Awel y Môr Offshore Wind Farm

Vessel Emissions Clarification Note

Deadline 1

Date: 24 October 2022

Revision: B

Document Reference: 1.20

PINS Reference: N/A

Fferm Wynt Alltraeth
AWEL Y MÔR
Offshore Wind Farm

REVISION	DATE	STATUS/ REASON FOR ISSUE	AUTHOR:	CHECKED BY:	APPROVED BY:
A	October 2022	Issue to NRW	SLR	RWE	RWE
B	October 2022	Deadline 1	SLR	RWE	RWE

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Natural Resources Wales

Technical Response

Awel y Môr Offshore Wind Farm

October 2022

1.0 Introduction

Following submission of the Development Consent Order (DCO) application which included an Environmental Statement (ES), for the proposed Awel y Môr (AyM) Offshore Wind Farm, Natural Resources Wales (NRW) has provided a Relevant Representation[1] and technical consultation response on the marine licence (ML) application[2] to provide feedback on a range of topics.

Within the Relevant Representation, the following request relating to Air Quality was made:

> *"3.7. **Air Quality***
>
> *3.7.1. NRW agrees with the conclusions in the ES (Volume 3, Chapter 11) (AS-030) that construction and operational onshore traffic is unlikely to have significant effects on any designated nature conservation site (SSSI, SAC, SPA and Ramsar site).*
>
> *3.7.2. NRW notes that the works will be within the proximity of Ancient Woodland. Planning Policy Wales recognises the significant value of ancient woodlands and makes provision for their protection against damage or loss. Our standing advice to all planning proposals that may affect (directly or indirectly) ancient woodland can be found at Natural Resources Wales / Advice to planning authorities considering proposals affecting ancient woodland. The LPA will be able to advise with respect to the acceptability of the proposals in terms of Ancient Woodland.*
>
> *3.7.3. However, we note that there is no assessment of any air quality impacts arising from marine vessel emissions. It is unclear whether marine vessels will operate within proximity to sensitive coastal onshore habitat (that may support features of SSSIs/SACs/Ramsar). We advise the Applicant provides additional information to demonstrate that there will not be significant impacts from marine vessel emissions."*

This request was also reiterated within their technical consultation response on the ML application:

> *"An assessment of air quality has been undertaken. However as detailed by NRW (A) it is unclear whether vessels will operate in the proximity to sensitive coastal onshore habitats, we request that you provide additional information to demonstrate that there will not be significant impacts from marine vessel emission on sensitive habitats. "*

Whilst there is agreement on the majority of the air quality assessment outcomes provided in the ES, NRW requested that consideration should be given to marine vessel emissions that would operate within proximity to sensitive coastal onshore habitat. This technical note has been prepared by SLR Consulting Ltd (SLR) in response to NRW's request and to provide consideration of air quality impacts upon sensitive onshore habitats arising from marine vessel emissions, in accordance with the Welsh Government's Local Air Quality Management Technical Guidance (LAQM.TG(22)).

[1] Natural Resources Wales. Proposed Awel Y Môr Offshore Wind Farm (EN010112). Relevant Representation from Natural Resources Wales.

[2] Natural Resources Wales. Marine Licence Application ORML2233 – – Awel y Môr offshore wind farm. 8th September 2022.

The scope of the assessment comprises the following:

- review of consultation outcomes received during the Environmental Impact Assessment (EIA) exercise to date;
- review of baseline environment, including:
    - existing vessel movements; and
    - likely future baseline conditions.
- review of current marine vessel emissions regulations;
- vessel emissions screening assessment, including:
    - review of sensitive receptors likely to be impacted; and
    - comparison of the extent of predicted marine vessel movements associated with all stages of the offshore wind farm with reference to screening thresholds to determine whether further assessment is required.

For the purposes of this screening assessment, consideration has been given to national and international ecological designations with sensitive onshore qualifying features (i.e. sensitive to air pollution). These designations, as requested by NRW, comprise:

- Special Areas of Conservation (SACs);
- Special Protection Areas (SPAs) and Ramsar sites; and
- Sites of special scientific interest (SSSIs).

Consideration of offshore designations/nature conservation sites has not been undertaken, as per NRW's instruction.

