



Preliminary Environmental Information Report

Volume 2

Chapter 6: Air Quality

6 Air Quality

6.1 Introduction

6.1.1.1 This chapter of our Preliminary Environmental Information Report (PEIR) considers the effects from construction and operation of the River Thames Scheme (RTS) ('the project') in relation to air quality. Within this chapter we have included topic specific sections on:

- Legislation, policy and guidance (noting any changes since Environmental Impact Assessment (EIA) scoping);
- Engagement with consultees, including responses to comments received on the RTS EIA Scoping Report;
- The assessment methodology for this topic (again noting any changes or updates since EIA scoping);
- Key environmental considerations and opportunities;
- Primary and tertiary mitigation;
- Our preliminary assessment of effects;
- Secondary mitigation; and
- Future work for this topic of the EIA.

6.1.1.2 For a summary of the key baseline elements associated with air quality see Section 5.2.

6.1.1.3 The criteria used to determine the air quality study areas remain unchanged from those proposed in the Air Quality chapter of our RTS EIA Scoping Report (Environment Agency and Surrey County Council, October 2022) ('the EIA Scoping Report'). We have included slight changes to the study areas to accommodate minor revisions made for the project boundary for PEIR, which are described in Section 2.4 of Chapter 2: Project Description. The topic study areas are broken down into the following:

- Air quality – vehicle emissions;
- Air quality – dust emissions; and
- Air quality – odour emissions.

6.1.1.4 This chapter considers potential effects associated with the release of dust; emissions from vehicles and plant; and the release of odour, from the construction and operation of the project.

- 6.1.1.5 Potential effects are considered in respect to receptors including local residents, schools, hospitals and care homes; public areas; businesses; and ecological receptors.
- 6.1.1.6 The effects of traffic, plant and inland water vessels on local air quality will be assessed at sensitive human and ecological receptor locations, with the latter informing the Habitats Regulations Assessment (HRA) and the Ecological Impact Assessment (EclA).
- 6.1.1.7 This chapter should be read in conjunction with Chapter 7: Biodiversity, Chapter 11: Health, Chapter 13: Materials and Waste, Chapter 15: Socio-Economics, Chapter 16: Soils and Land, Chapter 17: Traffic and Transport and Chapter 18: Water Environment.

6.2 Legislation, Policy and Guidance

- 6.2.1.1 Much of the legislation, policy and guidance, including the Air Quality Objectives (AQOs) and Air Quality Standards (AQSs), and the types of human receptors that are sensitive to emissions and thus where the AQOs apply, remains unchanged from our EIA Scoping Report (Section 6.2.1.2). Key changes since our EIA Scoping Report are described here. Changes have also been made where the request to consider additional legislation, policy or guidance was made in the Planning Inspectorate (PINS) EIA Scoping Opinion (dated 15 November 2022) ('the PINS Scoping Opinion').
- 6.2.1.2 Since the publication of our EIA Scoping Report in October 2022, the National Policy Statement (NPS) for Water Resources Infrastructure (Department for Environment, Food and Rural Affairs (Defra), 2023a) ('the 2023 NPS') has been updated and finalised. Changes to the NPS relevant to air quality (Section 4.2 of the NPS) since the draft version was released in 2018 are that:
- Paragraph 4.2.3 additionally states that: "*Applicants should seek through the design of any proposed scheme to minimise the emission of air pollutants as far as reasonably practicable;*"
 - Paragraph 4.2.3 now also clarifies that air quality assessments should consider the potential for significant effects against "*relevant statutory air quality limits or statutory air quality targets or impede the attainment of statutory targets*". Statutory targets are discussed in Section 6.2.1.7;

- Paragraph 4.2.4 expands the range of locations at which “*air quality considerations are likely to be particularly relevant*” and states that “*Consideration should also be given to disparity of exposure and whether any air pollution generated by a proposed scheme will exacerbate already-high levels of exposure*”. Changes to paragraph 4.2.6 also reflects the requirement to prevent exceedance of statutory targets; and
- Paragraph 4.2.5 expands the expected contents of an Environmental Statement to request “*existing (background) and baseline air quality levels*” and to describe “*how the scheme has been designed so as to prevent air pollutant emissions*”.

6.2.1.3 Section 4.2.7 to Section 4.2.9 of the 2023 NPS substantially rewrites the 2018 Draft NPS (Section 4.2.13). It principally requires that “*Where a proposed development is likely to lead to a breach of any relevant statutory air quality limits or statutory air quality objectives or affect the ability of a non-compliant area to achieve compliance or impede meeting national statutory targets, the applicant should work with the relevant authorities to secure appropriate mitigation measures to ensure that any statutory air quality limits and statutory air quality objectives are not breached and sufficient consideration of targets is made.*”

6.2.1.4 It also outlines the locations where air quality is likely to be particularly relevant, including air quality management areas (AQMAs); and expands upon the range of mitigation measures which should be considered within the assessment.

6.2.1.5 Changes were also made in Section 4.2.10 to Section 4.2.14 of the 2023 NPS, relating to the “Decision Making” criteria regulators should consider.

6.2.1.6 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 were published in January 2023, as required in the Environment Act 2021 (described in Section 4.2.1.1 of Appendix M of our EIA Scoping Report). They set the following legally binding targets (LBTs) for fine particulate matter with a diameter of less than 2.5 micrometres (PM_{2.5}) to be met by 2040:

- Annual mean concentration target (AMCT) of 10µg/m³; and
- Population exposure reduction target (PERT) of 35 per cent compared to 2018 exposure.

- 6.2.1.7 The Environmental Improvement Plan 2023 (Defra, 2023c) sets interim targets (ITs) to be met by the end of January 2028:
- AMCT of 12µg/m³; and
 - PERT of 22 per cent compared to 2018 exposure.
- 6.2.1.8 The Royal Borough of Kingston Upon Thames (RBKUT) and London Borough of Richmond Upon Thames (LBRUT) are committed to achieving annual mean PM_{2.5} concentrations of less than 10µg/m³ across their administrative areas by 2030, in line with the World Health Organisation (WHO, 2005) guidelines. This target is referenced in the London Environment Strategy (Greater London Authority (GLA), 2018), the London Local Air Quality Management Policy Guidance (Mayor of London, 2019) and the Elmbridge Borough Council (EBC) 2021 – 2026 Air Quality Action Plan (EBC, 2021b).
- 6.2.1.9 To account for this target and the 2023 NPS, annual mean PM_{2.5} concentrations will be considered against both the 10µg/m³ LBT and 20µg/m³ AQS.
- 6.2.1.10 The Clean Air Strategy 2023 (Defra, 2023b) has also been published since our EIA Scoping Report was finalised. Whilst not establishing an AQO or AQS for ambient ammonia (NH₃) concentrations, it describes NH₃ as a “*reactive gas which impacts biodiversity*”. Along with nitrogen oxides (NO_x), NH₃ should therefore also be considered in environmental assessments.
- 6.2.1.11 Whilst not regulated by AQSs or AQOs, guidance issued by the Institute of Air Quality Management (IAQM, 2020) (‘the IAQM 2020 guidance’) specifies critical levels for concentrations of NH₃ in ambient air against which vehicle and Non-Road Mobile Machinery (NRMM) emissions from the project should be assessed, below which significant harmful effects are “*not thought to occur*”. They have been adopted by the European Union and are cited in the Defra and Environment Agency (Defra and Environment Agency 2023) guidance, which applicants for Environmental Permits would be expected to use when assessing risks to air.
- 6.2.1.12 The IAQM 2020 guidance also indicates that critical loads can be found on the Air Pollution Information System (APIS) website (Centre of Ecology and Hydrology, 2023) and defines critical loads as “*Deposition flux of an air pollutant below which significant harmful effects on sensitive*

ecosystems do not occur, according to present knowledge. Usually measured in units of kilograms per hectare per year (kg/ha/yr)”.

