
Robin Rigg Monitoring Windfarm Site Benthic Data Report, May 2010

1. Introduction

In order to comply with Marine Environment Monitoring Programme (MEMP) and FEPA licence requirements for the monitoring of the Robin Rigg Offshore Windfarm a benthic survey of the windfarm site was undertaken on 6th May 2010.

This technical note summarises the methodology and results of this survey. No data interpretation has been undertaken.

2. Method

A benthic survey of the Robin Rigg windfarm site for macro invertebrates was conducted using the fisheries patrol vessel *Solway Protector*. Five sampling stations were sampled within the wind farm site itself as well as 3 reference (control) sampling stations just outside the wind farm area. Locations of sampling stations are presented in **Figure 1**. The sampling stations were selected at positions that were sampled during the original baseline survey for the EIA pre-construction in accordance with the requirements of the MEMP.

Samples were recovered using a 0.1m² Day grab. At each sampling station duplicate grab samples were collected. The time and location the grab was dropped were recorded using the vessel's Global Positioning System (GPS), depth was measured using the vessel's sounder and temperature was measured by the vessel's in-built thermometer. Surface water salinity was measured using a hand held refractometer and turbidity was measured using a Secchi disc.

Duplicate grab samples were taken at each sampling station. A visual assessment of sediment type in each grab sample was made and a sample of sediment from the first grab sample was retained for particle size analysis (PSA) and Total Organic Carbon (TOC) analysis. The sediment from each grab sample was then sieved using a 1mm mesh and the fauna retained in the sieve and preserved in 5% formaldehyde. Under normal procedure (according to the approved methodology) invertebrate identification is only performed on one set of faunal samples, however for this survey due to an error both sets of samples were sent for invertebrate identification. For this reason results of invertebrate identification for both sets of faunal samples have been presented in this report (**Appendix A**) and these results have been average in the results table to be consistent with previous reports.

Taxonomic identification of the macro-faunal species found in the samples was undertaken by Identichaete, while the PSA and TOC analysis on the sediment samples was undertaken by AES Laboratories¹.

¹ United Kingdom Accreditation Service (UKAS) accredited laboratory

2.1 Results

The physical and environmental data from the survey are recorded in **Table 1.1**.

Table 1.1 – Sampling station locations and physical data, May 2010

Sampling station	Date	Time (GMT)	Lat.	Long.	Depth (m)	Salinity (‰)	Water Temp (°C)	Secchi Depth (m)	Visual Sediment Type
Site 1	05/05/10	1440	N54°45.8560'	W003°41.1010'	13.11	32	11	3	Very Fine Sand
Site 2	05/05/10	1451	N54°44.9930'	W003°41.0860'	17.98	32	11	3	Fine Sand
Site 3	05/05/10	1410	N54°44.9260'	W003°44.4050'	24.99	33	11	3	Fine Sand
Site 4	05/05/10	1420	N54°45.8740'	W003°44.0830'	29.87	33	11	3	Very Fine Sand
Site 5	05/05/10	1356	N54°44.1100'	W003°44.1010'	39.93	32	11	3	Fine Sand
Site 6	05/05/10	1431	N54°46.3980'	W003°41.0390'	13.11	33	11	2.5	Fine Sand
Control 1	05/05/10	1707	N54°47.3280'	W003°43.4320'	17.98	33	10.6	3.5	Fine Sand
Control 2	05/05/10	1646	N54°46.0300'	W003°36.4640'	25.91	32	10.9	3.5	Fine Sand
Control 3	05/05/10	1336	N54°41.9950'	W003°43.1760'	32.92	32	11	3	Fine Sand

Results of particle size analysis and percentage TOC are shown in **Table 1.2**. Particle size distributions agree with the visual assessment for sites for the majority of samples taken. According to the PSA the majority of the samples from within the wind farm site are made up of fine sands, or very fine sands. This is consistent with previous surveys.

