H2Teesside Project

Planning Inspectorate Reference: EN070009

Land within the boroughs of Redcar and Cleveland and Stockton-on-Tees, Teesside and within the borough of Hartlepool, County Durham

Document Reference: 6.4.42: Technical Note Updates to Air Quality and Traffic Cumulative Assessments

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)

Applicant: H2 Teesside Ltd

Date: December 2024

Rev: 0

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1.0 INTRODUCTION

1.1 Overview

1.1.1 On 25 March 2024, H2Teesside Limited (the 'Applicant') made an application for a Development Consent Order (DCO) (the 'DCO Application') under the Planning Act 2008 to the Planning Inspectorate, the body which considers such applications on behalf of the Secretary of State for Energy Security and Net Zero. The DCO Application was accepted for Examination on 22 April 2024.

1.1.2 The Applicant is seeking development consent for the construction, operation (including maintenance where relevant) and decommissioning of the H2Teesside Project (the Proposed Development).

1.1.3 The Proposed Development is an up to 1.2-Gigawatt Thermal (GWth) Carbon Capture and Storage (CCS) enabled Hydrogen Production Facility, associated connections, temporary construction compound areas and landscape / ecological areas, on land in Redcar and Cleveland, Stockton-on-Tees, and Hartlepool (hereafter referred to as the 'Proposed Development Site').

1.2 Technical Note Structure

1.2.1 The Cumulative and Combined Effects Assessment and its appendices have been updated by the Applicant to:

- make corrections and clarifications contained in the Errata Report [PDA-021];
- consider changes to the status of planning applications for the Other Developments; and
- account for the changes to the Proposed Development identified in the Change Application Report [CR1-044]; and
- account for the changes to construction routing as a result of weight restrictions in Billingham coming to light as presented in the updated CTMP [REP4-007] and the updated Figures 15-2 [REP4-009] and 15-4 [REP4-010], submitted at Deadline 4 of the Examination.

1.2.2 The Cumulative and Combined Effects Assessment has been updated following the methodology set out in Section 3 of Chapter 23: Cumulative and Combined Effects [APP-076]. The additional Other Developments identified in the updated short list are subsequently considered in this Technical Note to understand any implications on the Traffic and Transport and Air Quality assessments included within the submitted DCO Application. Traffic noise is not considered in this Technical Note, as the effects of the Proposed Development alone were assessed as Negligible within the ES [APP-063].

1.2.3 This Technical Note contains updated cumulative assessments for the Traffic and Transport and Air Quality disciplines to accompany the updated Cumulative and Combined Effects Assessment, submitted into the Examination at Deadline 5. This technical note should be read in conjunction with the updated submitted

Cumulative and Combined Effects Assessment, which collectively comprises the following documents:

- Chapter 23: Cumulative and Combined Effects;
- Appendix 23A: Other developments within the search area;
- Appendix 23B: Assessment of Cumulative Effects - Stages 1-2;
- Appendix 23C: Shortlist of other developments within the Search Area;
- Appendix 23D: Stage 4 - Assessment of Cumulative and Combined Effects;
- Appendix 23E: Socio-economic Cumulative Assessment;
- Figure 23-1: Zones of Influence for Cumulative Effects Assessment;
- Figure 23-2: Long List of Other Developments; and
- Figure 23-3: Short List of Other Developments;

1.2.4 This technical note supplements the cumulative effects assessment undertaken for the Air Quality and Traffic and Transport disciplines in the DCO Application, the purpose being to account for changes that have occurred since the original submission (see Section **Error! Reference source not found.**). This technical note should also be read in conjunction with the following documents forming part of the submitted DCO Application:

- Chapter 8: Air Quality [APP-060] (the 'ES Traffic Chapter');
- Appendix 8A: Air Quality - Construction Assessment [APP-190];
- Appendix 8B: Air Quality - Operational Phase [APP-191];
- Chapter 15: Traffic and Transport [APP-068] (the 'ES Traffic Chapter'); and
- Appendix 15A: Transport Assessment [APP-210].

1.2.5 The structure of this Technical Note is as follows:

- **Section 2:** Implications for ES Traffic Chapter as a result of the additional Other Developments;
- **Section 3:** Implications for Appendix 15A Transport Assessment as a result of the additional Other Developments;
- **Section 4:** Implications for ES Traffic Chapter as a result of the additional Other Developments;
- **Section 5:** Implications for Appendix 8A Air Quality - Construction Assessment as a result of the additional Other Developments; and
- **Section 6:** Implications for Appendix 8B Air Quality - Operational Phase as a result of the additional Other Developments.

1.2.6 Table numbers in this Technical Note reflect those in their corresponding sections Original ES Document.

2.0 IMPLICATIONS FOR CHAPTER 15: TRAFFIC AND TRANSPORT [APP-068]

2.1 Overview

2.1.1 The Traffic and Transport chapter has been updated to account for the additional Other Developments identified in the updated Cumulative and Combined Effects Assessment documentation submitted at Deadline 5. The updates should be read in conjunction with Chapter 15: Traffic and Transport of the Environmental Statement (ES) [APP-068] for additional context.

2.1.2 No changes have been made to any of the Figures [APP-161 to APP-164] and the updates Figure 15-2 [REP4-009] and Figure 15-4 [REP4-010] associated with Chapter 15: Traffic and Transport [APP-068] of the ES.

2.1.3 The first seven sections of the ES Traffic Chapter (Introduction; Legislation, Planning Policy Context and Other Guidance; Assessment Methodology and Significance Criteria; Baseline Conditions; Proposed Development Design and Impact Avoidance; Impacts and Likely Significant Effects and Essential Mitigation and Enhancement Measures) are not included in this Technical Note as no changes have resulted from the update exercise affecting the content of each of these sections. As such, the 2026 baseline traffic flows, peak Proposed Scheme traffic flows, magnitude criteria, sensitivity criteria and significance criteria applied in the chapter are also used in this note.

2.2 Cumulative Effects

2.2.1 There is the potential for cumulative traffic and transport effects as a result of the Proposed Development, where effects may interact with other planned projects and local plan allocations in the vicinity (hereafter referred to as 'other developments').

Cumulative Effects During Construction

2.2.2 The details of the other developments are included within the updated Appendix 15A: Transport Assessment (see Section 3 below) and with reference to Appendix 15A, Table 15A-46, the additional levels of traffic due to the Other Developments identified within the study area can be given as follows in updated Table 15-16 below.

2.2.3 An assessment of the potential for cumulative effects upon traffic from the Other Developments during the peak year of the construction phase of the Proposed Development is included within updated Table 15-16, below.

Table 15-16: **Daily Total Other Developments Traffic**

LINK		DAILY TOTAL CUMULATIVE TRAFFIC	
		TOTAL VEHICLES	TOTAL HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	2,886	471
2	A1085 Trunk Road, 1.34 km south of West Coatham Lane	9,287	1,248
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	426	36
4	A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	9,813	1,313
5	A1085 Broadway, 230 m east of Birchington Avenue	3,672	37
6	A1380 High Street, 50 m east of Lackenby Lane	431	60
7	A66, 140 m east of Whitworth Road	10,790	1,740
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	16	7
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	24	10
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	146	58
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	9,554	1,613
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	5,589	1,258
13	A1046 Haverton Hill Road, approximately 800 m south of Port Clarence Street / Hope Street.	24	10
14	A1185, 800 m west of A178 Seaton Carew Road	24	10
15	Belasis Avenue	24	10

2.2.4 In order to determine the magnitude of impact, the Proposed Development peak of construction traffic flows have been combined with the other developments traffic from updated Table 15-16 to provide a new Proposed Development plus other developments traffic scenario, which has then been considered against the 2026 baseline traffic and this is set out in updated Table 15-17 below.

Table 15-17: Percentage Increase in Traffic due to Other Developments and the Proposed Development in 2026

LINK		2026 BASELINE FLOW		OTHER DEVELOPMENTS PLUS PEAK OF H2TEESSIDE CONSTRUCTION TRAFFIC		PERCENTAGE INCREASE (%)	
		DAILY TOTAL VEHICLES	DAILY TOTAL HGVS	DAILY TOTAL VEHICLES	DAILY TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	12,948	1,107	3,098	404	24%	36%
2	A1085 Trunk Road, 1.34 km south of West Coatham Lane	15,176	1,345	10,841	1,448	71%	108%
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	12,438	804	657	36	5%	4%
4	A1085 Trunk Road, 500 km north of A1053 Tees Dock Road	16,940	2,122	11,175	1,488	66%	70%
5	A1085 Broadway, 230 m east of Birchington Avenue	8,537	549	4,034	35	47%	6%
6	A1380 High Street, 50 m east of Lackenby Lane	10,375	871	517	58	5%	7%
7	A66, 140 m east of Whitworth Road	20,955	3,863	10,721	1,830	51%	47%
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	8,030	945	430	79	5%	8%
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	8,243	1,053	438	82	5%	8%
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	4,437	907	636	130	14%	14%

LINK		2026 BASELINE FLOW		OTHER DEVELOPMENTS PLUS PEAK OF H2TEESSIDE CONSTRUCTION TRAFFIC		PERCENTAGE INCREASE (%)	
		DAILY TOTAL VEHICLES	DAILY TOTAL HGVS	DAILY TOTAL VEHICLES	DAILY TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	13,265	1,247	8,245	1,761	62%	141%
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	32,129	2,105	4,192	1,358	13%	65%
13	A1046 Haverton Hill Road, approximately 800 m south of Port Clarence Street / Hope Street.	14,686	1,169	231	64	2%	5%
14	A1185, 800 m west of A178 Seaton Carew Road	5,109	1,101	134	82	3%	7%
15	Belasis Avenue	2,586	76	231	46	9%	61%

2.2.5 Based upon the above percentage increases in traffic at the peak year of construction 2026 with committed development, updated Table 15-18 provides an overview of the magnitude of impact on each of the transport related impacts,.

Table 15-18: Proposed Development Peak of Construction with Other Developments Magnitude of Impact

LINK		SENSITIVITY	PERCENTAGE INCREASE (%)		MAGNITUDE OF IMPACT			
			TOTAL VEHICLES	TOTAL HGVS	SEVERANCE	PEDESTRIAN AMENITY	FEAR AND INTIMIDATION	HIGHWAY SAFETY
1	A1085 Trunk Road, 100 m east of Ennis Road	Low	24%	36%	Low	Very Low	Very Low	Low
2	A1085 Trunk Road, 1,340 m south of West Coatham Lane	Low	71%	108%	High	Low	High	Low
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	High	5%	4%	Very low	Very low	Very low	Very Low
4	A1085 Trunk Road, 0.5 km north of A1053 Tees Dock Road	Low	66%	70%	Medium	Low	High	Low
5	A1085 Broadway, 230 m east of Birchington Avenue	Medium	47%	6%	Low	Very low	Low	Low
6	A1380 High Street, 50 m east of Lackenby Lane	Medium	5%	7%	Very Low	Very low	Very low	Very Low
7	A66, 140 m east of Whitworth Road	Low	51%	47%	Low	Very low	Very low	Low
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	High	5%	8%	Very Low	Very low	Very low	Very Low
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	Low	5%	8%	Very low	Very Low	Low	Very Low

LINK		SENSITIVITY	PERCENTAGE INCREASE (%)		MAGNITUDE OF IMPACT			
			TOTAL VEHICLES	TOTAL HGVS	SEVERANCE	PEDESTRIAN AMENITY	FEAR AND INTIMIDATION	HIGHWAY SAFETY
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	Low	14%	14%	Very low	Very low	Very low	Very Low
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	Low	62%	141%	High	Medium	High	Medium
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	Low	13%	65%	Medium	Low	Medium	Low
13	A1046 Haverton Hill Road, approximately 800 m south of Port Clarence Street / Hope Street.	Low	2%	5%	Very Low	Very low	Very low	Very Low
14	A1185, 800 m west of A178 Seaton Carew Road	Low	3%	7%	Very Low	Very low	Very Low	Very Low
15	Belasis Avenue	Medium	9%	61%	Low	Very low	Very Low	Low

2.2.6 Based upon the above impact magnitude and the sensitivity rating of each link, the predicted classification of effects during the peak of construction are summarised in updated Table 15-19 below.

Table 15-19: Classification of Environmental Effects at the Peak of Construction for H2Teesside plus Other Developments

LINK		SENSITVITY	SIGNIFICANCE OF EFFECT			
			SEVERANCE	PEDESTRIAN AMENITY	FEAR AND INTIMIDATION	HIGHWAY SAFETY
1	A1085 Trunk Road, 100 m east of Ennis Road	Low	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**
2	A1085 Trunk Road, 1.34 km south of West Coatham Lane	Low	Moderate Adverse **Significant**	Negligible **Not Significant**	Moderate Adverse **Significant**	Negligible **Not Significant**
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	High	Minor Adverse **Not Significant**	Minor Adverse **Not Significant**	Minor Adverse **Not Significant**	Minor Adverse **Not Significant**
4	A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	Low	Minor Adverse **Not Significant**	Negligible **Not Significant**	Moderate Adverse **Significant**	Negligible **Not Significant**
5	A1085 Broadway, 230 m east of Birchington Avenue	Medium	Minor Adverse **Not Significant**	Negligible **Not Significant**	Minor Adverse **Not Significant**	Minor Adverse **Not Significant**
6	A1380 High Street, 50 m east of Lackenby Lane	Medium	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**
7	A66, 140 m east of Whitworth Road	Low	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**

LINK		SENSITVITY	SIGNIFICANCE OF EFFECT			
			SEVERANCE	PEDESTRIAN AMENITY	FEAR AND INTIMIDATION	HIGHWAY SAFETY
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	High	Minor Adverse **Not Significant**	Minor Adverse **Not Significant**	Minor Adverse **Not Significant**	Minor Adverse **Not Significant**
9	A178 Seaton Carew Road, 530 m north of Huntsman Drive	Low	Negligible **Not Significant**	Negligible **Not Significant**	Minor Adverse **Not Significant**	Negligible **Not Significant**
10	Unnamed Road, 720 m east of A178 Seaton Carew Road	Low	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**
11	A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout	Low	Moderate Adverse **Significant**	Minor Adverse **Not Significant**	Moderate Adverse **Significant**	Minor Adverse **Not Significant**
12	A174 (West of Greystone Roundabout), 1 km west of the A174/A1053 Greystones roundabout.	Low	Minor Adverse **Not Significant**	Negligible **Not Significant**	Minor Adverse **Not Significant**	Negligible **Not Significant**
13	A1046 Haverton Hill Road, approximately 800 m south of Port Clarence Street / Hope Street.	Low	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**

LINK		SENSITVITY	SIGNIFICANCE OF EFFECT			
			SEVERANCE	PEDESTRIAN AMENITY	FEAR AND INTIMIDATION	HIGHWAY SAFETY
14	A1185, 800 m west of A178 Seaton Carew Road	Low	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**
15	Belasis Avenue	Medium	Minor Adverse **Not Significant**	Negligible **Not Significant**	Negligible **Not Significant**	Minor Adverse **Not Significant**

2.2.7 From Table 4 above it can be seen that with the inclusion of the other developments all links are not predicted to experience a significant adverse environmental effect, except for the following expected to experience **Significant adverse** effects:

- link 2 – A1085 Trunk Road, 1.34 km south of West Coatham Lane;
- link 4 – A1085 Trunk Road, 500 m north of A1053 Tees Dock Road; and
- link 11 – A1053 Greystone Road, 600 m north of the A174/ A1053 Greystones roundabout

2.2.8 Link 4 is predicted to have a moderate adverse effect in terms of Fear and Intimidation, with Links 2 and 11 having a moderate adverse effect in terms of Severance and Fear and Intimidation. However, all three links are located within areas that are considered to be largely industrial with no residential properties, with no footway running alongside the A1053 Greystones Road, and as such are unlikely to be subject to significant numbers of non-motorised users. Furthermore, any cumulative impact from the construction of Other Developments would be minimised as far as is possible through liaison with other contractors, as set out in Section 6: Consultation of the Framework CTMP [REP4-007] and Section 5: Roles and Responsibilities of the Framework CWTP [REP2-013].

2.2.9 In addition, the effect from just the consideration of the Proposed Development concluded in Table 15-15 that the effect was **Negligible (Not Significant)** against all of the criteria on the above mentioned affected links.

2.2.10 Therefore, any effect upon non-motorised users in regard to both Fear and Intimidation and Severance is likely to be reduced, with the addition of just the Proposed Development construction traffic predicted to have a **Negligible** to **Minor (Not Significant)** effect as set out in Table 15-17. The overall effect can be reduced to **Minor (Not Significant)**, taking into account the implementation of a CTMP by the Proposed Development and the Other Developments..

2.2.11 In addition, with reference to Appendix 15A: Transport Assessment, the A1085 / Steel House Gate / West Coatham lane roundabout is predicted to operate within capacity with the cumulative construction traffic from the Proposed Development, HyGreen and Net Zero Teesside. Therefore, there is considered to be a **Not Significant** effect on Driver Delay.

Cumulative Effects During Operation

2.2.12 As set out in Section 15.6: Impacts and Likely Significant Effects of the ES Traffic Chapter, once operational the Proposed Development is not considered to result in a severe impact upon the local highway network and therefore no further assessment has been undertaken.

Cumulative Effects During Decommissioning

2.2.13 As set out in Section 15.6: Impacts and Likely Significant Effects of the ES Traffic Chapter, the decommissioning of the Proposed Development is not considered to result in any additional impact to that assessed during the construction phase and therefore no further assessment has been undertaken.

3.0 IMPLICATIONS FOR APPENDIX 15A: TRANSPORT ASSESSMENT [APP-210]

3.1.1 The Transport Appendix has been updated to account for the additional Other Developments identified in the updated Cumulative and Combined Effects Assessment documentation as updated at Deadline 5. The updates should be read in conjunction with Appendix 15A [APP-210] of the ES for additional context.

3.1.2 No changes are made to any of the Annexes associated with Appendix 15A [APP-210] of the ES.

3.1.3 The first four sections (Introduction; Proposed Development; Legislation, Planning Policy Context and Other Guidance; and Existing Conditions) and the final three sections of Appendix 15A (Junction Impact Assessment; Summary and Conclusion; and References) are not included in this Technical Note as no changes have resulted from the update exercise affecting the content of each of these sections of the Transport Assessment in the Original ES [APP-210].

3.2 Proposed Development Trip Generation

Construction Phase Trip Generation

3.2.1 There are seven construction compounds, with four to the north of the River Tees and three to the south of the River Tees, as follows:

- North of River Tees:
  - Navigator Compound;
  - Seal Sands Compound;
  - Greatham Satellite Compound;
  - Cowpen Bewley Satellite Compound; and
  - Billingham Industrial Park Satellite Compound.
- South of River Tees:
  - Main Site Compound, and
  - Wilton International Satellite Compound.

3.2.2 A number of the tables set out in the original Appendix 15A have been updated (with the same reference numbers) to account for the updated cumulative traffic impact of the Proposed Development and Other Developments within the Study Area.

Table 15A-26: Construction Worker Vehicle Trips per Day

LOCATION	PERCENTAGE SPLIT OF TRAFFIC	ARRIVALS	DEPARTURES	TWO WAY
Main Site				
Construction worker car trips per day to Main Site	Main Site 100%	462	462	923
Total	100%	462	462	923
Pipeline North of River				
Construction car trips per day to Billingham Industrial Park Satellite Compound	21%	24	24	48
Construction car trips per day to Cowpen Bewley Satellite Compound	26%	29	29	58
Construction car trips per day to Greatham Satellite Compound	28%	32	32	64
Construction car trips per day to Seal Sands Compound	12%	14	14	28
Construction car trips per day to Navigator	13%	14	14	28
Total	100%	113	113	226
Pipeline South of River				
Construction car trips per day to Main Site Compound	50%	38	38	76
Construction car trips per day to Wilton International Satellite Compound	50%	38	38	76
Total	100%	76	76	152

Table 15A-29: Construction HGV Vehicle Trips per Day

LOCATION	PERCENTAGE SPLIT OF TRAFFIC	ARRIVALS	DEPARTURES	TWO WAY
Main Site				
Construction worker car trips per day to the Main Site	Main Site 100%	81	81	162
Total	100%	81	81	162
Connection Corridors North of the River Tees				
Construction car trips per day to Billingham Industrial Park Satellite Compound	21%	4	4	8
Construction car trips per day to Cowpen Bewley Satellite Compound	26%	5	5	10
Construction car trips per day to Greatham Satellite Compound	28%	5	5	10
Construction car trips per day to Seal Sands Compound	12%	2	2	4
Construction car trips per day to Navigator	13%	2	2	4
Total	100%	18	18	38
Connection Corridors South of the River Tees				
Construction car trips per day to Main Site Compound	50%	6	6	12
Construction car trips per day to Wilton International Satellite Compound	50%	6	6	12
Total	100%	12	12	24

Table 15A-34: Construction Traffic Flows

LINK		DAILY CONSTRUCTION TRAFFIC (TWO WAY FLOWS)	
		TOTAL VEHICLES	TOTAL HGVS
1	A1085 Trunk Road, 100m east of Ennis Road	289	0
2	A1085 Trunk Road, 1345m south of West Coatham Lane	1070	185
3	A1042 Kirkleatham Lane, 85m south of Staintondale Avenue	145	0
4	A1085 Trunk Road, 500m north of A1053 Tees Dock Road	1070	185
5	A1085 Broadway, 235m east of Birchington Avenue	238	0
6	A1380 High Street, 50m east of Lackenby Lane	56	0
7	A66, 140m east of Whitworth Road	719	92
8	A1046 Port Clarence Road, 20m north of Beech Terrace	225	36
9	A178 Seaton Carew Road, 535m north of Huntsman Drive	225	36
10	Unnamed Road, 725m east of A178 Seaton Carew Road	263	36
11	A1053 Greystone Road (MAY 2023 data)	197	92
12	A174 (West of Greystone Roundabout) (May 2022 data)	141	92
13	A1046 Haverton Hill Road (MAY 2022 data)	225	36
14	A1185 (west of A178 Seaton Carew Road) (May 2022 data)	73	36
15	Belasis Avenue	113	18

Table 15A-37: Daily Construction Compound Connection Corridor Worker Traffic Flows – South of the River Tees

HOUR BEGINING	% OF DAILY INBOUND	% OF DAILY OUTBOUND	MAIN SITE COMPOUND		WILTON COMPOUND	
			ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES
06:00	0%	0%	13	1	13	1
07:00	9%	8%	9	1	9	1
08:00	9%	8%	2	1	2	1
09:00	9%	8%	2	1	2	1
10:00	9%	8%	2	1	2	1
11:00	9%	8%	2	1	2	1
12:00	9%	8%	2	2	2	2
13:00	9%	8%	2	2	2	2
14:00	9%	8%	1	1	1	1
15:00	9%	8%	1	1	1	1
16:00	9%	8%	1	2	1	2
17:00	9%	8%	1	6	1	6
18:00	0%	8%	1	13	1	13
19:00	0%	0%	1	6	1	6
20:00	0%	0%	0	0	0	0
21:00	0%	0%	0	0	0	0
Totals	100%	100%	38	38	38	38

Table 15A-38: Daily Construction Compound Connection Corridor Worker Traffic Flows – North of the River Tees

HOUR BEGINING	% OF DAILY INBOUND	% OF DAILY OUTBOUND	NAVIGATOR COMPOUND		SEAL SANDS COMPOUND		GREATHAM COMPOUND		COWPEN COMPOUND		CF COMPOUND	
			ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES	ARRIVALS	DEPARTURES
06:00	0%	0%	4	0	5	0	11	1	10	1	8	0
07:00	9%	8%	1	0	3	0	8	1	7	1	6	0
08:00	9%	8%	1	0	1	0	2	1	1	1	1	0
09:00	9%	8%	1	0	1	0	1	1	1	1	1	0
10:00	9%	8%	1	0	1	0	1	1	1	1	1	1
11:00	9%	8%	1	1	1	0	1	1	1	1	1	1
12:00	9%	8%	1	1	1	1	2	1	1	1	1	1
13:00	9%	8%	0	0	1	1	1	1	1	1	1	1
14:00	9%	8%	0	0	0	0	1	1	1	1	1	1
15:00	9%	8%	0	1	0	0	1	1	1	1	0	1
16:00	9%	8%	0	2	0	1	1	2	1	1	0	1
17:00	9%	8%	0	5	0	2	1	5	1	4	1	4
18:00	0%	8%	0	2	0	5	1	11	1	10	1	8
19:00	0%	0%	0	0	0	2	1	5	1	5	0	4
20:00	0%	0%	0	0	0	0	0	0	0	0	0	0
21:00	0%	0%	14	14	0	0	0	0	0	0	0	0
Totals	100%	100%	4	0	14	14	32	32	26	29	24	24

3.3 Cumulative Developments

3.3.1 The full updated short list of other developments has been reviewed and is set out in the following tables, with a comment against each regarding if it is considered to have an impact during the peak month of traffic generation in June 2026.

