

Annual FEPA Monitoring Report

June 2005

North Hoyle Offshore Wind Farm



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1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

This document describes the monitoring undertaken during 2003-4 to comply with the conditions of the Food and Environmental Protection Act (FEPA) 1985: Part II (as amended), licence reference 31579/05/0 (as amended), issued to NWP Offshore Ltd. for the North Hoyle Offshore Wind Farm.

1.2 MARINE SEDIMENTS

Subtidal sediments were sampled from 20 agreed locations in and around the development site using a Day Grab. Particle size analysis was carried out to allow detection of any future changes in sediment conditions at the sites and, in particular, any influence on benthic invertebrate communities. Any changes in sediment characteristics for the 2003 survey have generally occurred at both control sites and those situated within the wind farm. Sites within the wind farm have shown both increases and decreases in sediment coarseness. Based upon these findings, at this time it is not justifiable to attribute these changes to wind farm construction. Moreover it is likely that such changes are attributable to either natural variation in sea bed sediments based at these locations or chance. However, the results from future monitoring surveys will help to confirm whether this is the case or whether sediment alteration has occurred, or will occur, following wind farm construction.

Suspended sediments have been monitored to determine any near and far field effects of wind farm construction and post-construction conditions. This report describes the results of during construction monitoring undertaken between 17 March 2003 and 23 April 2003.

Construction monitoring immediately followed the baseline monitoring period to enable identification of immediate changes to suspended sediment concentrations (under continuing weather conditions) following the instigation of the construction period. The 38 day period covered all installation drilling and piling activities for 3 monopiles. There was no overall detectable increase in suspended sediment load in the local environment as a result of monopile installation works. The relatively high background levels also show clearly the importance of weather conditions as the overriding influence on suspended sediment concentrations.

The dominance of natural processes in driving suspended sediment concentrations was evident in data obtained before and during the construction period. Both daily and semi-lunar tidal patterns drive suspended sediment concentrations at the site but increased wind speed, mediated through elevated wave height, can also be significant.

It is possible, however, to make an assessment of the relative impact of construction activities on suspended sediment loads by making some precautionary (i.e. pessimistic) assumptions:

Elevations of suspended sediment concentration in excess of 10 mg/l should be readily detectable. For the purposes of this exercise let us therefore assume that construction activities did raise suspended sediment concentrations by 10 mg/l. It is known that natural events routinely elevate suspended sediments by in excess of 200 mg/l. Thus monitored monopile installation activities had an impact not in excess of 5% above background levels. In reality the actual impact is believed to be very much smaller since the total material available for suspension was less than 1000 m³ over the entire installation process (cf. Section 3.2.3.3).

This compares favourably with the prediction in the Environmental Statement that the additional contribution to suspended sediment concentrations in the mouth of the Dee estuary would be less than 10%.

1.3 BENTHIC ORGANISMS

Three replicate grab samples were obtained from the 20 locations used for the subtidal sediment sampling by the same methods to provide information about the benthic infaunal communities. Beam trawls at 22 locations augmented this data with information about the epifaunal communities present. Statistical techniques were used to interpret the raw data to assess if there had been any changes to the benthic communities characteristics as the result of wind farm construction.

Changes have been observed in the number of species and individuals with reductions noted at most sites, however, major species from 2001 and 2002 still dominate or remain common. Those species which were present during 2002 but absent in 2003 were only present in very low numbers in the baseline surveys. Communities therefore appear similar to those of the baseline. There appears to be no discernible pattern for this reduction in taxa and individuals, rather this has occurred at sites across the entire area including those within the wind farm and at distant control sites. Reasons for such changes include alterations in sediment characteristics at particular sites, chance and inter-annual variations at the population level.

Major species present in 2002 still dominate or remain common in 2003 with those which were absent only being present in very low numbers in the 2002 survey.

Although it is not possible to identify definitive biotopes, they are in agreement with the classifications made in 2001 and certainly do not give any reason to alter the biotope map as it currently stands.

Overall a reduction in taxa and individuals was seen at most sites during 2003. There appears to be no uniform pattern for this reduction in taxa and individuals, rather this has occurred at sites across the entire area including those within the wind farm and at distant control sites

Sites which had experienced a large decrease in taxa and individuals in 2003, had experienced a change in substratum to one that would generally support a less diverse benthic community (e.g. site 4 altered from poorly sorted gravel in 2002 to medium sand in 2003 which will generally support a less diverse benthic community). Substratum changes are not necessarily attributable to wind farm construction and can equally be attributed to natural sediment flux.

Those sites which also experienced benthic population fluctuations but had similar sediment characteristics to previous surveys were, due to their locations away from wind farm construction activity, attributed either to chance or as a result of inter-annual variation. Many infauna can experience huge variations in numbers from one year to the next.

Those sites both within the wind farm and its surrounding area, which had a similar benthic community composition in 2002, were still similar in 2003 indicating no impact. This includes sites within the construction area still clustering well together with control sites indicating that changes solely within the wind farm area have not been experienced.

Sites along the cable route in 2003 were still very similar to other inshore control sites indicating no impact.

The Thumbnail crab *Thia scutellata* appeared to be present in reduced numbers in 2003, but this did not seem to be related to the wind farm construction.