Table 1.2 – Particle Size Analysis (PSA) and Total Organic Carbon (TOC) of sediment, May 2010

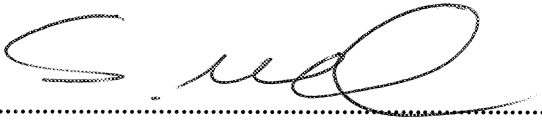
Sampling station	>4000 µm (%)	4000-2000 µm (%)	2000-1000 µm (%)	1000-500 µm (%)	500-250 µm (%)	250-125 µm (%)	125-63 µm (%)	<63 µm (%)	TOC (%)
Site 1	<0.1	<0.1	<0.1	<0.1	14.15	80.48	2.99	2.360	<1.0
Site 2	<0.1	<0.1	<0.1	<0.1	0.48	89.17	7.03	3.310	<1.0
Site 3	<0.1	<0.1	<0.1	<0.1	4.1	83.02	10.03	2.810	<1.0
Site 4	<0.1	<0.1	<0.1	<0.1	43.93	50.13	2.74	3.170	<1.0
Site 5	<0.1	<0.1	<0.1	<0.1	0.28	63.78	30.66	5.260	<1.0
Site 6	<0.1	<0.1	<0.1	<0.1	0.98	86.32	10.43	0.2500	<1.0
Control 1	<0.1	<0.1	<0.1	<0.1	<0.1	33.95	58.6	6.740	<1.0
Control 2	<0.1	<0.1	<0.1	<0.1	0.17	65.69	28.25	5.870	<1.0
Control 3	<0.1	<0.1	<0.1	<0.1	26.42	57.74	11.82	4.020	<1.0

In total 13 species of invertebrates were identified from the grab samples collected and one species of fish, the sand eel *Hyperoplus lanceolatus* (**Table 1.3**). The invertebrate communities from this area are consistent with an impoverished sand associated community dominated by the amphipod *Bathyporeia* spp. and the polychaete *Nephtys cirrosa*. The species found in this survey are consistent with previous benthic surveys, however the overall diversity and productivity (i.e. number of species and individuals) of the sampling stations are much reduced. For example a total of 26 species and 618 individuals were encountered during the last benthic survey of the wind farm and control sites compared to the 14 species and 30.5 individuals encountered during this survey.

Table 1.3 – Macro-invertebrate counts from Robin Rigg Windfarm site, May 2010

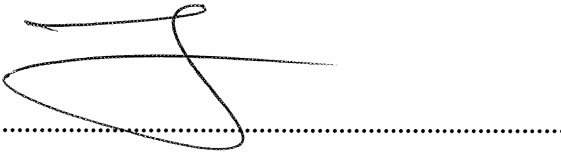
Species	Sampling Station and Species Counts									Total
	S1	S2	S3	S4	S5	S6	C1	C2	C3	
<i>Sigalion mathildae</i>							0.5			0.5
<i>Sthenelais limicola</i>								0.5		0.5
<i>Nephtys cirrosa</i>	0.5	1.5	1.5		0.5	0.5	2	1.5	1.5	9.5
<i>Scolelepis mesnili</i>		0.5	0.5							1
<i>Ophelia borealis</i>					0.5				1	1.5
<i>Bathyporeia elegans</i>		0.5	1.5			2	0.5		1	5.5
<i>Liocarcinus marmoreus</i>							0.5			0.5
<i>Portumnus latipes</i>		0.5								0.5
<i>Tellimya ferruginosa</i>	0.5									0.5
<i>Mactra stultorum</i>	0.5							0.5		1
<i>Fabulina fabula</i>							1			1
<i>Donax vittatus</i>							3.5			3.5
<i>Echinocardium cordatum</i>	1.5			0.5				2.5		4.5
<i>Hyperoplus lanceolatus</i>						0.5				0.5
Total number of individuals	3	3	4.5	0.5	1	3	8	5	3.5	30.5
Total number of species	4	4	3	1	2	3	6	4	3	14

