NORTH FALLS

Offshore Wind Farm

ENVIRONMENTAL STATEMENT

Appendix 26.2 Road Traffic Noise Assessment

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NORTH FALLS
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Glossary of Acronyms

AAWT	Annual Average Weekday Traffic
BNL	Basic Noise Level
CRTN	Calculation of Road Traffic Noise
CTR	Construction Traffic Receptor
dB	Decibel
DEFRA	Department for Environment, Food and Rural Affairs
HGV	Heavy Goods Vehicles
LiDAR	Light detection and ranging
LOAEL	Lowest Observed Adverse Effect Level
NAC	Noise Advisory Council
NVSR	Noise and Vibration Sensitive Receptor
OS	Ordnance Survey
PEIR	Preliminary Environmental Information Report
SOAEL	Significant Observed Adverse Effect Level

Glossary of Terminology

The Project Or 'North Falls'	North Falls Offshore Wind Farm, including all onshore and offshore infrastructure.
For further explanation of acoustics specific terms, refer to Appendix 26.1 Baseline Noise Survey and Acoustic Terminology (Volume 3.3).	

1 Introduction

1. This Appendix to the Environmental Statement (ES) for the proposed North Falls Offshore Wind Farm (herein 'the Project' or 'North Falls') details the construction road traffic noise assessment including traffic data, calculation procedures and results.

2 Off-site construction traffic data

2. This section outlines the traffic data provided by the Project's Transport Consultants and which is described in detail in ES Chapter 27 Traffic and Transport (Document Reference: 3.1.29) and ES Appendix 27.1 Transport Assessment (Document Reference: 3.3.64) of the ES.

3. Traffic data were provided by the Transport Consultants as 18hr Annual Average Weekday Traffic (AAWT), along with speed data, total vehicles and percentage Heavy Goods Vehicles (HGVs). Traffic data are provided for the following:

   - North Falls alone (Table 1);
   - North Falls and Five Estuaries Offshore Wind Farm (herein 'Five Estuaries') (Scenario 1) cumulative (Table 2); and
   - North Falls, Five Estuaries (Scenario 1) and other cumulative projects (Table 2).

4. Details of the cumulative scenarios are provided in Section 26.8 of ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28), with further detail provided in ES Chapter 5 Project Description (Document Reference: 3.1.7).

5. Where speed data were provided by the Transport Consultants (as described ES Appendix 27.1 Transport Assessment (Document Reference: 3.3.64)) in these were included in the calculations. Where speed data were unavailable, these have been determined based on road classification in accordance with Calculation of Road Traffic Noise (CRTN) paragraph 14.2.

Table 1 Traffic data – North Falls alone

Link ID	Description	Speed data type	Speed (kmph)	Baseline		Baseline + peak construction traffic		Baseline + average construction traffic	
				18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV
1	A120 from the A12 to the A133	CRTN road class	97	47,908	3,069	48,692	3,563	48,476	3,450
2	A120 from the A133 to Harwich Road	CRTN road class	97	47,908	3,069	48,733	3,563	48,527	3,450
3	A120 from Harwich Road to Bentley Road	CRTN road class	70	16,748	2,093	17,573	2,587	17,367	2,474
4	Bentley Road from the A120 to Little Bromley	Measured	69	1,096	20	1,612	255	1,464	181
5	Bentley Road through Little Bromley	Measured	69	1,096	20	1,117	20	1,145	20
6	B1035 south of the A120 to Tendring Green	Measured	68	6,131	106	6,387	178	6,307	156
7	Bromley Road north of Little Bromley	Measured	67	1,788	35	1,810	35	1,837	35
8	Bromley Road south of the A137	Measured	67	1,788	35	1,810	35	1,837	35
9	A137 east-west through Lawford	CRTN road class	50	14,087	435	14,087	435	14,087	435
10	A137 north-south through Lawford	CRTN road class	50	14,087	435	14,093	435	14,090	435
13	B1035 south of the B1352	Measured	48	8,994	190	9,065	190	9,037	190
14	B1035 north of the A120	Measured	48	8,994	190	9,124	219	9,075	209
15	A120 from Bentley Road to the B1035	CRTN road class	70	16,748	2,093	17,610	2,587	17,396	2,474
16	A120 from the B1035 to Colchester Road	CRTN road class	70	16,748	2,093	17,284	2,587	17,159	2,474
18	A120 from Colchester Road to the B1352	CRTN road class	70	10,736	1,598	11,272	2,092	11,147	1,980
19	A120 from the B1352 to Parkeston Road	CRTN road class	70	10,736	1,598	11,257	2,092	11,136	1,980
20	A133 south of the A120	CRTN road class	80	34,166	1,485	34,627	1,750	34,463	1,661
21a	A133 to the Crown	CRTN road class	81	34,404	1,177	34,973	1,442	34,764	1,353
21b	A133 from Crown Lane to the B1034	CRTN road class	81	34,404	1,177	34,991	1,442	34,776	1,353
22	A133 south of the B1033 to Progress Way	CRTN road class	70	22,732	669	23,012	775	22,911	740
23	A133 south of Progress Way to the B1032	CRTN road class	81	22,732	669	22,996	775	22,877	740

