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Bramford to Twinstead Reinforcement

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Air Quality

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Contents

13.	Air Quality	1
13.1	Introduction	1
13.2	Regulatory and Planning Policy Context	1
13.3	Scope of the Assessment	2
13.4	Approach and Methods	3
13.5	Baseline Environment	7
13.6	Likely Significant Effects During Construction (Without Mitigation)	12
13.7	Likely Significant Effects During Operation (Without Mitigation)	14
13.8	Proposed Mitigation During Construction	14
13.9	Proposed Mitigation During Operation	15
13.10	Residual Significant Effects (With Mitigation)	15
13.11	Sensitivity Testing	15
13.12	Conclusion	16

13. Air Quality

13.1 Introduction

- 13.1.1 This Environmental Statement (ES) chapter details the likely significant effects of the project on air quality. The receptors considered within this chapter comprise human receptors, particularly residential and community receptors close to the Order Limits. The chapter has links with ES Chapter 7: Biodiversity (**application document 6.2.7**), which assesses the significance of the effects of dust and emissions on ecological receptors.
- 13.1.2 Machinery and vehicles can generate dust and fine particulate matter, particularly through earthwork and soil stripping activities during construction. Machinery and vehicles also emit exhaust emissions through the combustion of fossil fuels.
- 13.1.3 There is limited potential for the project to generate dust and emissions during operation, due to the limited activities associated with inspection and maintenance. This has been scoped out of the assessment (see Section 13.3 for further details).
- 13.1.4 This chapter also has links with the Transport Assessment (**application document 5.7**), which provides the baseline information used to assess the impacts of construction traffic using the road network on air quality. Cumulative effects between the project and other proposed developments as well as receptors affected by more than one source of direct environmental impact resulting from the same development are considered in ES Chapter 15: Cumulative Effects Assessment (**application document 6.2.15**).
- 13.1.5 This chapter is supported by the following appendix:
- Appendix 13.1: Dust Risk Assessment (**application document 6.3.13.1**).
- 13.1.6 This chapter is also supported by the following figures, which can be found in ES Volume 6.4: Figures (**application document 6.4**):
- Figure 13.1: Air Quality Study Area; and
 - Figure 12.1: Traffic and Transport Study Area.

13.2 Regulatory and Planning Policy Context

National Policy Statement

- 13.2.1 Chapter 2: Regulatory and Planning Policy Context (**application document 6.2.2**) sets out the overarching policy relevant to the project including the Overarching National Policy Statement (NPS) for Energy (EN-1) (Department of Energy and Climate Change (DECC), 2011a). This is supported by NPS for Electricity Networks (EN-5) (DECC, 2011b).
- 13.2.2 EN-1 states that energy projects could have adverse effects on air quality. Paragraph 5.2.7 of EN-1 states that the ES should describe '*any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project*'. The consultation draft of Overarching NPS for Energy (EN-1) (Department for Business, Energy and Industrial Strategy (BEIS), 2021) contains the same text.
- 13.2.3 EN-5 (DECC, 2011b) and the consultation draft of EN-5 (BEIS, 2021b) make no specific reference to air quality.

- 13.2.4 Full consideration of the NPS can be found in the Planning Statement (**application document 7.1**).

Other Relevant Policy and Guidance

- 13.2.5 ES Appendix 2.1: Legislation, Policy and Guidance (**application document 6.3.2.1**) includes legislation and national policy relevant to air quality. It also outlines key guidance documents that have been referenced when writing this chapter.
- 13.2.6 ES Appendix 2.2: Local Planning Policy (**application document 6.3.2.2**) lists the local policy potentially relevant to air quality. The emerging Babergh and Mid Suffolk Joint Local Plan (2020) Policy LP17 requires developments to be environmentally sustainable and appropriately mitigated against adverse environmental impacts and should consider issues such as air quality. The adopted Braintree District Council Local Plan (2022) Policy LPP 70 states that proposals should prevent unacceptable risks from all pollution, including emissions and air quality.

