The air quality ES chapter reports on the likely air quality effects associated with the demolition and construction stage and operational stage of the proposed development.

Existing Conditions

A desk-based review was undertaken to establish the existing baseline conditions in the study area. The latest Cornwall Council air quality status report and Defra estimated background pollution maps were used to determine the existing and future air quality of the site and study area.

Baseline air quality surrounding the site is likely to be primarily influenced by emissions from local road traffic, including traffic accessing Falmouth Docks, as well as emissions from existing vessels using Falmouth Docks.

The site is not located within an Air Quality Management Area. Air quality monitoring in the immediate vicinity of the site has not been undertaken since 2020. Air quality is no longer monitored by Cornwall Council in Falmouth due to pollutant concentrations continuously being recorded well below the National Air Quality Objectives.

The following sensitive receptors were identified with respect to road traffic emissions:

- Residential properties (Railway Cottages, Bar Road, Ridge House Apartments, Melvill Road, Lansdowne Road, Imperial Court);
- Retirement Home (Trelawny House); and
- Student Accommodation (Pendennis Rise).

The following sensitive receptors were identified with respect to vessel emissions and odour:

- Residential properties (predominantly located south and south-west of the site, the closest residential properties include Challenger Quay, those on Tinners Walk, St Smithwick Way, Bar Road and Pendennis Rise);
- Retirement home (Trelawny House, Bar Road);
- Student Accommodation (Pendennis Rise); and
- Commercial & Recreational Facilities (Discovery Quay, Mooring, Hotels and Holiday Rentals, the closet of which are predominantly located south and west of the site. National Maritime Museum).

Demolition and Construction

During the demolition and construction stage the following impacts and effects have been assessed:

- Demolition and construction stage dust impacts and associated effects on human health and amenity which would result in not significant effects;
- Odour emissions from dredging which would result in not significant negligible to slight adverse effects; and
- Demolition and construction stage vehicle exhaust emissions and the associated air quality effects of NO_2, PM_{10} and $PM_{2.5}$ at existing off-site human health receptors which would result in not significant negligible adverse effects.

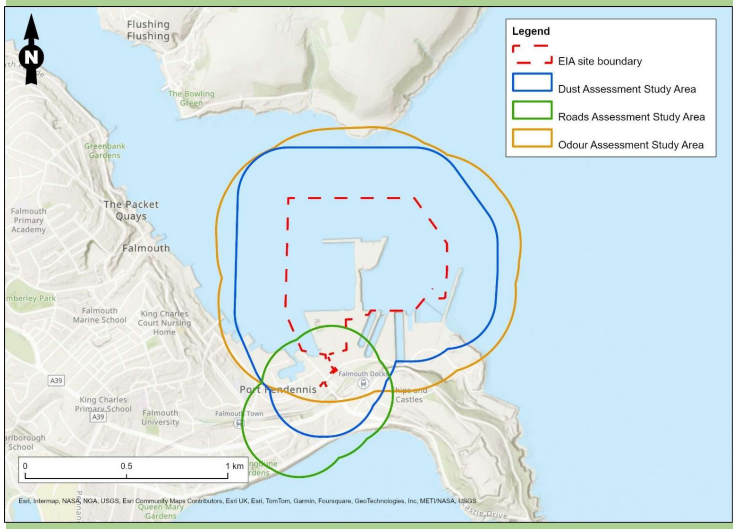
Operation

The proposed development would increase freight activity and cruise ship capacity at Falmouth Docks whereas the other existing activities and associated berthing vessels would remain the same. It is assumed that 12 additional freight ships would dock each year and 11 additional Excellence Class cruise vessels may visit the docks each year when the proposed development is complete, which is not expected to lead to a significant increase in emissions.

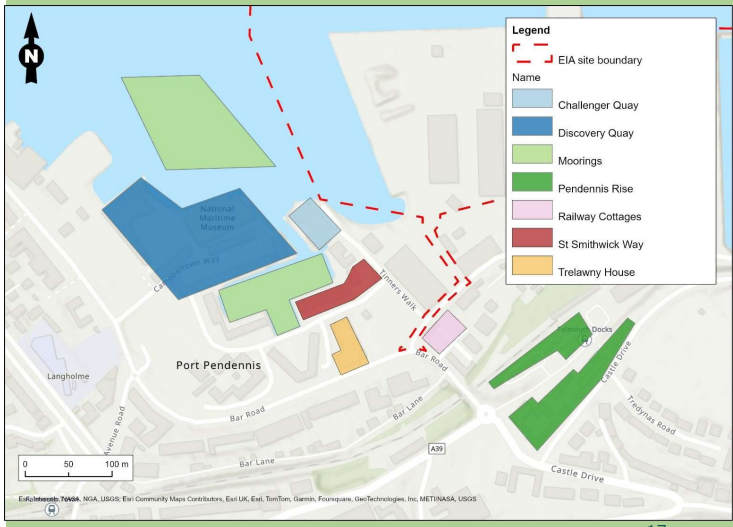
During operation the following impacts and effects have been assessed:

- Operational stage vessel emissions and the associated air quality effects of NO_2, PM_{10} and $PM_{2.5}$ on sensitive receptors which would result in not significant negligible adverse effects; and
- The site's suitability for human health receptors, considering potential air pollutant impacts from existing and new emission sources, was assessed. It is concluded that the site is suitable for the proposed uses during the operational stage.

15. Air Quality



Air Quality Study Areas



Sensitive Receptors for Vessel Emissions and Odour

15 Air Quality

15.1 Introduction

15.1.1 This chapter reports on the likely air quality effects associated with the demolition and construction stage and operational stage of the proposed development.

15.1.2 This chapter is supported by the following technical appendices within ES Volume 2:

- Technical Appendix 15.1 - Legislation, Policy and Consultation;
- Technical Appendix 15.2 – Assessment Methodology; and
- Technical Appendix 15.3 – Results.

15.1.3 The assessment has been informed by the following legislation, policies and published guidance:

- National Legislation and Policy:
  - Air Quality Strategy for England, Scotland, Wales, and Northern Ireland (2007)[1], which implements the European Union's Directives and sets out the air quality objectives and Government policy on achieving these objectives;
  - Air Quality Standards (Amendment) Regulations (2016)[2], which amended the Standard Regulations (2010)[3];
  - Part IV of the Environment Act (1995 (as amended))[4] and the Environment Act (2021)[5];
  - Clean Air Strategy (2019)[6];
  - The Environmental Targets (Fine Particulate Matter) (England) Regulations (2023)[7]; and
  - National Planning Policy Framework (NPPF) 2024[8], in particular the following sections:
    Chapter 2 – Achieving sustainable development;
    Chapter 4 – Decision-making;
    Chapter 9 – Promoting sustainable transport; and
    Chapter 15 – Conserving and enhancing the natural environment.
- Regional Policy:
  - Cornwall Local Plan[9], in particular Policy 16: Health and Wellbeing;
  - Cornwall Air Quality Action Plan[10]; and
  - Chief Planning Officer's Advice Note: Planning for Air Quality[11]
- National guidance and industry standards:
  - Planning Practice Guidance (PPG)[12];
  - Defra's Local Air Quality Management Technical Guidance (2022) (LAQM.TG(22))[13];
  - Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (2024)[14];
  - Environmental Protection UK (EPUK)/IAQM Guidance on Land-Use Planning and Development Control: Planning for Air Quality[15]; and
  - IAQM Guidance on the assessment of odour for planning[16].

15.1.4 Further details are provided in Technical Appendix 15.1.

15.2 Consultation

15.2.1 Table 15.1 summarises the key EIA Scoping Opinion responses with respect to the air quality assessment.

Table 15.1: Summary of Consultation

Consultee /Date of Consultation	Summary of Comments	Summary of Action Taken and Where in this Chapter Comments are Addressed
Cornwall Council Scoping Opinion received 6 October 2023	Agreement with the scope to be included in the EIA. Agreement that SO_2 is scoped out in line with LAQM.TG(22); however, CC encourage the EIA to look into addressing/responding emissions related to boat engines running due to an existing significant number of complaints received by CC. There would be emission of NO_x and CO_2 from boats, it would be good if any application does consider this upfront.	The reasons for scoping out the impacts of SO_2 emissions are provided in Section 15.3 Assessment Scope. An assessment of effects from NO_2, PM_{10} and $PM_{2.5}$ emissions from ships during the operational stage has been undertaken in Section 15.9.
Marine Management Organisation Scoping Opinion received 25 October 2023	The MMO agrees with the topics outlined in the scoping request and have outlined that the assessment should take account the risks of air pollution and how these can be managed or reduced in the ES.	Potential air quality effects have been identified in Section 15.3 Assessment Scope and have been assessed in Section 15.9 Assessment of Effects. The need for any further mitigation would be outlined in Section 15.10 Additional Mitigation.

15.3 Assessment Scope

15.3.1 The assessment has been undertaken in accordance with the relevant air quality guidance and account has been taken of all applicable legislation, guidance, and policy.

15.3.2 Professional judgement has been used to determine the overall significance of effect in accordance with IAQM Guidance.