Overall, there is no evidence of any major changes to invertebrate numbers and distribution as a result of the installation and operational activities of the wind farm, though minor changes cannot be discounted.

From Beam trawl survey results, those sites likely to have been most affected by construction disturbance supported broadly similar numbers of invertebrate species, in November 2003 compared to August 2001. Numbers of invertebrates were reduced at some sites within the

wind farm but this was attributed to highly variable and mobile species especially at sites 7 and 8, within the wind farm area, due mainly to changes in the numbers of the common starfish *Asterias rubens*. Changes in numbers of the great majority of species, whether positive or negative, appear to be largely unrelated to their position relative to the development activities.

There was no indication of any detrimental changes to invertebrate communities in the vicinity of the cable route to Rhyl.

This section has presented the findings from the construction phase survey of 2003. The North Hoyle environmental statement stated that: "Overall only minor, and localised impacts would arise during construction. These are not significant in terms of impacts on the benthic community types present". After the initial consideration of these results it is probable that this statement is correct, however, it is not possible to formulate any definite conclusions with regard to such impacts from construction until further monitoring has been completed over the course of the next few monitoring phases.

1.4 FISH

Consultation with fisherman and appropriate bodies has been undertaken and is ongoing through the Fisheries Liaison Officer. Only two adverse reports were received from fishermen throughout the year. The construction phase of the North Hoyle wind-farm project has not had a significant, if any, effect on marine fish or fishing in the area. Whether or not this phase has affected migratory species (salmon, sea trout and European eels) in the River Clwyd (or Dee) is too soon to tell. The smolts from the 2003-4 spawning season will not emigrate for at least two years and it will be another full year (i.e. 2007 at the earliest) before any of them return to spawn. Only then will it be possible to start looking objectively to see how numbers may have been affected by events.

In addition CEFAS trawl surveys have followed a consistent sampling protocol since 1989 and data has been procured to provide a useful baseline from 1993-2003 with which to examine future temporal trends in the relative abundance of demersal fish.

The Catch Per Unit Effort (CPUE) data suggests that no major deviations in demersal fish populations had occurred in autumn 2003. Thirteen of the seventeen species were caught in numbers which were within the ranges for the previous five years. Dab, plaice, scaldfish and Pogge all showed higher CPUE in 2003 than in the previous 5 years. Annual analysis of commercial stock assessment from future CEFAS beam trawl data will be undertaken from January 2005 set against this 10 year baseline.

1.5 MARINE MAMMALS

Marine mammal counts from existing stations and from anecdotal recordings during ornithology surveys will be presented in the next FEPA monitoring report due to delays encountered in obtaining count data.

1.6 ORNITHOLOGY

Boat surveys were undertaken over the period February 2003 to February 2004. One survey per month was completed for all months excepting April and December 2003 (due to inclement weather conditions). The boat survey data have been used in the subsequent analysis for all species except common scoter and red-throated diver which are known to be sensitive to boats and tend to be flushed as a boat approaches.

Aerial surveys of Liverpool Bay have been ongoing since the winter of 2000/2001, as part of the All Wales Common Scoter Surveys (AWCSS). Over the period covered by this FEPA monitoring report, surveys were in February and May 2003 and February 2004.

For the assessment of Objective 1, the analyses have required comparisons of the distribution of the birds across the different distance bands around the wind farm taking account of several other variables including species and time. The data have then been split into two stages: pre construction and construction. For several species, no firm conclusions can be drawn from the results of the surveys to determine if spatial distribution has changed during construction.

For red throated diver, the evidence suggests that there was a shift in distribution towards the wind farm during construction.

Cormorants were recorded within the wind farm during construction and the evidence suggests that there was a shift in distribution toward the wind farm during construction.

The results of the two analyses strongly suggested that shag was affected by the construction works and stayed further away from the wind farm.

Guillemots, Auks, Common and arctic terns did not change distribution patterns throughout the period.

Objective 2 seeks to evaluate whether the operating turbines cause a barrier to the movement of birds through the wind farm.

Construction was ongoing throughout the majority of this monitoring period and hence the number of turbines in position increased steadily over this period. The post construction period did not commence until March 2004, although some of the turbines were operational by November 2003. Therefore this objective will be considered in the next report, which will report on the monitoring of the operating wind farm.

For Objective 3, based on the aerial survey results, construction appeared to have very little effect on the distribution of common scoter as this species tended to remain away from the wind farm area in shallower water closer to the coast (pre and during construction).

The findings of the aerial surveys conducted between February 2003 and February 2004 do not show any significant changes in the distribution of common scoter. The results to date, therefore, indicate that no benthic monitoring under Objective 4 is likely to be required.

The findings of both the boat and aerial surveys recorded few species of conservation concern (e.g. red-throated diver, common scoter and sandwich tern) on or crossing the North Hoyle site.

Of the records which were made of these species from the boat surveys, almost all the birds were recorded at a height of less than 20m. In consideration to Objective 5, such flight heights will not result in the risk of these birds colliding with the turbine rotors.

1.7 FUTURE WORK

It is recommended that the results from the 2003 benthic and ornithology studies are not used in isolation, but in conjunction with the future monitoring programme which will take place following completion of the development.

In terms of ornithological monitoring, opportunities for further analyses of the data pre-, during and particularly post construction will be considered as part of the next monitoring report.

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