3.3.2 Professional judgment has been used to determine which Other Developments are considered relevant to the traffic and transport cumulative assessment. Key considerations include the availability of data for the Other Developments, their location within our study area, and the overall potential for these Developments to have cumulative impacts and effects on traffic and transport.

Table 15A-42: Updated Short List of Other Development Sites

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
1	TR030002	York Potash Ltd	The York Potash Harbour Facilities Order 2016. The installation of wharf/jetty facilities with two ship loaders capable of loading bulk dry material at a rate of 12m tons per annum (dry weight).	Bran Sand, Teesport	Yes
2	EN010082	Sembcorp Utilities (UK) Limited	The Tees Combined Cycle Power Plant. A gas fired CCGT power station with a maximum generating capacity of up to 1,700 MWe (Tbc).	Land at the Wilton International Site, Teesside	Yes
3	EN010103	BP	NZT.	Land within the vicinity of the Former Redcar Steel Works Site (STDC), Redcar and Stockton-on-Tees, TS10 5QW	Yes
5	D/4271/2021	BP	The Northern Endurance Partnership (NEP) Development: The essential nature of the NEP Development is the drilling of the NEP wells, the installation and commissioning of the required subsea infrastructure and the operation and maintenance of the wells and infrastructure for the injection and storage of carbon dioxide (CO_2) at the Endurance Store (Carbon Dioxide Appraisal and Storage Licence CS001), a	Southern North Sea with CO_2 export pipeline and power / communications cable making landfall at Teesside.	No - data not available and unlikely due to offshore nature

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
			geological storage site under the Southern North Sea.		
6	EN010051	Forewind Ltd.	Forewind Ltd. (formerly Dogger Bank Teesside B) - Project previously known as Dogger Bank Teesside A and B.	Dogger Bank Zone (North Sea), with cabling coming ashore between Redcar and Marske-by-the-Sea (Wilton complex, Redcar and Cleveland).	Yes
8	EN010150	Lighthouse Green Fuels Ltd	'Waste-to-sustainable aviation fuel' facility with on-site generating station capacity of up to 150 MW	Land at Port Clarence, near Stockton-on-Tees, Teesside	Yes
19	R/2017/0876/FFM	Peak Resources Ltd	Construction and operation of a mineral processing and refining facility.	Wilton International, Redcar	No – but operational traffic included within background traffic growth factors
20	R/2016/0484/FFM	CBRE	Proposed anaerobic biogas production facility	Former Croda Site, Wilton International, Redcar	Yes
22	R/2019/0767/OOM	Director of Regeneration and Neighbourhoods Hartlepool	Outline application for the construction of an energy recovery facility (ERF) and associated development	Grangetown Prairie, Land east of John Boyle Road and west of Tees Dock Road, Grangetown	Yes

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
30	R/2019/0031/FFM	Tourian Renewables Ltd	Tourian Renewables Ltd, construction and operation of a plastic conversion facility	Former Croda Site, Wilton International, Redcar	Yes
33	R/2017/0906/OOM	Sirius Minerals plc	Sirius Minerals Plc, outline planning application for an overhead conveyor and associated storage facilities in connection with the York potash project.	Land between Wilton International and Bran Sands, Redcar	Yes
35	R/2014/0627/FFM	York Potash Ltd		Doves Nest Farm and Haxby Plantation, Sneatonthorpe; underneath 252 sq km of the North York Moors National Park; a corridor extending underground from the edge of the National Park boundary to Wilton International Complex; at Ladycross Plantation near Egton, at Lockwood Beck Farm near Moorsholm and at Tocketts Lythe, near Guisborough.	Yes

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
41	R/2014/0372/OOM	The Lady Hewley Charity Trust Company Ltd	The Lady Hewley Charity Trust Company Ltd and Taylor - Outline application for residential development (up to 1250 dwellings)	Land at Low Grange Farm, Southbank	Yes
42	R/2020/0357/OOM	STDC	South Tees Development Corporation (STDC): Outline planning application for demolition of existing structures on site and the development of up to 418,000 m^2 (gross) of general industry (use class B2) and storage or distribution facilities (use class B8) with office accommodation (use class B1)	Land at South Tees Development Corporation east of Smiths Dock Road and west of Tees Dock Road, South Bank	Yes
46	R/2020/0411/FFM	Redcar Holdings Limited	Redcar Holdings Ltd: Construction of the Redcar Energy Centre (REC) consisting of a material recovery facility incorporating a bulk storage facility; an energy recovery facility; and an incinerator bottom ash recycling facility along with ancillary infrastructure and landscaping.	Land at the former Teesside Steel works at Redcar	Yes
48	R/2006/0433/OO	PD Teesport	P D Teesport: Outline application for development of a container terminal	Land at Teesport, Grangetown	No – same Transport Assessment as Development ID 465 so to prevent double counting, this development is not included.

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
51	R/2020/0819/ESM	STDC	South Tees Development Corporation (STDC): Outline planning application for development of up to 139,353 m^2 (gross) of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E.	Land bounded by Tees Dock Road to E, Bolckow Road Industrial Estate to SE, Eston Road and vacant land to W, Darlington and Saltburn railway line to NW	Yes - part development based upon a 2033 opening year
52	R/2020/0820/ESM	STDC	South Tees Development Corporation (STDC): Outline planning application for development of up to 92,903 m^2 (gross) of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E.	Land bounded by STDC Road Infrastructure to NW, E and S and Tees Dock Road to W Lackenby	No - from the supporting information the development will commence in 2028 and be complete by 2031
53	R/2020/0821/ESM	STDC	South Tees Development Corporation (STDC): Outline planning application for development of up to 464,515qm (gross) of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E.	Land bounded by edge of NWL Bran Sands Treatment Plant and former ICI landfull to SW; Redcar bulk terminal to NW line of vegetation tod point road to NE and existing internal roads to SE	Yes - part development based upon a 2033 opening year

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
54	R/2020/0822/ESM	STDC	South Tees Development Corporation (STDC): Outline planning application for the development of up to 185,806 m^2 (gross) of general industry (Use Class B2) and storage or distribution facilities (Use Class B8) with office accommodation (Use Class E.	Land bounded by Darlington to Saltburn railway line to SE; private internal road and open industrial land to NW; section of hot metal transfer railway line open land and south gare road to N; boundary wall of marsh farmhouse and adjacent industrial unit and open land to NE	Yes - part development based upon a 2033 opening year
55	R/2020/0823/ESM	STDC	South Tees Development Corporation (STDC): Outline planning application for the development of up to 15,794 m^2 (gross) of office accommodation (Use Class E).	Land bounded by A1085 trunk road to SE and roundabout providing access to local road network; private access track to E; internal roads to west and Darlington to Saltburn railway to NW, Redcar	No - from the data supplied construction will commence in 2026 and be complete by 2031, with no construction traffic data being available
65	MWP8 South Tees Eco-Park	NA	Tees Valley Joint Minerals and Waste Development Plan Documents, A site of	South Tees Eco-Park	No - assumed to be included within any

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
			approximately 27 ha is allocated for the development of the South Tees Eco-Park.		background traffic growth
76	H/2022/0181	Wynyard Park LTD	Outline planning application for the erection of up to 1400no. dwellings and up to 750 m^2 of non-residential floorspace (comprising Use Class E and Sui Generis).	Land north of A689, Wynyard Park Estate, Wynyard Woods, Wynyard, Hartlepool	No - negligible impact, covered by background traffic growth
80	H/2020/0276	Miller Homes and Bellway Homes	Erection of 570 dwellings and provision of a new roundabout and associated infrastructure	Land to the south of A179 and west of Middle Warren known as Upper Warren, Hartlepool	No - negligible impact, covered by background traffic growth
91	H/2014/0428	Tunstall Homes Ltd	Outline application with all matters reserved for residential development comprising up to 1,200 dwellings	Land south of Elwick Road, High Tunstall, Hartlepool, TS26 0LQ	No - negligible impact, covered by background traffic growth
95	H/2019/0275	Graythorp Energy Limited	Energy recovery (energy from waste) facility and associated infrastructure.	Land to the south of Tofts Road West, south of Hartlepool	No – the trip generation will not affect any of the relevant links
121a	21/0594/EIASCP	The Mary Street Estate Limited a British Land Company	Redevelopment of land to provide urban logistics and industrial development - Link to 21-2124-SOR (ID: 231)	Teesside Park Phase 3, Aintree Oval	No - data not available at scoping stage

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
121b	21/2124/SOR	The Mary Street Estate Limited a British Land Company	Scoping request for outline planning permission with all matters reserved except for access comprising the demolition of existing buildings and the construction of employment floorspace (Use Classes E(g)(iii) (Light Industrial Processes), B2 (General Industrial) and B8 (Storage and Distribution) and ancillary office floorspace (E(g)(iii)	Teesside Park Phase 3 Newmarket Avenue Thornaby	No - data not available at scoping stage
131	22/2386/SOR	Tees Valley Net Zero (Protium Green Solutions Limited)	Scoping opinion for Green Hydrogen Production Facility and Wind Turbine	Land off Haverton Hill Road, Billingham, TS23 1PZ	No - data not available at scoping stage
135	23/0090/EIS	Suez Recycling and Recovery UK Ltd	Carbon capture facility for existing Energy from Waste site	Suez Tees Valley Site, Haverton Hill Road, Billingham, TS23 1PY	No - data not available
150	13/0342/EIS	Cameron Hall Developments Ltd	Outline application for the construction of up to 500 houses, Primary School (inc Sport Facilities) and nursery, Retail Units (up to 500 m^2), Doctors Surgery, Community Facilities	Land at Wynyard Village	No - negligible impact, covered by background traffic growth
157	08/3644/EIS	Northshore Development Partnership Ltd	Outline planning application for residential (Class C3), employment (Class B1), health care facility (Class D1), leisure (Class A3, A4, A5, C1 and D2), ancillary retail and services (Class A1 and A2) and car dealership (sui generis)	Land to the north of the River Tees to the south of A1046 and Church Road and east of the Square	No - data not available

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
166	13/2892/EIS	O2N Energy (Billingham) LLP	Development of materials recycling facility and production of energy from waste,	GrowHow Stores New Road, Billingham	No - negligible impact, covered by background traffic growth
167	22/1145/SCO	Not provided	Screening opinion for proposed hydrogen production plant, battery storage and hydrogen re-fuelling point.	Energy from Waste Plant, New Road, Billingham, TS23 1LE	No - data not available
168	Stockton-on-Tees Local Plan, Policy SD4 Economic Growth Strategy	NA	Stockton-on-Tees Local Plan, Main growth location for hazardous installations including liquid and gas processing, bio-fuels and bio-refineries, chemical processing, resource recovery, and waste treatment, energy generation, carbon capture and storage and other activities, Seal Sands.	Seal Sands	No - assumed to be included within any background traffic growth
172	R/2020/0685/ESM	STDC	South Tees Development Corporation (STDC): Outline planning application for demolition of existing redundant quay structures, capital dredging and development of new quay and associated works (PHASE 2)	Land at South Bank Wharf, Grangetown, Lackenby	Yes
173	R/2022/0773/ESM	Tees Valley Lithium Limited	Construction of a Lithium Hydroxide Monohydrate manufacturing plant and ancillary development	Plots 1A and 1B, Wilton International Site, near Redcar, Middlesbrough, Teesside, TS90 8WS	Yes - operational phase

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
174	R/2014/0626/FFM	York Potash Ltd	Mineral (Polyhalite) granulation and storage facility	Wilton International Complex, Redcar	Yes
178	R/2023/0291/ESM	Green Lithium Refining Limited	Outline application (all matters reserved) for the development of a 3 line low-carbon lithium refinery and associated dock-side reception, handling, storage, and manufacturing facilities for the production of high-quality, battery-grade lithium hydroxide monohydrate	Land off Kinkerdale Road, Teesport, Grangetown, TS6 6UE	No - negligible impact, covered by background traffic growth
205	H/2023/0128	Environment Agency	Scoping opinion in respect of Greatham North East Flood Alleviation Scheme	LAND AT GREATHAM FLOOD CELL, GREATHAM, HARTLEPOOL	No - data not available
206	22/1525/EIS	Teesside Green Energy Park Limited	Erection of an energy recovery facility and associated infrastructure for fuel receipt and storage, power generation, power export, process emissions control, maintenance, offices.	Land At Seal Sands Billingham	No - negligible impact, covered by background traffic growth
219	23/1019/EIS	Greenergy International Ltd	Development of Greenergy Renewable Fuels and Circular Products Facility	Land West Of Epax Pharma U K Limited North South Access Road Seal Sands TS2 1UB	No - negligible impact, covered by background traffic growth
222	R/2023/0179/SCP	BP	HyGreen Hydrogen Project	Land at the Foundry Site, STDC and in the vicinity of Wilton International,	Yes

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
				Lackenby and Grangetown near Redcar	
236	EN040001	Teesside Flexible Regas Port Limited	The project is a liquefied natural gas (LNG) importation terminal.	Land at Seal Sands, near Stockton-on-Tees, Teesside	No – no traffic flows given at scoping stage
258	R/2023/0600/HD	Circular Fuels Arboretum Limited	Hazardous Substance Consent for the storage and processing of 1200 tonnes of liquefied flammable gases (notably 1150 tonnes dimethyl ether (DME) and 50 tonnes propane).	Plot 6, Dorman Point, Teesworks, South Teesside	No – no details on traffic flows and the affected links
259	R/2024/0098/ESM	Anglo American Woodsmith Ltd	Full planning application for port handling facility and overland conveyor, above and below ground infrastructure, internal access roads, car parking, landscaping and supporting utility infrastructure	Land between Wilton International and the River Tees	Yes
260	R/2023/0793/ESM	British Steel Limited	Hybrid application to include detailed planning permission for the erection of steel manufacturing facility (electric arc furnace) and outline permission for associated buildings, apparatus and infrastructure (all matters reserved).	Land at Lackenby Works, Redcar, Teesside	Yes
268	R/2023/0820/ESM	Cleansing Services Group	Hazardous waste to energy process plant	At Wilton International, within Teesside Freeport	No – there are no details on the trip assignment

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
273	R/2024/0065/FF	SeAH Wind Ltd	Alterations to manufacturing facility including proposed extract chimneys 50m max height (3); smoking shelters (4); paint booth drum store; bins stores (6); portable gas store; scrap iron store; liquid oxygen store; weighbridges (3); LPG store; external generators (2); water tank and infrastructure.	Land at South Bank, Tees Dock Road, Grangetown, Lackenby	No – there is no transport-related information on the planning portal
282	R/2024/0292/FFM	South Tees Developments Limited	Erection of Freeport and Transport Office including formation of car and HGV parking areas, security cabins, bus shelters, cycle sheds, landscaping and boundary treatments along with laying out of adjacent transport hub including bus stop and car parking area.	Land near Roundabout at Smiths Dock Road and Dockside Road Teesport, Grangetown	Yes
283	R/2022/0290/FFM	Biffa Waste Services Limited	Proposed Plastics Recycling Facility	Wes Building, Biffa Polymers, Wilton Site, Lazenby	No – there are no details of traffic flows and respective links affected given
370	H/2024/0149	Environment Agency	Engineering operations and associated works/access to restore Greatham Beck to its original line, removal of tidal structure including the re-establishment of natural saltmarsh and mudflat habitats, the permanent diversion of a public right of way and the creation of a temporary site compound area east of Marsh House Lane.	Land to the southwest of Greatham Village, Hartlepool	No – there are no details of traffic flows and respective links affected

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
375	H/2014/0405	Persimmon Homes Teesside	Full planning application for demolition of buildings, construction of 144 dwellings (C3), construction of accesses to Stockton Road and Brierton Lane, roads, bridge with associated structures and associated earthworks, drainage features, public open space, landscaping, ecological works, electrical sub stations, vehicular circulation, pumping stations and infrastructure.	Land between A689 and Brierton Lane	No – the trip generation will not affect any of the relevant links
399	22/0334/EIS	Vistry Partnerships North	Hybrid planning application comprising of 1) full application for the erection of 385 dwellings with associated infrastructure, access and landscaping and 2) Outline application with some matters reserved (appearance, landscaping, layout and scale) for the erection of up to 285 dwellings	Land At Summerville Farm Harrowgate Lane Stockton-on-Tees	No – the trip generation will not affect any of the relevant links
414	22/1041/SOR	Millennium EFW Ltd	Scoping opinion request for proposed waste to fuel (WtF) facility at Reclamation Pond	Tees Valley Energy From Waste Site 1 Huntsman Drive Seal Sands Middlesbrough TS2 1TT	No – there is no transport-related information on the planning portal
417	22/1717/SCO	Tees Valley Net Zero Limited	Screening opinion for a Polymer Electrolyte Membrane (PEM) electrolyser for the production of hydrogen as well as hydrogen storage and dispatch facilities and a single	Land north of the River Tees near Port Clarence in Stockton-on-Tees	No – there is no transport-related information on the planning portal

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
			1MW wind turbine with a tip height of up to 100m.		
419	24/1208/FUL	Navigator Terminals Seal Sands	Installation and operation of a Carbon Dioxide storage terminal.	Navigator Terminals Seal Sands, Seal Sands Road, Stockton-on-Tees	No - there are no details on trip assignment onto the links
452	24/0709/FUL	Greenergy Biofueld Teesside Limited	Application for a proposed Carbon Capture, Storage and Utilisation (CCSU) plant.	Greenergy Biofuels Teesside Limited Seal Sands Road Seal Sands Middlesbrough TS2 1UB	No – there are no details of traffic flows and respective links affected given
465	MLA/2020/00079/1	PD Teesport Limited	The marine elements of the NGCT have not yet been implemented. PDT has therefore submitted this marine licence application to allow for the implementation of the marine elements of the proposed scheme. The proposed scheme is made of: • Capital dredging of the approach channel to the NGCT as well as creation of a new berth pocket (up to 4.8 million m3 of material). • Disposal of dredged material. • Construction of a piled quay structure (overall length of 1,035m, as defined in the 2008 HRO), with the potential for reclamation with dredged material and beneficial re-use of	Teesport Estate	Yes

ID	APPLICATION REFERENCE	APPLICANT	OTHER DEVELOPMENT DETAILS	LOCATION	INCLUDE IN ASSESSMENT
			dredged material for raising of land levels within the proposed terminal site. • Construction of various landside elements (buildings, rail terminal, road access, lighting, drainage and a pumping station).		
466	MLA/2019/00469/1	Teesside GasPort	A scheme is proposed to import Liquefied Natural Gas (LNG) to an existing jetty on the Tees estuary. The proposed scheme comprises the installation of a floating storage regasification unit (FSRU) at an existing, currently unused jetty. When the FSRU is in place, LNG carriers will berth next to the FRSU in a side-to-side mooring configuration and discharge the LNG into the FSRU before leaving again.	Teesport (within Tees estuary)	Yes
468	R/2024/0321/FFM	South Tees Developments Limited	Erection of industrial units for light industrial, general industrial and storage distribution uses (with associated office accommodation), associated access, landscaping, parking and service yards, and associated infrastructure works.	Land at South Tees Development Corporation east of Smiths Dock Road and west of Tees Dock Road, South Bank	Yes

3.3.3 Having reviewed the supporting information in regard to the Other Developments that are being included, the daily traffic flows to be used within the assessment at the peak year of construction can be given as follows in updated Tables 15A-43 to 47.

Table 15A-43: Other Development Sites – Daily Traffic Generation – Site ID 2 to 22 (1 of 5)

LINK		2		2		3		6		8		20		22	
		VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	0	0	0	0	381	0	0	0	0	0	0	0	0	0
2	A1085 Trunk Road, 1.34 km south of West Coatham Lane	86	11	63	5	1,199	80	0	0	0	0	8	6	0	8
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	0	0	0	0	0	0	81	0	0	0	10	8	0	10
4	A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	86	11	63	5	1,199	80	0	0	0	0	8	6	0	8
5	A1085 Broadway, 235 m east of Birchington Avenue	108	6	83	3	300	0	0	0	0	0	8	6	0	8
6	A1380 High Street, 50 m east of Lackenby Lane	38	3	29	2	42	0	129	37	0	0	0	0	0	0
7	A66, 140 m east of Whitworth Road	341	70	247	36	781	40	415	291	0	0	8	6	189	8
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	0	0	0	0	0	0	0	0	1325	0	0	0	0	0
9	A178 Seaton Carew Road, 535 m north of Huntsman Drive	0	0	0	0	0	0	0	0	686	102	0	0	0	0
10	Unnamed Road, 725 m east of A178 Seaton Carew Road	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	A1053 Greystone Road (May 2023 data)	408	68	261	34	118	40	415	291	0	0	8	6	0	8

LINK		2		2		3		6		8		20		22	
		VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS
12	A174 (West of Greystone Roundabout) (May 2022 data)	83	32	49	9	76	40	372	229	0	0	0	0	0	0
13	A1046 Haverton Hill Road (May 2022 data)	0	0	0	0	0	0	0	0	1075	0	0	0	0	0
14	A1185 (west of A178 Seaton Carew Road) (May 2022 data)	0	0	0	0	0	0	0	0	527	103	0	0	0	0
15	Belasis Avenue	0	0	0	0	0	0	0	0	225	0	0	0	0	0

Table 15A-44: Other Development Sites – Daily Traffic Generation – Site ID 30 to 51 (2 of 5)

LINK		30		33		35		41		42		51	
		VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	21	8	640	183	0	0	0	0	0	0	0	0
2	A1085 Trunk Road, 1.34 km south of West Coatham Lane	21	8	640	183	0	0	1,026	0	1,775	206	654	0
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	10	4	0	0	0	0	0	0	0	0	0	0
4	A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	21	8	640	183	334	40	1,026	0	1,775	206	654	0
5	A1085 Broadway, 235 m east of Birchington Avenue	10	4	0	0	0	0	2,822	0	142	16	0	0
6	A1380 High Street, 50 m east of Lackenby Lane	0	0	0	0	0	0	0	0	142	16	0	0
7	A66, 140 m east of Whitworth Road	10	4	728	383	299	31	0	0	3,515	408	1,478	0
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	0	0	0	0	0	0	0	0	0	0	0	0
9	A178 Seaton Carew Road, 535 m north of Huntsman Drive	0	0	0	0	0	0	0	0	0	0	0	0
10	Unnamed Road, 725 m east of A178 Seaton Carew Road	0	0	0	0	0	0	0	0	0	0	0	0
11	A1053 Greystone Road (May 2023 data)	0	0	615	306	205	26	898	0	2,095	243	638	0
12	A174 (West of Greystone Roundabout) (May 2022 data)	21	8	753	306	249	26	128	0	817	95	0	0
13	A1046 Haverton Hill Road (May 2022 data)	0	0	0	0	0	0	0	0	0	0	0	0
14	A1185 (west of A178 Seaton Carew Road) (May 2022 data)	0	0	0	0	0	0	0	0	0	0	0	0
15	Belasis Avenue	0	0	0	0	0	0	0	0	0	0	0	0

Table 15A-45: Other Development Sites – Daily Traffic Generation- Site ID 53 to 222 (3 of 5)

LINK		53		54		172		173		174		222	
		VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS	VEHS	HGVS
1	A1085 Trunk Road, 100 m east of Ennis Road	917	157	457	56	0	0	0	0	0	0	104	0
2	A1085 Trunk Road, 1.34 km south of West Coatham Lane	1,037	176	516	63	0	0	0	0	640	183	473	110
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	117	17	59	7	0	0	0	0	0	0	52	0
4	A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	1,037	176	516	63	0	0	0	0	640	183	473	110
5	A1085 Broadway, 235 m east of Birchington Avenue	0	0	0	0	0	0	0	0	0	0	85	0
6	A1380 High Street, 50 m east of Lackenby Lane	0	0	0	0	0	0	0	0	0	0	25	0
7	A66, 140 m east of Whitworth Road	384	66	191	24	177	42	48	0	0	0	287	55
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	0	0	0	0	0	0	0	0	0	0	0	0
9	A178 Seaton Carew Road, 535 m north of Huntsman Drive	0	0	0	0	0	0	0	0	0	0	0	0
10	Unnamed Road, 725 m east of A178 Seaton Carew Road	0	0	0	0	0	0	0	0	0	0	0	0
11	A1053 Greystone Road (May 2023 data)	476	81	237	28	141	42	48	0	615	306	101	55
12	A174 (West of Greystone Roundabout) (May 2022 data)	183	34	91	11	0	0	102	0	743	306	76	55
13	A1046 Haverton Hill Road (May 2022 data)	0	0	0	0	0	0	0	0	0	0	0	0
14	A1185 (west of A178 Seaton Carew Road) (May 2022 data)	0	0	0	0	0	0	0	0	0	0	0	0
15	Belasis Avenue	0	0	0	0	0	0	0	0	0	0	0	0

Table 15A-46: NEW Other Development Sites – Daily Traffic Generation- Site ID 1 to 468 (4 of 5)

LINK		ID 1		ID 260		ID 46		ID 468 ID 282		ID 465	
		VEHS	HGV	VEHS	HGV	VEHS	HGV	VEHS	HGV	VEHS	HGV
1	A1085 Trunk Road, 100 m east of Ennis Road	207	67	0	0	10	0	0	0	0	0
2	A1085 Trunk Road, 1.34 km south of West Coatham Lane	207	67	266	110	306	0	0	0	0	0
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	0	0	60	0	37	0	0	0	0	0
4	A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	207	67	424	110	0	0	340	25	0	0
5	A1085 Broadway, 235 m east of Birchington Avenue	0	0	0	0	0	0	24	2	0	0
6	A1380 High Street, 50 m east of Lackenby Lane	0	0	0	0	0	0	26	2	0	0
7	A66, 140 m east of Whitworth Road	0	0	141	55	201	0	409	27	800	0
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	0	0	0	0	0	0	0	0	0	0
9	A178 Seaton Carew Road, 535 m north of Huntsman Drive	0	0	0	0	0	0	0	0	0	0
10	Unnamed Road, 725 m east of A178 Seaton Carew Road	0	0	0	0	0	0	0	0	0	0
11	A1053 Greystone Road (May 2023 data)	66	0	259	55	81	0	430	32	1300	0
12	A174 (West of Greystone Roundabout) (May 2022 data)	26	0	200	55	78	0	162	12	1200	0
13	A1046 Haverton Hill Road (May 2022 data)	0	0	0	0	0	0	0	0	0	0
14	A1185 (west of A178 Seaton Carew Road) (May 2022 data)	0	0	0	0	0	0	0	0	0	0
15	Belasis Avenue	0	0	0	0	0	0	0	0	0	0

Table 15A-47: NEW Other Development Sites – Daily Traffic Generation- Site ID 256 (5 of 5)

LINK		ID 256	
		VEHS	HGV
1	A1085 Trunk Road, 100 m east of Ennis Road	150	0
2	A1085 Trunk Road, 1.34 km south of West Coatham Lane	371	40
3	A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	0	0
4	A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	371	40
5	A1085 Broadway, 235 m east of Birchington Avenue	90	0
6	A1380 High Street, 50 m east of Lackenby Lane	0	0
7	A66, 140 m east of Whitworth Road	141	40
8	A1046 Port Clarence Road, 20 m north of Beech Terrace	0	0
9	A178 Seaton Carew Road, 535 m north of Huntsman Drive	0	0
10	Unnamed Road, 725 m east of A178 Seaton Carew Road	0	0
11	A1053 Greystone Road (May 2023 data)	140	0
12	A174 (West of Greystone Roundabout) (May 2022 data)	180	40
13	A1046 Haverton Hill Road (May 2022 data)	0	0
14	A1185 (west of A178 Seaton Carew Road) (May 2022 data)	0	0
15	Belasis Avenue	0	0

3.3.4 Taking the total committed development flows from updated Table 15A-43, Table 15A-44 , Table 15A-45, Table 15A-46 and Table 15A-47, they can then be combined to provide the total traffic flows on each link as follows in Table 15A-48.