Technical Scope

15.3.3 The technical scope of the assessment has considered the following:

- Demolition and construction stage dust impacts and associated effects on human health, ecological sites, and amenity, in accordance with the IAQM Guidance, identifying appropriate demolition and construction mitigation measures based on the assessed level of risk;
- Qualitative assessment of odour emissions from dredging during the demolition and construction stage following IAQM Guidance;
- Quantitative assessment of demolition and construction stage vehicle exhaust emissions and the associated air quality effects of NO_2, PM_{10} and $PM_{2.5}$ at existing off-site human health receptors;

[1] Department of the Environment, Food and Rural Affairs, 2007. The Air Quality Strategy for England, Scotland, Wales, Northern Ireland (Volume 1).
[2] Secretary of State, 2016. Statutory Instrument 2016, No. 1184, The Air Quality Standards (Amendment) Regulations 2016.
[3] Secretary of State, 2010. Statutory Instrument 2010, No. 1001, The Air Quality Standards Regulations 2010.
[4] Secretary of State. The Environment Act 1995 Part IV Air Quality.
[5] Secretary of State, 2021. The Environment Act 2021.
[6] Department for Environment, Food and Rural Affairs (Defra), 2019. Clean Air Strategy.
[7] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. SI 2023:96
[8] Ministry of Housing, Communities and Local Government, 2024. National Planning Policy Framework. London. HMSO
[9] Cornwall Council, 2016. Cornwall Local Plan Strategic Policies 2010-2030.
[10] Cornwall Council, 2020. Cornwall Air Quality Action Plan.
[11] Chief Planning Officer, 2017. Chief Planning Officer's Advice Note: Planning for Air Quality.
[12] Ministry of Housing, Communities and Local Government, 2021. Planning Practice Guidance. Available at: https://www.gov.uk/government/collections/planning-practice-guidance (accessed 12/05/2023)
[13] Department of the Environment, Food and Rural Affairs, 2022. Local Air Quality Management Technical Guidance, LAQM.TG(22). London. HMSO.
[14] Stoaling et al., 2024. Guidance on the Assessment of Dust from Demolition and Construction. IAQM, v2.2.
[15] Moorcroft and Barrowcliffe. et al., 2017. Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London.
[16] Bull et al., 2018. IAQM Guidance on the assessment of odour for planning – version 1.1, Institute of Air Quality Management, London

- Qualitative assessment of operational stage vessel emissions and the potential for air quality effects at sensitive receptors; and
- The site's suitability for human health receptors considering potential air pollutant impacts from existing and new emission sources.

15.3.4 The following have been scoped out of this chapter:

- Demolition and construction stage equipment emissions – Activities associated with the proposed terrestrial construction works will involve excavators, earth movers, forklift trucks, mobile cranes, piling rigs and hammers. Terrestrial proposed development works would occur in the western area of the site, would be temporary, short-term, and intermittent and occur at least 100 m from off-site receptors. Given the small quantity of construction equipment involved and the separation distance to receptors, impacts would be negligible and not significant.
- Demolition and construction stage vessel emissions - Marine proposed development works involving dredging would be temporary, short-term and intermittent with each area dredged sequentially with two barges alongside for disposal. Vessel movements associated with dredging operations would take place between approximately 170 m and 800 m from off-site receptors and average approximately 4-6 one-way barge movements per day to take uncontaminated material to the offshore disposal site for approximately 36 weeks. Additional construction vessel movements would be well below the LAQM.TG(22) criteria outlined in the Spatial Scope for an assessment of vessel emissions to be necessary at Ports, and the distance to the receptors will be such that impacts would be negligible and not significant.
- Demolition and construction stage ecological receptors – A screening distance of 50 m to designated ecological receptors in accordance with the IAQM Guidance outlined in Spatial Scope section has been used to identify designated sites that could be impacted by dust emissions. Designated ecological sites located within 50 m of the proposed development includes the Fal and Helford Special Area of Conservation (SAC) and the Falmouth Bay to St Austell Bay Special Protection Area (SPA); marine habitats are not considered sensitive to dust soiling/smothering in relation to airborne dust. No designated terrestrial habitats are located within 50 m of the site boundary.
- Combustion plant emissions - No centralised heat and energy plant are planned for the proposed development; therefore, an assessment of combustion plant emissions was not required.
- Vehicle emissions impacts on ecological receptors – There are no terrestrial designated ecological sites within 200 m of a road within 10 km of the site with a potential for an increase in traffic in either the demolition and construction or operational stages[17]. The impacts of road traffic emissions on terrestrial ecological receptors have therefore been scoped out in accordance with the criteria outlined in the Spatial Scope section.
- Sulphur Dioxide (SO_2) emissions – Whilst SO_2 is emitted from fuel oil burned in vessels, the sulphur content of the fuel of vessels visiting UK harbours is limited to less than 0.1 %. In addition, the vessel movements are well below LAQM.TG(22) criteria outlined in the Spatial Scope section for an assessment of SO_2 emissions. The impact of SO_2 emissions from vessels is therefore scoped out of the assessment.
- Vessel emissions impacts on ecological receptors – Designated ecological sites located within 250 m of the proposed development berths and main areas of additional vessel manoeuvring include the Fal and Helford SAC, the Falmouth Bay to St Austell Bay SPA and the Lower Fal and Helford Intertidal Site of Special Scientific Interest (SSSI). There are no habitats sensitive to nitrogen deposition within the SPA. Habitats sensitive to nitrogen within the SAC and SSSI include salt marshes and vegetated sea cliffs; however, salt marshes and vegetative sea cliffs are not located within 250 m of the berths and main areas of manoeuvring[18]. The impacts of vessel emissions on ecological receptors will therefore be negligible and the effects not significant.
- Operational stage vehicle emissions – The operation of the proposed development is projected to generate a total of 48 vehicle movements per day with 29 heavy duty vehicles (HDVs) as annual average daily traffic (AADT). The projected vehicle movements do not exceed the EPUK/IAQM criteria outlined in the Spatial Scope section for an assessment of road traffic emissions on human health to be necessary. A specific air quality assessment of operational stage road traffic emissions on human health receptors has therefore not been undertaken as impacts would be negligible and the effects not significant.

Spatial Scope

15.3.5 The study area for the demolition and construction stage dust and amenity assessment extends up to 250 m from the site boundary, and 50 m from the routes anticipated to be used by demolition and construction vehicles on the public highway and up to 250 m from the site entrances in accordance with IAQM Guidance.

15.3.6 For the assessment of road traffic emissions during the demolition and construction stage, the study area for human health receptors has been defined as roads which would experience a significant increase in development traffic that may lead to adverse effects on local air quality, in accordance with EPUK/IAQM Guidance and LAQM.TG(22). The selection of receptors has been based on locations which are likely to see the largest increases in traffic and where there is potential congestion and current air quality is poorest.

15.3.7 EPUK/IAQM Guidance provides the following indicative criteria for when a detailed air quality assessment may be required:

- A change of Light Duty Vehicles (LDVs) flows of more than 100 AADT within or adjacent to an Air Quality Management Area (AQMA) or more than 500 AADT elsewhere.
- A change of HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.

15.3.8 There are no AQMAs within Falmouth and therefore the criteria outside of an AQMA would apply for the assessment.

15.3.9 For designated nature conservation sites, the criteria for an assessment to be undertaken is a change in traffic of more than 1,000 vehicles per day or 200 HDVs on a road within 200 m of a designated habitat (including Local Nature Reserves (LNR), Local Wildlife Sites (LWS) and Ancient Woodland (AW)) alone or in combination with other developments[19]. The AADT thresholds do not themselves imply any intrinsic environmental effect and are used to indicate potential need for further investigation.

15.3.10 For the assessment of odour, effects have been considered at sensitive receptors located within 400 m of the areas to be dredged and where dredged material may be stockpiled.

15.3.11 The predicted increase in vessel movements (12 freight ships and 11 excellence class cruise ships per year) would be well below the LAQM.TG(22) assessment screening level of 5,000 large ship movements per year. Therefore, the effect of vessel emissions have been assessed qualitatively at receptors within 250 m of the berths and main areas of manoeuvring in line with LAQM.TG(22).

15.3.12 For the assessment of site suitability, the study area is defined by locations on-site where members of the public might be expected to be regularly present over the averaging period of the short-term national air quality objectives (NAQOs), as cruise ships typically dock for a day (arrive during the morning high-tide and depart during the evening high-tide).

15.3.13 The study area is presented in Figure 15.1.

[17] Natural England. Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. NEA001 June 2018

[18] Air Pollution Information System, 2024. Site Relevant Critical Loads and Source Attribution. Available: https://www.apis.ac.uk/srcl

[19] Highways England. Design Manual for Roads and Bridges LA105 Air Quality. Revision 0.

