6. Air Quality

Executive Summary

This chapter sets out the potential effects of construction and operation of the proposed development on air quality at sensitive human and ecological receptors.

This chapter outlines the relevant legislation and policy, includes a review of the existing baseline conditions, consideration of the potential impacts and identification of proportionate mitigation for likely significant adverse effects resulting from the proposed development.

Study Outline

Following consultation with Pembrokeshire County Council, this chapter and accompanying appendices considers the potential emission sources of air pollutants and dust associated with the proposed development as set out below:

Construction phase

- Dust emissions generated by demolition and construction activities including site preparation, excavation and material handling/storage.

Operational phase

- Emissions of pollutants to air from the proposed on-site auxiliary power compound.

Findings

The construction dust risk assessment concluded that, in the absence of mitigation, there is predicted to be a medium risk of dust impacts from earthworks and construction activities and a low risk of dust impacts from demolition activities.

Good practice mitigation measures would be needed to reduce the potential for dust emissions to lead to significant effects in the vicinity of the proposed development. The mitigation measures presented in this assessment would normally be sufficient to reduce construction dust nuisance and risks to human health and ecological impacts to a 'not significant' effect.

The mitigation measures taken forward from this assessment would be used by the contractor to develop a Construction Environmental Management Plan (CEMP) (see (Appendix 3.1 (Framework Construction Environmental Management Plan) for further description)) for agreement with the relevant local planning authority prior to construction commencing (usually required as a condition of the planning permission).

The results of the air dispersion modelling of emissions from the auxiliary power compound indicate that the predicted concentrations at sensitive human receptors do not exceed any relevant long-term or short-term environmental quality standards (EQS).

For annual mean nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$) concentrations, the respective process contributions (PCs) are less than 1% of the relevant long-term EQS and the impacts are considered 'insignificant' as per Environment Agency guidance.

As per the Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM) planning guidance, the percentage change in concentration relative to the EQS

means the impact is considered ‘negligible adverse’ when operating the proposed auxiliary power compound.

For short-term PM_{10} concentrations, the PC is less than 10% of the relevant EQS and the impacts are considered ‘insignificant’. As per the EPUK and IAQM planning guidance, the percentage change in concentration relative to the EQS means the impact is considered ‘negligible adverse’.

For short-term NO_2 concentrations, the PC is above 10% of the relevant EQS (i.e. 63.6%). However, the corresponding PEC is less than 70% of the relevant EQS and the impacts are considered ‘not significant’.

At the assessed protected conservation areas, the results indicate that the annual mean PCs are less than 1% of the relevant critical level and critical load value and the effect is considered ‘insignificant’ as per Natural Resource Wales (NRW) guidance.

For the maximum 24-hour mean critical level for oxides of nitrogen (NOx), the PC is either less than 10% of the relevant EQS, or where the PC is above 10% of the relevant EQS, the corresponding PEC is less than 70% of the relevant EQS and the impacts are considered ‘not significant’.

This assessment assumes the auxiliary power compound operates simultaneously and continuously at full load as this approach ensures that the worst-case or maximum short-term concentrations are quantified. This is an overly conservative approach to the assessment as in practice, the auxiliary power compound would typically operate up to 180 hours per year and are unlikely to operate simultaneously or for a continuous period up to 24 hours. Therefore, the results presented are likely to be considerably higher than would reasonably be expected.

Based on the findings of the assessment of pollutant emission during the operation phase, it is concluded that the proposed auxiliary power compound is acceptable from an air quality perspective.

6.1. Introduction

6.1.1. This chapter presents information required by the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017[49]. As part of the Environmental Impact Assessment (EIA) process, this Environmental Statement (ES) chapter reports the potential significant effects for Air Quality as a result of the proposed development. This assessment outlines the relevant legislation and policy, includes a review of the existing baseline conditions, consideration of the potential impacts and identification of proportionate mitigation for likely significant adverse effects resulting from the proposed development.

6.1.2. The approach to this assessment follows the EIA Scoping Report [50] submitted to Pembrokeshire County Council (PCC) and consultation outlined in Table 6.2 and has been prepared in accordance with the EIA Scoping Opinion[51] for the proposed development from PCC.

6.1.3. This chapter is supported by the following appendices and figures, and includes cross-references to other chapters and figures where appropriate:

- Appendix 6.1 (Air Quality Technical Appendix – Legislation Policy and Guidance);
- Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology);
- Appendix 6.3 (Air Quality Technical Appendix – Impact Assessment Results);
- Appendix 6.4 (Air Quality Technical Appendix – Air Quality Mitigation);
- Figure 6.1 (Air Quality Management Area (AQMA) and Air Quality Monitoring Locations);
- Figure 6.2 (Assessed Sensitive Receptor Locations); and
- Figure 6.3 (Construction Dust Risk Assessment Study Areas).

6.1.4. Chapter 3 (Proposed Development) contains a detailed description of the proposed development.

Study Outline

6.1.5. Following consultation with PCC, this chapter and accompanying appendices considers the potential emission sources of air pollutants and dust associated with the proposed development as set out below:

Construction phase

- Dust emissions generated by demolition and construction activities including site preparation, excavation and material handling/storage.

Operational phase

- Emissions of pollutants to air from the proposed on-site auxiliary power compound.

