

Observations on the proposed Ballincor Windfarm

An Coimisiún Pleanála - Case reference: PAX92.324279

Applicant: RWE Renewables Ireland Ltd.

Proposed Site Location: Townlands of Cloonaheen, Ballincor Demesne, and Curralanty, County Offaly, and Clonfree, Castletown and Cronekill, County Tipperary.

INTRODUCTION

I make these observations on the proposed Ballincor Windfarm as a professional hydrogeologist and engineer of some 50 years experience, particularly in groundwater and wetland hydrology, but also having worked on the hydrology and conservation of Sharavogue Bog Special Area of Conservation (SAC) which is adjacent to the proposed windfarm site. The proposed windfarm is located within the same catchment area serving this SAC. As a professor of environmental engineering at Trinity College Dublin, I have previously served as a technical advisor to An Bord Pleanála and to the EPA.

The following observations are focused on the hydrological and hydrogeological aspects of the proposed development

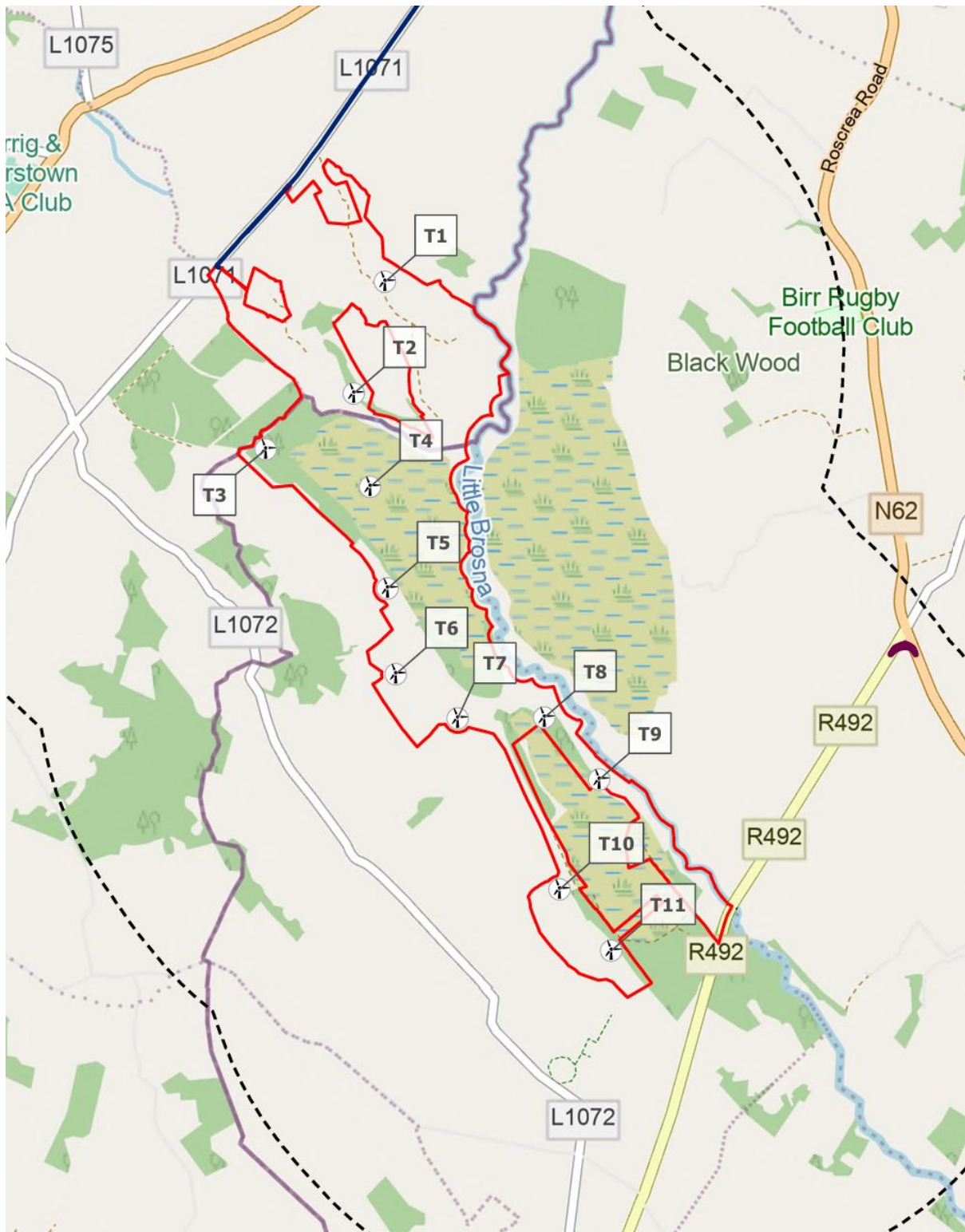
CONTEXT

While it is recognized that there is considerable political pressure to develop renewable energy sources and windfarms in particular, this proposed location is unsuitable for several reasons. Risks to the integrity of a designated wetland (SAC) in the same catchment, environment/biodiversity and the sheer impact of 180-metre high turbines on a sensitive landscape render the site unacceptable. The submitted EIAR is totally inadequate in addressing these risks.

HYDROLOGY

The elongated linear windfarm site, comprising a proposed 11 turbines and ancillary works, is situated on a Locally Important Aquifer (the Waulsortian and Ballysteen limestones) which is overlain by glacial limestone till and peat, adjacent to the Little Brosna River. The northern end of the site touches on esker gravels and more karstified bedrock.

