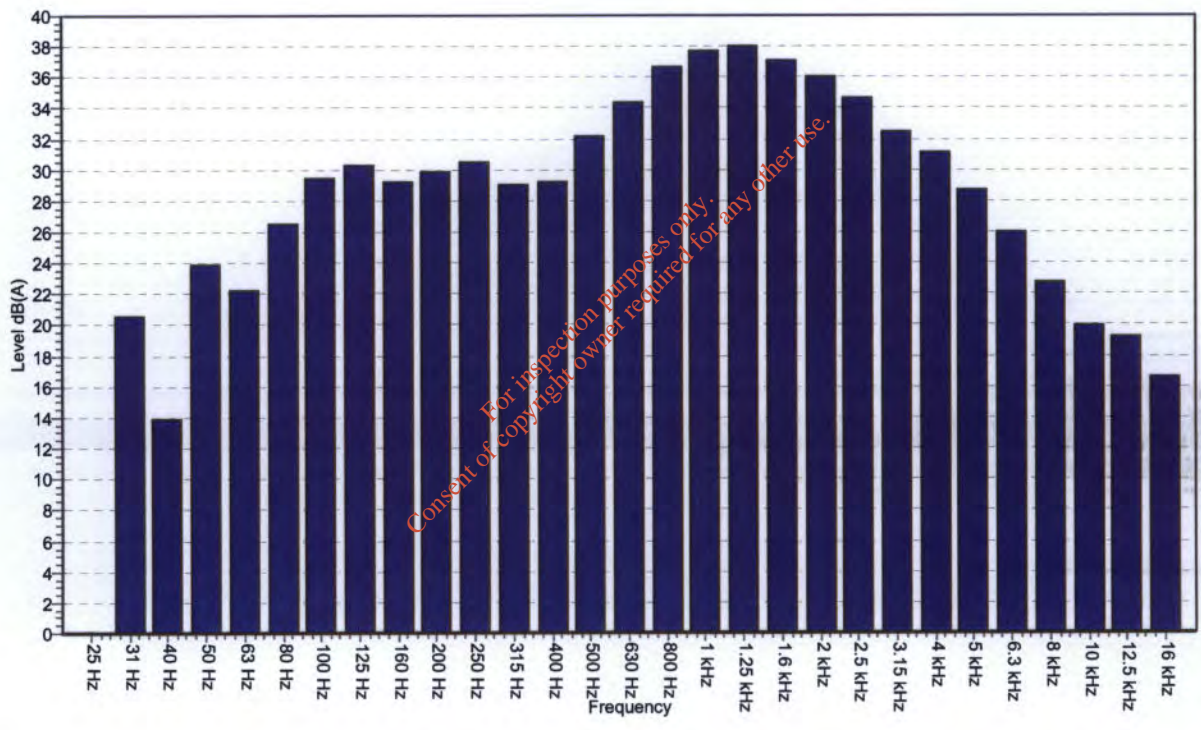
Date: 22/08/05 Time: 22:35:43

Run Time: 00:04:48
 Range: 40-100 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)	0.0	20.6	13.9	23.9	22.3	26.5	29.4	30.2	29.3	29.8	30.5
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)	29.0	29.2	32.2	34.4	36.6	37.7	38.0	37.1	36.1	34.7	32.5
Duration (s)	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)	31.1	28.8	26.0	22.8	19.9	19.2	16.6	46.7	61.7	62.5
Duration (s)	9	9	9	9	9	9	9	9	9	9



Notes: Night-time Survey, Noise Measurement Location N2, 1/3 Octave Frequency Analysis

Printed: 23/08/05 14:20:40

Noise Measurement Report

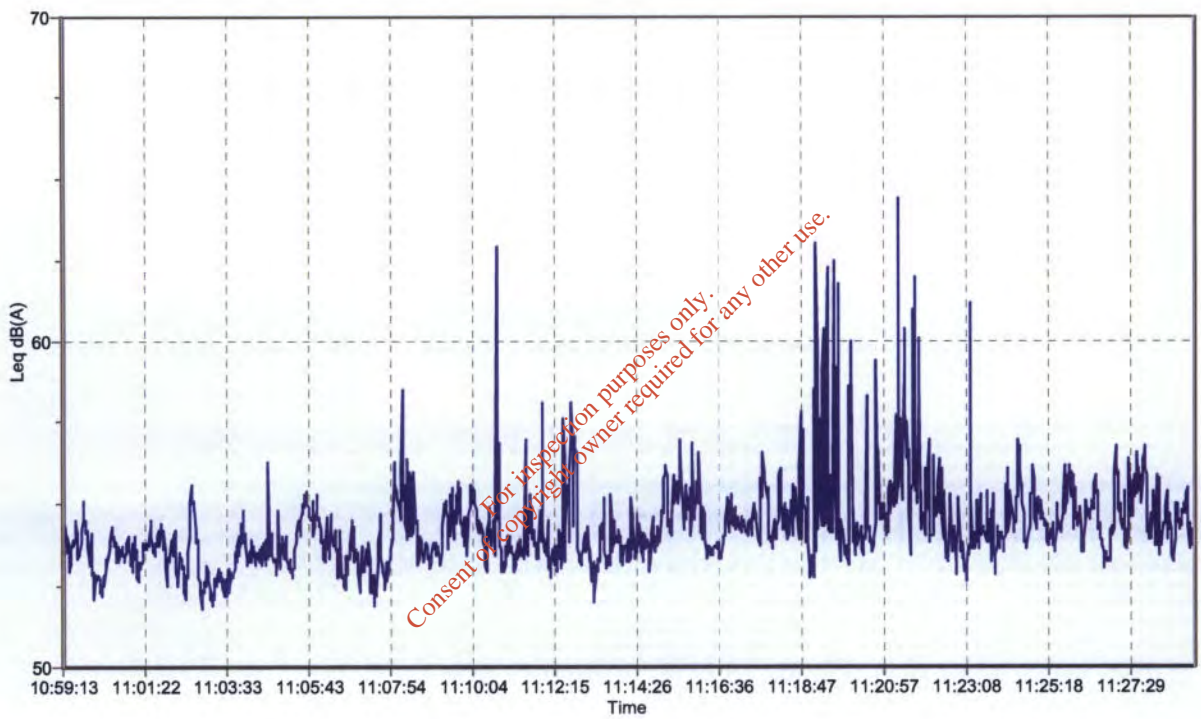
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 10:59:13

Run Time: 00:30:00
Range: 40-100 dB

Leq 54.5 dBA
Lepd 42.5 dBA
LAE 86.8 dBA
LAFmax 66.9 dBA
Peak 88.8 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	75.4 dBA	54.1 dBA	52.9 dBA	52.6 dBA	52.1 dBA



Notes: Daytime Survey, Noise Measurement Location N3, Broadband

Printed: 23/08/05 12:21:21

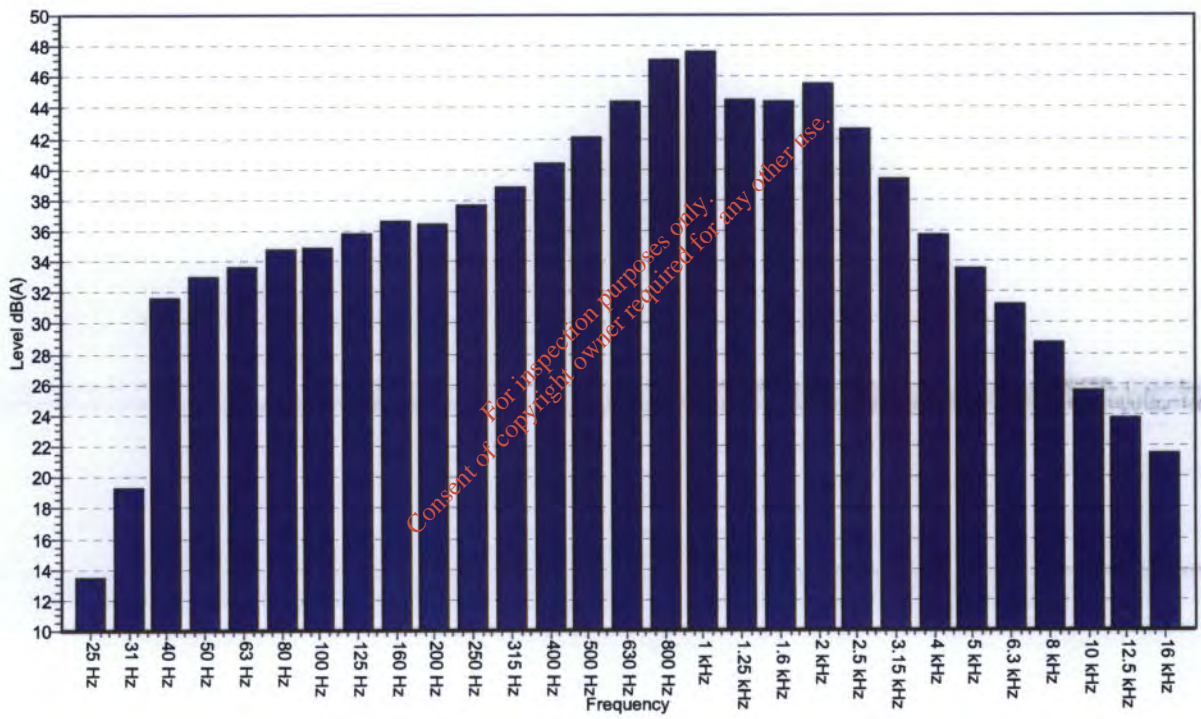
Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 11:31:27

Run Time: 00:04:48
 Range: 40-100 dB
 Spectrum 'A' weighted

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	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
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq	
Duration (s)	9	9	9	9	9	9	9	9	9	9	



Notes: Daytime Survey, Noise Measurement Location N3, 1/3 Octave Frequency Analysis

Printed: 23/08/05 12:23:25

Noise Measurement Report

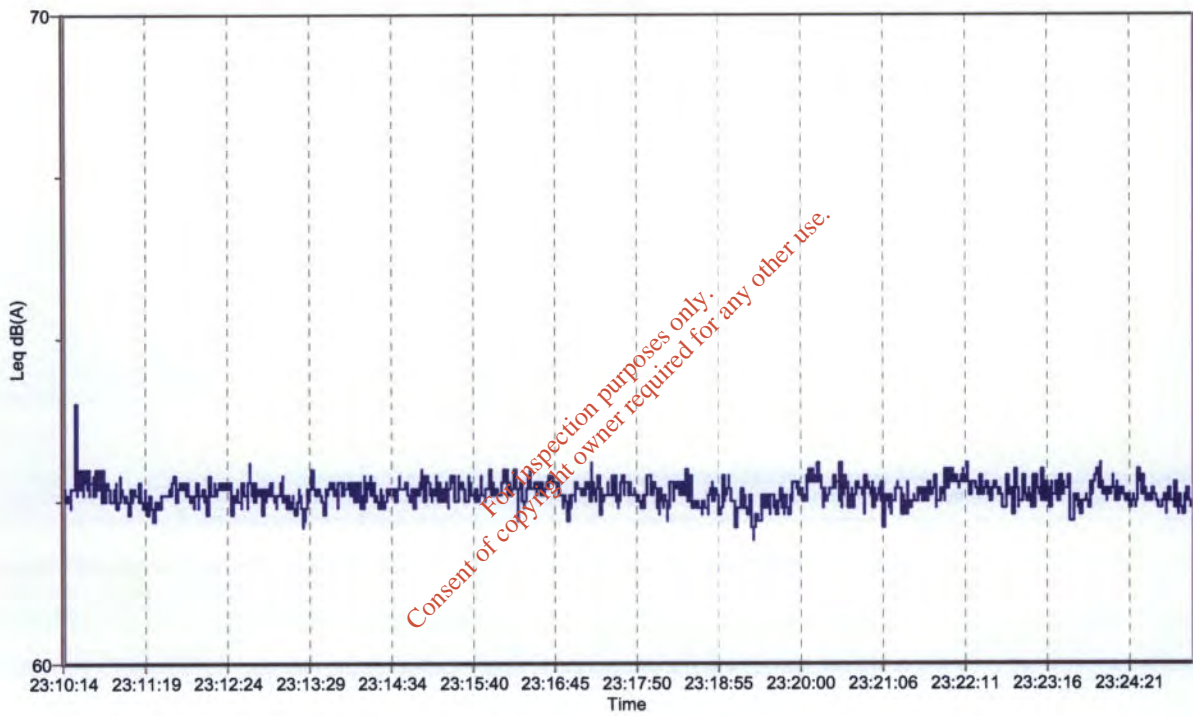
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 23:10:14