[49] Welsh Assembly Government (2017). The Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017. [Online] Available at: https://www.legislation.gov.uk/wsi/2017/567/contents [Accessed 22 October 2025].

[50] Sweco (2023). EIA Scoping Report. Project DARC – Cawdor Barracks (65208061-SWE-XX-XX-T-J-0002-CawdorScopingReport. 10 March 2023.

[51] Pembrokeshire County Council (PCC). Scoping Opinion response. 15 May 2023.

6.1.6. As agreed with PCC[51], the air quality assessment will focus on the following pollutants; nitrogen dioxide (NO_2); PM_{10} (particles with an aerodynamic diameter of 10 microns or less) and $PM_{2.5}$ (particles with an aerodynamic diameter of 2.5 microns or less).

6.1.7. It should be noted this assessment does not consider emissions from associated construction and operational phase traffic movements and emissions from construction plant and machinery. As agreed with PCC[51], these elements are scoped out of the EIA as they are likely to lead to a negligible change in air quality.

6.2. Legislation and Policy

6.2.1. The national legislation and regulatory frameworks applicable in this assessment for Air Quality are summarised in this section.

Legislation

6.2.2. Legislation relevant to the assessment of Air Quality includes the following (see Appendix 6.1 (Air Quality Technical Appendix – Legislation Policy and Guidance) for further details)):

- European Directive on Ambient Air Quality (2008/50/EC)[52];
- The Environment (Legislative Functions from Directives) (EU Exit) Regulations 2019[53];
- Air Quality Strategy (2007)[54];
- Environment Act 1995[55];
- Environment Act 2021[56];
- Environment (Air Quality and Soundscapes) (Wales) Act 2024[57];
- The Air Quality Standards Regulations 2010[58];
- The Air Quality Standards (Wales) Regulations 2010[59]; and
- The Air Quality (Wales) Regulations 2000[60].

[52] European Union (2008). Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe OJ L 152, 11.6.2008, pp. 1–44.

[53] UK Government (2019). The Environment (Legislative Functions from Directives) (EU Exit) Regulations 2019. [Online] Available at: https://www.legislation.gov.uk/uksi/2019/1350/contents/made [Accessed 22 October 2025].

[54] Department for Environment, Food and Rural Affairs (Defra) (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

[55] UK Government (1995). Environment Act 1995. [Online] Available at: https://www.legislation.gov.uk/ukpga/1995/25/contents [Accessed 22 October 2025].

[56] UK Government (2021). Environment Act 2021. [Online] Available at: https://www.legislation.gov.uk/ukpga/2021/30/contents [Accessed 22 October 2025].

[57] Welsh Assembly Government (2024). Environment (Air Quality and Soundscapes) (Wales) Act 2024. [Online] Available at: https://www.legislation.gov.uk/en/asc/2024/2/contents [Accessed 22 October 2025].

[58] UK Government (2010). The Air Quality Standards Regulations 2010. [Online] Available at: https://www.legislation.gov.uk/uksi/2010/1001/contents [Accessed 22 October 2025].

[59] Welsh Assembly Government (2010). The Air Quality Standards (Wales) Regulations 2010. [Online] Available at: https://www.legislation.gov.uk/wsi/2010/1433/contents [Accessed 22 October 2025].

[60] Welsh Assembly Government (2000). The Air Quality (Wales) Regulations 2000. [Online] Available at: https://www.legislation.gov.uk/wsi/2000/1940/contents/made [Accessed 22 October 2025].

6.2.3. The national air quality objectives (AQOs) for the pollutants considered in this assessment are enacted by the Air Quality (Wales) Regulations 2000 and Air Quality Standards Regulations 2010 and are presented in Table 6.1. The national AQOs are numerically identical to the European limit values, enacted through the Air Quality Standards (Wales) Regulations 2010.

6.2.4. The Environment (Air Quality and Soundscapes) (Wales) Act 2024 provides a framework for setting national air quality targets and amending existing legislation relating to the national air quality strategy and local air quality management.

6.2.5. For the purposes of reporting, the AQOs and Air Quality Assessment Levels (AQALs) have been collectively termed as Environmental Quality Standards (EQSs).

Table 6.1: Relevant long-term (i.e. annual mean) and short-term EQSs for human and ecological receptors

Pollutant	EQS (µg/m^3)	Measured as	Set for Protection of:
Nitrogen dioxide (NO2)	40	Annual mean	Human health
	200	One hour mean, not to be exceeded more than 18 times per year (equivalent to the 99.79th percentile of hourly means)	
Particulate matter (PM10)	40	Annual mean	
	50	24-hour mean, not to be exceeded more than 35 times a year	
Particulate matter (PM2.5)	25	Annual mean	
Oxides of nitrogen (NOx)	30	Annual mean	Protected conservation areas

National Policy

6.2.6. Planning Policy Wales (PPW) 2024[61] sets out the Welsh Government's planning policy framework for the whole of Wales, including the Welsh Government's expectation for the content and quality of planning applications and local planning policy. PPW sets out the policy that the proposed development should comply with. It is also the basis for informing a judgement on the impacts of a development, for example whether the proposed development is consistent with the requirements of the PPW. Compliance of the proposed development with the PPW is detailed within the Planning Statement.

6.2.7. PPW is also supported by the following Technical Advice Notes (TANs) relevant to Air Quality, which are described further in Appendix 6.1 (Air Quality Technical Appendix – Legislation Policy and Guidance):

- TAN 5: Nature Conservation and Planning[62]; and
- TAN 6: Planning for Sustainable Rural Communities[63].