- 6.2.1.13 Our EIA Scoping Report referenced the London Plan Guidance: Air Quality Neutral (AQN) Consultation Draft (GLA, 2021a) and the London Plan Guidance: Air Quality Positive, consultation draft (GLA, 2021b). Modified versions of both documents were adopted during February 2023.
- 6.2.1.14 The 2021 Consultation Draft of the AQN guidance screened out the requirement to undertake an assessment for *“Developments with emission sources that are not covered by the Air Quality Neutral benchmarks”*. The 2023 *“Air Quality Neutral London Plan Guidance”* (Mayor of London, 2023a; ‘the 2023 AQN guidance’) omits this text.
- 6.2.1.15 The 2023 AQN guidance requires for the gross number of trips (once complete and operational), and emissions from any proposed sources of combustion to be considered in an air quality neutral assessment. The guidance requires that they are calculated for proposed schemes in London as trips per annum and grams of NO_x per square metre of floorspace per annum respectively.
- 6.2.1.16 Despite changes in wording proposed in the guidance, it is not proposed that an air quality neutral assessment is undertaken for three reasons. Firstly, it is anticipated that most vehicle movements attributable to the project once operational will be associated with the use of the new green and blue open spaces, which are predominantly anticipated to be proposed outside of London. The number of vehicle movements proposed within London is therefore expected to be relatively limited. Secondly, no equivalent guidance has been published by the Surrey Local Authorities or within the 2023 NPS. There is therefore no policy basis for schemes outside of London to follow the 2023 AQN guidance or to demonstrate air quality neutrality. Thirdly, no sources of combustion, including mains gas, are proposed at the weirs; therefore, there are no emissions against which air quality neutrality would require determining within Greater London.
- 6.2.1.17 The Air Quality Positive London Plan Guidance (Mayor of London, 2023b) continues not to apply to developments which are not referable to the Mayor under the Town and Country Planning (Mayor of London) Order 2008.

- 6.2.1.18 Reference to the ‘Guidance on the Assessment of Minerals Dust Impacts for Planning’ (IAQM, 2016) (‘the IAQM 2016 guidance’) was not made in the list of legislation, policy and guidance in the EIA Scoping Report. This is because it was discounted from the proposed assessment method for assessing fugitive dust and emissions generated from construction related activities. However, following scoping feedback, a hybrid version of the methods utilising both the IAQM 2016 guidance and the methodologically similar ‘Guidance on the assessment of dust from demolition & construction’ (IAQM, 2023; ‘the IAQM 2023 guidance’) is instead proposed. It should be noted that the IAQM 2023 guidance is the latest version (version 2.1) of the IAQM ‘Guidance on the assessment of dust from demolition and construction’ (2014) referenced throughout our EIA Scoping Report. This guidance was updated in August 2023 with minor amendments to the construction dust assessment methodology. The method used to assess construction dust effects is described in Appendix 6.2.
- 6.2.1.19 The ‘Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air’ (Environment Agency, 2014) will also be used to calculate the amount of nitrogen and NH₃ deposited in relation to its effects on ecosystem eutrophication and acidification.

6.3 Engagement

6.3.1 Responses to EIA Scoping

- 6.3.1.1 Table 6-1 summarises the responses to comments received on our Scoping Report following formal submission to the Planning Inspectorate (PINS) including the PINS EIA Scoping Opinion (dated 15 November 2022) (‘the PINS Scoping Opinion’) and any key comments received from statutory consultees. Full consultee comments on our EIA Scoping Report and our responses to these comments are provided in Appendix 4.1.

Table 6-1: Responses to comments received on our EIA Scoping Report

Consultee or Organisation	Summary of Comment	Project Response
PINS	<p>Limited information has been provided in the Scoping Report regarding NRMM therefore the Inspectorate does not agree that this matter can be scoped out. The Environmental Statement (ES) should determine the type, number, location (including proximity to receptors) and operational hours of NRMM and quantify emissions; significant effects should be assessed where they are likely to occur.</p>	<p>An assessment of NRMM emissions will be undertaken for the ES. Impacts will initially be screened and then quantified using dispersion modelling where necessary. Regardless of whether screened out or included in modelling, the ES will determine the type, number, location (including proximity to receptors) and operational hours of NRMM; and quantify emissions.</p>
PINS	<p>The Inspectorate does not agree that impacts to air quality from vehicle movements transporting hazardous waste and materials can be scoped out; these movements should be considered as part of the construction traffic vehicle movements and emissions.</p>	<p>Vehicles transporting hazardous waste on roads from site will be considered within the construction vehicles emissions assessment within our PEIR and ES.</p>
PINS	<p>Effects from use of the recreational areas is not included in the potential effects on air quality. As multiple options remain for these areas, the potential air quality impact is unknown during operation and a worst-case scenario is not proposed. The ES should describe a worst-case scenario during operation of the recreational areas and include any potential impacts to air quality in the operational assessment where effects are likely to be significant.</p>	<p>Screening of an operational worst case will be undertaken for the design to be assessed for the ES (and dispersion modelling will be undertaken where necessary). The screening procedure is described in Sections 6.4.3.6 to 6.4.3.18.</p>
PINS	<p>The Inspectorate disagrees with the proposed screening process set out in Scoping Report</p>	<p>Impacts on designated ecological sites (defined in Section 6.4.3.16) from dust and particulate matter</p>

Consultee or Organisation	Summary of Comment	Project Response
	<p>paragraph 6.2.3.19. Focus should not be solely on Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites and sites such as (but not limited to) Sites of Special Scientific Interest (SSSI), Local Wildlife Sites (LWS) and National Nature Reserves (NNR) should be included as receptors.</p> <p>Habitats known to not be sensitive to NO_x or nitrogen deposition are proposed to be screened out of assessment, however, there are multiple other emissions that have potential to impact habitats such as dust, particulates and ammonia, therefore, sites with potential to be impacted by any changes in air quality should be included in the ES assessment.</p> <p>The exceedance of 1,000 Annual Average Daily Traffic (AADT) does not take into account the vehicle type, speed or cumulative traffic. The ES should use multiple applicable variables (in line with relevant guidance) to inform an assessment of impacts on ecological receptors.</p>	<p>generated from construction related activities will be assessed using the hybrid construction dust method outlined in Appendix 6.2. This assessment will consider multiple applicable variables in line with relevant guidance (such as meteorological conditions, receptor sensitivity) to inform an assessment of impacts on those designated sites.</p> <p>Potential impacts on ecological receptors (defined in Section 6.4.3.16) in terms of annual mean NO_x concentrations, nitrogen deposition, acid deposition and concentrations of ammonia resulting from vehicle exhaust emissions associated with construction or operation of the project will be assessed, in relation to emissions from vehicles and, for construction, project-derived NRMM (subject to reliable emissions data being available for the NRMM).</p> <p>At the ES stage, designated ecological sites will be screened; and if necessary, ecological receptors will be included within the dispersion modelling assessment.</p> <p>Where the impact of the project on air quality (both alone and, where applicable, in-combination with live plans and projects), caused either the critical load or critical level to exceed 1% at ecological receptors, the impacts and effect caused to the qualifying features within the designated ecological site will be</p>

Consultee or Organisation	Summary of Comment	Project Response
		determined. Depending on the type of habitat, this will be used to inform the ES Chapter and HRA.
PINS	Ammonia is not considered as a potential pollutant in the EIA Scoping Report. The ES should assess impacts from this pollutant or demonstrate that the vehicle traffic associated with the Proposed Development is unlikely to give rise to significant effects from ammonia emissions.	Assessment of potential impacts on designated ecological sites will be undertaken in terms of annual mean ammonia concentrations resulting from vehicle exhaust emissions from construction and operation of the RTS. It will also be considered in the assessment of impacts generated as a result of nitrogen and acid deposition.
PINS	EIA Scoping Report paragraph 6.4.1.1 only mentions human receptors in relation to demolition of buildings. For clarity, this should also include impacts on ecological receptors.	The impacts on designated ecological sites will be considered within the qualitative dust risk assessment for the construction phase of the RTS (in relation to fugitive dust from construction activities) in accordance with the appropriate IAQM guidance (see Appendix 6.2). This has been reported in the PEIR and will be included in the ES.
PINS	The EIA Scoping Report states use of electric or low-emission fleet vehicles could be prioritised as secondary mitigation for effects arising from air quality changes. The ES should explain any assumptions made in the assessment about use of such vehicles for the purposes of establishing residual effects.	The ES will explain any assumptions made in the assessment about use of such vehicles for the purposes of establishing residual effects.
PINS	Effort should be made to agree the final monitoring sites to be used for model verification and sensitive receptor locations with relevant consultation bodies, including the local authorities. The ES should include plan(s) showing the location of human and ecological	Further consultation will be undertaken with the local authorities at the ES stage to agree which monitoring sites will be used for model verification and sensitive receptor locations; as well as regarding emissions factors and background pollutant concentrations.