Run Time: 00:15:00
Range: 40-100 dB

Leq 62.7 dBA
Lepd 47.6 dBA
LAE 92.0 dBA
LAFmax 67.8 dBA
Peak 96.3 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	150.0 dBA	62.8 dBA	62.4 dBA	62.2 dBA	62.0 dBA



Notes: Night-time Survey, Noise Measurement Location N3, Broadband

Printed: 23/08/05 14:28:17

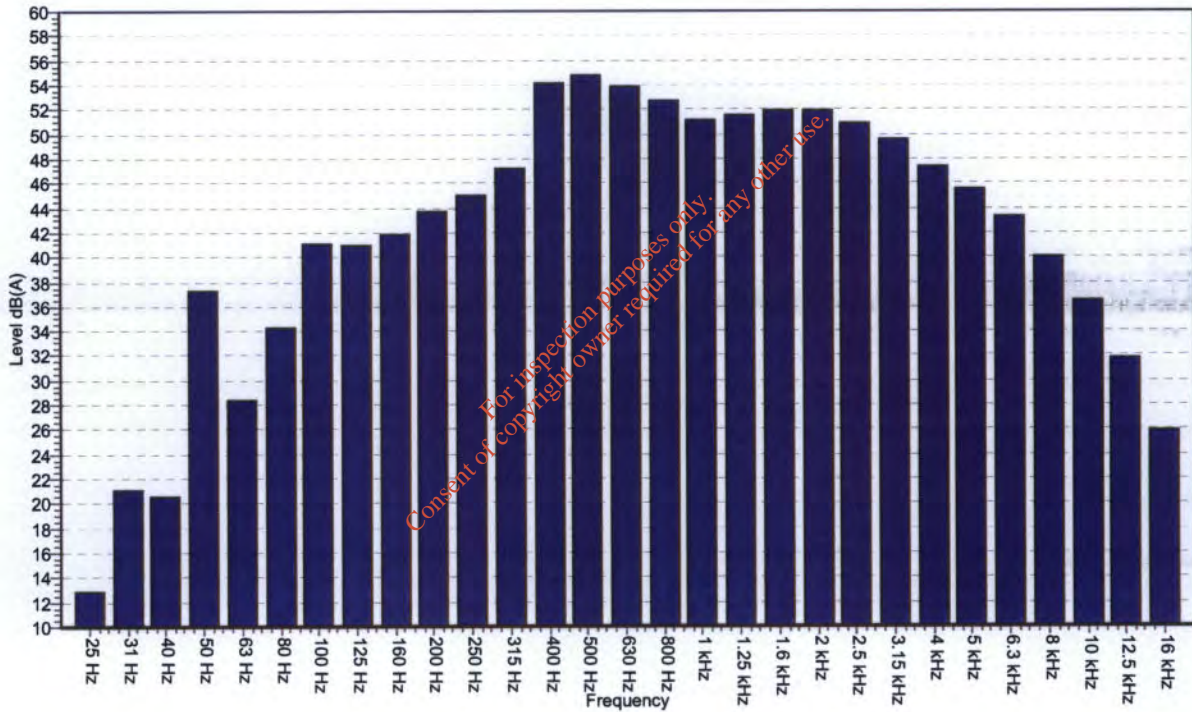
Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 23:28:18

Run Time: 00:04:48
 Range: 40-100 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)	12.8	21.1	20.5	37.3	28.4	34.3	41.0	40.9	41.9	43.7	45.0
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)	47.2	54.1	54.8	53.9	52.7	51.1	51.6	52.0	51.9	50.9	49.6
Duration (s)	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)	47.4	45.5	43.3	40.0	36.5	31.8	26.0	62.9	69.9	71.5	
Duration (s)	9	9	9	9	9	9	9	9	9	9	



Notes: Night-time Survey, Noise Measurement Location N3, 1/3 Octave Frequency Analysis

Printed: 23/08/05 14:30:13

Noise Measurement Report

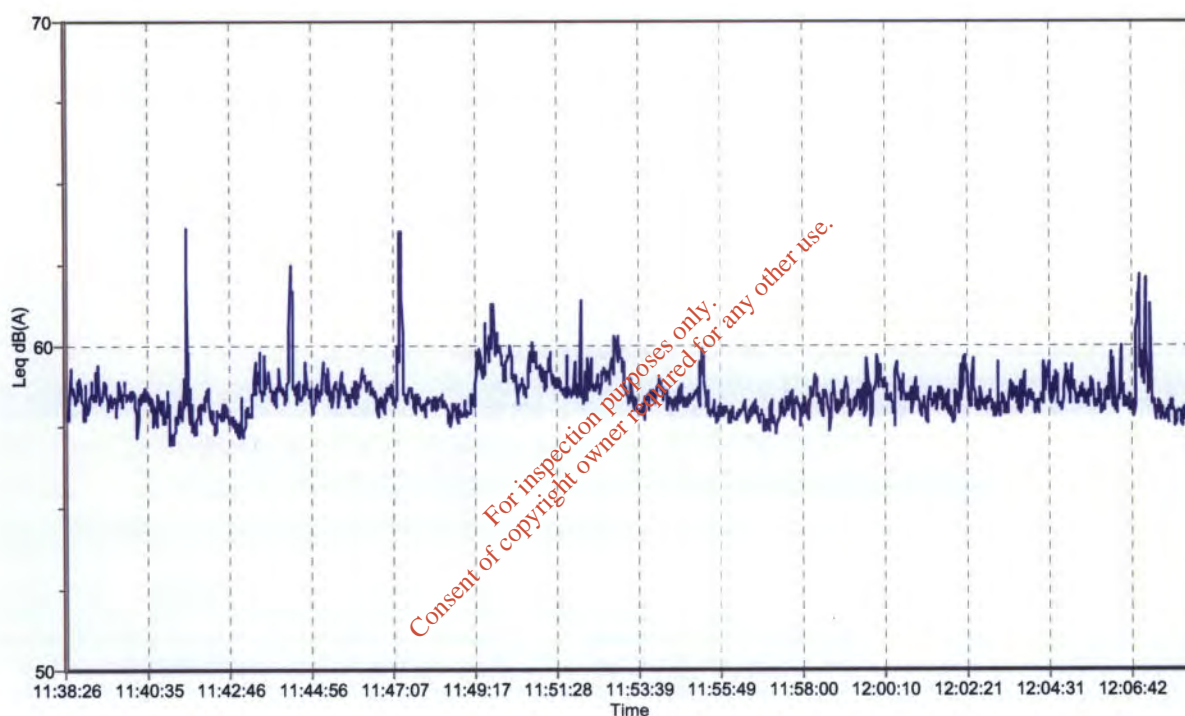
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 11:38:26

Run Time: 00:30:00
Range: 40-100 dB

Leq 58.5 dBA
Lepd 46.5 dBA
LAE 90.9 dBA
LAFmax 66.6 dBA
Peak 84.6 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	150.0 dBA	58.5 dBA	57.8 dBA	57.6 dBA	57.3 dBA



Notes: Daytime Survey, Noise Measurement Location N4, Broadband

Printed: 23/08/05 12:25:18

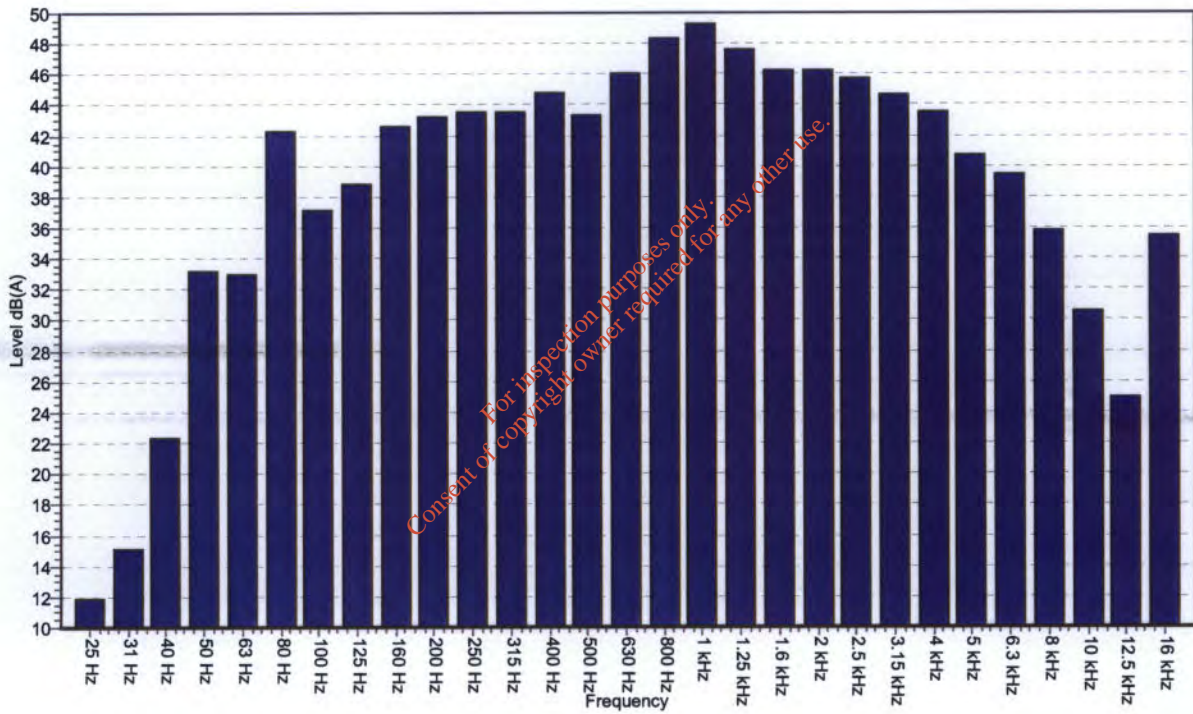
Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 12:09:18

Run Time: 00:04:48
 Range: 40-100 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)	11.9	15.1	22.3	33.2	32.9	42.2	37.1	38.8	42.6	43.2	43.5
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)	43.5	44.8	43.3	46.0	48.3	49.3	47.6	46.3	46.2	45.7	44.7
Duration (s)	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)	43.5	40.7	39.5	35.8	30.5	24.9	35.5	57.5	69.3	71.1	
Duration (s)	9	9	9	9	9	9	9	9	9	9	



Notes: Daytime Survey, Noise Measurement Location N4, 1/3 Octave Frequency Analysis