The overall windfarm site is some 5km long and up to 1.6km wide with current landuse of cutover bog and wet grassland. The cutover, drained peatland forms the bulk of the site and most of the turbine sites are along the margins of this former wetland. One turbine site (T4) is in the centre of the peatland and two (T8,T9) are close to the Little Brosna River which forms the eastern boundary of the site. The overall site is reported as 355ha and the development will result in 34ha of 'changed landuse' (EIAR sec.8-4-2-1) although elsewhere (p.9-45), it is estimated that only 20ha will be occupied by the windfarm infrastructure. Changed landuse is acknowledged in affecting the hydrology/surface runoff but the use of methodology of UK SuDs (Sustainable Urban Drainage) calculations as referenced in the EIAR is not appropriate here.



Extract of EIAR Fig 8-1 : Site map.

(Townlands: Curralanty: the marsh of An Leantach; Ballincor: a settlement that has moved, indicative of wetlands)

The site investigation undertaken involved 23 trial pits up to 3.9m depth which appeared to be focused on ground conditions at the turbine sites and along the proposed road infrastructure, rather than investigating the site's hydrological regime.

Only 3 logged boreholes were drilled for site investigation, with depths of 6.8, 12 and 18.8m respectively. No borehole groundwater levels were recorded. Such a borehole investigation is not adequate for defining the hydrogeology of such a complex site. However, 124 probes of peat depth were undertaken recording depths of peat averaging 1.2m with a maximum of 4.1m which is consistent with a degraded peatland site. Not surprisingly, greater depths of peat were recorded along the margins of site, beside the river. No attempt was made to contour the present depths of peat on the site.



Figure 1 of EIAR Appendix 8-1: Site Investigation. Note position of TP5 close to T5, with a view across the adjacent Sharavogue SAC to the east.

