18 AIR QUALITY

This section of the EIA Report provides an overview of baseline air quality within the area, identifies appropriate receptors to air quality impacts and considers the potential for impacts on these receptors as a result of the following:

- construction phase dust and particulate matter emissions;
- construction and operational phase plant exhaust emissions;
- construction and operational phase vessel exhaust emissions; and,
- construction and operational phase road traffic exhaust emissions.

18.1 Policy and consultation

18.1.1 Legislation

European Union (EU) legislation forms the basis for UK air quality policy. The EU Air Quality Framework Directive 96/62/EC on Ambient Air Quality Assessment and Management entered into force in September 1996 (European Parliament, 1996). This was a framework for tackling air quality through setting European-wide air quality limit values in a series of Daughter Directives, prescribing how air quality should be assessed and managed by the Member States. Directive 96/62/EC and the first three Daughter Directives were combined to form the new EU Directive 2008/50/EC (European Parliament, 2008) on Ambient Air Quality and Cleaner Air for Europe, which came into force June 2008.

The 1995 Environment Act (HMSO, 1995) required the preparation of a national Air Quality Strategy (AQS) which set air quality standards and Objectives for specified pollutants. The Act also outlined measures to be taken by local planning authorities in relation to meeting these standards and Objectives (the Local Air Quality Management (LAQM) system).

The UK AQS was originally adopted in 1997 (DoE, 1997) and has been reviewed and updated in order to take account of the evolving EU Legislation, technical and policy developments and the latest information on health effects of air pollution. The strategy was revised and reissued in 2000 as the AQS for England, Scotland, Wales and Northern Ireland (DETR, 2000). This was subsequently amended in 2003 (DETR, 2003) and was last updated in July 2007 (Defra, 2007).

The UK Government published its Clean Air Strategy (CAS) in January 2019 (Defra, 2019a), which reset the focus for the first time since the 2007 Air Quality Strategy revision. The CAS identifies a series of 'new' air quality issues, including biomass combustion, shipping emissions and releases from agricultural activities. There is a recognition that the effects of pollutant deposition on sensitive ecosystems and habitats needs greater focus. The concept of an overall exposure reduction approach is raised, in recognition that numerical standards are not safe dividing lines between a risk and a safe exposure, within a population with a varying age and health profile. The CAS is supplemented by an Industrial Strategy, policy guidance for the ports sector, a developing approach for aviation and by plans for road transport fuels shift to zero emissions by 2040.

The standards and Objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) (HMSO, 2000), and the Air Quality (England) (Amendment) Regulations 2002 (HMSO, 2002); the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance (HMSO, 2010).

The current air quality standards and Objectives (for the purpose of LAQM) of relevance to this assessment are outlined in **Table 18.1**. Pollutant standards relate to ambient pollutant concentrations in air, set based on medical and scientific evidence of how each pollutant affects human health. Pollutant Objectives however incorporate future dates by which each standard is to be achieved, taking into account economic considerations, practicability and technical feasibility.

Where an air quality Objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as Air Quality Management Areas (AQMAs) and take action, along with others, to work towards meeting the Objectives. Following the designation of an AQMA, local authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the Objectives and improve air quality locally.

Possible exceedances of air quality Objectives are usually assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the Objective.

Table 18.1 Air quality strategy Objectives (England) for the purpose of local air quality management

Pollutant	Air Quality Objective		To be achieved by
	Concentration	Measured as*	
Nitrogen dioxide (NO_2)	200µg.m^{-3}	1 hour mean not to be exceeded more than 18 times per year	31/12/2005
	40µg.m^{-3}	Annual mean	31/12/2005
Particles (PM_{10})	50µg.m^{-3}	24-hour mean not to be exceeded more than 35 times per year	31/12/2004
	40µg.m^{-3}	Annual mean	31/12/2004
Particles ($PM_{2.5}$)	25µg.m^{-3}	Annual mean (target)	2020
	15% cut in annual mean (urban background exposure)		2010 - 2020

Note: * how the Objectives are to be measured is set out in the UK Air Quality (England) Regulations (2000)

18.1.2 National planning policy

National Policy Statement for Ports

The NPS for Ports (Department for Transport, 2012) sets out the requirements for air quality assessments of port developments. These are summarised in **Table 18.2**.

Table 18.2 Summary of NPS for Ports requirements with regard to air quality

NPS requirement	NPS reference	Section of EIA report where requirement has been addressed
Where the project is likely to have adverse effects on air quality, the applicant should undertake an assessment of the impacts of the proposed project as part of the Environmental Statement (ES).	Section 5.7.4	**Sections 18.5** and **18.6**

NPS requirement	NPS reference	Section of EIA report where requirement has been addressed
The ES should describe: • any significant air emissions, their mitigation and any residual effects, distinguishing between the construction and operation stages and taking account of any significant emissions from any road traffic generated by the project; • the predicted absolute emission levels from the proposed project, after mitigation methods have been applied; and • existing air quality levels and the relative change in air quality from existing levels.	Section 5.7.5	Existing air quality levels are detailed in **Section 18.4** Impacts and any required mitigation measures are detailed in **Section 18.5** and **18.6**.
The applicant should assess the potential for insect infestation and emissions of odour, dust, steam, smoke and artificial light to have a detrimental impact on amenity, as part of the Environmental Statement.	Section 5.8.4	Impacts of dust emissions are considered in **Section 18.5.1**
In particular, the assessment provided by the applicant should describe: • the type, quantity and timing of emissions; • aspects of the development which may give rise to emissions; • premises or locations that may be affected by the emissions; • effects of the emission on identified premises or locations; and • measures to be employed in preventing or mitigating the emissions.	Section 5.8.5	The methodology for the assessment is set out in **Section 18.3**. Potential impacts of air emissions are detailed in **Section 18.5** and **18.6**, in addition to required mitigation measures.
The applicant is advised to consult the relevant local planning authority and, where appropriate, the Environment Agency (EA) about the scope and methodology of the assessment.	Section 5.8.6	Consultation was undertaken with the Environmental Protection department at RCBC via email, as discussed in **Section 18.2.4**.

