

6 AIR QUALITY

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APPENDICES

Presented in Volume 3 of this Environmental Statement:

- Appendix 6.1 Construction phase assessment method
- Appendix 6.2 Detailed dispersion modelling assessment method (industrial sources)
- Appendix 6.3 Detailed dispersion modelling assessment method (air quality vehicle emissions)
- Appendix 6.4 Construction phase dust mitigation measures
- Appendix 6.5 Assessment of effects at human receptors (established baseline)
- Appendix 6.6 Assessment of effects at ecological receptors (established baseline)
- Appendix 6.7 Interim scenarios results

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Presented in Volume 4 of this Environmental Statement:

- Figure 6.1 Sources, buildings and receptors in the Port Talbot area included S2 and S4
- Figure 6.2 Sources, buildings and receptors in the Port Talbot area included in S1a, S2a, S3 and S4a
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- Figure 6.4 All Ecological receptors included in all modelled scenarios (showing 2km and 10km buffer)
- Figure 6.5 Air quality study area
- Figure 6.6 Map delineating areas where the process contribution (S5–S4) exceeds 1% of CL_{Min}N

6.1 Introduction

- 6.1.1 Regulation 4(2) of the Town & Country Planning EIA (Wales) Regulations 2017 requires that the EIA *'must identify, describe and assess... the direct and indirect significant effects of the Proposed Development on [inter alia]... air...'*
- 6.1.2 This chapter assesses the likely significant effects of the Proposed Development on air quality. A supporting appendix is provided in **ES Appendix 6.1** to **6.7**.

6.2 Statutory and planning context

- 6.2.1 The air quality assessment has been undertaken within the context of relevant planning policies, guidance documents and legislative instruments. These are summarised in **Table 6.1** below.

Table 6.1 Legislation and guidance relevant to air quality

Document	Summary
Legislation	
Environmental Protection Act 1990 (H.M. Government, 1990)	Imposes duties on local authorities to deal with 'statutory nuisances', including smoke emitted from premises that is prejudicial to health or a nuisance; fumes or gases emitted from premises that is prejudicial to health or a nuisance or any dust, steam, smell or other effluvia arising on industrial, trade or business premises that is prejudicial to health or a nuisance. This requirement to regulate potential impacts on amenity underpins the requirement to assess dust and odour generated by the Proposed Development.
Environment Act 1995 (H.M. Government, 1995)	Requires all local authorities to carry out periodic reviews of air quality within their administrative areas. Where air quality is known or expected to exceed one or more of the Air Quality Objectives (AQOs), they must declare an air quality management area (AQMA) and implement an air quality action plan (AQAP) to work toward meeting the AQOs.
Air Quality (Wales) Regulations 2000 (H.M. Government, 2000) Air Quality (Amendment) (Wales) Regulations 2002 (H.M. Government, 2002)	These collectively establish the AQOs which are used by local authorities in reviewing air quality within their jurisdiction and declaring AQMAs in accordance with the Environment Act 1995. AQOs are established for benzene, 1-3-Butadiene, carbon monoxide (CO), nitrogen dioxide (NO ₂), lead (Pb), fine particulate matter with a diameter of less than 10 micrometres (PM ₁₀) and sulphur dioxide (SO ₂).
EU Directive 2008/50/EC Air Quality Standards (Wales) Regulations 2010 (H.M. Government, 2010)	The European Union (EU) Directive 2008/50/EC prescribed air quality limit values for a number of pollutants (designed to protect human health and critical levels to protect vegetation). These were transposed into Welsh Law via the Air Quality

Document	Summary
	Standards (Wales) Regulations, therefore prescribing Air Quality Standards (AQSs).
Environment (Air Quality and Soundscapes) (Wales) Act 2024 (H.M. Government, 2024)	The Act requires Welsh Ministers to pass Regulations establishing a target governing annual mean PM_{2.5} concentrations. The target should have regard for guidelines published by the World Health Organisation in its most recent air quality guidelines. Regulations under this legislation have not yet been adopted. However, a target of 10µg/m³ (annual mean target by 2040) has been adopted in England. This assessment has assumed the same target will be adopted in Wales.
Development Plan Policy (incl. Future Wales 2040 and the NPT LDP 2011-2026)	
Planning Policy Wales (Welsh Assembly Government, 2024)	The Planning Policy Wales requires developments to: <i>“address any implication arising as a result of its association with, or location within, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors; not create areas of poor air quality; and seek to incorporate measures which reduce overall exposure to air and noise pollution.”</i> Development applicants should also consider whether the location and design of proposed development is acceptable, where air pollution is likely to affect a protected species or is proposed in an area likely to affect a statutorily designated site. Development may be refused where impacts are unacceptable, for example where adequate mitigation is unlikely to safeguard local air quality.
Future Wales: The National Plan 2040 (Welsh Assembly Government, 2021)	The need to consider air quality in planning decisions is also supported in Future Wales: The National Plan 2040, which is the national development framework setting the direction for development in Wales to 2040.
Neath Port Talbot Local Development Plan 2011 – 2026 (Neath Port Talbot Council, 2016a)	Policy SP16: Environmental Protection states that: <i>“Air, water and ground quality and the environment generally will be protected and where feasible improved through... ensuring that proposals have no significant adverse effects on water, ground or air quality and do not significantly increase pollution levels [and] ensuring that developments do not increase the number of people exposed to significant levels of pollution.”</i> Policy EN8: Pollution and Land Stability states that <i>“proposals which would be likely to have an unacceptable adverse effect on health, biodiversity and / or local amenity or would expose people to unacceptable risk due to [air pollution] will not be permitted”</i> and <i>“Proposals which would create new problems or exacerbate existing problems detailed above will not be acceptable unless mitigation</i>

Document	Summary
	<i>measures are included to reduce the risk of harm to public health, biodiversity and/or local amenity to an acceptable level."</i>
Material Considerations (incl. TAN guidance)	
Technical Advice Note 5 (TAN 5): Nature Conservation (Welsh Assembly Government, 2009)	TAN 5 confirms the importance of preventing impacts on designated ecological sites.
Neath Port Talbot Pollution Supplementary Planning Guidance (SPG) (Neath Port Talbot Council, 2016b)	The Neath Port Talbot Pollution SPG was adopted in October 2016 and sets out information about pollution issues in Neath Port Talbot and provides details on relevant matters that should be taken into consideration when assessing proposed developments within the borough. In relation to air quality the SPG sets out details on how to assess air quality impacts associated with development plans and to meet the relevant planning policies set out within the Local Development Plan.
Clean Air Plan for Wales (2020) (Welsh Government, 2020)	The objective of the Clean Air Plan for Wales is to improve air quality and reduce the impacts of air pollution on human health, biodiversity, the natural environment and the economy. The Plan sets out a 10-year pathway to achieving cleaner air and is based upon four main areas: People – protecting the health and well-being of current and future generations; Environment – taking action to support the natural environment, ecosystems and biodiversity; Prosperity – working with industry to reduce emission, supporting a cleaner and more prosperous Wales; and Place – creating sustainable places through better planning, infrastructure and transport.
Local Air Quality Management Technical Guidance (Defra and the devolved administrations, 2022) ('TG22')	Provides guidance for local authorities to assess and, where required, deliver improvements in air quality within their jurisdiction, as well as technical guidance for undertaking detailed dispersion modelling assessment, including recommendations of where the AQOs should be applied.
Guidance on Land-Use Planning and Development Control: Planning for Air quality Version 1.2 (Environmental Protection UK (EPUK) and the IAQM, 2017) ('the EPUK-IAQM guidance') (EPUK and IAQM, 2017)	Provides the method used to determine the magnitude of impacts, receptor sensitivity and significance of effects in relation to the assessment of industrial and vehicle emissions. It also identifies mitigation measures which can be implemented to reduce air quality effects attributable to a development project.
Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (Institute of Air Quality Management, IAQM, 2024) ('the IAQM 2024 guidance')	The assessment of fugitive dust generated by construction related activities has been informed by the method outlined in this guidance. Mitigation measures from this guidance have also been assigned, relative to the level of risk identified from this assessment.

Document	Summary
Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites 2020 (EPUK and IAQM, 2020) ('the IAQM 2020 guidance')	Establishes the method which has been used to assess air quality effects on designated ecological sites.
Air emissions risk assessment for your environmental permit (Defra and Environment Agency, 2023)*	This describes the Environmental Assessment Levels and critical loads against which projects requiring an Environmental Permit application can be assessed. It also outlines the method which can be used to screen emissions to air at human and ecological receptors, to determine whether further assessment (detailed dispersion modelling) is required.
Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air (Environment Agency, 2014)*	Has been used to calculate the amount of nitrogen, sulphur and NH ₃ deposited in relation to its effects on ecosystem eutrophication and acidification.

* As there is no equivalent guidance applicable to Wales, this guidance has been used instead and is considered appropriate for this assessment.

6.3 Consultation undertaken

- 6.3.1 This chapter has been prepared following the methodology outlined in informal air quality EIA scoping consultation note provided in **ES Appendix 4.1** to agree the assessment method during April and May 2024. Feedback was received from the local planning authority, Neath Port Talbot Council (NPTC) at a meeting on 20th June 2024, and from Natural Resources Wales (NRW), who regulates the Site's Environmental Permit, on 9th May 2024 and 20th June during the meeting. The feedback received is reflected in the assessment reported in this chapter. **Table 6.2** summarises the feedback received and either provides or signposts responses.

Table 6.2 Feedback received on Scoping Technical Note, issued to NPTC and NRW

Consultee	Summary of Comment	Project Response or cross-reference
NPTC	The ES chapter should quantitatively assess the EAF versus both the established and interim baselines.	The ES chapter has determined the potential for significant effects against the established baseline and has also quantified pollutant concentrations in the interim baseline.
NPTC	A Welsh PM _{2.5} new standard is emerging. It is likely to match or better the long-term target for England (10µg/m ³) and account for the 2021 World Health Organisation Guideline of 5µg/m ³ .	The assessment has considered assessment against both of these thresholds to provide context. It is noted that information from Welsh Government indicates that work to develop the new PM _{2.5} standard is in progress but it is not expected that a value will be available for consultation until autumn 2025. In the absence of the new Welsh

Consultee	Summary of Comment	Project Response or cross-reference
		standard, the long-term target for England has been used to provide context.
NPTC	PM _{2.5} data from the council should be presented; they have measures for 18 month on PM _{2.5}	See Section 6.5 .
NPTC	The closest monitor to the Site may not represent background pollutant concentrations. Consideration should be given to their other monitoring sites.	Full consideration has been given to the monitoring sites available within the area, within the baseline assessment and assessment of industrial and vehicle emissions.
NPTC	A receptor should be added at Lower West End, due to its proximity to the main entrance of the steelworks.	A receptor has been added on the façade of a representative residence on this road.
NPTC	Shipping and rail emissions should be screened	Shipping and rail movements have been screened in Paragraph 6.4.27 to Paragraph 6.4.34 below.
NPTC	Use meteorological data from the Port Talbot Margam air quality monitoring station to sensitivity test the effect of the meteorological conditions captured within the assessment on air quality.	See Appendix 6.2 .
NPTC	Emissions from industrial sources within 10 km of the Site should be considered cumulatively, as should traffic along the roads most expected to be affected by the EAF.	This is described in Section 6.11 .
NRW	The scoping technical note stated that “ <i>key air pollutants of concern for human health</i> ” and sensitive features will be assessed. However, other air pollutants should also be considered in a proper air quality impact assessment.	The assessment of construction dust, and dust generated from operational activities, focussed on dust and particulate matter (explicitly PM₁₀ and implicitly PM_{2.5}). The pollutants which have been assessed in the assessment of industrial and vehicle emissions are outlined in Table 6.3. Emissions factors are provided for the key pollutants which generate emissions to air, including oxides of nitrogen (NO_x), PM₁₀, PM_{2.5}, nitrogen dioxide (NO₂) and ammonia (NH₃). Other pollutants are not emitted in significant quantities as to have an effect on air quality. The pollutants modelled for industrial sources include all those for which reasonably reliable emissions data are available for the Proposed

Consultee	Summary of Comment	Project Response or cross-reference
		Development, as well as following the relevant technical guidance for this type of industrial process. These pollutants include those with a Best Available Techniques- Associated Emissions Level (BAT-AEL) (dust and dioxins), those where the Emissions Limit Value has been discussed with regulators (NO_x, carbon monoxide (CO) and sulphur dioxide (SO₂)) and species where there are data from the original equipment manufacturer (Chromium, Cr; mercury, Hg; and Lead, Pb). An emission factor for benzo(a)pyrene has been taken from the National Atmospheric Emissions Inventory (NAEI). Whilst there are emissions data for nickel in the NAEI, the data from which it is derived may apply to making high-alloy grades of steel. Three of the four existing UK EAFs are likely to have a higher nickel content and as such the NAEI figures are not considered representative for the EAF to be installed in Port Talbot.
NRW	The assessment of dust generated from operational activities should not only consider the presence of best available techniques (BAT) to determine whether a more detailed qualitative assessment is required.	The assessment has detailed mitigation measures more generally which are used to control dust from operational related activities (Section 6.8). For these reasons, further assessment has been screened out.
NRW	The scoping technical note proposed to use numerical weather prediction (NWP) data for air quality modelling impact assessment. However, no detailed NWP data information was provided, for example, NWP model type and its resolution etc. Also, sensitivity analysis for the met data used will also be a common practice.	This is discussed in Paragraph 6.4.49, Paragraph 6.4.71 and Appendix 6.2.
NRW	Coastline may have an impact on air dispersion so its impact on local air quality needs to be considered. The reasons provided in the Temple scoping technical note for not undertaking a coastline impact assessment may not be justified. ADMS may be run with sensitivity analysis and professional judgment	This is discussed in Paragraph 6.4.49, Paragraph 6.4.71 and Appendix 6.2.

Consultee	Summary of Comment	Project Response or cross-reference
	in considering the potential coastline effect.	
NRW	For combustion emissions, type of fuels is also needed to be considered for the screening assessment distance. Natural Resources Wales / What to do before you apply for a standalone Medium Combustion Plant (MCP) less than 50 MW thermal input that is also a Specified Generator (SG) or Part B activity.	Based on the guidance provided at the location provided, the maximum screening distance cited has been used (Paragraph 6.4.30).
NRW	At this stage, we do not make comments on the suitability of selected ecological receptors and human receptors. However, it will be visually helpful to mark these receptors in a map.	Figures presenting the sources and receptors included are presented in Appendix 6.2 .
NRW	One-year meteorological data may not be able to address the yearly variation of meteorological conditions.	Five years of meteorological data have been used in all scenarios where point and road source modelling was undertaken. The approach adopted for model verification of road traffic (using one year of meteorological data) complies with TG22.

6.3.2 Neither NPTC nor NRW commented on the justification proposed to screen out the assessment of odour from the assessment provided in the informal scoping technical note. Significant emissions of odour are considered unlikely to be generated by the EAF, because the Site will be regulated by an Environmental Permit and BAT implemented. Odour assessment therefore is not required.

