Environmental Statement: Chapter 11 – Air Quality

Development of National Significance Pre-Application Consultation

Alaw Môn Solar Farm

Land west of the B5112, 415m south of Llyn Alaw, 500m east of Llantrisant and 1.5km west of Llannerch-y-Medd, Anglesey

October 2023

11.0 AIR QUALITY

Introduction

11.1 This chapter of the ES assesses the likely significant effects of the Development on the environment with respect to air quality.

11.2 As specified in Planning Inspectorate Wales's (now Planning and Environment Decisions Wales ('PEDW')) EIA Scoping Direction (Appendix 2.2 of the ES), the scope of this chapter is limited to the impacts of the Development's construction vehicle emissions on designated ecological sites. There are no designated ecological sites within relevant screening distances of the Development and therefore it is not necessary to consider the impact of construction dust.

11.3 The Development will connect to the electricity network via the National Grid Substation at Wylfa. The route is shown on Figure 1.1 of the ES, and the connection will be provided by underground cabling located within the adopted highway of local roads, including the A5025. Construction of the underground cable connection is not anticipated to lead to an increase in vehicle movements in excess of the Joint Nature Conservation Committee's ('JNCC') de-minimis threshold[1] adjacent to any designated ecological site. The construction of the underground cable connection is therefore not anticipated to have any significant air quality effect at any designated ecological site and has therefore not been considered further in this chapter.

11.4 The chapter has been prepared by Air Quality Consultants Ltd and, as required by the 2017 EIA Regulations, staff are suitably qualified and experienced. The project team includes Chartered Scientists ('CSci') and full members of the Institute of Air Quality Management ('IAQM') and Institute of Environmental Sciences ('IES').

Legislative Context

Air Quality Strategy

11.5 The Air Quality Strategy[i] published by the Department for Environment, Food, and Rural Affairs ('DEFRA') and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives.

The Clean Air Plan for Wales

11.6 In August 2020, the Welsh Government published the Clean Air Plan for Wales[ii] ('the Plan'), which aims to *'improve air quality and reduce the impacts of air pollution on human health, biodiversity, the natural environment and our economy'*. The Plan sets out the following four themes, around which it is structured, with actions to enable collaborative approaches to reducing air pollution:

- People: Protecting the health and well-being of current and future generations;
- Environment: Taking action to support our natural environment, ecosystems and biodiversity;
- Prosperity: Working with industry to reduce emissions, supporting a cleaner and more prosperous Wales; and

[1] The JNCC provides *'a threshold of 0.15% of existing AADT'* below which a scheme is considered to have a de-minimis impact in isolation which is sufficiently small that consideration of impacts in-combination with other plans and projects is not necessary, regardless of the distance from the road. For the A5025, 0.15% of the existing AADT would be approximately 8 vehicles as an AADT or 2,982 vehicles annually. Annual construction vehicle movements are expected to be well below 2,982.

- Place: Creating sustainable places through better planning, infrastructure and transport.

11.7 The Plan states that the Welsh Government will *'publish and consult on a White Paper on a Clean Air Act for Wales before the end of this Senedd Term'*, which will include:

- *'New powers for smoke control linked to tackling air pollution from domestic burning (PM2.5);*
- *A requirement for a Clean Air Plan / Strategy to be published / reviewed every 5 years;*
- *Potential new air quality targets (for example, taking account of World Health Organisation (WHO) guidelines for air quality);*
- *Clarified and strengthened local air quality management legislation*
- *Strengthened powers to address road vehicle idling;*
- *Consolidated powers to implement Clean Air Zones / Low Emission Zones;*
- *Focused powers to protect vulnerable groups from the effects of air pollution;*
- *Enhanced air quality monitoring and modelling; and*
- *A potential new duty on public bodies to adhere to guidance encouraging different ways of working and actions to reduce air pollution and support decarbonisation.'*