National Planning Policy Framework

The NPPF (MHCLG, 2019a) was updated in February 2019 and refers to the LAQM process by recognising that:

> *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas".*

The NPPF identifies that local planning authorities should maintain consistency within the Local Air Quality Management process and states that:

> *"Planning decisions should ensure that any new development within Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

The requirements of the NPPF were considered within this assessment.

Planning Practice Guidance

The UK Government Planning Practice Guidance (MHCLG, 2019b) provides guidance on how the planning process can take account of the impact new development may have on air quality. The guidance states that air quality may be relevant to a planning application where:

- traffic in the vicinity of the development may be affected by increasing volume or congestion or altering the fleet composition on local roads;
- new point sources of air pollution are to be introduced;
- people may be exposed to existing sources of pollution including dust;
- potentially unacceptable impacts (such as dust) may arise during construction; and
- biodiversity may be affected.

These aspects were considered within this air quality assessment.

18.1.3 Local planning policy

RCBC adopted its Local Plan in May 2018 (RCBC, 2018) which sets out the development strategy across the borough until 2032. A review of the Local Plan identified the following policy of relevance to air quality:

> *"**Policy SD4 General Development Principles***
> *In assessing the suitability of a site or location, development will be permitted where it:*
> *[…]*
> *b. will not have a significant adverse impact on the amenities of occupiers of existing or proposed nearby land and buildings;*
> *[…]*
> *e. avoids locations that would put the environment, or human health or safety, at unacceptable risk;*
> *[…]*
> *h. will not result in an adverse effect on the integrity of a Natura 2000 site, either alone or in combination with other plans or projects.*
>
> *All development must be designed to a high standard. Development proposals will be expected to:*
> *[…]*
> *n. minimise pollution including light and noise and vibration levels to meet or exceed acceptable limits;*
> *[…]"*

The requirements of this policy were considered within this assessment.

18.1.4 Consultation

Details of the consultation undertaken and the responses received with regard to air quality are detailed in **Table 18.3**.

Table 18.3 Consultation responses

Consultation method	Consultee	Response received	How the response has been addressed
Scoping consultation response to RCBC 12 August 2020	Natural England	Air quality in the UK has improved over recent decades but air pollution remains a significant issue; for example over 97% of sensitive habitat area in England is predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition (England Biodiversity Strategy, Defra 2011). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The planning system plays a key role in determining the location of developments which may give rise to pollution, either directly or from traffic generation, and hence planning decisions can have a significant impact on the quality of air, water and land. The assessment should take account of the risks of air pollution and how these can be managed or reduced. Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (www.apis.ac.uk). Further information on air pollution modelling and assessment can be found on the Environment Agency website.	A review of sensitive habitats which required consideration in the assessment has been undertaken using the Air Pollution Information System (APIS) website, as discussed in **Section 18.4.4**. The potential for impacts to occur at designated ecological sites is considered in **Section 18.5** and **18.6.**
Scoping consultation response to RCBC received June 2019	RCBC Environmental Protection	Advised that the applicant contact the Environmental Protection department to discuss and agree methodology for air quality and noise and vibration assessments	Consultation was undertaken with the Environmental Protection department at RCBC via email, as discussed in **Section 18.2.4**.
Scoping consultation response to RCBC received August 2020	RCBC Environmental Protection	Raised no objections to the proposals.	
Scoping Opinion 2 August 2019	MMO	The inclusion of an air quality assessment within the EIA was agreed	Comment noted
Consultation on assessment scope and methodology via email	RCBC Environmental Protection	The environmental protection department confirmed that the assessment methodology as set out in this Section is acceptable.	As per the methodology set out in **Section 18.2.**

18.2 Methodology

The assessment methodologies set out in this section were agreed with RCBC's environmental protection department, as detailed in **Table 18.3**. The assessment was undertaken with reference to information from a number of sources, as detailed in **Table 18.4.**

Table 18.4 Key information sources

Data Source	Reference
Centre for Ecology and Hydrology (CEH)	Air Pollution Information System (APIS) http://www.apis.ac.uk
Department for Environment Food and Rural Affairs (Defra)	Local Air Quality Management (LAQM) Technical Guidance TG(16) (Defra, 2018)
Defra's LAQM Support Tools	LAQM 1 km x 1 km grid background pollutant maps (Defra, 2020)
Institute of Air Quality Management (IAQM)	Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2016)
RCBC	2020 Annual Status Report (RCBC, 2020)

18.2.1 Baseline air quality conditions

Monitoring data collected by RCBC were reviewed to establish baseline air quality conditions at receptors. In addition, background pollutant concentrations were obtained from Defra mapping for the 1km x 1km grid squares covering the study area (Defra, 2020) to determine background pollutant concentrations across the site.

18.2.2 Construction phase dust and particulate matter assessment

An assessment of potential impacts associated with the construction phase was undertaken in accordance with IAQM guidance (IAQM, 2016). A summary of the assessment process is provided below:

Construction phase assessment steps:

1) Screen the need for a more detailed assessment;
2) Separately for demolition, earthworks, construction and trackout:
   A. determine potential dust emission magnitude;
   B. determine sensitivity of the area; and
   C. establish the risk of dust impacts.
3) Determine site specific mitigation; and
4) Examine the residual effects to determine whether or not additional mitigation is required.