13.3 Scope of the Assessment

- 13.3.1 ES Appendix 5.1: Scope of the Assessment (**application document 6.3.5.1**) outlines the scope of the assessment for air quality. This has been informed by the Scoping Opinion provided by the Planning Inspectorate (**application document 6.6**) on behalf of the Secretary of State, following the submission of the Scoping Report (**application document 6.5.1**).
- 13.3.2 The scope has also been informed through engagement with relevant consultees as summarised in ES Appendix 5.2: Response to Consultation Feedback (**application document 6.3.5.2**).
- 13.3.3 The Scoping Report (**application document 6.5.1**) confirmed that there were likely to be low vehicles numbers associated with the operation of the project, therefore it proposed scoping out air quality during the operational phase. The Planning Inspectorate agreed with this in the Scoping Opinion (see ID 4.8.5 in **application document 6.6**). Therefore, operational effects are scoped out of this chapter.
- 13.3.4 Therefore, the specific aspects that are scoped into the air quality assessment are:
- Construction dust (human and ecological receptors);
 - Construction generator use (human receptors); and
 - Construction traffic emissions (human receptors).

Project Engagement

- 13.3.5 National Grid has held a number of meetings with relevant organisations including Babergh and Mid Suffolk District Council and Braintree District Council. With specific reference to air quality, an initial meeting was held with Babergh and Mid Suffolk District Council and Braintree District Council on 4 March 2021. The proposed scope of assessment work was discussed with regards to air quality. At this meeting, National Grid proposed scoping out air quality during the operational phase. No specific comments were raised by consultees during the meeting.

- 13.3.6 Further details on how consultation responses have informed the assessment can be found in ES Appendix 5.2: Response to Consultation Feedback (**application document 6.3.5.2**).

13.4 Approach and Methods

- 13.4.1 This section describes the methodology used to establish the baseline environment and the adopted approach to assessing the significance of potential effects on air quality. A desk study has been undertaken to inform the assessment of significant effects.

Data Sources

- 13.4.2 The assessment has been informed by a desk study which has drawn on the following key information sources:

- Defra Air Quality Management Area (AQMA) dataset (Defra, 2021a);
- Department for Environment Food and Rural Affairs (Defra) Background Air Quality Archive (2018-base year) (Defra, 2021b);
- Local Air Quality Management Reports (Braintree District Council, 2020);
- Local Air Quality Management Reports (Babergh and Mid Suffolk District Councils, 2021);
- Baseline data on ecological designated sites collected as part of ES Chapter 7: Biodiversity (**application document 6.2.7**); and
- Ordnance Survey (OS) AddressBase Plus dataset (OS, 2022).

- 13.4.3 All of the information collated has been incorporated into the baseline environment description presented in Section 13.5.

Study Area

- 13.4.4 This section describes the study areas used for the air quality assessment. Different study areas are needed to assess the impacts of fugitive dust emissions from construction and to assess the emissions from vehicles using public highways due to the differing nature of dispersion of pollutants from these sources.

Dust

- 13.4.5 The study area for fugitive dust emissions from construction is defined by the screening criteria from the Institute of Air Quality Management (IAQM) Construction Dust Guidance (IAQM, 2016). Areas are scoped into the assessment where there is:

- A human receptor within the Order Limits plus a 350m area surrounding, or within 50m of the proposed routes used by construction traffic on the public highway up to 500m from all construction access points; or
- An ecological designated site within the Order Limits plus a 50m area surrounding, or within 50m of the proposed routes used by construction traffic on the public highway up to 500m from all construction access points.

- 13.4.6 The study area for the dust assessment is shown on ES Figure 13.1: Air Quality Study Area (**application document 6.4**).

Generator Use

- 13.4.7 No specific guidance exists on the definition for a study area from point sources due to the large variation in the area of potential impact from different types of sources. For the purposes of this assessment a study area of up to a 100m radius from the compound areas listed within ES Chapter 4: Project Description (**application document 6.2.4**) and the trenchless crossing compounds is judged to be appropriate given the potential size and duration of the operations to be undertaken and the likely size of plant required. Beyond this distance it is judged that the effect of any emissions on local air quality would not be significant. Generators in other areas are considered to be of a size and their use appropriately infrequent to be scoped out of assessment. The compound areas and the trenchless crossings are shown on ES Figure 4.1: The Project (**application document 6.4**).

Construction Traffic

- 13.4.8 Routes for construction traffic on the public highway, as shown on ES Figure 12.1: Traffic and Transport Study Area (**application document 6.4**), are considered as part of the assessment for construction vehicle emissions. The Affected Road Network (ARN) is defined according to the IAQM Planning Guidance (IAQM, 2017) predicted change in traffic volume criteria, which are:
- A change in light duty vehicles of 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA or 500 AADT elsewhere; and/or
 - A change in heavy duty vehicles >3.5 tonnes of 25 AADT within or adjacent to an AQMA or 100 AADT elsewhere.
- 13.4.9 The study area is taken to be within 200m of the ARN based on the Design Manual for Roads and Bridges LA 105 Air Quality (Highways England *et al.*, 2019c) as beyond this distance emitted pollutants are generally accepted to have dispersed to match background concentrations. In areas where the above criteria are met, human receptors within 200m of the road within the ARN are scoped into the assessment.