Consultee or Organisation	Summary of Comment	Project Response
	receptors within the air quality study area.	These cannot yet be selected as the air quality model study areas (for construction and operation) is presently unknown. The ES will include plans showing the location of human and ecological receptors within the air quality model study area.
PINS	<p>The EIA Scoping Report describes potential changes in air quality from movements on the road network but does not include emissions from boats although the potential for use of the river/ barges during construction is described in Chapter 17.</p> <p>Should boats be used during construction and/or operation, the ES should describe the number and routing of movements and vehicle type and assess potential air quality effects from these vessels where they are likely to be significant. Any associated mitigation should be described and secured through the Development Consent Order (DCO) i.e. reducing waiting times at locks.</p>	Further detail will be provided in the ES on the number of river transport movements predicted as a result of the RTS and the class of vessels to be used. Their potential for air quality effects will be screened, and where required a detailed air quality assessment may be undertaken using the ADMS-Roads dispersion model (ADMS being the commercial name for the Atmospheric Dispersion Modelling System). If required, appropriate mitigation will be proposed in the ES, describing how this will be secured.
Local Planning Authority (LPA) Project Group	In addition to European designated sites, SSSIs, NNRs, Local Nature Reserves (LNRs), Ancient Woodland and LWS should also be considered in the assessment of air quality impacts on ecological receptors, in accordance with the IAQM's 'A guide to the assessment of air quality impacts on designated nature conservation sites' (2020).	We will consider SACs, SPAs, Ramsar Sites, SSSIs, NNRs, LNRs, Ancient Woodland, LWSs and Sites of Nature Conservation Interest (SNCIs).
LPA Project Group	Whilst impacts from river transport emissions resulting from the RTS, such as those associated with construction material movement by	Further detail will be provided in the ES on the number of river transport movements predicted as a result of the RTS and the class of vessels to

Consultee or Organisation	Summary of Comment	Project Response
	use of barge, particularly during capacity improvement construction works, are unlikely to be significant, further detail should be provided in the Air Quality Chapter of ES on the number of river transport movements predicted as a result of the RTS and the class of vehicles to be used.	be used. Their potential for air quality impacts will be screened, and where required a detailed air quality assessment may be undertaken using the ADMS-Roads dispersion model.
LPA Project Group	The IAQM 2014 guidance is accepted as appropriate as a basis for the construction dust assessment. However, should excavation and / or processing exceed 200,000 tonnes per annum (tpa), the IAQM 2016 'Guidance on the Assessment of Minerals Dust Impacts' would be more suitable.	Our Scoping Report provided justification in 6.2.2.3 to 6.2.2.6 explaining why this guidance is not appropriate and the IAQM 2014 (now IAQM 2023) guidance should be used. However, an assessment will be undertaken in the ES using a hybrid approach making use of both documents (which were developed in accordance with the same broad principles). The method used is described in Appendix 6.2.
LPA Project Group	Acid deposition and concentrations of ammonia resulting from road traffic emissions and their contribution to nitrogen deposition should also be considered in relation to impacts on ecological receptors.	Assessment of potential impacts on designated ecological sites in terms of annual mean ammonia concentrations resulting from vehicle exhaust emissions associated construction of the project will be undertaken in the ES.

6.3.2 Other Engagement since EIA Scoping

6.3.2.1 Section 6.2.2 of our EIA Scoping Report summarises the stakeholder engagement relevant to Air Quality that was undertaken prior to submission of the EIA Scoping Report.

6.3.2.2 We have since engaged with the LBRUT, Spelthorne Borough Council (SBC), EBC, Runnymede Borough Council (RBC) and the RBKUT during May 2023 in order to agree the methodology and proposed locations for diffusion tube monitoring sites. Once these sites had been agreed, a final methodology was provided later that month and permissions were

obtained prior to commencing the monitoring work. Appendix 6.1 provides further detail on the diffusion tube monitoring survey.

6.3.2.3 Further engagement (commencing in March 2023) also took place with these authorities, as well as the Royal Borough of Windsor and Maidenhead (RBWM) to propose the ES assessment methodology (see Section 6.4) and to obtain copies of any odour complaints the authorities held within the odour study area (see Section 5.2). Collectively, we agreed the following for the ES:

- The types of receptors that should be considered as sensitive to dust within the construction dust assessment (see Appendix 6.2);
- We will provide further detail regarding the method used to generate traffic data used in the air quality assessment;
- Mitigation measures to consider;
- The screening criteria used to determine the model study areas will account for new bridges and roads;
- A diurnal profile will be used in modelling (where possible); and
- the odour assessment will account for dewatering operations (among other potential causes of fish death).

6.4 Methodology

6.4.1 Introduction

6.4.1.1 This section should be read in conjunction with Chapter 4 'Approach to the Environmental Assessment' which sets out relevant information on the design parameters and information that have informed our PEIR assessment, and how we have approached various aspects of the assessment including:

- The scope of the assessment;
- The methodology (including the approach to defining the baseline environment, topic study areas, and assessment methodology and criteria);
- The approach to mitigation; and
- The approach to cumulative effects.

6.4.1.2 The assessment methodology used for the air quality assessment in our PEIR and to be used in the ES is presented in Section 6.7 of our EIA Scoping Report and updated below in Sections 6.4.2 to 6.4.6.

6.4.1.3 For our PEIR, detailed information related to the construction of the project is not yet available. The assessment of air quality effects presented in our PEIR is therefore approximate and preliminary and will be updated when further detail is known for the ES.

6.4.2 Baseline

Assessment Method for the PEIR

6.4.2.1 'Baseline' air quality refers to the concentrations of relevant substances that are already present in ambient air.

6.4.2.2 The method used in the PEIR to assess baseline air quality remains unchanged from Section 6.2 of our EIA Scoping Report, except as follows:

- the number of thresholds against which air pollutant concentrations has been compared has increased. This is described in Section 6.4.2.3;
- baseline conditions at ecological receptors have been outlined. This is explained in Sections 6.4.2.4 to 6.4.2.6;
- the sources of information underlying the baseline description of air pollutants has been updated to account for new information. This is explained in Section 6.4.2.7; and
- the odour complaints history available at the time of writing has been reviewed and summarised in Section 5.2.1.5 of Chapter 5: Site Description.

Thresholds that air pollutant emissions have been compared against

6.4.2.3 Due to updates in legislation and feedback received in the PINS Scoping Opinion, as described in Sections 6.2 and 6.3, the number of AQOs, AQSs, critical levels and LBTs against which baseline air quality is characterised has been extended. These 'thresholds' are shown in Table 6-2: Air Quality Standards to be Applied for this Assessment.

Table 6-2: Air Quality Standards to be Applied for this Assessment

Pollutant	Threshold level	Type of threshold	Measured as	Receptors to which threshold level applies
NH ₃	1 µg/m ³ (for lichens and bryophytes) 3 µg/m ³ elsewhere	Critical level	Annual mean	Ecological receptors (if sensitive)
NO _x	30µg/m ³	AQS	Annual mean	Ecological receptors (if sensitive)
Nitrogen dioxide (NO ₂)	200µg/m ³ , not to be exceeded more than 18 times per year	AQO	One-hour mean	Anywhere where a member of the public may spend one hour or longer
NO ₂	40µg/m ³	AQO	Annual mean	Human residences, schools and hospitals
Particles with a diameter of less than 10 micrometres (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times per year	AQO	24-hour mean	Human residences, schools and hospitals and private gardens
PM ₁₀	40µg/m ³	AQO	Annual mean	Human residences, schools and hospitals
PM _{2.5}	20µg/m ³	AQS	Annual mean	Human residences, schools and hospitals
PM _{2.5}	10µg/m ³	LBT	Annual mean	Human residences, schools and hospitals

Baseline Conditions at Ecological Receptors

6.4.2.4 The APIS website has been used to obtain, for selected habitats:

- Background rates of nitrogen deposition, which identify the rate at which nitrogen is deposited from air on soils, from where it can lead to eutrophication;
- Nitrogen (eutrophication) critical loads;
- Background rates of nitrogen and sulphur deposition which can lead to acidification (i.e. acid deposition);
- Critical loads relating to nitrogen and sulphur due to the impacts of acidification on ecosystems; and
- Background annual mean NH₃ concentrations.