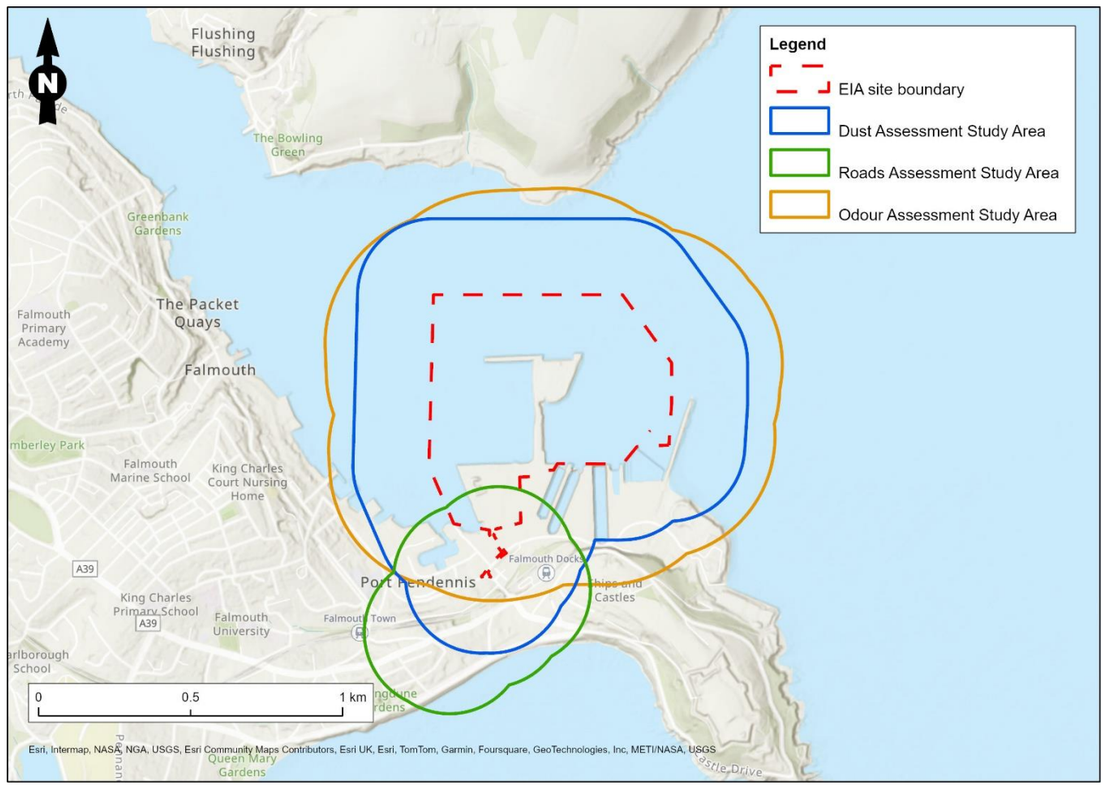


Figure 15.1: Assessment of Effects Study Area

Temporal Scope and Assessment Scenarios

15.3.14 The assessment has considered impacts arising during the demolition and construction stage which would be of expected to be temporary and short-term in nature (up to 5 years) and from the operational stage which would be expected to be permanent and long-term in nature (i.e. more than 10 years).

Demolition and Construction Stage

15.3.15 The demolition and construction assessment has predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations from road traffic for the following scenarios:

- Scenario 1 Baseline: existing baseline (2023);
- Scenario 2 Do Minimum: future baseline traffic without the proposed development (2026); and
- Scenario 3 Do Something: future baseline traffic with peak demolition and construction stage traffic (2026).

15.3.16 For Scenario 1, 2023 emission rates and background concentrations were used in combination with 2023 baseline traffic flows.

15.3.17 For Scenario 2, 2026 emission rates and background concentrations were used in combination with 2026 baseline traffic flows.

15.3.18 For Scenario 3, 2026 emission rates and background concentrations were used in combination with 2026 baseline traffic flows and peak demolition and construction stage vehicle movements.

[20] Cornwall Council, 2023. 2023 Air Quality Annual Status Report (ASR).

15.4 Baseline Characterisation Method

Desk Study

15.4.1 In order to establish the existing baseline air quality conditions in the study area, relevant data was reviewed and assessed. The data sets and associated sources can be summarised as follows:

- Air quality monitoring available in the latest CC air quality status report[20]; and
- Defra background pollution maps[21].

Field Study

15.4.2 Field study/data collection was not required at the site as the data provided by other sources was deemed to be adequate and representative of the site conditions.

15.5 Assessment Method

Methodology

Demolition and Construction Stage

Dust and Amenity

15.5.1 During the demolition and construction stage, there would be potential impacts from dust annoyance and locally elevated concentrations of PM_{10}. The suspension of particles in the air is dependent on surface characteristics, weather conditions and on-site activities. These impacts have the potential to occur when dust generating activities coincide with dry, windy conditions, and where sensitive receptors are located downwind of the dust source. Separation distance is also an important factor as dust annoyance is usually limited to within a few hundred metres of its source. This is due to the rapid decrease in concentrations with distance from the source due to dispersion.

15.5.2 The assessment of potential demolition and construction dust impacts has followed IAQM Guidance.

15.5.3 The IAQM assessment methodology considers three separate dust effects and defines their significance according to the sensitivity of the surrounding area, as follows:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to PM_{10}.

15.5.4 IAQM Guidance recommends that the risk of dust emission magnitude is combined with the sensitivity of the study area to determine the risk of dust impacts from demolition and construction stage activities. The risk of dust arising in sufficient quantities to cause annoyance and/or health impacts is determined using four risk categories: high, medium, low, or negligible. Depending on the level of risk for each activity, appropriate mitigation is selected.

15.5.5 Full details of the dust risk assessment methodology are provided in Technical Appendix 15.2.

Odour

15.5.6 The dredging operations have the potential to lead to odour emissions impacting on existing receptors in the area when the seabed material is brought to the surface. Odour generating activities will be intermittent and short-term in nature with varying and unknown odour source strength. It would not be possible to accurately model odour emissions from the dredging activities and therefore an assessment using the source-pathway-receptor (SPR) approach within the IAQM odour guidance has been used to assess the effects. The SPR approach is described in Technical Appendix 15.2.

15.5.7 The odour source potential, pathway effectiveness, and receptor sensitivity factors are combined with the source odour strength to determine the risk of odour exposure and the significance of the effect.

Road Traffic Emissions

[21] Defra, 2021. Background Mapping data for local authorities. Available: https://uk-air.defra.gov.uk/data/laqm-background-home (accessed 21 November 2024)

15.5.8 The changes to air quality due to demolition and construction stage traffic emissions have been predicted using the ADMS-Roads dispersion model. The model has been extensively validated against both field and laboratory datasets and against monitoring data in cities throughout the UK.

15.5.9 ADMS-Roads requires the user to provide various input data, including the AADT flows, the proportion of HDV, road characteristics (including road width, street canyon height, and gradients where applicable), and the vehicle speed. The demolition and construction traffic data were entered into the ADMS-Roads model, along with speed data to provide emission rates for each of the modelled road links. Model input parameters and data, including traffic data, are provided in Technical Appendix 15.2. Information on the trip generation and transport modelling approach that has been adopted is provided in ES Chapter 13: Transport and Accessibility.

15.5.10 Traffic emissions were calculated using the Emission Factors Toolkit (EFT) v12 which utilises nitrogen oxides (NO_x), PM_{10} and $PM_{2.5}$ emission factors from the European Environment Agency COPERT 5 emission tool. The predicted concentrations of roadside NO_x were converted to roadside NO_2 using the LAQM conversion calculator[22].

15.5.11 ADMS-Roads was executed using appropriate and representative meteorological data from Culdrose meteorological station. Full details of modelling parameters and data are provided in Technical Appendix 15.2.

15.5.12 The accuracy of the modelled road concentrations could not be verified against local monitoring data as there is none available in Falmouth. A verification factor was derived from a review of recent modelling studies undertaken by Ramboll. The highest factor calculated from previous modelling studies during the 12-month period prior to undertaking this assessment was used as a conservative approach to minimising underprediction in the model outputs. Details on the verification process are presented in Technical Appendix 15.2.

Operational Stage

Vessel Emissions

15.5.13 A qualitative assessment of operational stage vessel emissions has been undertaken to determine the effect on air quality at sensitive human health receptors.

15.5.14 The assessment has been carried out by considering the predicted number of additional vessel movements, baseline air quality, emission height and distance to sensitive receptors.

Site Suitability

15.5.15 A qualitative assessment has been carried out of the site's suitability for the proposed uses following the same methodology as the assessment of operational stage vessel emissions.

15.6 Assessment Criteria

15.6.1 The general criteria used to assess if an effect is significant or not, is set out in ES Chapter 2 EIA Process and Methodology; further details are provided herein. This is determined by consideration of the sensitivity of the receptor, magnitude of impact and scale of the effect. In considering the significance of an effect, consideration has been given to the duration of the effect, the geographical extent of the effect and the application of professional judgement.

Receptor Sensitivity/Value Criteria

Demolition and Construction Stage

Dust and Amenity

15.6.2 The sensitivity of receptors has been classified as low, medium, or high, in accordance with the criteria presented in Table 15.2.

Table 15.2: Receptor Sensitivity Criteria

Pollutant	Time Period
Low	• The enjoyment of amenity would not reasonably be expected; or • Property would not reasonably be expected to be diminished in appearance, aesthetics, or value by soiling; or • There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. • Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.
Medium	• Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or • First occupants moving into residential dwellings on a large, phased housing development; or • The appearance, aesthetics or value of their property could be diminished by soiling; or • The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. • Indicative examples include parks and places of work.
High	• Users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. • Indicative examples include dwellings, museums, and other culturally important collections, medium- and long-term car parks and car showrooms.

Odour

15.6.3 The sensitivity of receptors to odour impacts have been classified as low, medium, or high, in accordance with the criteria presented in Table 15.3.

Table 15.3: Receptor Sensitivity Criteria for Odour Impacts

Classification	Example
Low	Surrounding land where: • The enjoyment of amenity would not reasonably be expected; or • There is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples may include industrial use, farms, footpaths and roads
Medium	Surrounding land where: • Users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level of amenity as in their home; or • People wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples may include places of work, commercial/retail premises and playing/recreation fields.
High	Surrounding land where: • Users can reasonably expect enjoyment of a high level of amenity; and • People would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of the use of the land.

22 Department for Environment Food and Rural Affairs, 2020. NOX to NO2 Calculator v8.1. Available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/

Table 15.3: Receptor Sensitivity Criteria for Odour Impacts	
Classification	**Example**
	Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.