Groundwater appeared to be encountered in most of the trial pits and water level was indicated to be between 0.4 to 1.5m below ground level in the peat areas and less than 6m elsewhere. However, there was no attempt to further define the groundwater level regime. EPA mapping was relied on to indicate the likely groundwater quality parameters of Electrical Conductivity (EC) and pH, of 260-600 μ S/cm and 7.2-7.33 respectively. Measurements undertaken of the *surface* river water quality on the site (EIAR p.9-22) reflected these figures but the probability of a connection to groundwater was not explored. Nevertheless, it was stated (EIAR p.9-34) that “along the eastern margin of the proposed windfarm site, fen peat is present and there is upwelling of base-rich water that supports carr woodland and calcareous

fen vegetation”, which presages a possible hydrogeological connection with the adjacent Sharavogue Bog SAC.

The Little Brosna is an important conduit for drainage of the both the windfarm site and Sharavogue Bog SAC as it runs between the two. There is a gauging station in Birr and modelling was reported in the EIAR to transfer the flow data to the windfarm site, some 8km to the south. However, there was no validation by on-site flow measurement. Published OPW CFRAM modelling was relied upon for flood prediction at the site. Turbines T1, T2, T8 and T9 were deemed to be at risk of flooding at the 1% and 0.1% Annual Exceedance Probability (100 and 1000 year) risk levels. The implications of this flood risk were not explored.

The stated objective in the EIAR of these hydrological investigations was to devise a suitable Conceptual Site Model (CSM) which could be the basis for determining environmental impact of the development. It appeared from the EIAR that a robust CSM was not developed and reliance was placed on the investigated ground conditions along the road infrastructure and at the turbines, to determine impact. Such reliance is inadequate if there are sensitive receptors (such as an SAC) in close proximity and whether adjacent landuse could be affected. (The Little Brosna is historically part of an arterial drainage scheme which is currently under its own Environmental Impact Study, which was only briefly mentioned in the EIAR).

Moreover, the NIS (p88) recognized that the Sharavogue Bog SAC has ‘groundwater dependent habitats’ and the windfarm site is within the Zone of Influence (ZOI) of the SAC – and there is likely a hydrogeological connection, albeit not investigated.

At the least, in this context, a hydrological water balance should have been undertaken with on-site measurements of water levels and flows. Such an assessment would then provide a basis for determining environmental impact. In the case of wind turbines, the creation of the road and hardstanding infrastructure along with deep foundations (gravity or piled) would have a significant impact on the local hydrological regime. None of the few trial boreholes on this site reached bedrock, so the nature of the likely foundation design remains a presumption and determining hydrological impact even more presumptuous. Reliance on published hydrological information is no substitute for local field investigation and analysis.

It is clear from personal experience of the area that the peatlands on both sides of the Little Brosna River were once a form of Callows (as is still the case for riverine wetlands downstream of the windfarm site). On Sharavogue bog, there are springs on the eastern margin which partly sustain the hydroecology of the wetland. Upward pressure from groundwater is likely a supporting environmental condition for the wetland – but overall drainage is towards the river. It is very likely the same situation applied to the western side of the river, ie the windfarm site. Any springs that might have occurred along the western boundary of the site have probably been subsumed in the artificial drainage installed under the arterial drainage scheme. The remaining

peat is a residual of that process but nevertheless is hydrologically active, given that many of the trial pits indicated gravelly substrate with connections to groundwater.. The whole area, both sides of the Little Brosna, were likely parts of a riparian callows type of habitat. Constructing 11 turbines with foundations and infrastructure would be an anathema to any conservation/restoration.

LANDSCAPE

In the context of the windfarm site and Sharavogue Bog bisected by the Little Brosna, the surrounding landscape is recognized as of a sensitive nature already, by Offaly County Council. As can be seen from the photo of Trial Pit 5 (below), the shallow valley of the river with its callows would be irredeemably visually damaged by the presence of wind turbines of a height equivalent to a 60 storey building. Irrespective of the impact on bird and wildlife, and lack of formal landscape designation, the ambience and serenity of the area, as realized in the conserved Sharavogue bog, would be severely affected.