Printed: 23/08/05 12:27:23

Noise Measurement Report

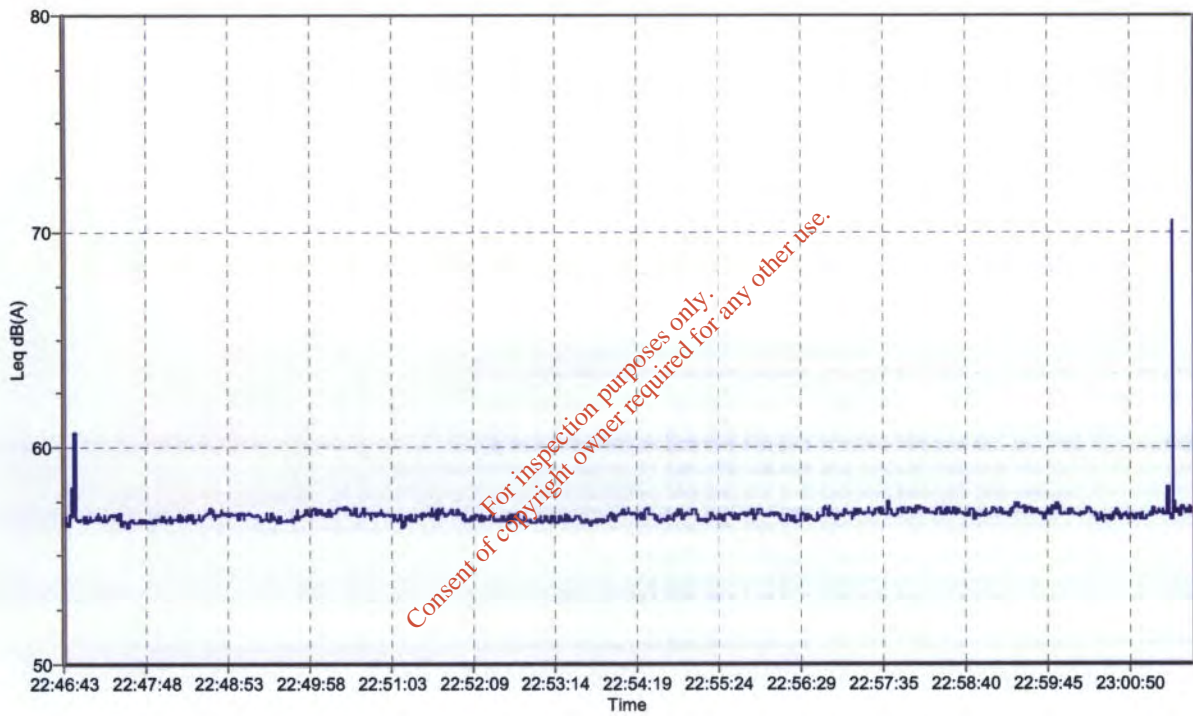
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 22:46:43

Run Time: 00:15:00
Range: 40-100 dB

Leq 57.0 dBA
Lepd 42.0 dBA
LAE 86.4 dBA
LAFmax 78.4 dBA
Peak 99.2 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	150.0 dBA	57.0 dBA	56.5 dBA	56.4 dBA	56.2 dBA



Notes: Night-time Survey, Noise Measurement Location N4, Broadband

Printed: 23/08/05 14:22:35

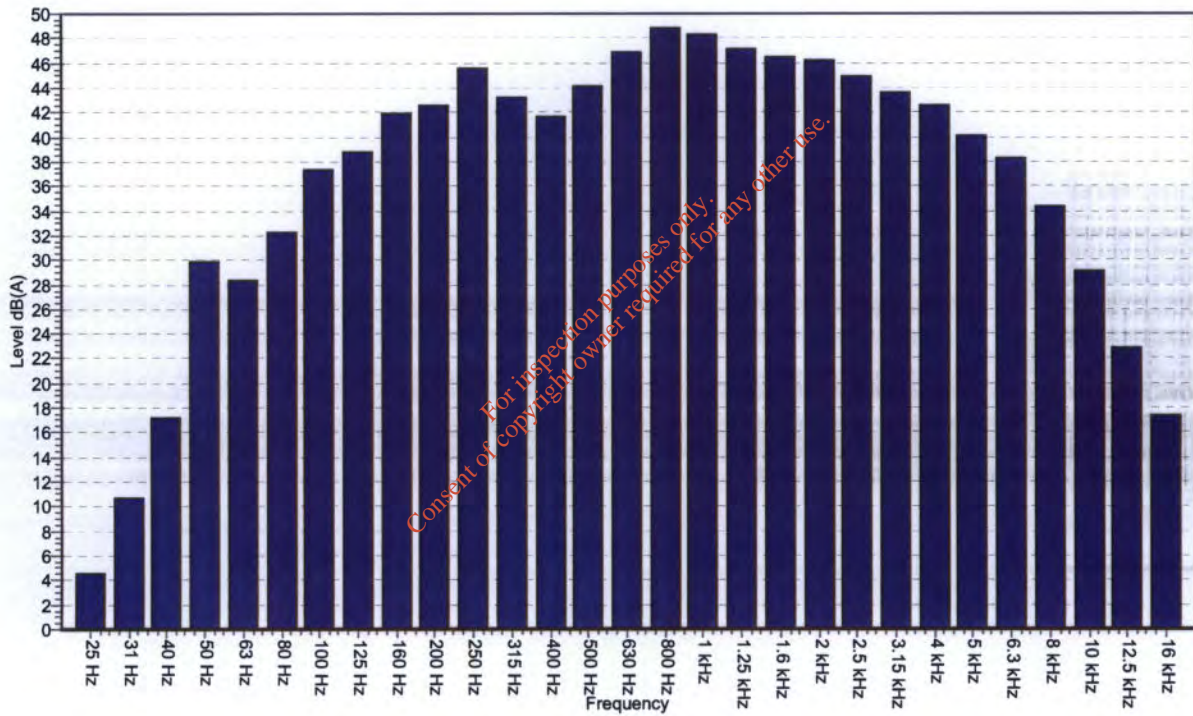
Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 23:01:59

Run Time: 00:04:48
 Range: 40-100 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)	4.5	10.7	17.3	29.9	28.3	32.2	37.4	38.8	42.0	42.6	45.5
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)	43.3	41.7	44.1	46.9	48.8	48.4	47.1	46.5	46.2	44.9	43.6
Duration (s)	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)	42.5	40.1	38.2	34.3	29.1	22.9	17.4	57.3	66.0	67.1	
Duration (s)	9	9	9	9	9	9	9	9	9	9	



Notes: Night-time Survey, Noise Measurement Location N4, 1/3 Octave Frequency Analysis

Printed: 23/08/05 14:25:32

Noise Measurement Report

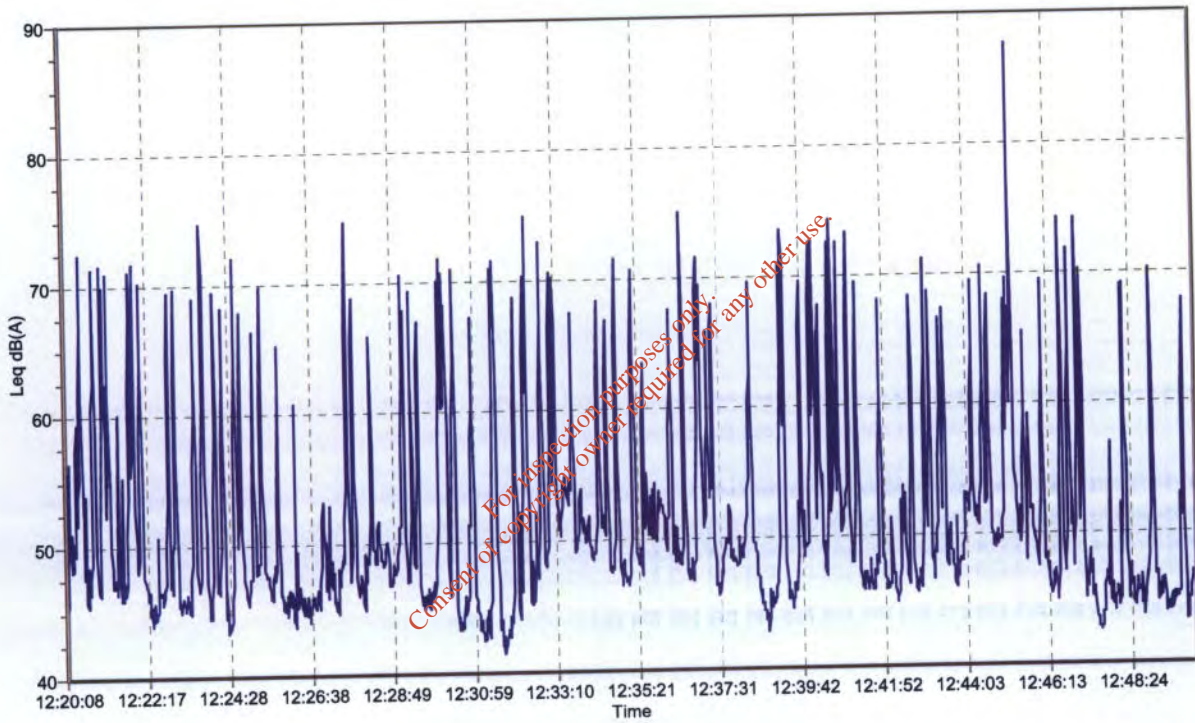
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 12:20:08

Run Time: 00:30:00
Range: 40-100 dB

Leq 61.3^dBA
Lepd 49.3^dBA
LAE 93.7 dBA
LAFmax 92.1^dBA
Peak 107.8^dBC

L1.0 L10.0 L50.0 L90.0 L95.0 L99.0
72.4^dBA 62.7^dBA 48.7^dBA 44.7^dBA 43.9^dBA 42.4^dBA



Notes: Daytime Survey, Noise Measurement Location N5, Broadband

Printed: 23/08/05 12:29:20

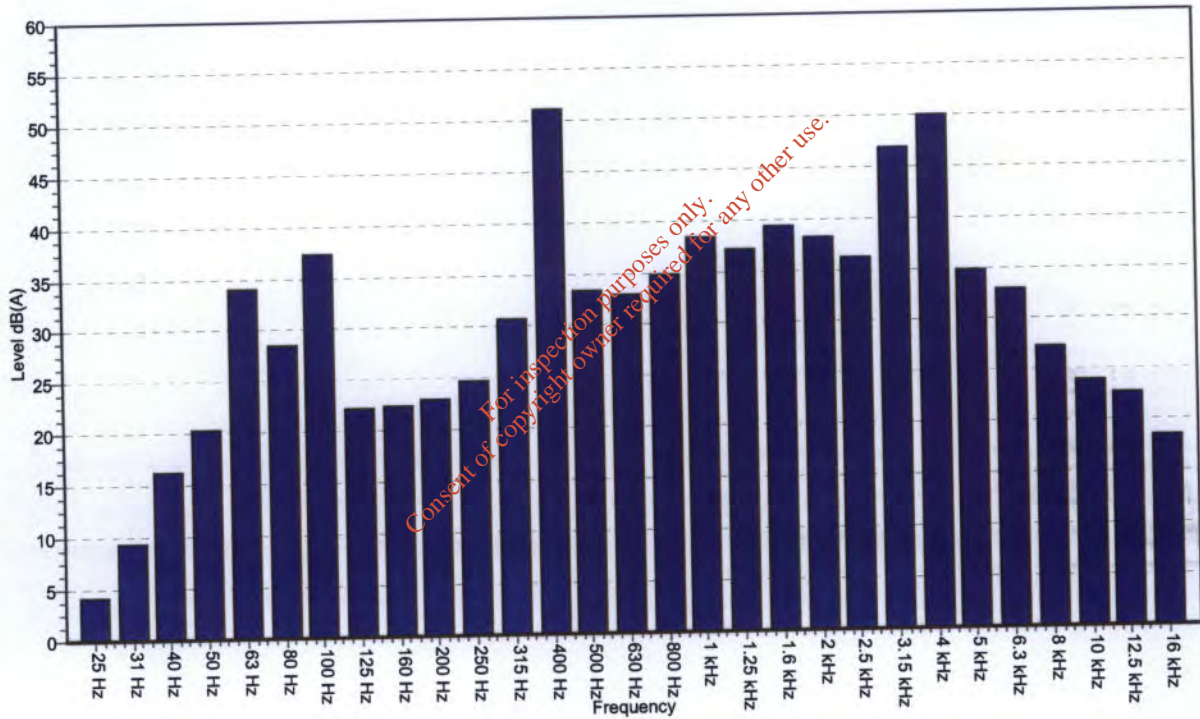
Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 12:50:50

Run Time: 00:04:48
 Range: 40-100 dB
 Spectrum: 'A' weighted

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	4.2	9.4	16.3	20.4	34.0	28.5	37.2	22.2	22.5	23.0	24.7
	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	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
Duration (s)	30.7	51.1	33.3	32.9	34.7	38.4	37.2	39.3	38.2	36.2	46.9
	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq	
Duration (s)	50.0	34.7	33.0	27.2	24.0	22.7	18.5	48.3	66.5	72.6	
	9	9	9	9	9	9	9	9	9	9	



