

Dublin Array Project,
Saorgus Energy,
Kerry Technology Park,
Tralee,
Co. Kerry.

28 June 2013

Re: PERMISSION for development of a wind farm on the Kish and Bray banks including 145 wind turbines with a maximum blade tip height of 160m, and associated infrastructure including monopile turbine foundations, scour protection, two meteorological masts of up to 100m in height, interturbine/export cabling and offshore substation. An Environmental Impact Statement (EIS) and Natura Impact Statement (NIS) have been prepared and submitted as part of this application.

App: Saorgus Energy LTD.

To Whom It May Concern:

Thank you for referring this application to An Taisce for comment.

An Taisce has reviewed the Environmental Impact Statement (EIS) and Natura Impact Statement (NIS) submitted as part of the application for planning permission. We have the following points to make regarding the proposed project.

Hydrodynamics

The Kish Bank is an important Benthic habitat, one whose “calculated diversity, richness and evenness of the [Kish bank is] broadly similar to those designated as habitats of community importance within the UK jurisdiction”¹ according to the National Parks and Wildlife Service *Irish Wildlife Manual No. 29*, page 2.

The effect of the development of a large wind farm on this and the Bray bank, and its effect on the benthic habitat, cannot be confidently predicted because there has been no post construction study done of a sandbank on which a wind farm of comparable size has been constructed. This precluded the carrying out of a desk review of the most pertinent documents, an activity recommended by the (then) Department of the Environment, Heritage and Local Government under landscape sensitivity analysis methodology planning guidelines for wind energy.² The Scroby Sands wind farm in the UK is similarly located on a sandbank, but this development consists in only 30 turbines, and post construction examination of the sandbank indicated secondary scour in certain locations, which was a ‘surprise’³.

The *Dublin Array EIS Volume 2 – Addendum, Appendix B – Hydrodynamics (2013)* for the Kish and Bray Banks states “It can be concluded that sufficient ambient tidal shear force is available for the surface sand layers on the Kish and Bray Sand Banks to be active, being constantly mobilised and deposited during tidal cycles. The residual tidal circulation is important for retaining sediment along the sand bank.”⁴ The impact

¹ See <http://www.npws.ie/publications/irishwildlifemanuals/IWM29.pdf>.

² See <http://www.environ.ie/en/Publications/DevelopmentandHousing/Planning/FileDownload,1633,en.pdf>

³ See <http://www.cefas.defra.gov.uk/media/393609/app-3-4-rag-coastal-processes.pdf>

⁴ See <http://www.dublinarray.com/downloads/leis/Appendix-B-Hydrodynamics.pdf>

assessment states that the maximum wake effect from the turbine monopiles is generally 100 to 150m at a 0.05m/s (water velocity) reduction, while increases in velocity will be local to the monopiles (5 to 10m) with an increase of between 0.2 and 0.4m/s.

It is also concluded that “from the modelling ... very localised changes in velocity will arise but on the scale of the normal ambient tidal currents such changes are not significant and will not alter the hydrodynamic regime of the Kish/Bray Sand Banks. The modelling exercise clearly shows that impact from the 145 individual monopiles spaced at approximately 500m are independent of each other and will not give rise to any cumulative impact. In terms of the residual tidal circulation pattern for the Kish and Bray Sand Banks which dictates overall sediment movement the proposed Array has no discernible effect on the residual current.”⁴

However the maximum wake effect, as mentioned earlier, extends to 150m in some cases, which, when considered for two adjacent turbines 500m apart, is a significant area. It is of concern to An Taisce that the construction of such a large wind farm, and the altered hydrodynamics around 145 turbine monopiles, could have unforeseen cumulative effects on the tidal circulation which is so important for retaining sediment on the bank.