1.1 Assessment Context

Throughout the course of completing the EIA, consultation with statutory consultees was undertaken to agree upon the extent and scope of the air quality assessment. This has included undertaking EIA Scoping with the Planning Inspectorate (PINS), under which process NRW was a consultee to PINS, and also direct consultation with NRW (among other statutory consultees), comprising:

- Submission of a Scoping Report to seek a Scoping Opinion;
- AyM Evidence Plan (Air Quality Expert Topic Group (ETG)) process, comprising discussions with NRW and Denbighshire County Council; and
- Statutory Consultation (Section 42) that was accompanied by a Preliminary Environmental Information Report (PEIR).

Consideration of vessel emissions for inclusion within the air quality assessment was not raised or requested by any relevant stakeholder during the pre-application consultation process.

2.0 Vessel Emissions

2.1 Baseline Environment

The proposed AyM Offshore Wind Farm is located within the Irish Sea, an area already characterised by a high volume of shipping traffic including large ships/tankers. Offshore vessel movements associated with AyM would represent a small number of overall vessel traffic in comparison (particularly smaller vessels) and therefore accounts for a small proportion of total Irish Sea emissions. Further information is provided within ES Volume 2, Chapter 9 Shipping and Navigation.

2.2 Current and Future Regulation

Sulphur dioxide (SO_2) vessel emissions within the Irish Sea are regulated by the following legislation:

- the European Union (EU) Sulphur Directive which stipulates a maximum 0.5% sulphur fuel content for ships in all EU waters by 2020, and a 0.1% limit in ports; and
- the International Maritime Organization (IMO) introduced a global fuel sulphur limit of 0.5% in 2020.

Furthermore, as per Defra's 2019 Clean Air Strategy, the UK is intending to include the Irish Sea as an Emission Control Area (ECA), whereby strict controls to minimise SO_2 and nitrogen oxides (NO_x) emissions from shipping are to be implemented in line with 'The International Convention for the Prevention of Pollution from Ships' (MARPOL), specifically Annex VI 'Prevention of Air Pollution from Ships'.

Vessel emission restrictions are expected to tighten in future years, following the availability and introduction of cleaner technologies and fuels, alongside policy such as the Maritime 2050 and Clean Maritime Plan. These policies provides a strategy for the transition to zero emission shipping within the UK. Therefore, emission contributions from vessel emissions are expected to reduce even further.

3.0 Vessel Emissions Screening Assessment

3.1 Assessment Methodology

The screening of vessel emissions has been undertaken in accordance with the Welsh Government's LAQM.TG(22). Within LAQM TG(22), further assessment of marine vessel emissions is recommended where:

- there are more than 5,000 large ship movements[3] per year, with relevant exposure within 250m of berths and main areas of manoeuvring; or
- there are more than 15,000 large ship movements per year, with relevant exposure within 1km of these areas.

The screening thresholds indicate that sensitive receptors located up to 1km from vessel movements can be affected by vessel emissions. The offshore array is located 10.6km off the coast of North Wales, at its closest point. Given the separation distance, vessel movements associated with all phases of AyM are therefore only likely to interact with onshore sensitive coastal qualifying designations where they are:

- used to facilitate the construction and decommissioning of onshore infrastructure (e.g. cable laying near landfall); and/or
- exiting/entering a port.

The specific port location(s) to be utilised by vessels are yet to be determined, however all movements will be compliant/included within the port's capacity analysis undertaken in support of their existing consents. Therefore, further consideration to vessels exiting/entering a port has not been undertaken in this review. The focus of this assessment thus relates to the potential extent of vessels interacting within 1km of an onshore sensitive qualifying ecological receptor in proximity to the onshore works. With regard to this, vessel movements supporting onshore works would only occur during the construction phase (and potentially decommissioning phase) and would relate to laying cabling on the seaward approach to landfall, for instance. No nearshore activities are expected to be required in the operational phase.

Vessel movements used within this assessment derive from values provided within ES Volume 2 Chapter 1 Offshore Project Description. As described in ES Volume 2 Chapter 1, the Applicant requires flexibility in wind turbine generators (WTG) design to ensure that anticipated changes in available technology and project economics can be accommodated within the final project design. Therefore, ES Volume 2 Chapter 1 details the extent of vessel movements predicted to occur in relation to both scenarios for WTGs assessed by the EIA (up to 34 large, or up to 50 smaller WTGs are planned for AyM). These scenarios represent the maximum and minimum realistic worst-case scenarios against which environmental effects have been assessed. The use of these scenarios provides sufficient confidence in the assessment outcomes.