Notes: Daytime Survey, Noise Measurement Location N5, 1/3 Octave Frequency Analysis

Printed: 23/08/05 12:33:07

Noise Measurement Report

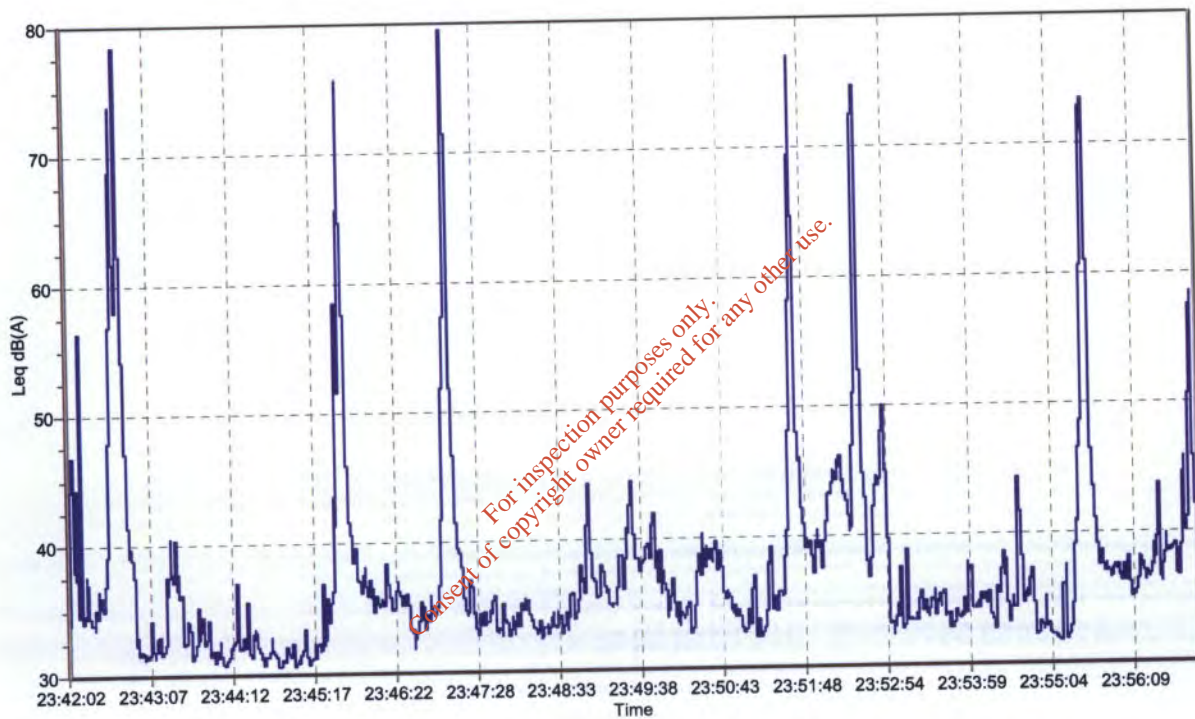
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 23:42:02

Run Time: 00:15:00
Range: 30-90 dB

Leq 57.4 dBA
Lepd 42.3 dBA
LAE 86.7 dBA
LAFmax 81.8 dBA
Peak 97.2 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
42.9 dBA	40.5 dBA	35.1 dBA	31.3 dBA	30.7 dBA	29.8 dBA



Notes: Night-time Survey, Noise Measurement Location N5, Broadband

Printed: 23/08/05 14:33:44

Noise Measurement Report

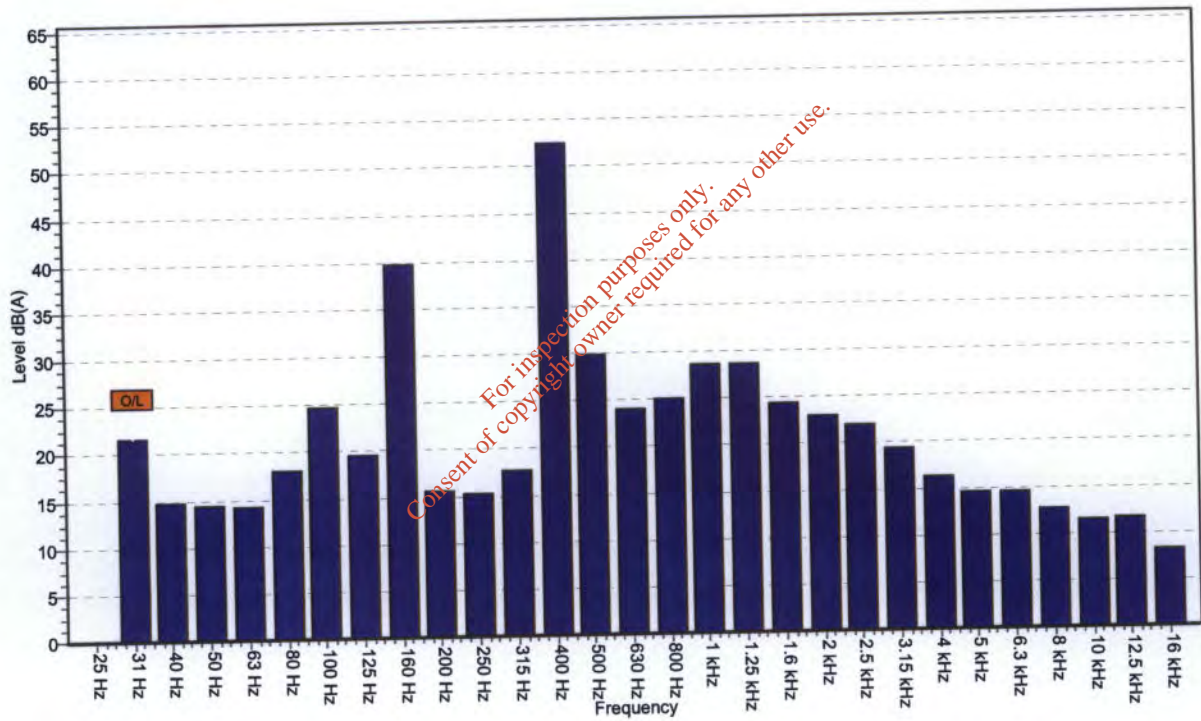
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 23:58:00

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

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	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
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq	
Duration (s)	9	9	9	9	9	9	9	9	9	9	

^ indicates overload



Notes: Night-time Survey, Noise Measurement Location N5, 1/3 Octave Frequency Analysis

Printed: 23/08/05 14:35:41

Noise Measurement Report

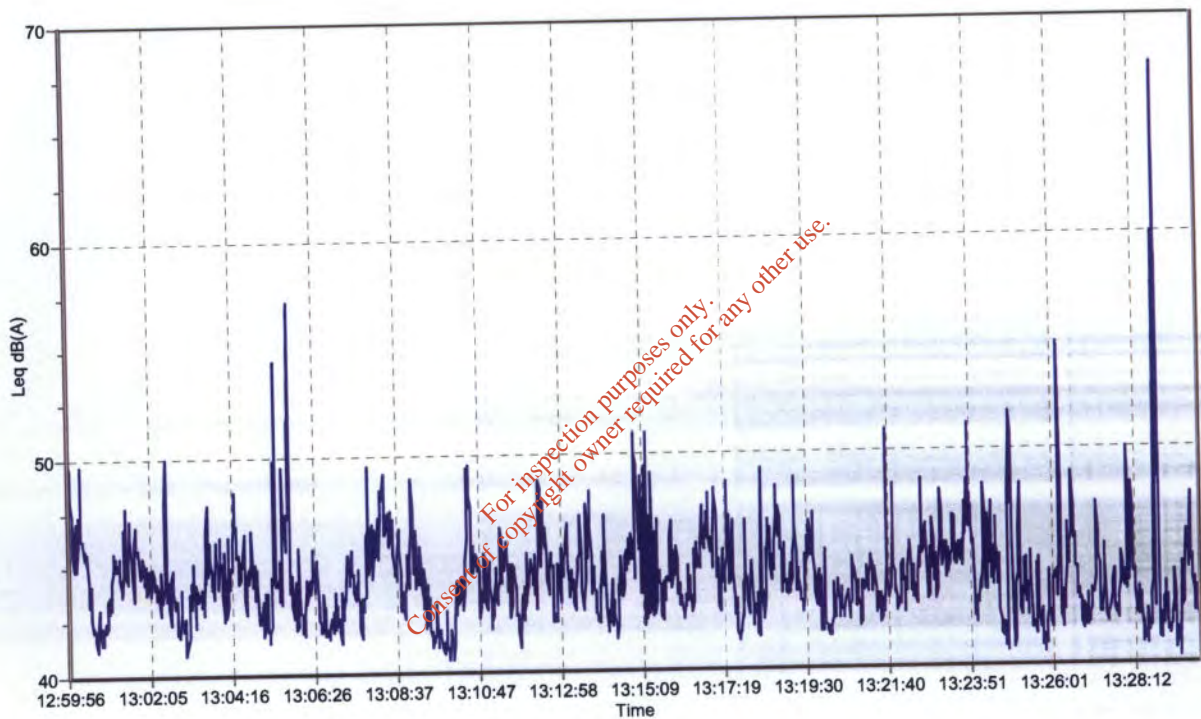
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 12:59:56

Run Time: 00:30:00
Range: 40-100 dB

Leq 45.3 dBA
Lepd 33.3 dBA
LAE 77.7 dBA
LAFmax 76.2 dBA
Peak 97.2 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	54.2 dBA	43.9 dBA	41.6 dBA	41.2 dBA	40.3 dBA



Notes: Daytime Survey, Noise Measurement Location N6, Broadband

Printed: 23/08/05 12:35:07

Noise Measurement Report

Serial No.: B16438FF Recal Due: 31/12/05

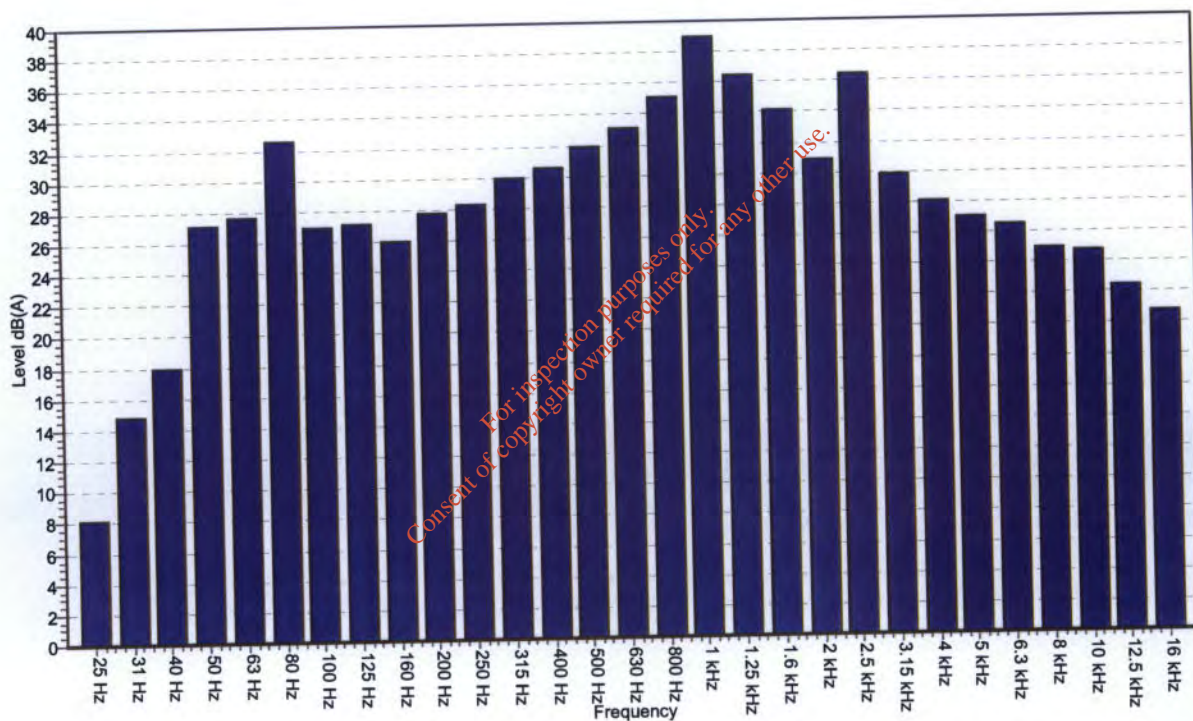
Date: 22/08/05 Time: 13:30:30

Run Time: 00:04:48
 Range: 40-100 dB
 Spectrum: 'A' weighted

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	8.1	14.8	17.9	27.1	27.7	32.6	26.9	27.2	26.1	27.8	28.3
	9	9	9	9	9	9	9	9	9	9	9