6.4 Approach to the assessment

Outline assessment approach

6.4.1 The approach taken for assessing the potential air quality impacts of the Proposed Development is as follows:

- Established baseline characterisation of local air quality;
- Qualitative assessment of fugitive dust and emissions from construction related activities;
- Qualitative assessment of fugitive dust and emissions once the Proposed Development is operational;
- Assessment of changes in road and non-road transport emissions, and industrial emissions, attributable to the Proposed Development whilst it undergoes construction and once operational;
- Screening and assessment of cumulative effects;
- Recommendation of mitigation measures, where appropriate, to ensure any adverse effects on air quality are minimised; and

- Identification of residual impacts resulting from the Proposed Development.
- 6.4.2 Further information is provided in the following subsections. As appropriate, these sections have characterised air quality with reference to established baseline and interim baseline conditions.
- 6.4.3 The 'heavy end' is defined as the existing stockyard, sinter plant, coke ovens, blast furnaces and steel converter. Closure of the coke ovens has already taken place (March 2024), with the closure of the remainder of the 'heavy end' taking place between May – September 2024. These closures took place irrespective of the grant of planning permission for the Proposed Development, but the EAF application is ultimately driven by the Applicant's desire to replace these 'heavy end' processes with alternative, greener and more economic methods of steel manufacture.
- 6.4.4 The interim baseline describes the steelworks as they will operate at the time of planning determination with closure of the 'heavy end'. The consideration of interim baseline conditions does not include the demolition of structures, buildings or plant and machinery in the 'heavy end'. Tata Steel UK Limited (Tata Steel) will close the 'heavy end', and in the process make all structures, buildings, plant and machinery safe but no demolition of this aspect will be carried out under the Proposed Development. The regeneration of the 'heavy end' will be subject to separate commercial and/or planning processes, at the appropriate time.
- 6.4.5 The 'established baseline' remains a relevant reference point to the ES because:
 - It is the situation that has occurred in Port Talbot for the majority of the past 50+ years;
 - It has strongly influenced the 'current state of the environment' at the Site;
 - It is the prevailing position at the time that the majority of baseline surveys for the current ES were completed; and
 - It is the position reflected in the Environmental Permit issued by NRW, under which the site currently operates. It is not intended to vary the permit prior to the planning application.
- 6.4.6 Impacts from the Proposed Development relating to changes in road traffic and industrial emissions have also been compared to the interim baseline because the closure of the 'heavy end' infrastructure will happen regardless of whether the EAF is approved and constructed and will pre-date the EAF commencing operations. However, these impacts are reported for context to indicate what may be expected to occur through the expected transitional period, therefore the significance of these impacts are not reported in this ES chapter.

Existing air quality characterisation

- 6.4.7 'Existing' air quality refers to the concentrations of relevant substances that are already present in ambient air, including from road traffic and industrial sources. Dust, generated from construction related activities and operational emissions, may also affect amenity and contribute to ambient PM₁₀ and PM_{2.5} concentrations.
- 6.4.8 There is no existing network of monitoring undertaken to monitor dust (particles that give rise to soiling, and to human health and ecological effects) levels across the United Kingdom, nor is the assessment of dust generated by activities dependent on baseline pollutant concentrations, therefore this has not been assessed.

- 6.4.9 The primary pollutants of interest for this assessment are NO_x, both the total and the nitrogen dioxide (NO₂) fraction in ambient air, SO₂, chromium (Cr), lead (Pb), mercury (Hg), ammonia (NH₃), CO, dioxins & furans, benzo[a]pyrene, PM₁₀ and PM_{2.5}, as well as dust generated from construction related activities. For the industrial point source modelling, all pollutants listed above were modelled, with the exception of NH₃, which was not considered relevant due to the expected (based on an understanding of the process) lack of industrial NH₃ sources of emissions at the Site once the EAF is operational. For the purposes of this assessment, the pollutants considered in the detailed dispersion modelling of road traffic emissions are NO_x, NO₂, PM₁₀, PM_{2.5} and NH₃. No other pollutants are considered likely to have a significant air quality impact..
- 6.4.10 To support the assessment of effects from travel and industrial emissions, a study has been undertaken using data obtained from continuous and diffusion tube monitoring stations maintained by NPTC and as part of the automatic urban and rural network (AURN) maintained for the Department for Environment, Food and Rural Affairs (Defra); and estimated background concentrations from Defra's United Kingdom Air Information Resource (UK-AIR) website.
- 6.4.11 As this section characterises air quality monitoring or modelled data using information from existing sources, sometimes collected some time ago, the existing and future trends either directly monitor the established baseline, or project how the established baseline was then expected to evolve. The interim baseline (as defined in **Paragraph 6.4.39**) will therefore not be characterised by reference to monitoring data. However, the dispersion modelling results corresponding to the interim baseline are set out in **Appendix 6**.
- 6.4.12 The baseline review and the assessment of changes in road and industrial emissions has contextualised pollutant concentrations against air quality thresholds (AQTs). These thresholds comprise:
- The Air Quality Standards (AQSS);
 - The Air Quality Objectives (AQOs);
 - The Air Quality Strategy Objective (AQSO) for benzo[a]pyrene;
 - Critical loads and critical levels for the protection of ecosystems;
 - The English and emerging Welsh legally binding target (LBT) for PM_{2.5}; and
 - Environmental Assessment Levels (EALs) specified in guidance.
- 6.4.13 The AQTs are shown in **Table 6.3** below. Whilst there is a difference in the locations where the thresholds should be applied, depending on whether assessment is undertaken against an AQO or AQS, it is customary to apply the human thresholds at the types of receptor defined, which match receptors where exposure is considered relevant in TG22.

Table 6.3 Air quality thresholds relevant to the assessment

Pollutant	Limit value	Measured as	Receptors to which threshold will be applied	Origin of AQT
NO _x	30µg/m ³	Annual mean	Ecological receptors	AQS
	200µg/m ³ , because data from the PT2 site show that O ₃ is below the AOT40 critical level and SO ₂ is below the lower critical level of 10µg/m ³	Daily mean	Ecological receptors	Guideline Critical Level ¹
NO ₂	200 µg/m ³ , not to be exceeded more than 18 times per year	One-hour mean	Anywhere where a member of the public may spend one hour or longer	AQO and AQS
	40 µg/m ³	Annual mean	Human residences, schools and hospitals	AQO and AQS
PM ₁₀	50 µg/m ³ , not to be exceeded more than 35 times per year	24-hour mean	Human residences, schools and hospitals and private gardens	AQO and AQS
	40 µg/m ³	Annual mean	Human residences, schools and hospitals	AQO and AQS
PM _{2.5}	20 µg/m ³ It is noted that AQS in Wales is 25 µg/m ³ and as such	Annual mean	Human residences, schools and hospitals	AQO and AQS

¹ The IAQM 2020 guidance cites this critical level as being based on evidence from the World Health Organization. "The WHO guidelines include a short term (24-hour average) NO_x critical level of 75 µg/m³. Originally set at 200 µg/m³ as a four-hour mean, the more detailed CD-ROM version of the 2000 WHO guidelines⁹¹ comments: "Experimental evidence exists that the CLE decreases from around 200 µg/m³ to 75 µg/m³ when in-combination with O₃ or SO₂ at or above their critical levels. In the knowledge that short-term episodes of elevated NO_x concentrations are generally combined with elevated concentrations of O₃ or SO₂, 75 µg/m³ is proposed for the 24 h mean." Ozone and SO₂ concentrations are typically low in the UK compared to many other countries. If a regulator does require the use of the short term NO_x critical level, given the low UK SO₂ concentrations IAQM consider it is most appropriate to use 200 µg/m³ as the short term critical load."

Pollutant	Limit value	Measured as	Receptors to which threshold will be applied	Origin of AQT
	the more stringent target of 20 $\mu\text{g}/\text{m}^3$ is used.			
	10 $\mu\text{g}/\text{m}^3$	Annual mean	Human residences, schools and hospitals	Potential legally binding target
SO ₂	266 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year	15-minute mean	Anywhere where a member of the public may spend 15 minutes or longer	AQS Target Value and AQO
	350 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 24 times a year	1-hour mean	Anywhere where a member of the public may spend one hour or longer	AQO and AQS
	125 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 3 times a year	24-hour mean	Human residences, schools, hospitals and private gardens	AQO and AQS
	10 $\mu\text{g}/\text{m}^3$ where lichens or bryophytes are present, 20 $\mu\text{g}/\text{m}^3$ where they're not present	Annual mean	Ecological receptors	Critical level
NH ₃	1 $\mu\text{g}/\text{m}^3$ where lichens and bryophytes are present, 3 $\mu\text{g}/\text{m}^3$ where they're not present.	Annual mean	Ecological receptors	Critical level
CO	10 mg/m^3	Maximum eight-hour running mean in any day period	Human residences, schools and hospitals and private gardens	AQO and AQS
	30 mg/m^3	1-hour mean	Anywhere	EAL

Pollutant	Limit value	Measured as	Receptors to which threshold will be applied	Origin of AQT
			where a member of the public may spend one hour or longer	
Polyaromatic hydrocarbons (benzo(a) pyrene, or B[a]P)	1 ng/m ³	Annual mean	Human residences, schools and hospitals	AQS
	0.25 ng/m ³	Annual mean	Human residences, schools and hospitals	AQSO and EAL
Lead (Pb)	0.5 µg/m ³	Annual mean	Human residences, schools and hospitals	AQS
	250 ng/m ³	Annual mean	Human residences, schools and hospitals	AQS Target Value
Mercury (Hg)	600 ng/m ³	1-hour mean	Anywhere where a member of the public may spend one hour or longer	EAL
	60 ng/m ³	24-hour mean	Human residences, schools and hospitals and private gardens	EAL
Chromium (Cr) (assuming all expressed as Cr III)	2 µg/m ³	24-hour mean	Human residences, schools and hospitals and private gardens	EAL

Assessment of construction dust emissions

Assessment method

- 6.4.14 Emissions to air from demolition and construction activities, particularly in the form of dust, have the potential to cause a loss of amenity (due to dust soiling) or to affect (vascular) plant species sensitive to dust. The finer fraction of dust, in the form of PM₁₀ and PM of finer fractions, also has the potential to affect human health. Given the variability of demolition and construction sites and the range of activities undertaken, a quantitative assessment of the dust and air pollutants generated is rarely feasible or practicable. Instead, a qualitative assessment has been undertaken to identify best practicable means for mitigating potential emissions.
- 6.4.15 The construction dust assessment study area has considered the potential for impact within 250 metres of the Site or 50 metres of routes used by construction vehicles on the public highway, up to 250 metres from the Site entrance. These represent the criteria which can be used to screen the need for a construction dust assessment, as outlined in the IAQM 2024 guidance (IAQM, 2024). Beyond this distance, impacts are not expected from construction dust. This distance is cited in the IAQM guidance as taking into account the exponential decline in both airborne concentrations and the rate of deposition with distance.
- 6.4.16 The IAQM 2024 guidance has been used to undertake the risk assessment and identify appropriate mitigation measures. The method involves assessment of the:
- **Dust emissions magnitude:** the dust emissions magnitude will be assessed as 'negligible', 'small', 'medium' or 'large' for each type of construction-related activity (demolition, earthworks, construction and trackout);
 - **Receptor sensitivity:** the 'area' sensitivity will be assessed as 'negligible', 'low', 'medium' or 'high' for each type of construction-related activity and each type of impact (amenity, human health and ecological) based on individual receptor sensitivity and proximity; and
 - **Assessment of dust risk:** The dust risk (or impact) at each individual receptor is assessed as 'negligible', 'low', 'medium' or 'high' based on the impact magnitude and receptor sensitivity.
- 6.4.17 The method is outlined in more detail in **Appendix 6.1**.
- 6.4.18 Impacts associated with construction dust will primarily arise for as long as construction-related activities take place (over a two-year period). Therefore, any impacts will be temporary.

Significance criteria

- 6.4.19 The significance of the potential for dust to affect sensitive receptors before mitigation has been assessed using professional judgement but based on the risk of dust impacts. The risk of dust impacts before mitigation does not typically require the significance to be determined, as the mitigation is embedded.
- 6.4.20 The significance of effects following the implementation of mitigation has then been reassessed. In this regard, the IAQM 2024 guidance indicates that *"For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'."*

Assessment of operational dust missions

- 6.4.21 Many activities on Site will be regulated under the Environmental Permitting Regulations, for which an amended Environmental Permit will be required and BAT will be implemented.
- 6.4.22 To determine the potential sources of dust emissions, a review of the development proposals and proposed mitigation has been undertaken.

Assessment of emissions during construction and once operational

Screening and dispersion modelling: Introduction

- 6.4.23 Both during construction and operation, emissions will be generated by the on-site industrial processes, vehicles, and other forms of transport (such as railways and ships used to transport goods to and from Site). During the construction phase, construction plant such as excavators will also be used.
- 6.4.24 TG22 (Defra, 2022) indicates that *“with suitable controls and site management, [construction plant] 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 the above points will likely provide sufficient screening.”* Based on construction information provided by the Applicant, it is understood that up to 60 plant will be used on an average day during construction. The following measures in TG22 will be implemented to control emissions, such that further assessment has been screened out:
- *“Ensure all equipment complies with the appropriate Non-Road Mobile Machinery (NRMM) standards;*
 - *Where feasible, ensure further abatement plant is installed on NRMM equipment, e.g. Diesel Particulate Filters (DPFs);*
 - *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 possible; and*
 - *Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).”*
- 6.4.25 In relation to shipping movements, within the established baseline there have been regular deliveries of iron ore, coal and coke by ship, amounting to 97 vessel movements during 2023 at Tata Steel UK Limited (Tata Steel)’s jetty and/or the Port Talbot Old Town Dock, amounting to millions of tonnes per year. Whilst the Site undergoes construction, the Applicant has confirmed that there may be an occasional abnormal load unloaded into the Port Talbot Old Town dock whilst construction is underway. Once the Site is operational, around 90 vessels per annum may load and unload at existing docks in Newport (55 km east of the Site), before being transported by rail. It is understood that around 500 vessels dock within Newport per annum (Newport City Council, 2016).
- 6.4.26 TG22 presents criteria which can be used to screen the potential for shipping vessels to generate movements to and from the Site. It advises that further assessment of air quality may be required at ports where there are more than 5,000 large ship movements per year with ‘relevant exposure’ within 250 metres of berths and the main areas of manoeuvring.

Assuming no very significant growth in vessel movements since 2015, the additional 90 vessel movements at Newport Dock are not anticipated to lead to this criterion being breached. Shipping vessel movements have therefore been screened out of further assessment.