Link ID	Description	Speed data type	Speed (kmph)	Baseline		Baseline + peak construction traffic		Baseline + average construction traffic	
				18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV
24	B1032 east of the A133 to Holland Road	CRTN road class	50	13,425	308	13,685	414	13,585	379
25	B1032 from Holland Road to Kings Parade	CRTN road class	50	14,154	224	14,413	330	14,313	295
26	B1032 from Kings Parade to the south of Great Holland	Measured	57	7,898	112	8,157	218	8,057	183
27	B1032 through Great Holland	Measured	57	7,898	112	7,959	112	7,931	112
28	B1033 north of the B1032 through Kirby Cross to Pork Lane	Measured	70	10,532	176	10,624	176	10,588	176
29	B1033 from Pork Lane to the south of Thorpe-le-Soken	Measured	70	10,532	176	10,715	209	10,639	199
30	B1033 south of the B1414 through Thorpe-le-Soken	Measured	70	10,532	176	10,715	209	10,639	199
31	B1414 east of the B1033	Measured	58	1,629	78	1,683	78	1,672	78
32	B1033 north of the B1414 through Thorpe-le-Soken	Measured	70	10,532	176	10,714	209	10,643	199
33	B1033 from the B1441 to the B1035 through Weeley	Measured	75	11,707	245	12,054	404	11,926	351
34	B1033 from the A133 to the B1441	Measured	75	11,707	245	12,054	404	11,926	351
35	B1035 north of B1033 to Whitehall Lane	Measured	54	1,792	38	2,155	164	2,029	121
36	B1035 through Tendring Green from Parsonage Lane to Stones Green Road	Measured	68	6,131	106	6,259	106	6,215	106
37	B1035 north of Whitehall Lane to Swan Road	Measured	54	1,792	38	1,992	77	1,917	59
38	B1035 through Goose Green	Measured	68	6,131	106	6,259	106	6,215	106
39	B1035 north of Swan Road to the south of Tendring	Measured	63	2,582	52	2,692	52	2,654	52
40	B1035 through Tendring to Crown Lane	Measured	63	2,582	52	2,692	52	2,654	52
41	Crown Lane	Measured	56	3,536	55	3,553	55	3,547	55
42	B1035 from Crown Lane to Lodge Lane	Measured	63	2,582	52	2,709	52	2,666	52

Link ID	Description	Speed data type	Speed (kmph)	Baseline		Baseline + peak construction traffic		Baseline + average construction traffic	
				18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV
43	A133/Colchester Road from A133/Colchester Road roundabout to end of TTSA	CRTN road class	81	13,159	748	13,255	748	13,215	748
44	B1441 (Progress Way) from A133/St Osyth Road/Progress Way Roundabout to B1414	CRTN road class	50	6,179	1,107	6,192	1,107	6,184	1,107
45	B1414 east of B1441 to B1033 in Thorpe-le-Soken	CRTN road class	50	5,769	870	5,773	870	5,772	870
46	B1441 from B1414 to B1033 in Weeley	CRTN road class	50	6,179	1,107	6,179	1,107	6,179	1,107
47	A120 from Parkeston Roundabout to St Nicholas Roundabout	CRTN road class	81	14,666	1,562	15,166	2,056	15,051	1,943
48	St John's Road from St Osyth Roundabout to end of TTSA	CRTN road class	50	16,823	251	16,871	251	16,844	251