6.4.2.5 In Section 5.2.1.6 of Chapter 5: Site Description, we have considered whether:

- Background rates of nitrogen deposition exceed the nitrogen (eutrophication) critical loads;
- Background rates of nitrogen deposition exceed the minimum nitrogen critical load (above which significant effects cannot be ruled out) relating to acid deposition; and
- Background ammonia concentrations exceed the annual mean ammonia critical load.

6.4.2.6 This has been considered at the seven designated ecological sites (defined in Section 6.4.3.16) that are located within 200 metres of the currently known construction traffic routes. The significance of this distance is discussed in Section 6.4.3.17 to Section 6.4.3.19.

New Sources of Information

6.4.2.7 Newer versions of the Air Quality Annual Status Reports (ASRs) cited in Section 6.2.1.4 of the EIA Scoping Report have been published. They are:

- EBC 2022b Air Quality Annual Status Report;
- LBRUT Air Quality ASR for 2021;
- RBWM 2022 Air Quality ASR; and
- RBC 2022 Air Quality ASR.

Assessment Method for the ES

- 6.4.2.8 The method used to report baseline conditions will generally not change, except to:
- account for new legislation, policy and guidance since the PEIR is published, if applicable;
 - account for new data released by third parties, such as new odour complaints or air quality monitoring data, if applicable;
 - describe the results of the project NO₂ monitoring survey; and
 - expand upon the summary provided in Section 5.2 of Chapter 5: Site Description.

6.4.3 Construction Effects

Assessment Method for the PEIR

Assessment of Dust and Odour from Construction Related Activities

- 6.4.3.1 A high-level assessment of dust impacts was undertaken for the PEIR, using a modified approach of the method outlined in Appendix 6.2, and as described in 6.4.3.2.
- 6.4.3.2 The dust assessment undertaken for our PEIR considered at least the worst-case receptors for each of the construction related activity (in terms of receptor sensitivity, downwind direction and proximity to the site) to inform the overall likely effect for each construction activity. The effects associated with the generation of PM₁₀ on human health were assumed to be no greater than the effect of dust generation on amenity, as primary and tertiary mitigation (see also Section 6.6) is expected to dampen down PM₁₀ and dust emissions and result in a similar dust emissions magnitude. The odour assessment used the source-pathway-receptor approach outlined in Section 6.4.3.25. Pathway effectiveness considered downwind direction and proximity to the site.

Assessment of Vehicle Emissions from Construction Traffic and NRMM

- 6.4.3.3 Our PEIR assessment considered effects on human and ecological receptors within 200 metres of routes likely to be used by Heavy Goods Vehicles transporting some of the excavated material from construction of the flood channel (see Figure 17.1 and Appendix 17.2) in relation to the

criteria described in Section 6.2.3.13 of our EIA Scoping Report to determine the magnitude of potential change. Other criteria from TG22 and professional judgement (with reference to baseline air quality conditions and the presence of receptors) have been respectively used to determine the magnitude of change in air quality from NRMM and other road traffic.

- 6.4.3.4 Human receptor sensitivity considered the definitions provided in Section 6.4.3.20. Ecologically sensitive receptors were either considered low (where not sensitive to the effects of nitrogen, acid or ammonia deposition) or high sensitivity. High sensitivity receptors were considered as sensitive to the effects of nitrogen, acid or ammonia deposition and were located within 200 metres of locations where vessels or NRMM are expected to be used.

Assessment Method for the ES

Assessment of Dust from Construction Related Activities

- 6.4.3.5 Following feedback from the PINS Scoping Opinion and subsequently with the local authorities, we will undertake a qualitative dust risk assessment for the construction phase using an approach considering the IAQM 2023 and IAQM 2016 guidance documents within the ES. The revised method is described in Appendix 6.2.

Assessment of Vehicle Emissions from Construction Traffic and NRMM

- 6.4.3.6 Following feedback from the PINS Scoping Opinion, emissions from vehicles, inland water vessels and plant that will be used in connection with construction related activities (including vehicles transporting hazardous waste on roads from site up to the major road network) will be assessed. The plant and inland water vessels are NRMM. NRMM not being used by the project are assumed to be accounted for in baseline/background.
- 6.4.3.7 Impacts will initially be screened and then quantified using dispersion modelling where necessary.
- 6.4.3.8 Regardless of whether NRMM are modelled or screened out, the air quality chapter of the ES will determine the indicative type, number, location (including proximity to receptors) and operational hours of NRMM

and quantify emissions, contextualised relative to emissions from other sources and baseline pollutant concentrations.

Screening of Road Traffic and Plant

- 6.4.3.9 The need to model vehicle or plant movements on roads or routes for which traffic data are made available will be screened.
- 6.4.3.10 Changes in traffic along a road or route which would trigger one or more of the screening criteria described in Section 6.2.3.13 of our EIA Scoping Report will be used. Additional relevant screening criteria, following PINS Scoping Opinion feedback and consultation with the local authorities, are as follows:
- Where the project would result in road realignment (where the road path is more than five metres from its original path at any point) or would introduce new roads, haul routes or construction compounds, etc., where the road is within or near an AQMA; or
 - Where the project introduces a new junction or removes an existing junction near to either relevant receptors, or junctions which would cause traffic to significantly accelerate or decelerate (such as at traffic lights or near roundabouts).
- 6.4.3.11 For screening, the interpretation of AQMA described in Section 6.2.3.15 of our EIA Scoping Report will be applied to the criteria above.
- 6.4.3.12 Plant emissions will also be screened against the criteria specified in Section 6.2.3.13 of our EIA Scoping Report and those listed above. Plant will be treated similarly to Heavy Duty Vehicle (HDV) movements.

Screening of Inland Water Vessels

- 6.4.3.13 This will take place using two stages. First, where inland water vessels are located more than 200 metres from receptors, they will be screened out from further assessment. Adoption of the 200 metre screening criteria is likely to screen out emissions at receptors that would not be materially affected. This reflects research reported by the Port of London Authority (2018) which demonstrated that the steepest fall in pollutant concentrations occurred within the first 20 metres from the source.
- 6.4.3.14 Second, professional judgement will be used to review the potential for emissions to have a potentially perceptible impact. This will consider the

number of, and emissions from, the additional vessel movements expected and the period over which emissions from these vessels will be generated. It will also account for the background annual mean NO_x, PM₁₀ and PM_{2.5} concentrations relative to the AQOs and LBT; and the relative contribution of existing vessel movements to annual mean pollutant concentrations.

Screening of Human Receptors

- 6.4.3.15 The method used to screen receptors remains unchanged from Section 6.3.2.16 of our EIA Scoping Report. For additional clarity, this will include any road where the project leads to a reduction in traffic volumes if it would otherwise need modelling to ensure the baseline contribution is adequately accounted for at nearby receptors where traffic volume increases are significant.

Screening of Ecological Receptors

- 6.4.3.16 Ecological receptors refer to the assessed pollutant-sensitive features within 'designated ecological sites', namely SACs, SPAs, Ramsar sites, SSSIs, NNRs, LNRs, Ancient Woodland, Local LWSs and SNCIs.
- 6.4.3.17 Similar to Section 6.2.3.19 of our EIA Scoping Report, ecological receptors will be included in the dispersion model where they cannot be screened out. The criteria are based on those from guidance (Natural England, 2018; IAQM, 2020) but have been modified to account for comments raised in the PINS Scoping Opinion. These criteria are as follows:
- Distance screen: Designated ecological sites more than 200 metres from any roads, routes or other significant sources of air pollutants for which traffic data etc. are available will be excluded.
 - Feature sensitivity screen: Features within designated ecological sites known not to be sensitive to eutrophication or acidification etc. because of changes to NO_x or NH₃ will be excluded. Features refer to 'qualifying features' of designated ecological sites which either directly contain or support the habitats or species that the site was designated to protect. Reference will be made to the MAGIC (Defra, n.d.) and APIS websites to determine whether features can be screened in or out of assessment.

- Spatial distribution of features screen: Unless features which are sensitive to pollution are located within 200 metres of any road, routes or other sources, the designated ecological site will be excluded.
- Effects of the project: Designated ecological sites will only be considered where the project leads to one or more of the screening criteria referenced in Section 6.2.3.13 of our EIA Scoping Report and Section 6.4.3.9 above to be breached in relation to roads, routes or other sources within 200 metres of screened in sources (as described in Section 6.4.3.6 to 6.4.3.15). Impacts will also be screened in where the project would lead to an increase in traffic of 1,000 vehicle movements (expressed as AADT flow) “in-combination” with other plans and projects.