Site Survey

- 13.4.10 No site surveys to gather baseline information have been undertaken as background air quality information is available and has been sourced from Defra and the relevant planning authorities as part of their obligations under the Environment Act 1995.

Assessment Methodology

- 13.4.11 This section sets out the methodology used for assessing the effects on air quality for those aspects scoped into the assessment, as set out within Chapter 13 of the Scoping Report (**application document 6.5.1**).

Value/Sensitivity

- 13.4.12 As noted in ES Appendix 5.4: Assessment Criteria (**application document 6.3.5.4**), all air quality receptors are treated equally, with sensitivity being identified as locations representative of exposure to the averaging periods of relevant air quality objectives/critical loads.

Magnitude

This is described below for each different aspect considered within the chapter.

Dust

- 13.4.13 The assessment of dust impacts is based on the IAQM Construction Dust Guidance (IAQM, 2016). The method requires the definition of the value (sensitivity) and magnitude of impact to provide an overall assessment of dust risk on human health, amenity (dust soiling) and ecology. The assessment of risk is used to determine whether additional mitigation is likely to be required to mitigate the effect.

Generator Use

- 13.4.14 The assessment of the impacts of emissions from generator use related to local power generation is based on the IAQM Air Quality for Planning guidance (IAQM, 2017) and professional judgement. The IAQM guidance provides an indicative threshold for Oxides of nitrogen (NO_x) emissions from single or combined sources, below which the impact of the emissions are unlikely to give rise to significant effects.
- 13.4.15 Where effects are likely to occur, the IAQM Air Quality for Planning guidance (IAQM, 2017) provides an indication of the likely magnitude of impact for short-term impacts as a percentage of the short-term Air Quality Assessment Level (AQAL). For long-term impacts, magnitude of an impact is based on the change in pollutant concentration resulting from the project as a percentage of the AQAL. The AQAL levels are defined further in ES Appendix 5.4: Assessment Criteria (**application document 6.3.5.4**).
- 13.4.16 The effect of generator use on ecological sites is scoped out of the assessment as generator operation would have intermittent and occur for sporadic periods at differing locations within the Order Limits throughout the temporary construction stage. It is not considered that emitted pollutants would occur over a long enough time period to have a material effect on rates of pollutant deposition.

Construction Traffic

- 13.4.17 The assessment of the impacts of emissions to air quality from construction traffic is based on the IAQM Air Quality for Planning guidance (IAQM, 2017). This provides screening criteria indicating the thresholds above which an assessment may be necessary. There are thresholds for the daily flows of light duty vehicles and heavy-duty vehicles (>3.5t), which vary depending on whether AQMA are present or not. Where the criteria are met, an assessment is generally considered necessary to determine the concentrations of pollutants in ambient air at human or ecological receptors adjacent to the ARN.
- 13.4.18 The magnitude of an impact is based on the change in pollutant concentration resulting from the project as a percentage of the AQAL. The AQAL levels are defined further in ES Appendix 5.4: Assessment Criteria (**application document 6.3.5.4**).

Significance

- 13.4.19 Likely significant effects have been assessed using professional judgement considering the sensitivity (or value) of the receptor, and the predicted magnitude of change (impact) likely to be caused by project activities. These factors are combined to give an overall significance of effect.

13.4.20 Significance has been derived using the matrix set out in Illustration 5.1 in ES Chapter 5: Environmental Impact Assessment (EIA) Approach and Method (**application document 6.2.5**). This has been supplemented by professional judgement, which where applicable, has been explained to give the rationale behind the values assigned. Likely significant effects, in the context of the Infrastructure Planning (EIA) 2017, are effects of moderate or greater significance.

Limitations of Assessment

13.4.21 As with all types of assessment of air quality effects, the assessment depends on the accuracy of data provided by third parties. It has therefore been assumed that data provided by third parties is accurate.

13.4.22 The assessment of the construction traffic impact on the local road network as presented in the Transport Assessment (**application document 5.7**) is not based on the use of regional transport modelling. Therefore, any assumptions on air quality impacts made in this chapter in relation to the road network are based on professional judgement and not modelled data.

