

A30 Chiverton to Carland Cross Environmental Statement

**Volume 6 Document Ref 6.4 ES Appendix 5.4
Air quality- baseline data**

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Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure)
Regulations 2009 (as amended)
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5.4 Baseline Data

Local air quality monitoring

- 5.4.1 Measurements of NO₂ pollutant concentrations in the local area are undertaken using passive monitoring diffusion tubes at 36 sites in the study area. Results of local monitoring are available from Cornwall Council air quality reports **Invalid source specified**.. Monitoring of PM₁₀ is not currently undertaken in the local area.
- 5.4.2 A summary of diffusion tube monitoring results for local air quality monitoring sites in the study area is presented in Table 5-1 for annual mean concentrations from 2012 to 2016. Any NO₂ annual mean concentrations exceeding the 40µg/m³ air quality objective are highlighted in bold. Concentrations of annual mean NO₂ exceeding the objective have been recorded in 2016 in the study area in urban areas of Newquay, Grampound and Truro.

Table 5-1 LAQM diffusion tube monitoring sites

Site ID	Location	Site type	Grid reference		In AQMA (Y/N)	NO ₂ annual mean concentration (µg/m ³)				
			X	Y		2012	2013	2014	2015	2016
CHW1	Chacewater	Urban traffic	174975	44393	N	-	-	-	-	22.4
CHW2	Chacewater	Urban traffic	175063	44417	N	-	-	-	-	33.1
CHW3	Chacewater	Urban traffic	175084	44430	N	-	-	-	-	26.9
CHW4	Chacewater	Urban traffic	175111	44438	N	-	-	-	-	31.5
CHW5	Chacewater	Urban traffic	175162	44452	N	-	-	-	-	20.9
GRA3	Grampound	Urban traffic	193644	48273	Y	-	-	54.4	51.8	57.2
GRA4	Grampound	Urban traffic	193695	48251	Y	-	-	46.1	41.8	42.9
GRA5	Grampound	Urban traffic	193580	48289	Y	-	-	32.5	27.1	30.6
GRA7	Grampound	Urban traffic	193418	48368	Y	-	-	-	-	17.0
GRA8	Grampound	Urban traffic	193535	48330	Y	-	-	-	-	29.2
NQY8	Newquay	Urban traffic	182926	60244	Y	-	36.3	34.7	33.1	40.8
NQY9	Newquay	Urban traffic	184957	60291	Y	-	33.0	35.6	33.0	35.4
TRU1	Threemilestone	Urban traffic	178142	45149	Y	31.7	29.5	32.5	28.1	31.0
TRU2	Threemilestone	Urban traffic	178103	45040	Y	31.7	29.5	32.5	29.4	18.5
TRU3	Threemilestone	Urban traffic	178360	45039	Y	-	-	-	-	15.7
TRU4	Truro	Urban traffic	179438	45079	Y	30.6	31.4	33.1	27.9	29.2
TRU6	Truro	Urban traffic	179515	45078	Y	43.5	45.6	52.7	47.6	49.4
TRU8	Truro	Urban traffic	179536	45072	Y	38.5	39.3	42.4	38.8	43.0
TRU12	Truro	Urban background	179848	44424	Y	6.7	6.7	6.1	5.4	6.0
TRU13	Truro	Urban traffic	180576	44822	Y	69.4	73.8	80.2	81.8	92.2
TRU14	Truro	Urban traffic	180772	44736	Y	-	19.4	17.5	17.2	19.2
TRU15	Truro	Urban traffic	180716	44754	Y	-	20.6	17.4	17.2	18.5
TRU16	Truro	Urban traffic	182235	45229	Y	-	51.5	50.1	42.9	46.7

Site ID	Location	Site type	Grid reference		In AQMA (Y/N)	NO ₂ annual mean concentration (µg/m ³)				
			X	Y		2012	2013	2014	2015	2016
TRU18	Truro	Urban traffic	183054	44876	Y	30.6	32.2	31.2	33.7	38.0
TRU20	Truro	Urban traffic	183071	44892	Y	37.7	39.0	38.5	36.4	35.4
TRU26	Truro	Urban traffic	180592	44858	Y	13.5	13.0	12.9	11.2	12.5
TRU27	Truro	Urban traffic	180641	44799	Y	67.7	80.1	82.9	85.4	84.2
TRU28	Truro	Urban traffic	180700	44777	Y	87.0	96.0	95.3	92.9	94.9
TRU29	Truro	Urban traffic	180851	44722	Y	27.5	29.0	28.4	25.9	30.1
TRU30	Truro	Urban traffic	180673	44800	Y	41.9	41.1	40.3	35.9	37.0
TRU31	Truro	Urban traffic	180782	44762	Y	33.7	31.4	34.7	32.6	33.1
TRU43	Truro	Urban traffic	182861	44929	Y	-	-	25.1	22.3	23.3
TRU44	Truro	Urban traffic	183638	45882	Y	-	-	25.7	21.9	24.1
TRU45	Truro	Urban traffic	180890	44732	Y	-	-	19.3	17.8	18.6
TRU46	Truro	Urban traffic	180938	44717	Y	-	-	16.4	15.1	16.3
TRU47	Truro	Urban traffic	182590	44409	Y	-	-	-	-	13.1