In assessing the significance of construction dust and particulate matter impacts using the IAQM guidance (IAQM, 2016), the dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts prior to mitigation. Once appropriate mitigation measures were identified, the significance of construction phase impacts was determined.

It should be noted that trackout is defined as the transport of dust and dirt from the construction site onto the public road network. Full details of the assessment methodology are provided in **Appendix 11**.

18.2.3 Construction phase plant emissions assessment

Defra technical guidance (Defra, 2018) states that emissions from Non-Road Mobile Machinery (NRMM) used on construction sites are unlikely to have a significant impact on local air quality where relevant control and management measures are employed. As such, emissions from NRMM were not considered quantitively in this assessment, and the relevant control measures to be employed are detailed in **Section 18.5.4**.

18.2.4 Construction and operational phase road traffic emissions assessment

The potential impact on local air quality as a result of traffic movements generated by the proposed scheme were screened using the methodology detailed in the latest IAQM and EPUK guidance (IAQM and EPUK, 2017).

The aforementioned guidance document sets out criteria for increases in Light Duty Vehicles (LDV) and Heavy Duty Vehicles (HDV) movements, above which a detailed assessment of air quality impacts may be required. If increases in LDV and HDV movements are below the criteria, there are unlikely to be any significant air quality impacts as a result of the proposed scheme and detailed assessment of air quality is not necessary. The assessment criteria are detailed in **Table 18.5**.

Table 18.5 IAQM and EPUK road traffic assessment criteria

Vehicle type	Criteria
LDV	A change in annual average daily traffic (AADT) of more than 100 within or adjacent to an AQMA or more than 500 elsewhere
HDV	An increase in HGV movements of more than 25 per day within or adjacent to an AQMA, or more than 100 elsewhere

18.2.5 Construction and operational phase vessel emissions assessment

The construction and operational phases of the proposed scheme will generate additional vessel movements. A qualitative assessment of the potential for significant impacts to occur due to increased vessel movements has been undertaken, taking into account the number of vessels generated during construction and operation, the duration that vessels would be used, aspects of the scheme design that would reduce these emissions and the distance to sensitive receptors.

18.2.6 Operational phase plant emissions assessment

Plant used during the operational phase may give rise to increases in air emissions. A qualitative assessment has been undertaken to consider the potential for significant impacts to occur, taking into account the number and types of plant to be used, how the plant would be powered (i.e. diesel or electricity) and the distance to sensitive receptors.