Table 15A-48: Total Other Development Traffic Flows

LINK		DAILY OTHER DEVELOPMENT TRAFFIC		NEW DAILY OTHER DEVELOPMENT TRAFFIC		TOTAL OTHER DAILY DEVELOPMENT TRAFFIC	
		TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS	TOTAL VEHICLES	TOTAL HGVS
1	A1085 Trunk Road, 100m east of Ennis Road	2,519	404	367	67	2,886	471
2	A1085 Trunk Road, 1345m south of West Coatham Lane	8,886	1,078	401	170	9,287	1,248
3	A1042 Kirkleatham Lane, 85m south of Staintondale Avenue	367	36	59	0	426	36
4	A1085 Trunk Road, 500m north of A1053 Tees Dock Road	9,220	1,118	593	195	9,813	1,313
5	A1085 Broadway, 235m east of Birchington Avenue	3,558	35	114	2	3,672	37
6	A1380 High Street, 50m east of Lackenby Lane	405	58	26	2	431	60
7	A66, 140m east of Whitworth Road	9,376	1,645	1,414	95	10,790	1,740
8	A1046 Port Clarence Road, 20m north of Beech Terrace	16	7	1325	0	1341	7
9	A178 Seaton Carew Road, 535m north of Huntsman Drive	24	10	686	102	710	112
10	Unnamed Road, 725m east of A178 Seaton Carew Road	146	58	0	0	146	58
11	A1053 Greystone Road	7,943	1,577	1,611	36	9,554	1,613
12	A174 (West of Greystone Roundabout)	4,003	1,173	1,586	85	5,589	1,258
13	A1046 Haverton Hill Road (May 2022 data)	24	10	1075	0	1099	10
14	A1185 (west of A178 Seaton Carew Road) (May 2022 data)	24	10	527	103	551	113
15	Belasis Avenue	24	10	225	0	249	10

3.3.5 The above updated tables have been used within Section 2.2 above to determine the cumulative environmental effect.

4.0 IMPLICATIONS FOR CHAPTER 8: AIR QUALITY [APP-060]

4.1.1 The Air Quality chapter has been updated to account for the additional Other Developments identified in the updated Cumulative and Combined Effects Assessment. The updates should be read in conjunction with the ES Air Quality Chapter for additional context.

4.1.2 No changes are made to any of the Figures associated with the ES Air Quality Chapter of the ES.

4.1.3 The first five sections (Introduction; Legislation, Planning Policy Context and Other Guidance; Assessment Methodology and Significance Criteria; Baseline Conditions; and Proposed Development Design and Impact Avoidance) and the final four sections of the ES Air Quality Chapter (Essential Mitigation and Enhancement Measures; Residual Effects and Conclusions; Summary of Residual Effects and References) are not included in this Technical Note as no changes have resulted from the update exercise affecting the content of each of these. As such, the same methodology and assessment criteria are applied in this note.

4.2 Impacts and Likely Significant Effects

Assessment of Construction Traffic

4.2.1 In the below updated Appendix 8A: Air Quality – Construction Assessment, updated Tables 8A-18 to 8A-20 show the predicted annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ at sensitive human health receptors along routes anticipated to be utilised by construction traffic. The updated appendix also includes predicted annual mean concentrations of NO_x, NH_3 and nitrogen and acid deposition at sensitive ecological receptors in updated Tables 8-21 and 8-23. Please see Table 8-6, Figure 8-1: Air Quality Study Area Human Health Receptors and Monitoring [APP-096] and Figure 8-3: Air Quality Study Area Construction [APP-098] for further details of the receptors modelled and Sections 2 and 3 above for further details of construction traffic movements.

4.2.2 The construction traffic air quality assessment is based on the Peak Construction Scenario (month 17 of construction) indicates that the impact at all human receptors can be considered Negligible. This is as both the change between the with and without the Proposed Development scenarios for all receptors is less than 1% of the AQAL and all receptors are below 75% of the AQAL.

4.2.3 Despite there being some sensitive human receptors along roads where construction traffic will be present, the largest change in AADT flow occurs on the unnamed road that connects the Proposed Development Site with the road network where there are no adjacent human receptors. The effect of construction traffic on air quality at human health receptors is therefore **Negligible** and **Not Significant**.

4.2.4 For all ecological receptors but RE008 (part of the Teesmouth and Cleveland SSSI and SPA north of the River Tees), the model predicts that the magnitude of impacts associated with emissions from the Proposed Development do not exceed the first stage screening threshold of 1% of the environmental standard for annual mean

NO_x and NH_3 concentrations. At RE008, the change in NO_x concentration at 0 m from the road is predicted to be 1.5% of the environmental standard, down to 0.7% at 10 m from the road. The total NO_x concentration at RE008 is 95.5% of the standard at 0 m from the road and 79.0% at 10 m from the road. The change in NH_3 concentration at 0 m from the road is predicted to be 1.2% of the environmental standard, down to 0.6% at 10 m from the road. The total NH_3 concentration at RE008 is 74.8% of the standard at 0 m from the road and 60.4% at 10 m from the road.

4.2.5 For all ecological receptors but RE002, RE007 and RE008 (all part of the Teesmouth and Cleveland SSSI and SPA north of the River Tees), the model predicts that the magnitude of impacts associated with emissions from the Proposed Development do not exceed the first stage screening threshold of 1% of the relevant environmental standard for nitrogen deposition. At RE002, the change in deposition at 5 m from the road is predicted to be 1.1% of the environmental standard, down to 0.8% at 10 m from the road. The total nitrogen deposition at RE002 is 199.9% of the standard at 0 m from the road and 180.0% at 10 m from the road. At RE007, the change in deposition at 4 m from the road is predicted to be 1.6% of the environmental standard, down to 1.1% at 10 m and 0.7% at 20m from the road. The total nitrogen deposition at RE007 is 203.9% of the standard at 0 m from the road and 183.4% at 10 m from the road. At RE008, the change in deposition at 0 m from the road is predicted to be 2.3% of the environmental standard, down to 1.1% at 10 m and 0.8% at 20 m from the road. The total nitrogen deposition at RE008 is 191.7% of the standard at 0 m from the road and 165.7% at 10 m from the road.

4.2.6 As the impact at some of the receptors is above the screening thresholds, the significance of effects associated with emissions from construction traffic on designated nature conservation sites is discussed in the Updated Cumulative and Combined Effects Assessment and the Report to Inform Habitats Regulations Assessment Report (5.10) submitted at Deadline 5 and has been judged as an effect that is **Not Significant**.

4.2.7 Acid deposition impacts do not exceed 1% of the environmental standards at any ecological receptors and can therefore be screened as not significant without need for further assessment.

Operation

4.2.8 The impact of point source emissions at human health receptors has been determined from model outputs at discrete receptor locations.

4.2.9 The maximum hourly, daily and annual mean predicted concentrations at human health receptors have been compared with the relevant AQALs, as summarised in Table 8-8. Any inconsistencies between the PEC (i.e. the process contribution, existing background concentration and the process contributions of other committed developments) and the predicted changes combined with the future year without development concentrations are due to rounding only.

4.2.10 As the PEC includes the process contribution, existing background concentration and the process contributions of other committed developments, the results presented within the assessment are inherently cumulative.

4.2.11 The results have been initially presented as the maximum concentration that occurs at sensitive receptors. The predicted concentrations at locations within the Study Area have been reported in updated Appendix 8B: Air Quality – Operational Phase, updated Tables 8B-14 to 8B-50, as well as the detailed concentrations at all identified receptor locations.

4.2.12 The impacts of all pollutants released from the Proposed Development are predicted to result in negligible adverse effects at all human health receptors within the study area, and these are considered to be **Not Significant**.

Table 8-8: Results of Operational Impact Assessment for Human Health Impacts

SPECIES	LOCATION	AQAL ($\mu g/m^3$)	PC ($\mu g/m^3$)	PC/AQAL (%)	MAGNITUDE OF IMPACT	BACKGROUND (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT WITH BC ($\mu g/m^3$)	PEC ($\mu g/m^3$)	PEC/AQAL (%)	SIGNIFICANCE OF EFFECT
Maximum NO_2 hourly mean (as the 99.79th percentile) – Normal Operation	Most affected sensitive receptor (O3)	200	0.9	0.5%	**Imperceptible**	26.6	35.1	36.1	18.0%	**Not Significant**
	Maximum anywhere outside site boundary		3.1	1.5%	**Imperceptible**	26.6	33.6	36.7	18.3%	**Not Significant**
Maximum NO_2 annual mean – Normal Operation	Most affected sensitive receptor (O3)	40	0.1	0.2%	**Imperceptible**	13.3	15.0	15.0	37.6%	**Not Significant**
	Maximum anywhere outside site boundary		0.2	0.6%	**Very Low**	13.3	15.5	15.8	39.4%	**Not Significant**
Maximum CO 8-hour rolling average – Normal Operation	Most affected sensitive receptor (O2)	10,000	0.1	<0.1%	**Imperceptible**	221.8	263.9	264.0	2.6%	**Not Significant**
	Maximum anywhere		0.3	<0.1%	**Imperceptible**	221.8	242.8	243.1	2.4%	**Not Significant**

SPECIES	LOCATION	AQAL ($\mu g/m^3$)	PC ($\mu g/m^3$)	PC/AQAL (%)	MAGNITUDE OF IMPACT	BACKGROUND (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT WITH BC ($\mu g/m^3$)	PEC ($\mu g/m^3$)	PEC/AQAL (%)	SIGNIFICANCE OF EFFECT
	outside site boundary									
PC = Process Contribution, AQAL = Air Quality Assessment Level, BC = Background Concentration, PEC = Predicted Environmental Concentration										

4.2.13 Operational air quality results for the worst affected ecological receptor (Teesmouth and Cleveland Coast SPA, SSSI and Ramsar site, located adjacent to the Main Site) are presented in updated Table 8-9. Results at all other ecological receptors are presented in Appendix 8B: Air Quality – Operational Phase in Section 5 of this Technical Note.

Table 8-9: Results of Operational Impact Assessment for Designated Habitats

SPECIES	AQAL ($\mu g/m^3$)	PC ($\mu g/m^3$)	PC/AQAL (%)	BC ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT WITH BC ($\mu G/M^3$)	PEC ($\mu g/m^3$)	PEC/AQAL (%)	SIGNIFICANCE OF EFFECT
Worst case receptor NO_x daily mean (as the 100^{th} percentile)	75	2.9	3.8%	34.0	43.5	46.4	61.8%	**Not Significant**
Worst case receptor NO_x annual mean	30	0.3	1.1%	20.7	23.9	24.2	80.7%	**Need for further assessment**
Worst case receptor NH_3 annual mean	3	0.01	0.4%	1.3	1.4	1.4	46.6%	**Not Significant**
Worst case receptor Nitrogen Deposition	10	0.1	1.1%	12.5	13.4	13.5	135.4%	**Need for further assessment**
Worst case receptor Acid Deposition	0.856 Min CL Min N/ 4.856 Min CL Max N / 4 Min CL Max S	0.008	0.4%	1.0	1.1	1.1	7.2%	**Not Significant**

4.2.14 The assessment results show that the predicted 24-hour average NO_x impacts are below the screening criteria for the need for further assessment at all receptors and can be considered **Not Significant**.

4.2.15 The assessment results show that the predicted annual average NH_3 impacts are below the screening criteria for the need for further assessment at all receptors and can be considered **Not Significant**.

4.2.16 The assessment results show that the predicted acid deposition impacts are below the screening criteria for the need for further assessment at all receptors and can be considered **Not Significant**.

4.2.17 PCs of more than 1% of the long-term critical level for NO_x occur at the adjacent Teesmouth and Cleveland Coast Ramsar, SPA, SSSI and Ramsar, but PECs are predicted to stay below 70% of the Critical Level at these locations, except at the Teesmouth and Cleveland Coast SSSI (OE6), where it is predicted to be of 76.5% of the critical level. Although this is above the second screening criteria, it is below 100% of the critical level.

4.2.18 The need for further assessment at all locations but OE6 can therefore be screened out based on the critical level criteria.

4.2.19 The assessment results show that the predicted nitrogen deposition impacts are below the criteria for likely significance at all receptors, as PCs are less than 1% of their respective critical loads at all receptors except for the nitrogen deposition at the Teesmouth and Cleveland Coast Ramsar, SPA, SSSI (OE1, OE2 and OE6). However, at sensitive features in the Ramsar/SPA (i.e. bird nesting locations), the PC is less than 1% of the critical load.

4.2.20 Further details concerning air quality impacts on designated sites is discussed in the updated Cumulative and Combined Effects Assessment and the Report to Inform Habitat Regulations Assessment submitted at Deadline 5.

Phase 1 Operation Combined with Phase 2 Enabling Works

4.2.21 As set out in Section 3: Assessment Methodology and Significance Criteria, an assessment of combined impacts from both peak construction and operational emissions (Phases 1 and 2) has been carried out to confirm no significant effects would occur during any overlap in activities. Note that this is overly conservative as only one phase would be operational and the other in construction, leading to less emissions from both operations and traffic.

4.2.22 The magnitude of impacts at sensitive receptors is predicted to be below 1% of their respective AQAL for human health impacts of any pollutant.

4.2.23 The magnitude of impacts at sensitive ecological receptors is predicted to be similar to that from construction and operations separately, as the location of the points of maximum impact are different during both phases. For all ecological receptors but RE008 (part of the Teesmouth and Cleveland SSSI and SPA north of the River Tees), the model predicts that the magnitude of impacts do not exceed the first stage screening threshold of 1% of the environmental standard or the second stage screening of the total concentrations being less than 70% of the environmental standard for annual mean NO_x and NH_3 concentrations. At RE008, the change in NO_x

concentration at 0 m from the road is predicted to be 1.5% of the environmental standard, down to 0.7% at 10 m from the road. The change in NH_3 concentration at 0 m from the road is predicted to be 1.3% of the environmental standard, down to 0.6% at 10 m from the road. At these two locations, the total increase in NO_x and NH_3, does not result in an exceedance of the critical levels. The combined change is therefore **Not Significant**.

4.2.24 For all ecological receptors but RE002, R003, RE007 and RE008 (all part of the Teesmouth and Cleveland SSSI and SPA north of the River Tees), the model predicts that the magnitude of impacts do not exceed the first stage screening threshold of 1% of the relevant environmental standard for nitrogen deposition. At RE002, the change in deposition at 5 m from the road is predicted to be 1.2% of the environmental standard, down to 0.9% at 10 m from the road. At RE003, the change in deposition at 107 m from the road is predicted to be 1.3% of the environmental standard, down to 0.1% at 147 m from the road. The slow decrease is due to a high proportion of the impact coming from operational emissions instead of traffic ones. At RE007, the change in deposition at 4 m from the road is predicted to be 1.6% of the environmental standard, down to 1.1% at 10 m and 0.8% at 20m from the road. At RE008, the change in deposition at 0 m from the road is predicted to be 2.3% of the environmental standard, down to 1.1% at 10 m and 0.8% at 20 m from the road.

4.2.25 The significance of effects associated with emissions from Phase 1 Operation Combined with Phase 2 Enabling Works on designated nature conservation sites is similar to the effects associated with construction traffic as discussed in the updated Cumulative and Combined Effects Assessment and the Report to Inform Habitats Regulations Assessment and has been judged as an effect that is Not Significant.

4.2.26 Acid deposition impacts do not exceed 1% of the environmental standards at any ecological receptors and can therefore be screened as not significant without need for further assessment.

4.2.27 See updated Appendix 8B: Air Quality – Operational Phase in Section 5 of this Technical Note for further details.

5.0 IMPLICATIONS FOR APPENDIX 8A: AIR QUALITY – CONSTRUCTION ASSESSMENT [APP-190]

5.1.1 Appendix 8A has been updated to account for the additional Other Developments identified in the updated Cumulative and Combined Effects Assessment (The updates should be read in conjunction with Appendix 8A [APP-190] of the ES (and its updates in section 4 of this note) for additional context.

5.1.2 The first four sections of Appendix 8A (Introduction; Scope; Methodology Overview; and Construction Dust Assessment) are not included in this Technical Note as no changes have resulted from the update exercise affecting the content of each of these sections. The tables of this appendix have been updated with the same reference table numbers for ease of read across.

5.2 Construction Traffic Assessment

5.2.1 Predictions have been made for the baseline year (2019) and the peak construction year (month 17) with the Proposed Development construction work and without the Proposed Development construction work. On the basis of these predictions, the change in key pollutant concentrations (NO_2, PM_{10}, $PM_{2.5}$ and NH_3) associated with the Proposed Development have been established.

5.2.2 The impact of the Proposed Development is based on modelled predictions of pollutant concentrations in the scenarios considered, and Defra Local Air Quality Management Technical Guidance (LAQM) guidance and tools, including the current version of the NO_x to NO_2 conversion (Defra, 2020a) approach for NO_2, PM_{10} and $PM_{2.5}$, the Calculator for Road Emissions of Ammonia (CREAM) tool adapted using EFT v12.0.1 data and background maps (Defra, 2020b). Predictions are also informed by two-way 24-hour Annual Average Daily Traffic (AADT) flow data as sourced from Chapter 15: Traffic and Transport [APP-068], and hourly sequential meteorological data from a representative meteorological station.

Model Inputs

5.2.3 The general model conditions that have been used in the assessment of road traffic emissions are summarised in updated Table 8A-10**Error! Reference source not found.**. Other more detailed data used to model the dispersion of emissions is considered below.

Table 8A-10: General ADMS Roads Model Conditions

VARIABLE	INPUT
Surface Roughness at source	0.5 m
Minimum Monin-Obukhov length for stable conditions	10 m
Receptors	Selected discrete receptors

VARIABLE	INPUT
Receptor location	X,Y co-ordinates determined by Geographic Information Systems (GIS). The height of residential receptors will be set at 1.5 m
Emissions	NO_X, PM_{10}, $PM_{2.5}$ and NH_3
Emission Factors	Emission Factor Toolkit version 12.0 for 2019 for baseline and construction year (2026) scenarios for NO_x, PM_{10} and $PM_{2.5}$. CREAM V1A for NH_3
Meteorological Data	1 year of hourly sequential data, Durham Tees Valley meteorological site (2019)
Emission Profiles	None used
Terrain Types	Flat terrain
Model Output	Long-term annual mean NO_X concentration ($\mu g/m^3$) Long-term annual mean PM_{10} concentration ($\mu g/m^3$) Long-term annual mean $PM_{2.5}$ concentration ($\mu g/m^3$) Long-term annual mean NH_3 concentration ($\mu g/m^3$)

Traffic Data

5.2.4 The traffic data used in this assessment takes the form of AADT.

5.2.5 The future construction base year is 2026. The construction base year is the period where the number of construction vehicles accessing the Proposed Development Site will peak and is assumed to be a worst-case scenario for assessing potential effects due to construction traffic (month 17 of construction). AADT traffic flows are presented in Table 8A-11 (for further detail, please refer to the ES Traffic Chapter as updated above).

Table 8A-11: Road Traffic Data

ROAD NAME	AVERAGE SPEED (KM/H)	BASE		FUTURE YEAR WITHOUT PROPOSED DEVELOPEMENT		FUTURE YEAR WITH PROPOSED DEVELOPMENT	
		Total AADT	HDV	Total AADT	HDV	Total AADT	HDV
A1085 Trunk Road, 100 m east of Ennis Road	70	12,274	1,049	15,834	1,578	16,124	1,578
A1085 Trunk Road, 1.34 km south of West Coatham Lane	82	14,387	1,275	24,463	2,593	25,533	2,778
A1042 Kirkleatham Lane, 85 m south of Staintondale Avenue	52	11,791	762	12,864	840	13,009	840
A1085 Trunk Road, 500 m north of A1053 Tees Dock Road	83	16,058	2,012	26,753	3,435	27,823	3,620
A1085 Broadway, 235 m east of Birchington Avenue	53	8,093	521	12,209	586	12,447	586
B1380 High Street, east of Lackenby Lane	50	9,835	826	10,806	931	10,862	931
A66, east of Whitworth Road	66	19,865	3,662	31,745	5,603	32,464	5,695
A1046 Port Clarence Road, north of Beech Terrace	47	7,612	896	9,371	952	9,596	988
A178 Seaton Carew Road, north of Huntsman Drive	72	7,814	998	8,953	1,165	9,178	1,201
Unnamed Road, east of A178 Seaton Carew Road	59	4,206	860	4,583	965	4,845	1,001
A1053 Greystone Road	94	14,387	1,392	22,819	2,860	23,017	2,953

ROAD NAME	AVERAGE SPEED (KM/H)	BASE		FUTURE YEAR WITHOUT PROPOSED DEVELOPEMENT		FUTURE YEAR WITH PROPOSED DEVELOPMENT	
		Total AADT	HDV	Total AADT	HDV	Total AADT	HDV
A174 (West of Greystone Roundabout)	106	31,758	1,936	37,718	3,363	37,859	3,456
B1275 Belasis Avenue	47	2,451	72	2,835	86	2,947	104
A1185 (west of A178 Seaton Carew Road)	72	5,651	1,026	5,660	1,214	5,733	1,250
Site Access	32	0	0	2,157	190	3,516	375
A1046 Haverton Hill Road [1]	47	14010	1115	15,785	1,179	15,898	1,197

[1] Base data is from year 2022

Emissions Data

5.2.6 The magnitude of road traffic emissions for the baseline and with development scenarios have been calculated from traffic flow data using the Defra's current emission factor database tool EFT 12.0 (Defra, 2023) and CREAM V1A adapted to EFT V12.0.1 data (Air Quality Consultant, 2023). The Calculator for Road Emissions of Ammonia (CREAM) tool, developed by Air Quality Consultants in 2020, has been utilised at the suggestion of Natural England, for ammonia emission predictions. Although the CREAM tool is based on Defra's EFT v9, the ammonia emission factors have been adapted for the Proposed Development using more recent data from EFT v12.0.1. This tool relies on remotely sensed pollutant measurements, real-world fuel consumption data, and ambient ammonia measurements from other ecological sites, such as Ashdown Forest, and applies these to the vehicle fleet on rural roads in the Teesside area.

5.2.7 The assessment considers the construction phase impact of road traffic emissions at receptors adjacent to roads in the vicinity of the Proposed Development Site.