Measurement Level (dB)	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
Duration (s)	29.9	30.6	31.9	33.1	35.1	39.0	36.5	34.1	30.9	36.4	29.9
	9	9	9	9	9	9	9	9	9	9	9

Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq
Duration (s)	28.1	27.1	26.5	25.0	24.8	22.4	20.8	49.1	65.5	68.8
	9	9	9	9	9	9	9	9	9	9



Notes: Daytime Survey, Noise Measurement Location N6, 1/3 Octave Frequency Analysis

Printed: 23/08/05 12:36:57

Noise Measurement Report

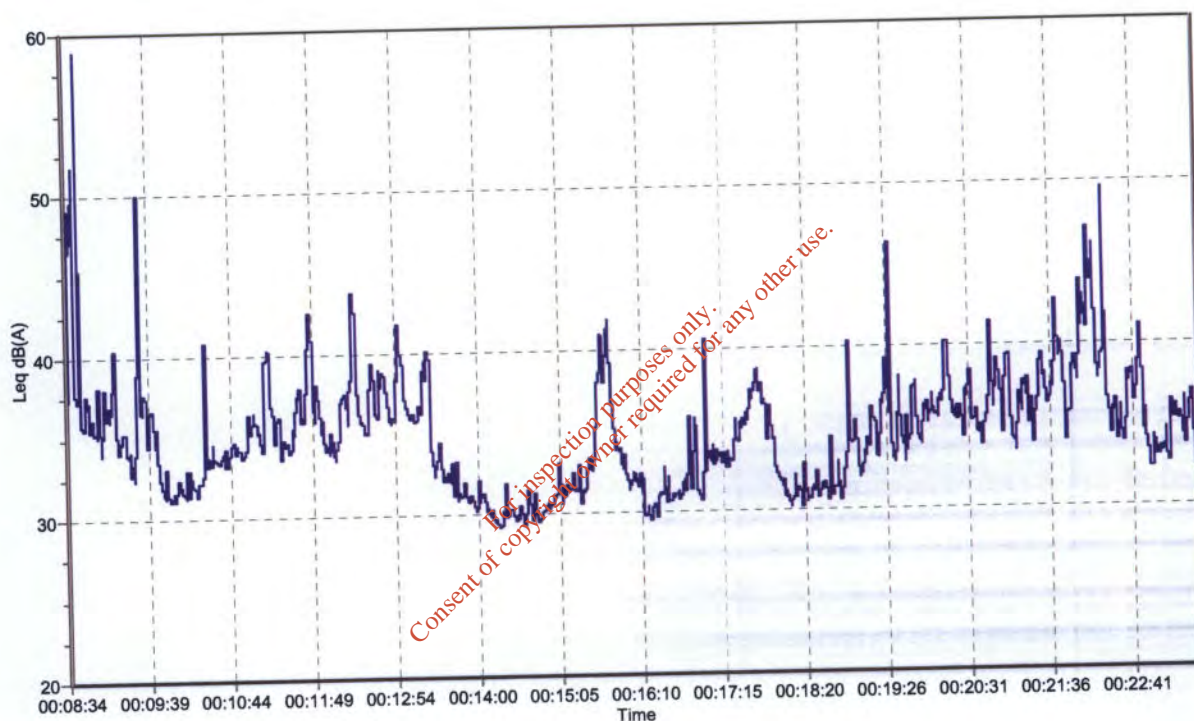
Serial No.: B16438FF Recal Due: 31/12/05

Date: 23/08/05 Time: 00:08:34

Run Time: 00:15:00
Range: 30-90 dB

Leq 37.5 dBA
Lepd 22.5 dBA
LAE 66.9 dBA
LAFmax 66.9 dBA
Peak 85.3 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	45.9 dBA	34.3 dBA	29.3 dBA	28.7 dBA	28.3 dBA



Notes: Night-time Survey, Noise Measurement Location N6, Broadband

Printed: 23/08/05 14:37:51

Noise Measurement Report

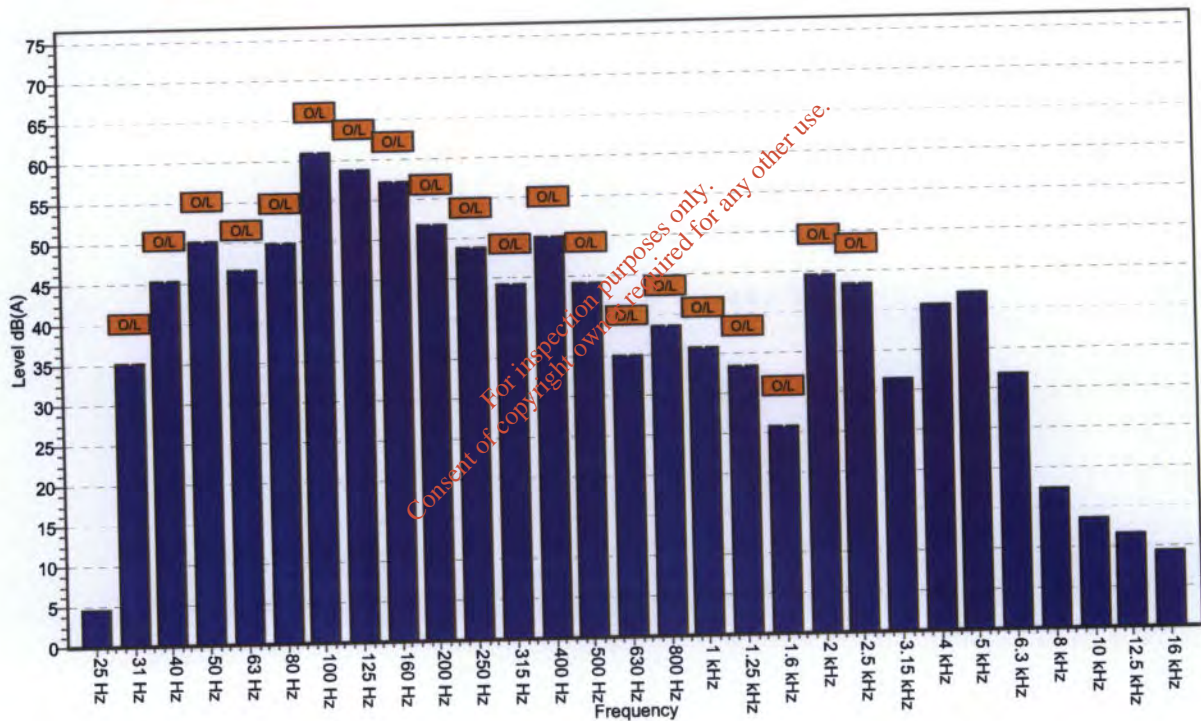
Serial No.: B16438FF Recal Due: 31/12/05

Date: 23/08/05 Time: 00:25:28

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

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	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
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq	
Duration (s)	9	9	9	9	9	9	9	9	9	9	

^ indicates overload



Notes: Night-time Survey, Noise Measurement Location N6, 1/3 Octave Frequency Analysis

Printed: 23/08/05 14:41:01

Noise Measurement Report

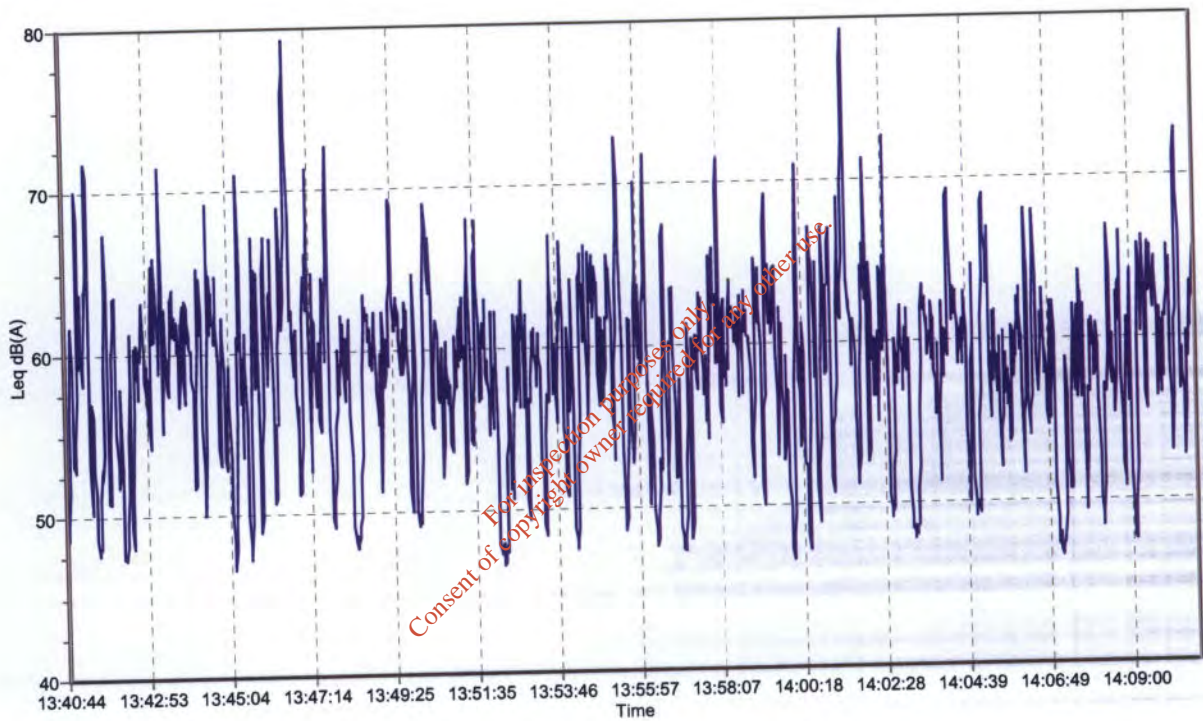
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 13:40:44

Run Time: 00:30:00
Range: 40-100 dB

Leq 62.1 dBA
Lepd 50.1 dBA
LAE 94.5 dBA
LAFmax 81.1 dBA
Peak 100.3 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	73.8 dBA	60.1 dBA	51.1 dBA	49.0 dBA	47.2 dBA