Key Parameters for Assessment and Assumptions

13.4.23 This section describes the key parameters and assumptions that have been used when undertaking the assessment presented within this ES Chapter. The assumptions are based on information presented within ES Chapter 4: Project Description (**application document 6.2.4**) and include:

- Any qualitative assessment of traffic-related air quality impacts is made against the screening criteria from the IAQM Planning Guidance (IAQM, 2017);
- Generator use: It is assumed that the main construction compound off the A134 would be connected to mains electricity. It is assumed that all remaining areas would be powered by diesel generators:
 - Construction works at the cable sealing end (CSE) compounds would be powered by a 60kVA generator to power site cabins, lighting and welfare facilities;
 - There would be mobile welfare units at multiple locations along the works to support the local site teams. These would be powered by 3–5kVA generators;
 - There would be portable generators for powering specific tools, such as drilling;
 - The trenchless crossings are assumed to have a 10kVA generator to power welfare facilities.
- Trenchless crossing construction methodology: The project has committed to undertaking trenchless crossings at the River Box, River Stour, Sudbury Branch Railway Line and to the south of Ansell's Grove. For the purposes of the air quality assessment, it has been assumed that:
 - The proposed technique would be horizontal directional drilling, which requires launch and receiving pits on either side of a drilled section. The drill rigs are assumed to be powered by diesel engines. It is assumed that the drill rigs would have a compressor (assumed to be powered off the drill rig diesel engine) to help with the drilling process;

- The assumption for the drilling direction of the trenchless crossings are provided in Table 4.7 of ES Chapter 4: Project Description (**application document 6.2.4**), but the assessment presented in this chapter considers both potential drilling directions as a worst-case.
- Construction traffic data assumptions: These are provided in the Transport Assessment (**application document 5.7**).

Embedded and Good Practice Measures

- 13.4.24 This section outlines the relevant embedded and good practice measures that have been embedded into the design of the project and therefore the assessment has been undertaken on the assumption that these measures would be carried out. All assessment work has applied a precautionary principle, in that where limited information is available (in terms of the project design), a realistic worst-case scenario is assessed.

Relevant Embedded Measures

- 13.4.25 No specific measures relevant to air quality have been embedded into the design of the project.

Good Practice Measures

- 13.4.26 The Code of Construction Practice (CoCP) (**application document 7.5.1**) sets out the standard good practice measures that would be undertaken during construction of the project if it is granted consent. The relevant good practice measures relating to air quality include a commitment to locate activities that may produce a nuisance away from sensitive receptors where practicable (GG10) and plant and vehicles conforming to relevant applicable standards (GG12).
- 13.4.27 Chapter 13 of the Construction Environmental Management Plan (**application document 7.5**) elaborates on the good practice measures set out in the CoCP by providing additional details in relation to reducing the risk of dust and emissions assessed in the Dust Risk Assessment in ES Appendix 13.1: Dust Risk Assessment (**application document 6.2.13.1**).

13.5 Baseline Environment

Existing Baseline

Background Pollutant Concentrations

- 13.5.1 Background pollutant concentrations have been obtained from the latest Defra Background Air Quality Archive (Defra, 2021b) for the peak construction year of 2025 from the 2018-base year dataset. The key pollutants of concern are:
- Oxides of nitrogen (NO_x) – mixture of gases that are composed of nitrogen and oxygen with the potential to impact human and ecological health;
 - Nitrogen dioxide (NO₂) – an oxide of nitrogen with the potential to impact human health;
 - Particulate matter (PM₁₀) – fine particles with the potential to impact human health; and

- Particulate matter (PM_{2.5}) – ultra-fine particles with the potential to impact human health.

13.5.2 The average, maximum and minimum concentrations for each project section as defined in ES Chapter 4: Project Description (**application document 6.2.4**) are shown in Table 13.1.

Table 13.1 – Background Air Pollutant Concentrations

Section	NO _x (µg/m ³)			NO ₂ (µg/m ³)			PM ₁₀ (µg/m ³)			PM _{2.5} (µg/m ³)		
	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.	Ave.	Max.	Min.
AB Bramford Substation/Hintlesham	8.2	9.8	7.7	6.4	7.6	6.1	14.4	15.6	13.1	8.4	8.8	8.1
C Brett Valley	7.8	8.1	7.6	6.1	6.4	6.0	14.0	14.5	13.5	8.3	8.5	8.2
D Polstead	7.7	7.9	7.5	6.0	6.2	5.9	14.4	15.4	13.4	8.4	8.8	8.2
E Dedham Vale Area of Outstanding Natural Beauty (AONB)	7.7	8.0	7.6	6.1	6.3	6.0	14.3	15.4	13.2	8.5	8.8	8.2
F Leavenheath/ Assington	7.6	8.0	7.5	6.0	6.3	5.9	14.5	15.2	13.2	8.5	8.7	8.2
G Stour Valley	7.6	7.7	7.5	6.0	6.0	5.9	14.6	15.6	13.5	8.5	8.8	8.2
H Grid Supply Point (GSP) Substation	7.5	7.7	7.2	5.9	6.1	5.7	14.8	15.6	14.1	8.6	8.7	8.4
UK annual mean ambient air quality objective for the protection of human health (µg/m ³)	30*			40			40			20		