Like the Scroby Sands development mentioned earlier the effect of secondary scouring (scour wakes) around the proposed rock armour scour protection was not thoroughly investigated during the preparation of the EIS or NIS. Scour is the erosion occurring on the seabed as a result of local alterations of water flow around obstacles. It is mentioned in the *Strategic Review of Offshore Wind Farm Monitoring Data associated with FEPA Licensing Conditions*, carried out by the Centre for Environment, Fisheries and Aquaculture Science (with input from UK government agencies FERA and SMRU), that scour wakes cover larger areas than monopile scour and therefore can impact upon adjacent structures, such as other turbines.⁵

The *DTI Strategic Environmental Assessment Area 6, Irish Sea, seabed and surficial geology and processes - continental shelf and margins commissioned report CR/05/057* - compiled by the British Geological Survey, in a section on sediment grain size, seabed stress and currents, states:

“The amount of stress imposed on the seabed and thus the amount and type of sediment imported into, deposited, or exported out of the study area varies with position and time. As a result, in areas of seabed scour and grain bedload transport, there are continuous processes of sediment reworking and redistribution resulting in ‘seabed polishing’. The end-members of the processes driving sediment transport and deposition are large areas of (a) exposed bedrock and exposed strongly cohesive unsorted gravel, sand and mud (collectively termed diamicton) and (b) muddy sediment. ... Areas of least seabed stress are characterised by more or less stable fine-grained muddy sediments, significant proportions of which have been deposited from suspension in conditions where there are very low seabed currents”⁶

Potentially large areas of seabed can undergo sediment varying processes and it is only in areas of ‘least seabed stress’ that fine grained sediments are found. The Kish and Bray banks consist primarily of sand and some gravel⁴; the effect of seabed scour induced by altered hydrodynamics around 145 monopiles, and their scour protection, on this sediment type could be large areas of altered seabed.

It is of further concern that the other proposed wind farms, namely the Arklow and Codling bank (permission for 200 turbines and 220 turbines respectively) wind farms, are also to be located on sandbanks, which will further reduce this habitat type. As only 7 turbines have so far been constructed on the Arklow bank the full impact of this development cannot yet be fully understood. The loss of significant

⁵ See <http://www.cefas.defra.gov.uk/media/393539/annex-3-coastal-processes.pdf>

⁶ See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/197293/SEA6_Geology_BGS.pdf

areas of the Kish and Bray banks as well as potentially significant areas of the Arklow and Codling banks could have unforeseen cumulative impacts on seabird populations, since the habitat type is an important nursery area for fish and therefore a feeding ground for seabirds. Since the development of large wind farms may have unforeseen cumulative effects on the hydrodynamics of these sites, this overall impact on benthic and seabird populations is hard to predict.

Finally under the Habitats Directive (92/43/EC), as transposed in Ireland, sandbanks are habitats for which SACs must be designated and within which these habitats must be maintained at favourable conservation status.⁷

The lack of any previous post construction sandbank impact report (for a large development), coupled with the potential impact that scour wakes could have on the seabed, and the cumulative impact of this development and the Arklow and Codling sandbanks developments, indicates that the EIS and NIS submitted are inadequate in the information they provide on the impacts the wind farm development could have on sandbank habitats.

Seabirds

It is mentioned in the *Dublin Array EIS Volume 2 – Addendum, Appendix C- Birds (2013)* that “divers were often flushed from the water surface some distance from the boat so that most of the records are of birds in flight” and that:

“Given their response to disturbance, any Red Throated Divers using the Banks during the construction phase may be displaced from the area. However, as construction will only be ongoing in a small part of the wind farm area at any one time, any displacement of Red-throated Divers will be localised and will affect an insignificant number of birds.”⁸

It is not mentioned at what distance the birds are disturbed and therefore what percentage of the sandbank area will be off limits to them during construction. Also, the effect on these birds of the two maintenance boats per day is not mentioned. Since they are easily disturbed the effect that these two maintenance boats per day could have on their usage of the site should be investigated.

A post construction survey was done on the bird use of the Arklow bank 7 turbine wind farm and it was found that “[t]he only statistically significant result is for Red-throated Diver, which is showing a decline in numbers using Arklow Bank.”⁸ The *Dublin Array EIS Volume 2 – Addendum, Appendix C – Birds (2013)* goes on to mention that if this species are being displaced from the Arklow bank then they are not using the Kish or Bray bank as an alternative. However displacement from the Kish and Bray banks, as well as from the Arklow bank, could have a cumulative effect on the population of this species.

Shag is a species of interest at both Lambay Island SPA and Skerries Islands SPA. The Lambay Island colony is the largest in Ireland and is of international importance. It is mentioned that the birds travel to the Kish and Bray banks to forage, but no reference is made to the potential impact of construction on this species⁸. Since the Lambay island colony is of national importance and the construction period of the development is estimated at three years, this is an important consideration.