Legislation for the Protection of Sensitive Ecosystems

11.8 Sites of national importance may be designated as Sites of Special Scientific Interest ('SSSI'). Originally notified under the National Parks and Access to the Countryside Act[iii], SSSIs have been re-notified under the Wildlife and Countryside Act[iv]. Improved provisions for the protection and management of SSSIs (in England and Wales) were introduced by the Countryside and Rights of Way Act (2000) (the 'CROW Act'). If a development is *'likely to damage'* a SSSI, the CROW Act requires that a relevant conservation body (i.e. Natural Resources Wales) is consulted. The CROW Act also provides protection to local nature conservation sites, which can be particularly important in providing 'stepping stones' or 'buffers' to SSSIs and internationally designated ecological sites, such as Special Areas of Conservation ('SAC').

11.9 The Environment (Wales) Act[v] requires that public authorities seek to maintain and enhance biodiversity in the proper exercise of their functions. It also requires public authorities, in delivering their biodiversity duties, to promote the resilience of ecosystems.

11.10 Local planning authorities should set criteria-based policies against which proposals for any development on or affecting protected wildlife sites will be judged, making distinctions between different levels of site designation. If significant harm from a development cannot be prevented, adequately mitigated against, or compensated for, then planning permission should be refused.

Planning Policy Context

Future Wales: The National Plan 2040 (2021)

11.11 The Future Wales: The National Plan (2040)[vi] was published in 2021. Within this, Policy 18 refers to impacts on designated ecological sites and states:

> ***'Proposals for renewable and low carbon energy projects (including repowering) qualifying as Developments of National Significance will be permitted subject to policy 17 and the following criteria:***
>
> ***...***

> ***4. there are no unacceptable adverse impacts on national statutory designated sites for nature conservation (and the features for which they have been designated), protected habitats and species;'***

Planning Policy Wales (2021): Technical Advice Notes

11.12 Land-use planning policy in Wales is established within the policy document Planning Policy Wales ('PPW'), which provides the strategic policy framework for the effective preparation of local planning authority development plans. PPW is supported by a series of Technical Advice Notes ('TAN') and National Assembly for Wales Circulars. Local planning authorities have to take PPW, TANs and Circulars into account when preparing Development Plans.

11.13 TAN 5[vii] on Nature Conservation and Planning makes reference to the need for impacts on designated ecological sites to be considered by developers. An assessment of the in-combination impacts is also required for European and internationally designated ecological sites.

Local Planning Policy

Anglesey and Gwynedd Joint Local Development Plan (2011 – 2026)

11.14 The Anglesey and Gwynedd Joint Local Development Plan[viii] was published in 2017. Included within the plan is Policy PS 7 on Renewable Energy Technology, which refers to impacts on ecological sites. The Joint Local Development Plan aims to promote renewable energy generation whilst also:

> ***'Ensuring that installations in accordance with PS 19 do not individually or cumulatively compromise the objectives of international, national and local nature conservation designations;'***

11.15 Policy AMG 6: Protecting Sites of Regional or Local Significance states:

> ***'Proposals that are likely to cause direct or indirect significant harm to Local Nature Reserves (LNR), Wildlife Sites (WS) or regionally important geological / geomorphologic sites (RIGS) will be refused, unless it can be proven that there is an overriding social, environmental and/or economic need for the development, and that there is no other suitable site that would avoid having a detrimental impact on sites of local nature conservation value or local geological importance.'***

Assessment Methodology

Assessment Criteria

11.16 Objectives for the protection of vegetation and ecosystems have been set by the UK Government. The objectives are the same as the EU limit values. The limit values and objectives only apply a) more than 20km from an agglomeration (about 250,000 people), and b) more than 5km from Part A industrial sources, motorways and built-up areas of more than 5,000 people. Critical levels and critical loads are the ambient concentrations and deposition fluxes below which significant harmful effects to sensitive ecosystems are unlikely to occur. Some of the critical levels are set at the same concentrations as the objectives, but do not have the same legal standing. Typically, the potential for exceedances of the critical levels and critical loads is considered in the context of the level of protection afforded to the ecological site as a whole.