*Relevant to the protection of vegetation and ecosystems

13.5.3 All of the concentrations shown in Table 13.1 are below 50% of the UK limit values for the concentrations of pollutants in ambient air, suggesting substantial headroom before an exceedance might occur. With reference to the World Health Organisation (WHO) guidelines for NO₂, PM₁₀ and PM_{2.5} (WHO, 2021), background concentrations of NO₂ are up to 76% of the suggested limit of 10µg/m³, concentrations of PM₁₀ are up to 104% of the limit suggested limit of 15µg/m³, and PM_{2.5} concentrations are up to 176% of the suggested limit of 5µg/m³.

Human Receptors

13.5.4 Table 13.2 shows the cumulative receptor numbers in bands in relation to each of the project sections. Receptors have been classified according to the classifications field in the OS AddressBase Plus dataset (OS, 2022). Residential receptors include houses and farms, or any location that people may be present during the day and sleeping over-night. Community receptors include village halls or scout huts. Commercial properties include offices and businesses. Some receptors may include multiple and different records, such as a residential home with a commercial office, or a farm with a residential farmhouse and numerous commercial farm buildings attached.

13.5.5 The receptors relating to ‘trackout’ are those which could be impacted by material tracked from the temporary access points onto the local road network during construction and re-suspended in the air as particulate matter. The temporary access points are shown on Figure 13.1: Air Quality Study Area (**application document 6.4**).

Table 13.2 – Cumulative Banded Human Receptors per Section

Receptor Type	Distance from the Order Limits					Trackout
	0–20m	0–50m	0–100m	0–200m	0–350m	
Section AB Bramford Substation/Hintlesham						
Residential	48	96	157	261	362	240
Community	0	0	0	1	4	6
Commercial	1	15	17	27	41	7
Total	49	111	174	289	407	253
Section C Brett Valley						
Residential	4	18	53	154	197	87
Community	0	1	2	2	2	1
Commercial	0	1	1	2	6	0
Total	4	20	56	158	205	88
Section D Polstead						
Residential	17	35	68	101	115	84
Community	0	0	0	0	0	1
Commercial	0	1	1	2	5	0
Total	17	36	69	103	120	85
Section E Dedham Valley AONB						
Residential	3	13	24	37	57	109
Community	0	0	0	0	0	0
Commercial	1	2	2	5	5	1
Total	4	15	26	42	62	110
Section F Leavenheath/Assington						
Residential	20	50	86	178	228	115
Community	0	1	2	2	3	1
Commercial	2	4	4	14	19	10

Receptor Type	Distance from the Order Limits					Trackout
	0–20m	0–50m	0–100m	0–200m	0–350m	
Total	22	55	92	194	250	126
Section G Stour Valley						
Residential	29	70	94	151	243	191
Community	3	5	6	6	9	8
Commercial	1	4	6	14	26	18
Total	33	79	106	171	278	217
Section H GSP Substation						
Residential	14	37	74	132	211	181
Community	1	1	3	3	3	5
Commercial	6	9	16	22	29	16
Total	21	47	93	157	243	202

Ecological Receptors

13.5.6 The nearest ecological receptors are shown in Table 13.3 along with the distance to the Order Limits. Further details on these sites can be found in ES Appendix 7.1: Habitats Baseline Report (**application document 6.3.7.1**).