Kittiwake is present at four SPAs (Lambay Island, Howth Head, Ireland’s Eye, and Wicklow Head) and all of these are considered nationally important for this species. It is noted that this species are present on the banks all year round, and that they are a collision risk concern because of their flight heights. Also, it is stated that “due to a lack of detailed behavioural observations, the actual collision risk – that is taking into account the avoidance behaviour of the birds – is not available in the literature.” Further large numbers of Kittiwakes have been recorded in the vicinity of the Arklow bank. Since the construction of the 7 turbines

⁷ See <http://www.npws.ie/marine/marinehabitats/>

⁸ See <http://www.dublinarray.com/downloads/Ieis/Appendix-C-Birds.pdf> page 13.

on the Arklow bank there has been a slight decrease in the numbers of Kittiwake, although this appears to be part of a decline in numbers also noticed at other colonies⁸. Since this is a species of national importance which is known to frequent the Kish and Bray banks, and since they are also present at at least one other sandbank on which a large wind farm is planned, a more thorough investigation of the cumulative effect that these large wind farm developments may have on this species is warranted.

Common, Arctic and Roseate terns are mentioned as conservation features for three SPAs; Rockabill (site code: 004014), Dalkey Islands (site code: 004172), and South Dublin Bay and River Tolka estuary (site code: 004024). Rockabill and the Dalkey Islands are breeding colonies for all three Tern species while the Rockabill Roseate Tern population is given by Birdwatch Ireland as 1,200 pairs, representing 90% of the north-western European population. The EIS gives the displacement risk for each of the three tern species a numerical figure based on Furness and Wade (2012)⁸ (in their publication *Vulnerability of Scottish Seabirds to Offshore Wind Turbines*. Report prepared for Marine Scotland by MacArthur Green Ltd.) The Common Tern is given 8, Roseate; 9, and Arctic; 10, which means they should not be considered focal species for concern about potential displacement effects, but neither are they very unlikely to be affected by displacement. Given the importance of the terns, especially the Rockabill Roseate terns, this displacement could potentially be significant.

For all seabird species the impact of the wind farm on usage of the site is dependent on the impact on fish species. Since, as mentioned earlier, the development could have unforeseen effects on the sandbank, An Taisce submits that the impact on fish species, and thereby on the features of the SPA, arising from the wind farm is hard to predict.

Pollution

According to the Natura 2000 Standard Data form for South Dublin Bay SAC (site code: 000210) “pollution such as oil spillages from Dublin Port and shipping is a threat.”⁹ The qualifying interests for this site are Mudflats and sandflats not covered by seawater at low tide [1140].

This SAC was not included in the NIS (2013) further assessment because:

“Taking account of distance and the character of this qualifying feature there will be no interactions or pathways for impacts arising from the proposed development which may affect the habitats for which this site is designated.”¹⁰

Likewise for North Dublin Bay SAC (site code: 000206), the Natura Standard Data form states:

“Owing to its location in Dublin Bay, pollution such as oil spillages from Dublin Port and shipping is a threat.”¹¹

North Dublin Bay SAC was also excluded from further assessment for the same reason as above. The qualifying interests for this site include mudflats and sandflats not covered by seawater at low tide [1140], annual vegetation of drift lines [1210], Salicornia and other annuals colonizing mud and sand [1310], Spartina swards (*Spartinion maritima*) [1320], Atlantic salt meadows (*Glauco-Puccinellietalia maritima*) [1330], Mediterranean salt meadows (*Juncetalia maritimi*) [1410], and embryonic shifting dunes [2110]. All of these are Annex I habitats protected under the Habitats Directive (Directive 92/43/EEC).

Dublin port will be used by ships during construction, so the possibility of pollution impact on South and North Dublin Bay SAC should have been included in the further assessment. It is mentioned *Dublin Array EIS Vol 1 – Non Technical Summary (2013)* (page 19) that:

⁹ See <http://www.npws.ie/media/npwsie/content/images/protectedsites/natura2000/NF000210.pdf>

¹⁰ See <http://www.dublinarray.com/downloads/2nis/Natura-Impact-Statement.pdf> page 18.