5.2.8 Unlike NO_x emissions, which are regulated by Euro standards for road vehicles, NH_3 emissions remain unregulated, leading to greater uncertainty. Measurements of NH_3 are rarely made, as this is not widely required for regulatory purposes, and the lack of consistent data introduces uncertainty in predicting nitrogen deposition rates from ammonia. The NH_3-derived nitrogen deposition rates typically represent an upper estimate, which must be accounted for in the appropriate assessment process.

Background Concentrations

5.2.9 The new data used in the assessment is presented for the centre of each 1 x 1 km grid square in updated Table 8A-14 (updated to include NH_3). .

5.2.10 Background ammonia concentrations were sourced from the Air Pollution Information System (APIS, 2017), which provides ecological data for the sensitive habitats impacted by the project. Critical loads for nitrogen and acid deposition were calculated based on the habitat types at the selected ecological receptors (Table 8A-13), with the model assuming grassland as the primary habitat for the Teesmouth and Cleveland Coast and forest for Charlton's Pond LNR and Wilton Woods Complex LWS.

Table 8A-14: Modelled Background Concentrations

POLLUTANT	YEAR	CONCENTRATION RANGE ACROSS THE STUDY AREA ($\mu g/m^3$)
NH_3	2020 - 2022	1.23 – 1.68

Bias Adjustment of Road Contribution NO_x, NO_2, PM_{10}, $PM_{2.5}$ and NH_3

5.2.11 A Bias adjustment factor of 1 has been applied to NH_3 concentrations.

Calculation of Nitrogen Deposition for Ecological Receptors

5.2.12 Conversion factors for calculating nitrogen deposition from modelled NO_2 and NH_3 are found in the DMRB LA 105 Air Quality (Highways England, 2019).

5.2.13 The conversion rates and factors used in the assessment are detailed in updated Table 8A-17.

Table 8A-17: Conversion Factors – Calculation of Nutrient Nitrogen Deposition

POLLUTANT	DEPOSITION VELOCITY GRASSLANDS (m/s)	DEPOSITION VELOCITY FORESTS (m/s)	CONVERSION FACTOR (µg/m^3/s TO kg/ha/yr)
NO_2	0.0015	0.003	96
NH_3	0.02	0.03	259.7

Results of the Construction Traffic Assessment

5.2.14 The predicted change in annual mean NO_2 concentrations that are predicted to occur due to traffic associated with Proposed Development construction works at the selected sensitive receptors, are presented in updated Table 8A-18. Any inconsistencies between the total and the predicted change combined with the future year without development concentrations are due to rounding only.

5.2.15 The maximum predicted change in annual mean NO_2 concentrations at the selected sensitive receptors is +0.1 µg/m^3, which would occur in the vicinity of receptors near Saltview Terrace (R001, R002), High Clarence Primary School (R003), Fieldview Close (R004), Broadway (R005), Eversham Road (R006), Bolckow Road (R008), St Nicholas Close (R009) and Kirkleatham Lane (R010). The reported change in NO_2 concentration at this location is due to the impact of emissions from construction road traffic from the Proposed Development.

5.2.16 The total annual mean NO_2 at all the receptors would remain below the annual mean NO_2 Air Quality Assessment Level (AQAL), with the highest total concentration of 25.3 µg/m^3 at receptor R003, therefore the change is not predicted to lead to a risk of the annual mean or the hourly mean AQAL being exceeded.

5.2.17 The significance of the predicted change in annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations during Proposed Development construction in planning terms is discussed in Chapter 8: Air Quality [APP-060] as updated above.

Table 8A-18: Predicted Change in Annual Mean NO_2 Concentrations at Discrete Receptors (µg/m^3) due to Construction Road Traffic Emissions, with Comparison Against AQAL

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R001	18.8	0.1	0.2	19.1	47.9
R002	19.1	0.1	0.2	19.4	48.5

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R003	24.7	0.1	0.3	25.3	63.2
R004	18.3	0.1	0.2	18.8	47.0
R005	16.5	0.1	0.2	16.6	41.6
R006	17.8	0.1	0.2	17.9	44.8
R007	14.4	<0.1	0.1	14.4	36.0
R008	16.9	0.1	0.2	17.0	42.4
R009	16.9	0.1	0.2	17.0	42.4
R010	17.6	0.1	0.1	17.7	44.2
R011	17.2	<0.1	0.1	17.2	43.1
R012	19.3	<0.1	0.1	19.3	48.3
R013	15.1	<0.1	<0.1	15.2	37.9
R014	12.6	<0.1	<0.1	12.6	31.5
R015	13.9	<0.1	<0.1	13.9	34.8
R016	17.2	<0.1	0.1	17.2	43.0
R017	14.8	<0.1	0.1	14.9	37.2
R018	12.1	<0.1	<0.1	12.1	30.3
R019	13.5	<0.1	0.1	13.5	33.7
R020	13.5	<0.1	0.1	13.5	33.8
R021	14.3	<0.1	0.1	14.3	35.7
R022	14.8	<0.1	0.1	14.8	37.1

5.2.18 The change in annual mean PM_{10} and $PM_{2.5}$ concentrations at discrete receptors predicted to occur from the road traffic associated with the construction of the Proposed Development, at the selected sensitive receptors, is presented in updated Table 8A-19 and Table 8A-20. Any inconsistencies between the total and the predicted change combined with the future year without development concentrations are due to rounding only.

5.2.19 The maximum predicted change in annual mean PM_{10} and $PM_{2.5}$ concentrations at the selected sensitive receptors is +0.1 µg/m^3. This change in annual mean PM_{10} and $PM_{2.5}$ concentrations would not be a perceptible at air quality sensitive receptors, nor would it result in additional days on which the PM_{10} 24-hour objective is exceeded.

5.2.20 The predicted annual mean concentrations are well below the respective AQAL for PM_{10} and $PM_{2.5}$.

Table 8A-19: Predicted Change in Annual Mean PM_{10} Concentrations at Discrete Receptors (µg/m³) due to Cumulative Construction Road Traffic Emissions, with Comparison Against AQAL

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL	EXCEEDANCES (NB OF DAYS)
R001	12.3	<0.1	0.1	12.4	30.9	1
R002	12.4	<0.1	0.1	12.5	31.3	1
R003	13.1	0.1	0.1	13.4	33.4	<1
R004	12.3	<0.1	0.1	12.5	31.3	1
R005	13.1	<0.1	0.1	13.1	32.7	<1
R006	13.6	<0.1	0.1	13.6	34.1	<1
R007	12.2	<0.1	<0.1	12.2	30.5	1
R008	13.1	<0.1	0.1	13.2	32.9	<1
R009	13.1	<0.1	0.1	13.1	32.7	<1
R010	12.8	<0.1	0.1	12.8	32.0	1
R011	12.6	<0.1	<0.1	12.6	31.5	1
R012	13.4	<0.1	<0.1	13.4	33.6	<1
R013	14.6	<0.1	<0.1	14.6	36.4	<1
R014	12.3	<0.1	<0.1	12.3	30.7	1
R015	12.8	<0.1	<0.1	12.8	31.9	1
R016	15.3	<0.1	<0.1	15.3	38.3	<1
R017	12.9	<0.1	<0.1	12.9	32.3	1
R018	11.9	<0.1	<0.1	11.9	29.8	1
R019	12.5	<0.1	<0.1	12.5	31.2	1
R020	12.5	<0.1	<0.1	12.5	31.2	1
R021	12.8	<0.1	<0.1	12.8	32.0	1
R022	12.9	<0.1	<0.1	12.9	32.2	1

Table 8A-20: Predicted Change in Annual Mean $PM_{2.5}$ Concentrations at Discrete Receptors (µg/m³) due to Cumulative Construction Road Traffic Emissions, with Comparison Against AQAL

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R001	7.9	<0.1	0.1	7.9	39.6

RECEPTOR	2026 FUTURE YEAR WITHOUT DEVELOPEMENT	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
R002	7.9	<0.1	0.1	8.0	40.0
R003	8.4	<0.1	0.1	8.5	42.4
R004	7.8	<0.1	0.1	7.9	39.7
R005	8.3	<0.1	0.1	8.3	41.6
R006	8.6	<0.1	0.1	8.6	43.1
R007	7.9	<0.1	<0.1	7.9	39.3
R008	8.4	<0.1	0.1	8.4	41.9
R009	8.3	<0.1	0.1	8.3	41.6
R010	8.2	<0.1	0.1	8.2	41.1
R011	8.1	<0.1	<0.1	8.1	40.6
R012	8.4	<0.1	<0.1	8.4	42.1
R013	8.6	<0.1	<0.1	8.6	43.0
R014	7.7	<0.1	<0.1	7.7	38.4
R015	8.0	<0.1	<0.1	8.0	39.8
R016	9.0	<0.1	<0.1	9.0	45.1
R017	7.9	<0.1	<0.1	7.9	39.3
R018	7.5	<0.1	<0.1	7.5	37.3
R019	7.8	<0.1	<0.1	7.8	38.8
R020	7.8	<0.1	<0.1	7.8	38.8
R021	7.9	<0.1	<0.1	7.9	39.6
R022	8.0	<0.1	0.1	8.0	39.9

5.2.21 Updated Table 8A-21 to Table 8A-24 display the relevant information and modelling results for the assessment of cumulative construction traffic impacts on ecological sites, this is discussed in the Updated Cumulative and Combined Effects Assessment. Results for the In-Combination assessment, that forms part of the Report to Inform Habitats Regulations Assessments, are presented in Annex B below.

Table 8A-21: Dispersion Modelling Results for Ecological Receptors – NO_x Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	18.8	0.1	0.3	22.5	75.2
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	18.2	0.2	0.8	33.4	111.3
RE003	Teesmouth and Cleveland Coast SSSI	18.0	0.2	0.8	19.0	63.3
RE004	Charlton's Pond LNR	19.7	<0.1	<0.1	20.0	66.7
RE005	Teesmouth and Cleveland Coast SSSI and SPA	22.8	0.1	0.4	27.7	92.3
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	20.1	0.2	0.6	27.8	92.5
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	20.1	0.3	0.9	32.1	107.0
RE008	Teesmouth and Cleveland Coast SSSI and SPA	18.8	0.5	1.5	28.6	95.5
RE009	Teesmouth and Cleveland Coast SSSI and SPA	22.7	0.0	0.1	23.4	77.9
RE010	Wilton Woods Complex LWS	14.6	0.0	0.1	22.4	74.7

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

Table 8A-22: Dispersion Modelling Results for Ecological Receptors – NH_3 Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	1.4	<0.1	0.3	1.7	56.9
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	1.2	<0.1	0.6	2.5	83.6
RE003	Teesmouth and Cleveland Coast SSSI	1.3	<0.1	0.5	1.3	44.8
RE004	Charlton's Pond LNR	1.7	<0.1	<0.1	1.7	56.8
RE005	Teesmouth and Cleveland Coast SSSI and SPA	1.6	<0.1	0.3	2.0	65.3
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	1.5	<0.1	0.6	2.2	72.8
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	1.5	<0.1	0.9	2.6	85.7
RE008	Teesmouth and Cleveland Coast SSSI and SPA	1.4	<0.1	1.2	2.2	74.8
RE009	Teesmouth and Cleveland Coast SSSI and SPA	1.6	<0.1	<0.1	1.7	55.0
RE010	Wilton Woods Complex LWS	1.5	<0.1	0.2	2.1	68.8

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

Table 8A-23: Dispersion Modelling Results for Ecological Receptors – Nutrient Nitrogen Deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITICAL LOAD (AQAL)	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	14.0	10	0.1	0.5	15.9	159.4
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	12.2	10	0.1	1.1	20.0	199.9
RE003	Teesmouth and Cleveland Coast SSSI	12.3	10	0.1	0.9	12.8	127.6
RE004	Charlton's Pond LNR	28.0	10	<0.1	0.1	28.2	281.9
RE005	Teesmouth and Cleveland Coast SSSI and SPA	14.1	10	0.1	0.5	16.3	163.1
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.0	10	0.1	1.0	18.1	180.7
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.0	10	0.2	1.6	20.4	203.9
RE008	Teesmouth and Cleveland Coast SSSI and SPA	14.0	10	0.2	2.3	19.2	191.7
RE009	Teesmouth and Cleveland Coast SSSI and SPA	14.1	10	<0.1	0.1	14.4	143.9
RE010	Wilton Woods Complex LWS	26.4	10	<0.1	0.5	31.8	318.0

**Full transect results available in Annex A where "change as % of AQAL" is >1%*

Table 8A-24: Dispersion Modelling Results for Ecological Receptors – Acid Deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITICAL LOAD (AQAL)	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	1.20	4.856	<0.1	0.1	1.3	27.6
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	1.00	4.856	<0.1	0.2	1.6	32.0
RE003	Teesmouth and Cleveland Coast SSSI	1.02	4.856	<0.1	0.1	1.1	21.6
RE004	Charlton's Pond LNR	2.26	Not Sensitive				
RE005	Teesmouth and Cleveland Coast SSSI and SPA	1.20	4.856	<0.1	0.1	1.4	27.9
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	1.20	4.856	<0.1	0.1	1.5	30.8
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	1.20	4.856	<0.1	0.2	1.7	34.2
RE008	Teesmouth and Cleveland Coast SSSI and SPA	1.20	4.856	<0.1	0.3	1.6	32.4
RE009	Teesmouth and Cleveland Coast SSSI and SPA	1.20	4.856	<0.1	<0.1	1.2	25.1
RE010	Wilton Woods Complex LWS	2.05	Not Sensitive				

5.3 References

5.3.1 Air Quality Consultant (2023), Calculator for Roads Emissions of Ammonia CREAM V1A.

5.4 Annex A: Dispersion Modelling Results

Table 8A-25: Dispersion Modelling Results for Ecological Receptor Transects – NO_x Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_0m	Teesmouth and Cleveland Coast SSSI and SPA	18.8	0.5	1.5%	28.6	95.5%
RE008_10m		18.8	0.2	0.7%	23.7	79.0%
RE008_20m		18.8	0.2	0.5%	22.2	74.1%
RE008_30m		18.8	0.1	0.4%	21.5	71.7%
RE008_40m		18.8	0.1	0.3%	21.1	70.2%
RE008_50m		18.8	0.1	0.3%	20.8	69.3%
RE008_60m		18.8	0.1	0.2%	20.6	68.6%
RE008_70m		18.8	0.1	0.2%	20.4	68.1%
RE008_80m		18.8	0.1	0.2%	20.3	67.7%
RE008_90m		18.8	0.1	0.2%	20.2	67.3%
RE008_100m		18.8	0.1	0.2%	20.1	67.1%
RE008_110m		18.8	<0.1	0.2%	20.0	66.8%
RE008_120m		18.8	<0.1	0.2%	20.0	66.6%
RE008_130m		18.8	<0.1	0.1%	19.9	66.5%
RE008_140m		18.8	<0.1	0.1%	19.9	66.3%
RE008_150m		18.8	<0.1	0.1%	19.8	66.2%
RE008_160m		18.8	<0.1	0.1%	19.8	66.0%
RE008_170m		18.8	<0.1	0.1%	19.8	65.9%

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_180m		18.8	<0.1	0.1%	19.7	65.8%
RE008_190m		18.8	<0.1	0.1%	19.7	65.7%
RE008_200m		18.8	<0.1	0.1%	19.7	65.6%

Table 8A-26: Dispersion Modelling Results for Ecological Receptor Transects – NH_3 Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_0m	Teesmouth and Cleveland Coast SSSI and SPA	1.4	<0.1	1.2%	2.24	74.8%
RE008_10m		1.4	<0.1	0.6%	1.81	60.4%
RE008_20m		1.4	<0.1	0.4%	1.68	56.1%
RE008_30m		1.4	<0.1	0.3%	1.62	54.0%
RE008_40m		1.4	<0.1	0.3%	1.58	52.7%
RE008_50m		1.4	<0.1	0.2%	1.56	51.9%
RE008_60m		1.4	<0.1	0.2%	1.54	51.3%
RE008_70m		1.4	<0.1	0.2%	1.53	50.9%
RE008_80m		1.4	<0.1	0.2%	1.52	50.5%
RE008_90m		1.4	<0.1	0.2%	1.51	50.2%
RE008_100m		1.4	<0.1	0.1%	1.50	50.0%
RE008_110m		1.4	<0.1	0.1%	1.49	49.8%
RE008_120m		1.4	<0.1	0.1%	1.49	49.6%
RE008_130m		1.4	<0.1	0.1%	1.48	49.4%
RE008_140m		1.4	<0.1	0.1%	1.48	49.3%
RE008_150m		1.4	<0.1	0.1%	1.48	49.2%
RE008_160m		1.4	<0.1	0.1%	1.47	49.1%
RE008_170m		1.4	<0.1	0.1%	1.47	49.0%
RE008_180m		1.4	<0.1	0.1%	1.47	48.9%

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_190m		1.4	<0.1	0.1%	1.46	48.8%
RE008_200m		1.4	<0.1	0.1%	1.46	48.7%

Table 8A-27: Dispersion Modelling Results for Ecological Receptor Transects – Nutrient Nitrogen Deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE002_5m	Teesmouth and Cleveland Coast SSSI and SPA	12.2	0.1	1.1%	20.0	199.9%
RE002_10m		12.2	0.1	0.8%	18.0	180.0%
RE002_15m		12.2	0.1	0.7%	16.9	168.8%
RE002_20m		12.2	0.1	0.6%	16.1	161.5%
RE002_25m		12.2	0.1	0.5%	15.6	156.3%
RE002_35m		12.2	<0.1	0.4%	14.9	149.5%
RE002_45m		12.2	<0.1	0.4%	14.5	145.2%
RE002_55m		12.2	<0.1	0.3%	14.2	142.2%
RE002_65m		12.2	<0.1	0.3%	14.0	140.0%
RE002_75m		12.2	<0.1	0.3%	13.8	138.2%
RE002_85m		12.2	<0.1	0.3%	13.7	136.9%
RE002_95m		12.2	<0.1	0.2%	13.6	135.8%
RE002_105m		12.2	<0.1	0.2%	13.5	134.8%
RE002_130m		12.2	<0.1	0.2%	13.3	133.1%
RE002_155m		12.2	<0.1	0.2%	13.2	131.8%
RE002_180m		12.2	<0.1	0.2%	13.1	130.9%
RE002_200m		12.2	<0.1	0.2%	13.0	130.3%
RE007_4.05m		14.0	0.2	1.6%	20.4	203.9%
RE007_10m		14.0	0.1	1.1%	18.3	183.4%

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE007_20m	Teesmouth and Cleveland Coast SSSI and SPA	14.0	0.1	0.7%	16.9	169.1%
RE007_30m		14.0	0.1	0.6%	16.2	162.3%
RE007_40m		14.0	<0.1	0.5%	15.8	158.3%
RE007_50m		14.0	<0.1	0.4%	15.6	155.6%
RE007_60m		14.0	<0.1	0.4%	15.4	153.7%
RE007_70m		14.0	<0.1	0.3%	15.2	152.2%
RE007_80m		14.0	<0.1	0.3%	15.1	151.1%
RE007_90m		14.0	<0.1	0.3	15.0	150.2%
RE007_100m		14.0	<0.1	0.2%	14.9	149.4%
RE007_110m		14.0	<0.1	0.2%	14.9	148.8%
RE007_120m		14.0	<0.1	0.2%	14.8	148.2%
RE007_130m		14.0	<0.1	0.2%	14.8	147.7%
RE007_140m		14.0	<0.1	0.2%	14.7	147.3%
RE007_150m		14.0	<0.1	0.2%	14.7	146.9%
RE007_160m		14.0	<0.1	0.2%	14.7	146.6%
RE007_170m		14.0	<0.1	0.2%	14.6	146.3%
RE007_180m		14.0	<0.1	0.2%	14.6	146.0%
RE007_190m		14.0	<0.1	0.2%	14.6	145.8%
RE007_200m		14.0	<0.1	0.1%	14.6	145.5%
RE008_0m		14.0	0.2	2.3%	19.17	191.7%

RECEPTOR*	SITE NAME	BACKGROUND	CHANGE DUE TO ROAD	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE008_10m	Teesmouth and Cleveland Coast SSSI and SPA	14.0	0.1	1.1%	16.57	165.7%
RE008_20m		14.0	0.1	0.8%	15.79	157.9%
RE008_30m		14.0	0.1	0.6%	15.41	154.1%
RE008_40m		14.0	<0.1	0.5%	15.18	151.8%
RE008_50m		14.0	<0.1	0.4%	15.03	150.3%
RE008_60m		14.0	<0.1	0.4%	14.92	149.2%
RE008_70m		14.0	<0.1	0.3%	14.84	148.4%
RE008_80m		14.0	<0.1	0.3%	14.77	147.7%
RE008_90m		14.0	<0.1	0.3%	14.72	147.2%
RE008_100m		14.0	<0.1	0.3%	14.68	146.8%
RE008_110m		14.0	<0.1	0.3%	14.64	146.4%
RE008_120m		14.0	<0.1	0.2%	14.61	146.1%
RE008_130m		14.0	<0.1	0.2%	14.58	145.8%
RE008_140m		14.0	<0.1	0.2%	14.55	145.5%
RE008_150m		14.0	<0.1	0.2%	14.53	145.3%
RE008_160m		14.0	<0.1	0.2%	14.51	145.1%
RE008_170m		14.0	<0.1	0.2%	14.49	144.9%
RE008_180m		14.0	<0.1	0.2%	14.48	144.8%
RE008_190m		14.0	<0.1	0.2%	14.46	144.6%
RE008_200m		14.0	<0.1	0.2%	14.45	144.5%

5.5 Annex B: In Combination Modelling Results at Ecological Receptors

An 'in combination' assessment requires an assessment of the effects of the scheme when considered cumulatively with all forecast traffic growth on the road network. This does not normally require the modelling of any additional scenarios beyond those stated, but does require the project ecologist to be mindful of not purely focussing on the impact of the specific scheme in isolation, but comparing the Do Something scenario with the Future Baseline scenario (which assumes no growth in traffic flow from the base year to the opening year) in order to take full account of the effects of traffic growth without the obscuring effect of improved vehicle emission factors.

Unlike the results presented in updated Table 8A-21 and updated Table 8A-22, where Other Developments (as listed in Table 15A-42) are considered part of the Future Year Without Development scenario, the In-Combination assessment considers them jointly with the Proposed Development scenario. The Future Year Without Development scenario becomes a Future Base – using traffic flows from Base year, but emission factors from future years to separate the effect of reductions in emissions due to the change in vehicle fleet from changes in traffic flow.

Only impacts at internationally designated sites are considered in the Report to Inform Habitats Regulations Assessment Report, therefore only results at these sites are presented in the tables below. As the SSSI and SPA areas overlap, the tables below also set out the cumulative impact to the SSSI.

Table 8A-28: Dispersion Modelling Results for Ecological Receptors – NO_x Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	FUTURE BASE	CHANGE DUE TO PROPOSED AND CUMULATIVE DEVELOPMENTS	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	18.8	22.0	0.5	1.8	22.5	75.2
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	18.2	29.7	3.6	12.2	33.4	111.3
RE005	Teesmouth and Cleveland Coast SSSI and SPA	22.8	26.9	0.8	2.7	27.7	92.3
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	20.1	26.6	1.1	3.7	27.8	92.5
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	20.1	30.4	1.7	5.7	32.1	107.0
RE008	Teesmouth and Cleveland Coast SSSI and SPA	18.8	27.3	1.3	4.3	28.6	95.5
RE009	Teesmouth and Cleveland Coast SSSI and SPA	22.7	23.3	0.1	0.4	23.4	77.9

Table 8A-29: Dispersion Modelling Results for Ecological Receptors – NH_3 Annual Mean (µg/m^3)

RECEPTOR*	SITE NAME	BACKGROUND	FUTURE BASE	CHANGE DUE TO PROPOSED AND CUMULATIVE DEVELOPMENTS	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	1.4	1.6	0.1	5.0	1.7	56.9
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	1.2	1.9	0.6	19.2	2.5	83.6
RE005	Teesmouth and Cleveland Coast SSSI and SPA	1.6	1.8	0.2	5.4	2.0	65.3
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	1.5	1.9	0.3	8.8	2.2	72.8
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	1.5	2.2	0.4	12.2	2.6	85.7
RE008	Teesmouth and Cleveland Coast SSSI and SPA	1.4	2.0	0.3	9.2	2.2	74.8
RE009	Teesmouth and Cleveland Coast SSSI and SPA	1.6	1.6	<0.1	1.0	1.7	55.0

Table 8A-30: Dispersion Modelling Results for Ecological Receptors – Nutrient Nitrogen Deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITICAL LOAD (AQAL)	FUTURE BASE	CHANGE DUE TO PROPOSED AND CUMULATIVE DEVELOPMENTS	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	14.0	10	15.1	0.8	8.1	15.9	159.4
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	12.2	10	16.7	3.3	32.6	20.0	199.9
RE005	Teesmouth and Cleveland Coast SSSI and SPA	14.1	10	15.4	0.9	9.1	16.3	163.1
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.0	10	16.6	1.5	14.6	18.1	180.7
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	14.0	10	18.4	2.0	20.3	20.4	203.9
RE008	Teesmouth and Cleveland Coast SSSI and SPA	14.0	10	17.6	1.5	15.4	19.2	191.7
RE009	Teesmouth and Cleveland Coast SSSI and SPA	14.1	10	14.2	0.2	1.6	14.4	143.9

Table 8A-31: Dispersion Modelling Results for Ecological Receptors – Acid Deposition (kgN/ha/yr)

RECEPTOR*	SITE NAME	BACKGROUND	CRITICAL LOAD (AQAL)	FUTURE BASE	CHANGE DUE TO PROPOSED AND CUMULATIVE DEVELOPMENTS	CHANGE AS % OF AQAL	TOTAL	TOTAL AS % OF AQAL
RE001	Teesmouth and Cleveland Coast SSSI and SPA	1.20	4.856	0.1	0.1	1.2	1.3	27.6
RE002	Teesmouth and Cleveland Coast SSSI and SPA and Coatham Marsh LWS	1.00	4.856	0.3	0.2	4.8	1.6	32.0
RE005	Teesmouth and Cleveland Coast SSSI and SPA	1.20	4.856	0.1	0.1	1.3	1.4	27.9
RE006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	1.20	4.856	0.2	0.1	2.1	1.5	30.8
RE007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	1.20	4.856	0.3	0.1	3.0	1.7	34.2
RE008	Teesmouth and Cleveland Coast SSSI and SPA	1.20	4.856	0.3	0.1	2.3	1.6	32.4
RE009	Teesmouth and Cleveland Coast SSSI and SPA	1.20	4.856	0.0	<0.1	0.2	1.2	25.1

6.0 IMPLICATIONS FOR APPENDIX 8B: AIR QUALITY – OPERATIONAL PHASE [APP-191]

6.1.1 Appendix 8B has been updated to account for the additional Other Developments identified in the updated Cumulative and Combined Effects. The updates should be read in conjunction with original Appendix 8B [APP-191] for additional context.