11.17 The critical levels for annual mean and maximum 24-hour mean nitrogen oxide ('NOx') concentrations are set out in Table 11.1. Critical loads for Y Werthyr have been derived from the 'Air Pollution Information System' ('APIS')[xiii] and are set out in Table 11.2. Y Werthyr is the only designated ecological site within 200m of the construction vehicle route, where changes in traffic exceed the de-minimis criteria[1] and is located approximately 4.5km to the south of the Development (see Figure 11.1).

Table 11.1: Vegetation and Ecosystem Critical Levels [a]

Pollutant	Time Period	Critical Level
Nitrogen Oxides (Expressed as NO_2)	Annual Mean [b]	30 µg/m^3
	24-hour Mean [c]	75 µg/m^3

[a] The critical levels has defined by the World Health Organisation[ix].

[b] Away from major sources, this critical level is set as an objective[i] and a limit value[x].

[c] This critical level is not an objective and thus does not have the same legal standing.

Table 11.2: Vegetation and Ecosystem Critical Loads

Ecological Site	Nutrient Nitrogen Deposition		Acid Deposition	
	kgN/ha/yr	Habitat Type	'Nmax' (keq/ha/yr)	Habitat Type
Y Werthyr SSSI	10	Fens	Not Sensitive	Fens

Source: Design Manual for Road and Bridges Guidance

11.18 The Design Manual for Roads and Bridges ('DMRB') provides guidance and requirements for the design and impact assessment for strategic road schemes in the UK. DMRB LA 105[xi] provides guidance on assessing impacts on air quality, which can be applied to any scheme that alters traffic. The guidance is produced by Highways England (now National Highways) and overseen by the Welsh Government, amongst others.

Screening Criteria

Screening Criteria for Road Traffic Assessments

11.19 The DMRB (LA 105) has developed screening criteria which determine whether an assessment of air quality impacts is required. The approach compares the changes in vehicle flows on local roads against the criteria set out below, in order to determine "affected" roads. If any of the following criteria are met then an assessment is required:

- Road alignment will change by 5m or more;
- Daily traffic flows will change by 1,000 Annual Average Daily Traffic ('AADT') movements or more;
- Heavy Duty Vehicle ('HDV') flows will change by 200 AADT movements or more; or
- Significant changes in speed or congestion are predicted.

11.20 Where the changes in vehicle flows on a road, speed or alignment do not satisfy any of the above criteria, the impact of a project can be considered to be neutral in terms of local air quality and no further work is needed.

11.21 The guidance then requires any nature conservation sites, and their characteristics, near to any affected road to be identified. Only sites within 200m of roads affected by the project require consideration.

11.22 Natural Resources Wales has previously indicated that it accepts the use of the DMRB traffic flow screening criteria when assessing air quality impacts on nature conservation sites.

11.23 When assessing impacts on internationally-designated ecological sites, there is a potential issue of whether these screening criteria should be applied to a project in isolation (as recommended in the DMRB guidance) or to a scheme in combination with other plans and projects (as explained in case law[2]). However, there are no internationally-designated ecological sites close to roads identified as the construction route, which could be impacted by the Development alone, or in combination with other committed developments. In the context of SSSIs, TAN 5 does not require an assessment of significance

[2] Judgment in Wealden District Council v Secretary of State for Communities and Local Government, Lewes District Council and South Downs National Park Authority [2017] EWHC 351.

in combination with other plans and projects, and it is considered appropriate to apply these criteria in line with the DMRB advice and thus to the change caused by a project in isolation.

JNCC De-Minimis Criteria

11.24 The JNCC provides decision making thresholds for air pollution[xii]. This includes a set of 'road relevant thresholds', which relate to increases in AADT movements required to trigger an exceedance of 1% of the critical level or load for NOx, ammonia and nitrogen deposition ('Ndep') as a function of distance from the road. These screening values provided by the JNCC are shown in Table 11.3 and Table 11.4.