Road Traffic and Vessel Emissions

15.6.4 The NAQOs are the concentrations of pollutants in the atmosphere which can broadly be taken to achieve an acceptable level of environmental quality. The standards are based on the assessment of the effects on human health (including sensitive sub-groups) or ecosystems. In general, these are concentration limits, above which sensitive members of the public (e.g., children, the elderly and the unwell) might experience adverse health effects. Objectives are policy targets often expressed as maximum concentrations not to be exceeded either without exception or with a limited number of exceedances within a specified timescale.

15.6.5 For some pollutants, there are both long-term (e.g., annual mean) and short-term (e.g., 1-hour mean) objectives. These periods reflect the varying impacts on health of differing exposures to pollutants. Long-term objectives are generally lower than short-term objectives owing to the chronic health effects associated with exposure to low concentrations of pollutants for longer periods of time.

15.6.6 The NAQOs relevant for this assessment are presented in Table 15.4.

Table 15.4: Human Health NAQOs		
Pollutant	**Time Period**	**Objective**
NO_2	Annual Mean	40 µg/m^3
	1-hour mean	200 µg/m^3 not to be exceeded more than 18 times a year
PM_{10}	Annual mean	40 µg/m^3
	24-hour mean	50 µg/m^3 not to be exceeded more than 35 times a year
$PM_{2.5}$	Annual Mean	20 µg/m^3

15.6.7 There are no degrees of sensitivity of receptors to poor air quality, rather, members of the public are all deemed to be sensitive receptors and the assessment is based on whether they are likely to be present for the averaging period of the objective. This is dependent on the land use at a particular location, i.e. the annual mean NAQO is applicable at residential properties, schools and hospitals, whilst the short-term objectives apply to locations where people are present for shorter periods such as commercial buildings, gardens, parks and shopping streets.

15.6.8 The NAQOs have been applied to external air where there is relevant exposure to the public over the associated averaging periods within each NAQO, as detailed in Table 15.5 and specified by LAQM.TG(22). The NAQOs do not apply to indoor workplace locations, to internal air or where members of the public are unlikely to be regularly exposed (i.e. centre of roadways).

Table 15.5: Locations Where Air Quality Objectives Apply		
Averaging Period	**Objectives Should Apply at**	**Objectives Should Generally Not Apply at**
Annual mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access.

Table 15.5: Locations Where Air Quality Objectives Apply		
Averaging Period	**Objectives Should Apply at**	**Objectives Should Generally Not Apply at**
24-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1-hour mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expect to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

15.6.9 Based on the above table, only the 1-hour mean objective would apply to members of the public who were within the site.

Operational Stage

Vessel Emissions

15.6.10 The same receptor sensitivity/value criteria apply for the operational stage as for the demolition and construction stage.

Impact Magnitude Criteria

Demolition and Construction Stage

Dust and Amenity

15.6.11 According to IAQM Guidance, the dust risk assessment is undertaken to classify the risk of dust impacts and determine the appropriate level of mitigation to be applied; it does not determine the impact magnitude *per se*.

Odour

15.6.12 The criteria provided in IAQM Guidance was used to assess the potential risk of odour impacts to air quality from demolition and construction activity in the absence of mitigation. The approach involves establishing the source odour potential and pathway effectiveness to determine the risk of odour exposure. The risk of the odour exposure is then combined with the receptor sensitivity to determine the magnitude of the effect. As the odour effect is directly determined from the risk of odour exposure and the receptor sensitivity, the impact magnitude is not determined. Full details of the odour risk assessment methodology are provided in Technical Appendix 15.2.

Road Traffic Emissions

15.6.13 The assessment of operational stage impacts on local air quality has used the approach developed by the EPUK/IAQM Guidance, which considers the change in air quality resulting from a new development on existing receptors. EPUK/IAQM Guidance has produced a matrix which is used to calculate the impacts at individual receptor locations, as presented in Table 15.6.

15.6.14 EPUK/IAQM Guidance considers both the magnitude of change at each receptor and the resulting overall concentration. The absolute concentration at the receptor is also taken into consideration i.e., if the receptor is close to or above the NAQO, marginal changes in magnitude may be determined to be

moderate; however, if the receptor is less than 75 % of the NAQO level marginal changes in magnitude may be determined to be negligible.

Table 15.6: EPUK/IAQM Impact Descriptors for Individual High Sensitivity Receptors

Long-Term Average Concentration at Receptor with Development	**Percentage (%) Change in Concentration Relative to Annual Mean NAQO**			
	<1	**2 - 5**	**6 - 10**	**>10**
75 % or less of NAQO	Negligible	Negligible	Slight	Moderate
76 - 94 % of NAQO	Negligible	Slight	Moderate	Moderate
76 - 94 % of NAQO	Negligible	Slight	Moderate	Moderate
95 - 102 % of NAQO	Slight	Moderate	Moderate	Substantial
103 - 109 % of NAQO	Moderate	Moderate	Substantial	Substantial

Notes:

The impact is described as adverse where concentrations increase, and beneficial where concentrations decrease.

% change rounded to nearest whole number, where the % change is less than 0.5 % the impact would be Negligible.

15.6.15 Similar criteria have not been provided for locations where the short-term NAQOs would apply, i.e., amenity and commercial locations. In urban areas, particularly where residential receptors are widespread, it is generally accepted that the annual mean NAQOs, applicable at high sensitivity receptors, are the most reliable for evaluating the severity of impacts. Research has concluded that exceedances of the 1-hour mean NO_2 NAQO are unlikely to occur where annual mean concentrations do not exceed 60 µg/m^3 [13] and road traffic is the principal source of pollution. This relationship was used to assess whether exceedances of the NO_2 1-hour mean objective are likely. Similarly, PM_{10} annual mean concentrations below 32 µg/m^3 were used to screen the 24-hour PM_{10} mean NAQO.

Operational Stage

Vessel Emissions

15.6.16 The same assessment criteria apply as for the demolition and construction stage road traffic emissions.

Site Suitability

15.6.17 There is no official guidance in the UK on how to assess the significance of air quality impacts of emission sources on proposed receptors introduced by a development. In accordance with standard industry practice, the assessment of the site suitability for the proposed development's uses has been scoped to predict air quality at the site.

15.6.18 Site suitability is based on whether the NAQOs for each pollutant are exceeded or not. In the event that predicted pollutant concentrations exceed the NAQOs, mitigation would be required to bring pollutant concentrations down to protect new receptors from poor air quality.

15.6.19 As outlined in Table 15.5, the NAQOs only apply to locations where members of the public are likely to receive relevant exposure. Therefore, site suitability has been assessed for short-term NAQOs at the site.

Scale of Effect Criteria

15.6.20 In determining the significance of reported effects, consideration has been given to the type of effect i.e. direct, indirect or secondary, the geographical extent of the effect and the duration of the effect i.e. temporary which is considered to be either short-term (up to 5 years) or medium-term (5-10 years) or long-term (10 years or more).

Demolition and Construction Stage

Dust and Amenity

15.6.21 IAQM Guidance recommends that no assessment of the significance of dust effects is made without mitigation in place, as mitigation is assumed to be secured by industry best practice, planning conditions, legal requirements or required by regulations. With appropriate mitigation in place, the effect of demolition and construction stage dust emission impacts on air quality is always assessed as not significant. The purpose of the demolition and construction stage dust assessment has therefore been to identify the appropriate level of mitigation to employ. This is a binary judgement, i.e., the overall effect is either significant or not significant, and there are no degrees of significance or scale of the overall effect.

15.6.22 Therefore, demolition and construction dust effects are considered to be not significant for existing human health and ecological receptors and proposed human health receptors. However, for the purposes of the EIA and to enable a consistent comparative intra-cumulative assessment to be undertaken in ES Chapter 20: Intra-Cumulative Effects, the following approach has been adopted; the scale of demolition and construction dust effects is considered to be **Minor Adverse** for all receptor types.

Odour

15.6.23 For odour, the risk category from the source-pathway-receptor assessment is combined with the receptor sensitivity to give the odour effect for different receptor classes as shown in Table 15.7.

Table 15.7: Magnitude of Odour Effect

Risk of Odour Exposure	**Receptor Sensitivity**		
	Low	**Medium**	**High**
High	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
Medium	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect
Low	Negligible Effect	Negligible Effect	Slight Adverse Effect
Negligible	Negligible Effect	Negligible Effect	Negligible Effect

15.6.24 Where the effect is moderate or substantial this is judged to be a significant effect, a negligible or slight adverse effect would be considered 'not significant'. In addition, IAQM Guidance states that:

> "Concluding that an effect is significant should not mean, of itself, that a development proposal is unacceptable and the planning application should be refused; rather, it should mean that careful consideration needs to be given to the consequences, scope for securing further mitigation, and the balance with any wider environmental, social and economic benefits that the proposal would bring."

15.6.25 The overall effect at existing human health receptors is considered to be either significant or not significant. However, for the purposes of the EIA and to enable a consistent, comparative intra-cumulative assessment within ES Chapter 20: Intra-Cumulative Effects, the following scaled approach has been adopted;

- overall 'not significant' effects are considered to be **Minor Adverse**; and
- overall 'significant' effects are considered to be **Moderate Adverse**.

Road Traffic Emissions

15.6.26 For the increase in emissions as a result of demolition and construction stage activity the significance criteria/factors outlined below have been used. As indicated by the EPUK/IAQM Guidance, professional judgement has been used to determine the overall significance of air quality effects.

15.6.27 The EPUK/IAQM Guidance states that the overall significance of the effect on air quality should be based on professional judgement, considering the predicted impacts at the modelled receptor locations and *"…will need to take into account such factors as:*

- The existing and future air quality in the absence of the development;
- The extent of current and future population exposure to the impacts; and
- The influence and validity of any assumptions adopted when undertaking the prediction of impacts."

