
Robin Rigg Monitoring. Cable Route Benthic Macro Invertebrate Survey Data Report, June 2009

1. Introduction

In order to comply with Marine Environment Monitoring Programme (MEMP) and FEPA licence requirements for the construction of the Robin Rigg Offshore Windfarm a benthic survey along the cable route of the windfarm was undertaken on 23rd June 2009

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

2. Method

A benthic survey for macro invertebrates of the Robin Rigg windfarm cable route was conducted using the fisheries patrol vessel *Solway Protector*. Eight sampling stations were sampled along the length of the cable route (**Figure 1**).

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 clarity was measured using a Secchi disc. A visual assessment of sediment type was also made. Each sediment sample was sieved using a 1mm mesh and the material retained in the sieve was transferred to labelled sample bottles and preserved in 5% formaldehyde. A sediment sub-sample was taken for particle size analysis (PSA) and Total Organic Carbon (TOC) analysis.

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. Although duplicate grab samples were taken at each sampling station, in accordance with the approved methodology invertebrate identification, PSA and TOC were only performed on the first sample taken, with the second sample being preserved for reference.

3. Results

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

¹ United Kingdom Accreditation Service (UKAS) accredited laboratory

Table 1.1 – Sampling station locations and physical data, June 2009

Sampling station	Date	Time (GMT)	Lat.	Long.	Depth (m)	Salinity (‰)	Water Temp (°C)	Secchi Depth (m)	Visual Sediment Type	Sea State (Beaufort Force)
Site 1	23/06/09	11.30	N54°44.9900'	W003°41.1200'	7.88	34	14.4	3.5	Fine Sand	0
Site 2	23/06/09	11.23	N54°44.8100'	W003°40.8800'	8.79	34	14.4	3.5	Fine Sand	0
Site 3	23/06/09	11.14	N54°44.6400'	W003°40.1300'	16.97	34	14.4	3.5	Fine Sand	0
Site 4	23/06/09	10.54	N54°44.2400'	W003°39.3900'	16.06	34	14.4	3.5	Fine Sand	0
Site 5	23/06/09	10.46	N54°44.0300'	W003°38.6900'	7.88	34	14.4	3.5	Fine Sand	0
Site 6	23/06/09	10.37	N54°43.7800'	W003°37.8700'	13.03	34	14.4	3.5	Fine Sand	0
Site 7	23/06/09	10.28	N54°43.3500'	W003°36.5200'	16.06	34	14.4	3.5	Fine Sand	0
Site 8	23/06/09	10.19	N54°42.7600'	W003°35.5700'	18.79	34	14.4	3.5	Fine Sand	0

NB * Beaufort force 0 describes a sea state that is flat

Particle size distributions agree with the visual assessment that sediments in this area largely comprise medium to very fine sands (**Table 1.2**).

Table 1.2 – Particle Size Analysis (PSA) and Total Organic Carbon (TOC) of sediment, July 2009

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	0	0	0.6	0.5	33.1	30.0	35.9	6.6
Site 2	0	0	0	0	0.3	74.2	21.2	4.3	1.0
Site 3	0	0	0	0	40.0	48.6	2.5	8.9	<1.0
Site 4	0	0	0	0.3	1.0	83.9	9.7	5.2	<1.0
Site 5	0	1.8	2.4	8.3	25.6	23.7	23.0	15.2	1.1
Site 6	0	0	0	0.1	0.3	79.4	17.0	3.2	<1.0
Site 7	0	0	0	2.1	0	86.9	9.2	1.8	<1.0
Site 8	0	0	0	0	0	87.9	12.0	0.7	<1.0


In total 29 species of invertebrate were identified from the samples taken. Although no statistical analysis has been undertaken it can be seen that generally the invertebrate samples were more diverse (i.e. a larger number of species) and more productive (larger number of individuals) the closer inshore they were taken (**Table 1.3**). Samples taken from sampling stations seven and eight contained a greater variety of species and larger total number of animals, with bivalves being more abundant. The invertebrates found in the other samples appear to be consistent with an impoverished sand community including fauna such as the amphipod *Bathyporeia* spp and the polychaete *Nephtys cirrosa*.

Table 1.3 – Macro-invertebrate counts from Robin Rigg cable route, June 2009

	Sampling Station and Species Counts								Total	
	1	2	3	4	5	6	7	8		
<i>Nemertea indet*</i>	1				2				3	4
<i>Eteone flava/longa</i>	1	1			1	1				8
<i>Glycera tridactyla</i>	4	3				1				48
<i>Nephtys cirrosa</i>		5	1	15	3	14	9	1		7
<i>Nephtys hombergii</i>	7									1
<i>Scoloplos armiger</i>		1								1
<i>Goniada maculata</i>	1									1
<i>Paraonis fulgens</i>							1			10
<i>Scolecopsis mesnili</i>							2	8		18
<i>Spio martinensis</i>	5	13								22
<i>Magelona johnstoni</i>		18	1		1	1	1			1
<i>Ophelia borealis</i>			1							247
<i>Scalibregma inflatum</i>	246		1							3
<i>Gastrosaccus spinifer</i>						2	1			1
<i>Schistomysis spiritus</i>				1						2
<i>Perioculodes longimanus</i>		2								2
<i>Pontocrates arenarius</i>		1		1						107
<i>Bathyporeia elegans</i>		4	1	42	27	24	5	4		4
<i>Bathyporeia nana</i>				4						1
<i>Megaluropus agilis</i>		1								9
<i>Pseudocuma longicornis</i>		2		1	1	2	3			3
<i>Nucula nitidosa</i>	2	1								2
<i>Tellimya ferruginosa</i>		2								2
<i>Mysella bidentata</i>	2									40
<i>Fabulina fabula</i>	21	15		1		2	1			1
<i>Donax vittatus</i>			1							7
<i>Abra alba</i>	6	1								1
<i>Spisula subtruncata</i>		1								3
<i>Echinocardium cordatum</i>		1		1		1				3
Number of individuals	296	72	6	66	35	48	23	13		559
Number of species	11	17	6	8	6	9	8	3		29

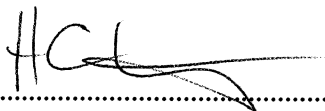
NOTE: Indet = not possible to identify to higher taxonomic resolution

Author: Jane Lancaster



.....