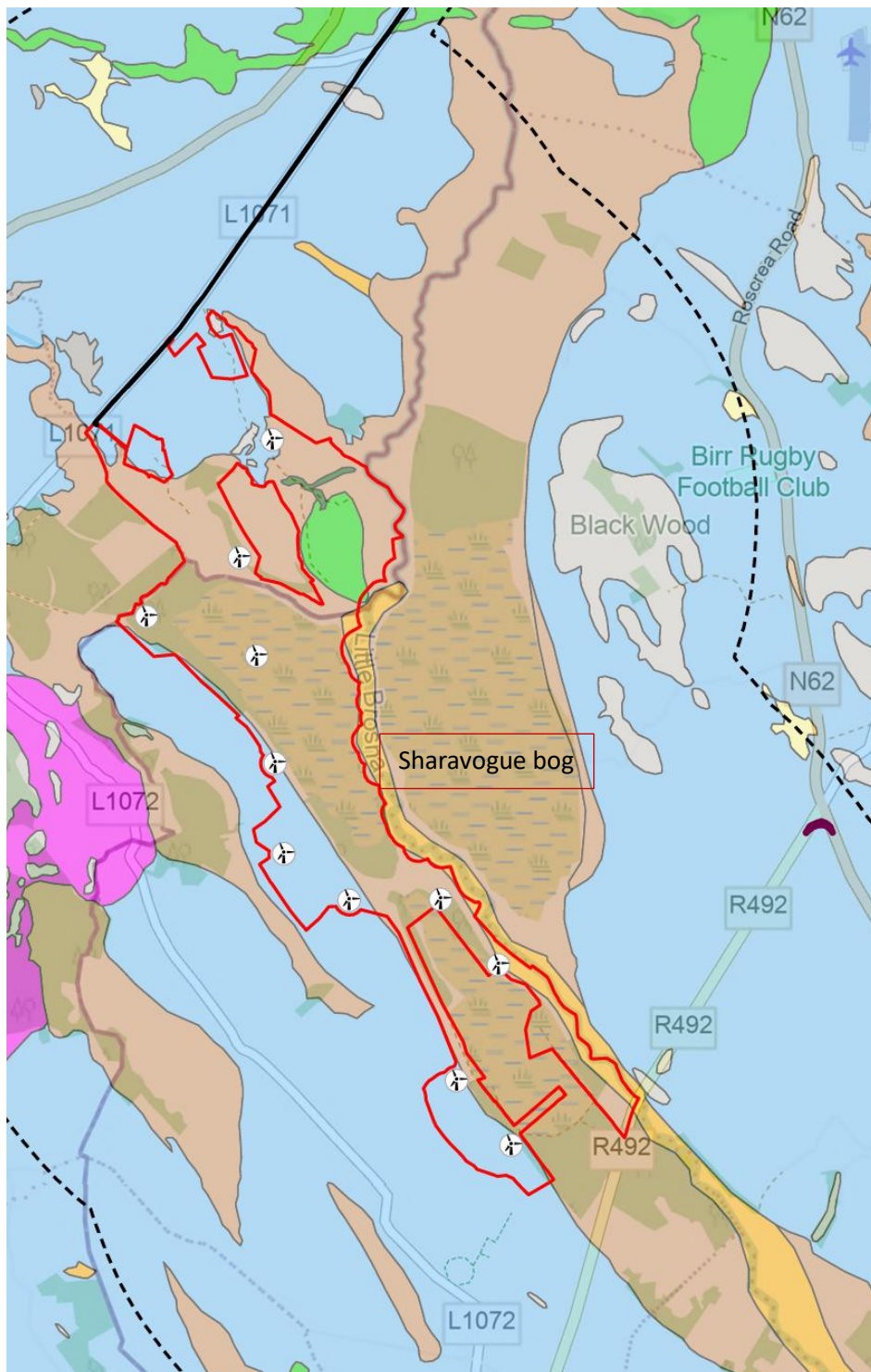
CONCLUSION

While concentrating on the hydrological aspects of the development at Ballincor, it is clear that the investigation and assessment of environmental impact is inadequate. It has depended on published information, much of which is irrelevant and requires field validation. Moreover, while the NIS recognizes there is likely to be a hydrogeological connection between the site and the adjacent SAC, it has not been investigated, nor the impact of deep turbine foundations and infrastructure.