15.6.28 At individual receptor locations, a moderate or substantial impact is judged to be significant, whereas a negligible or slight impact is not significant. The EPUK/IAQM Guidance states that the overall significance of the effect on local air quality is a binary judgement. Therefore, the overall effect at existing human health receptors and ecological receptors is considered to be either significant or not significant.

15.6.29 Therefore, the overall effect at existing human health receptors is considered to be either significant or not significant. However, for the purposes of the EIA and to enable a consistent, comparative intra-cumulative assessment within ES Chapter 20: Intra-Cumulative Effects, the following scaled approach has been adopted;

- overall 'not significant' effects are considered to be **Minor Adverse**; and
- overall 'significant' effects are considered to be **Moderate Adverse**.

Operational Stage

Vessel Emissions

15.6.30 The same assessment criteria apply as for the demolition and construction stage road traffic emissions.

Site Suitability

15.6.31 The assessment of the site suitability for the proposed development has been based on whether the short-term NAQOs for each pollutant are exceeded or not.

15.6.32 For the purposes of the EIA and to enable a consistent, comparative intra-cumulative assessment within ES Chapter 20: intra-Cumulative Effects, the following scaled approach has been adopted;

- where a pollutant concentration is below the NAQO, the scale of effect is considered to be **Minor Adverse**.

Nature of Effect Criteria

15.6.33 The nature of the effect is in accordance with Chapter 2 and has been described as either adverse, neutral or beneficial.

15.7 Assumptions and Limitations

15.7.1 The assessment has relied on data provided by CC, Defra and the Applicant's transport consultant (Ramboll) to characterise baseline conditions of the study area. It has been assumed that these datasets have been reported correctly.

15.7.2 There are many components that contribute to the uncertainty in modelled pollutant concentrations. Although ADMS-Roads have been extensively validated against field datasets and their use has gained wide acceptance throughout the UK, no computer-based model is able to totally replicate actual conditions as it is required to simplify real-world conditions into a series of algorithms. The models used in this assessment are also dependent upon several sources of data which will have inherent uncertainties associated with them.

15.7.3 Model verification has used a conservative adjustment factor obtained from a review of recent projects verification process. Whilst this introduces a level of uncertainty into the predicted concentrations as a result of road traffic impacts, the significance has been discussed in relation to the predicted concentrations resulting from the modelling.

15.7.4 The proposed development traffic impacts have been assessed using predicted traffic flows generated by Ramboll. Traffic data has been used to establish the exiting baseline, future baseline, and future baseline with peak demolition and construction traffic. Further details on the methodology followed to determine model traffic data used in this assessment are outlined in ES Chapter 13: Transport and Accessibility.

15.7.5 Traffic emissions were calculated using the EFT v12, which utilises emission factors from the European Environment Agency COPERT 5 emission tool. The assessment has assumed air quality at background and roadside locations is expected to improve in future years due to the gradual renewal of the vehicle fleet with less polluting and more efficient models.

15.7.6 It is difficult to predict impacts on short-term objectives from traffic impacts as the air quality model (as set up for the assessment) does not provide reliable prediction of 1-hour mean NO_2 concentrations. The relationship between annual mean concentrations and 1-hour concentrations was used to assess whether exceedances of the 1-hour mean objective for NO_2. Similarly, the relationship between annual mean concentrations and 24-hour concentrations was used to assess whether exceedances of the 24-hour mean objective for PM_{10}[13].

15.7.7 Notwithstanding these assumptions and limitations, the methodology adopted for this assessment is considered robust, utilising reasonably available information, and conforms to the requirement of relevant guidance and standard practice.

15.8 Baseline Conditions

Existing Baseline

15.8.1 CC has investigated air quality within its jurisdiction as part of its responsibilities under the LAQM regime. Baseline air quality surrounding the site is likely to be primarily influenced by emissions from local road traffic, including traffic accessing Falmouth Docks, as well as emissions from existing vessels using Falmouth Docks.

15.8.2 CC have declared nine AQMAs; the site is not located in an AQMA and the closest AQMA (Kerrier AQMA) is located approximately 14 km north-west of the site and was declared for exceedances of the annual mean NO_2 NAQO.

15.8.3 CC operates both continuous automatic monitoring and passive diffusion tube monitoring of air quality at a number of locations. A summary of the closest and most representative monitoring locations for the site are presented in Figure 15.2 and Table 15.8.

15.8.4 Air quality monitoring in the immediate vicinity of the site has not been undertaken since 2020. CC no longer monitor air quality in Falmouth due to pollutant concentrations in the area continuously being recorded well below the NAQOs. The closest monitoring sites are now located in Ponsanooth (PNS1, PNS2 and PNS3) approximately 7.5 km north-west of the site.

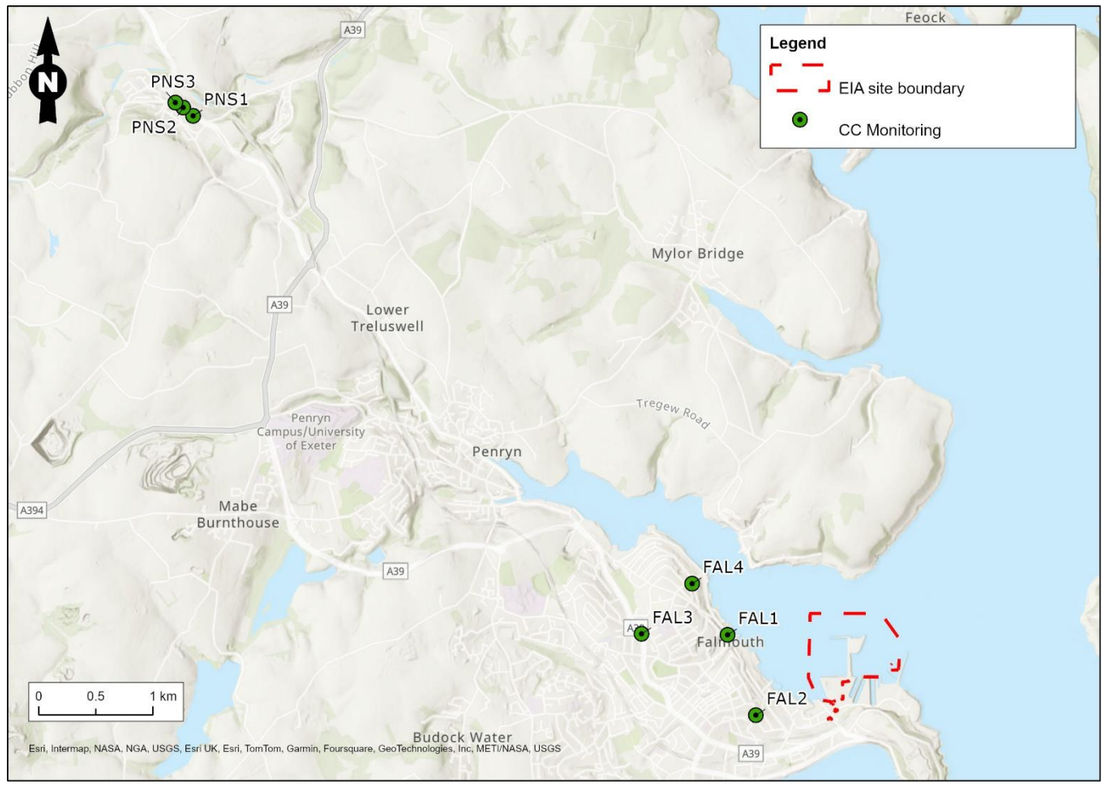


Figure 15.2: Monitoring Locations

Table 15.8: Measured Annual Mean NO_2 Concentrations (µg/m³)

Site ID	Type	2018	2019	2020	2021	2022
FAL1	Roadside	17.6*	15.8	11.7	-	-
FAL2	Roadside	14.9	15.1	12.6	-	-
FAL3	Roadside	21.3	21.5	16.7*	-	-
FAL4	Urban Background	9.0*	8.7	6.4*	-	-
PNS1	Roadside	-	-	-	31.5	31.5
PNS2	Roadside	-	-	-	19.7	25.0
PNS3	Roadside	-	-	-	36.5*	30.5
Objective		40				

Notes:
* data capture <75 %

15.8.5 Table 15.8 shows the annual mean NO_2 NAQO was not exceeded at monitoring locations between 2018 and 2022. NO_2 concentrations monitored in 2020 and 2021 would have been impacted by reductions in human activity during the Covid-19 pandemic; however, Table 15.8 shows annual mean NO_2 concentrations remained well below the NAQO at PNS1, PNS2 and PNS3 in 2022.

15.8.6 The monitoring data outlined in Table 15.8 also indicates the 1-hour mean NO_2 NAQO is unlikely to have been exceeded in the study area between 2018 to 2022 as annual mean NO_2 concentrations were below 60 µg/m³.

15.8.7 CC undertake continuous monitoring for PM_{10} and $PM_{2.5}$, however, there is no PM monitoring undertaken in proximity to the site. The most recently available CC ASR shows there were no exceedances of the PM_{10} and $PM_{2.5}$ NAQOs at monitoring sites outside the study area between 2018 and 2022.

Defra Background Maps

15.8.8 In addition to measured concentrations, estimated background concentrations from the national maps provided by Defra were obtained for NO_2, PM_{10} and $PM_{2.5}$ for the site.