Notes: Daytime Survey, Noise Measurement Location N7, Broadband

Printed: 23/08/05 12:38:37

Noise Measurement Report

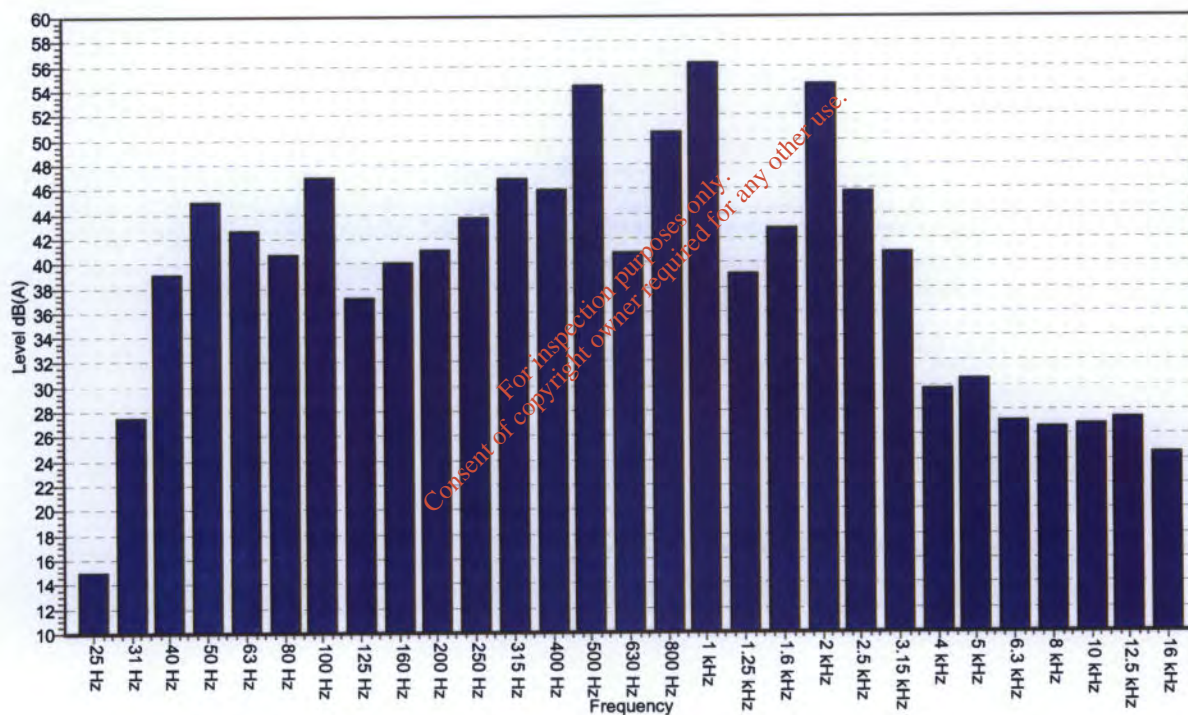
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 14:11:18

Run Time: 00:04:48
 Range: 40-100 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)	15.0	27.5	39.1	44.9	42.6	40.6	47.0	37.2	40.1	41.1	43.7
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)	46.8	45.9	54.4	40.8	50.6	56.3	39.1	42.7	54.6	45.8	40.8
Duration (s)	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)	29.6	30.6	27.0	26.6	26.9	27.3	24.5	64.2	77.5	76.9 [^]	
Duration (s)	9	9	9	9	9	9	9	9	9	9	

[^] indicates overload



Notes: Daytime Survey, Noise Measurement Location N7, 1/3 Octave Frequency Analysis

Printed: 23/08/05 12:40:20

Noise Measurement Report

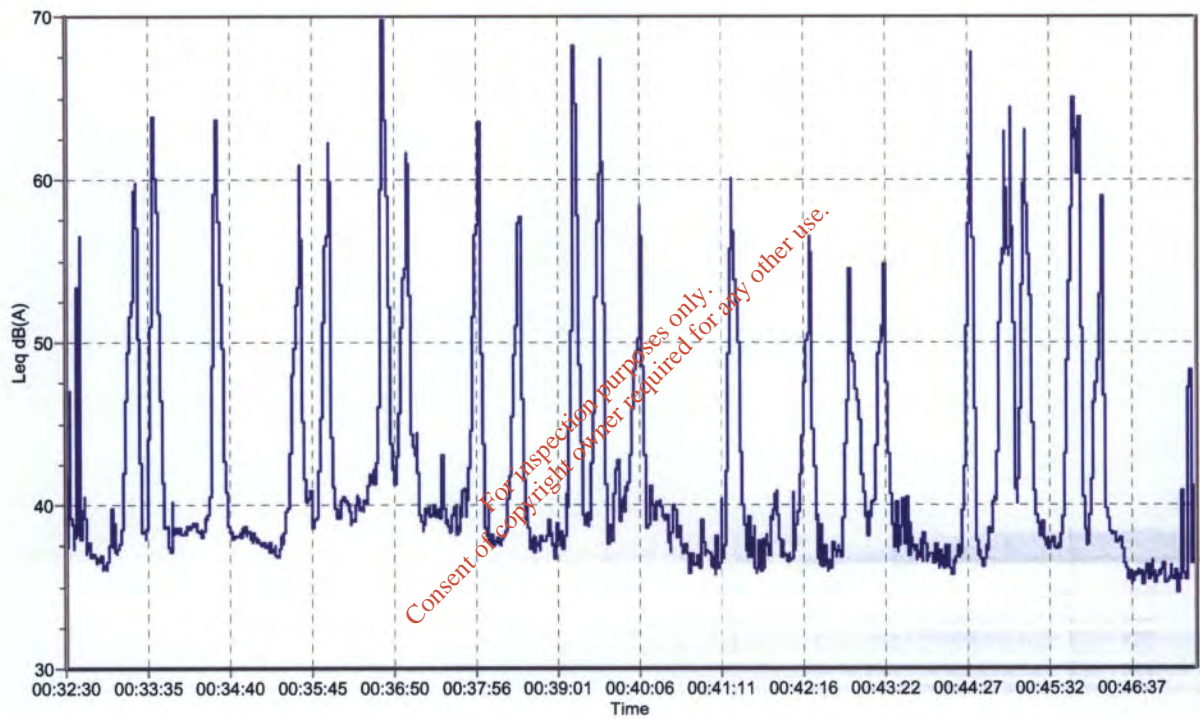
Serial No.: B16438FF Recal Due: 31/12/05

Date: 23/08/05 Time: 00:32:30

Run Time: 00:15:00
Range: 30-90 dB

Leq 51.7^dBA
Lepd 36.6^dBA
LAE 81.0 dBA
LAFmax 76.4^dBA
Peak 95.6^dBC

L1.0 L10.0 L50.0 L90.0 L95.0 L99.0
150.0^dBA 80.3^dBA 40.3^dBA 36.2^dBA 35.7^dBA 34.7^dBA



Notes: Night-time Survey, Noise Measurement Location N7, Broadband

Printed: 23/08/05 14:42:47

Noise Measurement Report

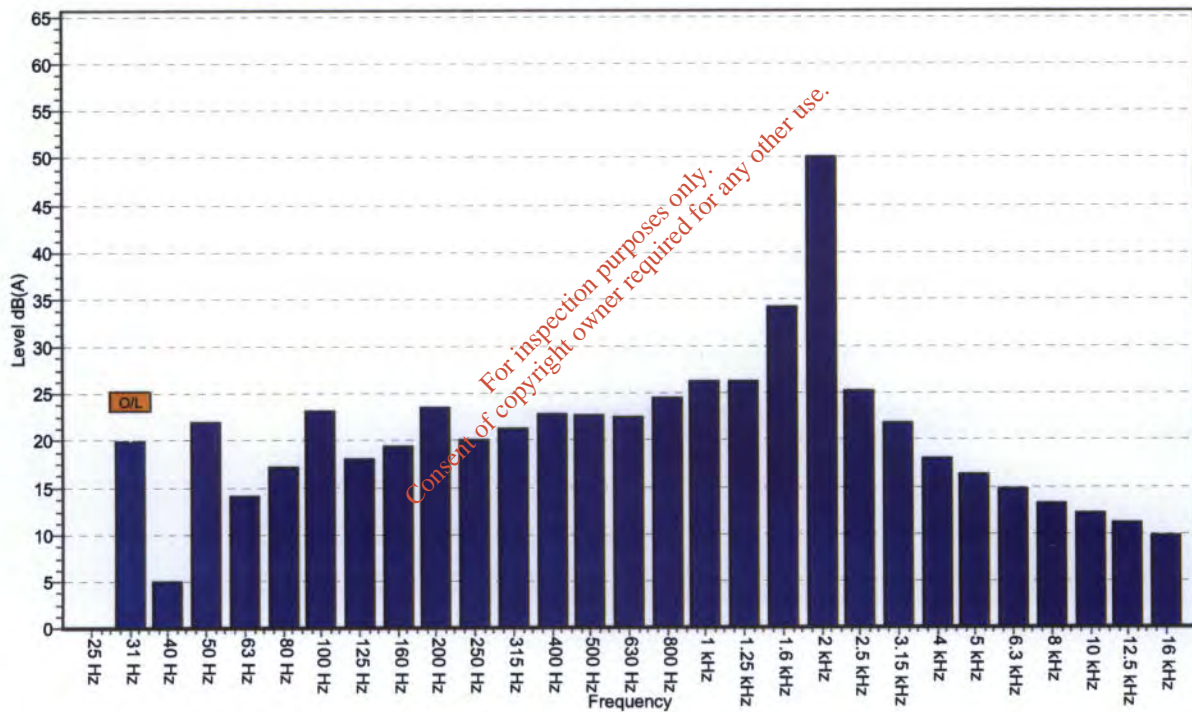
Serial No.: B16438FF Recal Due: 31/12/05

Date: 23/08/05 Time: 00:47:48

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)	0.0	19.9 [^]	5.0	22.0	14.1	17.1	23.1	18.0	19.3	23.5	20.0
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)	21.2	22.8	22.7	22.5	24.5	26.3	26.3	34.1	50.1	25.2	21.8
Duration (s)	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)	17.9	16.3	14.8	13.3	12.2	11.1	9.7	50.2	57.5	60.1	
Duration (s)	9	9	9	9	9	9	9	9	9	9	

[^] indicates overload



Notes: Night-time Survey, Noise Measurement Location N7, 1/3 Octave Frequency Analysis

Printed: 23/08/05 14:45:52

Noise Measurement Report

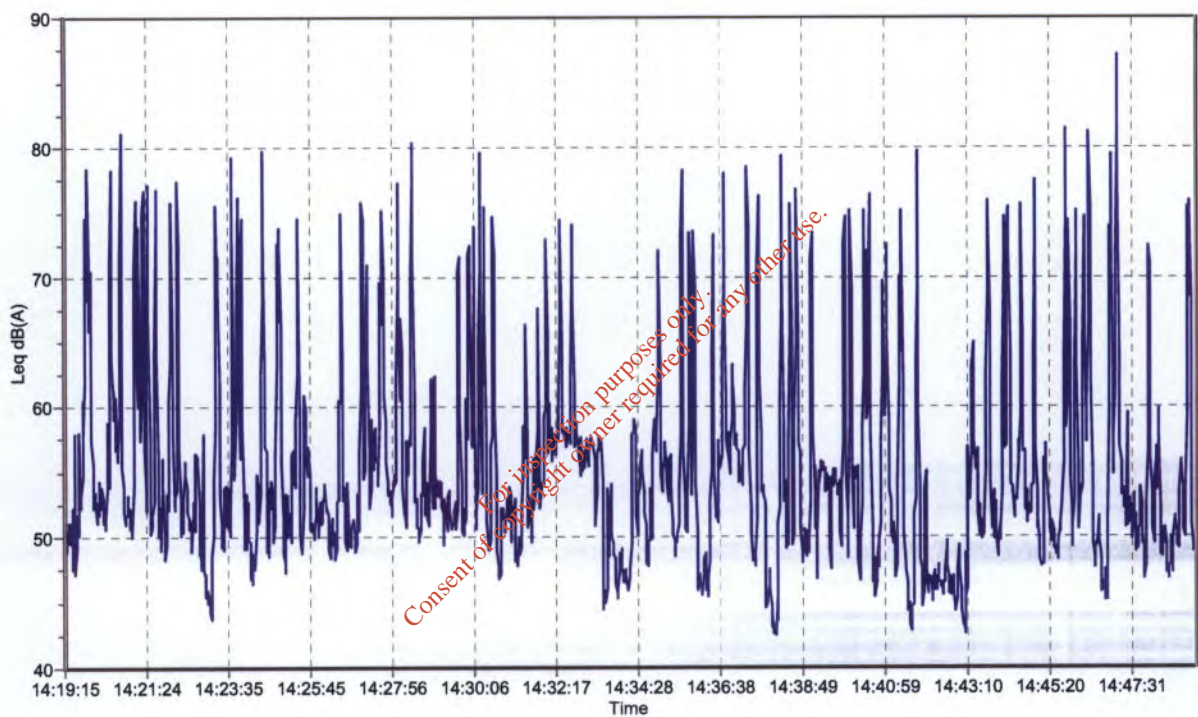
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 14:19:15