Table 2 Cumulative Traffic data

Link ID	Description	North Falls + Five Estuaries (Scenario 1)				North Falls + Five Estuaries + Other Cumulative projects			
		Baseline + peak construction traffic		Baseline + average construction traffic		Baseline + peak construction traffic		Baseline + average construction traffic	
		18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV
1	A120 from the A12 to the A133	48,864	3,674	48,574	3,512	49,420	4,171	49,130	4,009
2	A120 from the A133 to Harwich Road	49,065	3,674	48,724	3,512	49,980	4,419	49,639	4,257
3	A120 from Harwich Road to Bentley Road	17,905	2,698	17,564	2,536	18,820	3,443	18,479	3,282
4	Bentley Road from the A120 to Little Bromley	1,918	385	1,648	261	2,605	881	2,335	758

Link ID	Description	North Falls + Five Estuaries (Scenario 1)				North Falls + Five Estuaries + Other Cumulative projects			
		Baseline + peak construction traffic		Baseline + average construction traffic		Baseline + peak construction traffic		Baseline + average construction traffic	
		18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV
5	Bentley Road through Little Bromley	1,204	20	1,169	20	1,249	20	1,214	20
6	B1035 south of the A120 to Tendring Green	6,418	178	6,324	157	8,759	515	8,665	494
7	Bromley Road north of Little Bromley	1,897	35	1,862	35	1,942	35	1,907	35
8	Bromley Road south of the A137	1,897	35	1,862	35	1,942	35	1,907	35
9	A137 east-west through Lawford	14,087	435	14,087	435	14,087	435	14,087	435
10	A137 north-south through Lawford	14,093	435	14,091	435	14,093	435	14,091	435
13	B1035 south of the B1352	9,067	190	9,039	190	9,067	190	9,039	190
14	B1035 north of the A120	9,129	219	9,077	209	9,672	219	9,619	209
15	A120 from Bentley Road to the B1035	17,905	2,698	17,564	2,536	19,552	3,612	19,210	3,450
16	A120 from the B1035 to Colchester Road	17,412	2,698	17,231	2,536	18,379	3,363	18,198	3,202
18	A120 from Colchester Road to the B1352	11,400	2,203	11,219	2,042	12,367	2,869	12,186	2,707
19	A120 from the B1352 to Parkeston Road	11,377	2,203	11,203	2,042	12,060	2,826	11,886	2,664
20	A133 south of the A120	34,658	1,753	34,482	1,664	35,476	1,753	35,301	1,664
21a	A133 to the Crown	35,025	1,445	34,786	1,356	36,404	1,451	36,165	1,362
21b	A133 from Crown Lane to the B1034	35,006	1,445	34,798	1,356	36,385	1,451	36,177	1,362
22	A133 south of the B1033 to Progress Way	23,044	778	22,929	741	24,377	778	24,262	741
23	A133 south of Progress Way to the B1032	23,024	778	22,916	741	23,047	778	22,939	741
24	B1032 east of the A133 to Holland Road	13,699	417	13,591	380	13,706	417	13,599	380