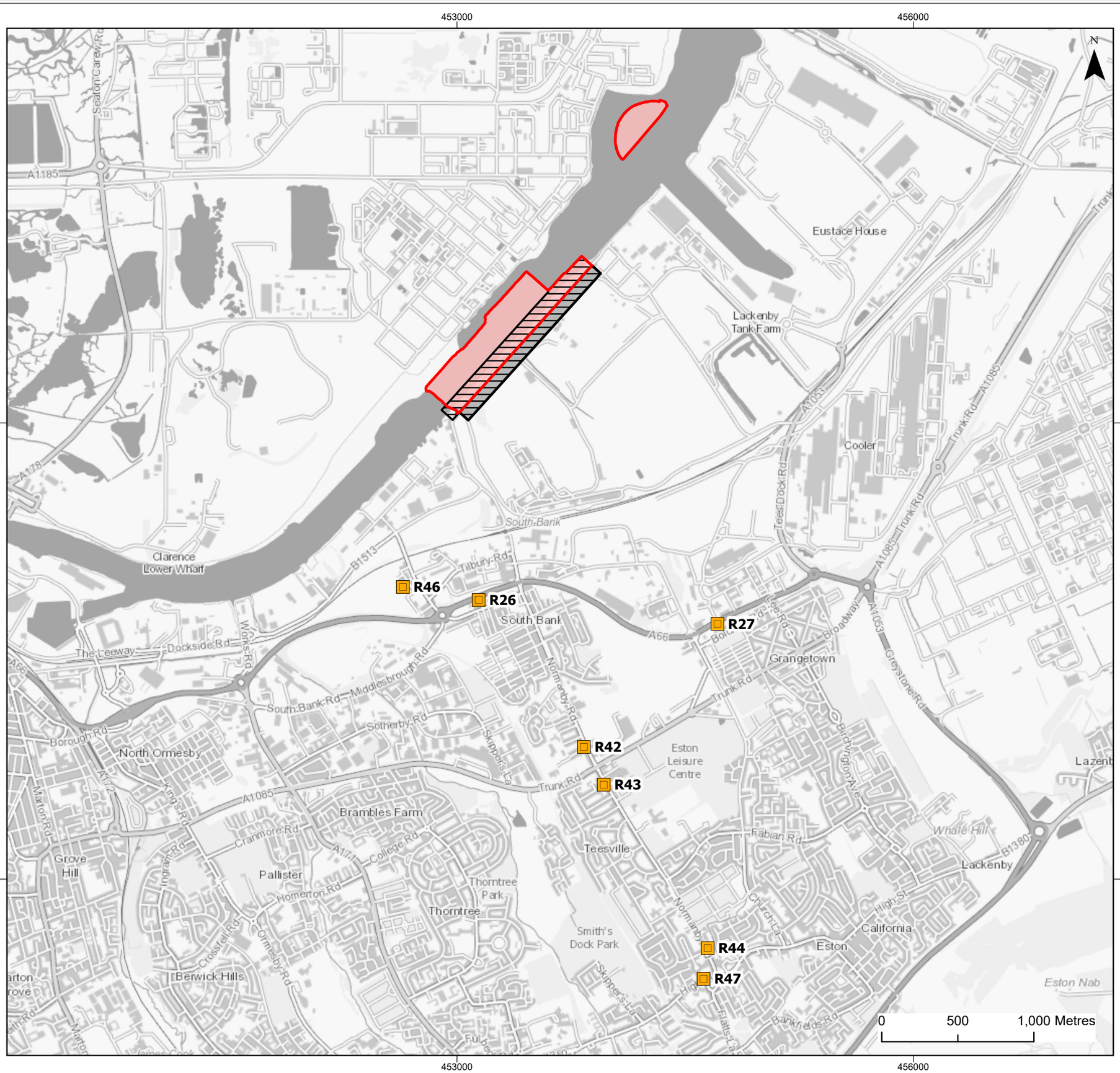
18.3 Existing environment

18.3.1 Local air quality management

The proposed scheme footprint is not located within or in the vicinity of any AQMAs; RCBC has not declared any AQMAs within its area of jurisdiction.

18.3.2 Air quality monitoring

RCBC undertakes monitoring using both automatic and passive methods within the Teesside area. The closest monitoring locations to the proposed scheme are NO_2 diffusion tubes, as shown in **Figure 18.1**. Recent monitoring data were obtained from the latest Annual Status Report published by RCBC (RCBC, 2020) and are reported in **Table 18.6**.



Legend

- Proposed Dredge and Excavation Envelope (including side slopes)
- Proposed Quay Envelope
- Proposed Demolition Area
- Air Quality Monitoring Locations

Client:	Project:
Tees Valley Combined Authority	South Bank Quay

Title: Air Quality Monitoring Locations

Figure: 18.1

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	29/10/2020	TC	CG	A3	1:25,000

Co-ordinate system: British National Grid

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Table 18.6 RCBC monitoring data

Site ID	Location	Site type	Annual Mean Concentration (µg.m^{-3})				
			2015	2016	2017	2018	2019
R26	South Bank, Trunk Road	Roadside	21.9	20.5	19.8	24.7	19.5
R27	West Lane, Grangetown	Roadside	30	26.4	25.5	29.8	24.8
R42	Primrose Court	Roadside	-	-	-	16.6	13.9
R43	Normanby Road	Roadside	-	-	-	16.1	15.2
R44	Normanby Road	Roadside	-	-	-	15.7	12.9
R46	Haven Site	Suburban	-	-	-	-	16.1
R47	Whitehouse Café	Roadside	-	-	-	-	20.3

As shown in **Table 18.6**, annual mean concentrations of NO_2 have been below the Objective of 40 µg.m^{-3} over the last five years, indicating that air quality in the area is generally good.

18.3.3 Background pollutant concentrations

The 2020 background concentrations of NO_2, PM_{10} and $PM_{2.5}$ were obtained from the latest 2018-based air pollutant concentration maps provided by Defra for the 11 grid squares covering the proposed scheme footprint. The maximum, minimum and average values are detailed in **Table 18.7**.

Table 18.7 2020 background pollutant concentrations (µg.m^{-3}) obtained for 1km x 1km grid squares covering the scheme boundary

Pollutant	2020 Background Concentration (µg.m^{-3})		
	NO_2	PM_{10}	$PM_{2.5}$
Maximum	27.36	11.52	7.02
Minimum	12.76	9.88	6.62
Average	17.19	10.31	6.82

Background concentrations of NO_2, $PM_{2.5}$ and PM_{10} within the proposed scheme footprint are 'well below' (i.e. less than 75% of) their respective annual mean air quality Objectives. These mapped background concentrations of NO_2 are generally consistent with those monitored by RCBC (**Table 18.6** above).

18.3.4 Identification of sensitive receptors

The UK's health-based air quality Objectives only apply where there is relevant human exposure; annual mean Objectives apply at locations were members of the public may be regularly exposed, such as residential properties, schools, hospitals and care homes. Short-term averaging periods apply at the aforementioned locations, in addition to hotels, gardens of residential properties, outdoor areas of bus and railway stations, outdoor seating areas and busy shopping streets.

The proposed scheme is located in an industrial area with no residential receptors in the vicinity; the only receptors present are those at places of work at which the public would not have regular access. The closest sensitive residential receptors are located along the A66 in South Bank, approximately 1.1km south of the proposed scheme. Receptors in places of work are, however, sensitive to emissions of dust, and are present within 350m of the proposed construction works.

The River Tees and the area of shoreline at the mouth are designated as the Teesmouth and Cleveland Coast SPA, SSSI and Ramsar site. A review of these designated sites has been undertaken to determine whether there were any habitats sensitive to air pollution effects which required consideration in the assessment.

The proposed scheme is located opposite an area of mudflat (North Tees Mudflat) used by birds and there are other such areas of this habitat within the River Tees. As the mudflats within the estuary are intertidal and, therefore, 'washed' by estuarine waters twice a day, it is considered that these areas would not experience any significant effects as a result of pollutant or dust deposition.

Towards the mouth of the estuary, there are some areas of saltmarsh habitat at Seal Sands and dune habitats are present along the coastline, both of which are reported on the APIS website as sensitive to changes in pollutant concentrations and deposition. These areas are located approximately 1.7km north-west of the closest part of the scheme boundary (the Tees Dock turning circle) and 2.7km north respectively. Across these distances, it is not anticipated that emissions from activities within the proposed scheme footprint during construction or operation would give rise to significant effects in these areas. The habitats present in relation to the proposed scheme are shown in **Figure 18.2**.

The potential for significant impacts to occur as a result of movements of construction and operational phase vessel movements, which would occur closer to the saltmarsh and dune habitats as vessels enter the River Tees, has been considered in the assessment.