In short, the development of a windfarm on part of an historical callows wetland (itself a protected habitat), part of which is already a valuable SAC, is unacceptable, notwithstanding national needs for renewable energy. Planning permission should be refused in this case.

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ILLUSTRATIVE FIGURES FROM THE EIAR



Extract from fig 8.4 of EIAR : Subsoils map: *Riparian peatland was part of an integrated callows-type regime. Sharavogue Bog is an SAC*

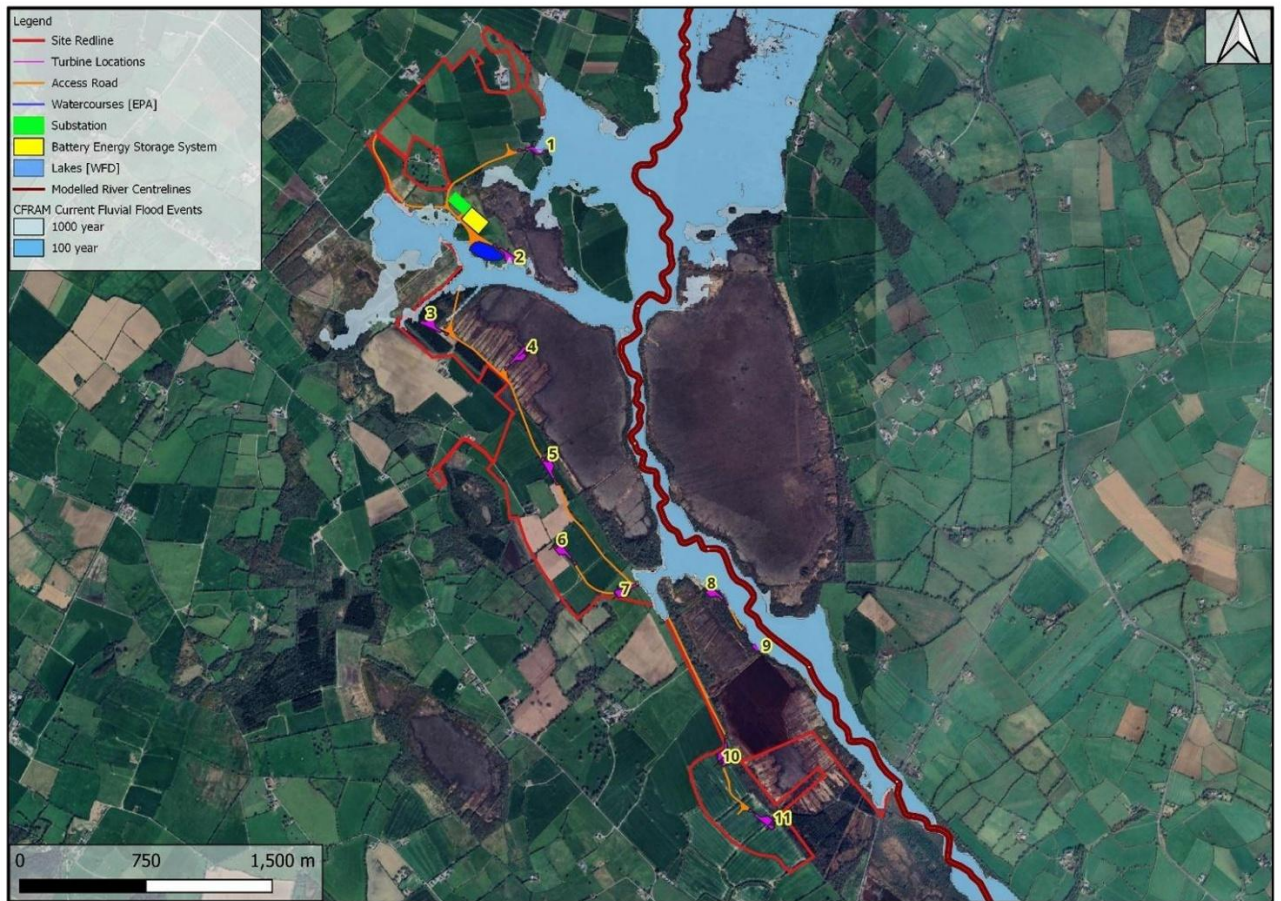


Figure 3-4: CFRAM Existing Fluvial Flood Extents