Reviewer: Hugh Watson



.....

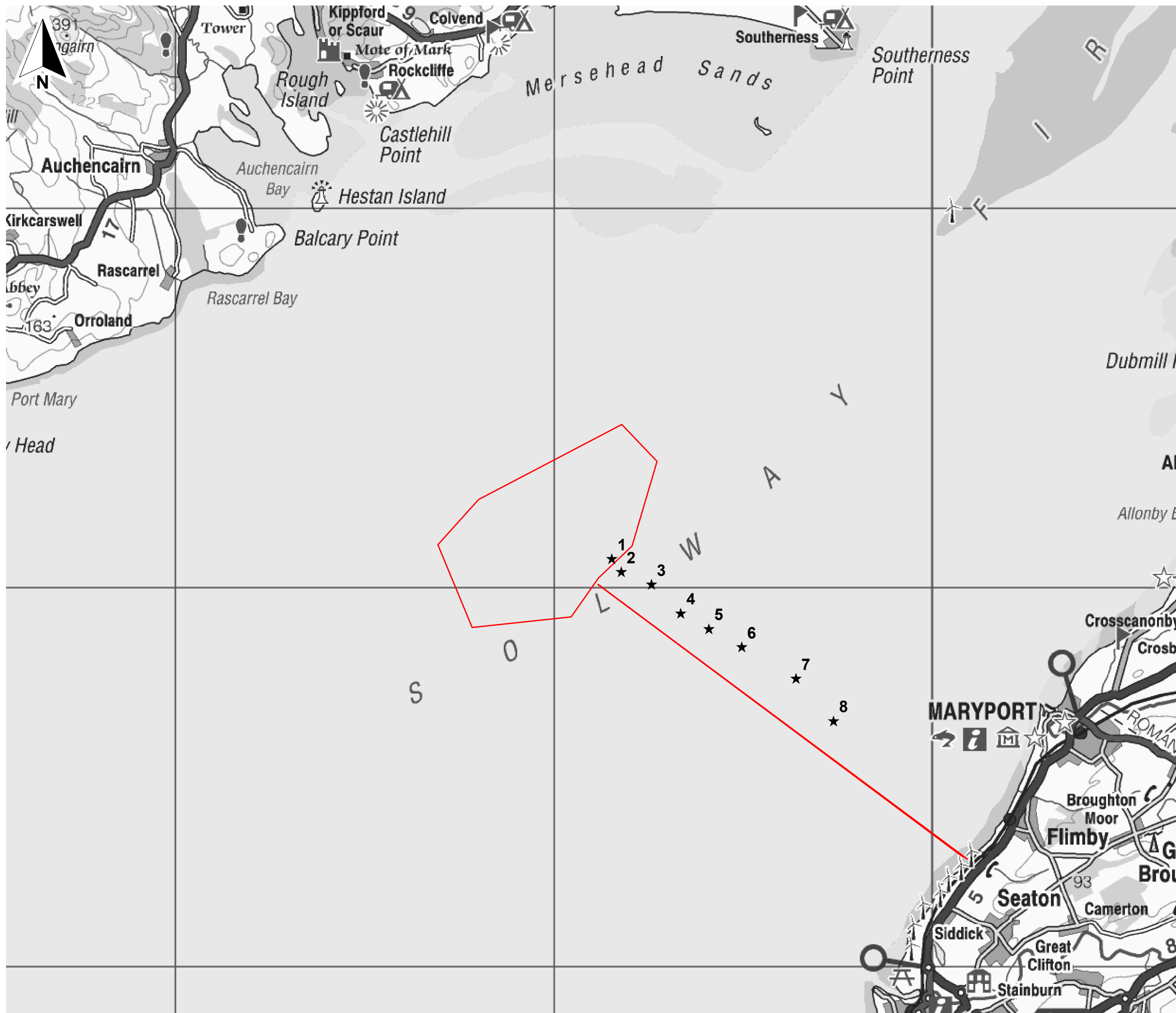
Issue date:

Copyright Notice

The contents and layout of this Technical Note are subject to copyright owned by Entec (© Entec UK Limited 2009) save to the extent that copyright has been legally assigned by us to another party or is used by Entec under licence.

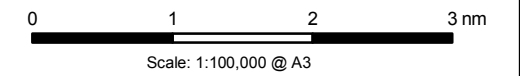
Third Party Disclaimer

Any disclosure of this Technical Note to a third party is subject to this disclaimer. The Technical Note was prepared by Entec at the instruction of, and for use by, our client. It does not in any way constitute advice to any third party who is able to access it by any means. Entec excludes to the fullest extent lawfully permitted all liability for any loss or damage howsoever arising from reliance on the contents of this Technical Note. We do not however exclude our liability (if any) for personal injury or death resulting from our negligence, for fraud or any other matter in relation to which we cannot legally exclude liability.



Key

- ★ Benthic grab of sampling station
- Boundary of windfarm site & cable route



Robin Rigg Monitoring

Figure 1
Location of the Robin Rigg
Cable Route Grab Sampling Stations
(June 2009)

August 2009
 20501-W003 CHAPA01

Entec