[61] Welsh Assembly Government (2024). Planning Policy Wales, Edition 12, February 2024.

[62] Welsh Assembly Government (2009). Technical Advice Note 5: Nature Conservation and Planning.

[63] Welsh Assembly Government (2010). Technical Advice Note 6: Planning for Sustainable Rural Communities.

Local Policy

6.2.8. Local policy is provided by PCC – Local Development Plan[64]. This policy is described further in Appendix 6.1 (Air Quality Technical Appendix – Legislation Policy and Guidance).

6.2.9. This chapter makes reference to the current local development plan (LDP) and the planning statement for the proposed development considers emerging policies and therefore considers the LDP Review which is currently being developed.

6.3. Methodology

6.3.1. The following section provides an overview of the methodology used to determine the likely significant effects on Air Quality as a result of the construction and operation of the proposed development. The full description of the assessment methodology can be found in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology).

6.3.2. It should be noted the likely significant effects on air quality as a result of activities associated with the decommissioning phase have not been considered as these would be on a considerably smaller scale than those identified for the construction and operational phase.

Construction

Dust effects

6.3.3. The assessment of dust emissions during the construction phase follows the Institute of Air Quality Management (IAQM) construction dust guidance[65]. The IAQM construction dust assessment methodology provides techniques for three separate dust effects:

- annoyance due to dust soiling;
- harm to ecological receptors (also referred to in this chapter as protected conservation areas); and,
- risk of health effects due to a significant increase in exposure to PM_{10} and $PM_{2.5}$.

6.3.4. As per IAQM construction dust guidance[65], a dust emission magnitude is assigned on the basis of the scale and nature of the dust generating works. The sensitivity of the area is then determined, which takes into consideration the number and distance of receptors from the site and baseline conditions.

6.3.5. Based on the matrix of relationships between the sensitivity of the area and the assigned dust emission magnitude, the IAQM construction dust guidance[65] determines the risk level for the key potential dust emission sources associated with construction and based on the outcome of this, sets out recommendations for control and mitigation of dust emissions to achieve a residual effect of 'not significant'.

Emissions from auxiliary power compound

6.3.6. The assessment of pollutant emissions from the operation of the proposed auxiliary power compound has been carried out using the Lakes Software *AERMOD View* air dispersion modelling software.

[64] Pembrokeshire County Council (2013). Local Development Plan: Planning Pembrokeshire's Future. [Online] Available at: https://www.pembrokeshire.gov.uk/adopted-local-development-plan [Accessed 21 October 2025].

[65] Institute of Air Quality Management (IAQM) (2024). Guidance on the assessment of dust from demolition and construction.

6.3.7. The dispersion model was run to provide the Process Contribution (PC). The PC is the estimated maximum environmental concentration of substances due to releases from the process alone. The results were then combined with baseline concentrations (see Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology)) to provide the Predicted Environmental Concentration (PEC) of the substances of interest.

6.3.8. The PECs were then compared against the appropriate environmental standards for air emissions for each substance to determine the nature and extent of any potential adverse effects.

6.3.9. The predicted concentrations of NOx were also used to assess the potential impact on critical levels and critical loads (i.e. acid and nutrient nitrogen deposition) at the assessed protected conservation areas. Details of the deposition assessment methodology are provided in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology)).

6.3.10. The location of the proposed auxiliary power compound and associated buildings are shown in Figure 3.1 (Proposed Development Overview).

Construction Phase Significance Criteria

6.3.11. As discussed in Section 6.3, the IAQM construction dust guidance[65] sets out a process to determine the risk level for the key potential dust emission sources associated with construction and based on the outcome of this, sets out recommendations for control and mitigation of dust emissions to achieve a residual effect of 'not significant'.

6.3.12. As per IAQM construction dust guidance[65], following *Step 2A – Define potential dust emission magnitude*, a dust emission magnitude is assigned on the basis of the scale and nature of the dust generating works. Then, applying *Step 2B – Define sensitivity of the area*, sensitivity is assigned, which takes into consideration the number and distance of receptors from the site and baseline conditions. Following these steps, appropriate site-specific mitigation (*Step 3 – Site-specific mitigation*) can be recommended.

6.3.13. The approach in *Step 4 – Determine significant effects* has been adopted to determine the significance of impacts with regard to dust emissions. The construction dust guidance[65] states the following:

> *"For almost all construction activity, the aim should be to prevent significant impacts on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant".*

6.3.14. IAQM construction dust guidance[65] also states that:

> *"Even with a rigorous DMP (Dust Management Plan) in place, it is not possible to guarantee that the dust mitigation measures will be effective all the time, and if, for example, dust emissions occur under adverse weather conditions, or there is an interruption to the water supply used for dust suppression, the local community may experience occasional, short-term dust annoyance. The likely scale of this would not normally be considered sufficient to change the conclusion that, with mitigation, the impacts will be 'not significant".*

6.3.15. Step 4 of IAQM construction dust guidance[65] recognises that the key to the above approach is that it assumes that the regulators ensure that the proposed mitigation measures are implemented. The management plan would include the necessary systems and procedures to enable on-going checking by the regulators to ensure that mitigation is being delivered, and that it is effective in reducing any residual effect to 'not significant', in line with the guidance.