Table 13.3 – Ecological Receptors

Site Name	Designating Organisation ID	Distance to Order Limits (m)
Section AB Bramford Substation/Hintlesham		
Hintlesham Woods Site of Special Scientific Interest (SSSI) and Ancient Woodland (AWI)	SSSI 1004385 AWI 1117096	0 (within Order Limits)
Railway Walk, Hadleigh Local Nature Reserve (LNR), County Wildlife Site (CWS)	LNR 1009093 CWS Babergh 60	0 (within Order Limits)
Tom's/Broadoak Wood CWS	CWS Babergh 63	0 (adjacent Order Limits)
Valley Farm Meadow CWS	CWS Babergh 61	0 (within Order Limits)
Section C Brett Valley		
Railway Walk, Hadleigh LNR/CWS	LNR 1009093 CWS Babergh 60	0 (within Order Limits)

Site Name	Designating Organisation ID	Distance to Order Limits (m)
Section D Polstead		
Millfield Wood North AWI/CWS	AWI 1116957 CWS Babergh 112	0 (adjacent to Order Limits)
Millfield Wood South AWI/CWS	AWI 1411358 CWS Babergh 112	0 (adjacent Order Limits)
Valley Farm Wood CWS	CWS Babergh 81	0 (within Order Limits)
Layham Pit Woodland and Meadow CWS	CWS Babergh 171	0 (within Order Limits)
Roadside Nature Reserve 202	CWS Babergh 181	0 (within Order Limits)
Section E Dedham Valley AONB		
Broom Hill Wood AWI/CWS	AWI 1116953 CWS Babergh 101	0 (adjacent to Order Limits)
Bushy Park Wood AWI/CWS	AWI 1411357 CWS Babergh 102	0 (adjacent to Order Limits)
The Dollops CWS	CWS Babergh 185	0 (within Order Limits)
Section F Leavenheath/Assington		
Arger Fen SSSI	SSSI 1002262	10
Leadenhall Wood AWI/CWS	CWS Babergh 138 AWI 1411350	2
Tiger Hill LNR	LNR 1009204	10
Roadside Nature Reserve 195 CWS	CWS Babergh 179	0 (within Order Limits)
Section G Stour Valley		
Alphamstone Complex LWS	LWS Bra239	0 (within Order Limits)
Alphamstone Meadows LWS	LWS Bra240	0 (within Order Limits)
Loshes Meadow Complex (part Essex Wildlife Trust Reserve) LWS	LWS Bra241	0 (within Order Limits)
Moat Farm/Burnt House Marsh LWS	LWS Bra244	10
Daws Hall LWS	LWS Bra248	5
Twinstead Marsh LWS	LWS Bra222	0 (within Order Limits)
Ansell's Grove/Ash Ground LWS	LWS Bra233	0 (within Order Limits)

Site Name	Designating Organisation ID	Distance to Order Limits (m)
Pebmarsh House LWS	LWS Bra238	0 (adjacent to Order Limits)
Section H GSP Substation		
Waldegrave Wood LWS/AWI	AWI 1420162 LWS Bra200	0 (adjacent to Order Limits)
Butler's Wood LWS/AWI	AWI 1116843 LWS Bra201	0 (adjacent to Order Limits)

Future Baseline

- 13.5.7 Background concentrations of air pollutants NO₂, PM₁₀ and PM_{2.5} are expected to reduce over time in response to national and local policies designed to reduce air emissions outlined in the Government's Clean Air Strategy (Defra, 2019). The rate of reduction is expected to be greater for NO₂ than fine particles because of specific policies targeting the reduction of road traffic emissions.

13.6 Likely Significant Effects During Construction (Without Mitigation)

Introduction

- 13.6.1 This section sets out the likely significant effects on air quality during construction. The assessment assumes that the good practice measures in the CoCP (**application document 7.5.1**) are in place, and the results of the assessment then inform the need for any additional mitigation requirements during construction (see Section 13.8).
- 13.6.2 As described in ES Chapter 4: Project Description (**application document 6.2.4**), the main project comprises reinforcement of an existing transmission network with a combination of underground cables and overhead lines, and this in some chapters is assessed separately to the provision of a GSP substation. The air quality assessment considers the project as a whole (main works and GSP substation together) to allow for a full consideration of the effects on receptors. In addition, the construction routes used would apply for the whole project. Therefore, the main project and GSP substation are both assessed together.
- 13.6.3 The assessment presented in Sections 13.6 to 13.10 is based on the Proposed Alignment, which is the design that is shown on ES Figure 4.1: The Project (**application document 6.4**). However, it should be noted that the permanent aspects of the project, including pylon locations, are not fixed and could be located anywhere within the LoD, as defined on the Work Plans (**application document 2.5**). The sensitivity testing in Section 13.11 considers whether there would be new or different effects should alternative locations be taken forward.