EIAR Modelled flood extents under existing hydrology (Appendix 9-3). Both sides of the river are effectively riparian wetlands and, here, as callows

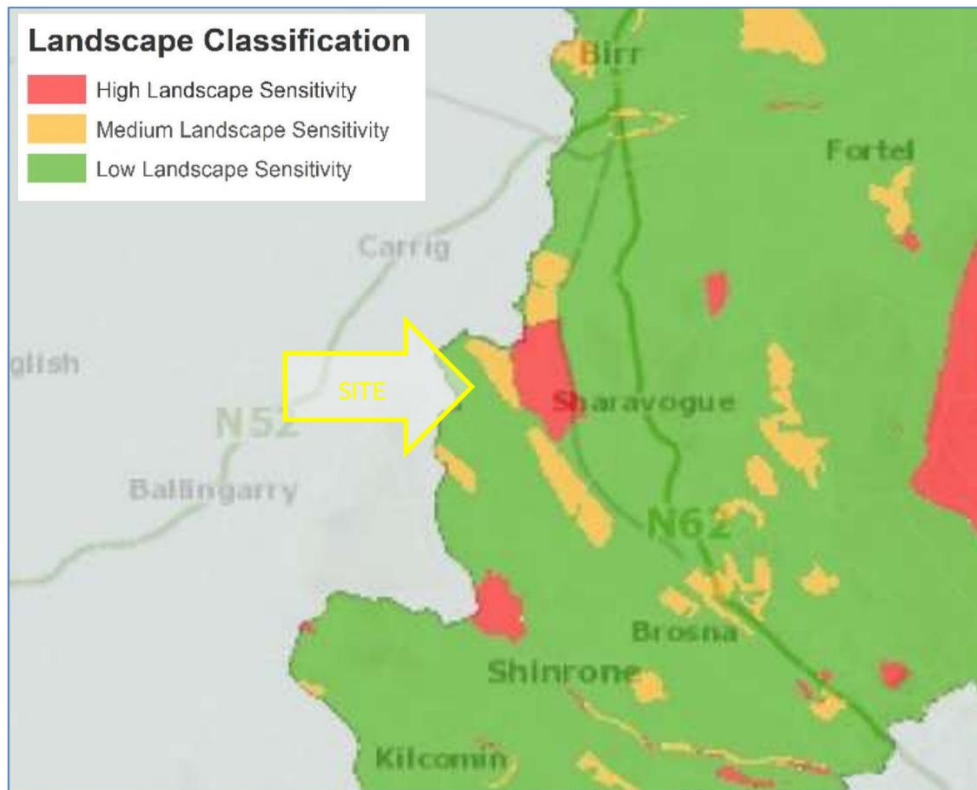


Figure 12.3 Excerpt from Offaly County Development Plan - Landscape Sensitivity Map

Sharavogue Bog SAC immediately to the east of the windfarm site is already established as an area of high landscape sensitivity. (EIAR ch. 12)

TP05



View from Trial Pit TP5, close to turbine T5, over Sharavogue Bog in the distance (EIAR Appendix 8.1 on Site Investigation)