The LAQM.TG(22) screening criteria relates to the number of large ships movements per year; however the extent of predicted construction vessels numbers for AyM provided in Volume 2 Chapter 1 relates to the total number of round trips for each phase. In order to derive the number of vessel movements per year for each phase, the total number of vessels movements (round trips) has been multiplied by two. The screening of vessel movements has been undertaken for each discrete phase (construction, operational & maintenance and decommissioning).

3.2 Review of Designated Onshore Ecosystems

Figure 1 provides an illustration of the relevant coastal (onshore) ecological designations in proximity to the AyM Draft Order Limits. This comprises SACs, SPAs, Ramsar sites and SSSIs. The Draft Order Limits have been used to

[3] Cross-channel ferries, roll on-roll off ships, bulk cargo, container ships, cruise liners, etc – one ship generating two movements (arrival and departure).

indicatively represent the spatial extent of vessel movements and potential interaction with onshore qualifying ecosystems.

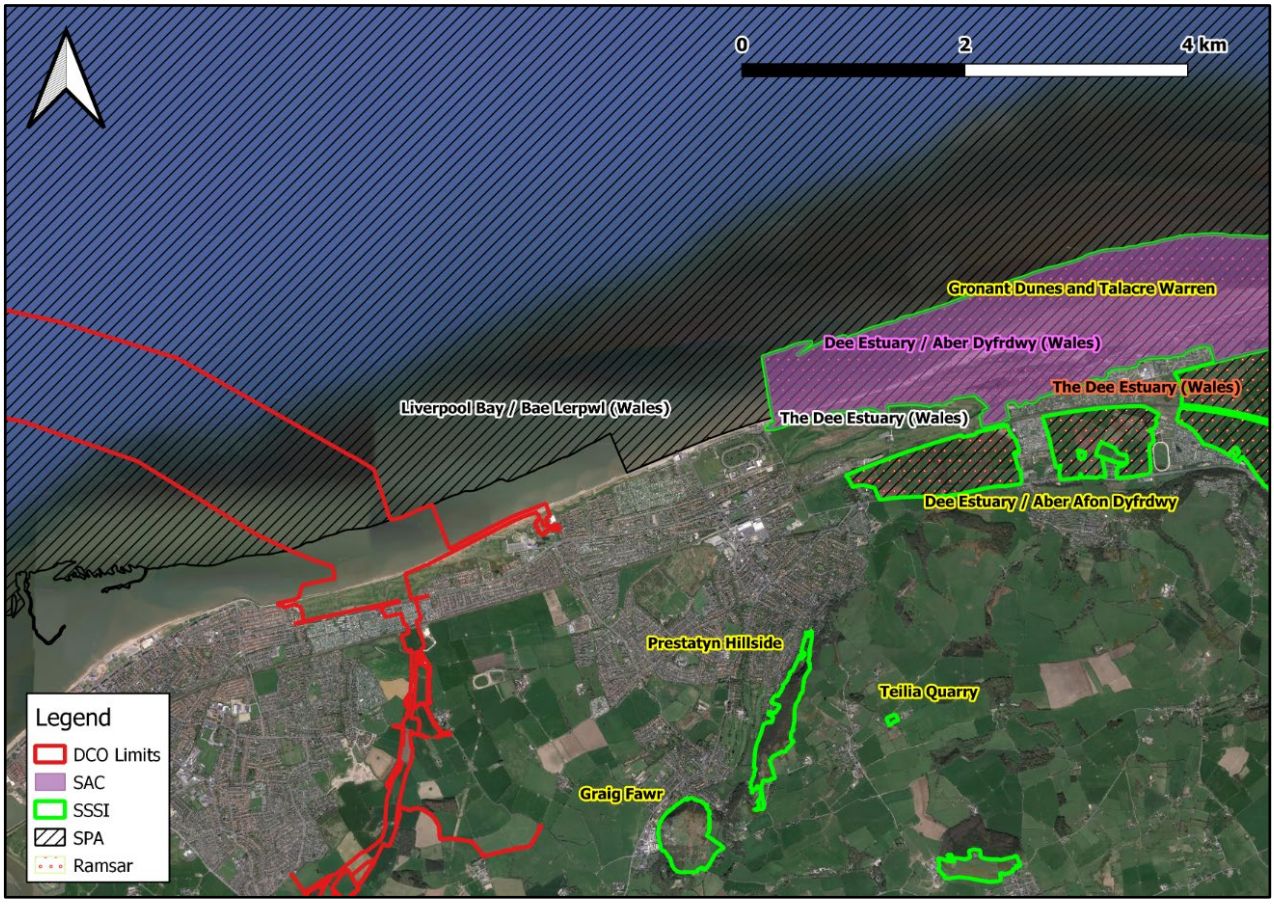

Figure 1 - Coastal National and International Designations in Proximity to the DCO Limits