Link ID	Description	North Falls + Five Estuaries (Scenario 1)				North Falls + Five Estuaries + Other Cumulative projects			
		Baseline + peak construction traffic		Baseline + average construction traffic		Baseline + peak construction traffic		Baseline + average construction traffic	
		18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV
25	B1032 from Holland Road to Kings Parade	14,427	333	14,319	296	14,435	333	14,327	296
26	B1032 from Kings Parade to the south of Great Holland	8,171	221	8,063	184	8,179	221	8,071	184
27	B1032 through Great Holland	7,960	112	7,932	112	7,960	112	7,932	112
28	B1033 north of the B1032 through Kirby Cross to Pork Lane	10,637	176	10,596	176	10,650	176	10,609	176
29	B1033 from Pork Lane to the south of Thorpe-le-Soken	10,728	209	10,647	199	10,741	209	10,660	199
30	B1033 south of the B1414 through Thorpe-le-Soken	10,728	209	10,647	199	10,741	209	10,660	199
31	B1414 east of the B1033	1,710	78	1,679	78	1,722	78	1,691	78
32	B1033 north of the B1414 through Thorpe-le-Soken	10,738	209	10,658	199	10,762	209	10,682	199
33	B1033 from the B1441 to the B1035 through Weeley	12,057	404	11,931	353	14,707	410	14,581	358
34	B1033 from the A133 to the B1441	12,057	404	11,931	353	15,695	410	15,568	358
35	B1035 north of B1033 to Whitehall Lane	2,182	164	2,048	123	2,207	164	2,072	123
36	B1035 through Tendring Green from Parsonage Lane to Stones Green Road	6,285	106	6,230	106	6,310	106	6,255	106
37	B1035 north of Whitehall Lane to Swan Road	2,017	77	1,932	60	2,041	77	1,956	60
38	B1035 through Goose Green	6,285	106	6,230	106	6,310	106	6,255	106
39	B1035 north of Swan Road to the south of Tendring	2,717	52	2,669	52	2,742	52	2,693	52
40	B1035 through Tendring to Crown Lane	2,717	52	2,669	52	2,742	52	2,693	52
41	Crown Lane	3,554	55	3,548	55	3,554	55	3,548	55
42	B1035 from Crown Lane to Lodge Lane	2,736	52	2,681	52	2,760	52	2,705	52

Link ID	Description	North Falls + Five Estuaries (Scenario 1)				North Falls + Five Estuaries + Other Cumulative projects			
		Baseline + peak construction traffic		Baseline + average construction traffic		Baseline + peak construction traffic		Baseline + average construction traffic	
		18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV	18-hr AAWT	HGV
43	A133/Colchester Road from A133/Colchester Road roundabout to end of TTSA	13,256	748	13,216	748	13,817	748	13,776	748
44	B1441 (Progress Way) from A133/St Osyth Road/Progress Way Roundabout to B1414	6,196	1,107	6,190	1,107	6,200	1,107	6,195	1,107
45	B1414 east of B1441 to B1033 in Thorpe-le-Soken	5,773	870	5,772	870	5,773	870	5,772	870
46	B1441 from B1414 to B1033 in Weeley	6,179	1,107	6,179	1,107	6,834	1,107	6,834	1,107
47	A120 from Parkeston Roundabout to St Nicholas Roundabout	15,285	2,167	15,118	2,005	15,579	2,293	15,412	2,131
48	St John's Road from St Osyth Roundabout to end of TTSA	16,880	251	16,858	251	16,890	251	16,868	251

3 Calculation results

3.1 North Falls alone

3.1.1 Basic noise level calculations

6. Noise impacts on all road links to be used during the construction of North Falls were assessed by comparing the calculated Basic Noise Level (BNL), as defined in CRTN, for the baseline traffic flows and for the peak and average scenarios, provided in Table 3.

Table 3 Calculated BNLs and magnitude of impact, North Falls alone

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic (dB)	Magnitude of impact	Baseline + average construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic (dB)	Magnitude of impact
1	79.4	79.6	0.2	Negligible	79.6	0.2	Negligible
2	79.4	79.6	0.2	Negligible	79.6	0.2	Negligible
3	73.6	74.1	0.5	Negligible	74.0	0.4	Negligible
4	56.9	62.6	5.7	High	61.4	4.5	Medium
5	56.9	57.1	0.2	Negligible	57.3	0.4	Negligible
6	66.7	67.2	0.5	Negligible	67.1	0.4	Negligible
7	60.4	60.5	0.1	Negligible	60.6	0.2	Negligible
8	60.4	60.5	0.1	Negligible	60.6	0.2	Negligible
9	69.0	69.0	0.0	Negligible	69.0	0.0	Negligible
10	69.0	69.0	0.0	Negligible	69.0	0.0	Negligible
13	66.5	66.5	0.0	Negligible	66.5	0.0	Negligible
14	66.5	66.7	0.2	Negligible	66.6	0.1	Negligible
15	73.6	74.1	0.5	Negligible	74.0	0.4	Negligible
16	73.6	74.1	0.5	Negligible	74.0	0.4	Negligible
18	72.0	72.8	0.8	Negligible	72.6	0.6	Negligible
19	72.0	72.8	0.8	Negligible	72.6	0.6	Negligible
20	76.0	76.2	0.2	Negligible	76.2	0.2	Negligible
21a	75.9	76.2	0.3	Negligible	76.1	0.2	Negligible
21b	75.9	76.2	0.3	Negligible	76.1	0.2	Negligible
22	73.0	73.1	0.1	Negligible	73.1	0.1	Negligible