6.4.3.18 All ecological receptors that are screened into the assessment will be considered ‘high sensitivity’, due to receptors not sensitive to the effects of air pollution being screened out.

Modelling Setup

6.4.3.19 The dispersion modelling method (relating to model setup and interpretation of impacts at human receptor locations) remains unchanged from Section 6.7.1.21 to Section 6.7.1.32 of our EIA Scoping Report, except as follows:

- We will also model a ‘Do Nothing’ scenario (future baseline traffic without in-combination schemes) where at least one ecological receptor is modelled;
- Where screened in, NRMM and inland water vessels will be modelled in the ‘Do-Something’ construction scenario;
- Road vehicle speeds will be reduced at junctions;
- Emissions factors for plant are likely to be calculated based on emissions data for Heavy Goods Vehicles or Articulated Dump Trucks (accounting for speed and loading) obtained from the National Atmospheric Emissions Inventory website;
- Houseboats will be considered as high sensitivity human receptors;
- We will request information on traffic data variation for each hour of a typical week for each modelled road to enable a diurnal profile to be produced. Where data are not available for a specific road link, we will apply a profile based on the ‘average distribution by day of the

week' for Great Britain during 2019 (Department for Transport, 2020) or apply another appropriate approach to capturing diurnal variation;

- Further consultation will be undertaken with Surrey County Council, EBC, LBRUT, RBWM, RBC and SBC to agree which monitoring sites will be used for model verification, sensitive receptor locations, emissions factors and background pollutant concentrations to be used in the assessment (although the latter two will match the assessed year); and
- The ES will explain any assumptions made in the assessment about use of electric vehicles for the purposes of establishing residual effects.

Further ES methodology clarifications

- 6.4.3.20 Human receptors will be considered within the assessment at locations where the annual mean AQOs should be applied in accordance with the definitions provided in the Local Air Quality Management Technical Guidance (Defra, 2022) ('TG22') (see also Section 6.2.1.2 of our EIA Scoping Report). They will therefore include:
- Residences, schools and hospitals. These receptors will typically be considered high sensitivity;
 - Impacts on human receptors may also be assessed at locations where exposure may be more chronic, where only the hourly or 24-hour mean AQOs should be applied. Chronic exposure may also affect locations where members of the public may spend one hour or longer. These receptors will be considered as medium sensitivity; and
 - Low sensitivity receptors are unlikely to be modelled.
- 6.4.3.21 Model verification will be undertaken using appropriate diffusion tube monitors and/ or automatic monitoring sites located within or near the project boundary for PEIR. Different adjustment factors may be produced for different modelled areas, depending on local characteristics.
- 6.4.3.22 Some additional or different areas will also be modelled for the baseline (model verification) scenario, including roads within 200 metres of the monitoring locations. The monitoring locations will be determined once the model study area has been finalised (which is ongoing) and their suitability for use in model verification has been checked.

6.4.3.23 Additional monitoring for NO₂ using diffusion tubes commenced in June 2023 to inform the ES in areas where both traffic attributable to the project is expected to be introduced; and sufficient local authority monitoring is not currently available. Some of these points may be used for model verification. The method used to undertake the air quality monitoring programme is described in Appendix 6.1.

6.4.3.24 To assess effects at ecological receptor locations, assessments will be undertaken involving six steps, noted below (wherever required, critical loads, critical levels and background nitrogen, acid or NH₃ concentrations will be obtained from the United Kingdom Air Information Resource (Defra, 2020) background maps, monitoring data or APIS website):

- First, the verified modelled road NO_x will be added to background NO_x concentrations for comparison against the annual mean NO_x AQO. Where the process contribution (PC), i.e. contribution from the project, exceeds one per cent of the critical level, the data will be passed to the project ecologists for further determination as significant or insignificant.
- Second, the NH₃ total concentration will be compared to the critical load of 3µg/m³, applicable in habitats or ecosystems when there are no lichens or bryophytes present; or 1µg/m³ where they are present. Where the PC exceeds one per cent of the critical level, the data will be passed to the project ecologists for further determination as significant or insignificant.
- Third, the annual mean nitrogen deposition concentration will be converted from the annual mean NO_x PC using the method outlined in Environment Agency (2014) guidance, in relation to its potential to cause eutrophication. The nitrogen deposition concentration will be compared to the nitrogen critical load. Where the PC exceeds one per cent of the critical load, the data will be passed to the project ecologists for further determination as significant or insignificant, using the process (and criterion) outlined in Natural England guidance (Natural England, 2018).
- Fourth, the latest version of the National Highways NO_x to NH₃ calculator will be used to convert the NO_x road traffic PC to NH₃ at each receptor and converted to deposited NH₃ using the Environment Agency 2014 guidance (Environment Agency, 2014). Deposited NH₃ from NRMM will also be calculated. This deposited NH₃ will be added

to the deposited nitrogen PC for comparison against the one per cent criterion.

- Fifth, the annual mean nitrogen deposition concentration will be converted from the annual mean NO_x PC using the method outlined in the Environment Agency 2014 guidance, in relation to its potential to cause acidification, and compared to the critical load function. Where the PC exceeds one per cent of the critical load function and the predicted environmental concentration exceeds 70 per cent of the critical load function, the data will be passed to the project ecologists for further determination as significant or insignificant. The contribution from road traffic to sulphur concentrations is expected to be negligible and will not be modelled.
- Sixth, the NH₃ PC will be added to the acidifying nitrogen deposition PC for comparison against the acid deposition criteria outlined in the fifth stage.

ES Assessment of Odour Arising from Channel Excavation

6.4.3.25 The method that will be used within the ES to qualitatively assess and describe impacts arising from odours associated with channel excavation remain unchanged from Section 6.7.1.14 of our EIA Scoping Report. Dewatering will be included in the assessment.

6.4.3.26 Table 6-3 below replicates the criteria from the ‘Guidance on the assessment of odour for planning’ (IAQM, 2018) (‘the IAQM 2018 guidance’), which are proposed to be used to assess source strength, pathway effectiveness and receptor sensitivity (named as steps 1, 2 and 4 in Sections 6.7.1.14 to 6.7.1.18 of the EIA Scoping Report).

Table 6-3: Source-Pathway-Receptor (S-P-R) Risk Factors (IAQM 2018 Guidance)

Source odour potential	Pathway effectiveness	Receptor
<p>Large source odour potential Large scale odour source Materials usage: >100,000 tonnes/ m³ / year Area sources >1,000 m² Highly odorous release</p>	<p>Highly effective pathway for odour flux to receptor Receptor adjacent to source/ site Distance well below official set-back distances</p>	<p>High sensitivity receptor Surrounding land where users can expect to enjoy a high level of amenity and where people would reasonably be expected to be present continuously, or</p>

Source odour potential	Pathway effectiveness	Receptor
<p>Low odour detection thresholds Offensiveness: “most offensive” Hedonic tone score = -2 to -4 No mitigation (open air operation, no containment)</p>	<p>Wind direction: high frequency (%) of winds from source to receptor or downwind, from source, of prevailing wind direction Effectiveness of dispersion/ dilution: open processes with low-level releases, e.g. lagoons, uncovered effluent treatment plant, landfilling of putrescible wastes.</p>	<p>at least regularly for extended periods, as part of the normal intended use of the land, e.g. residential dwellings, schools/ educational facilities, hospitals, tourist/ cultural areas/ attractions.</p>
<p>Medium source odour potential Medium scale odour source Materials usage: 1,000 – 100,000 tonnes/ m³/ year Area sources 100 – 1,000 m² Moderately odorous release Offensiveness: “moderately offensive” Hedonic tone score = 0 to -2 Some mitigation, but significant residual odour remains</p>	<p>Moderately effective pathway for odour flux to receptor Receptor is local to the source Where mitigation relies on dispersion/ dilution – releases are elevated but compromised by building effects.</p>	<p>Medium sensitivity receptor Surrounding land where 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 people would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal intended use of the land e.g. places of work, commercial/ retail premises, playing/ recreation fields.</p>
<p>Small source odour potential Small scale odour source Materials usage: <1,000 tonnes/ m³/ year Area sources <10 m² High odour detection thresholds Offensiveness: “less offensive” Hedonic tone score = 0 to +4</p>	<p>Ineffective pathway for odour flux to receptor Receptor is remote from source/ site Distance exceeds any official set-back distances Wind direction: low frequency (%) of winds from source to receptor or upwind, from source, of prevailing wind direction</p>	<p>Low sensitivity receptor Surrounding land where the enjoyment of amenity would not reasonably be expected or where 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 intended land use e.g. industrial</p>

Source odour potential	Pathway effectiveness	Receptor
Effective, tangible mitigation measures in place	Where mitigation relies on dispersion/ dilution – releases are from high level (e.g. stacks or roof vents > 3 metre above roof/ ridge height) and are not compromised by building effects.	areas, farms, footpaths, roads.