18.4 Potential impacts during the construction phase

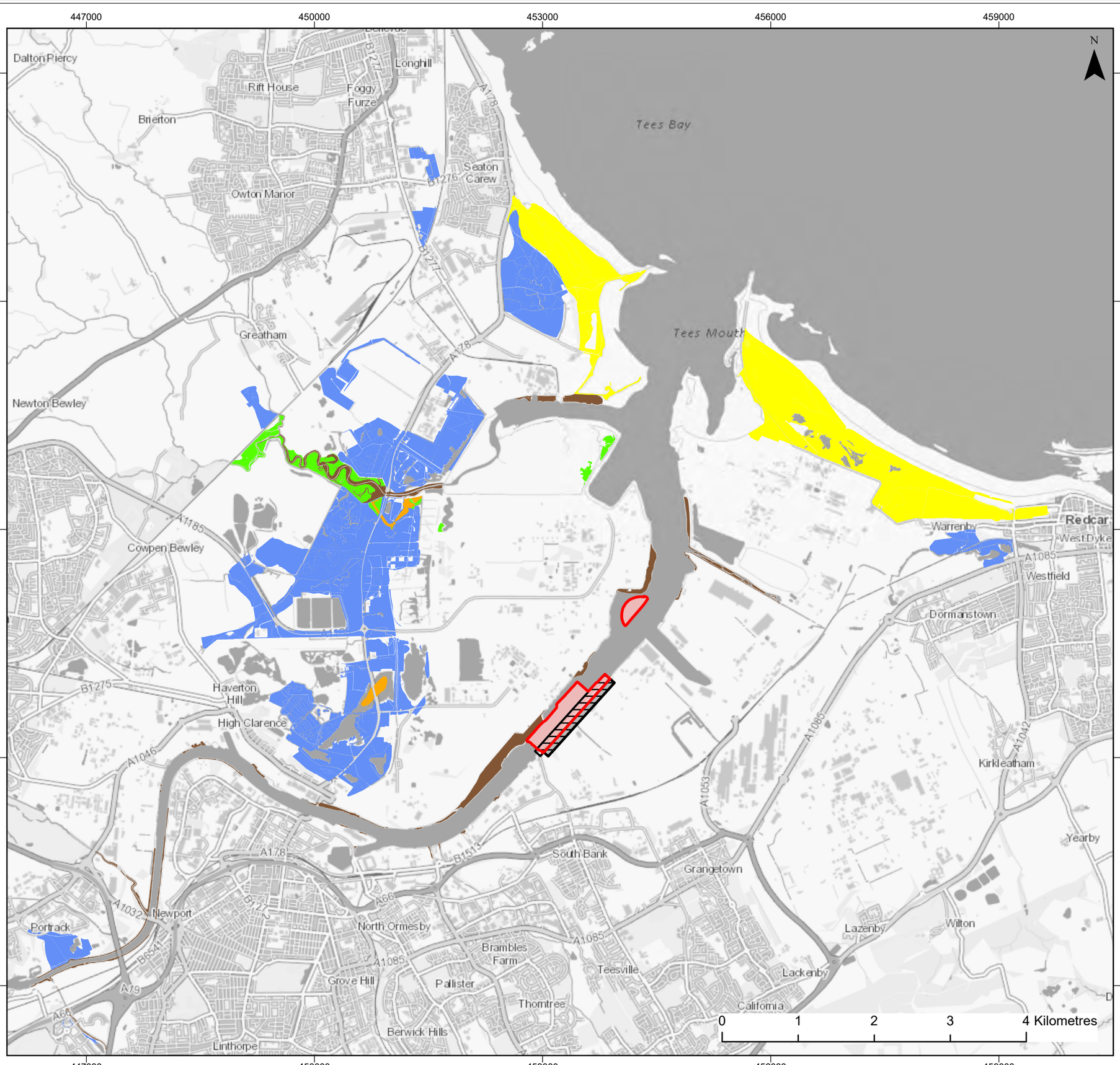
18.4.1 Construction dust and particulate matter assessment

A qualitative assessment of construction phase dust and PM_{10} emissions was carried out in accordance with the IAQM guidance (IAQM, 2016). The methodology for the dust assessment is provided in **Appendix 11**.

The construction works associated with the proposed scheme have the potential to impact on local air quality conditions as follows:

- Dust emissions generated by demolition, excavation, construction and earthwork activities required during the construction phase have the potential to cause nuisance to, and soiling of, sensitive receptors.
- Emissions of exhaust pollutants, especially NO_2 and PM_{10} from construction traffic on the local road network, have the potential to adversely impact local air quality at sensitive receptors situated adjacent to the routes utilised by construction vehicles.
- Emissions of NO_2 and PM_{10} from NRMM operating within the proposed scheme footprint have the potential to adversely impact local air quality at sensitive receptors in close proximity to the works.

The potential for sensitive receptors to be affected will depend on where within the site the dust raising activity takes place, the nature of the activity and controls, and meteorological dispersion conditions.



Legend

- Proposed Dredge and Excavation Envelope (including side slopes)
- Proposed Quay Envelope
- Proposed Demolition Area

Priority Habitat Inventory

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal sand dunes
- Mudflats
- Saline lagoons

Client:	Project:
Tees Valley Combined Authority	South Bank Quay

Title: **Air Quality - Habitat Locations**

Figure: 18.2

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
0	29/10/2020	TC	CG	A3	1:50,000

Co-ordinate system: British National Grid

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18.4.1.1 Step 1: Screen the need for a Detailed Assessment

The IAQM guidance (IAQM, 2016) states that a Detailed Assessment is required if there are human receptors located within 350m and / or ecological sites within 50m of the site boundary. There are human receptors in places of work present within 350m, therefore a Detailed Assessment has been undertaken. The site is also located within the Teesmouth and Cleveland Coast SPA, SSSI and Ramsar site; however, as the immediate area is intertidal and is washed by the sea on a daily basis it is unlikely that significant impacts associated with dust deposition would occur. However, this receptor has been included to provide a conservative assessment. Distance buffers around the proposed scheme footprint are shown in **Figure 18.3**.