Run Time: 00:30:00
Range: 40-100 dB

Leq 65.7 dBA
Lepd 53.6 dBA
LAE 98.0 dBA
LAFmax 87.9 dBA
Peak 100.5 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	72.3 dBA	53.8 dBA	47.1 dBA	45.4 dBA	42.7 dBA



Notes: Daytime Survey, Noise Measurement Location N8, Broadband

Printed: 23/08/05 12:50:56

Noise Measurement Report

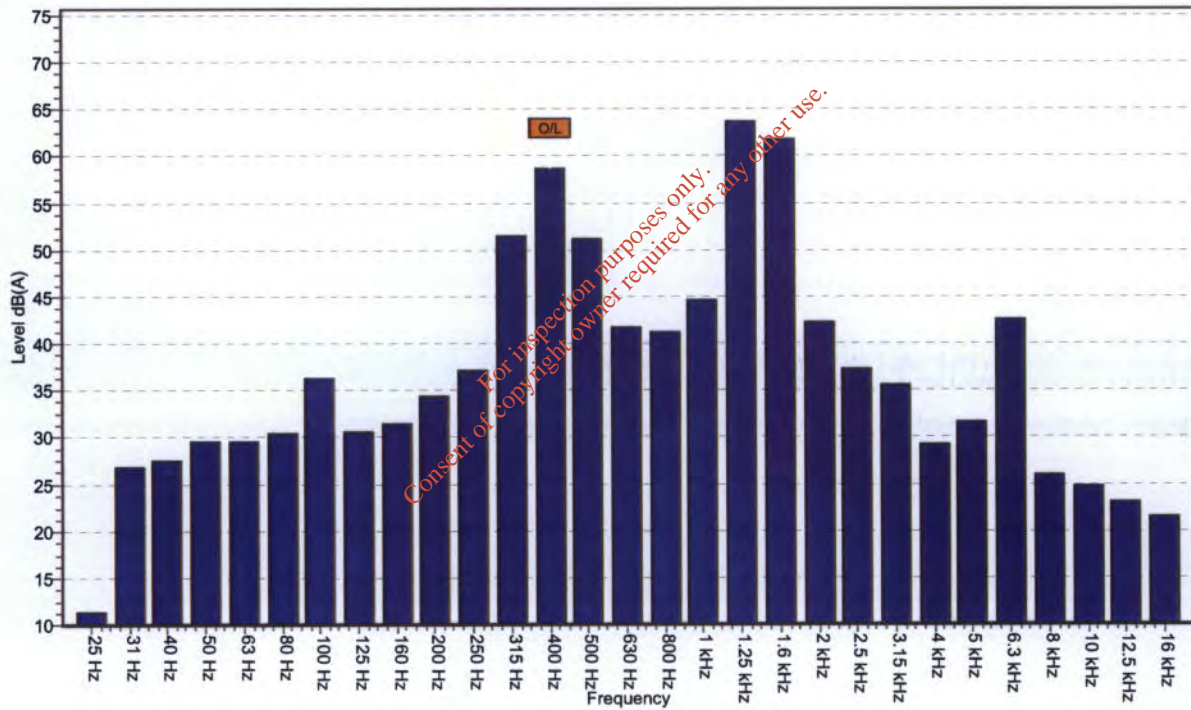
Serial No.: B16438FF Recal Due: 31/12/05

Date: 22/08/05 Time: 14:49:52

Run Time: 00:04:48
 Range: 40-100 dB
 Spectrum 'A' weighted

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	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
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	L Aeq	L Ceq	L Zeq	
Duration (s)	9	9	9	9	9	9	9	9	9	9	

^ Indicates overload



Notes: Daytime Survey, Noise Measurement Location N8, 1/3 Octave Frequency Analysis

Printed: 23/08/05 12:52:45

Noise Measurement Report

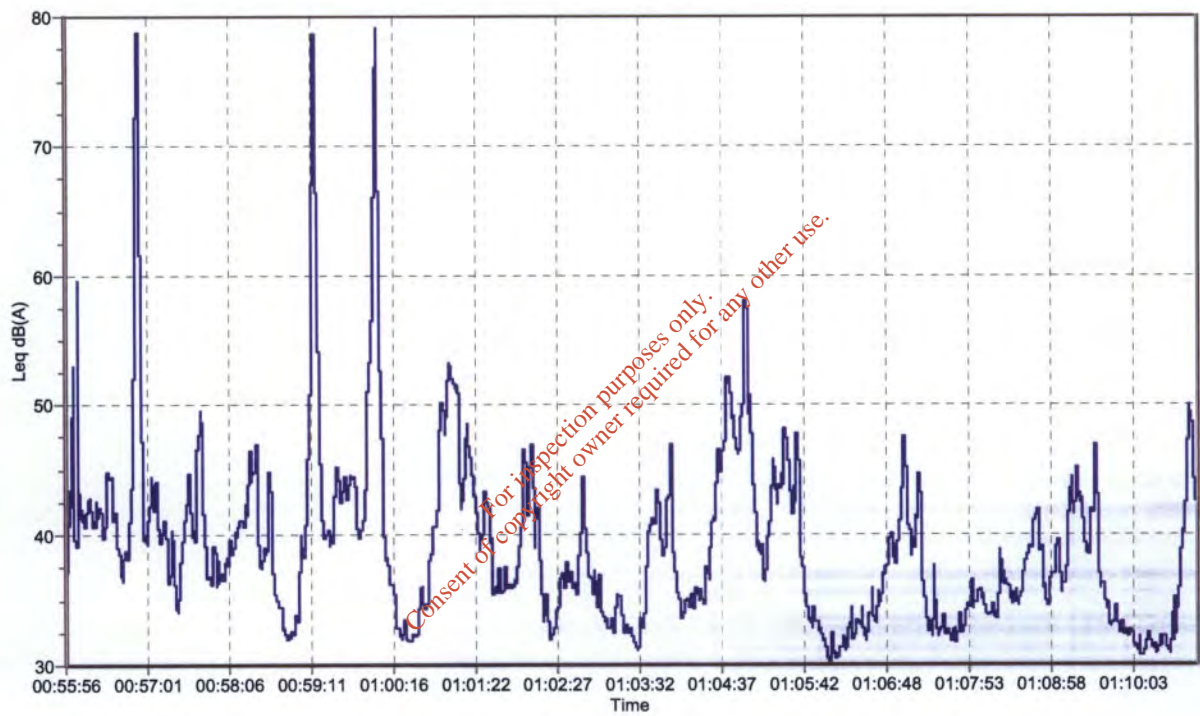
Serial No.: B16438FF Recal Due: 31/12/05

Date: 23/08/05 Time: 00:55:56

Run Time: 00:15:00
Range: 30-90 dB

Leq 56.8 dBA
Lepd 41.7 dBA
LAE 86.1 dBA
LAFmax 81.6 dBA
Peak 97.6 dBC

L1.0	L10.0	L50.0	L90.0	L95.0	L99.0
150.0 dBA	150.0 dBA	39.0 dBA	31.9 dBA	31.1 dBA	29.9 dBA



Notes: Night-time Survey, Noise Measurement Location N8, Broadband

Printed: 23/08/05 14:47:32

Noise Measurement Report

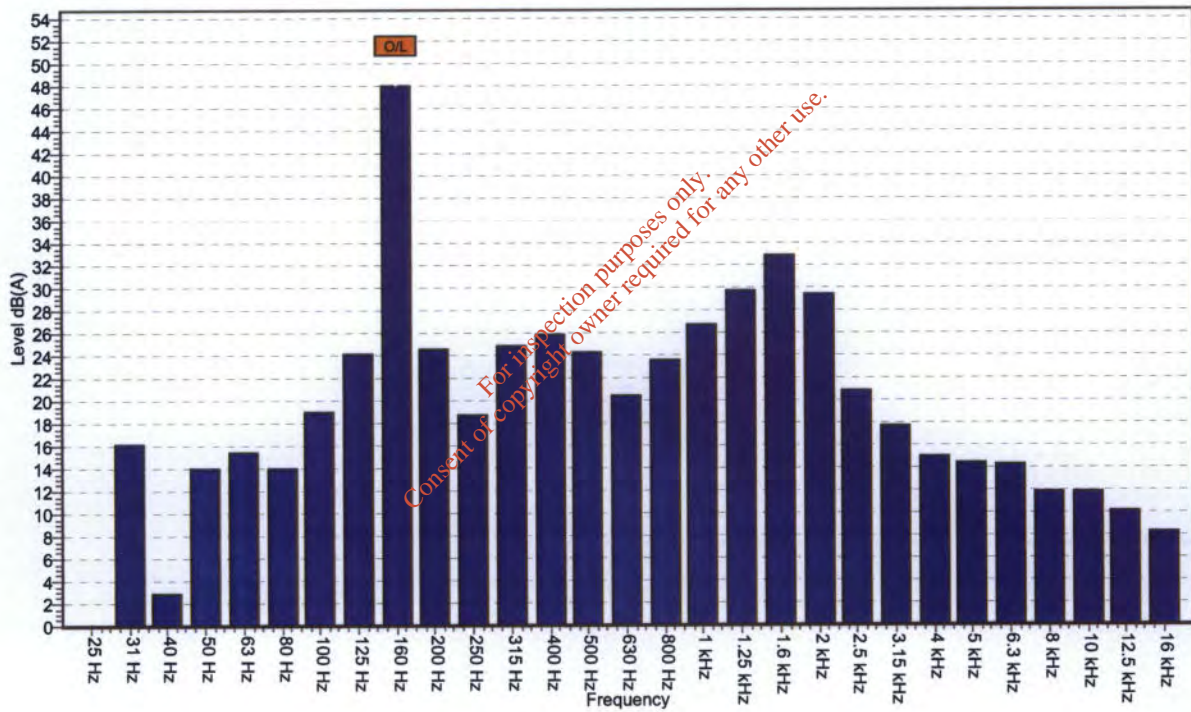
Serial No.: B16438FF Recal Due: 31/12/05

Date: 23/08/05 Time: 01:11:27

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

Measurement Level (dB)	25 Hz	31 Hz	40 Hz	50 Hz	63 Hz	80 Hz	100 Hz	125 Hz	160 Hz	200 Hz	250 Hz
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	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
Duration (s)	9	9	9	9	9	9	9	9	9	9	9
Measurement Level (dB)	4 kHz	5 kHz	6.3 kHz	8 kHz	10 kHz	12.5 kHz	16 kHz	LAeq	LCeq	LZeq	
Duration (s)	9	9	9	9	9	9	9	9	9	9	

^ indicates overload



Notes: Night-time Survey, Noise Measurement Location N8, 1/3 Octave Frequency Analysis

Printed: 23/08/05 14:49:27

APPENDIX 12.1

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Appendix 12.1

Recorded Archaeological Monuments and Places

The recorded archaeological monuments and places within c. 1.5km of the proposed scheme are listed below, all noted in the Record of Monuments and Places for Co. Cork and the Archaeological Inventory of County Cork, Vol. 1: West Cork (Power 1992). The monuments are listed in a standard format as follows:

RMP No.	Classification
Location	Description
NGR	
OD'	
Inventory No.	