- 6.4.27 Regarding rail movements, the Applicant has stated that up to 88 train movements each week may arise in addition to the existing 152 weekly movements to and from Site (~13 additional movements per day)², which will be fuelled by fossil fuels (diesel) or hydrogenated vegetable oils. Many of the additional future train journeys will relate to the use of the scrapyard. Offloading activities in this area will not take place within 15 metres of sensitive receptors.
- 6.4.28 TG22 indicates that the impact of additional moving trains can be screened out in areas where background annual mean NO₂ concentrations are <25µg/m³ during 2027, the year when the EAF will open. Based on the Defra background maps, this background concentration was not anticipated to be breached in Wales³. Therefore, rail movements have been screened out of further assessment.
- 6.4.29 With non-road transport screened out, the assessment of emissions has focused on changes in road traffic and industrial source contributions, which have been quantified.
- 6.4.30 With regard to fugitive emissions, the established baseline scenarios include the following fugitive sources which will all be closed from September 2024 onwards and so are not included in any of the future scenarios: the blast furnace casthouses, coke oven leakage, Basic Oxygen Steelmaking (BOS) Plant roof, and iron ore and coal stockyards.
- 6.4.31 The interim baseline and Electric Arc Furnace (EAF) Operational scenarios do not include any new fugitive sources. As the EAF is continuously charged, it inherently releases less dust than the previous BOS process, and therefore the expectation is that the very visible emissions that were previously noted from the BOS Plant roof will be absent once the EAF is operating in that building. Additionally, the EAF secondary extraction system has a higher capacity than the existing BOS secondary extraction and so no significant fugitive emissions are anticipated from the building in the EAF Operational scenario.
- 6.4.32 The fugitive emissions from brake and tyre wear on road surface will also reduce in the EAF Operational scenarios, when compared to the established baseline scenarios, due to there being a smaller number of vehicles present. Therefore, fugitive emissions at operational phase have not been quantified.
- 6.4.33 Road transport and stationary industrial sources emissions have been quantified. All stationary sources at the Tata Steel UK Limited (Tata Steel) site⁴ and all roads for which traffic data were provided (within the traffic study area) have been assessed.

² In addition, during the period when de-rolling takes place, there may be additional movement of scrap off site by rail and movement of by-products such as BETSI/BOS Fines. The number of additional movements this will generate is presently unknown.

³ The Applicant has assumed that most rail journeys will be made via the South West Main Line, passing through much of south Wales. The whole of Wales was used as the criteria here, as the rail movements will utilise routes across the country. This therefore includes consideration of the area surrounding the Site and Port Talbot specifically.

⁴ To ensure safe operation it is necessary to have an emergency back-up diesel generator to ensure continuity of supply of critical cooling water in the event of failure of the electrical power supply. It is anticipated that the back-up plant would therefore be used very infrequently, typically for a very limited number of hours per year. Due to the limited hours of operation and the short term, temporary and reversible nature of any resulting effect they are screened out of the air quality modelling scenarios presented in this Environment Statement.

Representative human receptors, as well as designated ecological sites up to 10 km from the Site, have been considered. In relation to ecological receptors and based on Natural Resources Wales guidance (not dated) (which applies to industrial emission sources), the maximum distance required to be considered between the source and receptors is 2 km for SSSIs or Marine Conservation Zones, or 10 km for Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites.

- 6.4.34 The assessment of additional road traffic emissions attributable to both the construction and operational phases of the Proposed Development has been undertaken using the ADMS-Roads software, supplied by Cambridge Environmental Research Consultants (CERC).
- 6.4.35 The assessment of point source dispersion has been undertaken for the industrial emissions generated by the Site using the ADMS software (version 6.0.0, March 2023), (CERC, 2024) supplied by CERC. ADMS is a short-range, new generation, Gaussian plume air dispersion model. The model enables the characterisation of the atmospheric boundary layer properties by the boundary layer depth and the Monin-Obukhov length. Dispersion under convective meteorological conditions uses a skewed Gaussian concentration distribution (shown by validation studies to be a better representation than a symmetrical Gaussian distribution).
- 6.4.36 ADMS has been used in previous studies to model the air quality impact of existing and proposed industrial installations, both in the UK and abroad, and is considered fit for the purposes of this assessment. The model has been extensively validated and a list of references is available on the supplier's website.
- 6.4.37 Predicted pollutant concentrations for various scenarios have been compared to each other. The modelling has considered background conditions, industrial emissions contributions, and road traffic emissions, based on the year being assessed.

Assessment scenarios

- 6.4.38 As mentioned in **Section 6.4.2**, the established baseline represents the steelworks with 'heavy end' infrastructure in place as operating in 2023 and early 2024 and for the majority of the preceding 60+ years. 2023 emissions were the most recent year of data representative of industrial established baseline emissions (Appendix 6.2, Section 6.1.19).
- 6.4.39 The interim baseline represents the period following phased closure of heavy end infrastructure, before the EAF becomes operational.
- 6.4.40 Construction is expected to commence during 2025. The Proposed Development will initially open during 2027. However, the established baseline represents the situation during 2023; and the interim baseline during 2024.
- 6.4.41 Since background concentrations of air pollutants, vehicle emissions, traffic volumes using the local road network and emissions from cumulative developments differ during different calendar years, it has been necessary to create bespoke models for the established baseline and interim baseline, enabling like-for-like comparison with the Proposed Development.
- 6.4.42 As part of the modelling assessment, in order to undertake model verification for additional scenarios, the following scenarios have been modelled:

Model verification scenario

- Scenario 1 (S1) – Model verification, using 2022 road traffic data (see **Appendix 6.3**). TG22 indicates that industrial sources should not be verified, so they do not add specific value to this model verification scenario.
- 6.4.43 To enable model verification for road traffic (as detailed in Appendix 6.3), accurate monitoring data for NPTC must be available, and traffic data from 2022 with 2022 monitoring data. This accords with the approach recommended in TG22, which states “*If possible, meteorological, background pollution, and emissions data should all be derived from the same year*”.
- 6.4.44 The Proposed Development has been compared to either the established or interim baseline, within the following construction and operational scenarios:

Construction scenarios

- Scenario 2 (S2) – Future construction (established baseline) without development (2025):
 - *Industrial Emissions*: Established baseline + emissions from the Sustainable Aviation Fuel (SAF) / Project Lanzatech Site and the Sandvik Osprey metal processing facility (both due to open during 2026), hereafter collectively described as ‘cumulative emissions’, identified in the air quality study area; and
 - *Road transport emissions*: 2022 baseline traffic (as S1) + traffic generated from the SAF whilst it undergoes construction⁵;
 - Scenario 3 (S3) – Future construction with development (2025):
 - *Industrial Emissions*: Interim baseline + cumulative emissions; and
 - *Road transport emissions*: Interim baseline traffic + traffic generated from the SAF facility whilst it undergoes construction + EAF construction traffic;
- 6.4.45 The components included in the Interim baseline within S3 are described below.

Interim construction scenario

- Scenario 2a (S2a) – Bespoke interim baseline for construction (2025):
 - *Industrial Emissions*: Interim baseline + cumulative emissions;
 - *Road transport emissions*: Interim baseline traffic + traffic generated from the SAF facility whilst it undergoes construction; and
 - This is compared to S3 (as detailed above).
- 6.4.46 Scenario 2a (S2a) above represents the industrial and traffic emissions during the year when construction is expected to commence (2025) but differs from Scenario 2 as it utilises the interim baseline rather than the established baseline. The interim baseline is outlined in **Paragraph 6.4.39** and represents the period following closure of heavy end infrastructure, before the EAF becomes operational. This means that the industrial and traffic emissions differ between Scenario 2 (utilising the established baseline) and Scenario 2a (utilising the interim baseline). This scenario is therefore compared against

⁵ The SAF will open during 2026, so will undergo construction during 2025, the year for which construction emissions have been assessed. Assessing SAF construction traffic with industrial emissions once it opens is therefore conservative, acknowledging that the SAF facility will become operational and generate industrial emissions before EAF would open.

Scenario 3, in order to offer a comparison between the pollutant concentrations during the established baseline and interim baseline.

Operational scenarios

- Scenario 4 (S4) – Future operational scenario (established baseline) without development (2027):
 - *Industrial Emissions*: Established baseline + cumulative emissions;
 - *Road transport emissions*: Established baseline + traffic generated from the SAF facility once operational;
- Scenario 5 (S5) – Future operational scenario with development (2027):
 - *Industrial emissions*: The sources which will be present once the Proposed Development is operational + cumulative emissions; and
 - *Road transport emissions*: EAF traffic (which does not increase from S4a, see below) + cumulative traffic.

6.4.47 Scenarios 4 and 5 above represent the industrial and traffic emissions during the year when EAF is expected to become operational (2027). For the ‘without development’ scenario (Scenario 4, S4), the industrial and traffic models both include the established baseline emissions and cumulative emissions from the SAF and Sandvik Osprey metal processing facility. For the ‘with development’ scenario (Scenario 5, S5), the industrial sources include all those that will be present once the Proposed Development is operational, including EAF and cumulative sources. The traffic sources include the interim baseline traffic (see the Interim Operational Scenario section below), cumulative traffic sources that will be present once the Proposed Development is operational, and also the operational traffic from the EAF.

Interim operational scenario

- Scenario 4a (S4a) – Bespoke interim baseline for operation (2027):
 - *Industrial Emissions*: Interim baseline + the emissions from cumulative developments;
 - *Road transport emissions*: Interim baseline traffic + traffic generated from the SAF facility once operational;
 - *This is compared to S5 (as detailed above)*

6.4.48 Scenario 4a (S4a) above represents the industrial and traffic emissions during the year when EAF is expected to become operational (2027) but differs from Scenario 4 as it utilises the interim baseline rather than the established baseline. The interim baseline represents the period following closure of heavy end infrastructure, before the EAF becomes operational. This means that the industrial and traffic emissions differ between Scenario 4 (utilising the established baseline) and Scenario 4a (utilising the interim baseline). This scenario is therefore compared against Scenario 5, in order to offer a comparison between the pollutant concentrations during the established baseline and interim baseline.

6.4.49 A series of sensitivity tests have also been undertaken, to understand the influence which modelled parameters may have on the results obtained (**Paragraph 6.4.71** and **Appendix 6.2**). These tests generally remodel one or more of the scenarios listed above but where one of the parameters differs. The sensitivity tests have demonstrated there were no systematic errors found in any scenarios tested. The datasets used for the

assessment are therefore robust. Further, as part of the sensitivity tests for this assessment, an additional scenario was considered:

- Scenario 4b (S4b): Bespoke interim baseline for operation without cumulative development (2027):
 - *Established baseline traffic, but using 2027 'emissions factors'; as well as Industrial Sources present in the interim baseline .*

6.4.50 This sensitivity test was undertaken using one year of meteorological monitoring data to allow for 'in-combination' effects to be accounted for in relation to the assessment at ecological receptors (**Section 10.8**).

6.4.51 The sources modelled in each scenario are summarised in **Table 6.4** below.

Table 6.4 Summary of Sources included in each modelled scenario

Feature considered within the assessment	Scenario Reference							
	S1	S2	S2a	S3	S4	S4a	S4b	S5
Road Traffic Data (✓ if included)								
2022 Established Baseline	✓						✓	
2025 Bespoke Established Baseline (2022 Established Baseline + cumulative)		✓						
2027 Bespoke Established Baseline (2022 Established Baseline + cumulative)					✓			
2025 Bespoke Interim Baseline (2022 Interim Baseline + cumulative)			✓	✓				
2027 Bespoke Interim Baseline (2022 Interim Baseline + cumulative)						✓		✓
Site construction traffic				✓				
Tata Steel UK Limited (Tata Steel) Industrial Emissions Sources (✓ if included)								
Established Baseline (2023)	✓	✓			✓			
Interim Baseline (2025)			✓	✓		✓	✓	
EAF Operational (2027)								✓
Cumulative Industrial Emissions Sources (✓ if included)								
SAF Facility ¹		✓	✓	✓	✓	✓		✓
Sandvik Osprey Facility		✓	✓	✓	✓	✓		✓
Note: ¹ Operating under normal conditions; excluding emissions from generators in emergency conditions.								

- 6.4.52 S3 and S5 have respectively been compared to those predicted in S2 and S4. Results in S3 and S5 have also been compared to S2a and S4a, respectively. Emissions from cumulative sources are included in all four scenarios⁶. Finally, the results of S5 have been compared to S4b at Ecological Receptors (within **Appendix 6.1**), to enable a discussion of in-combination effects with the Interim Scenario. Further explanation regarding the approach adopted to account for cumulative emissions is provided in **Section 6.11**.
- 6.4.53 The traffic data provided for the established baseline was for 2022. As discussed, this also matched the latest year for which NO₂ diffusion tube monitoring data were made available by NPTC, to enable model 'verification' (see **Appendix 6.3**). Consequently, 2022 background pollutant concentrations, vehicle emissions factors and traffic data were used to verify the dispersion model. Traffic growth between 2022 and 2023 is not expected to materially differ and was thus used as provided.
- 6.4.54 In S2, S2a and S3, vehicle emissions and background pollutant concentrations for 2025 were used, noting that the EAF would commence construction during 2025.
- 6.4.55 In S4, S4a, S4b and S5, vehicle emissions and background pollutant concentrations for 2027 were used.
- 6.4.56 Further explanation is provided in relation to the source of the emissions factors, the background concentrations applied and the modelling assessment approach more generally throughout **Appendix 6.2** and **Appendix 6.3**. This includes the receptors which have been assessed.

Assessing impacts and effects

- 6.4.57 Impact magnitude descriptors were considered, alongside receptor sensitivity, to determine air quality effect descriptors for specific receptors considered in this assessment, in relation to effects from the Proposed Development against the bespoke established baseline.
- 6.4.58 The assessment has reported pollutant impacts at receptor locations where the ambient AQOs are recommended to be applied (in the case of human receptors), or at designated ecological sites. Consequently, all reported receptors should be considered as being of a 'high' sensitivity.

Impact magnitude at human receptor locations

- 6.4.59 The potential impacts on pollutants were assessed by comparing estimated concentrations with the AQTs presented in **Table 6.5**, with and without the Proposed Development in place. This was done for all pollutants excluding dioxins and furans, for which an assessment against the AQT is not possible in the absence of an AQT. Therefore, professional judgement has been used to describe the impacts of dioxins and furans, considering the absolute change in emissions, use of BAT and background concentrations. For the remaining pollutants, the EPUK-IAQM guidance descriptors for magnitude of impact were used to assess the annual mean changes in pollutant concentrations, primarily because the mechanism considers the effects in terms of the magnitude of change from predicted concentrations and relative to the AQALs.

⁶ Cumulative industrial emissions for predictions against the short-term AQTs are not included in S2 and S4, so the assessment against S3 and S5 has reported in-combination emissions. This approach is conservative.