6.1.2 The first section of Appendix 8A (Introduction) of the ES and two further sections (Baseline Air Quality; and Summary of Background Air Quality) are not included in this Technical Note as no changes have resulted from the update exercise affecting the content of each of these sections.

6.2 Scope

6.2.1 This assessment only considers changes which relate to the Updated Cumulative and Combined Effects Assessment; if no change is listed then conditions are the same as those as presented in the Original ES plus relevant subsequent submissions into Examination.

Cumulative Impacts

6.2.2 The full list of cumulative schemes to be considered for the Proposed Development can be found below whilst details of the model inputs are provided in Annex B. Some developments, such as HyGreen, are not predicted to have any operational emissions to air and have therefore not been considered in this assessment. The cumulative impact of the following consented schemes with the Proposed Development have been considered in this assessment:

- ID 2: The Tees Combined Cycle Power Plant, EN010082;
- ID 3: Net Zero Teesside, EN010103;
- ID 19: Peak Resources Ltd, R/2017/0876/FFM;
- ID 20: CBRE anaerobic biogas production facility and combined heat and power plant, R/2016/0484/FFM;
- ID 22: Grangetown energy recovery facility (ERF), R/2019/0767/OOM;
- ID 30: Tourian Renewables, R/2019/0031/FFM;
- ID 46: Redcar Energy Centre (REC), R/2020/0411/FFM;
- ID166: O2N Energy (materials recycling facility and production of energy from waste), 13/2892/EIS;
- ID 178: Green Lithium Refining, R/2023/0291/ESM;
- ID 212: Teesside Green Energy Park, 22/1525/EIS; and
- ID 219: Greenergy Renewable Fuels and Circular Products Facility, 23/1019/EIS.

6.2.3 The update to the cumulative impacts of schemes within the Proposed Development study areas considers the following additional schemes in the assessment:

- ID 135: Suez Recycling and Recovery UK Ltd, 23/0090/EIS;
- ID 1: York Potash Limited, TR030002;
- ID 8: Lighthouse Green Fuels Ltd, EN010150;
- ID 260: British Steel Limited, R/2023/0793;
- ID 267: Willis Sustainable Fuels Ltd, R/2023/0646/ESM;
- ID 268: CSG, R/2023/0820/ESM; and
- ID 452: Greenergy Biofuels Immingham, 24/0709/FUL.

Sources of Information

6.2.4 The data that has been used within this assessment includes pertinent information from:

- Chapter 4: Proposed Development [APP-056];
- data on emissions to atmosphere from the operational process, supplied by the Applicant or derived from achievable emission levels set out in industry sector guidance;
- details on the Proposed Development site layout, including account for the Changes in the Changes Application Report;
- Ordnance Survey mapping (OS, 2023);
- baseline air quality data from project specific monitoring, published sources and Local Authorities; and
- meteorological data supplied by ADM Ltd (AMD Ltd, 2023).

6.3 Methodology

Emissions Data

6.3.1 Predicted emissions from the Cumulative Developments are presented in Annex B.

Building Downwash Effects

6.3.2 The modelled building locations used in the model for the Proposed Development are the same as those presented in the Original ES and accounting for the Changes Application, and shown in Table 8B-7. The modelled buildings when considering the cumulative schemes are slightly different as only the normal operation scenario is being considered, which means the lower buildings who would only impact emissions from the fired heater have been removed. The modelled building locations when including the cumulative schemes are shown in updated Table 8B-63.

Table 8B-7: Buildings Incorporated into the Modelling Assessment

BUILDING MODEL ID	BUILDING CENTRE GRID REFERENCE (X, Y)	HEIGHT (m)	LENGTH (m)	WIDTH (m)	ANGLE (°)
Tank2P2	456592, 525846	22	15	15	112
Tank1P2	456571, 525855	22	15	15	112
ASU_P2	456516, 525951	40	85	57	112
VAU121-A_P1_AuxBoilerandBFWP1	456421, 525323	15	35	15	112
DV113-B	456596, 525687	52	6	6	112
PAU110-A_P2	456591, 525824	15	20	18	112
PAU110-A_P1	456398, 525298	15	20	18	112
VAU115-A	456513, 525672	25	50	26	112
VAU121-A_P2	456635, 525767	15	35	15	112
PAU122-A_P2	456606, 525776	20	12	20	112
PAU122-A_P1	456419, 525348	20	12	20	112
Compressor shelter H2 storage P2	456584, 525628	15	17	37	112
Compressor Shelter H2 storage P1	456506, 525470	15	17	37	112
Raw water treatment P2	456717, 525779	20	53	17	112
Raw water treatment P1	456278, 525322	20	17	53	112
Demin Water plant package P2	456631, 525807	15	38	24	112
Demin Water plant package P1	456299, 525241	15	38	24	112
Cooling water unit P1	456273, 525408	17	32	32	112
Cooling water unit P2	456458, 525786	17	32	32	112
DV111-A_P1	456374, 525360	31	6	6	112
DV111-A_P2	456578, 525793	31	6	6	112
PAU112_P2	456543, 525717	19	27	35	112
VAU111-A_SUB_U1_P2	456557, 525752	32	27	33	112
PAU112_P1	456401, 525440	19	27	35	112
GHR_ATR_AnalyserP1	456387, 525405	23	27	33	112

Calculation of Deposition at Sensitive Ecological Receptors

6.3.3 This assessment only considers changes which relate to the Updated Cumulative and Combined Effects Assessment; if no change is listed then conditions are the same as those as presented in the Original ES plus relevant subsequent submissions

into Examination. The deposition of nutrient nitrogen and acid at sensitive ecological receptors has been calculated, using the modelled process contribution predicted at the receptor points. The deposition rates are determined using conversion rates and factors contained within Environment Agency guidance (Air Quality Advisory Group, 2014), which account for variations deposition mechanisms in different types of habitats.

6.3.4 The conversion rates and factors used in the assessment are detailed in Table 8B-8 and 8B-9.

Table 8B-8: Conversion Factors – Calculation of Nutrient Nitrogen Deposition

POLLUTANT	DEPOSITION VELOCITY GRASSLAND (m/s)	DEPOSITION VELOCITY WOODLAND (m/s)	CONVERSION FACTOR (µg/m^3/s to kgN/ha/yr)
NO_x as NO_2	0.0015	0.003	96
NH_3	0.02	0.03	259.7

Table 8B-9: Conversion Factors – Calculation of Acid Deposition

POLLUTANT	DEPOSITION VELOCITY GRASSLAND (m/s)	DEPOSITION VELOCITY WOODLAND (m/s)	CONVERSION FACTOR (µg/m^2/s to keq/ha/yr)
SO_2	0.012	0.024	9.86
NO_2	0.0015	0.003	6.85
NH_3	0.02	0.03	18.54
HCl	0.025	0.06	8.65
HF	0.025	0.06	8.65

6.4 Assessment of Limitations and Assumptions

6.4.1 This assessment only considers changes which relate to the Updated Cumulative and Combined Effects Assessment; there is no change as the limitations and assumptions as presented in the Original ES.

6.5 Operational Emissions Modelling Results

6.5.1 This assessment only considers changes which relate to the Updated Cumulative and Combined Effects Assessment; if no change is listed then conditions are the same as those as presented in the Original ES plus relevant subsequent submissions into Examination. For the result sections below, that means the “PC” values have not changed, only the “Future year without Proposed Development” and the “PEC” have been updated.

Human Health Receptor Results

Nitrogen Dioxide Emissions

6.5.2 The predicted change in annual mean NO_2 concentrations that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-14. Any variations in the addition of the change to the baseline concentrations are due to rounding only.

6.5.3 The maximum predicted annual mean NO2 concentration that occurs anywhere within the Study Area as a result of the Proposed Development is 0.2 µg/m3, and this occurs at close to the northern boundary of the site, within the dunes of the Teesmouth and Cleveland Coast SSSI, SPA and Ramsar site. The annual mean NO2 predicted environmental concentration (i.e. the process contribution, existing background concentration and the process contributions of other committed developments) is 15.8 µg/m3 and therefore is below the annual mean NO2 AQAL of 40 µg/m3. NO2 emissions from the Proposed Development are therefore not predicted to lead to a risk of the annual mean AQALs being exceeded anywhere within the Study Area.

6.5.4 The discrete receptor most affected by long term emissions from the Proposed Development is receptor O2, Cleveland Golf Links with a predicted annual mean NO2 concentration as a result of the Proposed Development of 0.1 µg/m3, representing 0.2% of the AQAL.

6.5.5 The significance of the predicted change in annual mean NO_2 concentrations in planning terms is discussed in Section 4 above.

Table 8B-14: Predicted Change in Annual Mean NO_2 Concentrations – Normal Operation

RECEPTOR	AQAL (µg/m³)	PREDICTED CONCENTRATION (PC) (µg/m³)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m³)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m³)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m³)	PEC/AQAL (%)
O1	40	0.1	0.1%	13.3	15.0	15.0	37.6%
O2	40	0.1	0.2%	13.3	15.0	15.1	37.8%
O3	40	0.1	0.2%	13.3	15.3	15.4	38.5%
O4	40	0.1	0.1%	13.3	15.2	15.3	38.2%
O5	40	0.1	0.1%	13.3	14.9	14.9	37.3%
O6	40	<0.1	0.1%	13.3	15.4	15.4	38.5%
O7	40	<0.1	0.1%	13.3	14.8	14.8	37.1%
O8	40	<0.1	0.1%	13.3	15.2	15.2	38.0%
O9	40	<0.1	0.1%	13.3	14.7	14.7	36.8%

PC = Process Contribution, AQAL = Air Quality Assessment Level, BC = Background Concentration, PEC = Predicted Environmental Concentration

6.5.6 The predicted change in hourly mean NO_2 concentrations (as the 99.79th percentile of hourly averages) that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-15.

6.5.7 The maximum predicted hourly mean NO2 concentration (as the 99.79th percentile of hourly averages) during normal operation that occurs anywhere within the Study Area as a result of the Proposed Development is 3.08 µg/m^3, and this occurs again just to the east of the Proposed Development. The predicted environmental concentration (i.e., the process contribution, the existing background concentration and the process contribution from other committed developments) is 36.7 µg/m^3 and therefore is well below the hourly mean NO2 AQAL of 200 µg/m^3.

6.5.8 During the Start Up Scenario 1, the maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during that occurs anywhere within the Study Area (2 km) as a result of the Proposed Development is 9.7 µg/m^3, and this occurs to the east of the Proposed Development. The predicted environmental concentration (i.e., the process contribution the existing background concentration and the process contribution from other committed developments) is 43.3 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

6.5.9 During the Start Up Scenario 2, the maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during that occurs anywhere within the Study Area (2 km) as a result of the Proposed Development is 9.2 µg/m^3, and this occurs to the east of the Proposed Development. The predicted environmental concentration (i.e., the process contribution the existing background concentration and the process contribution from other committed developments) is 42.8 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

6.5.10 During the Start Up Scenario 3, the maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during that occurs anywhere within the Study Area (2 km) as a result of the Proposed Development is 9.7 µg/m^3, and this occurs to the east of the Proposed Development. The predicted environmental concentration (i.e., the process contribution the existing background concentration and the process contribution from other committed developments) is 43.3 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

6.5.11 During the Emergency Scenario 1, the maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during that occurs anywhere within the Study Area as a result of the Proposed Development is 87.7 µg/m^3, and this occurs to the east of the operational Proposed Development. The predicted environmental concentration (i.e., the process contribution, the existing background concentration and the process contribution from other committed developments) is 121.3 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

6.5.12 During the Emergency Scenario 2, the maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during that occurs anywhere within the Study Area as a result of the Proposed Development is 78.2 µg/m^3, and this occurs to the east of the operational Proposed Development. The

predicted environmental concentration (i.e., the process contribution, the existing background concentration and the process contribution from other committed developments) is 107.2 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

6.5.13 During the Emergency Scenario 3, the maximum predicted hourly mean NO_2 concentration (as the 99.79th percentile of hourly averages) during that occurs anywhere within the Study Area as a result of the Proposed Development is 78.2 µg/m^3, and this occurs to the east of the operational Proposed Development. The predicted environmental concentration (i.e., the process contribution, the existing background concentration and the process contribution from other committed developments) is 111.8 µg/m^3 and therefore is well below the hourly mean NO_2 AQAL of 200 µg/m^3.

6.5.14 The discrete receptor most affected by short term emissions from the Proposed Development during normal operation is receptor O2, Cleveland Golf Links, with a predicted hourly mean NO_2 Process Contribution as a result of the Proposed Development of 1.0 µg/m^3, and a PEC of 36.0 µg/m^3 during normal operation.

6.5.15 NO_2 emissions from the Proposed Development are therefore not predicted to lead to a risk of the hourly mean air quality standard being exceeded anywhere within the Study Area.

6.5.16 The impact from the normal, start up and emergency operation of the Proposed Development is not predicted to exceed the stage one screening criteria that states that an emission may be considered to have an insignificant impact where the short term PC is less than 10% of the AQAL at all sensitive receptors.

6.5.17 At the place of maximum impact, impacts from the normal and start-up operation of the Proposed Development are not predicted to exceed the stage one screening criteria that states that an emission may be considered to have an insignificant impact where the short-term PC is less than 10% of the AQAL. In the emergency scenario, the impacts could exceed 10% of the AQAL, however the PEC would remain below 100% of the AQAL and would not occur at a location where the public is regularly present. Overall, emissions can be considered to have an effect which is not significant.

Table 8B-15: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Normal Operation

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	200	0.9	0.5%	26.6	35.1	36.1	18.0%
O2	200	1.0	0.5%	26.6	35.1	36.0	18.0%
O3	200	1.0	0.5%	26.6	37.4	38.4	19.2%
O4	200	0.9	0.5%	26.6	36.9	37.8	18.9%
O5	200	0.8	0.4%	26.6	35.2	36.0	18.0%
O6	200	0.7	0.4%	26.6	35.5	36.2	18.1%
O7	200	0.7	0.3%	26.6	35.1	35.8	17.9%
O8	200	0.7	0.3%	26.6	35.4	36.1	18.0%
O9	200	0.7	0.3%	26.6	35.6	36.3	18.2%

Table 8B-16: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Start Up Scenario 1

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	200	2.0	1.0%	26.6	35.1	37.1	18.6%
O2	200	2.2	1.1%	26.6	35.1	37.3	18.6%
O3	200	2.0	1.0%	26.6	37.4	39.4	19.7%
O4	200	1.9	0.9%	26.6	36.9	38.7	19.4%
O5	200	2.0	1.0%	26.6	35.2	37.3	18.6%
O6	200	1.6	0.8%	26.6	35.5	37.0	18.5%
O7	200	1.8	0.9%	26.6	35.1	36.9	18.4%
O8	200	1.5	0.7%	26.6	35.4	36.9	18.5%
O9	200	1.7	0.8%	26.6	35.6	37.3	18.6%

Table 8B-17: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Start Up Scenario 2

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	200	2.0	1.0%	26.6	35.1	37.2	18.6%
O2	200	2.2	1.1%	26.6	34.1	36.3	18.1%
O3	200	2.0	1.0%	26.6	36.4	38.4	19.2%
O4	200	1.9	0.9%	26.6	35.9	37.8	18.9%
O5	200	2.0	1.0%	26.6	34.5	36.5	18.2%
O6	200	1.6	0.8%	26.6	34.7	36.3	18.2%
O7	200	1.7	0.9%	26.6	34.4	36.2	18.1%
O8	200	1.5	0.7%	26.6	34.8	36.2	18.1%
O9	200	1.6	0.8%	26.6	35.0	36.6	18.3%

Table 8B-18: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Start Up Scenario 3

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	200	2.0	1.0%	26.6	35.1	37.2	18.6%
O2	200	2.2	1.1%	26.6	35.1	37.3	18.6%
O3	200	2.0	1.0%	26.6	37.4	39.4	19.7%
O4	200	1.9	0.9%	26.6	36.9	38.7	19.4%
O5	200	2.0	1.0%	26.6	35.2	37.3	18.6%
O6	200	1.6	0.8%	26.6	35.5	37.0	18.5%
O7	200	1.8	0.9%	26.6	35.1	36.9	18.5%
O8	200	1.5	0.7%	26.6	35.4	36.9	18.5%
O9	200	1.6	0.8%	26.6	35.6	37.3	18.6%

Table 8B-19: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Emergency Scenario 1

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	200	9.7	4.9%	26.6	35.1	44.8	22.4%
O2	200	7.7	3.8%	26.6	35.1	42.8	21.4%
O3	200	12.5	6.2%	26.6	37.4	49.9	24.9%
O4	200	12.2	6.1%	26.6	36.9	49.1	24.5%
O5	200	6.2	3.1%	26.6	35.2	41.4	20.7%
O6	200	9.4	4.7%	26.6	35.5	44.9	22.4%
O7	200	5.7	2.9%	26.6	35.1	40.9	20.4%
O8	200	7.4	3.7%	26.6	35.4	42.8	21.4%
O9	200	5.4	2.7%	26.6	35.6	41.1	20.5%

Table 8B-20: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Emergency Scenario 2

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	200	9.7	4.9%	26.6	35.1	44.8	22.4%
O2	200	7.7	3.8%	26.6	35.1	42.8	21.4%
O3	200	12.5	6.2%	26.6	37.4	49.9	24.9%
O4	200	12.2	6.1%	26.6	36.9	49.1	24.5%
O5	200	6.2	3.1%	26.6	35.2	41.4	20.7%
O6	200	9.4	4.7%	26.6	35.5	44.9	22.4%
O7	200	5.7	2.9%	26.6	35.1	40.9	20.4%
O8	200	7.4	3.7%	26.6	35.4	42.8	21.4%
O9	200	5.4	2.7%	26.6	35.6	41.1	20.5%

Table 8B-21: Predicted Change in Hourly Mean NO_2 Concentrations (as the 99.79th Percentile of Hourly Averages) – Emergency Scenario 3

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	200	9.7	4.9%	26.6	35.1	44.8	22.4%
O2	200	7.7	3.8%	26.6	35.1	42.8	21.4%
O3	200	12.5	6.2%	26.6	37.4	49.9	24.9%
O4	200	12.2	6.1%	26.6	36.9	49.1	24.5%
O5	200	6.2	3.1%	26.6	35.2	41.4	20.7%
O6	200	9.4	4.7%	26.6	35.5	44.9	22.4%
O7	200	5.7	2.9%	26.6	35.1	40.9	20.4%
O8	200	7.4	3.7%	26.6	35.4	42.8	21.4%
O9	200	5.4	2.7%	26.6	35.6	41.1	20.5%

Carbon Monoxide Emissions

6.5.18 The predicted change in the maximum eight hour rolling mean CO concentrations that would occur during the operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-22 to Table 8B-28. Any variations in the addition of the change to the baseline concentrations are due to rounding only.

6.5.19 The maximum eight hour rolling mean CO PC that is predicted to occur anywhere in the study area as a result of the Proposed Development is less than 1% of the relevant AQAL for every scenario. In addition, the maximum predicted PEC at any receptor is 2.4% of the AQAL during normal operation.

6.5.20 The maximum one hour mean CO PC that is predicted to occur anywhere in the study area as a result of the Proposed Development is less than 1% of the relevant AQAL for every scenario. The maximum predicted PEC at any receptor is also less than 1% during normal operation.

6.5.21 The impact from the normal, start up and emergency operation of the Proposed Development is not predicted to exceed the stage one screening criteria that states that an emission may be considered to have an insignificant impact where the short-term PC is less than 10% of the AQAL.