Table 11.3: AADT Movements Required to Result in a 1% Change of Critical Level NOx and Ammonia

Distance from Road (m)	1% of Critical Load for NOx (30 µg/m^3)	1% of Critical Load for Ammonia (1 µg/m^3)	1% of Critical Load for Ammonia (3 µg/m^3)
25	547	731	2,194
50	917	1,145	3,434
100	1,620	1,791	5,372
150	2,410	2,327	6,980
200	3,242	2,802	8,406

Table 11.4: AADT Movements Required to Result in a 1% Change of Critical Load Nitrogen Deposition

Distance from Road (m)	1% of CL (5 kg-N/ha/yr)	1% of CL (10 kg-N/ha/yr)	1% of CL (15 kg-N/ha/yr)	1% of CL (20 kg-N/ha/yr)
Deposition to Forest Vegetation				
25	207	415	622	829
50	303	606	909	1,212
100	443	887	1,330	1,773
150	554	1,108	1,661	2,215
200	648	1,297	1,945	2,594
Deposition to Short Vegetation				
25	359	717	1,076	1,434
50	529	1,058	1,587	2,116
100	780	1,561	2,341	3,121
150	980	1,959	2,939	3,918
200	1,151	2,302	3,453	4,604

Consultation

11.25 The Planning Inspectorate Wales's (now PEDW) EIA Scoping Direction (Appendix 2.2 of the ES) requested that the impacts of the Development's construction vehicle emissions on designated ecological sites should be considered in the ES.

Study Area

11.26 The study area for the assessment of the likely significant effects of the Development has been identified using professional judgement, focussing on the areas where effects are likely to be significant based on the screening criteria discussed above. It includes all of the roads along which the Development's construction traffic vehicles would be routed within 200 m of relevant ecological sites. The study area is shown in Figure 11.1.

Existing Conditions

11.27 Baseline air quality conditions within the study area have been defined using:

- Background concentrations, which have been defined using DEFRA's 2018-based background maps[xiv]. These cover the whole of the UK on a 1x1 km grid; and
- Background nitrogen deposition fluxes to the SSSI have been taken from the APIS website[xiii].

Impacts on Designated Ecological Sites

11.28 The first step in considering the road traffic emissions' impacts on designated ecological sites has been to identify nearby ecological sites within 200m of the Development's construction vehicle routes. It has been assumed that all identified ecological sites have habitats sensitive to NOx and nitrogen and acid deposition. The screening criteria from the DMRB guidance of 1,000 AADT movements, as well as decision making thresholds defined by the JNCC (see paragraph 11.24), have been used to screen the potential for significant effects on locally designated ecological sites.

11.29 The operational Development does not have any local emissions to air and vehicle movements to and from the Site for its service and maintenance will be infrequent (two visits per month). Therefore, air quality impacts during operation of the Development have been scoped out of this assessment, as these will be not significant.

Assessment of Significance

11.30 The determination of significance has been based on professional judgement with reference to the screening criteria, timescales for impact and the sensitivity of the designated ecological site.

Baseline Conditions

11.31 The Y Werthyr SSSI is the only designated site within 200m of any roads which have been identified to be used by the Development's construction vehicles (see Figure 11.1). It includes fen and grassland habitats. There are no European or internationally designated ecological sites within the study area.

National Background Pollution Maps

11.32 The maximum estimated background annual mean NO_x concentration[xiv] at the Y Werthyr SSSI was 4.7 µg/m^3 in 2019, which is well below the critical level of 30 µg/m^3.

Background Deposition and Acidity

11.33 Background nitrogen deposition fluxes to the habitats are presented in Table 11.5 for 2019. Background nutrient nitrogen deposition exceeds the critical load. The habitat is not sensitive to acid deposition.

Table 11.5: Estimated Background Nitrogen Deposition

Ecological Site	Nutrient Nitrogen Deposition (kgN/ha/yr)
Y Werthyr	14.3
Critical Load	**10**

Likely Significant Effects

Construction Phase

11.34 The proposed routing arrangement, along with 200m distance buffers from these roads, is shown in Figure 11.1. The construction vehicles will travel along the B5112 towards the A55. Y Werthyr SSSI is 4.5 km southeast of the Site and approximately 80m from the B5112.