Operational Phase Significance Criteria

6.3.16. For the assessment of pollutant emissions during operation, the likely impact at the assessed human receptors was based on the change in the predicted pollutant concentrations due to

the operation of the proposed auxiliary power compound. The pollutant EQSs considered are presented in Table 6.1.

6.3.17. For the assessed protected conservation areas, the assessment considers the change in critical levels (i.e. ambient concentrations) and critical loads (i.e. acidic and nutrient nitrogen deposition).

6.3.18. As well as comparing the total predicted concentrations of pollutants to their respective EQS, the significance of the potential changes in pollutant concentrations were assessed on the basis of the air quality planning guidance produced by EPUK and IAQM. This sets out the framework for describing air quality impacts, whether 'adverse' or 'beneficial', from a dispersion modelling assessment that can be used as a starting point to make a judgement of the overall significance of the effect. It should be noted that an impact is the change in the concentration of an air pollutant, as experienced by a receptor, as a result of a proposed development. The guidance states the following:

> "…the assessment may use its own set of criteria to define magnitude, but the important matter to be concluded is the likely significant effects of the impacts on air quality. There is, therefore, a two-stage process to be followed in the assessment:

- *a qualitative or quantitative description of the impacts on local air quality arising from the development; and*
- *a judgement on the overall significance of the effects of any impacts."*

6.3.19. Further description is presented in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology).

Study Area

6.3.20. Human receptors include locations where members of the public could be present over both short or long periods, for example residential properties, schools, hospitals, doctors' surgeries, places of worship, streets, shops, playing fields or parks and public rights of way (PRoW); including footpaths.

6.3.21. An ecological receptor (also referred to in this chapter as a 'protected conservation area') refers to any habitat that might be sensitive to dust soiling, pollutants, nutrient nitrogen and acid deposition.

6.3.22. The construction dust risk assessment study area is defined in accordance with the IAQM construction dust guidance[65]. The study area encompasses an area of up to 250 m from the application site boundary for human receptors and up to 50 m from the application site boundary for ecological receptors. In addition, the study area also includes a 50 m buffer from either side of the road for construction haul routes up to 250 m from the application site exit(s).

6.3.23. For emissions of pollutants from the proposed auxiliary power compound, the closest and most relevant sensitive human receptors (such as residential properties and the Cawdor Barracks accommodation) to the emission sources were considered.

6.3.24. In line with Natural Resource Wales (NRW) guidance[66], it is necessary to identify European sites (i.e. Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar sites), Site of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Marine Conservation Zones (MCZ) within 2.5 km of the assessed combustion plant.

[66] Natural Resource Wales (NRW) (2025). Assessing air quality impacts as part of your planning application. [Online] Available at: https://naturalresources.wales/guidance-and-advice/business-sectors/planning-and-development/advice-for-developers/assessing-air-quality-impacts-as-part-of-your-planning-application/?lang=en [Accessed 06 November 2025].

6.3.25. Details of the receptor locations included within the assessment are outlined in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology).

6.3.26. The location of the application site and key environmental constraints can be found in Figure 3.3 (General Constraints Plan).

Baseline

6.3.27. The following sources of information were used to provide an overview of baseline air quality across the Cawdor Barracks site and the surrounding area:

- pollutant background maps for the key assessment pollutants, provided by the Department for Environment, Food and Rural Affairs (Defra) background maps[67], with data provided at 1 km x 1 km grid resolution;
- the most recent local air quality management (LAQM) report[68], and associated air quality monitoring data published by PCC at the time of the assessment;
- ambient air quality monitoring data published by Defra as part of the national Automatic Urban and Rural Network (AURN) for air quality monitoring[69]; and
- Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) database for ecological designations[70].

Guidance

6.3.28. Guidance is provided by the following documents of relevance to Air Quality, which are described in further detail in Appendix 6.1 (Air Quality Technical Appendix – Legislation Policy and Guidance):

- Defra *Local Air Management Review and Assessment Technical Guidance (TG22)* (2025)71;
- EPUK and IAQM *Land-use Planning and Development Control: Planning for Air Quality (2017) v1.2*[72];
- NRW *Assessing air quality impacts as part of your planning application (2025)*[66];
- IAQM *Guidance on the Assessment of Dust from Demolition and Construction (2024) v2.2*[73];

[67] Department for Environment, Food and Rural Affairs (Defra) (2021). Background Mapping data for local authorities. [Online] Available at: https://uk-air.defra.gov.uk/data/laqm-background-home [Accessed 21 October 2025].

[68] Pembrokeshire County Council (PCC) (2024). 2024 Annual Progress Report. September 2024.

[69] Department for Environment, Food and Rural Affairs (Defra) (2025). Automatic Urban and Rural Network (AURN). [Online] Available at: https://uk-air.defra.gov.uk/networks/network-info?view=aurn [Accessed 21 October 2025].

[70] Department for Environment, Food and Rural Affairs (Defra) (2025). Multi-Agency Geographic Information for the Countryside (MAGIC). [Online] Available at: https://magic.defra.gov.uk/MagicMap.html [Accessed 21 October 2025].

[71] Department for Environment, Food and Rural Affairs (Defra) (2022). Local Air Quality Management Technical Guidance (TG22). [Online] Available at: https://laqm.defra.gov.uk/wp-content/uploads/2021/03/LAQM-TG22-May-25-v2.1.pdf [Accessed 03 November 2025].