6.4.3.27 As per step 3 of the method in our EIA Scoping Report (Section 6.7.1.17), when the source odour potential and pathway effectiveness for each receptor have been defined using Table 6-3, these are considered together to predict the risk of odour exposure (impact) at the receptor location, using the matrix shown in Table 6-4.

Table 6-4: Risk of Odour Exposure (Impact) at the Specific Receptor Location.

	Source Odour Potential: Small	Source Odour Potential: Medium	Source Odour Potential: Large
Highly Effective Pathway	Low Risk	Medium Risk	High Risk
Moderately Effective Pathway	Negligible Risk	Low Risk	Medium Risk
Ineffective Pathway	Negligible Risk	Negligible Risk	Low Risk

6.4.3.28 As per step 5 of the method from our EIA Scoping Report (Section 6.7.1.19), the effect of the odour impact on the specific receptor location is then estimated by taking into consideration its sensitivity. This can be estimated using the matrix shown in Table 6-5.

Table 6-5: Magnitude of Odour Effect at Receptor Location

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

6.4.3.29 Where moderate or substantial odour impacts are predicted at multiple receptors in the qualitative assessment, a detailed dispersion modelling assessment of odour effects of exposed or stockpiled soils will be undertaken using ADMS-Roads. It is anticipated that “library” odour emissions rates would be used (such as in relation to ‘green’ waste collected historically at waste transfer stations).

6.4.3.30 Where dispersion modelling is undertaken:

- Professional judgement and project information will be used to determine the length, width and height of sources modelled and settings appropriately representing the temperature and velocity at which odour would be passively released.
- Three years of meteorological monitoring data from the London Heathrow Airport monitoring station (including 2019) will be used in the dispersion modelling assessment.
- The impacts and effects of odour will be determined at both discrete and hypothetical receptor locations (within a contour plot). The contour plots will delineate areas where the 98th percentile of hourly mean odour concentrations exceed 3 European odour units per metre cubed of air (ouE/m³). This odour threshold is equivalent to the ‘H4 Benchmark Odour criteria’ for ‘moderately offensive’ odours defined in the IAQM 2018 guidance.

- At the discrete receptors, the potential odour impacts at each individual receptor will be determined with reference to the impact assessment criteria in the IAQM 2018 guidance.

6.4.4 Operational Effects

Assessment Method for the PEIR

6.4.4.1 The method used to assess impacts from operation for our PEIR followed the same approach adopted to assess construction impacts for our PEIR (see also Sections 6.4.3.1 to 6.4.3.4).

Assessment Method for the ES

Assessment of Vehicle Emissions from Operational Traffic

6.4.4.2 The methodology for the assessment of effects from operation on air quality due to emissions from traffic will be identical to the construction phase emissions assessment, except that:

- the model study area and scenarios modelled will differ; and
- construction plant and inland water vessels will not be modelled as, once operational, the project is not anticipated to generate enough inland water vessel movements to result in significant effects.

6.4.4.3 Further consultation proposed to address construction air dispersion modelling, as discussed in Section 6.4.3.19, will provide the same information to cover operational air dispersion modelling.

6.4.4.4 Traffic data used will include a worst-case scenario from operation of the recreational areas.

6.4.4.5 The assessment of effects on ecological receptors from the operation of the project will follow the same methodology as that described in Sections 6.4.3.16 to 6.4.3.18.

Assessment of Odour Arising from Channel Operation

6.4.4.6 For the ES, we will undertake a qualitative assessment of odour emissions associated with potential fish mortality from all causes associated with the project, including the introduction of nutrient rich water

to lakes and operation of the weir gates following high precipitation and flood events.

6.4.4.7 The methodology for the assessment is expected to follow the qualitative method as outlined in Section 6.4.3.25 for the construction phase odour assessment. The air quality assessment will focus on the potential that fish death may generate odour whereas Chapter 7: Biodiversity and Chapter 18: Water Environment will assess impacts from fish death on the species and the water environment, respectively.

6.4.4.8 Odour from these sources is expected to be transient and generally insignificant. Dispersion modelling of odour effects is therefore not expected to be undertaken.

6.4.5 Cumulative Effects

6.4.5.1 The method used to consider cumulative effects has not been amended since the EIA Scoping Report (Section 6.7.3). However, the following clarifications are made as more potential air quality effects have been scoped in.

6.4.5.2 It is not initially proposed to model baseline air quality effects from inland water vessels or plant from nearby committed and consented schemes. This is because emissions from sailing boats, workboats or motorboats, personal watercraft and inland goods carrying vessels (based on projected 2008 surveyed data) are each accounted for in the estimated Defra (2020b) ambient air pollutant concentrations (Tsigatakis, 2019). They would also contribute to pollutants detected at any representative air quality monitoring sites.

6.4.5.3 In relation to plant, TG22 also indicates that *“Experience of assessing the exhaust emissions from on-site plant and site traffic suggests that, with suitable controls and site management, they are unlikely to make a significant impact on local air quality. In the vast majority of cases they will not need to be quantitatively assessed – qualitative consideration [to best practice mitigation] will likely provide sufficient screening.”* It is anticipated that standard practice mitigation measures will be employed at any sites adjacent to the project; or plant emissions will not be of a sufficient nature and scale as to generate significant cumulative effects.

6.4.6 Assumptions and Limitations

Assessment Method for the PEIR

- 6.4.6.1 The assumptions made regarding the assessment of impacts for our PEIR are described in Section 6.7.1.1.

Assessment Method for the ES

- 6.4.6.2 The following assumptions and limitations have been identified in addition to those reported in Section 6.8 our EIA Scoping Report.
- 6.4.6.3 Assumptions may need to be made regarding the volume of traffic, maximum pollutant emissions rates (based on engine size and classification parameters), assumed worst-case load, diurnal variation throughout the day, speed and path length and/or location of inland water vessels, vehicles and/or plant used in connection with the project. The traffic data will also be used as received. Information will be obtained from the traffic and transport assessment or publicly available records in the absence of vehicle or NRMM-specific information where available.
- 6.4.6.4 The output of any tools or data made available by third parties in connection with the assessment will be assumed to be accurate.
- 6.4.6.5 Any data obtained from monitoring sites, managed either by Local Authorities or temporarily installed in connection with the project, will have uncertainties. Unless reported by Local Authorities, assumptions about the location and height at which monitors are installed may be estimated with reference to publicly available street level photographs, as is usual practice.
- 6.4.6.6 There are inherent uncertainties with using diffusion tubes, associated with the analysis method itself, as well as the methods used to process diffusion tube data, and inherent uncertainty associated with assessing the effects of accuracy and seasonality on the monitoring results (AEA Energy and Environment, 2008; TG22). Care has been taken to ensure any monitoring locations installed in connection with the project are installed at representative locations in accordance with this prevailing guidance as far as is practicable.

- 6.4.6.7 There are inherent uncertainties in selecting emissions rates for odour modelling. Efforts will be made to select odour emissions rates which best represent conditions expected.
- 6.4.6.8 The odour emissions model will use hourly sequential meteorological data to predict dispersion within different conditions. It is possible that short-term exposure could lead to elevated odour concentrations but which then do not exceed the odour assessment criterion after being averaged over an hour. In this case, the situation could arise where, over the year, the 30uE/m³ criterion may be complied with but, over the period for which the odour is emitted, it may be exceeded.
- 6.4.6.9 The IAQM 2018 guidance advises that calm wind conditions tend to lead to worst-case conditions for odour dispersion. Due to constraints of the model used, calm conditions will not specifically be accounted for.
- 6.4.6.10 The odour assessment criteria upon which the IAQM 2018 guidance criteria were based are derived from a dose-response relationship, which was carried out based on a limited number of processes using older-generation dispersion models. It is therefore possible that odours at concentrations below 30uE/m³, where odours would be predicted to exert a 'slight' or 'negligible' effect, may still lead to the generation of complaints or affect amenity, or vice versa.