Dust

- 13.6.4 The assessment of amenity on human receptors is necessarily intertwined with the assessment of human health to provide an overall risk of dust impacts, the results of the dust risk assessment for both aspects have been considered as part of the results presented within this chapter. The assessment of dust on ecological receptors is considered within ES Chapter 7: Biodiversity (**application document 6.2.7**).
- 13.6.5 ES Appendix 13.1: Dust Risk Assessment (**application document 6.3.13.1**) presents the IAQM construction dust risk assessment which has been undertaken for the project. This considered the potential working areas, the soil parent material from the British Geological Society, the scale of earthworks and the typical construction activities. The assessment also considered the sensitivity of receptors based on the various tables set out in the IAQM dust risk assessment guidance (IAQM, 2016). It split the construction activities into demolition, earthworks, construction and trackout. Professional judgement was used in the application of the IAQM dust risk assessment guidance (IAQM, 2014).
- 13.6.6 The full results of the assessment are described in ES Appendix 13.1: Dust Risk Assessment (**application document 6.3.13.1**), and the highest overall assessment of the risk of dust impacts for each of the construction sections ranged from **medium** to **high**. The numbers of affected receptors for each section can be found in Table 13.2.
- 13.6.7 The high risk of dust is particularly associated with dust soiling from earthworks and construction vehicle trackout due to earthworks. However, with the good practice measures from the CoCP (**application document 7.5.1**) in place, the risk of dust impacts and their effects are expected to be short term and **not significant**.

Generator Use

- 13.6.8 Emissions to air can be generated from the use of diesel-powered non-road mobile machinery and diesel-powered generators related to construction activities.
- 13.6.9 The use of construction non-road mobile machinery is unlikely to result in significant effects on local air quality according to the guidance from Local Air Quality Management – Technical Guidance (TG22) paragraph 7.30 (Defra, 2021e). This guidance is provided on the basis of previous assessments of the emissions of non-road mobile machinery, which determined that emissions are unlikely to make a significant impact on local air quality with suitable controls and site management in place. Good practice measure GG12 in the CoCP (**application document 7.5.1**) states that non-road mobile machinery and plant, including generators, would meet the European Stage V engine emission standards (European Parliament and Council, 2016).
- 13.6.10 It has been assumed that diesel powered plant may be present at the site compounds (except the A131 which is assumed to be mains electricity). There two residential properties within 100m of the proposed trenchless crossings beneath the River Stour and the Sudbury Branch Railway Line, where diesel powered generators could be used. These are Daws Hall Cottage and Walnut House. There are no residential properties within 100m of the compound areas at the other trenchless crossings (River Box and Ansell's Grove). Emissions to air from the use of diesel-powered plant for activities such as those directly related to the trenchless crossing may be perceptible at the residential receptor within 100m, but are unlikely to be perceptible at receptors beyond this distance due to the expected size of the plant.

- 13.6.11 Given the nature of the plant to be used and the good practice measures that would be in place, emissions are highly unlikely to cause an exceedance of the legislative 1-hour limit value for NO₂ of 200µg/m³ (Air Quality Standard Regulations 2010), especially given the low background concentrations of NO₂ in the area. Whilst no exposure to fossil fuel-based air pollutants can be considered safe to human health based on the latest guidance issued by the WHO (2021), the fact that the limit and objective value is highly unlikely to be exceeded means any effects measured against the air quality objectives can be considered short term and **not significant**.

Construction Traffic

- 13.6.12 Effects relating to construction traffic were provisionally scoped out of the assessment in the Scoping Report (**application document 6.5.1**) on the basis that the estimated vehicle numbers would be low. Further work has been undertaken as part of the Transport Assessment (**application document 5.7**) to understand the traffic flows on the road network. It is currently anticipated that there would be no construction traffic through the AQMA in Sudbury based on the construction routes shown on ES Figure 12.1: Traffic and Transport Study Area (**application document 6.4**). This is also noted in Section 5.4 of the Construction Traffic Management Plan (CTMP) (**application document 7.6**).
- 13.6.13 Based on the construction traffic flows, the changes in traffic flows fall below the screening criteria outlined in the IAQM guidance (IAQM, 2016). Further to this, it is not anticipated that the works would result in changes that would exceed the traffic screening criteria due to traffic re-routeing as a result of construction traffic or road closures. It is anticipated that the air quality impacts of the emissions from construction traffic would not result in any significant changes to local air quality.
- 13.6.14 The assessment of the construction routes has shown that any changes in local air quality due to construction traffic volumes would be short term and **not significant** based on the changes in traffic flows in the Transport Assessment (**application document 5.7**).

Summary of Construction Effects

- 13.6.15 The construction phase of the project carries risks of generating dust and creating emissions to air (both through generator use and construction traffic) that could affect human and ecological receptors. The assessment undertaken demonstrates that, with the application of good practice measures within the CoCP (**application document 7.5.1**), that there are **no significant effects** in relation to air quality during construction.