Table 8B-22: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Normal Operation

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	10,000	0.1	<0.1%	221.8	250.3	250.4	2.5%
O2	10,000	0.1	<0.1%	221.8	263.9	264.0	2.6%
O3	10,000	0.1	<0.1%	221.8	240.7	240.7	2.4%
O4	10,000	0.1	<0.1%	221.8	239.9	240.0	2.4%
O5	10,000	0.1	<0.1%	221.8	253.3	253.3	2.5%
O6	10,000	0.1	<0.1%	221.8	249.9	249.9	2.5%
O7	10,000	0.1	<0.1%	221.8	247.8	247.9	2.5%
O8	10,000	0.1	<0.1%	221.8	244.5	244.5	2.4%
O9	10,000	<0.1	<0.1%	221.8	245.1	245.1	2.5%

Table 8B-23: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Start Up Scenario 1

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	10,000	18.6	0.2%	221.8	250.4	269.0	2.7%
O2	10,000	22.1	0.2%	221.8	264.0	286.1	2.9%
O3	10,000	14.3	0.1%	221.8	240.7	255.0	2.6%
O4	10,000	14.8	0.1%	221.8	240.0	254.9	2.5%
O5	10,000	19.2	0.2%	221.8	253.3	272.5	2.7%
O6	10,000	17.5	0.2%	221.8	249.9	267.5	2.7%
O7	10,000	14.8	0.1%	221.8	247.9	262.6	2.6%
O8	10,000	18.7	0.2%	221.8	244.5	263.2	2.6%
O9	10,000	13.7	0.1%	221.8	245.1	258.8	2.6%

Table 8B-24: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Start Up Scenario 2

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	10,000	18.3	0.2%	221.8	250.4	268.7	2.7%
O2	10,000	21.5	0.2%	221.8	264.0	285.5	2.9%
O3	10,000	14.2	0.1%	221.8	240.7	254.9	2.5%
O4	10,000	14.5	0.1%	221.8	240.0	254.6	2.5%
O5	10,000	18.3	0.2%	221.8	253.3	271.6	2.7%
O6	10,000	16.7	0.2%	221.8	249.9	266.7	2.7%
O7	10,000	14.0	0.1%	221.8	247.9	261.9	2.6%
O8	10,000	17.6	0.2%	221.8	244.5	262.2	2.6%
O9	10,000	12.9	0.1%	221.8	245.1	258.0	2.6%

Table 8B-25: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Start Up Scenario 3

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	10,000	18.7	0.2%	221.8	250.4	269.1	2.7%
O2	10,000	22.3	0.2%	221.8	264.0	286.3	2.9%
O3	10,000	14.2	0.1%	221.8	240.7	255.0	2.5%
O4	10,000	14.9	0.1%	221.8	240.0	254.9	2.5%
O5	10,000	19.4	0.2%	221.8	253.3	272.7	2.7%
O6	10,000	17.7	0.2%	221.8	249.9	267.7	2.7%
O7	10,000	15.0	0.1%	221.8	247.9	262.9	2.6%
O8	10,000	18.9	0.2%	221.8	244.5	263.5	2.6%
O9	10,000	13.9	0.1%	221.8	245.1	259.0	2.6%

Table 8B-26: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Emergency Scenario 1

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	10,000	19.8	0.2%	221.8	250.4	270.1	2.7%
O2	10,000	22.6	0.2%	221.8	264.0	286.6	2.9%
O3	10,000	23.1	0.2%	221.8	240.7	263.8	2.6%
O4	10,000	18.3	0.2%	221.8	240.0	258.4	2.6%
O5	10,000	19.6	0.2%	221.8	253.3	272.9	2.7%
O6	10,000	18.3	0.2%	221.8	249.9	268.2	2.7%
O7	10,000	15.1	0.2%	221.8	247.9	262.9	2.6%
O8	10,000	19.2	0.2%	221.8	244.5	263.7	2.6%
O9	10,000	13.9	0.1%	221.8	245.1	259.0	2.6%

Table 8B-27: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Emergency Scenario 2

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	10,000	19.4	0.2%	221.8	250.4	269.8	2.7%
O2	10,000	22.0	0.2%	221.8	264.0	286.0	2.9%
O3	10,000	23.1	0.2%	221.8	240.7	263.8	2.6%
O4	10,000	18.3	0.2%	221.8	240.0	258.3	2.6%
O5	10,000	18.7	0.2%	221.8	253.3	272.0	2.7%
O6	10,000	17.5	0.2%	221.8	249.9	267.5	2.7%
O7	10,000	14.4	0.1%	221.8	247.9	262.3	2.6%
O8	10,000	18.2	0.2%	221.8	244.5	262.7	2.6%
O9	10,000	13.1	0.1%	221.8	245.1	258.2	2.6%

Table 8B-28: Predicted Change in Maximum 8 Hour Rolling Mean CO Concentrations – Emergency Scenario 3

RECEPTOR	AQAL ($\mu g/m^3$)	PREDICTED CONCENTRATION (PC) ($\mu g/m^3$)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu g/m^3$)	PEC/AQAL (%)
O1	10,000	19.8	0.2%	221.8	250.4	270.2	2.7%
O2	10,000	22.8	0.2%	221.8	264.0	286.8	2.9%
O3	10,000	23.1	0.2%	221.8	240.7	263.8	2.6%
O4	10,000	18.3	0.2%	221.8	240.0	258.4	2.6%
O5	10,000	19.8	0.2%	221.8	253.3	273.1	2.7%
O6	10,000	18.5	0.2%	221.8	249.9	268.4	2.7%
O7	10,000	15.3	0.2%	221.8	247.9	263.1	2.6%
O8	10,000	19.5	0.2%	221.8	244.5	264.0	2.6%
O9	10,000	14.1	0.1%	221.8	245.1	259.2	2.6%

Table 8B-29:Predicted Change in Maximum 1 Hour CO Concentrations – Normal Operation

RECEPTOR	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/AQAL (%)
O1	30,000	0.2	<0.1%	221.8	264.2	264.4	0.9%
O2	30,000	0.2	<0.1%	221.8	270.8	271.0	0.9%
O3	30,000	0.2	<0.1%	221.8	261.6	261.8	0.9%
O4	30,000	0.2	<0.1%	221.8	260.9	261.1	0.9%
O5	30,000	0.2	<0.1%	221.8	258.0	258.2	0.9%
O6	30,000	0.1	<0.1%	221.8	256.3	256.4	0.9%
O7	30,000	0.1	<0.1%	221.8	257.8	257.9	0.9%
O8	30,000	0.1	<0.1%	221.8	259.6	259.8	0.9%
O9	30,000	0.1	<0.1%	221.8	256.1	256.2	0.9%

Table 8B-30: Predicted Change in Maximum 1 Hour CO Concentrations – Start Up Scenario 1

RECEPTOR	AQAL ($\mu g/m^3$)	PROCESS CONTRIBUTION (PC) ($\mu g/m^3$)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) ($\mu g/m^3$)	PEC/AQAL (%)
O1	30,000	32.1	0.1%	221.8	264.2	296.3	1.0%
O2	30,000	32.4	0.1%	221.8	270.8	303.2	1.0%
O3	30,000	25.4	0.1%	221.8	261.6	287.0	1.0%
O4	30,000	24.5	0.1%	221.8	260.9	285.4	1.0%
O5	30,000	29.2	0.1%	221.8	258.0	287.3	1.0%
O6	30,000	25.3	0.1%	221.8	256.3	281.6	0.9%
O7	30,000	25.0	0.1%	221.8	257.8	282.8	0.9%
O8	30,000	22.6	0.1%	221.8	259.6	282.2	0.9%
O9	30,000	22.7	0.1%	221.8	256.1	278.8	0.9%

Table 8B-31: Predicted Change in Maximum 1 Hour CO Concentrations – Start Up Scenario 2

RECEPTOR	AQAL ($\mu g/m^3$)	PROCESS CONTRIBUTION (PC) ($\mu g/m^3$)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) ($\mu g/m^3$)	PEC/AQAL (%)
O1	30,000	30.5	0.1%	221.8	264.2	294.8	1.0%
O2	30,000	30.9	0.1%	221.8	270.8	301.7	1.0%
O3	30,000	24.0	0.1%	221.8	261.6	285.6	1.0%
O4	30,000	23.4	0.1%	221.8	260.9	284.3	0.9%
O5	30,000	27.1	0.1%	221.8	258.0	285.1	1.0%
O6	30,000	23.8	0.1%	221.8	256.3	280.0	0.9%
O7	30,000	23.2	0.1%	221.8	257.8	281.0	0.9%
O8	30,000	20.9	0.1%	221.8	259.6	280.5	0.9%
O9	30,000	20.9	0.1%	221.8	256.1	277.0	0.9%

Table 8B-32: Predicted Change in Maximum 1 Hour CO Concentrations – Start Up Scenario 3

RECEPTOR	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/AQAL (%)
O1	30,000	32.5	0.1%	221.8	264.2	296.7	1.0%
O2	30,000	32.8	0.1%	221.8	270.8	303.6	1.0%
O3	30,000	25.9	0.1%	221.8	261.6	287.5	1.0%
O4	30,000	24.8	0.1%	221.8	260.9	285.7	1.0%
O5	30,000	29.9	0.1%	221.8	258.0	287.9	1.0%
O6	30,000	25.8	0.1%	221.8	256.3	282.1	0.9%
O7	30,000	25.6	0.1%	221.8	257.8	283.4	0.9%
O8	30,000	23.1	0.1%	221.8	259.6	282.7	0.9%
O9	30,000	23.3	0.1%	221.8	256.1	279.4	0.9%

Table 8B-33: Predicted Change in Maximum 1 Hour CO Concentrations – Emergency Scenario 1

RECEPTOR	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/AQAL (%)
O1	30,000	32.7	0.1%	221.8	264.2	297.0	1.0%

RECEPTOR	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/AQAL (%)
O2	30,000	32.6	0.1%	221.8	270.8	303.4	1.0%
O3	30,000	37.7	0.1%	221.8	261.6	299.3	1.0%
O4	30,000	40.1	0.1%	221.8	260.9	301.0	1.0%
O5	30,000	29.6	0.1%	221.8	258.0	287.6	1.0%
O6	30,000	26.2	0.1%	221.8	256.3	282.5	0.9%
O7	30,000	25.3	0.1%	221.8	257.8	283.1	0.9%
O8	30,000	23.1	0.1%	221.8	259.6	282.7	0.9%
O9	30,000	22.9	0.1%	221.8	256.1	279.0	0.9%

Table 8B-34: Predicted Change in Maximum 1 Hour CO Concentrations – Emergency Scenario 2

RECEPTOR	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/AQAL (%)
O1	30,000	31.2	0.1%	221.8	264.2	295.4	1.0%
O2	30,000	31.2	0.1%	221.8	270.8	302.0	1.0%
O3	30,000	37.6	0.1%	221.8	261.6	299.2	1.0%

RECEPTOR	AQAL ($\mu g/m^3$)	PROCESS CONTRIBUTION (PC) ($\mu g/m^3$)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) ($\mu g/m^3$)	PEC/AQAL (%)
O4	30,000	40.1	0.1%	221.8	260.9	301.0	1.0%
O5	30,000	27.4	0.1%	221.8	258.0	285.4	1.0%
O6	30,000	24.6	0.1%	221.8	256.3	280.9	0.9%
O7	30,000	23.6	0.1%	221.8	257.8	281.4	0.9%
O8	30,000	21.5	0.1%	221.8	259.6	281.1	0.9%
O9	30,000	21.1	0.1%	221.8	256.1	277.2	0.9%

Table 8B-35: Predicted Change in Maximum 1 Hour CO Concentrations – Emergency Scenario 3

RECEPTOR	AQAL ($\mu g/m^3$)	PROCESS CONTRIBUTION (PC) ($\mu g/m^3$)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) ($\mu g/m^3$)	PEC/AQAL (%)
O1	30,000	33.2	0.1%	221.8	264.2	297.4	1.0%
O2	30,000	33.0	0.1%	221.8	270.8	303.8	1.0%
O3	30,000	37.7	0.1%	221.8	261.6	299.3	1.0%
O4	30,000	40.1	0.1%	221.8	260.9	301.0	1.0%
O5	30,000	30.3	0.1%	221.8	258.0	288.3	1.0%
O6	30,000	26.7	0.1%	221.8	256.3	283.0	0.9%
O7	30,000	25.9	0.1%	221.8	257.8	283.6	0.9%
O8	30,000	23.6	0.1%	221.8	259.6	283.2	0.9%
O9	30,000	23.5	0.1%	221.8	256.1	279.6	0.9%

Particulate Matter (PM_{10})

6.5.22 The predicted change in 90.41st percentile of 24-hour mean PM_{10} concentrations that would occur during the operation of the Proposed Development in start-up and emergency mode, at the identified human health receptors and at the offsite maximum, are presented in Table 8B-36 to Table 8B-41. Any variations in the addition of the change to the baseline concentrations are due to rounding only.

6.5.23 The maximum predicted short-term PC at any receptor is below 1% for all scenarios, while at the point of maximum impact it is up to 4.4%. This is predicted to occur during Start-up operation scenario, and during emergency operation. It is considered that the PC of PM_{10} would be unlikely to give rise to significant effects at any receptor location during all modelled scenarios.

6.5.24 The impact from the start up and emergency operation of the Proposed Development is not predicted to exceed the stage one screening criteria that states that an emission may be considered to have an insignificant impact where the short-term PC is less than 10% of the AQAL.

Table 8B-36: Predicted Change in 24-Hour Mean PM_{10} Concentrations (as the 90.41st Percentile of 24-Hour averages) – Start Up Scenario 1

RECEPTOR	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/AQAL (%)
O1	50	<0.1	<0.1%	19.2	19.4	19.4	38.8%
O2	50	0.1	0.1%	19.2	19.3	19.4	38.7%
O3	50	<0.1	0.1%	19.2	19.4	19.4	38.8%
O4	50	<0.1	<0.1%	19.2	19.4	19.4	38.8%
O5	50	<0.1	0.1%	19.2	19.3	19.4	38.7%
O6	50	<0.1	<0.1%	19.2	19.4	19.4	38.9%
O7	50	<0.1	0.1%	19.2	19.3	19.4	38.7%
O8	50	<0.1	<0.1%	19.2	19.4	19.4	38.8%
O9	50	<0.1	0.1%	19.2	19.3	19.3	38.7%

Table 8B-37: Predicted Change in 24-Hour Mean PM_{10} Concentrations (as the 90.41st Percentile of 24-Hour averages) – Start Up Scenario 2

RECEPTOR	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/AQAL (%)
O1	50	<0.1	0.1%	19.2	19.4	19.4	38.8%
O2	50	0.1	0.1%	19.2	19.3	19.4	38.7%
O3	50	<0.1	0.1%	19.2	19.4	19.4	38.8%
O4	50	<0.1	<0.1%	19.2	19.4	19.4	38.8%
O5	50	0.1	0.1%	19.2	19.3	19.4	38.7%
O6	50	<0.1	<0.1%	19.2	19.4	19.4	38.9%
O7	50	<0.1	0.1%	19.2	19.3	19.4	38.7%
O8	50	<0.1	<0.1%	19.2	19.4	19.4	38.8%
O9	50	<0.1	0.1%	19.2	19.3	19.3	38.7%

Table 8B-38: Predicted Change in 24-Hour Mean PM_{10} Concentrations (as the 90.41st Percentile of 24-Hour averages) – Start Up Scenario 3

RECEPTOR	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/AQAL (%)
O1	50	<0.1	<0.1%	19.2	19.4	19.4	38.8%
O2	50	0.1	0.1%	19.2	19.3	19.4	38.7%
O3	50	<0.1	0.1%	19.2	19.4	19.4	38.8%
O4	50	<0.1	<0.1%	19.2	19.4	19.4	38.8%
O5	50	<0.1	0.1%	19.2	19.3	19.4	38.7%
O6	50	<0.1	<0.1%	19.2	19.4	19.4	38.9%
O7	50	<0.1	0.1%	19.2	19.3	19.4	38.7%
O8	50	<0.1	<0.1%	19.2	19.4	19.4	38.8%
O9	50	<0.1	0.1%	19.2	19.3	19.3	38.7%

Table 8B-39: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41st Percentile of 24 Hour averages) – Emergency Scenario 1

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	50	0.2	0.3%	19.2	19.2	19.4	38.8%
O2	50	0.2	0.4%	19.2	19.2	19.4	38.7%
O3	50	0.1	0.3%	19.2	19.3	19.4	38.8%
O4	50	0.1	0.3%	19.2	19.3	19.4	38.8%
O5	50	0.1	0.3%	19.2	19.2	19.4	38.7%
O6	50	0.1	0.2%	19.2	19.3	19.4	38.9%
O7	50	0.1	0.2%	19.2	19.2	19.4	38.7%
O8	50	0.1	0.1%	19.2	19.3	19.4	38.8%
O9	50	0.1	0.2%	19.2	19.2	19.3	38.7%

Table 8B-40: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41st Percentile of 24 Hour averages) – Emergency Scenario 2

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	50	0.2	0.3%	19.2	19.2	19.4	38.8%
O2	50	0.2	0.4%	19.2	19.2	19.4	38.7%
O3	50	0.1	0.3%	19.2	19.3	19.4	38.8%
O4	50	0.1	0.2%	19.2	19.3	19.4	38.8%
O5	50	0.1	0.3%	19.2	19.2	19.4	38.7%
O6	50	0.1	0.2%	19.2	19.3	19.4	38.9%
O7	50	0.1	0.2%	19.2	19.2	19.4	38.7%
O8	50	0.1	0.1%	19.2	19.3	19.4	38.8%
O9	50	0.1	0.2%	19.2	19.2	19.3	38.7%

Table 8B-41: Predicted Change in 24 Hour Mean PM_{10} Concentrations (as the 90.41st Percentile of 24 Hour averages) – Emergency Scenario 3

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	50	0.2	0.3%	19.2	19.2	19.4	38.8%
O2	50	0.2	0.4%	19.2	19.2	19.4	38.7%
O3	50	0.1	0.3%	19.2	19.3	19.4	38.8%
O4	50	0.1	0.3%	19.2	19.3	19.4	38.8%
O5	50	0.1	0.3%	19.2	19.2	19.4	38.7%
O6	50	0.1	0.2%	19.2	19.3	19.4	38.9%
O7	50	0.1	0.2%	19.2	19.2	19.4	38.7%
O8	50	0.1	0.1%	19.2	19.3	19.4	38.8%
O9	50	0.1	0.2%	19.2	19.2	19.3	38.7%

Sulphur Dioxide

6.5.25 The predicted change in SO_2 concentrations that would occur during the Start-Up operation of the Proposed Development, at the identified human health receptors are presented in Table 8B-42 to Table 8B-50. Any variations in the addition of the change to the baseline concentrations are due to rounding only.

6.5.26 The SO_2 PC that is predicted to occur anywhere in the study area as a result of the Proposed Development is less than 1% of the relevant AQALs for short-term (24 hour mean, 1 hour mean and 15-minute mean) impacts. It is considered that the PC of SO_2 would be unlikely to give rise to significant effects at any receptor location during all modelled scenarios.

6.5.27 The impact from the start-up operation of the Proposed Development is not predicted to exceed the stage one screening criteria that states that an emission may be considered to have an insignificant impact where the short-term PC is less than 10% of the AQAL.

Table 8B-42: Predicted Change in 15 Minute Mean SO_2 Concentrations (as the 99.9th Percentile of 15 Minute averages) – Start-Up Scenario 1

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	260	0.1	<0.1%	4.0	13.9	14.0	5.4%
O2	260	0.1	<0.1%	4.0	13.9	14.0	5.4%
O3	260	0.1	<0.1%	4.0	14.4	14.5	5.6%
O4	260	0.1	<0.1%	4.0	15.0	15.1	5.8%
O5	260	0.1	<0.1%	4.0	15.3	15.4	5.9%
O6	260	0.1	<0.1%	4.0	16.2	16.2	6.2%
O7	260	0.1	<0.1%	4.0	16.7	16.8	6.5%
O8	260	0.1	<0.1%	4.0	16.5	16.5	6.4%
O9	260	0.1	<0.1%	4.0	16.6	16.6	6.4%

Table 8B-43: Predicted Change in 15 Minute Mean SO_2 Concentrations (as the 99.9th Percentile of 15 Minute averages) – Start-Up Scenario 2

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	260	0.1	<0.1%	4.0	13.9	14.0	5.4%
O2	260	0.1	<0.1%	4.0	13.9	14.0	5.4%
O3	260	0.1	<0.1%	4.0	14.4	14.5	5.6%
O4	260	0.1	<0.1%	4.0	15.0	15.0	5.8%
O5	260	0.1	<0.1%	4.0	15.3	15.4	5.9%
O6	260	0.1	<0.1%	4.0	16.2	16.2	6.2%
O7	260	0.1	<0.1%	4.0	16.7	16.8	6.5%
O8	260	0.1	<0.1%	4.0	16.5	16.5	6.4%
O9	260	0.1	<0.1%	4.0	16.6	16.6	6.4%

Table 8B-44: Predicted Change in 15 Minute Mean SO_2 Concentrations (as the 99.9th Percentile of 15 Minute averages) – Start-Up Scenario 3

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	260	0.1	<0.1%	4.0	13.9	14.0	5.4%
O2	260	0.1	<0.1%	4.0	13.9	14.0	5.4%
O3	260	0.1	<0.1%	4.0	14.4	14.5	5.6%
O4	260	0.1	<0.1%	4.0	15.0	15.1	5.8%
O5	260	0.1	<0.1%	4.0	15.3	15.4	5.9%
O6	260	0.1	<0.1%	4.0	16.2	16.2	6.2%
O7	260	0.1	<0.1%	4.0	16.7	16.8	6.5%
O8	260	0.1	<0.1%	4.0	16.5	16.5	6.4%
O9	260	0.1	<0.1%	4.0	16.6	16.6	6.4%

Table 8B-45: Predicted Change in 1 Hour Mean SO_2 Concentrations (as the 99.73rd Percentile of 1 Hour averages) – Start-Up Operation 1

RECEPTOR	AQAL (µg/m³)	PREDICTED CONCENTRATION (PC) (µg/m³)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m³)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m³)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m³)	PEC/AQAL (%)
O1	350	0.1	<0.1%	4.0	10.5	10.5	3.0%
O2	350	0.1	<0.1%	4.0	10.6	10.6	3.0%
O3	350	0.1	<0.1%	4.0	9.6	9.7	2.8%
O4	350	0.1	<0.1%	4.0	9.7	9.7	2.8%
O5	350	<0.1	<0.1%	4.0	10.3	10.3	2.9%
O6	350	<0.1	<0.1%	4.0	12.0	12.1	3.5%
O7	350	<0.1	<0.1%	4.0	11.0	11.1	3.2%
O8	350	<0.1	<0.1%	4.0	12.6	12.6	3.6%
O9	350	<0.1	<0.1%	4.0	11.0	11.0	3.2%

Table 8B-46: Predicted Change in 1 Hour Mean SO_2 Concentrations (as the 99.73rd Percentile of 1 Hour averages) – Start-Up Operation 2

RECEPTOR	AQAL (µg/m³)	PREDICTED CONCENTRATION (PC) (µg/m³)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m³)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m³)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m³)	PEC/AQAL (%)
O1	350	0.1	<0.1%	4.0	10.5	10.5	3.0%
O2	350	0.1	<0.1%	4.0	10.6	10.6	3.0%
O3	350	0.1	<0.1%	4.0	9.6	9.7	2.8%
O4	350	0.1	<0.1%	4.0	9.7	9.7	2.8%
O5	350	<0.1	<0.1%	4.0	10.3	10.3	2.9%
O6	350	<0.1	<0.1%	4.0	12.0	12.1	3.5%
O7	350	<0.1	<0.1%	4.0	11.0	11.1	3.2%
O8	350	<0.1	<0.1%	4.0	12.6	12.6	3.6%
O9	350	<0.1	<0.1%	4.0	11.0	11.0	3.2%

Table 8B-47: Predicted Change in 1 Hour Mean SO_2 Concentrations (as the 99.73rd Percentile of 1 Hour averages) – Start-Up Operation 3

RECEPTOR	AQAL (µg/m³)	PREDICTED CONCENTRATION (PC) (µg/m³)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m³)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m³)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m³)	PEC/AQAL (%)
O1	350	0.1	<0.1%	4.0	10.5	10.5	3.0%
O2	350	0.1	<0.1%	4.0	10.6	10.6	3.0%
O3	350	0.1	<0.1%	4.0	9.6	9.7	2.8%
O4	350	0.1	<0.1%	4.0	9.7	9.7	2.8%
O5	350	<0.1	<0.1%	4.0	10.3	10.3	2.9%
O6	350	<0.1	<0.1%	4.0	12.0	12.1	3.5%
O7	350	<0.1	<0.1%	4.0	11.0	11.1	3.2%
O8	350	<0.1	<0.1%	4.0	12.6	12.6	3.6%
O9	350	<0.1	<0.1%	4.0	11.0	11.0	3.2%

Table 8B-48: Predicted Change in 24 Hour Mean SO_2 Concentrations (as the 99.18th Percentile of 24 Hour averages) – Start-Up Operation 1

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	125	<0.1	<0.1%	4.0	6.3	6.3	5.0%
O2	125	<0.1	<0.1%	4.0	6.1	6.1	4.9%
O3	125	<0.1	<0.1%	4.0	6.0	6.0	4.8%
O4	125	<0.1	<0.1%	4.0	5.9	5.9	4.8%
O5	125	<0.1	<0.1%	4.0	6.0	6.0	4.8%
O6	125	<0.1	<0.1%	4.0	7.5	7.5	6.0%
O7	125	<0.1	<0.1%	4.0	6.2	6.2	5.0%
O8	125	<0.1	<0.1%	4.0	7.4	7.4	6.0%
O9	125	<0.1	<0.1%	4.0	6.2	6.3	5.0%

Table 8B-49: Predicted Change in 24 Hour Mean SO_2 Concentrations (as the 99.18th Percentile of 24 Hour averages) – Start-Up Operation 2

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	125	<0.1	<0.1%	4.0	6.3	6.3	5.0%
O2	125	<0.1	<0.1%	4.0	6.1	6.1	4.9%
O3	125	<0.1	<0.1%	4.0	6.0	6.0	4.8%
O4	125	<0.1	<0.1%	4.0	5.9	5.9	4.8%
O5	125	<0.1	<0.1%	4.0	6.0	6.0	4.8%
O6	125	<0.1	<0.1%	4.0	7.5	7.5	6.0%
O7	125	<0.1	<0.1%	4.0	6.2	6.2	5.0%
O8	125	<0.1	<0.1%	4.0	7.4	7.4	6.0%
O9	125	<0.1	<0.1%	4.0	6.2	6.3	5.0%

Table 8B-50: Predicted Change in 24 Hour Mean SO_2 Concentrations (as the 99.18th Percentile of 24 Hour averages) – Start-Up Operation 3

RECEPTOR	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/AQAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/AQAL (%)
O1	125	<0.1	<0.1%	4.0	6.3	6.3	5.0%
O2	125	<0.1	<0.1%	4.0	6.1	6.1	4.9%
O3	125	<0.1	<0.1%	4.0	6.0	6.0	4.8%
O4	125	<0.1	<0.1%	4.0	5.9	5.9	4.8%
O5	125	<0.1	<0.1%	4.0	6.0	6.0	4.8%
O6	125	<0.1	<0.1%	4.0	7.5	7.5	6.0%
O7	125	<0.1	<0.1%	4.0	6.2	6.2	5.0%
O8	125	<0.1	<0.1%	4.0	7.4	7.4	6.0%
O9	125	<0.1	<0.1%	4.0	6.2	6.3	5.0%

Ecological Receptors Results

6.5.28 The results of the dispersion modelling of predicted impacts on sensitive ecological receptors are presented in Table 8B-51 to Table 8B-55. The tables set out the predicted PC to atmospheric concentrations of NO_x and nutrient nitrogen and acid deposition, as well as PEC (i.e., the process contribution, existing background concentration and the process contributions of other committed developments). Any variations in the addition of the change to the baseline concentrations are due to rounding only.

6.5.29 Specific significance criteria relating to impacts on sensitive designated ecological receptors are set out within the Environment Agency air emissions risk assessment guidance (Defra and Environment Agency, 2016, as updated in 2023). The impact of stack emissions can be regarded as **insignificant** at sites with statutory designations if:

- the long-term PC is less than 1% of the critical level, or if greater than 1% then the PEC is less than 70% of the critical level; and / or
- the short-term PC is less than 10% of the critical level.

6.5.30 The impact of stack emissions can be regarded as **insignificant** at sites of local importance if:

- the long-term PC is less than 100% of the critical level; and / or
- the short-term PC is less than 100% of the critical level.