List of monuments and places:

CO135:018	Ringfort
Tawnies Upper 13808, 04246 100-200' OD 1893	In pasture, atop hill. Circular area (53m north-south; m54m east-west) enclosed by earthen bank (external height 2.8m) from east to northeast, with external fosse (depth 1.3m). Causeway (width 5m) across fosse to ENE.
CO135:019(01)	Graveyard
Tawnies Upper 13845, 04157 50-100' OD 3244	On steep south-facing slope overlooking Clonakilty. Inscribed headstones and chest tombs date from 18 th century. Contains Church of Ireland church (3356) built on site of earlier church (3171). In use.
CO135:019(02)	Church of Ireland Church.
Tawnies Upper 13845, 04158 50-100' OD 3356	In graveyard (3244). Built in 1818 (Lewis 1837, vol. 1, 348) probably on the site of earlier church (3171). Rectangular nave with chancel at east end. Embattled tower, with corner pinnacles, at west end. North and south transepts later additions. Vestry at northeast corner. Corner buttresses on nave, chancel and tower.
CO135:020	Ringfort
Scartagh 13893, 04234 200-300' OD 1861	In pasture, on south-facing slope. Roughly circular area (26m north south; 31m east-west) enclosed by earthen bank (height 1.4m) from east to northwest; scarp (height 0.4m) survives elsewhere.
CO135:021	Ringfort
Scartagh 13893, 04234 200-300' OD 1862	In pasture, on south-facing slope. Circular area (36.5m north south; 37m east-west) enclosed by earthen bank (height 1.3m), stone-faced in parts; shallow external fosse.

- CO135:023**
Gallanes
13967, 04261
200' OD
N/A
- Graveyard**
The site is located to east of main Cork/Clonakilty Road up a passage now flanked by modern bungalows. The site is situated on a west facing slope, on the 200' contour line. The Clonakilty hospital is visible to the southwest. The graveyard is enclosed by a rectangular earthen bank – stone facing visible on external west bank. The banks have hawthorn trees and briars. The interior slopes to southwest and rises quite steeply in the northeast corner. Interior covered in meadow grass. In the southwest end there are 32 small cement crosses set in regular pattern with roman numbers incised on their east face. Adjacent to these crosses is a modern head stone and grave of Kathleen O'Driscoll who died in 1947. A tall cross stands in the middle of the northern half of the graveyard with a white washed cairn of stones at the base. Cross made of cement. Access into the graveyard is through a modern iron gate in the northern corner of the west bank which leads into a short passage parallel to the west bank. Local information states that this was a paupers' graveyard at the time of the famine.
- CO135:051**
Cloheen
13764, 04031
100-200' OD
1321
- Ringfort**
In tillage, on gentle north-facing slope. Circular area (28m north-south; 28m east-west) defined by a low rise.
- CO135:052(01)**
Yaughals
Scartagh
Tawnies Upper
13853, 04144
N/A
- Market Town**
Situated on the Fede river at the head of the land-locked harbour of Clonakilty Bay. The full extent of the 17th century market town is unknown; originally built in the form of a cross (Smith 1750 vol 1, 251; Bennett 1869, 354) which as trade increased 'sprang out in every direction'. This is likely to correspond to the intersection of streets presently known as Asna Square and referred to as 'The Cross' on Tuipéar's map (Tuipéar 1988). Asna square is the current location of the 'Kilty Stone' reputed to have originated from Arundel Castle on the eastern side of Clonakilty Harbour (Healy 1988, 221). Sites contemporary with the 17th century town include a market house, and church and graveyard. The town was founded by the Earl of Cork who acquired the estate from William de Barry (Tuipéar 1988, 3). A petition from the corporation of Clonakilty is recorded in 1605 (Lewis 1837 vol 1, 347) suggesting the town was already established at that time. It received a charter from James I in 1613.
- CO135:052(02)**
Youghals
13819, 04142
50' OD
3473
- Brewery**
Built in 1807 by Richard Deasy (Tuipéar 1988, 25) on Fealge river, on west side of Clonakilty. Rectangular cobbled yard with well, enclosed by mainly two-storey buildings, some still in use. Remains of cooper's workshop on south range. Imposing engine house in northeast corner of complex with pair of brick chimneys projecting from northeast and southwest corners of structure, date plaque 1887 crediting the buildings to McCarthy and Santry. Another pair of brick chimneys on north range; taller of two has date plaque of 1915.
- CO135:05301**
Desert
14006, 04036
0-50' OD
3208
- Graveyard**
Atop low cliff on north shore of Clonakilty estuary. The site appears to have been completely removed by Cork County Council during road widening. Contained ruined church. Probably an early ecclesiastical site (Hurley 1980, 60).
- CO135:05302**
Desert
14009, 04034
0-50' OD
3128
- Church**
Graveyard and church appear to have been completely removed by Cork County Council during road-widening. Photographs taken in 1981 show north and west walls standing c. 1m high. Webster (1932, 273-4) illustrates unusual recess in western gable, which he interpreted as 'unusual arrangement for ringing the sacred bell'; he gives dimensions of church as '23ft 4in x 15ft 4in'.

CO135:054
Desert
13988, 04158
200-300' OD
1971

Possible ringfort

In pasture, on NW-facing slope, just below hilltop. Circular enclosure on OS map. No visible surface trace.

CO135:055
Desert
13983, 04173
200-300' OD
1440

Ringfort

In pasture, on west-facing slope. Roughly circular area (40.5m north-south; 43.5m east-west) enclosed by earthen bank (height 1.8m), with shallow external fosse. Gaps in bank to south (width 6m) and WSW (width 2m).

CO135:133
Tawnies upper
13858, 04141
N/A

Market House

Fronting onto the west side of McCurtain Hill and easily accessible from the road. A recently refurbished, two-storey, four-bay structure with central breakfront and semi-circular arcading on the ground floor. The hipped and slated roof has a newly inserted cupola. A market house is first mentioned here in 1642 (Tuipéar 1988, 33) This was replaced by the present structure in the early 18th century (Power *et al* 1992, 411). The building functioned as a Town Hall until 1953 and is now used as a restaurant.

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Appendix 12.2

Draft Maritime Sites and Monuments Record

Records of shipwrecks in Clonakilty Bay are contained within the Draft Maritime SMR, an inventory of all known shipwrecks in Ireland, produced by the Underwater Unit in the Department of Environment, Heritage and Local Government. These are listed in a standardised format as follows:

Site name
Date of
Loss
Place of
Loss
Description

List of shipwrecks:

Site name *Anna Cathrina*
Date of 11 March 1763
Loss
Place of Clonakilty
Loss
Description This vessel was en route from Cork to malaga, under Capt. Middleton, when she went ashore. Some of the cargo was saved.

Site name *Beatrice*
Date of 11 December 1906
Loss
Place of Near entrance to Clonakilty harbour
Loss
Description This wooden schooner of Millford weighed 78 tons and was 37 years old. The master was J. Gosnell or Goslong and the owner was Mrs. E. Gosnell of Clonakilty. She was en route from Newport, Mon. To Clonakilty with 4 crew and a cargo of coal when she became stranded and totally wrecked in a SW force 7 wind. The crew survived.

Site name *Beauty of Munster*
Date of 12 March 1880
Loss
Place of Muckross Bar, Clonakilty
Loss
Description This 27 year old wooden smack of Skibbereen weighed 43 tons. The owner and master was J. McCarthy of Sherkin Island. She was en route from Muckross Creek to Cork with 3 crew and a cargo of Barytes when she was stranded and totally wrecked in a SW force 2 wind. No lives were lost.

Site name *Delight*
Date of 7 February 1792
Loss
Place of Clonakilty Bay
Loss
Description This vessel was en route from Limerick to Poole, under Burke, when she was lost along with the crew.

Site name *Dorothea / Dorethea*
Date of 26 December 1763 / 17 January 1764
Loss
Place of Clonakilty Bay
Loss
Description This vessel was en route from Charente to Dublin, under Capt. Boyle, when she went ashore. The cargo was saved but the ship was destroyed.

Site name *Energy*
Date of 20 December 1847
Loss
Place of At Clonakilty / near Galley Head
Loss
Description This 278-ton sailing vessel was wrecked.

Site name *Francis & Elizabeth*
Date of 1 November 1772
Loss
Place of Off Clonakilty Bay
Loss
Description This vessel was en route from Lisbon to Dublin, under McCarthy and was lost. The crew survived.

Site name *Free Trade*
Date of 15 December 1848
Loss
Place of Clonakilty Bay
Loss
Description This vessel was en route from Ibraile to Sligo.

Site name *Harriet Williams*
Date of 13 Feb 1874
Loss
Place of Island in Clonakilty Bay
Loss
Description This collier was wrecked while en route from Llanelli to Huelva. The crew survived and the hull was sold by auction on the 7/3/1874.

Site name *Mary*
Date of 17 November 1802
Loss
Place of Red Strand, Clonakilty
Loss
Description This Liverpool vessel was wrecked while accrying calf-hides, butter and military uniforms from Limerick to England. Bodies from the wreck came ashore at Rosscarbery.

Site name *Morning Star*
Date of c. 1928
Loss
Place of Ring Bar, Clonakilty Harbour
Loss
Description This vessel was wrecked with the loss of two Scottish sailors. The captain was saved.

Site name *Nancy*
Date of 16 October 1849
Loss
Place of Clonakilty Bay
Loss
Description This vessel was en route from Nantes to Cork when she was lost.

Site name *Perseverance*
Date of 2 or 3 January 1788
Loss
Place of Bar of Clonakilty
Loss
Description This 400-ton ship of Greenock was en route from St. Ubes to Cork, under Lowry, with fruit and salt. She went to pieces on the bar and only 2 of the 19 crew survived.

Site name *Unknown*
Date of c. 1868
Loss
Place of Ring, Clonakilty Harbour
Loss
Description This ship was lost.

Site name *Unknown*
Date of 19th century
Loss
Place of Near Ring Bar, Clonakilty Harbour
Loss
Description This ship, loaded with timber, came ashore upside-down. Her name was unknown, as was the fate of her crew. The timber was taken by locals but was re-seized by the militia. Some of the cahins and anchors from the vessel were still visible between the rocks at low water in 1938.

Site name *Unknown*
Date of 19th century
Loss
Place of *Fiall an Ime*, west side of Dursey / Ring, Clonakilty Harbour
Loss
Description A small boat with a cargo of butter in firkins went off course in fog, struck the cliff and broke up.

APPENDIX 12.3

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Appendix 12.3**Archaeological Finds**

The recorded archaeological finds in the vicinity of the site are listed below, all noted in the National Museum of Ireland files, Kildare Street, Dublin 2, in local journals, or in other published catalogues of prehistoric material: Raftery (1983), Eogan (1965; 1983; 1994), Harbison (1968; 1969a; 1969b) and the Irish Stone Axe Project Database. The following townlands were assessed;

Ashgrove, Cappeen, Cloheen, Clonakilty, Desert, Scartagh, Tawnies Lower, Tawnies Upper and Youghals.

List of Finds:

NMI 1896:16-20**Cappeen**

Bronze Age Hoard

Catalogue number 11 in Hoards of the Bronze Age, Eogan, G. 1983, 9. found within a fort.

NMI 1913:24-29**Cappeen**

Copper Axes

Six copper axes found together and presented to the National Museum by Robert Day. All are of the Lough Ravel type, a flat axe with a thick butt and a gentle splaying and deep cutting edge, Harbison, P. 1968, 43.

Museum No. 30-35**Cappeen**

Early Bronze Age Axe

Harbison, P. 1969, 71

NMI Record**Desert**

Human remains

Record of human remains found during road widening between Clonakilty and Ring. Part of a graveyard reburial.

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Plate 12.1: Western boundary.



Plate 12.2: Southern boundary.

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Plate No: 12.1, 12.2
Job No: 702
Date: Oct '05
Client: WYG
Photo By: AnC





Plate 12.3: Fealge River.



Plate 12.4: Current site layout.

Plate No: 12.3, 12.4
Job No: 702
Date: Oct '05
Client: WYG
Photo By: AnC





Plate 12.5: Proposed site of primary settling tanks.



Plate 12.6: Proposed site of aeration tank.

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Plate No: 12.5, 12.6
Job No: 702
Date: Oct '05
Client: WYG
Photo By: AnC





Plate 12.7: Proposed site of compressor/dewatering house and picket fence thickener.



Plate 12.8: Proposed site of Long Quay storm water holding tank.

Plate No: 12.7, 12.8
Job No: 702
Date: Oct '05
Client: WYG
Photo By: AnC