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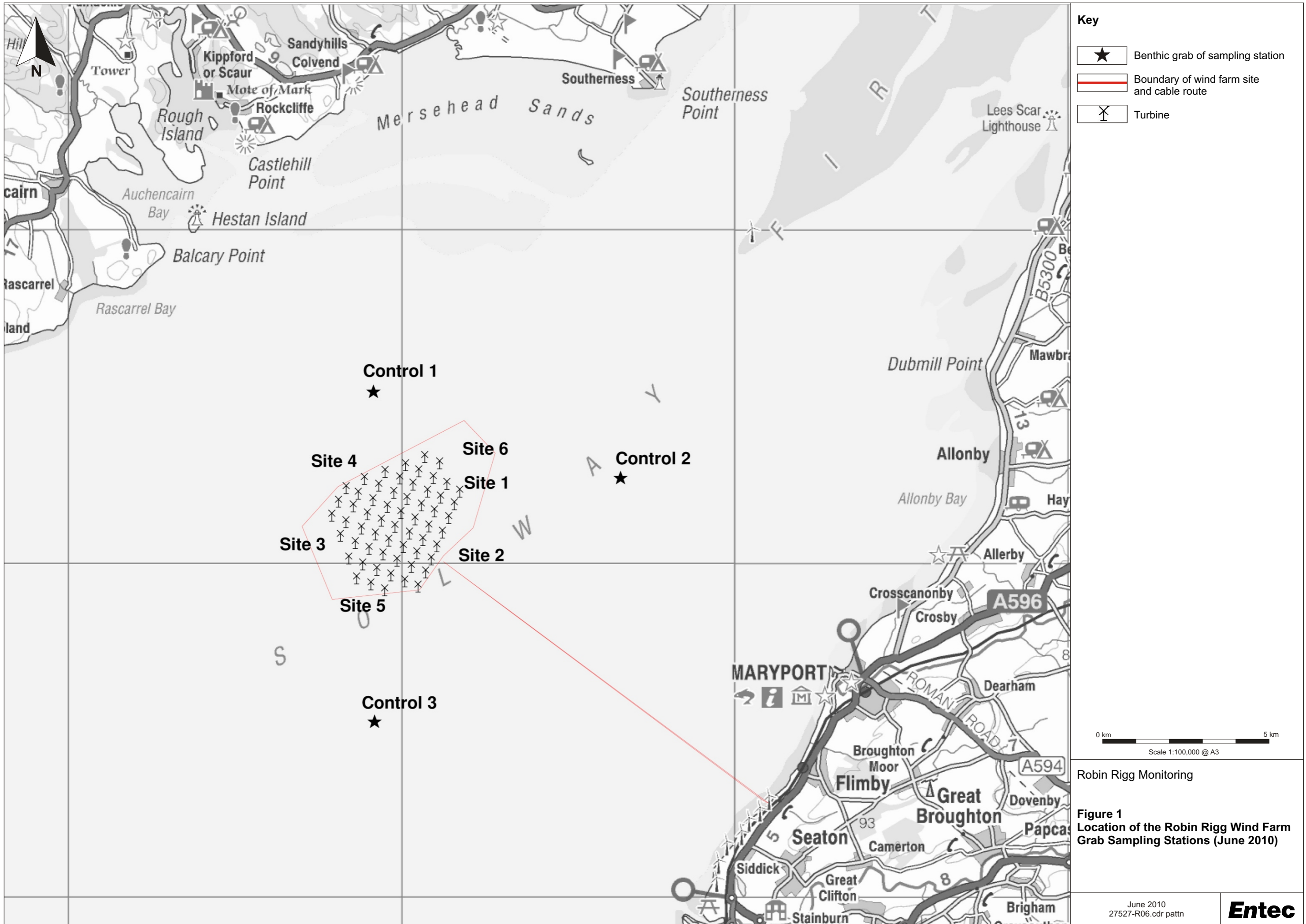
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Appendix A

Invertebrate counts from the Robin Rigg windfarm site and control grab sampling stations, May 2010

	Wind farm site												Control					
	1.1	1.2	2.1	2.2	3.1	3.2	4.1	4.2	5.1	5.2	6.1	6.2	1.1	1.2	2.1	2.2	3.1	3.2
<i>Sigalion mathildae</i>														1				
<i>Sthenelais limicola</i>															1			
<i>Nephtys cirrosa</i>	1			3	3					1		1	2	2	2	1	2	1
<i>Scolelepis mesnili</i>			1		1													
<i>Ophelia borealis</i>									1								2	
<i>Bathyporeia elegans</i>			1		3							4	1				1	1
<i>Liocarcinus marmoreus</i>														1				
<i>Portumnus latipes</i>			1															
<i>Tellimya ferruginosa</i>	1																	
<i>Mactra stultorum</i>		1															1	
<i>Fabulina fabula</i>													2					
<i>Donax vittatus</i>													3	4				
<i>Echinocardium cordatum</i>	1	2						1							3	2		
<i>Hyperoplus lanceolatus</i>												1						



- Key**
- ★ Benthic grab of sampling station
 - Boundary of wind farm site and cable route
 - X Turbine

0 km 5 km
 Scale 1:100,000 @ A3

Robin Rigg Monitoring
Figure 1
 Location of the Robin Rigg Wind Farm
 Grab Sampling Stations (June 2010)

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