15.8.9 Background concentrations are those levels that would be observed away from specific sources such as roads and industry and are therefore likely to be observed across most of the site. Background concentrations for the site have been defined using the national pollution maps published by Defra. These cover the whole country on a 1 km² grid.

15.8.10 Background concentrations for the existing baseline (2023) are outlined in Table 15.9.

Table 15.9: Defra's Mapped 2023 Annual Mean Background Concentrations (µg/m³)

Grid Reference	NO_2	PM_{10}	$PM_{2.5}$
181500, 032500	15.3	10.3	5.8
181500, 033500	8.0	10.4	5.5
182500, 032500	8.5	9.8	5.4
182500, 033500	7.5	9.6	5.2
Objective	40	40	20

Future Baseline

15.8.11 Air quality at background and roadside locations is expected to improve in future years due to the gradual renewal of the vehicle fleet with less polluting and more efficient engines. National policies such as the intention to ban new combustion engine private vehicle sales by 2035 will hasten and enforce this process.

15.8.12 Table 15.10 presents the NO_2, PM_{10} and $PM_{2.5}$ background concentrations at the site for 2027, the earliest year the site is expected to first become operational.

Table 15.10: Defra's Mapped 2027 Annual Mean Background Concentrations (µg/m³)

Grid Reference	NO_2	PM_{10}	$PM_{2.5}$
181500, 032500	14.8	10.0	5.5
181500, 033500	7.2	10.1	5.2
182500, 032500	7.7	9.5	5.1
182500, 033500	6.7	9.3	5.0
Objective	40	40	20

15.8.13 Table 15.10 indicates background concentrations would decrease from 2023 to 2027 and would be well below the annual mean NAQOs.

Sensitive Receptors

Road Traffic Emissions

15.8.14 The receptors identified as sensitive to emissions from increased road traffic emissions during the demolition and construction stage, and which have been 'scoped-in' to the assessment are summarised in Table 15.12 and shown in Figure 15.3.

15.8.15 Human health receptors have been assessed adjacent to those roads which would experience a significant increase in development traffic that may lead to adverse effects on local air quality, in accordance with EPUK/IAQM Guidance.

15.8.16 Sensitive receptors were chosen to represent places where members of the public receptors would receive relevant exposure to long- and short-term pollutant concentrations from road traffic.

15.8.17 When identifying road traffic receptors, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested, where there is a combined effect of several road links and where the traffic flows generated by the proposed development exceed the EPUK/IAQM Guidance thresholds.

15.8.18 Existing human health receptors were modelled at 1.5 m high to represent exposure at Ground Floor level.

Table 15.11: Summary of Sensitive Receptors to Road Traffic Emissions

Receptor ID	Description	X (m)	Y (m)	Hight (m)
R01	Railway Cottages (Residential)	181645.2	32322.7	1.5
R02	Bar Road (Residential)	181619.1	32286.0	1.5
R03	Bar Road (Residential)	181660.8	32249.5	1.5
R04	Pendennis Rise (Student Accommodation)	181698.4	32233.9	1.5
R05	Ridge House Apartments (Residential)	181618.2	32163.2	1.5
R06	Melvill Road (Residential)	181485.1	32076.7	1.5
R07	Lansdowne Road (Residential)	181454.1	32094.4	1.5
R08	Trelawny House (Retirement Living)	181549.6	32265.9	1.5
R09	Imperial Court (Residential)	181599.6	32255.3	1.5

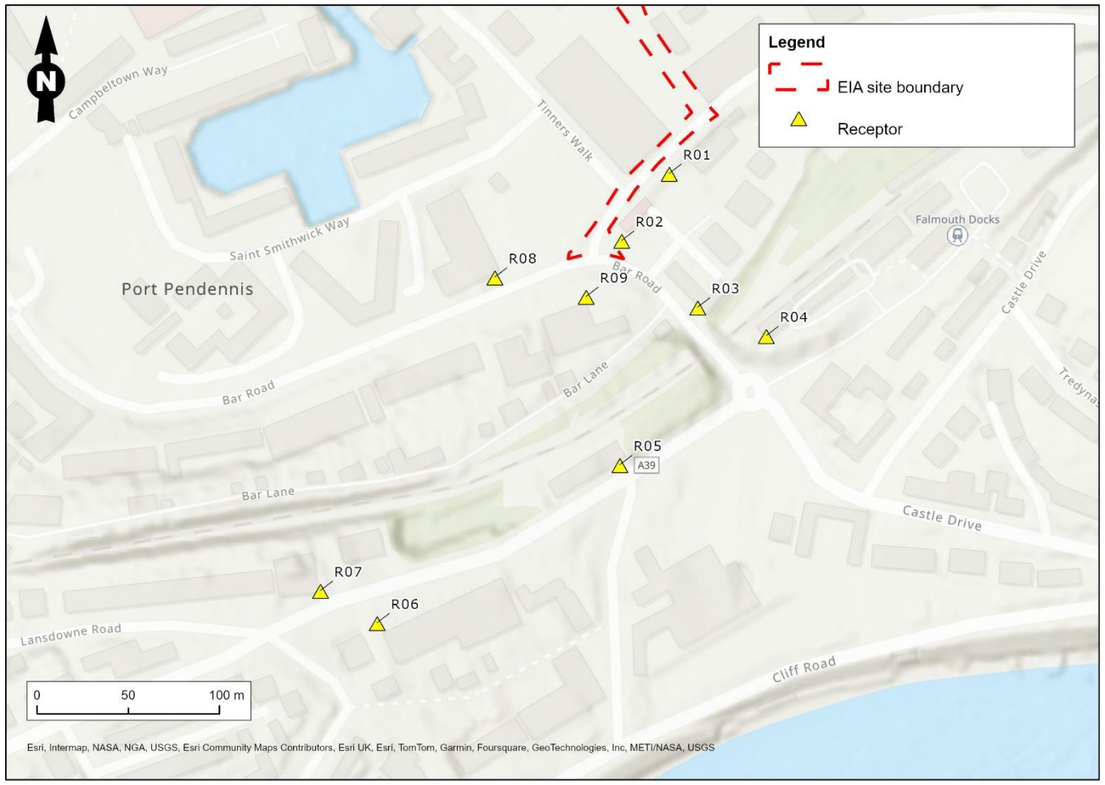


Figure 15.3: Sensitive Receptors for Demolition and Construction Stage Road Traffic Emissions

Vessel Emissions and Odour

15.8.19 The receptors identified as sensitive to emissions from construction activities and increased vessel activity associated with the operation of the proposed development, and which have been 'scoped-in' to the assessment are summarised in Table 15.12 and shown in Figure 15.4

15.8.20 Sensitive receptors were chosen to reflect places where members of the public would receive relevant exposure to long- and short-term pollutant concentrations and odour within 250 m of the site boundary.

Table 15.12: Summary of Sensitive Receptors to Vessel Emissions and Odour

Receptor	Description	Sensitivity
Assessment of Effects		
Residential properties	Predominantly located south and south-west of the site, the closest residential properties include Challenger Quay, those on Tinners Walk, Railway Cottages, St Smithwick Way, Bar Road and Pendennis Rise	High
Retirement Home	Trelawny House, Bar Road	High
Student Accommodation	Pendennis Rise	High

Table 15.12: Summary of Sensitive Receptors to Vessel Emissions and Odour		
Receptor	**Description**	**Sensitivity**
Assessment of Effects		
Commercial & Recreational Facilities	Discovery Quay, Mooring, Hotels and Holiday Rentals, the closet of which are predominantly located south and west of the site. National Maritime Museum	Medium

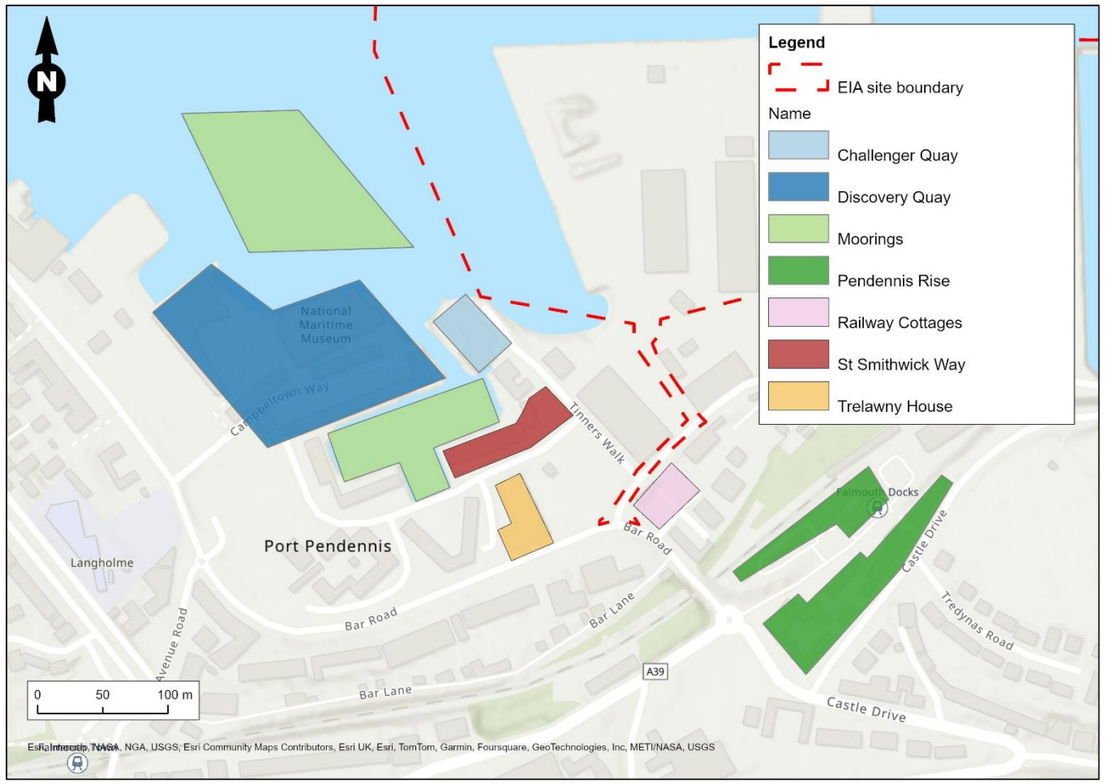


Figure 15.4: Sensitive Receptors for Vessel Emissions and Odour

Site Suitability

15.8.21 The proposed development introduces human health receptors sensitive to the short-term NAQOs due to cruise ship visits to the site. Future on-site receptors (cruise ship passengers) were considered when assessing site suitability regarding exposure to short-term pollutant concentrations during the operational stage.