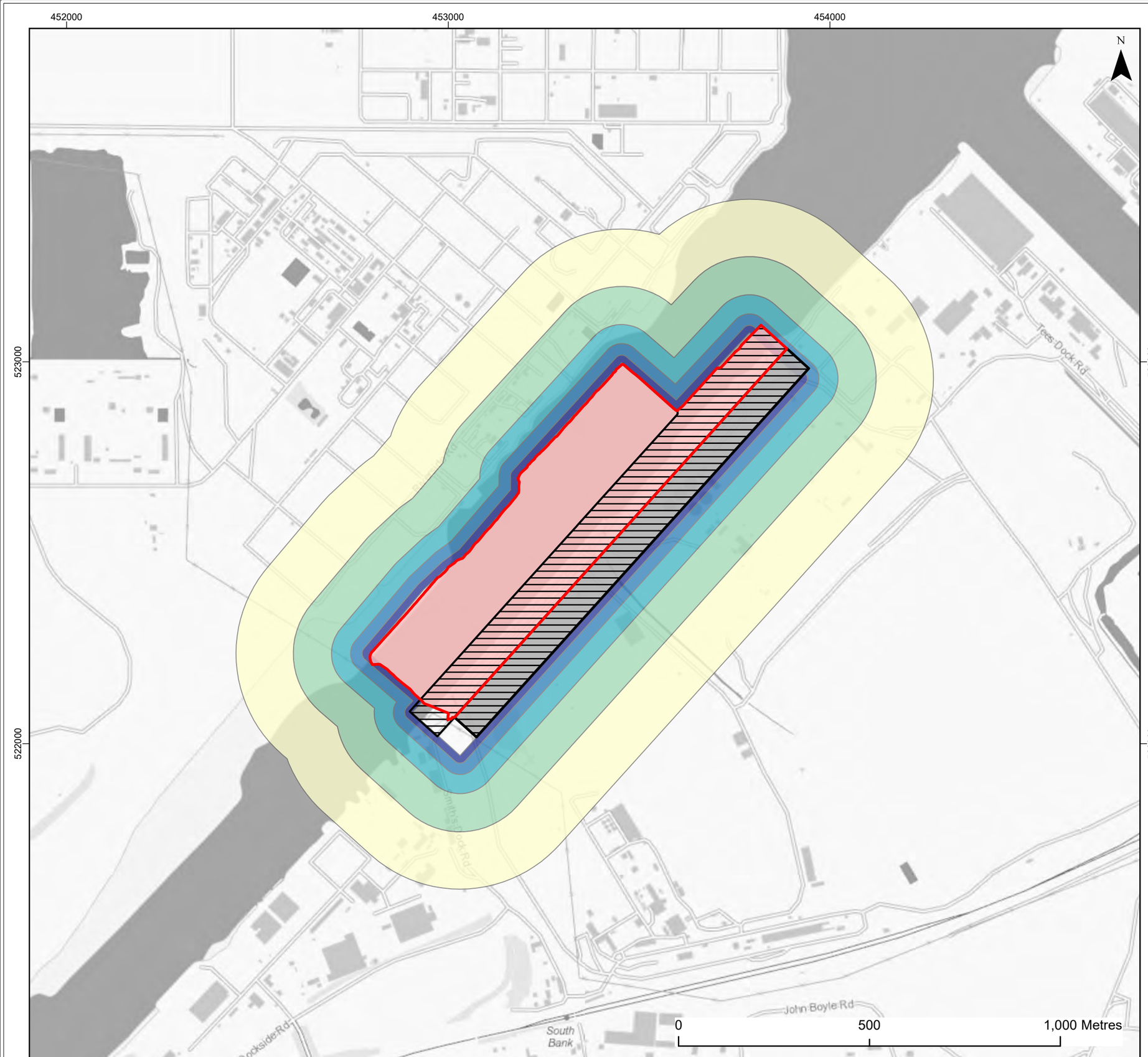
18.4.1.2 Step 2A: Define the potential dust emission magnitude

The IAQM guidance recommends that the dust emission magnitude is determined for demolition, earthworks, construction and trackout. The dust magnitudes for these activities were determined from site plans and in accordance with the IAQM methodology and are summarised in **Table 18.8**.

The risk of potential impact of construction phase dust and particulate matter emissions during earthworks, construction and trackout is used to recommend appropriate mitigation measures. The dust magnitude for construction activities has been categorised as **large** for demolition, earthworks and construction and **small** for trackout.

Table 18.8 Dust emission magnitude for the site

Construction activity	Dust emission magnitude	Reasoning
Demolition	Large	The concrete decks of the existing jetties and the wharf will be broken up, which is potentially dusty. It is proposed that all material (except timber) would be crushed on site and re-used as fill for the proposed scheme.
Earthworks	Large	Approximately 275,000m^3 of soils would be excavated to install the tie rods between the combi-wall and the anchor structure. Approximately 1,140,000m^3 of soils/landside material would need to be excavated to create the berth pocket.
Construction	Large	The quay would be constructed using concrete which is potentially dusty. There are limited landside structures/features to be constructed which are largely prefabricated (e.g. mooring bollards, lighting towers and an electrical substation). The total volume of concrete used for the proposed scheme would be greater than 100,000m^3.
Trackout	Small	There are paved access roads to the proposed scheme footprint; any unpaved roads within the site itself would be relatively short.