- 6.4.60 There are two AQTs defined in relation to annual mean concentrations of PM_{2.5}, benzo(a)pyrene and lead. The more stringent AQT has been applied for lead, for a conservative assessment approach. In relation to PM_{2.5} and benzo(a)pyrene, the determination of air quality impacts has compared concentrations using the AQT defined in legislation, rather than as a target or aspiration. This is because the application of the more stringent AQT can make small absolute changes in pollutant concentrations skew as a proportion of an AQAL which is already or nearly breached in background, leading to disproportionate adverse or beneficial effects. However, breaches of the more stringent criteria have been reported and contextualised.
- 6.4.61 **Table 6.5** shows the EPUK-IAQM guidance impact descriptors that take account of the percentage change in concentration relative to the “air quality assessment level (AQAL)”, i.e. the annual mean AQTs, and the annual mean concentration at the receptor during the assessment year.

Table 6.5 Air quality impact descriptors for changes to annual mean NO₂, PM₁₀ and PM_{2.5} concentrations

Annual mean concentration at receptor in assessment year	% Change in concentration relative to AQAL			
	1	2 – 5	6 – 10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76 – 94% of AQAL	Negligible	Slight	Moderate	Moderate
95 – 102% of AQAL	Slight	Moderate	Moderate	Substantial
103 – 109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

- 6.4.62 Changes in concentrations of pollutants requiring assessment against ‘short term’ AQTs, such as those with 1-hour or 15-minute averaging times, should not be assessed using these criteria. The following criteria are instead cited in the EPUK-IAQM guidance (EPUK and IAQM, 2017):
- <10% of the AQT: the impact is considered negligible;
 - 11-20% of the AQT: small;
 - 21-50% of the AQT: medium; and
 - >51%: the impact is considered large.
- 6.4.63 The EPUK-IAQM guidance does not offer impact magnitude descriptors for pollutants which should be assessed against 8-hour or 24-hour averaging times (other than for 24-hour mean PM₁₀ concentrations).
- 6.4.64 In establishing a process to enable insignificant impacts to be screened from further assessment, the Defra and Environment Agency (2024) guidance (Defra and Environment Agency, 2024) establishes a method to determine how to screen out impacts from further assessment, the first of which is to assess whether the process contribution (PC) exceeds 10% of the AQT. Consequently, the EPUK-IAQM guidance criteria have also been applied to other pollutants impacting human health with short-term impacts.

Significance of effects at human receptor locations

- 6.4.65 Since all the receptors considered have the same sensitivity, there is a direct relationship between impact descriptors and the significance of an effect at a specific receptor, as shown in **Table 6.6**. Moderate or major effects are considered potentially significant, and minor and negligible effects are considered not significant.

Table 6.6 Air quality effect descriptors for receptors considered

Impact Descriptor	Effects Descriptor
Negligible	Negligible
Slight	Minor
Moderate	Moderate
Substantial	Major

- 6.4.66 As per the EPUK-IAQM guidance, the overall significance of predicted changes in local air quality, including background pollutant concentrations, has been established through the consideration of the following factors:
- the existing and future air quality in the absence of the development;
 - duration (temporary or long term);
 - reversibility (reversible or permanent);
 - the extent of current and future population exposure to the impacts; and
 - the influence and validity of any assumptions adopted when undertaking the prediction of impacts.
- 6.4.67 Where potentially significant adverse effects are identified, reappraisal has been undertaken following the implementation of additional mitigation.

Assessing impacts at ecological receptor locations

- 6.4.68 The magnitude of impact was principally determined based on whether the PC (i.e. the difference between the scenarios) was greater than the following criteria, as recommended in the IAQM 2020 guidance (IAQM, 2020):
- 1% of 'long-term' critical loads or levels; or
 - 10% of 'short-term' critical levels (there are no 'short-term' critical loads).
- 6.4.69 The 'long-term' critical levels relate to those against which annual mean pollutant concentrations should be compared. 'Short-term' critical levels refer to those assessed over a shorter averaging timescale.
- 6.4.70 Where these criteria were breached, a secondary screen has been applied for local nature sites, based on the Defra & Environment Agency (2024) guidance. This guidance indicates that an impact cannot be screened out as insignificant where the PC exceeds 100% of 'long-term' critical levels or loads or 100% of 'short-term' critical levels or loads. For results exceeding these thresholds, the results have been passed onto the project ecologists for further determination as significant or insignificant.

Sensitivity Testing and Analysis

- 6.4.71 As described in **paragraph 6.4.49**, sensitivity testing has been undertaken to understand how the selection of meteorological data and inclusion of buildings, hills and coastline within the dispersion model influence the resulting pollutant concentrations. The results to these sensitivity tests are presented in **paragraph 6.1.32 to paragraph 6.1.37 and paragraph 6.1.55 to paragraph 6.1.59 of Appendix 6.2**.
- 6.4.72 Following a review of the minimum and maximum difference in NO_x, NO₂, PM₁₀ and PM_{2.5} concentrations (predicted from the industrial modelling only), depending on whether buildings, hills and coastline were accounted for in the dispersion models, the difference between the minimum and maximum pollutant concentrations was generally found to be less than 10% of the AQT. Exceptions were found in relation to daily mean NO_x concentrations at two designated ecological sites, which was not considered material owing to their proximity to two proposed industrial sources which are discussed throughout the chapter. Similar conclusions were reached when considering the impact of meteorological data on the results. All sensitivity tests have demonstrated there were no systematic errors found in any scenarios tested.
- 6.4.73 The model setup adopted has followed a robust approach and the sensitivity tests do not flag any results which require further consideration when determining the assessment of significance. Therefore, it is not considered that there is a need to weight the influence of external factors when considering *“the influence and validity of any assumptions adopted when undertaking the prediction of impacts”* at human and ecological receptor locations. Therefore, these have not been considered further.

Limitations of the assessment

- 6.4.74 Aside from the limitations and assumptions detailed throughout this chapter and **Appendix 6**, regarding the dispersion modelling:
- It is noted that an AQT is available for Chromium (VI); however, data speciating Chromium into types are not available. The Applicant has explained that *“except for some specific processes almost all the chromium in air emissions is present as CrIII and little or none as CrVI. With that in mind it would be very unrealistic to compare the PC for total chromium with the EAL for hexavalent chromium”*, Further comparison to this threshold has thus not been undertaken;
 - There will be uncertainties introduced as the model uses a series of algorithms to simplify real world dispersion processes. It has also been assumed that dispersion will conform to a Gaussian distribution, thereby simplifying dispersion conditions;
 - Much of the data imported into the model is based on reasonable estimates. For example, it is assumed that the AADT flow would represent conditions over a year, emissions generated from the Emissions Factor and Calculator for Road Emissions of Ammonia CREAM (V1A) represent the average of vehicles from the fleet and modelled background pollutant concentrations are representative of conditions at the Site. It is also assumed that the meteorological data, surface roughness and Monin-Obukhov length would represent dispersion conditions across the modelled domain; and
 - Where citations were not available, assumptions were made in relation to habitat types (and thus critical loads and background nitrogen and acid deposition concentrations) with reference to the Air Pollution Information System (APIS) website. The habitat type and nutrient nitrogen critical loads were provided by the Project Ecologists, to inform the assessment.

Design basis and assumptions

- 6.4.75 Traffic data were provided by the appointed Transport and Access Team for the project (see **ES Chapter: 12 Transport and access** for full details).
- 6.4.76 The assessment of the dust emissions magnitude was made with reference to information provided on construction related activities and the Site from the Applicant and was supplemented by assumptions made using professional judgement.
- 6.4.77 Information relating to the operation of the scrap metal facility, and the number of rail and ship movements were provided by the Applicant.

6.5 Established, interim and future environmental baseline

Air quality management areas (AQMA)

- 6.5.1 Many of the closest residences are located to the east of the Site, within the AQMA located approximately 550 m east of the Site boundary. The AQMA is situated west of the M4 Motorway and was designated in June 2000 due to the risk of exceeding the 24-hour mean for PM₁₀ in relation to industrial emissions. The extent of the AQMA is shown in **Figure 6.5**.

Local air quality monitoring

- 6.5.2 According to NPTCs most recent Air Quality Annual Status Report (2023 Air Quality Annual Status Report, containing 2022 monitoring data) (Neath Port Talbot Council, 2023), there were four automatic air quality monitoring stations operated by NPTC during 2022 (a fifth, the Twll-yn-y-Wal Park monitor, ceased operating in 2022). The nearest monitoring station to the Site is located 0.85 km from its boundary (PS2 - Prince Street). There were no NO₂ diffusion tubes in immediate proximity to the Site during 2022, although some further afield.
- 6.5.3 Of the five stations, only the one at the Margam (Fire Station) AURN monitors NO₂. The data from this station is summarised in **Table 6.7** below. No breach of the AQO was identified.

Table 6.7 Annual mean NO₂ concentrations monitored by NPTC at locations within 2 km of the Proposed Development site

Site ID	Site Name	Site Type	Distance from Proposed Devt. site (km)	Annual mean NO ₂ concentration (µg/m ³)				
				2019	2020	2021	2022	2023
PT2	Margam (Fire Station) AURN	Industrial	1.32	15	12	13	12	11
Objective				40				

- 6.5.4 Annual mean PM₁₀ concentrations monitored by NPTC from 2018 to 2023 are also outlined in **Table 6.8** below. No breach of the AQO was identified.
- 6.5.5 Breaches of the 24-hour mean PM₁₀ AQO were not identified at any of the monitoring locations during 2018 to 2022. However, during 2023, the 24-hour mean PM₁₀ AQO was breached at PS2, where 48 days exceeding the 50µg/m³ AQO were identified, 13 more days than is permissible during each calendar year.

Table 6.8 Annual mean PM₁₀ concentrations monitored by NPTC at locations within 2km of the Proposed Development site

Site ID	Site Name	Site Type ¹	Distance from Proposed Devt. site (km)	Annual mean PM ₁₀ concentration (µg/m ³)					
				2018	2019	2020	2021	2022	2023
PS2	Prince Street	Industrial	0.85	23	20	24	20	27	29
TW1	Twll-yn-y Wal Park	Industrial	0.89	21	21	20	-	-	-
DS1	Dyffryn School	Industrial	1.19	-	22	23	25	17	19
PT2	Port Talbot Margam (Fire Station) AURN	Industrial	1.32	23	21	21	25	26	26
LW1	Talbot Little Warren	Industrial	1.76	21	20	21	18	19	21

¹ As defined in the Neath Port Talbot Air Quality Annual Status Report (2023).

- 6.5.6 PM_{2.5} was also monitored at locations PT2, DS1, LW1 and PS2 between 2018 and 2023, and is included in **Table 6.9** below. The annual mean PM_{2.5} concentrations were well below the current AQO for all years of available monitoring data at these locations.

Table 6.9 Annual mean PM_{2.5} concentrations monitored by NPTC at locations within 2 km of the Proposed Development site

Site ID	Site Name	Site Type	Distance from Proposed Devt. site (km)	Annual mean PM _{2.5} concentration (µg/m ³)					
				2018	2019	2020	2021	2022	2023
PS2	Prince Street	Industrial	0.85	10	9	9	9	10	10
TW1	Twll-yn-y Wal Park	Industrial	0.89	-	-	-	#	-	--
DS1	Dyffryn School	Industrial	1.19	-	-	-	-	6	8
PT2	Port Talbot Margam (Fire Station) AURN	Industrial	1.32	10	11	11	9	8	8
LW1	Little Warren	Industrial	1.76	-	-	-	-	7	7
# Monitoring undertaken until March 2021 only. Data before this time not publicly available.									

6.5.7 Monitoring station PT2 (Port Talbot Margam (Fire Station) AURN) also monitors the air pollutants sulphur dioxide (SO₂) ozone (O₃) and carbon monoxide (CO). During 2022, there were no exceedances of the 8-hour maximum daily running average of 10 mg/m³ for CO, nor were there any exceedances of the 15-minute, 1-hour, or 24-hour maximum means for SO₂.

Background pollutant concentrations

6.5.8 Background concentrations of NO₂, PM₁₀ and PM_{2.5} were obtained from maps downloaded from the UK-AIR website (Defra, 2024a) maintained by Defra, which includes Welsh data and works closely with the devolved administrations in Wales. As such, it was deemed acceptable to use for this assessment. The maps present annual mean pollutant concentrations on a 1 km² basis for the years 2018 (the base mapping year) to 2030. The concentrations for the 1 km x 1 km grid square centred on OS coordinates 277277, 187009, corresponding to the location of the Site, for 2022, 2025 (the year in which construction activities are expected to commence) and 2027 (the year the Proposed Development is expected to be operational) are shown in **Table 6.10**. The data show that annual mean background pollutant concentrations are not expected to exceed the annual mean NO₂, PM₁₀ or PM_{2.5} AQOs in any of the presented years.

Table 6.10 Background pollutant concentrations at the Proposed Development from the UK-AIR website

Pollutant	2022 (µg/m ³)	2025 (µg/m ³)	2027 (µg/m ³)	Objective
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NO ₂	8.58	7.93	7.67	40
PM ₁₀	12.98	12.64	12.63	40
PM _{2.5}	7.43	7.14	7.14	20

Summary of existing baseline at site

- 6.5.9 Other than in relation to the 24-hour mean PM₁₀ AQO, all other AQOs and AQSS have been met in recent years, according to monitoring and mapped data.

6.6 Project characteristics and embedded mitigation

- 6.6.1 Any non-road mobile machinery used on-site which were purchased since the Non-Road Mobile Machinery Directive (97/68/EC) (H.M. Government, 1997), including subsequent amendments, will comply with the emissions requirements specified in the relevant legislation.
- 6.6.2 Demolition and construction effects will be mitigated through the implementation of a Construction Logistics Plan (CLP) and Construction Environmental Management Plan (CEMP), where practicable (and for the purposes of best practice) including measures to encourage active travel. This can be secured via a suitably worded planning condition.
- 6.6.3 As per the IAQM 2024 guidance, the dust assessment in **Section 6.7** has been undertaken assuming no mitigation is implemented. However, the measures which are recommended to be included in the CEMP, a Dust Management Plan (DMP) or equivalent (determined in the following construction dust assessment) are listed **Appendix 6.1**.
- 6.6.4 BAT will be used to reduce emissions from plant which will be installed with the EAF in place, designed with reference to the Best Available Techniques (BAT) Reference Document for Iron and Steel Production (BREF) (Remus et al., 2013). For example, primary dust generated directly from the EAF is treated in a Fume Extraction Plant (FEP).
- 6.6.5 Moreover, to reduce emissions of dioxins and furans to air, the waste gases from the EAF will be quenched rapidly to minimise the opportunity for dioxin formation, as is standard practice at many other EAF plants. Further dioxin abatement will be provided by injecting an adsorbent such as activated carbon into the waste gas system prior to the bag filter. Any remaining dioxins can be adsorbed onto the surface of the carbon particles, and the particles removed from the waste gas stream in the bag filter, preventing the dioxins from being emitted to atmosphere. This technique is described in Section 8.3.5.3 of BREF and has been applied at several EAF plants in Europe, but this will be the first installation of this additional abatement step in the UK.