6.5 Key Environmental Considerations and Opportunities

- 6.5.1.1 The key considerations with respect to air quality are:
- Human health and ecological receptors within the study area which are sensitive to fugitive dust generated by demolition, earthworks, construction and trackout activities.
 - Human health and ecological receptors within the study area which are sensitive to increase in ambient concentrations of air pollutants, which could affect human health or lead to acidification or eutrophication at ecological receptors.
 - There are numerous historical and authorised landfill sites and other areas of potentially contaminated land within the study area. The disruption of contaminants from these sites could generate odour, affecting amenity.
 - The introduction of nutrient rich water to lakes and the flood channel, operation of the weir gates following high precipitation and flood

events, and other operational uses of the project could lead to fish mortality. This could generate odour and affect amenity.

6.5.1.2 The key opportunity with respect to air quality is:

- The project could lead to a reduction in vehicle traffic, which could have a temporary or permanent positive effect on air quality, in at least some locations around site.

6.6 Primary and Tertiary Mitigation

6.6.1 Primary Mitigation

6.6.1.1 The following primary mitigation is proposed in relation to air quality effects:

- The provision of augmented flow;
- Apply mitigation hierarchy for habitats and species; and
- Habitat creation, mitigation or enhancement for other effects on habitats or species.

6.6.1.2 The provision of the augmented flow will reduce nutrient residence times and allow for fish movement through the flood channel and existing lakes. This will therefore reduce the risk of water quality deterioration, and subsequently reduce the potential for fish death and related odour.

6.6.1.3 Measures to mitigate effects that air pollution may have on sensitive features within ecologically designated sites, or on habitats and species, may be required to ensure that the project will not cause a likely significant effect. For the purposes of the Habitats Regulations Assessment, it will also need to ensure that where likely significant effects cannot be discounted, the project has no adverse effect on the integrity of European sites.

6.6.2 Tertiary Mitigation

6.6.2.1 The following tertiary mitigation is proposed in relation to air quality effects.

6.6.2.2 Standard construction practices to manage air quality will be followed. For example, mitigation measures in accordance with the following IAQM guidance documents: 'Guidance on the Assessment of Dust from

Demolition and Construction’ (2023) and ‘Guidance on the Assessment of Minerals Dust Impacts’ (2016). This is likely to include measures such as (this is not an exhaustive list):

- Storage of stockpiled material under cover, protected from the wind;
- Dust and acoustic barriers along traffic routes and working areas;
- Ensure effective water suppression is used during demolition and earthworks operations; and
- Set appropriate site speed limits for construction vehicles, with regular clearing, grading and maintenance of haul routes.

6.6.2.3 Mitigation measures for air quality will be recommended in accordance with the above documents plus the Mayor of London Supplementary Planning Guidance (SPG) (Mayor of London, 2014).

6.6.2.4 NRMM with low emissions will be used to reduce emissions of pollutants.

6.6.2.5 For works in London boroughs, the project will comply with emissions standards listed at www.nrmm.london and register NRMM to demonstrate compliance. Emissions standards for works in London boroughs will be implemented under the London Plan (GLA, 2021c). Not all operators will have plant compliant with the standards set and would therefore be required to upgrade or retrofit plant as appropriate.

6.6.2.6 The Materials Management Strategy will be further developed in parallel to the DCO process. Importing or disposing of materials closer to the project area will likely reduce the length and number of trips that vehicles need to make to off-site disposal facilities, thereby reducing the emissions of air pollutants generated. The Materials Management Strategy will also:

- Detail efficient management proposals for processing, recovery, or re-use of materials and waste generated by the project, reducing the need to import materials from off-site, and minimise the volume of unsuitable materials requiring off-site disposal;
- Be implemented in line with relevant permitting requirements and CL:AIRE Definition of Waste Code of Practice; and
- Inform design development and the development of appropriate primary, tertiary, and secondary mitigation.

6.6.2.7 An Air Quality Management Plan to include measures associated with managing dust emissions and air quality during earthworks, demolition,

construction activities, vehicle movements, odour and monitoring. This is likely to include measures such as (this is not an exhaustive list):

- Dampening of material using sprays, mists, microfoam or foam;
- Soft stripping inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust);
- Ensuring bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems;
- Regular clearing, grading and maintenance of haul routes. Recording of all inspections of haul routes and any subsequent action in a site log book;
- Ensuring that odorous materials are prioritised when removing materials from the worksites; and
- Implementing an appropriate monitoring scheme. This can range from visual inspections, dust deposition/flux monitoring, to real-time PM₁₀/PM_{2.5} continuous monitoring locations (to be agreed upon with the Local Authority).

6.6.2.8 A Construction Travel Plan that aims to proactively manage and influence workforce (and visitor) travel to and from worksites to limit traffic movement and thereby reduce emissions of air pollutants. This could include measures such as (this is not an exhaustive list):

- Setting out details of access arrangements to worksites to facilitate convenient and safe access for pedestrians, cyclists and drivers;
- Providing current information on the local transport network (pedestrian, cycle, bus, rail) to enable workers and visitors to make informed decisions on their travel behaviour; and
- Setting, monitoring and reporting against objectives to limit and reduce car travel.

6.6.2.9 An Operational Travel Plan that aims to proactively manage and influence employee (and visitor) travel to and from facilities being provided at the New Green and Blue Open Spaces, to encourage the use of sustainable travel methods and thereby reduce emissions of air pollutants. This could include measures such as (this is not an exhaustive list):

- Setting out details of access arrangements, vehicle/electric vehicle/bicycle parking availability and information on the local transport network (pedestrian, cycle, bus, rail) to enable employees and visitors to make informed decisions on their travel behaviour;
- Providing secure and convenient cycle storage and facilities such as changing facilities and lockers; and
- Setting, monitoring and reporting against objectives to limit and reduce car travel.

6.6.2.10 Managing and influencing travel patterns (in both the construction and operational phases) will reduce effects on air quality by reducing the likelihood that individuals will travel to the project site via private car and increase the likelihood that individuals will walk, cycle or use public transport to travel.

6.6.2.11 A Construction Logistics Plan that aims to detail the logistics management arrangements for worksites to minimise impacts on communities and the environment including on air quality from transportation of construction materials/waste. This could include measures such as (this is not an exhaustive list):

- Details on standard working hours and any requirements to restrict vehicle movements during certain sensitive periods of the day/month/year;
- Any commitments on construction vehicle routing e.g. any requirements to avoid certain junctions/routes/air pollution hotspots (e.g. AQMAs); and
- Co-ordination with local stakeholders (Local Highway Authority and developers) to minimise collective disruption to operation of the highway from construction works.

6.6.2.12 A Construction Traffic Management Plan that aims to ensure all highways works are safe, planned and co-ordinated in order to secure the expeditious movement of traffic on the road network and associated effects on air quality, and to minimise inconvenience to the public. This could include measures such as (this is not an exhaustive list):

- Necessary modification to parking restrictions or suspensions (amending existing or implementing new);
- Necessary bus stop suspensions or relocations;

- Details on off-site lorry holding arrangements (site management); and
- How stakeholder and community liaison and co-ordination will be managed.

6.7 Preliminary Assessment of Likely Significant Effects

6.7.1 Introduction

6.7.1.1 Our PEIR adopts a precautionary approach. Assessments reported within this chapter are a preliminary assessment of potential likely significant environmental effects based on the design parameters set out in Chapter 2. This precautionary approach has been taken for the PEIR as there is some information on the project that is currently incomplete and the parameters within Chapter 2 are high level and account for a range of uses and allowance for design development within a boundary that could possibly be refined once this work has been completed. For example, some designs, construction and mitigation details (and therefore also land requirements) or baseline information is still required from further surveys, assessments and/or consultation feedback. In making a determination of likely significant effects, we have considered the sensitivity of receptors (a receptor being a feature of the environment that responds to change) and the potential magnitude (i.e. size) of change caused by the RTS. The methodology for defining sensitivity and magnitude varies by topic and are defined in the topic sections of our Scoping Report and in Section 6.3.2.3 of this chapter.