15.9 Assessment of Effects

Demolition and Construction Stage

Dust and Amenity

15.9.1 Using the evaluation criteria within the IAQM's Guidance the potential dust emission magnitude has been identified for each stage of the proposed development as shown in Table 15.13 below.

Table 15.13: Dust Emissions Magnitude for Each Construction Activity		
Activity	**Dust Emission Magnitude**	**Justification**
Demolition	Small	Demolition of eight buildings would be less than 12,000 m^3.
Earthworks	N/A	No terrestrial earthworks required, existing quay is hardstanding, not applicable to dredging in marine environment.
Construction	Medium	Total building volume between 12,000 m^3 and 75,000 m^3. On-site concrete batching plant.
Trackout	N/A	No earthworks, limited potential for mud on vehicle wheels.

15.9.2 The next stage of the process is to define the sensitivity of the assessment area to dust soiling and human health impacts. This process combines the sensitivity of the receptor with distance from the source to determine the overall sensitivity as summarised in Table 15.14.

Table 15.14: Sensitivity of Area to Dust Impacts		
Sensitivity to Dust Soiling	**Sensitivity to Human Health Impacts**	**Sensitivity to Ecological Receptors**
Low – Residential properties more than 200 m from demolition and construction works, recreational receptors more than 100 m from demolition and construction works.	Low – Annual Mean PM_{10} concentrations below 24 µg/m^3 and residential properties more than 200 m from demolition and construction works, recreational receptors more than 100 m from demolition and construction works.	N/A – No terrestrial habitats within 50 m, marine habitats are considered not to be susceptible to airborne dust soiling/smothering.

15.9.3 The dust emission magnitude determined in Table 15.13 has been combined with the sensitivity assessment in Table 15.14 to define the risk of impacts for each construction activity of the proposed development in the absence of mitigation, as shown in Table 15.15.

Table 15.15: Risk of Dust Impacts in Absence of Mitigation				
Sensitivity of Surrounding Area to Impacts	**Dust Emission Magnitude**			
	Demolition (Small)	**Earthworks (N/A)**	**Construction (Medium)**	**Trackout (N/A)**
Dust Soiling (Low)	Negligible	N/A	Low Risk	N/A
Human Health (Low)	Negligible	N/A	Low Risk	N/A

15.9.4 The overall dust risk is predicted to be low in relation to construction activities and negligible in relation to demolition activities.

15.9.5 The IAQM Guidance recommends that no assessment of the significance of demolition and construction stage effects is made without mitigation in place. With the implementation of a Construction Environmental Management Plan (CEMP) and measures outlined in Table 15.16, the demolition and construction stage dust effects in the study area would be direct, temporary and **not significant**.

15.9.6 The control of dust emissions from construction sites relies upon good site management and mitigation techniques to reduce emissions of dust and limit dispersion. A summary of the mitigation measures recommended in the IAQM Guidance to reduce impacts from low-risk sites is provided in Table 15.16. It is recommended that these measures are included within a CEMP which could be secured through an appropriately worded planning condition. The proposed mitigation measures provided below are tried and tested and standard measures included in CEMPs on a regular basis.

Table 15.16: Recommended Dust Mitigation for Low Risk Sites

Stage	Mitigation Measure
Communications	Display the name and contact details of the responsible person for dust issues on site boundary in addition to head/regional office contact information.
Dust Management Plan	Develop and implement a Dust Management Plan (DMP) which would be included as part of the CEMP, to be approved by CC.
Site Management	Record all complaints and incidents in a site log. Take appropriate measures to reduce emissions in a timely manner, and record the measures taken within the log. Make the complaints log available to CC if requested. Record any exceptional dust incidents on- or off-site.
Monitoring	Undertake daily on- and off-site visual inspections where there are nearby receptors. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary. Carry out regular inspections to ensure compliance with the DMP and record results in the site logbook. Increase the frequency of inspections during activities with a high potential to create dust or in prolonged dry weather.
Preparing and Maintaining the Site	Plan site layout to locate dust generating activities as far as possible from receptors. Use solid screens around dusty activities and around stockpiles. Fully enclose the site or specific operations where there is a high potential for dust production and the site is active for an extensive period. If applicable, keep site fencing barriers and scaffolding clean using wet methods. Remove dust generating materials from site as soon as possible. Minimise emissions from stockpiles by covering, fencing, or damping down.
Operating Vehicle/Machinery and Sustainable Travel	Ensure vehicles switch off engines when stationary. Avoid use of diesel or petrol generators where possible.
Operations	Only use cutting, grinding, or sawing equipment with suitable dust suppression equipment or techniques. Ensure adequate water supply for effective dust and particulate matter suppression. Use enclosed chutes, conveyors, and covered skips. Minimise drop heights of materials. Ensure suitable cleaning material is available at all times to clean up spills.
Waste Management	No bonfires on-site.
Measures Specific to Construction	Avoid scabbling if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out. Concrete batching plant to be fitted with dust suppression as appropriate.

Odour

15.9.7 The dredging operations are described in Chapter 5: Construction and Demolition. The dredging process will involve the use of a backhoe dredger with a closed lid bucket and would be undertaken on a flood tide only (from 1.75 hours before low water to 1.75 hours before high water). If the dredging rate exceeds the rate at which material can be removed from site by HGV, there will be a requirement for temporary stockpiling of dredge material before it can be removed from site.

15.9.8 Odour from the dredged material will be released from the dredged areas as the sediment is brought to the surface and when the material is stored prior to removal from the site.

15.9.9 For the purposes of the odour assessment the dredging areas have been split into two; Western Wharf/Northern Wharf/North of Queens Wharf/Surface skim area, and South of Queens Wharf/North of Duchy Wharf.

15.9.10 Stockpiling could either occur in a vessel moored adjacent to one of the existing wharfs, the location of the mooring being dependent on which area was being dredged, or material could be stored on the quayside to the south of Duchy wharf. The latter option would involve placing the dredged material in a contained area to prevent leaching of contaminated water back into the sea. Given the available quayside space the likely storage volumes onshore would be small. In both cases odour would be released during the transfer of the sediment to the storage area and when it was removed from the storage area, but during storage the area would be covered thereby preventing odour release. The odour release would be intermittent and essentially the same, i.e. from a barge moored on one of the wharfs or from a storage area on the Duchy Wharf quayside during sediment transfer operations.

15.9.11 The assessment of odour emission impacts from the dredging and storage operations has been undertaken based on the source odour potential, pathway effectiveness and receptor sensitivity; the full results of which are detailed in Technical Appendix 15.3.

15.9.12 For the range of receptor locations assessed, the effect for both the dredging and storage operations is estimated to be temporary, reversible, short-term, direct **Negligible to Slight Adverse** (**not significant**).

Road Traffic Emissions

15.9.13 The results of the demolition and construction stage road traffic modelling assessment at existing receptors are shown in Table 15.17 to Table 15.19.

Table 15.17: Predicted Annual Mean NO_2 Concentrations

Receptor	Scenario 2 Do Minimum (µg/m³)	Scenario 3 Do Something (µg/m³)	Development Contribution (µg/m³)	Contribution Relative NAQO (%)	Impact Descriptor
R01	21.9	23.6	1.74	4.36	Negligible Adverse
R02	22.8	23.8	0.99	2.47	Negligible Adverse
R03	19.8	19.9	0.20	0.49	Negligible Adverse
R04	23.0	24.7	1.63	4.07	Negligible Adverse
R05	23.0	24.5	1.46	3.66	Negligible Adverse
R06	19.7	20.4	0.72	1.79	Negligible Adverse
R07	23.6	24.7	1.10	2.75	Negligible Adverse
R08	20.1	20.8	0.65	1.63	Negligible Adverse
R09	19.3	19.8	0.50	1.25	Negligible Adverse

Table 15.18: Predicted Annual Mean PM_{10} Concentrations

Receptor	Scenario 2 Do Minimum (µg/m³)	Scenario 3 Do Something (µg/m³)	Development Contribution (µg/m³)	Contribution Relative NAQO (%)	Impact Descriptor
R01	11.9	12.5	0.62	1.55	Negligible Adverse
R02	12.5	12.9	0.40	1.00	Negligible Adverse
R03	11.5	11.6	0.07	0.18	Negligible Adverse
R04	12.4	13.0	0.60	1.51	Negligible Adverse
R05	12.2	12.7	0.53	1.33	Negligible Adverse
R06	11.2	11.4	0.25	0.62	Negligible Adverse
R07	12.6	13.0	0.43	1.09	Negligible Adverse
R08	11.6	11.8	0.25	0.63	Negligible Adverse
R09	11.3	11.5	0.18	0.45	Negligible Adverse

Table 15.19: Predicted Annual Mean $PM_{2.5}$ Concentrations

Receptor	Scenario 2 Do Minimum (µg/m³)	Scenario 3 Do Something (µg/m³)	Development Contribution (µg/m³)	Contribution Relative NAQO (%)	Impact Descriptor
R01	6.5	6.8	0.32	1.62	Negligible Adverse
R02	6.8	7.0	0.21	1.05	Negligible Adverse
R03	6.3	6.3	0.04	0.19	Negligible Adverse
R04	6.7	7.0	0.31	1.56	Negligible Adverse
R05	6.7	6.9	0.28	1.39	Negligible Adverse
R06	6.1	6.2	0.13	0.65	Negligible Adverse
R07	6.9	7.1	0.23	1.14	Negligible Adverse
R08	6.3	6.4	0.13	0.66	Negligible Adverse
R09	6.1	6.2	0.09	0.47	Negligible Adverse

15.9.14 Table 15.17 to Table 15.19 shows the predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations in 2026 without and with the peak demolition and construction stage traffic are well below the relevant NAQOs at all assessed existing receptor locations.