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic (dB)	Magnitude of impact	Baseline + average construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic (dB)	Magnitude of impact
23	74.0	74.2	0.2	Negligible	74.1	0.1	Negligible
24	68.5	68.8	0.3	Negligible	68.7	0.2	Negligible
25	68.4	68.8	0.4	Negligible	68.7	0.3	Negligible
26	66.6	67.2	0.6	Negligible	67.0	0.4	Negligible
27	66.6	66.7	0.1	Negligible	66.6	0.0	Negligible
28	69.3	69.3	0.0	Negligible	69.3	0.0	Negligible
29	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
30	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
31	59.6	59.8	0.2	Negligible	59.8	0.2	Negligible
32	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
33	70.4	70.8	0.4	Negligible	70.6	0.2	Negligible
34	70.4	70.8	0.4	Negligible	70.6	0.2	Negligible
35	59.1	61.8	2.7	Low	61.0	1.9	Low
36	66.7	66.8	0.1	Negligible	66.8	0.1	Negligible
37	59.1	60.4	1.3	Low	59.9	0.8	Negligible
38	66.7	66.8	0.1	Negligible	66.8	0.1	Negligible
39	62.3	62.5	0.2	Negligible	62.4	0.1	Negligible
40	62.3	62.5	0.2	Negligible	62.4	0.1	Negligible
41	63.0	63.1	0.1	Negligible	63.1	0.1	Negligible
42	62.3	62.6	0.3	Negligible	62.5	0.2	Negligible
43	72.2	72.3	0.1	Negligible	72.3	0.1	Negligible
44	68.7	68.7	0.0	Negligible	68.7	0.0	Negligible

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic (dB)	Magnitude of impact	Baseline + average construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic (dB)	Magnitude of impact
45	67.9	67.9	0.0	Negligible	67.9	0.0	Negligible
46	68.7	68.7	0.0	Negligible	68.7	0.0	Negligible
47	73.6	74.2	0.6	Negligible	74.1	0.5	Negligible
48	69.2	69.2	0.0	Negligible	69.2	0.0	Negligible

3.1.2 Detailed calculations

7. Following the identification of potentially significant effects along Link 4 (Bentley Road), detailed calculations have been undertaken to provide further context to the potential effects in this area. The noise and vibration sensitive receptors (NVSRs) within 50m of Link 4 (CTR1 to CTR7) are identified in the ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28). The road traffic noise levels for the 'baseline year' and 'baseline plus peak construction traffic' scenarios have been calculated at each NVSR for comparison with the construction road traffic noise lowest observed adverse effect level (LOAEL) and significant observed adverse effect level (SOAEL) values detailed in the ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28).

8. Following the identification of potentially significant effects as stated in the ES Chapter 26 Noise and Vibration (Document Reference: 3.1.28), a mitigated modelling scenario was produced. This incorporated the proposed mitigation option of a temporary 40mph speed limit on Bentley Road from the A120 to the onshore cable route (Link 4).

9. The noise modelling study area extended to 300m in all directions from Link 4. This study area was determined based on a review of aerial imagery which did not identify any roads outside this study area with the potential to affect noise levels at the identified NVSRs.

10. The calculations of road traffic noise were undertaken using SoundPLAN (V8.2) noise modelling software. This software implements the sound propagation calculation methodology set out in CRTN.

3.1.2.1 Modelling input data

11. Inputs into the noise modelling software include traffic data (provided in Table 1), the ground topography, ground type, and buildings to form a 3D representation of the study area. Modelling input data are detailed in Table 4.