11.35 The Development's construction phase will last for up to 12 months.

11.36 During the Development's construction phase, an average of 120 vehicle movements per day (as an AADT) will be generated; 20 of which will be heavy goods vehicles ('HGV'). All of these vehicles will travel along the construction traffic route shown in Figure 11.1.

Effects

11.37 These increases in traffic are well below the DMRB screening criteria (as set out at paragraph 11.19) of 1,000 vehicles per day and 200 HDVs per day and therefore the effects of the Development's construction phase are judged to be negligible.

Cumulative Effects

11.38 Of the cumulative schemes identified in Chapter 2 EIA Methodology of the ES, all which may generate traffic in the vicinity of the Y Werthyr SSSI are solar farms. Similarly to the Development, the cumulative schemes would not generate emissions to air once operational, although additional traffic would be generated during the construction phases. Based on the locations, it is possible that construction traffic associated with each of these developments could potentially travel along the same route past the Y Werthyr SSSI as the Development. If any of the construction phases overlap, then there would be potential for cumulative effects.

11.39 As explained in paragraph 11.23 in the context of SSSIs in Wales, the DMRB criteria are most appropriate to apply to changes caused by a development in isolation and not in combination with other projects or plans. Nevertheless, this section briefly considers the implications if these criteria were applied to the total change caused by cumulative schemes.

11.40 As explained in paragraph 11.35, the duration of the construction works for the Development will be up to 12 months. Impacts from other schemes would thus need to occur during this same year in order for there to be a cumulative effect in the context of the DMRB criteria. For the DMRB criteria to be exceeded on-aggregate, cumulative schemes would need to add at least 880 AADT (or 180 HGVs per day) to the B5112 during this same year. The B5112 is a minor road with an existing total baseline flow of just 940 AADT[xv]. The likelihood of any further large-scale projects, which would generate this level of traffic on the B5112, coming forwards before the end of the construction period (2025) is considered to be extremely unlikely. Therefore, in a realistic 'worst case' scenario, the DMRB criteria will not be exceeded, even by multiple schemes acting in combination.

11.41 The potential for cumulative effects may also be considered using the road relevant decision-making thresholds provided by JNCC. The Y Werthyr SSSI is located approximately 80 m from the B5112. Table 11.3 and Table 11.4 show that, at 50m from the road, increases in AADT movements of 917, 1,145, and 1,058 would be required to respectively trigger exceedances of 1% of the critical level for NOx, the lower critical level for ammonia, and the critical load for Ndep of 10 kg-N/ha/yr to short vegetation, such as fens. At 80 m from the road, increases in traffic would need to be even greater than this (compare the values in Table 11.3 and Table 11.4 for 100 m from roads with those for 50 m from roads). Cumulative schemes would thus need to generate more than 797 AADT movements on the B5112, during the up to 12-month period of the Development's construction, in order to cause an exceedance of 1% of any critical level within the SSSI (i.e. 797 + 120 = 917). As noted above, this would constitute almost a doubling of the existing flow on the road. The likelihood of any further large scale projects, which would generate such an increase in traffic along the B5112, coming forward before the end of the construction period (2025) is considered to be extremely unlikely. The cumulative impacts are therefore considered to be negligible.

Summary

11.42 The impacts of traffic generated by the construction phase of the Development on designated ecological sites have been assessed. The impacts are anticipated to be ‘not significant’.

11.43 Table 11.6 contains a summary of the likely significant effects of the Development.

Table 11.6: Table of Significance – Air Quality

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	W	R	C	B	L	
Construction Phase											
Construction traffic emissions upon designated ecological sites	Temporary	Negligible	None		X						Negligible
Cumulative Effects											
No cumulative effects identified.											

*** Geographical Level of Importance**
I = International; UK = United Kingdom; W = Wales; R = Regional; C = County; Borough; L = Local

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