6.5.31 The effect of atmospheric NO_x concentrations, nitrogen deposition rates and acid deposition rates on the modelled receptor locations have been considered in detail in the Report to Inform Habitats Regulations Assessment (5.10) submitted with the Application. Further details on the impact of air quality on sensitive ecological receptors is provided in Chapter 12: Ecology and Nature Conservation [APP-064].

Oxides of Nitrogen and Ammonia Emissions – Critical Levels

6.5.32 The assessment results show that the predicted annual and 24-hour average NO_x impacts are below the criteria for likely significance at all receptors, except for the annual mean NO_x concentration at the Teesmouth and Cleveland Coast Ramsar, SPA, SSSI (OE6).

6.5.33 The assessment results show that the predicted annual and annual average NH3 impacts are below the screening criteria for the need for further assessment at all receptors.

6.5.34 PCs of more than 1% of the long-term critical level for NO_x occur at the adjacent Teesmouth and Cleveland Coast Ramsar, SPA, SSSI and Ramsar, but PECs are predicted to stay below 70% of the Critical Level at these locations, except at the Teesmouth and Cleveland Coast SSSI (OE6), where it is predicted to be of 80.7% of the critical level. Although this is above the second screening criteria, it is below 100% of the critical level.

6.5.35 Further details on oxides of nitrogen impacts from the Proposed Development on ecological receptors are presented in Chapter 12: Ecology and Nature Conservation [APP-064].

Nitrogen and acid deposition – Critical Loads

6.5.36 The Environment Agency and Natural England have agreed that depositional impacts that are below 1% of the minimum relevant critical load for a site can be regarded as likely to be **insignificant**. Guidance from the IAQM clarifies that the 1% threshold is not intended to be precise to a set number of decimal places but to the nearest whole number (paragraph 5.5.2.6 of Institute of Air Quality Management, 2020). Further interpretation of the significance of the depositional results is provided in Chapter 12: Ecology and Nature Conservation [APP-064].

6.5.37 The assessment results show that the predicted nitrogen and acid deposition impacts are below the criteria for likely significance at all receptors, as PCs are less than 1% of their respective critical loads at all receptors except for the nitrogen deposition at the Teesmouth and Cleveland Coast Ramsar, SPA, SSSI (OE1, OE2 and OE6). However, at sensitive features in the Ramsar/SPA (i.e. bird nesting locations), the PC is less than 1% of the critical load (See Figure 8-12), and therefore impacts can be regarded as likely to be insignificant there as well, according to the EA screening criteria.

6.5.38 The SSSI is designated for its dune habitat which is located north of the Main Site and is sensitive to nitrogen. The cumulative nitrogen dose exceeds 1% of the critical load being 1.1% of the critical load.

6.5.39 The PEC will also exceed the critical load being a maximum of 12.92 kgN/ha/yr at Coatham Sands/Dunes (OE6). This is due to the fact that current nitrogen deposition exceeds the critical load.

6.5.40 Further details on depositional impacts from the Proposed Development are presented in Chapter 12: Ecology and Nature Conservation [APP-064].

Table 8B-51: NO_x Annual Mean Dispersion Modelling Results for Ecological Receptors

RECEPTOR	SITE NAME	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/EAL (%)
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	30	0.3	1.1%	16.5	19.7	20.0	66.7%
OE2	Teesmouth and Cleveland Coast SPA, SSSI		0.3	1.1%	17.0	20.2	20.5	68.4%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		0.1	0.3%	20.9	23.4	23.5	78.2%
OE4	Eston Pumping Station LWS		0.1	0.2%	18.3	22.2	22.3	74.3%
OE5	Teesmouth NNR		<0.1	0.1%	21.2	23.2	23.3	77.5%
OE6	Teesmouth and Cleveland Coast SSSI		0.3	1.1%	20.7	23.9	24.2	80.7%
OE7	North York Moors SPA and SSSI		<0.1	<0.1%	6.6	7.1	7.1	23.6%

RECEPTOR	SITE NAME	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/EAL (%)
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar		<0.1	<0.1%	7.0	7.5	7.5	24.9%
OE9	Cliff Ridge SSSI		<0.1	<0.1%	6.6	7.1	7.1	23.7%
OE10	Durham Coast SSSI and Durham Coast NNR		0.3	1.1%	16.5	19.7	20.0	66.7%
OE11	Durham Coast SSSI		0.3	1.1%	17.0	20.2	20.5	68.4%
OE12	Hart Bog SSSI		0.1	0.3%	20.9	23.4	23.5	78.2%
OE13	Langbaurgh Ridge SSSI		0.1	0.2%	18.3	22.2	22.3	74.3%
OE14	Lovell Hill Pools SSSI		<0.1	0.1%	21.2	23.2	23.3	77.5%
OE15	Roseberry Topping SSSI		0.3	1.1%	20.7	23.9	24.2	80.7%
OE16	Saltburn Gill SSSI		<0.1	<0.1%	6.6	7.1	7.1	23.6%

Table 8B-52: Maximum 24-hour NO_x Dispersion Modelling Results for Ecological Receptors

RECEPTOR	SITE NAME	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/EAL (%)
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	75	2.7	3.6%	33.0	42.6	45.3	60.4%
OE2	Teesmouth and Cleveland Coast SPA, SSSI		2.9	3.8%	34.0	43.5	46.4	61.8%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		0.8	1.1%	41.8	53.3	54.2	72.2%
OE4	Eston Pumping Station LWS		1.3	1.7%	36.6	51.5	52.8	70.4%
OE5	Teesmouth NNR		0.7	0.9%	42.4	51.9	52.5	70.1%
OE6	Teesmouth and Cleveland Coast SSSI		2.9	3.8%	41.4	50.9	53.8	71.7%

RECEPTOR	SITE NAME	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/EAL (%)
OE7	North York Moors SPA and SSSI		0.2	0.2%	13.2	20.3	20.5	27.3%
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar		0.1	0.2%	14.0	19.1	19.2	25.6%
OE9	Cliff Ridge SSSI		0.1	0.1%	13.2	20.0	20.1	26.8%
OE10	Durham Coast SSSI and Durham Coast NNR		0.2	0.2%	15.8	21.1	21.3	28.3%
OE11	Durham Coast SSSI		0.2	0.2%	16.0	21.5	21.6	28.8%
OE12	Hart Bog SSSI		0.1	0.2%	16.2	20.8	20.9	27.9%
OE13	Langbaurgh Ridge SSSI		0.1	0.1%	14.2	20.1	20.2	27.0%
OE14	Lovell Hill Pools SSSI		0.3	0.4%	19.2	29.1	29.4	39.2%

RECEPTOR	SITE NAME	AQAL ($\mu g/m^3$)	PREDICTED CONCENTRATION (PC) ($\mu g/m^3$)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu g/m^3$)	PEC/EAL (%)
OE15	Roseberry Topping SSSI		0.1	0.2%	13.6	21.5	21.6	28.9%
OE16	Saltburn Gill SSSI		0.1	0.2%	17.8	24.0	24.1	32.1%

Table 8B-53: NH_3 Annual Mean Dispersion Modelling Results for Ecological Receptors

RECEPTOR	SITE NAME	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/EAL (%)
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	3	0.01	0.4%	1.2	1.3	1.3	43.2%
OE2	Teesmouth and Cleveland Coast SPA, SSSI		0.01	0.4%	1.2	1.3	1.3	43.2%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		<0.01	0.1%	1.3	1.3	1.3	44.4%
OE4	Eston Pumping Station LWS		<0.01	0.1%	1.4	1.4	1.4	48.0%
OE5	Teesmouth NNR		<0.01	<0.1%	1.3	1.3	1.3	44.3%
OE6	Teesmouth and Cleveland Coast SSSI		0.01	0.4%	1.3	1.4	1.4	46.6%
OE7	North York Moors SPA and SSSI		<0.01	<0.1%	0.9	0.9	0.9	30.3%

RECEPTOR	SITE NAME	AQAL ($\mu g/m^3$)	PROCESS CONTRIBUTION (PC) ($\mu g/m^3$)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) ($\mu g/m^3$)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) ($\mu g/m^3$)	PEC/EAL (%)
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar		<0.01	<0.1%	1.5	1.5	1.5	50.4%
OE9	Cliff Ridge SSSI		<0.01	<0.1%	1.4	1.4	1.4	46.9%
OE10	Durham Coast SSSI and Durham Coast NNR		<0.01	<0.1%	1.5	1.5	1.5	50.4%
OE11	Durham Coast SSSI		<0.01	<0.1%	1.6	1.6	1.6	53.8%
OE12	Hart Bog SSSI		<0.01	<0.1%	1.6	1.6	1.6	53.7%
OE13	Langbaurgh Ridge SSSI		<0.01	<0.1%	1.6	1.6	1.6	53.6%
OE14	Lovell Hill Pools SSSI		<0.01	<0.1%	1.3	1.3	1.3	43.8%
OE15	Roseberry Topping SSSI		<0.01	<0.1%	1.4	1.4	1.4	47.0%
OE16	Saltburn Gill SSSI		<0.01	<0.1%	1.1	1.1	1.1	37.0%

Table 8B-54: Dispersion Modelling Results for Ecological Receptors – Nutrient Nitrogen Deposition (Kg/Ha/Yr)

RECEPTOR	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (kgN/ha/yr)	PC % CRITICAL LOAD	BACKGROUND NITROGEN DEPOSITION (kgN/ha/yr)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (kgN/ha/yr)	PEC (kgN/ha/yr)	PEC % CRITICAL LOAD
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Coastal stable dune grassland (calcareous type)	10	0.11	1.1%	12.5	13.4	13.5	135.4%
OE2	Teesmouth and Cleveland Coast SPA, SSSI	Coastal stable dune grassland (calcareous type)	10	0.11	1.1%	12.5	13.4	13.5	135.4%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	Sub-Atlantic semi-dry calcareous grassland	10	0.03	0.3%	12.5	13.0	13.0	130.0%
OE4	Eston Pumping Station LWS	Sub-Atlantic semi-dry calcareous grassland	10	0.02	0.2%	12.7	13.5	13.5	135.2%
OE5	Teesmouth NNR	Coastal stable dune grassland (calcareous type)	10	0.01	0.1%	13.5	14.0	14.0	139.6%
OE6	Teesmouth and Cleveland Coast SSSI	Coastal stable dune grassland (calcareous type)	10	0.11	1.1%	12.5	13.4	13.5	135.4%

RECEPTOR	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (kgN/ha/yr)	PC % CRITICAL LOAD	BACKGROUND NITROGEN DEPOSITION (kgN/ha/yr)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (kgN/ha/yr)	PEC (kgN/ha/yr)	PEC % CRITICAL LOAD
OE7	North York Moors SPA and SSSI	Dry heaths, Raised and blanket bogs, Valley mires, poor fens and transition mires	5	<0.01	0.1%	15.5	15.6	15.6	312.9%
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar	Coastal stable dune grassland (calcareous type)	10	<0.01	<0.1%	13.5	13.6	13.6	136.3%
OE10	Durham Coast SSSI and Durham Coast NNR	Coastal stable dune grassland (calcareous type)	10	<0.01	<0.1%	13.5	13.6	13.6	136.2%
OE11	Durham Coast SSSI	Coastal stable dune grassland (calcareous type)	10	<0.01	<0.1%	13.5	13.6	13.7	136.4%
OE12	Hart Bog SSSI	Raised and blanket bogs, Valley mires, poor fens and transition mires	5	<0.01	<0.1%	14.8	14.9	14.9	298.5%
OE14	Lovell Hill Pools SSSI	Outstanding dragonfly	10	0.01	0.1%	13.5	13.6	13.7	136.4%

RECEPTOR	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (kgN/ha/yr)	PC % CRITICAL LOAD	BACKGROUND NITROGEN DEPOSITION (kgN/ha/yr)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (kgN/ha/yr)	PEC (kgN/ha/yr)	PEC % CRITICAL LOAD
		assemblage and Coenagrion pulchellum							
OE16	Saltburn Gill SSSI	Carpinus and Quercus mesic deciduous forest	15	0.01	<0.1%	21.8	22.0	22.0	146.6%

Table 8B-55: Dispersion Modelling Results for Ecological Receptors – Acid Deposition N (Keq/Ha/Yr)

RECEPTOR	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD (CL) RANGE	PC (keq/ha/yr)	PC % CRITICAL LOAD	BACKGROUND ACID DEPOSITION (keq/ha/yr)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (keq/ha/yr)	PEC (keq/ha/yr)	PEC % CRITICAL LOAD
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.008	0.2%	1.00	1.12	1.13	7.0%
OE2	Teesmouth and Cleveland Coast SPA, SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.008	0.2%	1.00	1.12	1.13	7.0%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.002	0.3%	0.89	1.00	1.01	6.7%
OE4	Eston Pumping Station LWS	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.002	0.4%	0.91	1.06	1.06	7.4%
OE5	Teesmouth NNR	No Sensitive Features							
OE6	Teesmouth and Cleveland Coast SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856	0.008	0.2%	1.00	1.12	1.14	7.2%

RECEPTOR	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD (CL) RANGE	PC (keq/ha/yr)	PC % CRITICAL LOAD	BACKGROUND ACID DEPOSITION (keq/ha/yr)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (keq/ha/yr)	PEC (keq/ha/yr)	PEC % CRITICAL LOAD
			Min CL Max S 4.0						
OE7	North York Moors SPA and SSSI	Calcareous grassland	Min CL min N 0.321 Min CL Max N 0.469 Min CL Max S 0.148	<0.001	<0.1%	1.26	1.28	1.28	253.7%
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	<0.001	0.1%	0.84	0.86	0.86	4.8%
OE10	Durham Coast SSSI and Durham Coast NNR	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	<0.001	0.1%	0.84	0.86	0.86	4.8%
OE11	Durham Coast SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	<0.001	0.1%	0.84	0.86	0.86	4.8%
OE12	Hart Bog SSSI	Calcareous grassland	Min CL min N 0.321 Min CL Max N 0.469 Min CL Max S 0.148	<0.001	<0.1%	0.82	0.84	0.84	178.2%

RECEPTOR	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD (CL) RANGE	PC (keq/ha/yr)	PC % CRITICAL LOAD	BACKGROUND ACID DEPOSITION (keq/ha/yr)	FUTURE YEAR WITHOUT PROPOSED DEVELOPMENT (keq/ha/yr)	PEC (keq/ha/yr)	PEC % CRITICAL LOAD
OE14	Lovell Hill Pools SSSI	No Sensitive Features							
OE16	Saltburn Gill SSSI	Calcareous grassland	Min CL min N 0.142 Min CL Max N 2.639 Min CL Max S 2.448	<0.001	<0.1%	0.81	0.85	0.85	32.3%

6.6 Conclusions

6.6.1 This report has assessed the impact on local air quality of the operation of the Proposed Development. The assessment has used the dispersion model ADMS to predict the increases in pollutant species released from the Proposed Development to the Study Areas for human health and designated ecosystems.

6.6.2 Emissions from the Fired Heater stacks, Auxiliary Boilers, flares and emergency generator stacks would result in small increases in ground-level concentrations of the modelled pollutants. Taking into account available information on background concentrations within the modelled domain, predicted operational concentrations of the modelled pollutants would be within current environmental standards for the protection of human health.

6.6.3 The modelling of impacts at designated ecological receptors (SACs / Ramsar / SPAs and SSSIs) and other ecological sites has predicted that emissions would be unlikely to give rise to significant impacts with regard to increases in atmospheric concentrations of NO_x and nutrient nitrogen and acid deposition. Further details on depositional impacts from the Proposed Development are presented in Chapter 12: Ecology and Nature Conservation [APP-064].

6.7 Annex B: Cumulative Assessment Inputs and In-Combination Results

Introduction

6.7.1 This Annex provides the details of the developments considered within the assessment to provide an inherently cumulative air quality assessment. This section is presented to inform on the cumulative inputs for the air quality model which have been utilised within the main air quality assessment and this section also present the In-Combination results. Cumulative impacts from existing sources of pollution in the area are accounted for in the adoption of site-specific background pollutant concentrations from archive sources and a programme of project-specific baseline air quality monitoring in close proximity to the Proposed Development site.

6.7.2 It is recognised, however, that there is a potential impact on local air quality from emission sources which have either received or are about to receive planning permission but have yet to come into operation. Some developments, such as HyGreen, are not predicted to have any operational emissions to air and have therefore not been considered in this assessment. Those that are relevant for consideration due to their potential operational air quality impacts are:

- ID 2: The Tees Combined Cycle Power Plant, EN010082;
- ID 3: Net Zero Teesside, EN010103;
- ID 19: Peak Resources Ltd, R/2017/0876/FFM;
- ID 20: CBRE anaerobic biogas production facility and combined heat and power plant, R/2016/0484/FFM;
- ID 22: Grangetown energy recovery facility (ERF), R/2019/0767/OOM;
- ID 30: Tourian Renewables, R/2019/0031/FFM;

- ID 46: Redcar Energy Centre (REC), R/2020/0411/FFM;
- ID166: O2N Energy (materials recycling facility and production of energy from waste), 13/2892/EIS;
- ID 178: Green Lithium Refining, R/2023/0291/ESM;
- ID 212: Teesside Green Energy Park, 22/1525/EIS; and
- ID 219: Greenergy Renewable Fuels and Circular Products Facility, 23/1019/EIS.

6.7.3 An update to the cumulative impacts of schemes within the Proposed Development study area and with enough data to be included in the detailed assessment considers the following additional schemes:

- ID 135: Suez Recycling and Recovery UK Ltd, 23/0090/EIS;
- ID 1: York Potash Limited, TR030002;
- ID 8: Lighthouse Green Fuels Ltd, EN010150;
- ID 260: British Steel Limited, R/2023/0793;
- ID 267: Willis Sustainable Fuels Ltd, R/2023/0646/ESM;
- ID 268: CSG, R/2023/0820/ESM; and
- ID 452: Greenergy Biofuels Immingham, 24/0709/FUL.

6.7.4 Given the distance of the development from the Proposed Development as well as the prevailing wind direction for the area and the quantity of pollutants emitted it is considered that the cumulative impacts will be **not significant** for the Peak Resources Ltd Facility, the Lighthouse Green Fuels Ltd and Willis Sustainable Fuels Ltd. Therefore, these developments have not been included in the dispersion modelling. All other developments listed above have been included in the operational dispersion modelling. This has enabled their pollutant contributions to be added to background pollutant concentrations. This provides a total pollutant concentration for the future year without Proposed Development. The predicted environmental concentration can then be calculated by the addition of the process contribution from the Proposed Development.

6.7.5 Information on the emissions from these sources has been derived from the available Planning Applications and has been included in the ADMS model. Due to the nature of these emissions, the cumulative assessment has only included emissions of NH_3, NO_x, PM_{10}, CO and SO_2, as these are the only pollutant species common to all the cumulative schemes.

Model Inputs

6.7.6 All cumulative model schemes have been assumed to run continuously at full output, therefore providing a worst-case assessment of the potential cumulative impact. The model inputs for the Proposed Development are as described in Tables 8B-2 and 8B-3, and those for the cumulative schemes are shown in updated Table 8B-57 to Table 8B-62.

Table 8B-56: Emission Inventory for the Cumulative Schemes (1)

Scheme	Net Zero Teesside	Redcar Energy Centre		Grangetown ERF	The Tees Combined Cycle Power Plant		CBRE	O2N Energy
Source name	NZT NE	Redcar Energy 1	Redcar Energy 2	Grangetown P	Teesside CCPP 1	Teesside CCPP2	CBRE_CHP	O2N
Stack Location	457046, 525393	455890, 526032	455895, 526030	454592, 521251	456453.55, 520437.16	456512.57, 520465.83	457285.3, 522315.2	446979, 521895
Temperature (°C)	60	140	140	140	72	72	200	138
Actual or Normalised (NTP)	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual
Efflux type	Velocity	Velocity	Velocity	Velocity	Volume	Velocity	Volume	Velocity
Velocity (m/s) / Volume flux (m^3/s)	24.8	19.1	19.1	15	928	18.462	9	16.95
Height (m)	115	80	80	70	75	75	28	65
Diameter (m)	6.6	2.3	2.3	3.48	8	8	0.52	2.1
NO_x (g/s)	34.10	6.70	6.70	9.70	22.30	22.30	2.57	5.85
NO_x (short term) (g/s)	34.10	6.70	6.70	9.70	22.30	22.30	2.57	5.85
CO(g/s)	100.20	2.80	2.80	4.00	22.30	22.30	7.18	0.98
SO_2(g/s)	-	-	-	-	-	-	1.80	0.98
SO_2(short term) (g/s)	-	-	-	-	-	-	1.80	0.98
PM_{10} (g/s)	-	-	-	-	-	-	-	0.20
NH_3 (g/s)	2.20	0.55	0.55	-	-	-	-	0.39
HCl (g/s)	-	-	-	-	-	-	-	0.2
HCl (short term) (g/s)	-	-	-	-	-	-	-	0.39

HF (g/s)	-	-	-	-	-	-	-	0.02
HF (Short term) (g/s)	-	-	-	-	-	-	-	0.04

Table 8B-57: Emission Inventory for the Cumulative Schemes (2)

Scheme	Green Lithium Refining				Teesside Green Energy Park
Source name	GreenLit1	GreenLit2	GreenLit3	GreenLit4	TeessideGreenPark
Stack Location	455768.9, 523356.714	455768.9, 523356.714	455452.814, 523651.395	455704.92, 523221.926	453157, 524499
Temperature (°C)	70	80	80	135	150
Actual or Normalised (NTP)	Actual	Actual	Actual	Actual	Actual
Efflux type	Velocity	Velocity	Velocity	Velocity	Velocity
Velocity (m/s) / Volume flux (m^3/s)	2.8	2.4	23.5	19.6	21.7
Height (m)	35	35	47	20	85
Diameter (m)	1.8	0.2	0.4	0.5	2
NO_x (g/s)	1.1531	-	-	0.25790	3.581
NO_x (short term)(g/s)	1.1531	-	-	0.25790	3.581
CO(g/s)	0.5766	-	-	0.2579	1.492
SO_2(g/s)	-	-	-	-	0.895
SO_2(short term) (g/s)	-	-	-	-	0.895
PM_{10} (g/s)	0.1153	0.0012	0.0456	-	0.149
NH_3 (g/s)	-	-	-	-	0.298
HCl (g/s)	-	-	-	-	0.1790
HCl (short term) (g/s)	-	-	-	-	0.119
HF (g/s)	-	-	-	-	0.03
HF (Short term) (g/s)	-	-	-	-	1.79

Table 8B-58: Emission Inventory for the Cumulative Schemes (3)

Scheme	Tourian Renewables							
Source name	TourianB1	TourianB2	TourianB3	TourianB4	TourianF1	TourianF2	TourianF3	TourianF4
Stack Location	457874.6, 521542.7	457881.7, 521526.8	457888.9, 521510.8	457896, 521494.9	457852.4, 521553.6	457856, 521555.2	457854, 521549.9	457857.7, 521551.6
Temperature (°C)	140	140	140	140	850	850	850	850
Actual or Normalised (NTP)	NTP	NTP	NTP	NTP	NTP	NTP	NTP	NTP
Efflux type	Volume	Volume	Volume	Volume	Volume	Volume	Volume	Volume
Velocity (m/s) / Volume flux (m^3/s)	0.407	0.407	0.407	0.407	0.249	0.249	0.249	0.249
Height (m)	18	18	18	18	12	12	12	12
Diameter (m)	0.2	0.2	0.2	0.2	2	2	2	2
NO_x (g/s)	0.0815	0.0815	0.0815	0.0815	0.0497	0.0497	0.0497	0.0497
NO_x (short term) (g/s)	0.0815	0.0815	0.0815	0.0815	0.0497	0.0497	0.0497	0.0497
CO(g/s)	0.0407	0.0407	0.0407	0.0407	0.0087	0.0087	0.0087	0.0087
SO_2(g/s)	0.0143	0.0143	0.0143	0.0143	0.0249	0.0249	0.0249	0.0249
SO_2 (short term) (g/s)	0.0143	0.0143	0.0143	0.0143	0.0249	0.0249	0.0249	0.0249
PM_{10} (g/s)	0.00204	0.00204	0.00204	0.00204	0.00124	0.00124	0.00124	0.00124
NH_3 (g/s)	-	-	-	-	-	-	-	-
HCl (g/s)	-	-	-	-	-	-	-	-
HCl (short term) (g/s)	-	-	-	-	-	-	-	-
HF (g/s)	-	-	-	-	-	-	-	-
HF (Short term) (g/s)	-	-	-	-	-	-	-	-

Table 8B-59: Emission Inventory for the Cumulative Schemes (4)