[72] Institute of Air Quality Management (IAQM) (2017). Land-Use Planning & Development Control: Planning For Air Quality

[73] Institute of Air Quality Management (IAQM) (2024). Guidance on the assessment of dust from demolition and construction

- IAQM *Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (2020) v1.1*[74]; and
- Environment Agency (EA) *Air emissions risk assessment for your environmental permit (2025)*[75]. To note the NRW guidance[66] refers to this guidance when assessing air emissions.

Consultation

6.3.29. As discussed in Section 6.1, an EIA Scoping Report was submitted to PCC in March 2023[50]. The EIA Scoping Opinion was received in May 2023[51]. The applicant's responses to the EIA Scoping Opinion are presented in Appendix 2.1 (DARC EIA Scoping Opinion Response Table).

6.3.30. As per the EIA Scoping Report, the construction and operational impact scoped into the EIA is the change in pollutant concentrations resulting from emissions associated with the proposed auxiliary power compound. At the time of scoping, the design and operational data relating to the proposed auxiliary power compound was not available. The relevant information was provided to PCC by email as per Table 6.2.

Table 6.2: Summary of Consultation

Consultee	Form of Consultation	Topics Discussed and Actions Agreed
Pembrokeshire County Council	Email	Construction dust risk assessment.

Assumptions and Limitations

6.3.31. For construction dust emissions, this assessment is based on information available at the time of writing, which may be subject to change as the final design details are developed. Where required, a precautionary approach has been taken and at this stage, it is considered that the information provided is sufficient to identify any likely impacts of dust emissions from activities associated with the construction of the proposed development. Further description is provided in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology).

6.3.32. All assumptions and limitations in relation to the assessment of emissions from the proposed auxiliary power compound are presented in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology).

6.4. Baseline Conditions

Local Air Quality

6.4.1. The immediate area surrounding the application site is predominantly rural in nature with the Pembrokeshire coastline and Newgale Beach approximately 1.1 km south-west and 1.4 km south, respectively, from the proposed development. The village of Penycwm is approximately 0.3 km south-east of the proposed development. A further description is provided in Chapter 3 (Proposed Development).

[74] Institute of Air Quality Management (IAQM) (2020). A guide to the assessment of air quality impacts on designated nature conservation sites.

[75] Environment Agency (2025). Air emissions risk assessment for your environmental permit. [Online] Available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit [Accessed November 2025]. To note, the NRW guidance[66] refers to this guidance when assessing air emissions.

6.4.2. The closest AQMA, termed 'AQMA No 1 2012' was declared by PCC in 2012 for elevated concentrations of annual mean NO_2. This AQMA is approximately 13 km south-east of the proposed development and has not been considered further in the assessment.

Monitoring

Automatic Monitoring

6.4.3. As part of the LAQM process, PCC carries out regular assessments and monitoring of air quality within its administrative boundary. However, there are currently no automatic monitoring sites or non-automatic monitoring sites (i.e. diffusion tubes) located within or near the study area.

6.4.4. There is currently one Defra-managed AURN automatic air quality monitoring site in Pembrokeshire, Site ID Narberth (UKA00323) (National Grid Reference E 214381 N 212758) (see Figure 6.1 (Air Quality Management Area (AQMA) and Air Quality Monitoring Locations)). This rural monitoring site type is located approximately 30 km south-east of the proposed development.

6.4.5. The measured annual mean NO_2, PM_{10}, and $PM_{2.5}$ concentrations between 2020 and 2024 are presented in Table 6.3.

Table 6.3: Narberth (UKA00323) Automatic Monitoring Annual Mean Concentrations (µg/m^3)

Site	Site Type	Pollutant		Annual Mean Concentration (µg/m3)				
			EQS1	2020	2021	2022	2023	2024
Narberth	Rural	NOx	302	0.7	0.6	0.5	0.5	0.4
		NO2	40	3.1	3.1	2.9	2.4	2.4
		PM10	40	10.5	10.1	11.3	10.0	9.8
		PM2.5	25	5.9	6	6.4	5.6	5.6

Note 1: For the purposes of reporting, the AQOs have been collectively termed as EQSs

Note 2: Annual mean EQS for the protection of vegetation

6.4.6. Table 6.3 indicates that the monitored concentrations at the Narberth (UKA00323) AURN site are well below the relevant EQS. Given that the proposed development would be situated within a rural area with similar surrounding land uses to those at Narberth, and with no significant sources of emissions to air in close proximity, concentrations recorded at Narberth (UKA00323) are likely to be representative of ambient air quality conditions at the application site.

Non-Automatic (Diffusion Tube Monitoring)

6.4.7. PCC measures annual mean NO_2 concentrations using passive diffusion tube monitoring at 45 roadside locations[68]. However, the closest diffusion tube monitoring location is Site ID: PCC30 (National Grid Reference E 194974 N 215448), which is approximately 13.5 km south-east of the proposed auxiliary power compound stacks. Therefore, the diffusion tube monitoring sites are not considered representative of the application site due to the monitoring site type (i.e. roadside) and respective distance from the application site.