Table 4 Noise model input data

Data	Usage	Source file	Origin
OS mapping	Locations of buildings and roads in study area	OS_MasterMap_669253_880737	Emapsite
		OS_MasterMap_717065_930746	North Falls Offshore Wind Ltd
Street-side Photography	Locations and heights of existing barriers	N/a	Google Street View
LiDAR composite Digital Terrain Model	Ground topography in study area	LIDAR-DTM-1m-2020-TM12nw LIDAR-DTM-1m-2020-TM02ne	Environment Agency (2020) LIDAR Composite DSM 2020 – 1m. Defra Data Services Platform. Available at: https://environment.data.gov.uk/DefraDataDownload/?Mode=survey

3.1.2.2 Acoustic model settings

12. Acoustic modelling has been undertaken using the following model settings:

- Maximum search radius of 3000m;
- Maximum number of reflections: one;
- Noise predictions carried out at ground floor level i.e. 1.5m above ground;
- Side diffraction enabled;
- Building heights set to 6m;
- Ground absorption has been set as:
  - Road surfaces G = 0 (hard ground);
  - All other areas G = 0.8 (80% soft ground, considered representative of the study area; and
- Road surfaces have been assumed to be standard hot rolled asphalt (surface correction factor of -0.5dB for speeds at or above 75kmph, for lower speeds the correction is -1dB).

3.1.2.3 Calculation results

13. The results of the calculations are shown in Table 5.

Table 5 Calculated road traffic noise levels

NVSR	Calculated daytime road traffic noise level (dB $L_{A10,18h}$)			Change in noise level from baseline (dB $L_{A10,18h}$)	
	Baseline year	Baseline year plus peak construction traffic	Baseline year plus peak construction traffic, mitigated	Baseline year plus peak construction traffic	Baseline year plus peak construction traffic, mitigated
CTR1	66.9	70.1	69.2	3.2	2.3
CTR2	58.3	60.4	59.8	2.1	1.5
CTR3	61.4	67.5	66.1	6.1	4.7
CTR4	55.2	59.3	57.9	4.1	2.7
CTR5	55.0	59.3	57.8	4.3	2.8
CTR6	59.0	64.5	63.0	5.5	4.0
CTR7	53.0	57.8	56.4	4.8	3.4

3.2 North Falls and Five Estuaries cumulative (Scenario 1)

3.2.1 Basic noise level calculations

14. The results of the BNL calculations and associated magnitude of impact, for the North Falls and Five Estuaries cumulative construction Scenario 1, are provided in Table 6.

Table 6 Calculated BNLs and magnitude of impact, North Falls and Five Estuaries (Scenario 1)

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic (dB)	Magnitude of impact	Baseline + average construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic (dB)	Magnitude of impact
1	79.4	79.7	0.3	Negligible	79.6	0.2	Negligible
2	79.4	79.7	0.3	Negligible	79.6	0.2	Negligible
3	73.6	74.3	0.7	Negligible	74.1	0.5	Negligible
4	56.9	64.4	7.5	High	62.8	5.9	High
5	56.9	57.6	0.7	Negligible	57.3	0.4	Negligible
6	66.7	67.2	0.5	Negligible	67.1	0.4	Negligible
7	60.4	60.8	0.4	Negligible	60.6	0.2	Negligible
8	60.4	60.8	0.4	Negligible	60.6	0.2	Negligible
9	69.0	69.0	0.0	Negligible	69.0	0.0	Negligible
10	69.0	69.0	0.0	Negligible	69.0	0.0	Negligible
13	66.5	66.5	0.0	Negligible	66.5	0.0	Negligible
14	66.5	66.7	0.2	Negligible	66.6	0.1	Negligible
15	73.6	74.3	0.7	Negligible	74.1	0.5	Negligible
16	73.6	74.2	0.6	Negligible	74.1	0.5	Negligible
18	72.0	72.9	0.9	Negligible	72.7	0.7	Negligible
19	72.0	72.9	0.9	Negligible	72.7	0.7	Negligible
20	76.0	76.2	0.2	Negligible	76.2	0.2	Negligible
21a	75.9	76.2	0.3	Negligible	76.1	0.2	Negligible
21b	75.9	76.2	0.3	Negligible	76.1	0.2	Negligible