Legend

- Proposed Dredge and Excavation Envelope (including side slopes)
- Proposed Quay Envelope
- Proposed Demolition Area

Construction Dust Distance Boundaries

Distance (metres)

- ≤20
- ≤50
- ≤100
- ≤200
- ≤350

Client:	Project:
Tees Valley Combined Authority	South Bank Quay

Title: Air Quality Construction Dust Distance Boundaries

Figure: 18.3

Revision:	Date:	Drawn:	Checked:	Size:	Scale:
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Co-ordinate system: British National Grid

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18.4.1.3 Step 2B: Define the sensitivity of the area

The sensitivity of human receptors to dust soiling and health effects of particulate matter associated with demolition, earthworks and trackout activities during construction of the proposed scheme are detailed below and summarised in **Table 18.9**.

Sensitivity of people to dust soiling

- Demolition, construction and earthworks: the only receptors within 350m are places of work which are categorised by the IAQM as medium sensitivity receptors. These are located within 20m of the proposed scheme boundary; the sensitivity is therefore considered to be **medium**.
- Trackout: construction access routes would also pass within 20m of medium-sensitivity places of work, up to 500m from the site entrance. The sensitivity is therefore considered to be **medium**.

Sensitivity of people to health effects of PM_{10}

- Demolition, construction and earthworks: receptors in adjacent places of work are considered to be of medium sensitivity to health effects of PM_{10}. The annual mean PM_{10} concentration at the site is less than 24µg.m^{-3}, and therefore the sensitivity is **low**.
- Trackout: the annual mean background PM10 concentration at the site is less than 24µg.m^{-3}, and there are medium sensitivity workplace receptors within 20m of the routes that construction vehicles will use to access the site. The sensitivity is therefore **low**.

Sensitivity of receptors to ecological effects

- Demolition, earthworks, construction and trackout: the proposed scheme is located within the Teesmouth and Cleveland Coast SPA, SSSI and Ramsar site; as described previously, mudflat features are intertidal and therefore unlikely to be affected by dust deposition. The sensitivity was therefore classified as **low**.

Table 18.9 Outcome of the sensitivity assessment of the area

Potential impact	Sensitivity of the surrounding area			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	Medium	Medium	Medium	Medium
Human health	Low	Low	Low	Low
Ecological effects	Low	Low	Low	Low

18.4.1.4 Step 2C: Define the risk of impacts

The dust emission magnitude detailed in **Table 18.8** is combined with the sensitivity of the area detailed in **Table 18.9** to determine the risk of impacts with no mitigation applied. The risks concluded for dust soiling and human health are detailed in **Table 18.10**.

Table 18.10 Summary of risk table to define site-specific mitigation

Potential impact	Risks			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	High Risk	Medium Risk	Medium Risk	Negligible Risk
Human health	Medium Risk	Low Risk	Low Risk	Negligible Risk
Ecological effects	Medium Risk	Low Risk	Low Risk	Negligible Risk

The risk of dust soiling impacts during the construction phase were therefore described as ‘high risk’ for demolition, ‘medium risk’ for earthworks and construction, and ‘negligible risk’ for trackout. The impacts on

human health and ecological receptors were described as 'medium risk' for demolition, 'low risk' for earthworks and construction and 'negligible risk' for trackout.

18.4.1.5 Step 3: Site-specific mitigation

Step three of the IAQM guidance (IAQM, 2016) identifies appropriate site-specific mitigation. These measures are related to the site risk for each activity.

The dust assessment determined that there was a risk of impacts resulting from construction activities without the implementation of mitigation measures. Additional guidance has been provided by the IAQM in relation to dust and air mitigation measures. It is recommended that the good practice measures outlined in the IAQM guidance are followed.

The recommendations below will be included in a CEMP to prevent or minimise the release of dust entering the atmosphere and/or being deposited on nearby receptors. The effective implementation of the CEMP will ensure that any potential dust releases associated with the construction phase will be reduced.

Highly recommended mitigation measures

A list of mitigation measures that are highly recommended for a **high risk** site by the IAQM, as determined by Step 2 of the construction dust and particulate matter assessment, is provided below. The mitigation measures have been tailored to the proposed scheme and therefore do not comprise a definitive list of all mitigation measures listed in the guidance.

Communications

- Display the head or regional office contact information and display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.

Dust management

- Develop and implement a CEMP, which may include measures to control other emissions, approved by the Local Authority.
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
- Carry out regular site inspections to monitor compliance with the CEMP and record the results. 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.
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced, and 10 mph on unsurfaced, haul roads and work areas.
- Implement a Travel Plan that supports and encourages sustainable travel for contractor operatives and staff (public transport, cycling, walking, and car-sharing).
- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Erect solid screens or barriers around dusty activities where practicable.
- Take measures to control site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Cover, seed or fence stockpiles to prevent wind whipping.
- Remove materials that have a potential to produce dust from site as soon as possible.
- Ensure all vehicles switch off engines when stationary - no idling vehicles.

- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use covered skips where practicable.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- Bonfires and burning of waste materials should not be permitted.

Measures specific to demolition

- Soft strip inside any buildings or structures before demolition.
- Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures specific to earthworks

- Re-vegetate earthworks and exposed areas to stabilise surfaces as soon as practicable, or use hessian, mulches or trackifiers.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- Only remove the cover in small areas during work and not all at once.

Measures specific to construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Measures specific to trackout

- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes where practicable, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Install a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site) where reasonably practicable.
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Locate site access gates at least 10 m from receptors where possible.