6.7 Assessment of potential construction phase effects

Qualitative construction dust assessment

- 6.7.1 As there are human receptors within 250 m of the Proposed Development, a dust risk assessment has been undertaken in accordance with the IAQM 2024 guidance.

Dust emissions magnitude

- 6.7.2 The dust emission magnitudes for each of the four construction related activities (demolition, earthworks, construction and trackout) are informed by the types of construction related activities expected to take place at the Site.
- 6.7.3 Potential dust emission magnitudes from each of the construction related activities has been assessed using the IAQM 2024 guidance criteria (**Appendix 6.1**) and are detailed in **Table 6.11**. It should be noted that in accordance with the IAQM 2024 guidance, the assessment has been undertaken assuming no mitigation measures have been secured.

Table 6.11 Dust emission magnitudes

Activity	Description	Dust emissions magnitude
Demolition	12,000-75,000 m ³ building being demolished. Demolition works to take place less than 10 m above ground level.	Medium
Earthworks	>10 earthmoving vehicles at any one time, on a Site with an area >110,000 m ² and >200,000 m ² of material generated from site levelling.	Large
Construction	The Proposed Development comprises chemical/material storage and transfer infrastructure and pipework (above and below ground), buildings, fume and dust treatment plant, water treatment facility, handling systems, electrical control rooms & power infrastructure, reutilised laboratories, offices, and ancillary facilities together with new and amended transport infrastructure, landscaping and green infrastructure, and associated development. Large is expected with a building volume of 720,000m ³ . On-site concrete batching will likely be used.	Large
Trackout	>100 HGVs will enter and leave Site per day whilst construction activities take place, according to information provided showing the maximum number of wagons required for activities including excavation, etc. Large has been assumed for a conservative assessment.	Large

Receptor sensitivity

- 6.7.4 **Table 6.12** outlines the sensitivity of the surrounding area, including receptors connected with committed and consented developments, determined in accordance with the IAQM 2024 guidance method summarised in **Appendix 6.1**.
- 6.7.5 As the Site was assessed as having a large trackout dust emissions magnitude, trackout was assumed to occur on applicable roads within 250 m of the likely site exit, as per the IAQM 2024 guidance.

Table 6.12 Sensitivity of the surrounding area

Potential Impact at Receptor	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	Low: >1 low sensitivity (industrial) receptor within 100 m of the Site.	Low: >1 low sensitivity (industrial) receptor within 100 m of the Site.	Low: >1 low sensitivity (industrial) receptor within 100 m of the Site.	Low: >1 low sensitivity (industrial) receptor within 250 m of routes along which trackout is expected to arise.
Human health impacts	Low: >1 low/medium sensitivity receptor with annual mean PM ₁₀ concentration <24µg/m ³ .	Low: >1 low/medium sensitivity receptor with annual mean PM ₁₀ concentration <24µg/m ³ .	Low: >1 low/medium sensitivity receptor with annual mean PM ₁₀ concentration <24µg/m ³ .	Low: >1 low sensitivity (industrial) receptor within 250 m of routes along which trackout is expected to arise and local annual mean PM ₁₀ concentrations 24 - 28µg/m ³ .
Ecological	Negligible: There are no designated ecological sites within 50 metres of the locations where demolition is proposed.	Medium: The Margam Moors Site of Special Scientific Interest is located adjacent to the proposed cable route near the south of the Site.	Negligible: There are no designated ecological sites within 50 metres of locations where construction is proposed.	Negligible: There are no designated ecological sites within 50 metres of the Site or routes along which trackout may arise.

Dust impact risk

- 6.7.6 The construction dust risks shown in **Table 6.13** have been assigned based on the dust emission magnitude associated with each on-site activity and the sensitivity of the surrounding area, using the IAQM 2024 guidance method described in **Appendix 6.1**.

Table 6.13 Summary of the dust risk from site activities

Potential Impact	Risk of Dust Impacts			
	Demolition	Earthworks	Construction	Trackout
Dust soiling	Low	Low	Low	Low

Human health impacts	Low	Low	Low	Low
Ecological	Negligible	Medium	Negligible	Negligible

- 6.7.7 The overall dust risk from the Site is predicted to be medium, due to potential impacts on ecologically sensitive receptors due to potential impacts on the Margam Moors SSSI during the excavation for the cable and the proximity of these works to the SSSI.
- 6.7.8 The embedded mitigation measures described in **Appendix 6.4** will be effective wherever potentially dusty construction activities take place. With these measures in place, effects on receptors are likely to be negligible, with possible short-term minor adverse effects during adverse weather conditions.

Anticipated effects – vehicle and industrial emissions

- 6.7.9 The section below details the results of the comparisons between the construction scenarios, as summarised below:
- Scenario 2 (S2) – Future Construction Without Development (2025);
 - Scenario 3 (S3) – Future Construction With Development (2025);

Construction (Human receptors)

- 6.7.10 **Table 6.14** to **Table 6.20** below present the predicted annual mean NO₂, PM₁₀, PM_{2.5}, and CO concentrations at each of the human receptor locations to which the annual mean AQTs should be applied for each pollutant in S2 and S3 (for example, parks and gardens have not been assessed for annual mean AQT compliance). They also show the percentage change in pollutant concentrations (with the Proposed Development in place) relative to the AQAL, the S3 pollutant concentration as a percentage of the AQAL, and the assigned EPUK-IAQM guidance impact descriptor. Road and industrial sources were considered cumulatively. The results are apportioned in **Appendix 6.6**.
- 6.7.11 In each instance, the impacts were assessed as having a negligible or beneficial impact and none of the AQTs were breached, with the exceptions of R10 and R21, which would breach the potentially forthcoming annual mean PM_{2.5} AQT of 10µg/m³ regardless of whether the Proposed Development proceeds, due to the already high background concentrations, close to exceeding the AQT. However, with the Proposed Development present, concentrations would be lower than compared to the established baseline, and so the extent that the PM_{2.5} AQT would be breached would be lower.
- 6.7.12 Consequently, the Proposed Development is likely to have short- to medium-term, local beneficial (and thus ‘not significant’) effects on air quality at existing human receptor locations during the construction phase.

Table 6.14 Comparison of annual mean NO₂ concentrations in S2 - Future construction without development (2025) and S3 - Future construction with development (2025)

Receptor ID	Annual mean NO ₂ concentration (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R1	14.15	13.16	-0.99	-2.47	Negligible

Receptor ID	Annual mean NO ₂ concentration (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R2	14.23	12.85	-1.38	-3.46	Negligible
R3	19.99	19.11	-0.88	-2.19	Negligible
R4	18.71	18.02	-0.70	-1.73	Negligible
R5	8.99	8.38	-0.62	-1.53	Negligible
R6	17.93	17.26	-0.67	-1.67	Negligible
R7	19.09	18.63	-0.46	-1.15	Negligible
R8	15.39	14.97	-0.41	-1.04	Negligible
R9	22.66	22.23	-0.43	-1.08	Negligible
R10	29.98	29.32	-0.66	-1.65	Negligible
R11	16.49	15.85	-0.63	-1.58	Negligible
R12	16.64	16.02	-0.61	-1.54	Negligible
R13	14.33	13.62	-0.71	-1.78	Negligible
R14	18.53	17.66	-0.87	-2.18	Negligible
R15	26.10	25.14	-0.96	-2.40	Negligible
R16	23.30	22.37	-0.93	-2.33	Negligible
R17	20.52	19.86	-0.66	-1.65	Negligible
R18	22.79	22.12	-0.68	-1.69	Negligible
R19	18.76	18.22	-0.54	-1.34	Negligible
R20	26.33	25.92	-0.41	-1.02	Negligible
R21	28.12	27.75	-0.37	-0.92	Negligible
R22	23.50	23.14	-0.35	-0.88	Negligible
R23	18.51	17.83	-0.68	-1.70	Negligible
R24	17.63	16.93	-0.70	-1.75	Negligible

Table 6.15 Comparison of hourly mean (99.8th percentile) NO₂ concentrations in S2 - Future construction without development (2025) and S3 - Future construction with development (2025)

Receptor ID	Hourly mean (99.8 th percentile) NO ₂ concentration by scenario (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R1	37.92	28.11	-9.81	-4.90	Negligible
R2	36.88	28.52	-8.36	-4.18	Negligible
R3	50.58	40.60	-9.98	-4.99	Negligible
R4	48.33	39.45	-8.88	-4.44	Negligible
R5	24.74	17.73	-7.01	-3.51	Negligible

Receptor ID	Hourly mean (99.8 th percentile) NO ₂ concentration by scenario (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R6	44.84	36.10	-8.75	-4.37	Negligible
R7	51.34	38.58	-12.76	-6.38	Negligible
R8	41.27	31.36	-9.91	-4.95	Negligible
R9	53.83	45.89	-7.94	-3.97	Negligible
R10	70.16	61.28	-8.88	-4.44	Negligible
R11	43.90	34.76	-9.14	-4.57	Negligible
R12	43.74	36.85	-6.89	-3.44	Negligible
R13	39.68	28.70	-10.98	-5.49	Negligible
R14	46.71	37.46	-9.25	-4.63	Negligible
R15	61.57	52.41	-9.15	-4.58	Negligible
R16	55.87	46.90	-8.97	-4.49	Negligible
R17	50.16	42.66	-7.50	-3.75	Negligible
R18	54.87	47.14	-7.72	-3.86	Negligible
R19	47.20	37.83	-9.37	-4.69	Negligible
R20	64.33	52.99	-11.34	-5.67	Negligible
R21	67.99	57.04	-10.95	-5.47	Negligible
R22	58.26	47.88	-10.38	-5.19	Negligible
R23	47.07	38.57	-8.50	-4.25	Negligible
R24	46.60	36.80	-9.80	-4.90	Negligible
P1	29.64	23.46	-6.18	-3.09	Negligible
P2	40.18	30.07	-10.12	-5.06	Negligible
P3	46.01	36.31	-9.70	-4.85	Negligible
P4	49.16	39.04	-10.13	-5.06	Negligible
P5	47.67	37.63	-10.03	-5.02	Negligible
P6	29.26	20.50	-8.76	-4.38	Negligible
P7	25.29	19.12	-6.17	-3.09	Negligible
P8	42.50	33.34	-9.16	-4.58	Negligible
P9	44.74	35.27	-9.46	-4.73	Negligible
P10	49.49	39.52	-9.96	-4.98	Negligible
P11	50.17	40.19	-9.98	-4.99	Negligible
P12	63.31	54.15	-9.16	-4.58	Negligible

Table 6.16 Comparison of annual mean PM₁₀ concentrations in S2 - Future construction without development (2025) and S3 - Future construction with development (2025)

Receptor ID	Annual mean PM ₁₀ concentration (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R1	14.91	13.23	-1.68	-4.19	Negligible
R2	16.64	13.14	-3.49	-8.74	Slight beneficial
R3	17.76	15.19	-2.57	-6.43	Slight beneficial
R4	16.19	14.51	-1.68	-4.21	Negligible
R5	11.49	10.51	-0.98	-2.46	Negligible
R6	14.55	13.66	-0.89	-2.22	Negligible
R7	15.04	14.20	-0.84	-2.10	Negligible
R8	14.33	13.52	-0.81	-2.03	Negligible
R9	16.10	15.50	-0.60	-1.49	Negligible
R10	18.52	16.94	-1.59	-3.97	Negligible
R11	16.27	14.14	-2.13	-5.32	Negligible
R12	16.85	14.26	-2.59	-6.48	Slight beneficial
R13	14.84	13.40	-1.44	-3.61	Negligible
R14	15.83	14.62	-1.22	-3.04	Negligible
R15	16.69	15.66	-1.03	-2.56	Negligible
R16	15.86	14.84	-1.02	-2.55	Negligible
R17	16.71	15.10	-1.61	-4.02	Negligible
R18	17.17	15.62	-1.56	-3.89	Negligible
R19	15.39	14.81	-0.58	-1.45	Negligible
R20	16.29	15.85	-0.44	-1.10	Negligible
R21	16.82	16.15	-0.67	-1.68	Negligible
R22	15.80	15.17	-0.63	-1.58	Negligible
R23	16.21	14.56	-1.65	-4.13	Negligible
R24	16.11	14.33	-1.78	-4.44	Negligible

Table 6.17 Comparison of 24-hour mean (90.4th percentile) PM₁₀ concentrations in S2 - Future construction without development (2025) and S3 - Future construction with development (2025)

Receptor ID	24-hour mean (90.4 th percentile) PM ₁₀ concentration (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R1	31.61	26.48	-5.13	-10.26	Negligible
R2	35.40	26.30	-9.10	-18.21	Slight beneficial

Receptor ID	24-hour mean (90.4 th percentile) PM ₁₀ concentration (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R3	36.79	30.40	-6.39	-12.78	Slight beneficial
R4	32.78	29.05	-3.73	-7.45	Negligible
R5	24.72	21.04	-3.68	-7.37	Negligible
R6	30.38	27.34	-3.05	-6.10	Negligible
R7	31.38	28.42	-2.97	-5.93	Negligible
R8	30.00	27.05	-2.95	-5.91	Negligible
R9	33.17	31.02	-2.15	-4.30	Negligible
R10	37.46	33.95	-3.51	-7.03	Negligible
R11	33.10	28.36	-4.74	-9.48	Negligible
R12	34.20	28.57	-5.63	-11.26	Slight beneficial
R13	32.01	26.82	-5.19	-10.38	Negligible
R14	29.92	29.52	-0.40	-0.81	Negligible
R15	33.47	31.49	-1.97	-3.94	Negligible
R16	31.81	29.85	-1.96	-3.93	Negligible
R17	33.99	30.26	-3.73	-7.47	Negligible
R18	34.83	31.29	-3.54	-7.07	Negligible
R19	31.63	29.63	-2.00	-4.01	Negligible
R20	33.23	31.71	-1.53	-3.06	Negligible
R21	34.72	32.30	-2.41	-4.83	Negligible
R22	32.64	30.34	-2.30	-4.60	Negligible
R23	33.06	29.17	-3.88	-7.76	Negligible
R24	32.65	28.72	-3.93	-7.86	Negligible
P1	27.17	24.97	-2.20	-4.40	Negligible
P2	30.01	26.75	-3.27	-6.54	Negligible
P3	33.89	28.82	-5.07	-10.15	Negligible
P4	31.17	28.94	-2.23	-4.46	Negligible
P5	35.56	29.34	-6.21	-12.43	Slight beneficial
P6	23.44	21.58	-1.86	-3.72	Negligible
P7	25.31	22.95	-2.37	-4.73	Negligible
P8	32.50	28.25	-4.24	-8.49	Negligible
P9	33.75	28.47	-5.28	-10.56	Slight beneficial
P10	31.04	28.77	-2.27	-4.55	Negligible
P11	36.63	30.26	-6.37	-12.74	Slight beneficial
P12	34.10	32.07	-2.02	-4.05	Negligible