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic (dB)	Magnitude of impact	Baseline + average construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic (dB)	Magnitude of impact
22	73.0	73.1	0.1	Negligible	73.1	0.1	Negligible
23	74.0	74.2	0.2	Negligible	74.1	0.1	Negligible
24	68.5	68.8	0.3	Negligible	68.7	0.2	Negligible
25	68.4	68.8	0.4	Negligible	68.7	0.3	Negligible
26	66.6	67.2	0.6	Negligible	67.0	0.4	Negligible
27	66.6	66.7	0.1	Negligible	66.6	0.0	Negligible
28	69.3	69.3	0.0	Negligible	69.3	0.0	Negligible
29	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
30	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
31	59.6	59.9	0.3	Negligible	59.8	0.2	Negligible
32	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
33	70.4	70.8	0.4	Negligible	70.6	0.2	Negligible
34	70.4	70.8	0.4	Negligible	70.6	0.2	Negligible
35	59.1	61.9	2.8	Low	61.1	2.0	Low
36	66.7	66.8	0.1	Negligible	66.8	0.1	Negligible
37	59.1	60.4	1.3	Low	59.9	0.8	Negligible
38	66.7	66.8	0.1	Negligible	66.8	0.1	Negligible
39	62.3	62.6	0.3	Negligible	62.5	0.2	Negligible
40	62.3	62.6	0.3	Negligible	62.5	0.2	Negligible
41	63.0	63.1	0.1	Negligible	63.1	0.1	Negligible
42	62.3	62.6	0.3	Negligible	62.5	0.2	Negligible
43	72.2	72.3	0.1	Negligible	72.3	0.1	Negligible

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic (dB)	Magnitude of impact	Baseline + average construction BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic (dB)	Magnitude of impact
44	68.7	68.7	0.0	Negligible	68.7	0.0	Negligible
45	67.9	67.9	0.0	Negligible	67.9	0.0	Negligible
46	68.7	68.7	0.0	Negligible	68.7	0.0	Negligible
47	73.6	74.3	0.7	Negligible	74.1	0.5	Negligible
48	69.2	69.2	0.0	Negligible	69.2	0.0	Negligible

3.2.2 Detailed calculations

15. The same detailed calculations undertaken for the North Falls alone scenario have also been undertaken for the North Falls and Five Estuaries cumulative construction Scenario 1, incorporating the proposed mitigation option of a temporary 40mph speed limit on Bentley Road from the A120 to Little Bromley (Link 4). The same modelling process and data was used as for the North Falls alone scenario, the only difference in the assessment is the use of the cumulative construction traffic data for the 'with development' scenario.

16. The results of the calculations are shown in Table 7 (peak flows) and Table 8 (average flows).

Table 7 Calculated road traffic noise levels, North Falls mitigated and Five Estuaries peak traffic

NVSR	Calculated daytime road traffic noise level (dB $L_{A10,18h}$)		Change in noise level from baseline (dB $L_{A10,18h}$)
	Baseline year	Baseline year plus peak construction traffic, mitigated	Baseline year plus peak construction traffic, mitigated
CTR1	66.9	70.5	3.6
CTR2	58.3	60.6	2.3
CTR3	61.4	68.1	6.7
CTR4	55.2	59.3	4.1
CTR5	55.0	59.2	4.2
CTR6	59.0	64.7	5.7
CTR7	53.0	57.9	4.9

Table 8 Calculated road traffic noise levels, North Falls mitigated and Five Estuaries average traffic

NVSR	Calculated daytime road traffic noise level (dB $L_{A10,18h}$)		Change in noise level from baseline (dB $L_{A10,18h}$)
	Baseline year	Baseline year plus average construction traffic, mitigated	Baseline year plus average construction traffic, mitigated
CTR1	66.9	69.3	2.4
CTR2	58.3	59.8	1.5
CTR3	61.4	66.3	4.9
CTR4	55.2	58.0	2.8
CTR5	55.0	57.9	2.9
CTR6	59.0	63.1	4.1
CTR7	53.0	56.5	3.5

3.3 North Falls, Five Estuaries and other projects cumulative (Scenario 1)

3.3.1 Basic noise level calculations

17. To assess the potential cumulative effects with other projects, the change in BNL has been calculated for the following scenarios:

    - Baseline vs Baseline + peak construction North Falls mitigated + Five Estuaries and other projects; and
    - Baseline vs Baseline + average construction North Falls mitigated + Five Estuaries and other projects.