Measures specific to NRMM

NRMM and plant should be well maintained. If any emissions of dark smoke occur, then the relevant machinery should stop immediately, and any problem should be rectified. In addition, the following controls should apply to NRMM:

- All NRMM should use fuel equivalent to ultralow sulphur diesel (fuel meeting the specification within EN590:2004).
- All NRMM will comply with regulation (EU) 2016/1628 of the European Parliament and of the European Council.
- All NRMM should be fitted with Diesel Particulate Filters (DPF) conforming to defined and demonstrated filtration efficiency (load/duty cycle permitting).
- The ongoing conformity of plant retrofitted with DPF, to a defined performance standard, should be ensured through a programme of onsite checks.
- Implementation of energy conservation measures including:
    - instructions to throttle down or switch off idle construction equipment;
    - switch off the engines of trucks while they are waiting to access the site and while they are being loaded or unloaded; and
    - ensure equipment is properly maintained to ensure efficient energy consumption.

18.4.1.6 Step 4: Determine significant effects

With the implementation of the above mitigation measures, the residual impacts from the construction phase of the proposed scheme are considered to be **not significant**, in accordance with IAQM guidance (IAQM, 2016).

18.4.2 Construction phase road traffic emissions

A review of the expected vehicle movements generated during the construction phase of the proposed scheme has been undertaken to determine whether the screening criteria detailed in **Table 18.5** would be exceeded. The number of daily vehicles generated during construction of Phases 1 and 2 concurrently are detailed in **Table 18.11**.

Table 18.11 Construction phase traffic generation

Road link	Construction traffic generation (2022)	
	AADT	HDVs
Tees Dock Road	241	41
Old Station Road	241	41
Dockside Road	241	41
A66 (East)	177	41
A66 (West)	141	41
A1053	141	41

As detailed in **Table 18.11**, the traffic generated by the proposed scheme does not exceed the screening criteria detailed in **Table 18.5**. The proposed schemes impact on local air quality can therefore be considered as **not significant**. A detailed impact assessment of road traffic exhaust emissions was therefore not required.

18.4.3 Construction vessel exhaust emissions

The proposed scheme would generate additional vessel movements during the construction phase. These have been quantified by the project team for each activity, as detailed in **Table 18.12**.

Table 18.12 Construction phase vessels generated by the proposed scheme

Activity	Number of vessels used	Duration (Phase 1 and 2 constructed concurrently) (weeks)
Demolition	3	52
Quay Wall	1	14
Dredging (one backhoe, one TSHD, two safety/workboats and three disposal barges)	6	20
Deliveries	29	-

As shown in **Table 18.12**, the construction of the proposed scheme would require few vessel movements for the duration of construction. With the exception of delivery vessels, these vessels would be operating in a localised area within and around the proposed scheme footprint, which is situated at a distance from sensitive human and ecological receptors.

Vessels used for the proposed dredging would be in use for a relatively short amount of time (approximately four months) and vessels required to transport construction materials to site would make one-off visits to either an existing berth on the Tees or part of the new wharf once constructed; emissions from such vessel movements are unlikely to have a significant effect on annual mean pollutant concentrations or deposition at human and ecological receptors. Whilst short-term emissions may be of a higher magnitude, given that air quality within RCBC's area of jurisdiction is relatively good, it is unlikely that any exceedances of the short-term air quality Objectives would be experienced. Furthermore, the North Sea is designated as an Emissions Control Area (ECA) under Annex VI of the International Maritime Organisation (IMO) Maritime pollution (MARPOL) Convention, and therefore vessels must comply with fuel quality standards which will minimise air emissions.

Demolition vessels would be in operation for a larger proportion of the year; however, given the low number of these vessels in operation and the distance to sensitive receptors, significant impacts are unlikely. Furthermore, these emissions would be temporary in nature and would only be experienced for the duration of the construction phase.

Given the above, impacts at human and ecological receptors as a result of construction phase vessel emissions are considered to be **not significant**.

18.5 Potential impacts during the operational phase

18.5.1 Operational phase road traffic emissions

During the operational phase, the proposed scheme would generate approximately 10 employees, which would generate 20 vehicle trips per day. This increase in vehicle trips is below the criteria detailed in **Table 18.5** and, as such, impacts of these emissions would be **not significant**.

18.5.2 Operational phase vessel emissions

As noted in **Section 3**, the scheme is predicted to generate up to 390 vessel calls per year, or just over one vessel call per day. Data obtained from PDT shows that in 2019 there were 16,433 vessel movements within the River Tees. Given this existing level of vessel activity, it is not anticipated that this increase in movements would give rise to a significant change in pollutant concentrations above the existing baseline at sensitive receptors, particularly as emissions from moving vessels would only be experienced at receptors for a short period of time; as a vessel moves past the receptor, the emissions would become subject to greater dispersion and dilution over an increased distance.

The proposed quay has been designed to provide shoreside power (termed 'cold ironing') and therefore vessels are not envisaged to require the use of main or auxiliary engines whilst berthed. Whilst it is acknowledged that some vessels may not have the capability to utilise this technology, it is likely to lead to a significant reduction in emissions from berthed vessels.

Given the number of vessel movements predicted during operation, the inclusion of shoreside power into the proposed scheme design and the distance to receptors, impacts during operation are considered to be **not significant**.

18.5.3 Operational phase plant emissions

The proposed scheme would utilise cranes, SPMTs and generators to power small tools and welding equipment. SPMTs would be electrically powered, in addition to some cranes. Therefore, during the operational phase, cranes and small generators may give rise to increases in air emissions. However, given the distances to sensitive receptors and the intermittent nature of the use of this equipment, it is unlikely that significant increases in pollutant concentrations would occur at sensitive receptors. Impacts are therefore considered to be **not significant**.