6.7.1.2 We are committed to including mitigation measures as necessary to address likely significant negative environmental effects as far as reasonably practicable. Both primary and tertiary mitigation are considered to form part of the RTS; those applicable to this topic are set out in Section 6.6. Several of these mitigation measures are still being developed, and therefore as a precaution, the preliminary assessment of effects for our PEIR does not assume full achievement of these in considering if a project effect is likely to be significant (Appendix 4.2 identifies the implementation status of primary and tertiary mitigation for the PEIR assessment). Furthermore, the potential likely significant effects reported within our PEIR have been assessed prior to the implementation of secondary mitigation measures, those applicable to this topic are set out in Section 6.7.5. These secondary mitigation measures are the subject

of further development; and given they are still being developed, are not able to be applied to develop a 'residual' effects assessment.

6.7.1.3 Our PEIR is based on the latest design and construction parameters and baseline information. As such the findings of the preliminary environmental appraisal presented within our PEIR may be subject to change as the design progresses, as mitigation is further developed or information from further studies becomes available, such as our work to develop the Materials Management Strategy and Traffic Management Plan. The final assessment of effects undertaken as part of the EIA and reported within the ES will be based on the latest information available at that time.

6.7.2 Potential Likely Significant Effects

6.7.2.1 Our preliminary assessment of likely significant environmental effects has identified the potential for the following significant effect from construction in relation to air quality:

- Temporary negative effects of NO_x and NH₃ on high sensitivity ecological receptors less than 200 metres of transport routes. Significant effects may occur as a result of the total construction-related vehicle movements (i.e. movement of construction vehicles, equipment and operatives on and off site).

6.7.2.2 Our preliminary assessment of likely significant environmental effects has identified the potential for the following significant effect from operation in relation to air quality:

- Permanent negative effects of NO_x and NH₃ on sensitive ecological receptors less than 200 metres of transport routes, with particular consideration of receptors within an AQMA. Significant effects may occur as a result of vehicle movements accessing priority areas for habitat creation, enhancement or mitigation, new green and blue open spaces and areas of enhanced public connection.

6.7.2.3 Further details of the potential likely significant effects from construction and operation with respect to receptors, project components and project activities, on air quality can be found in Table 1 and 2 in Appendix 6.3.

6.7.3 Potential Likely Non-Significant Effects

6.7.3.1 Further details of the non-significant effects from construction and operation with respect to receptors, project components and project activities, on air quality can be found in Table 3 and 4 in Appendix 6.3.

6.7.3.2 Some examples of non-significant air quality effects include (this is not an exhaustive list):

- Generation of dust, PM10 and PM2.5 from construction related activities on amenity and human health. This effect would be temporary through construction and negative. The effect of dust is not considered likely to be significant as the IAQM 2023 guidance indicates that “experience shows that [it] is normally possible” to implement mitigation, hence the residual effect will normally be ‘not significant’; and
- NO₂ emissions from vehicle movements for haulage of material for processing/ placement (including waste/ hazardous material). These emissions could impact on high-sensitivity human receptors <200 metres of these routes, with particular consideration of receptors within an AQMA. This effect would be temporary through construction and negative. Its impact was not considered significant as it is considered likely that the increase in NO₂ generated by the project would not result in adverse impacts across much of the dispersion model study area. This is because the contribution from the project is likely to be relatively small and NO₂ concentrations generally compliant with the AQO.

6.7.4 In-Combination Climate Impact

6.7.4.1 Consideration of ‘In-Combination Climate Impact’ (ICCI) has been undertaken. The preliminary environmental assessment has considered a future climate scenario and has identified certain potential likely significant environmental effects for this topic which may be exacerbated further by predicted climate change. Further consideration of ICCI will be included in the ES.

6.7.5 Secondary Mitigation

6.7.5.1 In order to reduce the magnitude of effects, the following secondary mitigation is currently under consideration:

- SPA / Ramsar mitigation, with precise mitigation to be determined by the HRA but might include measures such as seasonal restrictions; buffers; lake edge shallowing; habitat enhancement; construction noise barriers/screens; timed sheet piling; restricted lighting; avoidance of direct impacts (refer also to Chapter 7: Biodiversity). This secondary mitigation will work to reduce likely significant effects from construction and operation of the project on high sensitivity ecological receptors that are less than 200 metres away from transport routes.

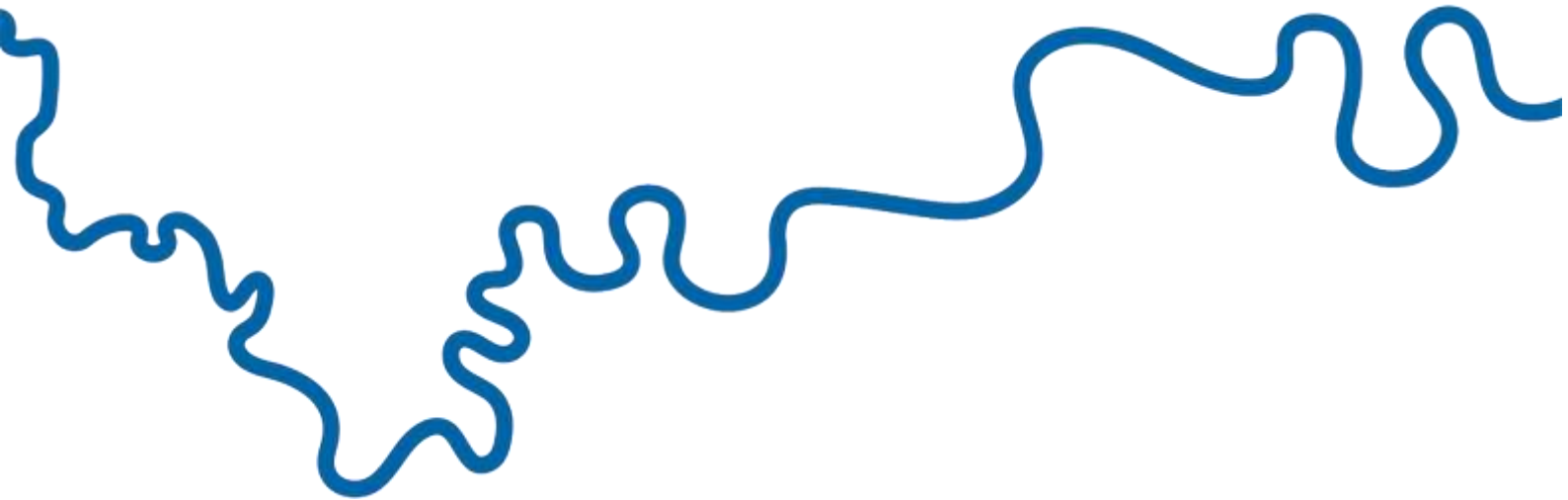
6.7.5.2 Further mitigation may be proposed if considered necessary at the ES stage. Primary and tertiary mitigation measures will be further developed through ongoing design and assessment; additional secondary mitigation measures may therefore not be required.

6.8 Further Work for the EIA

- 6.8.1.1 A detailed assessment of air quality effects from construction and operation of the project will be undertaken in accordance with the methodology set out in Section 6.4.
- 6.8.1.2 The assessment will be based on the effects scoped into the assessment and as per those included within this PEIR. It will take into account any relevant aspects of PINS EIA Scoping Opinion, be informed by any further information received during the statutory consultation process, as well as additional baseline information that may become available. It will also account for further consultation to be undertaken at ES Stage in relation to localised comments on dispersion modelling and locations in which particulate matter monitoring is recommended to monitor residual fugitive dust generated from construction related activities.
- 6.8.1.3 Additional baseline information could include updated odour complaints history provided by the local authorities, updated Defra background pollutant mapping data, and any updates to the APIS website database. In addition, NO₂ diffusion tube monitoring is currently taking place in areas where traffic attributable to the project is expected to be; this monitoring data will be used to inform the ES assessments.
- 6.8.1.4 The assessment will state the predicted significance of effects, provide further detail of relevant mitigation and document the subsequent residual

effects. The assessment of ecological effects will also be used to inform the HRA and the biodiversity impact assessment.

- 6.8.1.5 We consider that the further development of the project design and mitigation measures which will be reflected in the ES and DCO application, will enable a reduction in the scale of identified negative likely significant effects set out in this chapter.



The River Thames Scheme represents a new landscape-based approach to creating healthier, more resilient and more sustainable communities by reducing the risk of flooding and creating high quality natural environments.