Table 6.18 Comparison of annual mean PM_{2.5} concentrations in S2 - Future construction without development (2025) and S3 - Future construction with development (2025)

Receptor ID	Concentration (µg/m³)		Actual Change (µg/m³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R1	9.62	7.96	-1.66	-8.31	Slight beneficial
R2	11.38	7.91	-3.47	-17.37	Moderate beneficial
R3	11.94	9.39	-2.55	-12.75	Moderate beneficial
R4	10.73	9.06	-1.67	-8.33	Slight beneficial
R5	7.40	6.44	-0.97	-4.83	Negligible
R6	8.92	8.07	-0.85	-4.27	Negligible
R7	9.19	8.36	-0.82	-4.12	Negligible
R8	9.27	8.47	-0.81	-4.03	Negligible
R9	9.63	9.04	-0.58	-2.92	Negligible
R10	11.99	10.42	-1.57	-7.86	Slight beneficial
R11	10.96	8.85	-2.11	-10.55	Moderate beneficial
R12	11.47	8.90	-2.57	-12.85	Moderate beneficial
R13	9.46	8.04	-1.42	-7.10	Slight beneficial
R14	10.54	9.34	-1.20	-6.02	Slight beneficial
R15	10.49	9.48	-1.01	-5.04	Negligible
R16	10.03	9.03	-1.00	-5.01	Negligible
R17	10.97	9.37	-1.59	-7.97	Slight beneficial
R18	11.20	9.66	-1.54	-7.69	Slight beneficial
R19	9.62	9.07	-0.55	-2.74	Negligible
R20	10.19	9.77	-0.42	-2.10	Negligible
R21	10.68	10.02	-0.66	-3.32	Negligible
R22	10.07	9.44	-0.62	-3.12	Negligible
R23	10.72	9.08	-1.63	-8.17	Slight beneficial
R24	10.71	8.95	-1.76	-8.80	Slight beneficial

Table 6.19 Comparison of 8-hour rolling mean CO concentrations in S2 - Future construction without development (2025) and S3 - Future construction with development (2025)

Receptor ID	Maximum Rolling 8-hour CO concentration (mg/m³)		Actual Change (µg/m³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R1	1.59	0.41	-1.18	-11.82	Small beneficial

Receptor ID	Maximum Rolling 8-hour CO concentration (mg/m³)		Actual Change (µg/m³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R2	1.37	0.41	-0.97	-9.67	Negligible
R3	1.39	0.41	-0.98	-9.82	Negligible
R4	1.33	0.41	-0.92	-9.25	Negligible
R5	0.94	0.41	-0.53	-5.34	Negligible
R6	1.35	0.41	-0.95	-9.47	Negligible
R7	1.59	0.41	-1.18	-11.82	Small beneficial
R8	1.41	0.41	-1.01	-10.08	Negligible
R9	1.20	0.41	-0.79	-7.90	Negligible
R10	1.23	0.41	-0.82	-8.22	Negligible
R11	1.42	0.41	-1.01	-10.13	Negligible
R12	1.49	0.41	-1.09	-10.86	Negligible
R13	1.70	0.41	-1.29	-12.94	Small beneficial
R14	1.17	0.41	-0.77	-7.69	Negligible
R15	1.08	0.41	-0.68	-6.76	Negligible
R16	1.08	0.41	-0.67	-6.75	Negligible
R17	1.23	0.41	-0.82	-8.24	Negligible
R18	1.19	0.41	-0.79	-7.88	Negligible
R19	1.28	0.41	-0.87	-8.74	Negligible
R20	1.20	0.41	-0.80	-7.95	Negligible
R21	1.35	0.41	-0.94	-9.42	Negligible
R22	1.29	0.41	-0.88	-8.82	Negligible
R23	1.16	0.41	-0.76	-7.58	Negligible
R24	1.32	0.41	-0.91	-9.11	Negligible
P1	0.88	0.41	-0.47	-4.69	Negligible
P2	1.42	0.41	-1.01	-10.12	Negligible
P3	1.32	0.41	-0.91	-9.14	Negligible
P4	1.25	0.41	-0.84	-8.44	Negligible
P5	1.35	0.41	-0.94	-9.40	Negligible
P6	0.99	0.41	-0.59	-5.86	Negligible
P7	0.89	0.41	-0.48	-4.84	Negligible
P8	1.52	0.41	-1.12	-11.18	Small beneficial
P9	1.36	0.41	-0.96	-9.57	Negligible
P10	1.26	0.41	-0.85	-8.50	Negligible
P11	1.38	0.41	-0.98	-9.78	Negligible
P12	1.08	0.41	-0.67	-6.70	Negligible

Table 6.20 Comparison of 1-hour rolling mean CO concentrations in S2 - Future construction without development (2025) and S3 - Future construction with development (2025)

Receptor ID	Maximum Hourly CO concentration (mg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
R1	6.07	0.51	-5.56	-18.52	Small beneficial
R2	4.50	0.60	-3.90	-12.99	Small beneficial
R3	3.89	0.60	-3.29	-10.97	Negligible
R4	3.40	0.64	-2.76	-9.19	Negligible
R5	1.79	0.49	-1.30	-4.34	Negligible
R6	2.58	0.51	-2.07	-6.91	Negligible
R7	3.27	0.52	-2.75	-9.16	Negligible
R8	2.73	0.51	-2.22	-7.41	Negligible
R9	2.32	0.50	-1.83	-6.09	Negligible
R10	3.28	0.57	-2.72	-9.06	Negligible
R11	3.10	0.58	-2.52	-8.39	Negligible
R12	3.95	0.61	-3.34	-11.13	Small beneficial
R13	3.57	0.51	-3.06	-10.21	Negligible
R14	2.20	0.54	-1.66	-5.55	Negligible
R15	1.97	0.51	-1.45	-4.85	Negligible
R16	1.97	0.52	-1.45	-4.84	Negligible
R17	2.96	0.62	-2.35	-7.82	Negligible
R18	3.14	0.64	-2.50	-8.34	Negligible
R19	2.46	0.50	-1.97	-6.55	Negligible
R20	2.45	0.49	-1.96	-6.54	Negligible
R21	2.45	0.51	-1.94	-6.47	Negligible
R22	2.78	0.50	-2.28	-7.59	Negligible
R23	3.54	0.60	-2.94	-9.81	Negligible
R24	3.56	0.63	-2.93	-9.76	Negligible
P1	1.61	0.48	-1.13	-3.77	Negligible
P2	3.08	0.50	-2.57	-8.58	Negligible
P3	4.65	0.60	-4.05	-13.50	Small beneficial
P4	2.86	0.50	-2.36	-7.86	Negligible
P5	3.79	0.60	-3.19	-10.62	Negligible
P6	1.75	0.51	-1.24	-4.13	Negligible
P7	1.64	0.48	-1.16	-3.87	Negligible
P8	3.55	0.51	-3.04	-10.13	Negligible

Receptor ID	Maximum Hourly CO concentration (mg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S2	S3			
P9	4.86	0.60	-4.26	-14.20	Small beneficial
P10	2.89	0.50	-2.38	-7.94	Negligible
P11	3.88	0.60	-3.28	-10.93	Negligible
P12	1.95	0.51	-1.44	-4.79	Negligible

Construction - Ecological receptors

- 6.7.13 The section below details the results of the comparisons between the construction scenarios as summarised below:
- Scenario 2 (S2) – Future construction without development (2025);
 - Scenario 3 (S3) – Future construction with development (2025);
- 6.7.14 **Table 6.21** below presents the construction phase annual mean NO_x concentrations at ecological receptor locations. Those for other ecological parameters are presented in **Appendix 6.6**.
- 6.7.15 At all receptor locations (except E15 and E16), the impact at ecological receptors decreases in S3, representing beneficial impacts. Impacts at E15 and E16, which are located within the Junction 38 Wetland SINCR, have increased, but by less than 100% of the AQT.
- 6.7.16 The results demonstrate that concentrations at E15 and E16 are predicted to increase to levels exceeding the critical level, where they did not without the Proposed Development in place in relation to the daily NO_x AQT. The criteria used to determine significance of effects at designated ecological sites do not require consideration of the AQT, because they focus on the increase in the process contribution relative to the AQT rather than the AQT itself (**Paragraph 6.4.68 to Paragraph 6.4.70**). Consequently, these exceedances of the annual and daily NO_x AQT are not considered material to the assessment and are considered to not have a significant effect.
- 6.7.17 Table 6.34 and Table 6.35 in **Appendix 6.6** presents the changes in concentrations of annual mean NH₃ and SO₂ concentrations respectively, relative to the AQTs, for S2 and S3. Considering only emissions from industrial sources were modelled for SO₂, and noting that many sources of SO₂ will have ceased to operate whilst no new industrial sources will be introduced, it is unsurprising that annual mean SO₂ concentrations decrease.
- 6.7.18 The temporary increase in road traffic has led to ambient NH₃ concentrations increasing slightly in places, but not by more than the 1% PC screening criteria (see **Paragraph 6.4.68**).
- 6.7.19 Consequently, the Proposed Development is likely to have short- to medium-term, local effects on air quality considered to have 'not significant' and predominantly beneficial effects at designated ecological sites (in relation to critical levels) during the construction phase.
- 6.7.20 Table 6.36 in **Appendix 6.6** presents the construction phase nutrient nitrogen deposition generated in connection with the Proposed Development, at locations where sufficient

information were available from APIS and from the Ecology team to determine the habitat type and its sensitivity to nitrogen deposition. Similarly to the trend shown in the ambient NO_x concentrations, at all receptors apart from E15 and E16 there is a reduction in the levels of nutrient nitrogen deposition. The increase at E15 and E16 has been considered further within **ES Chapter 8: Biodiversity** due to the increase in nutrient nitrogen deposition being greater than 1%; however it is not considered significant as the 100% threshold at the SINC is not exceeded.

- 6.7.21 Table 6.37 in **Appendix 6.6** presents the construction phase acid deposition generated in connection with the Proposed Development. The potential effects of acid deposition on ecosystems are each dependent on concentration of nitrogen, ammonia and sulphur which are deposited. Following conversion from ambient to deposited concentrations, there was a net reduction or no change in deposited nitrogen concentrations in S3 than S2 at all receptor locations except E15 and E16. There was also a net reduction in deposited sulphur at all locations, by an amount exceeding that for deposited nitrogen. This means that there would be a net reduction in the process contribution (from the Proposed Development) when expressed as a percentage of the critical load function, demonstrating an overall net benefit. The process contribution is thus <1% of the critical load and has been screened out from further assessment.
- 6.7.22 Consequently, the Proposed Development is likely to have short- to medium-term, local beneficial or negligible (not significant) effects on air quality at existing designated ecological sites during the construction phase.

Table 6.21 Comparison of annual mean NO_x concentrations in S2 - Future construction without development (2025) and S3 - Future construction with development (2025)

Receptor ID	Background (µg/m ³)	Annual mean NO _x (µg/m ³)		Critical Level (µg/m ³)	PC as % of Critical Level
		S2	S3		
E1	9.90	15.11	14.18	30	-3.08
E2	7.95	11.84	11.23	30	-2.04
E3	6.96	10.40	9.70	30	-2.31
E4	12.81	27.77	26.34	30	-4.77
E5	9.90	17.33	16.14	30	-3.94
E6	10.20	16.01	15.22	30	-2.64
E7	10.20	16.00	15.28	30	-2.38
E8	6.82	11.14	10.51	30	-2.12
E9	6.82	10.40	9.79	30	-2.05
E10	6.30	9.32	8.72	30	-1.99
E11	6.30	8.97	8.39	30	-1.92
E12	11.54	21.48	20.91	30	-1.92
E13	11.54	34.60	34.03	30	-1.91
E14	17.34	40.02	38.83	30	-3.96
E15	24.33	32.79	37.56	30	15.90

Receptor ID	Background ($\mu\text{g}/\text{m}^3$)	Annual mean NO_x ($\mu\text{g}/\text{m}^3$)		Critical Level ($\mu\text{g}/\text{m}^3$)	PC as % of Critical Level
		S2	S3		
E16	24.33	31.89	34.08	30	7.28
E17	24.33	31.61	30.75	30	-2.88
E18	8.27	9.32	8.99	30	-1.10
E19	6.73	7.77	7.43	30	-1.12
E20	9.66	12.12	11.70	30	-1.39
E21	13.19	14.99	14.59	30	-1.33
E22	13.95	15.66	15.38	30	-0.93
E23	10.19	12.12	11.78	30	-1.12
E24	10.19	12.11	11.77	30	-1.13
E25	9.73	11.46	11.10	30	-1.19
E26	12.81	14.14	13.77	30	-1.21
E27	24.33	44.59	43.56	30	-3.43
E28	24.33	50.07	48.81	30	-4.19
E29	17.34	130.63	129.50	30	-3.79
E30	17.34	81.66	80.09	30	-5.24
E31	9.35	31.19	29.82	30	-4.56
E32	9.35	22.44	21.09	30	-4.53
E33	17.34	168.20	167.08	30	-3.74
E34	17.34	123.81	122.98	30	-2.76
E35	17.34	122.66	121.79	30	-2.92
E36	17.34	228.30	227.35	30	-3.16
E37	17.34	103.78	102.94	30	-2.79
E38	17.47	46.29	45.25	30	-3.46
E39	17.47	118.40	117.42	30	-3.27
E40	17.47	38.88	37.79	30	-3.63
E41	14.75	48.53	47.02	30	-5.04
E42	14.75	56.91	55.45	30	-4.88
E43	12.81	33.17	31.82	30	-4.52
E44	9.90	18.29	16.90	30	-4.62
E45	9.90	16.86	15.67	30	-3.95
E46	10.20	15.39	14.69	30	-2.34
E47	9.35	55.74	54.20	30	-5.13
E48	9.35	31.63	30.27	30	-4.51
E49	8.64	38.19	37.10	30	-3.64
E50	8.64	40.17	39.19	30	-3.24

Receptor ID	Background ($\mu\text{g}/\text{m}^3$)	Annual mean NO_x ($\mu\text{g}/\text{m}^3$)		Critical Level ($\mu\text{g}/\text{m}^3$)	PC as % of Critical Level
		S2	S3		
E51	17.34	54.46	53.04	30	-4.76
E52	17.34	69.54	68.09	30	-4.83
E53	17.34	32.05	30.73	30	-4.39
E54	17.47	97.85	96.86	30	-3.31
E55	8.58	12.26	11.40	30	-2.88

Interim Baseline

- 6.7.23 The results of the comparison between the interim baseline and future construction a scenarios (S2a and S3) are presented in **Appendix 6.7**. As expected, concentrations of the pollutants generated from road traffic (NO_2 , PM_{10} and $\text{PM}_{2.5}$) were greater in S3 than S2a. Indeed, at any of the assessed human receptors, annual mean concentrations of NO_2 , PM_{10} and $\text{PM}_{2.5}$ increased by a maximum of 2.2%, 0.6% and 0.7% relative to the AQT respectively. Greater increases (of up to 17%) were expected due to increases in hourly mean NO_2 concentrations; and small increases (up to 0.09%) were expected in 24-hour mean PM_{10} concentrations, each relative to the AQT.
- 6.7.24 Table 6.56 to Table 6.59 in **Appendix 6.7** present the annual mean NO_x , daily mean NO_x , annual mean NH_3 concentrations; and nutrient nitrogen and acid deposition, between S2a and S3. At the assessed receptor locations, concentrations of NO_x , NH_3 and SO_2 concentrations; and nutrient nitrogen and acid deposition; either increased or stayed consent. All increases were less than 1% of the critical load or level. The annual mean SO_2 concentration change is zero (and thus not reported), as the difference between these scenarios is attributable to road traffic. For the reasons discussed in **Paragraph 4.1.13**, these changes in concentrations are presented to provide context only and are not used to inform the requirement for mitigation or residual effects.