All coastal national and international designations are located 3km away from the Draft Order Limits (i.e. where the majority of nearshore vessel movements are expected). This is with the exception of the Liverpool Bay SPA. Given the separation distance (accounting for a suitable buffer e.g. >1km) impacts on all ecological designations (with the exception of the Liverpool Bay SPA) can therefore be scoped out from assessment – based upon the applied screening thresholds (Section 3.2), as effects from vessel emissions are not likely to occur.

The onshore elements of the Liverpool Bay SPA are located >1.7km from the Draft Order Limits. Vessel movements occurring in the nearshore (i.e. facilitating construction of onshore infrastructure) are therefore not likely to cause localised impacts on sensitive onshore coastal designations.

Based on the review of sensitive onshore designations, and separation distances to indicative locations of vessel movements generated by AyM through all phases of development, effects are not considered to be significant. Despite this, further consideration on the extent of nearshore vessel movements generated by AyM has been given.

3.3 Construction Phase Assessment

The number of predicted construction vessels movements provided in ES Volume 2 Chapter 1 relates to the extent of vessels generated throughout the whole construction period. The construction period is expected to last up to a minimum of 1.5 years. To increase the confidence in the screening exercise and minimise the use of assumptions, the total number of construction vessel movements estimated to occur throughout the whole construction phase has been used. This is believed to be conservative, as the screening thresholds relate to the number of vessel movements permitted to occur in an annual period. Actual annual movements are believed to be lower than those values used for screening.

Furthermore, in recognition of the LAQM.TG(22) screening thresholds, all vessels movements have been assumed to comprise large ships. As per LAQM.TG(22), large ship movements comprise cross-channel ferries, roll on-roll off ships, bulk cargo, container ships and cruise liners. It is unlikely that the vessels used for the construction phase will comprise large ships. Therefore, use of this assumption (i.e. assuming all vessels comprise large ships) is considered to be overly conservative – and increases the confidence in the overall assessment outcomes.

Vessel movements detailed within ES Volume 2 Chapter 1 have been categorised based upon their likelihood to occur within 250m or 1km to sensitive coastal onshore habitat receptors – to be consistent with the LAQM.TG(22) screening thresholds. Vessels used to facilitate connection of the offshore export cable to onshore infrastructure (Export Cable Vessels) have assumed to occur within 250m of a sensitive coastal onshore qualifying ecological receptor. All other vessels have assumed to occur within 1km of a sensitive coastal designated onshore habitat. On reflection, assuming that all construction vessel movements occur within 1km of a sensitive coastal onshore habitat receptor is considered highly conservative, given the location of the offshore turbine array (10.6km off the coast of North Wales) and geographic nature of offshore works.

Table 1 and Table 2 provides details of vessel movements that are likely to occur within 250m and 1km, respectively.

Table 1 – Extent of Construction Vessel Movements within 250m of a Receptor

Vessel Type	Vessel Movements (Round Trips)		Vessel Movements (Movements per Year) (A)	
	Large WTG	Small WTG	Large WTG	Small WTG
Export Cable Vessels	23	23	31	31
Export Cable Rock Berm Vessels	164	164	219	219
Total	**187**	**187**	**250**	**250**
LAQM.TG(22) Screening Criteria	**Relevant Exposure Within 250m**		**5,000**	

Note:
(A) The total number of vessels movements (round trips) has been multiplied by two to calculate the total number of movements (one ship generating two movements).