13.7 Likely Significant Effects During Operation (Without Mitigation)

- 13.7.1 Operational effects in relation to air quality have been scoped out of the assessment (see Section 13.3 for details).

13.8 Proposed Mitigation During Construction

- 13.8.1 The assessment has concluded that there are no likely significant effects in relation to air quality receptors during construction. Therefore, no mitigation measures have been identified beyond the good practice measures set out in the CoCP (**application document 7.5.1**).

13.9 Proposed Mitigation During Operation

- 13.9.1 Operational effects in relation to air quality have been scoped out of the assessment as described in Section 13.3. Therefore, no mitigation measures have been identified.

13.10 Residual Significant Effects (With Mitigation)

- 13.10.1 The assessment has concluded that there are no likely significant residual effects in relation to air quality receptors during construction.

13.11 Sensitivity Testing

Introduction

- 13.11.1 This section outlines alternative approaches to the baseline assessment presented in Sections 13.6 to 13.10. It considers the alternative construction schedule, which is described in ES Appendix 4.2: Construction Schedule (**application document 6.3.4.2**) and also flexibility between the baseline design and method set out within ES Chapter 4: Project Description (**application document 6.2.4**) and the Proposed Alignment shown on ES Figure 4.1: The Project (**application document 6.4**). Further details on the flexibility assumptions are outlined in Section 4.2 of ES Chapter 4: Project Description (**application document 6.2.4**).

Assessment of Alternative Construction Schedule

- 13.11.2 This chapter assumes the baseline construction schedule described in ES Appendix 4.2: Construction Schedule (**application document 6.3.4.2**) for the purposes of the assessment. Sensitivity testing considering the alternative scenario, which has a later start date due to the GSP substation being delivered pursuant to the Development Consent Order, has shown that there would be no new or different likely significant effects to those identified in the baseline construction schedule assessed in Sections 13.6 to 13.10 of this chapter.
- 13.11.3 The construction dust risk assessment includes provision for construction activities to take place during the summer, when the potential for fugitive dust is at its highest. Therefore, alternative project phasing, such as a later construction start date, would have no new or different likely significant effects to those identified in the baseline scenario assessed.

Flexibility in Design

Flexibility in Trenchless Crossings

- 13.11.4 The assessment of air quality effects from trenchless crossing has considered reasonable worst-case assumptions in terms of drill direction and both drill directions have been assessed. As such, varying the drill direction is not likely to result in new or different significant effects to those identified in Sections 13.6 to 13.10 of this chapter.

Flexibility Within The Order Limits

- 13.11.5 The IAQM dust risk assessment is based on the Order Limits as a reasonable worst case. Therefore, changing the location of project infrastructure within the Order Limits would not alter the number of receptors assessed within the dust risk assessment or their

distance from the development. As such, this sensitivity testing has shown that there would be no new or different likely significant effects as a result of project infrastructure being placed in a different location.

- 13.11.6 The assessment has assumed that diesel powered plant may be present at the site compounds (except for the compound off the A134 which is assumed to be mains electricity). If alternative locations were identified for site compounds this could lead to emissions to air from the use of diesel-powered plant for activities. However, given the limited number of residential properties that lie within close proximity to the Order Limits, the nature of the plant to be used and the good practice measures that would be in place, emissions are highly unlikely to cause an exceedance of the legislative 1-hour limit value for NO₂ of 200µg/m³ (Air Quality Standard Regulations 2010), especially given the low background concentrations of NO₂ in the area. Therefore, any effects resulting from different construction compound locations are likely to be short term and **not significant**.

Flexibility in Construction Routes

- 13.11.7 The screening of transport emissions from construction traffic has been undertaken using the IAQM criteria and has shown that no routes meet the screening criteria for a dispersion modelling assessment. The traffic assessment found no significant impacts on traffic flows, and also that no construction related traffic is expected to travel through the AQMA at Sudbury. Given the limited scope for changes in construction routes as described in the Transport Assessment (**application document 5.7**), it is unlikely that any new or different significant effects to local air quality would occur.

13.12 Conclusion

- 13.12.1 The assessment presented in Sections 13.6 to 13.10 has concluded that there are no likely significant residual effects in relation to air quality during construction. In addition, the sensitivity testing presented in Section 13.11 has shown that there would be no new or different significant effects through the application of either the alternative scenario or through flexibility within the Limits of Deviation. As such, the requirements of the NPS EN-1 and consultation draft NPS EN-1 are expected to be met.

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