Background Pollutant Concentrations

6.4.8. The Defra background maps were used to assess the background concentrations of NOx, NO_2, PM_{10} and $PM_{2.5}$ within study area. This resource provides estimated annual mean background concentrations at a resolution of 1 km x1 km across the UK.

6.4.9. The background concentrations reported for the grid square encompassing the application site for the current year (2025) are summarised in Table 6.4. These data demonstrate that annual mean concentrations for the assessed pollutants are well below the relevant EQS.

Table 6.4: Annual Mean Pollutant Defra Background Concentrations (µg/m^3)

Grid square		**NOx**	**NO_2**	**PM_{10}**	**$PM_{2.5}$**
	EQS	**30[1]**	**40**	**40**	**25**
184500,224500		3.1	2.5	8.6	4.6

Note 1: Annual mean EQS for the protection of vegetation

6.4.10. The background concentrations outlined in Table 6.4 substantiate the conclusion that the monitored background concentrations at the Narberth (UKA00323) AURN monitoring location (see Table 6.3) are likely to be representative of ambient conditions within the study area.

Receptors

6.4.11. For the assessment of construction dust emissions, the sensitive receptors considered in the assessment are discussed in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology).

6.4.12. For the assessment of operational emissions, the sensitive human receptors considered represent exposure locations such as nearby residential properties and the Cawdor Barracks accommodation.

6.4.13. For protected conservation areas; St. David's Peninsula Coast Site of Special Scientific Interest (SSSI); St David's/Ty Ddewi Special Area of Conservation (SAC); Pembrokeshire Marine / Sir Benfro Forol SAC; West Wales Marine / Gorllewin Cymru Forol SAC and Ramsey and St David's Peninsula Coast Special Protection Area (SPA) were included in the assessment.

6.4.14. Further information on the considered sensitive receptors is presented in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology) and the location of the assessed receptors are shown on Figure 6.2 (Assessed Sensitive Receptor Locations) and Figure 6.3 (Construction Dust Risk Assessment Study Areas).

6.5. Design Interventions and Controls

Design Interventions

6.5.1. The development of the proposed development design has been an iterative process. The environment team has worked in close collaboration with the design team to avoid or reduce environmental impacts through the proposed development design. These are referred to as design interventions. This approach follows EIA best practice and principles set out in the mitigation hierarchy; the first principle being to avoid potential adverse effects, where feasible, before seeking to minimise or mitigate for impacts.

6.5.2. Further description is provided in Chapter 3 (Proposed Development), which details the proposed design elements. This section of chapter provides more detail and background on relevant iterations made during the design process in response to input from this environmental topic.

6.5.3. Chapter 4 (Alternatives and Design Evolution) details the design alternatives that have been considered, including the environmental factors which have influenced the decision-making.

6.5.4. Whilst the proposed development typically applies an iterative design strategy, in terms of air quality and due to the existing site provision of utilities, this results in an essentially low polluting design. Therefore, only very limited iteration was necessary and needs to be outlined in this chapter.

Controls

6.5.5. Controls are included in the Environmental Management Measures Table contained within Appendix 3.1 (Framework Construction Environmental Management Plan (CEMP)). The Framework CEMP has been produced in support of the planning application to present the controls and mitigation identified in this assessment. The Framework CEMP will be developed into the Detailed CEMP for implementation during construction and will be secured by an appropriately worded planning condition. Further information on the Framework CEMP is provided in Chapter 3 (Proposed Development).

6.6. Potential Significant Effects

Construction Dust Risk Assessment

6.6.1. There are human receptors (including residential properties and on-site accommodation) within 250 m of the application site boundary and further assessment is required. It should be noted the Army personnel housed in the barracks are scheduled to leave in 2028 with construction of the proposed development being completed in 2029. For the purposes of this assessment, and to ensure a precautionary approach, the presence of Army personnel has been considered during the entire construction period. This ensures that potential air quality impacts on sensitive human receptors are fully assessed, regardless of the exact timing of their departure.

6.6.2. As there are no sensitive human receptors within 20 m of the likely construction route (i.e. the C3010 north of the A487) up to 250 m from the potential site exit, trackout has not been considered further in the assessment.

6.6.3. For ecological receptors, there is a parcel of restored ancient woodland adjacent to the western application site boundary and has been considered in the assessment accordingly.

6.6.4. The anticipated demolition activities associated with the construction of the proposed development are considered to represent a *small* dust emission magnitude. The earthworks and construction activities are considered to represent a *medium* dust emission magnitude. Further description is provided in Appendix 6.2 (Air Quality Technical Appendix – Air Quality Assessment Methodology).

6.6.5. Based on the matrix of relationships between the sensitivity of the area and the dust emission magnitude, for dust soiling impacts there is predicted to be a **medium risk** from earthworks and construction activities and a **low risk** from demolition activities. There is the potential for infrequent, short-term episodes when baseline dust deposition rates could be increased by an amount that nearby residents could perceive.

6.6.6. With regard to human health impacts, there is a **negligible** to **low risk** from all relevant dust generating activities as there is limited potential for emissions of PM_{10} and $PM_{2.5}$ to increase baseline concentrations to a value that is above the EQS set for human health.