Table 2 – Extent of Construction Vessel Movements within 1km of a Receptor

Vessel Type	Vessel Movements (Round Trips)		Vessel Movements (Movements per Year) (A)	
	Large WTG	Small WTG	Large WTG	Small WTG
Scour Layers Vessel	170	87	227	116
Gravity Base Foundation Ballast Vessel	315	371	420	495
Foundation Installation Spread	133	136	177	181
Transition Piece Installation	24	27	32	36
WTG Installation Spread	45	31	60	41
Commissioning Vessels	78	78	104	104
Accommodation Vessels	52	52	69	69
IA Cable Vessels	23	23	31	31
IA Rock Berm Vessels	84	84	112	112
Export Cable Vessels	23	23	31	31
Export Cable Rock Berm Vessels	164	164	219	219
Landfall Cable Installation Vessels	-	-	-	-
Substation Installation Vessels Topside	8	8	11	11
Substation Installation Vessels	16	16	21	21
Other Vessels	2,300	2,300	3,067	3,067
Total	**3,436**	**3,399**	**4,581**	**4,532**

Vessel Type	Vessel Movements (Round Trips)		Vessel Movements (Movements per Year) [A]	
	Large WTG	Small WTG	Large WTG	Small WTG
LAQM.TG(22) Screening Criteria	**Relevant Exposure Within 1km**		**15,000**	

Note:
(A) The total number of vessels movements (round trips) has been multiplied by two to calculate the total number of movements (one ship generating two movements).

Estimated vessels movements (assumed to be large ships which is considered unlikely), are below the LAQM.TG(22) screening thresholds. On this basis, emissions from vessel emissions associated with the construction phase are not considered to be significant, despite the overly conservative assessment methodology applied. Further assessment is therefore not required.

3.4 Operational & Maintenance Phase Assessment

Marine vessels will be used to for the maintenance of the offshore wind farm turbine array - located 10.6km off the coast of North Wales, at its closest. No nearshore activities are expected to be required in the operational phase.

In recognition of the LAQM.TG(22) screening thresholds, all vessels movements provided in Volume 2 Chapter 1 have been assumed to comprise large ships. It is unlikely that the vessels used for the Operation & Maintenance (O&M) phase will comprise large ships – given the nature of works. Therefore, use of this assumption (i.e. assuming all vessels comprise large ships) is considered to be overly conservative – and increases the confidence in the overall assessment outcomes.

Given that all vessels will likely be used to facilitate the maintenance of the offshore wind farm array, for the purposes of the assessment, it has been assumed that all vessel movements will occur within 1km of a sensitive coastal onshore habitat receptor – to be consistent with the LAQM.TG(22) screening thresholds. It is unlikely that O&M vessel movements will occur 250m of a coastal onshore habitat. On reflection, assuming that all O&M vessel movements occur within 1km of a sensitive coastal onshore habitat receptor is considered highly conservative, given the location of the offshore wind farm (10.6km off the coast). In practice, nearshore vessels would be limited to cable maintenance and repair activities.

Table 3 provides details of vessel movements that are likely to occur within 1km.

Table 3 – Extent of O&M Vessel Movements within 1km of a Receptor

Vessel Type	Vessel Movements (Round Trips)		Vessel Movements (Movements per Year) [A]	
	Large WTG	Small WTG	Large WTG	Small WTG
Jack-Up vessels	6	5	12	10
Service Operations Vessels (SOVs)	52	52	104	104
Accommodation O&M	n/a	n/a	n/a	n/a
Small O&M vessel (CTV)	1,095	1,095	2,190	2,190
Lift vessels	6	5	12	10
Cable maintenance vessels	1	1	2	2
Auxiliary Vessel	48	40	96	80
Total	**1,208**	**1,198**	**2,416**	**2,396**
LAQM.TG(22) Screening Criteria	**Relevant Exposure Within 1km**		**15,000**	

Note:
(A) The total number of vessels movements (round trips) has been multiplied by two to calculate the total number of movements (one ship generating two movements).

Estimated vessels movements (assumed to be large ships which is considered unlikely), are below the LAQM.TG(22) screening thresholds. On this basis, emissions from vessel emissions associated with the

construction phase are not considered to be significant, despite the overly conservative assessment methodology applied. Further assessment is therefore not required.

3.5 Decommissioning Phase Assessment

Details surrounding the decommissioning phase are yet to be fully clarified. In addition, it is also recognised that policy, legislation and local sensitivities evolve, which will limit the relevance of undertaking an assessment at this stage.