15.9.15 Results also indicate the short-term NO_2 and PM_{10} NAQO is likely to be met at existing receptors during peak demolition and construction activity as annual mean concentrations do not exceed 60 µg/m³ and 32 µg/m³ respectively.

15.9.16 The largest change in pollutant concentrations relative to the annual mean NAQOs are 4.36 % for NO_2, 1.55 % for PM_{10} and 1.62 % for $PM_{2.5}$.

15.9.17 Using the criteria set out in Table 15.6, the impact on NO_2, PM_{10} and $PM_{2.5}$ concentrations is described as negligible adverse at all assessed receptors.

15.9.18 The demolition and construction phase traffic movements assume that dredged material is removed from site in just over a year as this is the maximum rate that material can be removed from site by HGV. The predicted change in concentrations is therefore limited to this one-year period and would be lower than predicted should the dredged material be removed at a slower rate.

15.9.19 The predicted impact of demolition and construction traffic is based on a model verification factor of 2.5 which is conservative when considered against the average of the factors obtained by Ramboll (see Technical Appendix 15.2). In addition, the predicted development contribution would need to more than double to more than 4.0µg/m³ before the impact became significant at a receptor in accordance with Table 15.6.

15.9.20 The effect on NO_2, PM_{10} and $PM_{2.5}$ concentrations at sensitive human health receptors due to demolition and construction stage road vehicle movements is considered temporary, reversible, short-term, direct **Negligible Adverse** (**not significant**).

Operational Stage

Vessel Emissions

15.9.21 Vessels accessing the proposed development would include but not be limited to:

- Cruise ships (up to Excellence Class);
- Cargo vessels;
- MoD vessels;
- Fishing vessels;
- Ships for repair; and
- Tugboats with the floating offshore wind (FLOW) devices.

15.9.22 The proposed development would increase freight activity and cruise ship capacity at Falmouth Docks whereas the other existing activities and associated berthing vessels would remain the same. It is assumed that 12 additional freight ships and 11 additional excellence class vessels would dock each year when the proposed development is operational.

15.9.23 The increase in vessel movements falls well below the LAQM.TG(22) indicative assessment threshold of 5,000 large ship movements per year for the expansion of an existing port; therefore, the increase of 11 excellence class vessels and 12 freight ships per year would not be expected to lead to a significant increase in emissions.

15.9.24 Cruise ship activity would typically occur between 01 April to 31 October with limited visits in the winter months. Following the completion of the proposed development, cruise ships would approach Falmouth Docks through the Carrick Roads channel and would berth alongside the wharfs. Currently, excellence class vessels anchor within the Carrick Roads area and cruise passengers are transported to Falmouth Docks via tender. The increase in berth capacity as a result of the proposed development is anticipated to reduce the number of tender calls as the port could accommodate larger cruise ships. Therefore, the proposed development is not expected to result in a significant increase in vessel emissions.

15.9.25 The proposed change in cruise ship berthing to Falmouth Dock is not expected to result in a significant increase in exposure to pollutants at nearby receptors. The vessel funnels are approximately 40 m above sea level resulting in effective dispersion of pollutants and while there are sensitive human health receptors located within 250 m of the site boundary, receptors are not located within 250 m of the cruise ship berths and main areas of manoeuvring. Therefore, the change in cruise ship berthing location is not expected to lead to a significant increase in pollutant concentrations at sensitive receptors.

15.9.26 Freight ships would continue to approach and berth at Falmouth Docks as they do for existing operations. Therefore, additional human health receptors would not be exposed to emissions from freight ships.

15.9.27 The assessment of baseline concentrations indicates that annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ are likely well below 75 % of the annual mean NAQOs and would remain so when the proposed development becomes operational. As outlined above, the increase in cruise ship movements and change to berth location is not expected to lead to a significant increase in emissions or pollutant exposure at sensitive receptors. Therefore, in accordance with Table 15.6, the impact of the change in vessel emissions associated with the proposed development are expected to be Negligible Adverse.

15.9.28 The effect on NO_2, PM_{10} and $PM_{2.5}$ concentrations at sensitive human health receptors due to the operation of the vessels at the proposed development is considered permanent, irreversible, long-term, direct **Negligible Adverse** (**not significant**).

Site Suitability

15.9.29 The assessment of baseline concentrations at the site showed annual mean NO_2 and PM_{10} concentrations are currently well below 60 µg/m^3 and 32 µg/m^3 respectively, indicating the short-term NAQOs are likely to currently be met at the site.

15.9.30 Emissions on the road network surrounding the proposed development are unlikely to affect pollutant concentrations across the site as concentrations, particularly NO_2, drop off rapidly moving away from emission sources. Furthermore, air quality at background and roadside locations is expected to improve in future years due to the gradual renewal of the vehicle fleet with less polluting and more efficient engines, as shown in the assessment of baseline conditions. Therefore, the short-term NO_2 and PM_{10} NAQOs are unlikely to be exceeded in the future.

15.9.31 As the operation of vessels associated with the proposed development are not expected to have a significant effect on pollutant concentrations, concentrations of NO_2 and PM_{10} are not expected to exceed short-term NAQOs as a result of the operation of the proposed development.

15.9.32 As the NO_2 and PM_{10} short-term NAQOs are not expected to be exceeded, the site is considered suitable for the proposed uses during the operational stage.

15.10 Additional Mitigation

Demolition and Construction Stage

15.10.1 No significant adverse effects have been predicted for the demolition and construction stage. Accordingly, no additional mitigation is required.

Operational Development Stage

15.10.2 No significant adverse effects have been predicted at existing receptors and consequently no additional mitigation is required.

15.10.3 An upgrade to the high voltage electrical network at the docks is due to be complete by March 2025 and this will enable the provision of shore power units which will reduce vessel emissions.

15.10.4 The site is considered suitable for the development type proposed, with NO_2 and PM_{10} concentrations expected to be well within the short-term NAQOs at future receptors introduced by the proposed development. Accordingly, no additional mitigation is required.

15.11 Enhancement Measures

15.11.1 No enhancement measures are proposed in respect of air quality.

15.12 Demolition and Construction Residual Effects

15.12.1 As no additional mitigation would be required, the residual demolition and construction effects remain as reported in the assessment of effects section.

15.13 Operational Development Residual Effects

15.13.1 As no additional mitigation would be required, the residual operational development effects remain as reported in the assessment of effects section.

15.14 Summary of Significant Effects

15.14.1 Table 15.20 provides a tabulated summary of the outcomes of the air quality assessment of the proposed development. It reports on the likely significant effects with respect to air quality associated with the demolition and construction and operational stages of the proposed development.

Table 15.20: Summary of Air Quality Effects

Receptor	Description of Effect	Pre-Additional Mitigation Effect: Scale/ Nature/ Significance*	Additional Mitigation	Post-Additional Mitigation Effect: Scale/ Nature/ Significance*	Details of Residual Effect			
					Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Short-term/ Medium-term/ Long-term
Demolition and Construction								
Human health and amenity	Dust impacts	Not significant	Not required	Not significant	Direct	Temporary	Reversible	Short-term
Sensitive receptors to odour	Odour emissions from dredging	Negligible to Slight / Adverse / Not Significant	Not required	Negligible to Slight / Adverse/ Not Significant	Direct	Temporary	Reversible	Short-term
Off-site human health receptors	Vehicle exhaust emissions and the associated air quality effects of NO_2, PM_{10} and $PM_{2.5}$	Negligible / Adverse / Not Significant	Not required	Not Significant	Direct	Temporary	Reversible	Short-term
Operational Development								
Sensitive receptors to vessel emissions	Vessel emissions	Negligible / Adverse / Not Significant	Not required	Not Significant	Direct	Permanent	Irreversible	Long-term
On-site human health receptors	Air pollutant impacts from existing and new emissions sources	Suitable (Not Significant)	Not required	Suitable (Not Significant)	Direct	Permanent	Irreversible	Long-term

* For dust impacts and impacts from vehicle emissions there are no degrees of significance of effect as it is judged in the overall sense.

15.15 Cumulative Effects

Intra-Project Effects

15.15.1 As explained in Chapter 2: EIA Process and Methodology, intra-project cumulative effects are discussed in Chapter 20: Intra-Cumulative Effects.

Inter-Project Effects

15.15.2 No development projects have been identified as likely to have inter-project cumulative effects