6.6.7. For ecological impacts, there is a **negligible** to **low risk** from all relevant dust generating activities.

6.6.8. Therefore, it would be necessary to adopt an appropriate level of good practice mitigation to reduce the risks of causing a significant effect to nearby human and ecological receptors. The

mitigation measures, as recommended by the IAQM construction dust guidance[65] and taken forward from this assessment, would prevent or reduce potential nuisance dust or PM_{10} (and $PM_{2.5}$) emissions, which are associated with health impacts, such as exacerbating existing human health conditions, including asthma and other lung conditions.

6.6.9. Measures such as those specified in the IAQM construction dust guidance[65] guidance would normally be sufficient to reduce construction dust nuisance and risks to human health and ecological receptors to a 'not significant' effect.

6.6.10. The full list of recommended measures is provided in Tables 23 to Table 27 in Appendix 6.4 (Air Quality Technical Appendix – Air Quality Mitigation). The measures to control dust emissions taken forward from this assessment, derived from the highly recommended or desirable measures and the monitoring of the effectiveness of the mitigation, would be included in the air quality management strategies set out in the CEMP.

Operational Assessment

6.6.11. The predicted air quality impacts from the operation of the proposed auxiliary power compound were assessed against the relevant air quality standards and guidelines for the protection of human health and protected conservation areas.

6.6.12. For long-term (i.e. annual mean) modelled concentrations, it is assumed the assessed combustion plant operate simultaneously at full load for 180 hours per year as a worst-case approach to the assessment. In practice, it is unlikely that all considered generators would operate simultaneously or for such a prolonged period.

6.6.13. For short-term modelled concentrations, it is assumed the assessed combustion plant operate continuously at full load all year as this approach ensures that the worst-case or maximum modelled concentrations are quantified.

6.6.14. The results presented are the maximum modelled concentrations predicted at any of the assessed sensitive human receptor locations and protected conservation areas for the five years of meteorological data used in the study.

6.6.15. A summary of the results is provided below and presented in full in Appendix 6.3 (Air Quality Technical Appendix – Impact Assessment Results).

Results at human receptors

6.6.16. The results indicate that the predicted concentrations at sensitive human receptors do not exceed any relevant long-term or short-term EQS.

6.6.17. The modelled annual mean NO_2, PM_{10} and $PM_{2.5}$ PCs at human receptor locations are all less than 1% of the relevant long-term EQS and the impact is considered '**insignificant**' as per Environment Agency guidance[75].

6.6.18. As per the EPUK and IAQM planning guidance, the percentage change in concentration relative to the EQS means the impact is considered '**negligible adverse**' when operating the proposed auxiliary power compound.

6.6.19. For short-term PM_{10} concentrations, the PC is less than 10% of the relevant EQS at all of the assessment locations considered int his assessment and the impacts are considered '**insignificant**' as per Environment Agency guidance[75]. As per the EPUK & IAQM planning guidance, the percentage change in concentration relative to the EQS means the impact is also considered '**negligible adverse**'.

6.6.20. For short-term NO_2 concentrations, the PC is above 10% of the relevant EQS (i.e. 63.6%). However, the corresponding PEC is less than 70% of the relevant EQS and the impacts are considered '**not significant**'.

6.6.21. It is noted that although no exceedances are predicted, short-term NO_2 concentrations are elevated. This assessment assumes the proposed auxiliary power compound operate simultaneously and continuously at full load as this approach ensures that the worst-case or maximum short-term concentrations are quantified. This is an overly conservative approach to the assessment as in practice, the auxiliary power compound will typically operate up to 180 hours per year and are unlikely to operate simultaneously.

6.6.22. Furthermore, it is unlikely that the operation of the auxiliary power compound would coincide with all of the worst meteorological conditions (in terms of predicted PCs at assessed human receptor locations) each year. Therefore, the results presented are likely to be considerably higher than would reasonably be expected.

Results at protected conservation areas

6.6.23. For critical levels, the results indicate that at all of the assessed European designated sites and SSSI, the annual mean NOx contribution from the proposed auxiliary power compound is less than 1% of the relevant critical level and the effect is considered '**insignificant**' as per NRW guidance[66].

6.6.24. For daily mean NOx, the results indicate that the PCs are greater than 10% of the relevant critical level. However, the corresponding PECs are less than 70% of the relevant critical level and the impact is considered '**not significant**'.

6.6.25. As discussed previously, this assessment assumes the assessed combustion plant operate simultaneously and continuously as a worst-case approach. In practice, the auxiliary power compound is unlikely to operate simultaneously or for a continuous period up to 24 hours. Therefore, the results presented are likely to be considerably higher than would reasonably be expected.

6.6.26. For critical loads, the results indicate that the PCs are less than 1% of the relevant critical load value for acid and nutrient nitrogen deposition and the impact can be described as '**insignificant**' as per as per NRW guidance[66].

6.6.27. Based on the above assessment, it is concluded that the operation of the assessed combustion plant is acceptable from an air quality perspective.

6.7. Mitigation and Enhancement

6.7.1. Good practice mitigation measures would be needed to reduce the potential for dust emissions to lead to significant effects in the vicinity of the proposed development. The suggested good practice mitigation measures, which should be adopted for the proposed development are presented in Appendix 3.1 (Framework CEMP) and Appendix 6.4 (Air Quality Technical Appendix – Air Quality Mitigation).

6.7.2. The mitigation measures have been derived from those specified in the IAQM construction dust guidance[65] and where possible at this stage, adapted to the activities associated with construction of the proposed development. Measures such as those specified in the guidance would normally be sufficient to reduce construction dust nuisance and risks to human health and ecological receptors to a 'not significant' effect.