¹¹ See <http://www.npws.ie/media/npwsie/content/images/protectedsites/natura2000/NF000206.pdf>

“There is a risk of spillage of potentially polluting substances, such as oil and grout, during construction and operation of the wind farm. This risk will be minimised by ensuring that all materials that are to be used during construction be approved for use in the marine environment. Potentially polluting substances will be stored in bunded containers to prevent contamination in the event of leakage. Contractors will be required to put preventive measures in place to prevent spillage of contaminating substances, particularly when grouting is being performed during construction.”¹²

However the risk of oil spillages from Dublin Port and shipping is not mentioned. The construction, and subsequent maintenance visits to the site, will increase the risk of oil pollution from ships and small vessels, and this should be taken into account with respect to these SACs.

Marine Mammals

The harbour porpoise is a qualifying interest for the Rockabill to Dalkey SAC, which is about 1.6km west of the proposed development, while the Lambay island SAC has grey seals as a qualifying interest, and is about 20km away. No surveys had previously been carried out to establish baseline data for harbour porpoises in Irish waters, as the *EIS Volume 2 – Addendum, Appendix D – Mammals* notes “No studies have been carried out to estimate the home range, or movements, of individual harbour porpoises in Irish waters” (page 10). Ecology consulting LTD and Ecoserve carried out baseline surveys in 2001/2002 and 2010/2011 respectively, but the entire Ecoserve survey, and the wider range boat survey (up to 4km from the banks) carried out by Ecology Consulting LTD were boat transect surveys. Harbour porpoises display avoidance behaviours to motor vessels, so this survey method may not have given an accurate picture of this species’ use of the immediate area surrounding the banks. Ecology Consulting LTD also carried out fixed point surveys along the banks, though the 30 minute time over which this was done may not have allowed the animals to return to their usual use of the site after disturbance by the arrival of the boats. Finally Ecology Consulting LTD also carried out aerial surveys, however doubt has been cast on the accuracy of these, since harbour porpoises spend a large proportion of their time underwater¹³. Therefore the data gathered for harbour porpoise use of the Kish and Bray banks, and surrounding areas, may be questionable. Also any post construction impact assessment carried out may not be reliable.

Harbour porpoises use sound to navigate and any noise generated during construction could negatively impact this species by masking the detection of other sounds such as communication signals between individuals. Pile driving (inserting the monopiles into the seabed) creates high noise levels that can cause physical injury at close range, and hearing loss and behavioral changes further away.

Therefore it is of concern that while construction work is ongoing on the north western area of the development, the area of the Rockabill to Dalkey SAC acoustically affected is 52%. This reduces to 7% at a minimum, while construction is ongoing at the southwest corner. However with the use of a cofferdam system a maximum of 40% of the southern part of the Rockabill to Dalkey Island pcSAC is predicted to be affected to a level that may cause aversive reaction in harbour porpoise. However the *NPWS Conservation objectives supporting document - Marine Habitats and Species* for the pcSAC states:

“Proposed activities or operations should not introduce man-made energy (e.g. aerial or underwater noise, light or thermal energy) at levels that could result in a significant negative impact on individuals and/or the community of harbour porpoise within the site. This refers to the aquatic habitats used by the species in addition to important natural behaviours during the species annual cycle.”¹⁴

¹² See <http://www.dublinarray.com/downloads/1eis/EIS-Non-Tech-Summary.pdf> page 19.

¹³ See <http://www.jstor.org/discover/10.2307/3802415?uid=3738232&uid=2&uid=4&sid=21102472292457>

¹⁴ See http://www.npws.ie/publications/archive/003000_Rockabill%20to%20Dalkey%20Island%20SAC%20Marine%20Supporting%20Doc_V1.pdf

The construction of the Dublin Array wind farm would introduce man-made noise at levels that would result in significant negative impacts on individual harbour porpoises within the site. The distance quoted in the *EIS Volume 2 – Addendum, Appendix D – Mammals* for behavior effects or aversion is 13 – 15km (page 13). The Rockabill to Dalkey cSAC is considerably closer than this. Further there is no mention of avoiding pile driving operations at sensitive times of the year, such as calving/breeding times between May and August. It is mentioned that it is thought that these mammals move offshore to breed (page 11), but this should be investigated further to ensure that no negative impacts at this important time occur.

It is also of concern that if the construction starts at the centre of the proposed wind farm and proceeds south and north, the cumulative effect on the cSAC from two distinct areas of construction could be significant.