Potential mitigation

- 6.7.25 Additional mitigation (beyond embedded measures) is not considered to be required, owing to the relatively small impact which construction vehicle movements and plant will have on air quality.

Residual effects

- 6.7.26 It is likely that dust from fugitive construction related activities may have short-term, temporary adverse yet **negligible** effects, which can be considered '**not significant**', following the implementation of embedded mitigation. There may be temporary **minor** adverse effects during adverse weather conditions.
- 6.7.27 Effects from emissions generated from industrial and road traffic are considered likely to remain short- to medium-term, local, and either **negligible** or **beneficial** (and thus '**not significant**') on air quality at existing human receptor locations and (in comparison to critical levels and for the acid deposition relative to the critical load) designated ecological sites.

6.8 Assessment of potential operational phase effects

Anticipated effects – fugitive dust generated from operational activities

- 6.8.1 The processing of scrap for use in the EAF is expected to be the main source of fugitive dust once the Site is operational. Once trains arrive at the scrapyards, the process will involve tipping scrap into stockpiles, shredding, screening, further stockpiling, ready for onward transport. The shredding and shearing processes are fitted with wet scrubbing and bag filter technologies, which will prevent emissions to air.
- 6.8.2 The EAF facility itself will also generate dust. Primary dust is generated directly from the EAF and is drawn through the scrap charge in the hot waste gases to pre-heat it and recover energy and then transferred into the ducting above the plant and into the Fume Extraction Plant (FEP). Fugitive dusts, often called secondary dust, within the EAF building are extracted via a canopy located in the roof of the plant. This extraction is also transferred to the FEP and mixed with the primary waste gas stream. Further dusts are generated from the materials handling system and the ladle furnaces, which are also transferred to the FEP. This FEP contains bag filters that remove dust from the air with a very high efficiency.
- 6.8.3 Fugitive dust from the Site, including any other processes proposed, will continue to be controlled by the existing Air Quality Management Plan, which will be modified to cover EAF operation.
- 6.8.4 The Site is regulated by an Environmental Permit issued by Natural Resources Wales, which will require variation due to the Proposed Development. Owing to the mitigation measures proposed, potentially significant effects have been scoped out from further assessment.

Anticipated effects – vehicle and industrial emissions

- 6.8.5 The section below details the results of the comparisons between the operational scenarios as summarised below:
- Scenario 4 (S4) – Future Operational scenario Without Development (2027);
 - Scenario 5 (S5) – Future Operational Scenario With Development (2027);

Operational (human receptors)

- 6.8.6 **Table 6.22, Table 6.24 and Table 6.26** present the predicted annual mean NO₂, PM₁₀ and PM_{2.5} concentrations at each of the human receptor locations to which the annual mean AQTs should be applied in S4 and S5. They also show the percentage change in pollutant concentrations (with the Proposed Development in place) relative to the AQT, the S5 pollutant concentration as a percentage of the AQT, and the assigned EPUK-IAQM guidance impact descriptor. Road and industrial sources were considered cumulatively. The tables show that for all receptors, long term concentrations of NO₂, PM₁₀ and PM_{2.5} are expected to show a reduction between the S4 and S5 scenarios. This trend showing a reduction in emissions is therefore reflected in the NO₂, PM₁₀ and PM_{2.5} concentrations.
- 6.8.7 Likewise, using the method to assess impacts relating to hourly mean NO₂ and 24-hour mean PM₁₀ concentrations as described in **Section 6.4** above, the change in pollutant

concentrations between S4 and S5 is expected to be either beneficial or negligible, as shown in **Table 6.23** and **Table 6.25**.

- 6.8.8 Tables 6.22 to 6.27 in **Appendix 6.5** also present the predicted change in the other determinants (SO₂, CO, Hg, B[a]P, Pb, Cr and Dioxins & Furans) at each of the human receptor locations and assesses the magnitude of impacts as per the EPUK-IAQM guidance. In each instance, the impacts were assessed as having a negligible or beneficial impact (in some instances up to 'medium' beneficial), except for dioxins & furans.
- 6.8.9 Regarding dioxins and furans, increases and reductions in pollutant concentrations have been observed depending on the receptor location, however the absolute concentration values remain very small. The maximum increase was $8.54 \times 10^{-7} \text{ng/m}^3$ at R12; the maximum reduction was $3.9 \times 10^{-7} \text{ng/m}^3$ at R5. BAT has been used to control emissions of dioxins and furans, as described in **Paragraph 6.6.5**. The use of BAT will ensure that emissions are controlled to levels acceptable with the BREF to ensure adverse impacts are avoided. Consequently, when considered in the context of the benefit of the Proposed Development relative to the bespoke established baseline, the change in concentrations of Dioxins and Furans is not considered material.
- 6.8.10 None of these AQTs are breached in S5, except at two receptor locations in relation to the PM_{2.5} potential target. At both receptor locations, concentrations were lower than in S4. The AQSO for B[a]P and EAL for chromium is breached in background.
- 6.8.11 Consequently, the Proposed Development is likely to have medium- to long-term, local predominantly beneficial or otherwise negligible 'not significant' effects on air quality at existing human receptor locations once operational.

Table 6.22 Operational phase NO₂ dispersion modelling results at human receptors (annual mean) in Scenario 4 (S4) – Future operational scenario without development (2027) and Scenario 5 (S5) – Future operational scenario with development (2027)

Receptor ID	Maximum Concentration (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R1	12.99	12.03	-0.96	-2.40	Negligible
R2	13.13	11.76	-1.37	-3.42	Negligible
R3	18.15	17.34	-0.81	-2.02	Negligible
R4	17.14	16.59	-0.55	-1.39	Negligible
R5	8.64	8.09	-0.55	-1.38	Negligible
R6	16.53	15.89	-0.64	-1.61	Negligible
R7	17.41	16.98	-0.43	-1.07	Negligible
R8	13.82	13.44	-0.38	-0.95	Negligible
R9	20.18	19.78	-0.39	-0.98	Negligible
R10	28.79	28.27	-0.52	-1.30	Negligible
R11	15.44	14.97	-0.47	-1.18	Negligible
R12	15.51	15.04	-0.47	-1.16	Negligible

Receptor ID	Maximum Concentration (µg/m³)		Actual Change (µg/m³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R13	13.03	12.35	-0.68	-1.71	Negligible
R14	16.97	16.21	-0.77	-1.92	Negligible
R15	22.84	22.00	-0.84	-2.10	Negligible
R16	20.66	19.84	-0.82	-2.04	Negligible
R17	18.56	18.04	-0.52	-1.30	Negligible
R18	20.31	19.78	-0.53	-1.32	Negligible
R19	16.52	16.02	-0.50	-1.24	Negligible
R20	22.43	22.04	-0.39	-0.96	Negligible
R21	23.78	23.45	-0.33	-0.84	Negligible
R22	20.12	19.80	-0.32	-0.80	Negligible
R23	16.99	16.45	-0.54	-1.35	Negligible
R24	16.31	15.76	-0.54	-1.36	Negligible

Table 6.23 Comparison of hourly mean NO₂ concentrations in Scenario 4 (S4) – Future operational scenario without development (2027) and Scenario 5 (S5) – Future operational scenario with development (2027)

Receptor ID	Hourly mean NO ₂ concentration by scenario (µg/m³)		Actual Change (µg/m³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R1	35.60	26.88	-8.72	-4.36	Negligible
R2	34.67	26.93	-7.74	-3.87	Negligible
R3	46.90	37.69	-9.21	-4.60	Negligible
R4	45.18	37.06	-8.12	-4.06	Negligible
R5	24.04	17.96	-6.08	-3.04	Negligible
R6	42.05	34.30	-7.75	-3.88	Negligible
R7	47.98	36.31	-11.67	-5.83	Negligible
R8	38.13	29.49	-8.63	-4.32	Negligible
R9	48.85	41.84	-7.01	-3.51	Negligible
R10	67.78	60.44	-7.35	-3.67	Negligible
R11	41.82	33.71	-8.11	-4.06	Negligible
R12	41.48	34.43	-7.05	-3.52	Negligible
R13	37.08	27.14	-9.93	-4.97	Negligible
R14	43.61	35.64	-7.97	-3.99	Negligible
R15	55.04	47.33	-7.71	-3.86	Negligible
R16	50.58	43.27	-7.31	-3.66	Negligible

Receptor ID	Hourly mean NO ₂ concentration by scenario (µg/m ³)		Actual Change (µg/m ³)	% change of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R17	46.23	40.15	-6.09	-3.04	Negligible
R18	49.90	43.79	-6.11	-3.06	Negligible
R19	42.72	34.28	-8.44	-4.22	Negligible
R20	56.53	46.21	-10.32	-5.16	Negligible
R21	59.31	49.46	-9.85	-4.92	Negligible
R22	51.50	42.26	-9.24	-4.62	Negligible
R23	44.03	36.86	-7.17	-3.58	Negligible
R24	43.96	35.31	-8.65	-4.32	Negligible
P1	28.18	22.63	-5.55	-2.77	Negligible
P2	37.39	28.40	-8.99	-4.50	Negligible
P3	43.57	34.64	-8.93	-4.46	Negligible
P4	44.36	35.28	-9.09	-4.54	Negligible
P5	44.66	35.54	-9.12	-4.56	Negligible
P6	27.95	20.83	-7.12	-3.56	Negligible
P7	24.32	18.79	-5.54	-2.77	Negligible
P8	38.93	30.85	-8.08	-4.04	Negligible
P9	42.55	33.86	-8.69	-4.34	Negligible
P10	44.59	35.64	-8.95	-4.48	Negligible
P11	46.59	37.38	-9.20	-4.60	Negligible
P12	56.38	48.74	-7.65	-3.82	Negligible

Table 6.24 Operational phase PM₁₀ dispersion modelling results at human receptors (annual mean) in Scenario 4 (S4) – Future operational scenario without development (2027) and Scenario 5 (S5) – Future operational scenario with development (2027)

Receptor ID	Annual mean PM ₁₀ concentration (µg/m ³)		Actual Change (µg/m ³)	% of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R1	14.89	13.21	-1.67	-2.42	Negligible
R2	16.62	13.12	-3.50	-4.19	Slight beneficial
R3	17.72	15.17	-2.56	-8.74	Slight beneficial
R4	16.17	14.53	-1.64	-6.39	Negligible
R5	11.48	10.52	-0.97	-4.10	Negligible
R6	14.54	13.64	-0.90	-2.42	Negligible

Receptor ID	Annual mean PM ₁₀ concentration (µg/m³)		Actual Change (µg/m³)	% of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R7	15.03	14.19	-0.84	-2.25	Negligible
R8	14.32	13.51	-0.81	-2.09	Negligible
R9	16.06	15.47	-0.59	-2.02	Negligible
R10	18.49	16.94	-1.55	-1.48	Negligible
R11	16.25	14.17	-2.08	-3.87	Negligible
R12	16.81	14.27	-2.54	-5.19	Slight beneficial
R13	14.81	13.36	-1.45	-6.36	Negligible
R14	15.81	14.63	-1.18	-3.62	Negligible
R15	16.63	15.63	-1.00	-2.95	Negligible
R16	15.81	14.83	-0.98	-2.49	Negligible
R17	16.67	15.10	-1.57	-2.46	Negligible
R18	17.13	15.62	-1.52	-3.92	Negligible
R19	15.34	14.75	-0.59	-3.79	Negligible
R20	16.24	15.80	-0.44	-1.48	Negligible
R21	16.79	16.12	-0.67	-1.10	Negligible
R22	15.77	15.14	-0.63	-1.67	Negligible
R23	16.19	14.58	-1.61	-1.57	Negligible
R24	16.09	14.36	-1.73	-4.02	Negligible

Table 6.25 Operational phase PM₁₀ dispersion modelling results at human receptors (daily mean) in Scenario 4 (S4) – Future operational scenario without development (2027) and Scenario 5 (S5) – Future operational scenario with development (2027)

Receptor ID	Daily mean PM ₁₀ concentration (µg/m³)		Actual Change (µg/m³)	% of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R1	31.57	26.44	-5.13	-10.25	Negligible
R2	35.36	26.27	-9.09	-18.18	Slight beneficial
R3	36.71	30.36	-6.35	-12.70	Slight beneficial
R4	32.74	29.15	-3.59	-7.19	Negligible
R5	24.71	21.08	-3.63	-7.25	Negligible
R6	30.37	27.32	-3.05	-6.10	Negligible
R7	31.36	28.41	-2.95	-5.90	Negligible
R8	29.97	27.04	-2.93	-5.87	Negligible
R9	33.10	30.97	-2.13	-4.26	Negligible
R10	37.39	33.96	-3.43	-6.86	Negligible

Receptor ID	Daily mean PM ₁₀ concentration (µg/m³)		Actual Change (µg/m³)	% of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R11	33.06	28.40	-4.66	-9.31	Negligible
R12	34.13	28.61	-5.52	-11.04	Slight beneficial
R13	31.94	26.75	-5.20	-10.39	Negligible
R14	29.87	29.61	-0.26	-0.52	Negligible
R15	33.34	31.44	-1.91	-3.82	Negligible
R16	31.72	29.81	-1.90	-3.81	Negligible
R17	33.93	30.27	-3.66	-7.32	Negligible
R18	34.75	31.28	-3.46	-6.93	Negligible
R19	31.53	29.52	-2.01	-4.02	Negligible
R20	33.14	31.62	-1.52	-3.04	Negligible
R21	34.66	32.26	-2.39	-4.79	Negligible
R22	32.59	30.31	-2.28	-4.56	Negligible
R23	33.01	29.25	-3.76	-7.52	Negligible
R24	32.61	28.81	-3.80	-7.60	Negligible
P1	27.16	24.99	-2.16	-4.33	Negligible
P2	29.99	26.74	-3.24	-6.49	Negligible
P3	33.84	28.90	-4.94	-9.89	Negligible
P4	31.14	28.93	-2.21	-4.42	Negligible
P5	35.50	29.33	-6.17	-12.34	Slight beneficial
P6	23.41	21.63	-1.78	-3.56	Negligible
P7	25.30	22.97	-2.33	-4.65	Negligible
P8	32.41	28.18	-4.24	-8.48	Negligible
P9	33.71	28.57	-5.14	-10.29	Negligible
P10	31.01	28.75	-2.25	-4.51	Negligible
P11	36.55	30.22	-6.33	-12.66	Slight beneficial
P12	33.96	31.99	-1.96	-3.93	Negligible