6.8. Cumulative Effects

6.8.1. As part of the EIA process, the environment team has undertaken a coordinated, multidisciplinary approach to ensure cumulative effects are considered across disciplines and influenced design where appropriate.

6.8.2. The assessment on cumulative effects is presented in Chapter 17 (Cumulative Effects Assessment).

6.8.3. No significant intra-cumulative or inter-cumulative effects for this environmental topic are anticipated as a result of the proposed development.

6.9. Residual Significant Effects

6.9.1. With the implementation of standard good practice mitigation measures as recommended by the IAQM construction dust guidance[65] and referenced in Appendix 3.1 (Framework CEMP) and Appendix 6.4 (Air Quality Technical Appendix – Air Quality Mitigation), no significant residual effects for air quality are anticipated as a result of the proposed development construction phase.

6.9.2. The operational phase of the proposed development is predicted to have no significant effects on local air quality.

6.10. Monitoring

6.10.1. As the works associated with construction of the proposed development have been categorised as a medium risk (for earthworks and construction activities), an appropriate monitoring survey, as recommended in Table 23 of Appendix 6.4 (Air Quality Technical Appendix – Air Quality Mitigation), would be undertaken to form a key part of the overall dust mitigation and management process.

6.10.2. The approach and scope of the air quality monitoring survey would be informed by the IAQM Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites[76].

6.10.3. Examples of monitoring measures that may be taken forward from this assessment, are presented below:

- Undertake daily on-site and off-site inspection. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of application site boundary, with cleaning to be provided if necessary.
- Carry out regular site inspections, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
- Agree dust deposition, dust plant or real-time PM_{10} continuous monitoring locations (if required) with the local authority.

6.11. Summary and Conclusions

6.11.1. An Air Quality assessment has been carried out to understand the potential air quality impacts associated with the construction and operational phases of the proposed development.

6.11.2. A baseline review of existing air quality conditions across the modelled study area has been undertaken, utilising data from PCC and Defra. The review demonstrated that existing air quality background concentrations for NO_2, PM_{10} and $PM_{2.5}$ across the study area are likely to be well below the relevant EQS.

[76] IAQM (2018). Air Quality Monitoring in the Vicinity of Demolition and Construction Sites 2018.

6.11.3. The construction dust risk assessment concluded there is predicted to be a **low risk** from earthworks, construction and trackout activities and a **negligible risk** from demolition activities in the absence of mitigation.

6.11.4. Good practice mitigation measures would be needed to reduce the potential for dust emissions to lead to significant effects in the vicinity of the proposed development. The mitigation measures presented in Appendix 6.4 (Air Quality Technical Appendix – Air Quality Mitigation) (and included in Appendix 3.1: Framework CEMP) have been obtained from the IAQM construction dust guidance[65] and would normally be sufficient to reduce construction dust nuisance and risks to human health and ecological receptors to a '**not significant'** effect.

6.11.5. This chapter has also assessed the potential air quality impacts associated with the operation of the proposed auxiliary power compound. The predicted impacts were assessed against the relevant air quality standards and guidelines for the protection of human health and protected conservation areas.

Human receptors

6.11.6. For annual mean NO_2, PM_{10}, $PM_{2.5}$ concentrations, the respective PCs are less than 1% of the relevant long-term EQS and the impacts are considered '**insignificant**'.

6.11.7. As per the EPUK and IAQM planning guidance, the percentage change in concentration relative to the EQS means the impact is considered '**negligible adverse**' when operating the proposed auxiliary power compound.

6.11.8. For short-term PM_{10} concentrations, the PC is less than 10% of the relevant EQS and the impacts are considered '**insignificant**'. As per the EPUK & IAQM planning guidance, the percentage change in concentration relative to the EQS means the impact is also considered '**negligible adverse**'.

6.11.9. For short-term NO_2 concentrations, the PC is above 10% of the relevant EQS (i.e. 63.6%). However, the corresponding PEC is less than 70% of the relevant EQS and the impacts are considered '**not significant**'.

6.11.10. The conservative approach adopted throughout the assessment means the results presented are likely to be considerably higher than would reasonably be expected.

Protected conservation areas

6.11.11. For critical levels, the results indicate that at the assessed European designated sites and SSSI, the annual mean NOx contribution from the proposed auxiliary power compound is less than 1% of the relevant critical level and the effect is considered '**insignificant**'.

6.11.12. For daily mean NOx, the results indicate that the PCs are greater than 10% of the relevant critical level. However, the corresponding PECs are less than 70% of the relevant critical level and the impact is considered '**not significant**'.

6.11.13. This assessment assumes the assessed combustion plant operate simultaneously and continuously at full load as a worst-case approach. In practice, the auxiliary power compound is unlikely to operate simultaneously or for a continuous period up to 24 hours. Therefore, the results presented are likely to be considerably higher than would reasonably be expected.

6.11.14. For critical loads, the results indicate that the PCs are less than 1% of the relevant critical load value for acid and nutrient nitrogen deposition and the impact can be described as '**insignificant**'.

6.11.15. Based on the findings of the assessment of pollutant emission during the operation phase, it is concluded that the proposed auxiliary power compound are acceptable from an air quality perspective and would be in accordance with both local and national policy as described in Section 6.2.