The noise produced by operating turbines is transmitted down through the turbine structure and into the sea. Smaller 1.5MW turbines produce behavior responses in harbour porpoises at 200-300m, while bigger turbines, 4 – 5MW examples are likely to be noisier¹⁵. The turbines to be used in the Dublin Array will have an installed capacity of between 3 and 6MW¹², depending on installation date.

It is noted in the *Dublin Array EIS Volume 2 – Addendum, Appendix D – Mammals* that harbour porpoises have been known to approach the sound of wind turbines, and therefore there will be no exclusion of harbor porpoises from the site¹⁶. However this is based on a study (Kochinski *et al.*, 2003) done using a single 2MW turbine, which concluded that harbour porpoises are able to detect the low frequency sound generated by turbines¹⁷. The cumulative effect of a number of different turbines' operational noise levels, at the level generated by turbines of the same power, should be considered when assessing the impact of the development on the usage of the site by these mammals. It is also noted that, at the Egmond aan Zee wind farm off the Dutch coast, the number of harbour porpoises using the site increased after construction of the wind farm (after Scheidat *et al.*, 2011). The turbines in place there are 3MW¹⁸, which is the lower end of the proposed power level of the turbines which are to be installed on the Kish and Bray banks. Should more powerful turbines be installed on the banks, this study is no longer valid in this context.

The noise that the two maintenance boats per day will produce is not mentioned with respect to its impact on marine mammals and what impact they would have on harbour porpoises, a species which, as mentioned, displays avoidance behaviours to motor vessels.

Although Lambay Island SAC (site code: 000204) has grey seals as a feature of interest, they are not dealt with in much detail in the EIS or NIS. It is stated in the *Dublin Array EIS Vol 2 – Main EIS (2012)* (page 245) that “[t]here is no indication that the Kish and Bray banks are of particular importance for foraging seals.” This is based on aerial surveys carried out by Ecology Consulting in 2002, and on boat based surveys carried by EcoServe in 2010 and 2011, since both turned up low numbers of seals. It is of concern that, since seals can dive to considerable depths, the aerial survey may not give a truly representative spectrum of grey seals use of the area surrounding the banks. Seals are not dealt with in any great detail in the EIS or NIS; for example no mention is made of seals' use of other wind farm sites with respect to post construction impact. It appears that, since the surveys mentioned above did not record many seals in the area, the impact of the development on seals was not very thoroughly investigated.

Reefs

¹⁵ See

[http://iwc.int/cache/downloads/7rt8qdt9k3wocsgokcwwcgw48/Thomsen et al. 2006%20Effects%20OWF%20noise%20on%20marine%20mammals%20and%20fish.pdf](http://iwc.int/cache/downloads/7rt8qdt9k3wocsgokcwwcgw48/Thomsen_et_al._2006%20Effects%20OWF%20noise%20on%20marine%20mammals%20and%20fish.pdf) page 29-30.

¹⁶ See <http://www.dublinarray.com/downloads/1eis/Appendix-D-Mammals.pdf>

¹⁷ See <http://www.int-res.com/abstracts/meps/v265/p263-273/>

¹⁸ See <http://iopscience.iop.org/1748-9326/6/2/025102/fulltext/>

A number of Natura 2000 sites occur in the vicinity of the proposed development, and a number of these contain Annex 1 reefs [1170]. Of these the Dalkey island reefs are the closest and the potential impacts are increased turbidity, and re-suspension of polluted sediments during construction which would have a smothering effect.¹⁹ This is also recognised as a potential impact in the Dublin Array NIS, but the potential impacts are only seriously considered during construction, since the hydrodynamic impact assessment identified only a very localised effect of the development on tidal flows and velocities, and therefore concluded that there will be no significant impact on the sediment regime of the banks. As mentioned earlier the hydrodynamic impact assessment did not incorporate a desk study of impacts on similar sites and did not take account of secondary scour, the effect of which could have unforeseen impacts on sedimentary processes on the banks. This in turn may impact the nearby reefs by increasing sedimentation.

These concerns should be taken into account during the planning process. It is not yet clear whether this development can proceed via Article 6(3) of the Habitats Directive or whether the derogation in Article 6(4) is instead triggered.

Please acknowledge receipt of this submission.

Yours faithfully,

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¹⁹ See <http://www.cefas.defra.gov.uk/media/463712/monograph4-web.pdf>