Scheme	Greenergy International Ltd						
Source name	GreenEn1	GreenEn2	GreenEn3	GreenEn4	GreenEn5	GreenEn6	GreenEn7
Stack Location	452313.9,524445.5	452314.1,524423.1	452313.9,524400.4	452313.9,524377.8	452313.8,524355.4	452313.9,524332.7	452551.3,524556.4
Temperature (°C)	150	150	150	150	150	150	445
Actual or Normalised (NTP)	Actual	Actual	Actual	Actual	Actual	Actual	Actual
Efflux type	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity
Velocity (m/s) / Volume flux (m^3/s)	24.93	24.93	24.93	24.93	24.93	24.93	22.4
Height (m)	80	80	80	80	80	80	60
Diameter (m)	0.66	0.66	0.66	0.66	0.66	0.66	0.45
NO_x (g/s)	1.063	1.063	1.063	1.063	1.063	1.063	0.076
NO_x (short Term) (g/s)	1.063	1.063	1.063	1.063	1.063	1.063	0.076
CO(g/s)	0.354	0.354	0.354	0.354	0.354	0.354	-
SO_2(g/s)	0.213	0.213	0.213	0.213	0.213	0.213	-
SO_2(short term) (g/s)	0.213	0.213	0.213	0.213	0.213	0.213	-
PM_{10} (g/s) NH_3 (g/s)	0.071 -	0.071 -	0.071 -	0.071 -	0.071 -	0.071 -	- -
HCl (g/s)	0.071	0.071	0.071	0.071	0.071	0.071	-
HCl (short term) (g/s)	0.071	0.071	0.071	0.071	0.071	0.071	-
HF (g/s)	0.00071	0.00071	0.00071	0.00071	0.00071	0.00071	-
HF (Short term) (g/s)	0.00071	0.00071	0.00071	0.00071	0.00071	0.00071	-

Table 8B-60: Emission Inventory for the Cumulative Schemes (5)

Scheme	Greenergy International Ltd										
Source name	GreenEn8	GreenEn9	GreenEn10	GreenEn11	GreenEn12	GreenEn13	GreenEn14	GreenEn15	GreenEn16	GreenEn17	GreenEn18
Stack Location	452414.5,524464.9	452365.6,524419.4	452383.2,524414.5	452552.3,524487.4	452552.3,524490.1	452579.8,524382	452628.3,524388.9	452624.8,524383.2	452281.3,524260.3	452302.8,524480.1	452302.5,524536.9
Temperature (°C)	150	150	150	445	445	445	445	445	15	15	15
Actual or Normalised (NTP)	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual
Efflux type	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity	Velocity
Velocity (m/s) / Volume flux (m^3/s)	15.8	22.8	23.3	23.2	22.4	24.3	23.4	23.4	21.4	19.2	20.2
Height (m)	60	60	60	60	60	60	60	60	28	20	20
Diameter (m)	1	0.35	0.2	0.7	0.45	2.15	0.45	0.26	2.5	1.3	1.15
NO_x (g/s)	0.208	0.047	0.016	0.191	0.076	0.947	0.080	0.027	-	-	-
NO_x (short term) (g/s)	0.208	0.047	0.016	0.191	0.076	0.947	0.080	0.027	-	-	-
CO (g/s)	-	-	-	-	-	-	-	-	-	-	-
SO_2 (g/s)	-	-	-	-	-	-	-	-	-	-	-
SO_2 (short term) (g/s)	-	-	-	-	-	-	-	-	-	-	-
PM_{10} (g/s)	-	-	-	-	-	-	-	-	0.349	0.085	0.070

NH_3 (g/s)	-	-	-	-	-	-	-	-	-	-	-
HCl (g/s)	-	-	-	-	-	-	-	-	-	-	-
HCl (short term) (g/s)	-	-	-	-	-	-	-	-	-	-	-
HF (g/s)	-	-	-	-	-	-	-	-	-	-	-
HF (Short term) (g/s)	-	-	-	-	-	-	-	-	-	-	-

Table 8B-61: Emission Inventory for the Cumulative Schemes (5)

Scheme	York Potash	British Steel		CSG	Suez Recycling and Recovery			Greenergy Biofuels
Source name	YorkPotash	BritishSteel1	BritishSteel2	CSG	Suez1	Suez2	Suez3	GreenenBio
Stack Location	454769, 525676	455806, 521343	455817, 521342	456041, 520256	447969, 522433	447969, 522433	447969, 522433	453709, 524492
Temperature (°C)	200	80	80	54.5	67	67	67	47
Actual or Normalised (NTP)	Actual	Actual	Actual	Actual	Actual	Actual	Actual	Actual
Efflux type	Velocity	Volume	Volume	Velocity	Velocity	Velocity	Velocity	Velocity
Velocity (m/s) / Volume flux (m^3/s)	20	359.1	359.1	15.5	10.96	10.47	12.16	5.95
Height (m)	30	36	36	32	70	70	70	35
Diameter (m)	1	4.9	4.9	1.2	1.7	1.7	1.7	1.4
NO_x (g/s)	0.69	27.78	27.78	1.754	3.37	3.26	3.67	0.75
NO_x (short term) (g/s)	0.69	27.78	27.78	5.845	7.488	7.247	8.164	0.75
CO (g/s)	-	-	-	1.461	2.808	2.718	3.062	0.53
SO_2 (g/s)	0.21	6.94	6.94	0.4384	0.75	0.72	0.82	-
SO_2 (short term) (g/s)	0.21	6.94	6.94	2.9226	3.744	3.623	4.082	-
PM_{10} (g/s)		1.39	1.39	0.073	0.544	0.562	0.612	-
NH_3 (g/s)	-	-	-	-	0.19	0.18	0.2	0.01
HCl (g/s)	-	-	-	0.877	0.15	0.14	0.16	-
HCl (short term) (g/s)	-	-	-	0.877	1.123	1.087	1.225	-
HF (g/s)	-	-	-	0.015	0.019	0.018	0.02	-
HF (Short term) (g/s)	-	-	-	0.059	0.075	0.072	0.082	-

6.7.7 The buildings for each of the cumulative schemes, that may affect the dispersion of the emissions from the stacks have been included in the model run for the assessment of cumulative impacts. The buildings included in the model are shown in updated Table 8B-63.

Table 8B-62: Buildings for Inclusion in the Cumulative Scheme Model

CUMULATIVE SCHEME	BUILDING	GRID REFERENCE	HEIGHT (m)	LENGTH (m)	WIDTH (m)	ANGLE (°)
NZT Adsorber	Rectangular	457046, 525392	80.0	35.0	24.0	112.0
Redcar Energy Centre Boiler Hall	Rectangular	455863, 525961	49.0	25.0	63.0	112.5
Grangetown ERF	Rectangular	454568, 521276	45.0	25.0	63.0	65.0
The Tees CCPP HRSG 1	Rectangular	456468, 520407	45.0	26.0	30.0	65.0
The Tees CCPP HRSG 2	Rectangular	456528, 520434	45.0	26.0	30.0	65.0
CBRE CHP	Rectangular	457281, 522303	7.5	12.8	16.9	155.3
Green Lithium Refining	Rectangular	455571, 523563	43.0	317.3	69.2	135.2
Greenergy International Ltd	Rectangular	452304, 524389	47.0	65.2	129.9	269.7
Greenergy Biofuels	Rectangular	453712, 524509	10.0	16.0	20.0	180.0
British Steel	Rectangular	455816, 521401	22.0	46.0	24.0	0.0
Suez Recycling and Recovery	Rectangular	447963, 522493	41.0	82.5	56.7	0.0
CSG 1	Rectangular	456062, 520289	15.7	54.1	43.5	154.8
CSG 2	Rectangular	456070, 520291	30.7	56.0	17.5	244.6
CSG 3	Rectangular	456043, 520263	12.1	21.8	12.6	154.8

Cumulative Assessment Results – Human Health and Ecological Receptors

6.7.8 Results of the cumulative assessment are as presented in Section 8B.7 above. The results presented within the assessment are inherently cumulative, as explained in Section 6.7.1 of the original ES. In summary, the main assessment in inherently cumulative because the air quality modelling for the operational phase includes all relevant committed developments on top of the existing background, both with and without the Proposed Development.

In Combination Assessment Results – Ecological Receptors.

6.7.9 The updated in-combination assessment results below have been considered in the updated Report to Inform Habitats Regulations Assessment submitted at Deadline 5. They show results at the same locations as in the main assessment.

Table 8B-63: Annual Mean NO_x Dispersion Modelling Results for Ecological Receptors

RECEPTOR	SITE NAME	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/EAL (%)	BACKGROND CONCENTRATION (BC) (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/EAL (%)
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	30	3.5	11.7%	16.5	20.0	66.7%
OE2	Teesmouth and Cleveland Coast SPA, SSSI		3.5	11.7%	17.0	20.5	68.4%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		2.6	8.6%	20.9	23.5	78.2%
OE4	Eston Pumping Station LWS		4.0	13.3%	18.3	22.3	74.3%
OE5	Teesmouth NNR		2.1	6.9%	21.2	23.3	77.5%
OE6	Teesmouth and Cleveland Coast SSSI		3.5	11.7%	20.7	24.2	80.7%
OE7	North York Moors SPA and SSSI		0.5	1.6%	6.6	7.1	23.6%
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar		0.5	1.6%	7.0	7.5	24.9%
OE9	Cliff Ridge SSSI		0.5	1.7%	6.6	7.1	23.7%
OE10	Durham Coast SSSI and Durham Coast NNR		0.5	1.7%	7.9	8.4	28.0%
OE11	Durham Coast SSSI		0.6	1.9%	8.0	8.6	28.5%
OE12	Hart Bog SSSI		0.4	1.2%	8.1	8.5	28.2%
OE13	Langbaurgh Ridge SSSI		0.6	1.9%	7.1	7.7	25.5%
OE14	Lovell Hill Pools SSSI		0.9	3.1%	9.6	10.5	35.1%

RECEPTOR	SITE NAME	AQAL ($\mu g/m^3$)	PREDICTED CONCENTRATION (PC) ($\mu g/m^3$)	PC/EAL (%)	BACKGROND CONCENTRATION (BC) ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu g/m^3$)	PEC/EAL (%)
OE15	Roseberry Topping SSSI		0.6	1.9%	6.8	7.4	24.6%
OE16	Saltburn Gill SSSI		0.6	1.9%	8.9	9.5	31.6%

Table 8B-64: Maximum 24-hour NO_x Dispersion Modelling Results for Ecological Receptors

RECEPTOR	SITE NAME	AQAL (µg/m^3)	PREDICTED CONCENTRATION (PC) (µg/m^3)	PC/EAL (%)	BACKGROND CONCENTRATION (BC) (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) (µg/m^3)	PEC/EAL (%)
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	75	12.3	16.4%	33.0	45.3	60.4%
OE2	Teesmouth and Cleveland Coast SPA, SSSI		12.4	16.5%	34.0	46.4	61.8%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		12.4	16.5%	41.8	54.2	72.2%
OE4	Eston Pumping Station LWS		16.2	21.6%	36.6	52.8	70.4%
OE5	Teesmouth NNR		10.1	13.5%	42.4	52.5	70.1%
OE6	Teesmouth and Cleveland Coast SSSI		12.4	16.5%	41.4	53.8	71.7%
OE7	North York Moors SPA and SSSI		7.3	9.7%	13.2	20.5	27.3%
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar		5.2	7.0%	14.0	19.2	25.6%
OE9	Cliff Ridge SSSI		6.9	9.2%	13.2	20.1	26.8%
OE10	Durham Coast SSSI and Durham Coast NNR		5.5	7.3%	15.8	21.3	28.3%
OE11	Durham Coast SSSI		5.6	7.5%	16.0	21.6	28.8%
OE12	Hart Bog SSSI		4.7	6.3%	16.2	20.9	27.9%
OE13	Langbaurgh Ridge SSSI		6.0	8.1%	14.2	20.2	27.0%
OE14	Lovell Hill Pools SSSI		10.2	13.6%	19.2	29.4	39.2%

RECEPTOR	SITE NAME	AQAL ($\mu g/m^3$)	PREDICTED CONCENTRATION (PC) ($\mu g/m^3$)	PC/EAL (%)	BACKGROND CONCENTRATION (BC) ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATIONS (PEC) ($\mu g/m^3$)	PEC/EAL (%)
OE15	Roseberry Topping SSSI		8.0	10.7%	13.6	21.6	28.9%
OE16	Saltburn Gill SSSI		6.3	8.4%	17.8	24.1	32.1%

Table 8B-65: NH_3 Annual Mean Dispersion Modelling Results for Ecological Receptors

RECEPTOR	SITE NAME	AQAL (µg/m^3)	PROCESS CONTRIBUTION (PC) (µg/m^3)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) (µg/m^3)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) (µg/m^3)	PEC/EAL (%)
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	3	0.10	3.2%	1.2	1.3	43.2%
OE2	Teesmouth and Cleveland Coast SPA, SSSI		0.10	3.2%	1.2	1.3	43.2%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI		0.03	1.1%	1.3	1.3	44.4%
OE4	Eston Pumping Station LWS		0.04	1.3%	1.4	1.4	48.0%
OE5	Teesmouth NNR		0.03	1.0%	1.3	1.3	44.3%
OE6	Teesmouth and Cleveland Coast SSSI		0.10	3.2%	1.3	1.4	46.6%
OE7	North York Moors SPA and SSSI		0.01	0.3%	0.9	0.9	30.3%
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar		0.01	0.4%	1.5	1.5	50.4%
OE9	Cliff Ridge SSSI		0.01	0.3%	1.4	1.4	46.9%
OE10	Durham Coast SSSI and Durham Coast NNR		0.01	0.4%	1.5	1.5	50.4%
OE11	Durham Coast SSSI		0.01	0.5%	1.6	1.6	53.8%
OE12	Hart Bog SSSI		0.01	0.3%	1.6	1.6	53.7%

RECEPTOR	SITE NAME	AQAL ($\mu g/m^3$)	PROCESS CONTRIBUTION (PC) ($\mu g/m^3$)	PC/EAL (%)	BACKGROUND CONCENTRATION (BC) ($\mu g/m^3$)	PREDICTED ENVIRONMENTAL CONCENTRATION (PEC) ($\mu g/m^3$)	PEC/EAL (%)
OE13	Langbaurgh Ridge SSSI		0.01	0.3%	1.6	1.6	53.6%
OE14	Lovell Hill Pools SSSI		0.01	0.5%	1.3	1.3	43.8%
OE15	Roseberry Topping SSSI		0.01	0.3%	1.4	1.4	47.0%
OE16	Saltburn Gill SSSI		0.01	0.3%	1.1	1.1	37.0%

Table 8B-66: Dispersion Modelling Results for Ecological Receptors - Nutrient Nitrogen Deposition (Kg/Ha/Yr)

RECEPTOR ID	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (kg/ha/yr)	PC % CRITICAL LOAD	BACKGROUND NITROGEN DEPOSITION (kg/ha/yr)	PEC (kg/ha/yr)	PEC % CRITICAL LOAD
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Coastal stable dune grassland (calcareous type)	10	1.0	10.1%	12.5	13.5	135.4%
OE2	Teesmouth and Cleveland Coast SPA, SSSI	Coastal stable dune grassland (calcareous type)	10	1.0	10.1%	12.5	13.5	135.4%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	Sub-Atlantic semi-dry calcareous grassland	10	0.5	5.4%	12.5	13.0	130.0%
OE4	Eston Pumping Station LWS	Sub-Atlantic semi-dry calcareous grassland	10	0.8	7.8%	12.7	13.5	135.2%
OE5	Teesmouth NNR	Coastal stable dune grassland (calcareous type)	10	0.5	4.5%	13.5	14.0	139.6%
OE6	Teesmouth and Cleveland Coast SSSI	Coastal stable dune grassland (calcareous type)	10	1.0	10.1%	12.5	13.5	135.4%
OE7	North York Moors SPA and SSSI	Dry heaths, Raised and blanket bogs, Valley mires, poor fens and transition mires	5	0.1	2.3%	15.5	15.6	312.9%

RECEPTOR ID	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (kg/ha/yr)	PC % CRITICAL LOAD	BACKGROUND NITROGEN DEPOSITION (kg/ha/yr)	PEC (kg/ha/yr)	PEC % CRITICAL LOAD
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar	Coastal stable dune grassland (calcareous type)	10	0.1	1.3%	13.5	13.6	136.3%
OE10	Durham Coast SSSI and Durham Coast NNR	Coastal stable dune grassland (calcareous type)	10	0.1	1.4%	13.5	13.6	136.4%
OE11	Durham Coast SSSI	Coastal stable dune grassland (calcareous type)	10	0.2	1.5%	13.5	13.7	136.5%
OE12	Hart Bog SSSI	Raised and blanket bogs, Valley mires, poor fens and transition mires	5	0.1	2.0%	14.8	14.9	297.4%
OE14	Lovell Hill Pools SSSI	Outstanding dragonfly assemblage and Coenagrion pulchellum	10	0.2	2.1%	13.5	13.7	137.5%
OE16	Saltburn Gill SSSI	Carpinus and Quercus mesic deciduous forest	15	0.2	1.5%	21.8	22.0	146.6%

Table 8B-67: Dispersion Modelling Results for Ecological Receptors - Acid Deposition N (Keq/Ha/Yr)

RECEPTOR	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (keq/ha/yr)	PC % CRITICAL LOAD	BACKGROUND ACID DEPOSITION (keq/ha/yr)	PEC (keq/ha/yr)	PEC % CRITICAL LOAD
OE1	Teesmouth and Cleveland Coast Ramsar, SPA, SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.132	1.5%	1.00	1.13	26.0%
OE2	Teesmouth and Cleveland Coast SPA, SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.132	1.5%	1.00	1.13	26.0%
OE3	Coatham Marsh LWS and Teesmouth and Cleveland Coast SPA, SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.117	1.9%	0.89	1.01	8.6%
OE4	Eston Pumping Station LWS	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.151	2.4%	0.91	1.06	9.8%
OE5	Teesmouth NNR	No Sensitive Features						
OE6	Teesmouth and Cleveland Coast SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.132	1.5%	1.00	1.13	26.0%
OE7	North York Moors SPA and SSSI	Calcareous grassland	Min CL min N 0.321 Min CL Max N 0.469	0.019	3.7%	1.26	1.28	257.4%

RECEPTOR	SITE NAME	MOST STRINGENT CRITICAL LOAD CLASS APPLICABLE FOR THE SITE	LOWER VALUE OF APPLICABLE CRITICAL LOAD RANGE	PC (keq/ha/yr)	PC % CRITICAL LOAD	BACKGROUND ACID DEPOSITION (keq/ha/yr)	PEC (keq/ha/yr)	PEC % CRITICAL LOAD
			Min CL Max S 0.148					
OE8	North Cumbria Coast SPA, Durham Cost SAC, Northumbria Coast Ramsar	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.020	0.3%	0.84	0.86	5.1%
OE10	Durham Coast SSSI and Durham Coast NNR	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.022	0.3%	0.84	0.86	5.1%
OE11	Durham Coast SSSI	Calcareous grassland	Min CL min N 0.856 Min CL Max N 4.856 Min CL Max S 4.0	0.024	0.3%	0.84	0.86	5.1%
OE12	Hart Bog SSSI	Calcareous grassland	Min CL min N 0.321 Min CL Max N 0.469 Min CL Max S 0.148	0.016	3.4%	0.82	0.84	181.6%
OE14	Lovell Hill Pools SSSI	No Sensitive Features						
OE16	Saltburn Gill SSSI	Calcareous grassland	Min CL min N 0.142 Min CL Max N 2.639 Min CL Max S 2.448	0.043	1.6%	0.81	0.85	33.9%

6.8 Annex D: Combined Construction Traffic and Operational Phase at Traffic Receptors

Table 8B-68: NO_2 Annual Mean Dispersion Modelling Results for Human Health Receptors for Construction Traffic and Operational Phase Combined

RECEPTOR	PC (CONSTRUCTION TRAFFIC + OPERATIONAL) (µG/M3)	PC AS % OF AQAL
R001	0.1	0.2%
R002	0.1	0.2%
R003	0.1	0.3%
R004	0.1	0.2%
R005	0.1	0.2%
R006	0.1	0.3%
R007	0.1	0.1%
R008	0.1	0.3%
R009	0.1	0.2%
R010	0.1	0.2%
R011	0.1	0.2%
R012	0.1	0.1%
R013	<0.1	0.1%
R014	<0.1	0.1%
R015	<0.1	0.1%
R016	<0.1	0.1%
R017	<0.1	0.1%
R018	<0.1	0.1%
R019	<0.1	0.1%
R020	<0.1	0.1%
R021	0.1	0.1%
R022	0.1	0.1%

Table 8B-69: NO_x Annual Mean and Nitrogen Deposition Dispersion Modelling Results for Ecological Receptors for Construction Traffic and Operational Phase Combined

SITE ID	SITE DESCRIPTION	NO_x CONCENTRATION				NITROGEN DEPOSITION	
		PC (CONSTRUCTION TRAFFIC + OPERATIONAL) ($\mu g/m^3$)	PC AS % OF CRITICAL LEVEL	PEC ($\mu g/m^3$)	PEC AS % OF CRITICAL LEVEL	PC (CONSTRUCTION TRAFFIC + OPERATIONAL) (kgN/ha/yr)	PC AS % OF CRITICAL LOAD
RE_001	Teesmouth and Cleveland Coast SSSI and SPA	0.1	0.4%	22.3	74.3%	0.1	0.5%
RE_002	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	0.3	0.9%	33.4	111.4%	0.1	1.2%
RE_003	Teesmouth and Cleveland Coast SSSI	0.4	1.2%	19.1	63.7%	0.1	1.3%
RE_004	Charlton's Pond LNR	<0.1	0.1%	20.0	66.6%	<0.1	0.1%
RE_005	Teesmouth and Cleveland Coast SSSI and SPA	0.1	0.4%	27.2	90.7%	0.1	0.6%
RE_006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	0.2	0.7%	27.2	90.7%	0.1	1.0%
RE_007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	0.3	1.0%	31.3	104.2%	0.2	1.6%

SITE ID	SITE DESCRIPTION	NO_x CONCENTRATION				NITROGEN DEPOSITION	
		PC (CONSTRUCTION TRAFFIC + OPERATIONAL) (µg/m^3)	PC AS % OF CRITICAL LEVEL	PEC (µg/m^3)	PEC AS % OF CRITICAL LEVEL	PC (CONSTRUCTION TRAFFIC + OPERATIONAL) (kgN/ha/yr)	PC AS % OF CRITICAL LOAD
RE_008	Teesmouth and Cleveland Coast SSSI and SPA	0.5	1.5%	28.6	95.4%	0.2	2.3%
RE_009	Teesmouth and Cleveland Coast SSSI and SPA	<0.1	0.1%	23.3	77.8%	<0.1	0.1%
RE_010	Wilton Woods Complex LWS	0.1	0.2%	22.4	74.7%	0.1	0.5%

Table 8B-70: NH_3 Annual Mean and Acid Deposition Dispersion Modelling Results for Ecological Receptors for Construction Traffic and Operational Phase Combined

SITE ID	SITE DESCRIPTION	NO_x CONCENTRATION				NITROGEN DEPOSITION	
		PC (CONSTRUCTION TRAFFIC + OPERATIONAL) (µg/m^3)	PC AS % OF CRITICAL LEVEL	PEC (µg/m^3)	PEC AS % OF CRITICAL LEVEL	PC (CONSTRUCTION TRAFFIC + OPERATIONAL) (kgN/ha/yr)	PC AS % OF CRITICAL LOAD
RE_001	Teesmouth and Cleveland Coast SSSI and SPA	<0.1	0.3%	1.7	56.1%	0.1	0.5%
RE_002	Teesmouth and Cleveland Coast SSSI and SPA and Coathem Marsh LWS	<0.1	0.6%	2.5	83.7%	0.1	1.2%
RE_003	Teesmouth and Cleveland Coast SSSI	<0.1	0.6%	1.3	44.9%	0.1	1.3%
RE_004	Charlton's Pond LNR	<0.1	<0.1%	1.7	56.7%	NA	NA
RE_005	Teesmouth and Cleveland Coast SSSI and SPA	<0.1	0.3%	1.9	64.2%	0.1	0.6%
RE_006	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	<0.1	0.6%	2.1	71.2%	0.1	1.0%
RE_007	Teesmouth and Cleveland Coast SSSI, RAMSAR and SPA	<0.1	0.9%	2.5	83.1%	0.2	1.6%

SITE ID	SITE DESCRIPTION	NO_x CONCENTRATION				NITROGEN DEPOSITION	
		PC (CONSTRUCTION TRAFFIC + OPERATIONAL) ($\mu g/m^3$)	PC AS % OF CRITICAL LEVEL	PEC ($\mu g/m^3$)	PEC AS % OF CRITICAL LEVEL	PC (CONSTRUCTION TRAFFIC + OPERATIONAL) (kgN/ha/yr)	PC AS % OF CRITICAL LOAD
RE_008	Teesmouth and Cleveland Coast SSSI and SPA	<0.1	1.3%	2.2	74.7%	0.2	2.3%
RE_009	Teesmouth and Cleveland Coast SSSI and SPA	<0.1	0.1%	1.6	54.9%	0.0	0.1%
RE_010	Wilton Woods Complex LWS	<0.1	0.2%	2.1	68.9%	NA	NA