Table 6.26 Operational phase PM_{2.5} dispersion modelling results at human receptors (annual mean) in Scenario 4 (S4) – Future operational scenario without development (2027) and Scenario 5 (S5) – Future operational scenario with development (2027)

Receptor ID	Annual mean PM _{2.5} concentration (µg/m³)		Actual Change (µg/m³)	% of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R1	9.60	7.95	-1.66	-4.75	Slight beneficial
R2	11.37	7.90	-3.47	-8.28	Moderate beneficial

Receptor ID	Annual mean PM _{2.5} concentration (µg/m ³)		Actual Change (µg/m ³)	% of AQAL	EPUK-IAQM Impact descriptor
	S4	S5			
R3	11.91	9.38	-2.53	-17.35	Moderate beneficial
R4	10.71	9.09	-1.62	-12.66	Slight beneficial
R5	7.40	6.45	-0.95	-8.10	Negligible
R6	8.93	8.07	-0.86	-4.75	Negligible
R7	9.18	8.37	-0.82	-4.28	Negligible
R8	9.26	8.46	-0.80	-4.10	Negligible
R9	9.61	9.03	-0.58	-4.00	Negligible
R10	11.96	10.43	-1.53	-2.88	Slight beneficial
R11	10.94	8.88	-2.06	-7.64	Moderate
R12	11.44	8.93	-2.51	-10.29	Moderate
R13	9.44	8.02	-1.42	-12.55	Slight beneficial
R14	10.52	9.36	-1.16	-7.09	Slight beneficial
R15	10.44	9.47	-0.97	-5.80	Negligible
R16	9.99	9.03	-0.96	-4.85	Negligible
R17	10.94	9.39	-1.55	-4.81	Slight beneficial
R18	11.16	9.67	-1.50	-7.75	Slight beneficial
R19	9.58	9.04	-0.55	-7.48	Negligible
R20	10.14	9.72	-0.42	-2.74	Negligible
R21	10.64	9.98	-0.66	-2.09	Negligible
R22	10.03	9.41	-0.62	-3.30	Negligible
R23	10.70	9.11	-1.59	-3.10	Slight beneficial
R24	10.70	8.99	-1.71	-7.95	Slight beneficial

Operational phase - Ecological receptors

- 6.8.12 The section below details the results of the comparisons between the operational scenarios as summarised below:
- Scenario 4 (S4) – Future operational scenario without development (2027); and
 - Scenario 5 (S5) – Future operational scenario with development (2027);
- 6.8.13 Table 6.31 and Table 6.32 in **Appendix 6.6** presents the operational phase annual mean and daily mean NOx concentrations at ecological receptor locations.
- 6.8.14 At all receptor locations (except E15 and E16), the impact at ecological receptors decreases in S5, representing beneficial impacts. Impacts at E15 and E16, which are located within the Junction 38 Wetland SINC, have increased, but by less than 100% of the AQT. As per the Defra and Environment Agency (2024) guidance, this increase can be considered not significant.

- 6.8.15 Table 6.33 in **Appendix 6.6** shows that annual mean SO₂ concentrations reduced at all receptor locations.
- 6.8.16 Table 6.34 in **Appendix 6.6** shows that concentrations of NH₃ in ambient air will not increase as a result of the Proposed Development, as there will be a reduction in road traffic volumes. As such, this has not been assessed further.
- 6.8.17 Table 6.35 in **Appendix 6.6** shows that the Proposed Development will lead to increased nutrient nitrogen deposition exceeding 1% of the critical load at receptors E15 and E16. The increase at E15 and E16 has been considered further within **Chapter 8: Biodiversity** due to the increase in nutrient nitrogen deposition being greater than 1%; however it is not considered significant as the 100% threshold at the SINC is not exceeded.
- 6.8.18 Table 6.36 in **Appendix 6.6** presents the operational phase acid deposition generated in connection with the Proposed Development. The potential effects of acid deposition on ecosystems are each dependent on concentration of nitrogen, ammonia and sulphur which are deposited. Following conversion from ambient to deposited concentrations, there was a net reduction in deposited nitrogen concentrations in S5 than S4 at all receptor locations except E15 and E16. There was also a net reduction in deposited sulphur at all locations, by an amount exceeding that for deposited nitrogen. This means that there would be a net reduction in the process contribution (from the Proposed Development) when expressed as a percentage of the critical load function, demonstrating an overall net benefit. The process contribution is thus <1% of the critical load and has been screened from further assessment.
- 6.8.19 Consequently, the Proposed Development is likely to have generally beneficial and always 'not significant' air quality effects at designated ecological sites once the Proposed Development is operational.

Interim Baseline

- 6.8.20 The results of the comparison between S4a and S5 are presented in **Appendix 6.7** for context. As expected, concentrations of all the assessed pollutants were greater in S5 than S4a. Indeed, at any of the assessed human receptors, annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} increased by a maximum of 8.2%, 2.5% and 5.0% relative to the AQT respectively. Greater increases (of up to 16.6%) were expected due to increases in hourly mean NO₂ concentrations; and small increases (up to 0.3%) were expected in 24-hour mean PM₁₀ concentrations, each relative to the AQT.
- 6.8.21 At the ecological receptor locations, an increase in annual = SO₂ concentrations of >1% of the critical level; and in acid deposition of >1% of the critical load function, was occasionally observed at nationally or internationally designated sites. At locally designated site, the PC did not exceed 100% of any critical loads or levels.
- 6.8.22 For the reasons discussed in **Paragraph 4.1.13**, these changes in concentrations are presented to provide context only and are not used to inform the requirement for mitigation or residual effects.

Potential mitigation

- 6.8.23 Additional mitigation is considered not to be required.

Residual effects

- 6.8.24 Effects from emissions generated from industrial and road traffic are considered likely to remain permanent, local on air quality at existing human receptor locations and designated ecological sites. In general, the significance has been considered slight beneficial (not significant), with some negligible impacts but with impacts relating to key pollutants such as NO₂, PM₁₀, PM_{2.5}, SO₂ and CO being beneficial.

6.9 Further survey and monitoring requirements

- 6.9.1 Measures proposed to mitigate the effects of fugitive dust and emissions generated by construction related activity on amenity and human health may benefit from being monitored to ensure they are being implemented effectively. It is considered that these measures can effectively be implemented using the Construction Environmental Management Plan.

6.10 Opportunities for enhancement

- 6.10.1 The temporary package boilers (which are not part of the proposed development) are likely to be replaced with a permanent boiler plant. The permanent plant will be designed in a way which mitigates significant air quality impact.
- 6.10.2 The Air Quality Management Plan against which the Site is regulated by and Environmental Permit will be updated to ensure BAT is installed and fugitive dust and emissions are controlled.

6.11 Cumulative effects

- 6.11.1 Cumulative effects are the combined effects of several development projects (in conjunction with the Proposed Development) which may, on an individual basis be insignificant but, cumulatively, have a significant effect.
- 6.11.2 In relation to the dust assessments, the closest other committed developments are the P Fields Site, National Grid Margam Substation extension and cable connection construction and the Sandvik Osprey Metal Processing Facility. Based on the nature and scale of the Proposed Development and the three other committed developments, they would all be subject to planning conditions requiring them to adopt mitigation measures to limit emissions of dust and emissions. Consequently, cumulative effects connected to dust generating activities are not anticipated to be significant.
- 6.11.3 In relation to the assessment of vehicle emissions on human receptors, the traffic data provided considered the other committed developments considered by the Transport and Access team to be relevant to the assessment. Industrial sources within 10 km of the Site have also been screened and professional judgement applied. Therefore, the SAF has been included within the industrial source and road traffic emission assessments, as well as the Sandvik Osprey site included within the industrial emissions assessment. These have been accounted for in S2 to S5, S2a and S4a.
- 6.11.4 The vehicle study area was determined for the Transport and Access assessment (see **Chapter 12: Transport and access** for full details). During pre-application discussions with NPTC, it was informally agreed that the P Fields site could be scoped out of the

Transport and Access assessment, on the basis that it would not result in intensification on the highway network, so traffic data were not provided on a link-by-link basis. It is anticipated to contribute circa 26 two-way car trips and 150 heavy goods vehicle trips to the local road network per day whilst the P Fields site is redeveloped over 20 weeks. This will be approximately 57 heavy goods vehicle trips and 10 car trips when expressed as an AADT. If assessed in its own right, this would screen out the requirement for further air quality assessment against screening criteria found within Table 6.1 of the EPUK-IAQM guidance, which indicate when an air quality assessment may be required.

- 6.11.5 Considering the total predicted concentrations of NO₂, PM₁₀, PM_{2.5}, NO_x and NH₃ are generally well below the AQTs in S3, the addition of the P Fields site is unlikely to change the assessment conclusions, when compared against the bespoke interim baseline or bespoke established baseline.
- 6.11.6 Based on the description submitted regarding the planning application for the other committed industrial developments located near the Site, only one is anticipated to have resulted in significant emissions to air (the Coed Darcy Site, where 10 generators were installed as part of the short-term operating reserve). This is not located near any of the assessed receptors and has therefore been discounted from further assessment. There are therefore no other known stationary combustion plant or industrial sources with the potential to generate emissions which could adversely affect air quality in-combination with the Proposed Development.
- 6.11.7 The assessment of vehicle and industrial emissions at human receptors is considered to be inherently cumulative, because the assessment of significance has considered both the change in pollutant concentrations and the total concentrations, including contributions from other committed developments.
- 6.11.8 An in-combination assessment of effects at ecological sites, comparing S4b and S5, has been undertaken to demonstrate how pollutant concentrations increased from the interim baseline with the Proposed Development in place. **Appendix 6.7** shows that changes in annual and daily mean NO_x concentrations, annual mean NH₃ and SO₂ concentrations, nutrient nitrogen deposition and acid deposition exceed 1% at one or more of the designated ecological sites assessed. As iterated elsewhere however, increases against the interim baseline are provided for context only and are not considered potentially significant.
- 6.11.9 Considering the Proposed Development will predominantly have a beneficial effect on air quality (with negative effects not expected near roads used by cumulative traffic) or industrial sources, an in-combination assessment against the established baseline is not considered necessary or potentially significant.

6.12 Summary of effects

- 6.12.1 **Table 6.27** summarises the potential impacts and effects on receptors, additional mitigation proposed, and the significance of the residual effects reported in this ES chapter.
- 6.12.2 This chapter of the ES reviewed existing air quality within the study area and assessed the potential effect of the Proposed Development on air quality at existing sensitive human and ecological receptors. The primary pollutants of interest for this assessment were NO_x, NO₂, SO₂, Cr, Pb, Hg, NH₃, CO, B[a]P, dioxins & furans, PM₁₀ and PM_{2.5}. The

effects of dust deposition during the construction phase were also considered, as were the effects of the Sandvik Osprey metal processing facility and the SAF facility, cumulative developments in proximity of the Site.

- 6.12.3 Air quality at the Site and surrounding environs is generally good, with the exception of the 24-hour mean PM₁₀ AQO at monitoring site PS2 during 2023, where 48 days exceeded the 50µg/m³ AQO, 13 more days than is permissible during each calendar year. However, air quality, including PM₁₀ concentrations, in the vicinity of the Site is likely to improve over time and background concentrations of other pollutants were well below their respective AQTs.
- 6.12.4 Fugitive dust from demolition and construction related activities was assessed as having a maximum dust risk before mitigation of medium, for earthworks, due to potential impacts on ecologically sensitive receptors at the Margam Moors SSSI. Embedded mitigation measures will be implemented in the CEMP as part of the Proposed Development. With these measures in place, effects on receptors are likely to be negligible, with possible short-term minor adverse effects during adverse weather conditions.
- 6.12.5 Using BAT (measures to mitigate emissions based on design and technology) will reduce emissions from fugitive dust generated by the EAF and scrapyard.
- 6.12.6 The assessment of emissions associated with construction vehicle movements and industrial sources, when compared to the established baseline, has been assessed as being not significant, always beneficial at human receptors and generally beneficial at ecological receptors.
- 6.12.7 Construction vehicle movements led to concentrations of pollutants including NO_x, NO₂, NH₃, PM₁₀ and PM_{2.5} being slightly greater in EAF operational phase than in the interim baseline. Impacts on designated ecological sites did not breach 1% of critical loads or levels, the initial trigger for further assessment. The assessment against the interim baseline has been included for context only, so the significance of effects from the Proposed Development has not been compared against the interim baseline.
- 6.12.8 The assessment of effects when the Proposed Development is fully operational, including vehicle movements and industrial sources, when compared to the established baseline, has been assessed as being not significant, being always beneficial at human receptors for most pollutants including NO₂, PM₁₀, PM_{2.5}, CO and SO₂, and beneficial at ecological receptors aside from E15 and E16. The increase in nutrient nitrogen and acid deposition and ambient pollutant concentrations at E15 and E16 remained insignificant.
- 6.12.9 Predicted pollutant concentrations were greater during the EAF operational phase than those in the interim baseline at human and ecological receptor locations, as expected. For instance, changes in NO₂, PM₁₀ and PM_{2.5} concentrations were only slightly greater.

Table 6.27 Summary of residual significant effects

Environmental factor	Receptor	Impact	Potential effect	Additional mitigation proposed	Residual effect
Construction phase					
Dust risk	Dust soiling, human	Dust emissions from onsite activities including demolition, earthworks,	Negligible (short-term minor	No additional mitigation	Negligible/minor (not

Environmental factor	Receptor	Impact	Potential effect	Additional mitigation proposed	Residual effect
	health and ecological (Margam Moors) receptors	construction and trackout	averse)	proposed	significant)
Vehicle and industrial emissions	Human health and ecological receptors	Human health: changes to annual mean NO ₂ , PM ₁₀ , PM _{2.5} , and CO concentrations Ecological: changes to NO _x and NH ₃ concentrations; nutrient nitrogen and acid deposition	Negligible or beneficial	No additional mitigation proposed	Negligible/beneficial (not significant)
Operational phase					
Vehicle and industrial emissions	Human health and ecological receptors	NO ₂ , SO ₂ , CO, Hg, B[a]P, Pb, Cr and Dioxins & Furans, PM ₁₀ and PM _{2.5} Ecological: changes to NO _x , NH ₃ and SO ₂ concentrations; nutrient nitrogen and acid deposition	Slight beneficial	No additional mitigation proposed	Slight beneficial (not significant)

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