Decommissioning activities are expected to occur for up to 3 years. Decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, and impacts are likely to be lesser in comparison, given the following:

- Landfall infrastructure is expected to be left in situ where appropriate, to abate potential future impacts and minimise the extent of decommissioning activities;
- Vessel emission restrictions are expected to tighten in future years and in the interim before decommissioning activities occur (>25 years). This forecast is based on the introduction and availability of cleaner technologies and fuels, alongside legislation – as detailed in Section 2.2. Therefore, emission contributions from vessel emissions generated during the decommissioning phase are expected to be lower in comparison; and/or
- Air quality is expected to improve in future years, and in the interim before decommissioning activities occur (>25 years). This forecast is based on the introduction of policy and legislation, and availability of cleaner technologies. The likelihood of a significant effect arising during the decommissioning phase is therefore low.

These elements (alone and/or in combination) would result in a reduction in the level of significance in comparison to the assessment of construction effects. The outcomes of the construction phase assessment indicate that impacts from vessel emissions on sensitive onshore qualifying habitats are not significant. Further assessment in relation to the decommissioning phase is therefore not required.

Nonetheless, the decommissioning methodology would be finalised nearer to the end of the lifetime of AyM, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees. Furthermore, the draft DCO includes a requirement to submit a written scheme of decommissioning 6 months before decommissioning starts.

4.0 Conclusions

This technical note has been prepared to provide consideration of potential air quality impacts upon sensitive onshore habitats arising from marine vessel emissions – in response to NRW's request.

Throughout the course of completing the EIA, consultation with statutory consultees was undertaken to agree upon the extent and scope of the air quality assessment. Consideration of vessel emissions for inclusion within the air quality assessment was not raised or requested by any relevant stakeholder during the pre-application consultation process.

Marine vessel movements generated by AyM will occur in the Irish Sea. The Irish Sea is an area already characterised by a high volume of shipping traffic of which represent large ships/tankers. Offshore vessel movements associated with AyM would represent a small number of overall vessel traffic in comparison (particularly smaller vessels), therefore accounting for a small proportion of emissions.

Vessel emissions within the Irish Sea, such as SO_2, are regulated by legislation. As per Defra's 2019 Clean Air Strategy, the UK is intending to impose legislative NOx emissions limits to the Irish Sea. Vessel emission restrictions are expected to tighten in future years, following the introduction and availability of cleaner technologies and fuels, alongside policy such as the Maritime 2050 and Clean Maritime Plan. These policies provides a strategy for the transition to zero emission shipping within the UK. Therefore, emission contributions from vessel emissions are expected to reduce even further.

The assessment has utilised screening thresholds provided within the Welsh Government's LAQM.TG(22). As per LAQM.TG(22), further assessment is needed where:

- there are more than 5,000 large ship movements per year, with relevant exposure within 250m of berths and main areas of manoeuvring; or
- there are more than 15,000 large ship movements per year, with relevant exposure within 1km of these areas.

A numerical and spatial screening exercise has been undertaken, with reference to the above criteria, to determine whether further assessment is required.

Given the location of the offshore array (10.6km off the coast of North Wales, at its closest), vessel movements are only likely to interact with onshore coastal designations where they are facilitating/supporting onshore works - located in proximity to the coast (i.e. within 1km). As the specific port location(s) to be utilised by vessels are yet to be determined, it is not possible at this stage to consider the interaction of vessel movements associated with exiting/entering a port on onshore ecosystems. Despite this, all movements will be compliant/included within the port's capacity analysis undertaken in support of their planning application – no further assessment is needed.

Based on the spatial review of sensitive onshore designations, there is not expected to be any onshore sensitive ecosystem within 1.7km of the DCO Limits. The DCO Limits has been used to indicatively represent the spatial extent of vessel movements and potential interaction with onshore ecosystems.

Notwithstanding the above, consideration has been given to the extent of vessel movements generated by all stages of development (construction, operational and decommissioning phases).

Estimated vessels movements generated for construction and operation of the development (assumed to be large ships – considered unlikely), are below the LAQM.TG(22) screening thresholds, despite the overly conservative assessment methodology applied.

Details regarding the extent of vessel movements generated during decommissioning phase are yet to be fully clarified. The decommissioning methodology would be finalised nearer to the end of the lifetime of AyM, to be in line with current guidance, policy and legislation. Any such methodology would be agreed with the relevant authorities and statutory consultees. Nevertheless, decommissioning activities are not anticipated to exceed the construction phase worst case criteria assessed, given forecast improvements to air quality.

Given that vessel movements generated by the AyM will not exceed the LAQM.TG(22) screening thresholds and will not occur within 1.7km of a national or international onshore ecosystem, emissions from vessel emissions are not considered to be significant. Further assessment is therefore not required.

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