18. The results of the BNL calculations and associated magnitude of impact are provided in Table 9.

Table 9 Calculated BNLs and magnitude of impact, North Falls mitigated and Five Estuaries (Scenario 1) and Other Cumulative Projects

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction North Falls + Five Estuaries and other projects BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic and cumulative projects (dB)	Magnitude of impact	Baseline + average construction North Falls + Five Estuaries and other projects BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic and cumulative projects (dB)	Magnitude of impact
1	79.4	79.8	0.4	Negligible	79.8	0.4	Negligible
2	79.4	80.0	0.6	Negligible	79.9	0.5	Negligible
3	73.6	74.9	1.3	Low	74.8	1.2	Low
4	56.9	66.6	9.7	High	65.9	9.0	High
5	56.9	57.9	1.0	Low	57.7	0.8	Negligible
6	66.7	69.3	2.6	Low	69.2	2.5	Low
7	60.4	60.9	0.5	Negligible	60.8	0.4	Negligible
8	60.4	60.9	0.5	Negligible	60.8	0.4	Negligible
9	69.0	69.0	0.0	Negligible	69.0	0.0	Negligible
10	69.0	69.0	0.0	Negligible	69.0	0.0	Negligible
13	66.5	66.5	0.0	Negligible	66.5	0.0	Negligible
14	66.5	66.9	0.4	Negligible	66.8	0.3	Negligible
15	73.6	75.1	1.5	Low	75.0	1.4	Low
16	73.6	74.8	1.2	Low	74.7	1.1	Low
18	72.0	73.7	1.7	Low	73.6	1.6	Low
19	72.0	73.7	1.7	Low	73.5	1.5	Low
20	76.0	76.3	0.3	Negligible	76.2	0.2	Negligible
21a	75.9	76.3	0.4	Negligible	76.2	0.3	Negligible
21b	75.9	76.3	0.4	Negligible	76.2	0.3	Negligible

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction North Falls + Five Estuaries and other projects BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic and cumulative projects (dB)	Magnitude of impact	Baseline + average construction North Falls + Five Estuaries and other projects BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic and cumulative projects (dB)	Magnitude of impact
22	73.0	73.3	0.3	Negligible	73.3	0.3	Negligible
23	74.0	74.2	0.2	Negligible	74.1	0.1	Negligible
24	68.5	68.8	0.3	Negligible	68.7	0.2	Negligible
25	68.4	68.8	0.4	Negligible	68.7	0.3	Negligible
26	66.6	67.2	0.6	Negligible	67.0	0.4	Negligible
27	66.6	66.7	0.1	Negligible	66.6	0.0	Negligible
28	69.3	69.3	0.0	Negligible	69.3	0.0	Negligible
29	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
30	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
31	59.6	59.9	0.3	Negligible	59.8	0.2	Negligible
32	69.3	69.5	0.2	Negligible	69.4	0.1	Negligible
33	70.4	71.5	1.1	Low	71.4	1.0	Low
34	70.4	71.8	1.4	Low	71.6	1.2	Low
35	59.1	62.0	2.9	Low	61.2	2.1	Low
36	66.7	66.8	0.1	Negligible	66.8	0.1	Negligible
37	59.1	60.5	1.4	Low	60.0	0.9	Negligible
38	66.7	66.8	0.1	Negligible	66.8	0.1	Negligible
39	62.3	62.6	0.3	Negligible	62.5	0.2	Negligible
40	62.3	62.6	0.3	Negligible	62.5	0.2	Negligible
41	63.0	63.1	0.1	Negligible	63.1	0.1	Negligible
42	62.3	62.6	0.3	Negligible	62.6	0.3	Negligible
43	72.2	72.4	0.2	Negligible	72.4	0.2	Negligible

Link ID	Baseline BNL (dB $L_{A10,18hr}$)	Baseline + peak construction North Falls + Five Estuaries and other projects BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to peak construction traffic and cumulative projects (dB)	Magnitude of impact	Baseline + average construction North Falls + Five Estuaries and other projects BNL (dB $L_{A10,18hr}$)	Calculated change in BNL due to average construction traffic and cumulative projects (dB)	Magnitude of impact
44	68.7	68.7	0.0	Negligible	68.7	0.0	Negligible
45	67.9	67.9	0.0	Negligible	67.9	0.0	Negligible
46	68.7	68.8	0.1	Negligible	68.8	0.1	Negligible
47	73.6	74.5	0.9	Negligible	74.3	0.7	Negligible
48	69.2	69.2	0.0	Negligible	69.2	0.0	Negligible

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