Scheme-specific monitoring

- 5.4.3 Highways England carried out monitoring of NO₂ and NO_x using diffusion tubes at 16 monitoring sites. Nine of the sites were located where humans may be exposed to a change in emissions. The other seven sites were at locations of sensitive ecology.
- 5.4.4 The monitoring at sensitive human sites was undertaken for a period of 10 months (August 2016 – May 2017) adjacent to the existing A30 and the scheme. Monitoring was undertaken at the sensitive ecology sites for a period of six months (November 2016 – May 2017). The raw NO₂ concentrations measured for each period are shown in Table 5-5. The raw NO_x concentrations measured for each period at the survey locations representative of designated sites are shown in Table 5-3.
- 5.4.5 Where data capture is less than 75% at any location (i.e. 9 months), monitored results have been annualised, to determine a representative annual mean concentration for comparison with the annual mean NO₂ objective. This has been undertaken following the methodology set out in LAQM.TG16.
- 5.4.6 It is necessary to bias adjust diffusion tube results as these are not a reference method and therefore generally have lower accuracy. Calculated annual mean NO₂ concentrations have been bias-adjusted using the national spreadsheet method as no automatic monitors were available in the proximity of the survey with which to co-locate diffusion tubes. A bias-adjustment factor of 0.92 has been applied to the annualised NO₂ concentrations. No adjustment factor has been applied to monitored NO_x concentrations.
- 5.4.7 The monitored concentrations at all monitoring sites are below the air quality objectives with a maximum of 37.5µg/m³ being recorded at the junction of the A30 and the B3824.

Table 5-2 Monitored NO₂ concentrations at all monitoring sites (µg/m³)

Site ID	Site name	Site Type	X	Y	Data capture	Period average	Annual average
1	Chiverton Cross	Roadside	174757	47096	58%	21.9	20.7
2	Four Burrows (Rosconick)	Roadside	175246	47512	50%	17.8	16.5
3	(B3824)	Roadside	177419	48702	58%	33.2	31.3
4	Tresawsen	Roadside	178875	49455	50%	20.7	20.3
5	Marazanvose	Roadside	179850	50252	50%	28.1	27.6
6	Zelah 1	Roadside	181074	51751	58%	33.8	31.8
7	Zelah 2	Roadside	181545	52349	58%	13.3	12.5
8	(B3824)	Roadside	177676	48763	50%	38.1	37.5
9	Carland Cross (services)	Roadside	184796	54008	58%	20.4	19.2
10	Newlyn Downs SSSI 1.1	Rural	182808	53522	50%	6.9	5.6
11	Newlyn Downs SSSI 1.2	Rural	182903	53612	50%	7.3	6.0
12	Newlyn Downs SSSI 1.3	Rural	182972	53686	50%	7.7	6.3
13	Newlyn Downs SSSI 1.4	Rural	183041	53749	42%	7.7	6.8
14	Carrick Heaths (west) 2.1	Rural	178755	49891	50%	6.4	5.3
15	Carrick Heaths (west) 2.2	Rural	178755	49970	33%	7.5	5.3
16	Carrick Heaths (west) 2.3	Rural	178743	50052	25%	5.7	4.2

Table 5-3 Monitored NO_x concentrations at designated ecological sites (µg/m³)

Site ID	Site name	X	Y	Data capture	Period average	Annual average
10	Newlyn Downs SSSI 1.1	182808	53522	50%	10.1	9.0
11	Newlyn Downs SSSI 1.2	182903	53612	42%	11.0	9.7
12	Newlyn Downs SSSI 1.3	182972	53686	50%	12.5	11.0
13	Newlyn Downs SSSI 1.4	183041	53749	42%	10.7	10.3
14	Carrick Heaths (west) 2.1	178755	49891	50%	10.7	9.4
15	Carrick Heaths (west) 2.2	178755	49970	33%	7.8	5.9
16	Carrick Heaths (west) 2.3	178743	50052	33%	9.0	7.2

Background pollution concentrations

- 5.4.8 Background concentrations refer to the existing levels of pollution in the atmosphere, produced by a variety of sources, such as roads and industrial processes. Defra has produced estimated background air pollution data for each 1kmx1km OS grid square for each local authority area in the UK. Background maps are available for 2015 and projected through to 2030.
- 5.4.9 Estimated background air pollution data for 2016 for NO₂ and PM₁₀ for the local authorities close to the scheme are presented in Table 5-4. The table shows the maximum, minimum and average concentrations for the grid squares in CC.
- 5.4.10 As the table shows, none of the background concentrations are above the relevant annual AQS objective concentration for NO₂ or PM₁₀ (40µg/m³).

Table 5-4 Predicted background pollutant concentrations for 2016

Local Authority	Annual mean NO ₂ concentration (µg/m ³)			Annual mean PM ₁₀ concentration (µg/m ³)		
	Max	Min	Average	Max	Min	Average
Cornwall Council	17.4	2.4	4.3	21.6	9.0	12.3

- 5.4.11 There is limited background monitoring undertaken by CC. A comparison between one Defra modelled background concentration in Truro and the monitored background result in Truro has been provided in Table 5-5. The Defra modelled concentration is 15% higher than the observed concentration for the same year (2016).
- 5.4.12 Due to the limited existing background monitoring data available this assessment has used concentrations from the Defra maps to provide background concentrations for this assessment.

Table 5-5 Comparison between Defra modelled background concentration and local monitoring

Site ID	Grid reference		Monitored NO ₂ 2016 (µg/m ³)	Background NO ₂ 2016 (µg/m ³)	Difference µg/m ³	% change
	X	Y				
TRU12	179500	44500	6.0	6.9	0.9	15.0

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