Appendix 4.1

AIR QUALITY MONITORING

MONITORING SCOPE

The following monitoring was undertaken using passive diffusion tubes:

- Nitrogen Dioxide (NO_2) at 22 locations
- Nitrogen Oxides (NO_X) at 4 locations
- Ammonia (NH_3) at 4 locations
- Sulphur Dioxide (SO_2) at 3 locations

The locations are shown in **Figure 1**, and additional details in **Table 1**.

Single tubes were deployed at each location with the exception of:

- NK22, which is co-located with the automatic monitor in Immingham and where triplicate NO_2 and NO_X tubes were deployed for local bias adjustment factor generation, and
- locations NK1 and NK12, where triplicate NO2 tubes were used.

The diffusion tubes were exposed for monthly intervals over a period of 3 months as follows:

- Month/Period 1 - 24//09/2019 to 23/10/2019
- Month/Period 2 - 23/10/2019 to 21/11/2019
- Month/Period 3 - 21/11/2019 to 19/12/2019

The NO_2 (20% TEA in water), NO_X and SO_2 diffusion tubes were provided by Gradko Laboratories. The ammonia samplers (ALPHA samplers) were provided by Centre of Ecology and Hydrology (CEH).

DATA PROCESSING

Following the methodology prescribed by Defra[1], the raw data for NO_2 and NO_X have been bias adjusted, using local bias adjustment factors from the survey period, 0.85 for NO_2 and 1.1 for NO_X as NO_2. Details of the bias adjustment factor calculation are provided in **Figure 2** and **Figure 3** for NO_2 and NO_X respectively.

The NO_2 and NO_X data were also annualised using data from Defra's Automatic Urban and Rural monitoring network sites[2] within 50 miles of the site. The monitoring locations selected were Hull Freetown, Nottingham Centre, Sheffield Tinsley and Immingham (all urban background sites). The factors were applied to the monitoring period average concentrations to produce an annual mean concentration for 2019.

Concentrations of NH_3 and SO_2 are given as simple period averages.

[1] DEFRA (2016) Local Air Quality Management Technical Guidance (TG16)
[2] DEFRA (2020) Interactive Monitoring Networks Map available at https://uk-air.defra.gov.uk/interactive-map as accessed on 20/01/2020

RESULTS

The monitoring results are provided in **Tables 2 – 5** below.

Nitrogen Dioxide

NO_2 concentrations are highly unlikely to exceed the annual mean limit value established in the Air Quality Standards Regulations 2010[3] (or numerically identical UK air quality objective).

The maximum estimated 2019 annual mean NO_2 concentration was 27.0µg/m^3, at location NK07 adjacent to the Port of Immingham storage areas; the second highest was 24.5µg/m^3 at NK20 on Chase Hill Road. The lowest concentration of 8.7 µg/m^3 was recorded at location NK04, alongside the Humber Estuary to the north-west of the port.

Nitrogen Oxides

The maximum 2019 annual average concentration of 24.8µg/m^3 NOx (as NO_2) was measured at location NK14, just off Haven Road. The lowest period average concentration of 16.2µg/m^3 NOx was measured at location NK12, to the south of the North Killingholme Haven Pits.

These concentrations are within the critical level for NO_X, set for the protection of vegetation. (30µg/m^3). The critical level is the concentration of pollutant above which direct adverse effects may occur.

Ammonia

The highest period average concentration of 1µg/m^3 NH_3 was measured at location NK14 which also had the highest concentration of NO_X. The period mean concentrations do not exceed the annual mean critical level of 3µg/m^3 NH_3, applicable where lichens and bryophytes are not a key part of the ecosystem integrity[4], established by Convention on Long Range Transboundary Air Pollution[5]. The lowest period average concentration for NH_3 (0.6µg/m^3) was measured at location NK10 near the Humber Estuary, to the south of the main port activities.

Sulphur Dioxide

The highest period average concentration for SO_2 (4.4µg/m^3) was measured at location NK12, to the south of North Killingholme Haven Pits; the lowest SO_2 concentration of 1.6µg/m^3 was measured at location NK21, on Crook Mill Road to the west of the proposed power station.

The maximum period average concentrations of SO_2 are well within the annual and winter mean objective of 20µg/m^3 and, as such, it is highly unlikely that these objectives are exceeded in the area.

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[3] HMSO (2010). Air Quality Standards Regulations, Statutory Instrument 2010/1001 as amended by the Air Quality Standards (Amendment) Regulations, Statutory Instrument 2016/1184.

[4] The project ecologists have advised that, in the study area for the air quality monitoring, lichen and bryophytes are not a key part of the ecosystem integrity

[5] Atmospheric Pollutant Information System (2020). Critical Loads and Critical Levels available at http://www.apis.ac.uk/critical-loads-and-critical-levels-guide-data-provided-apis#_Toc279788054 as accessed 20/01/2020

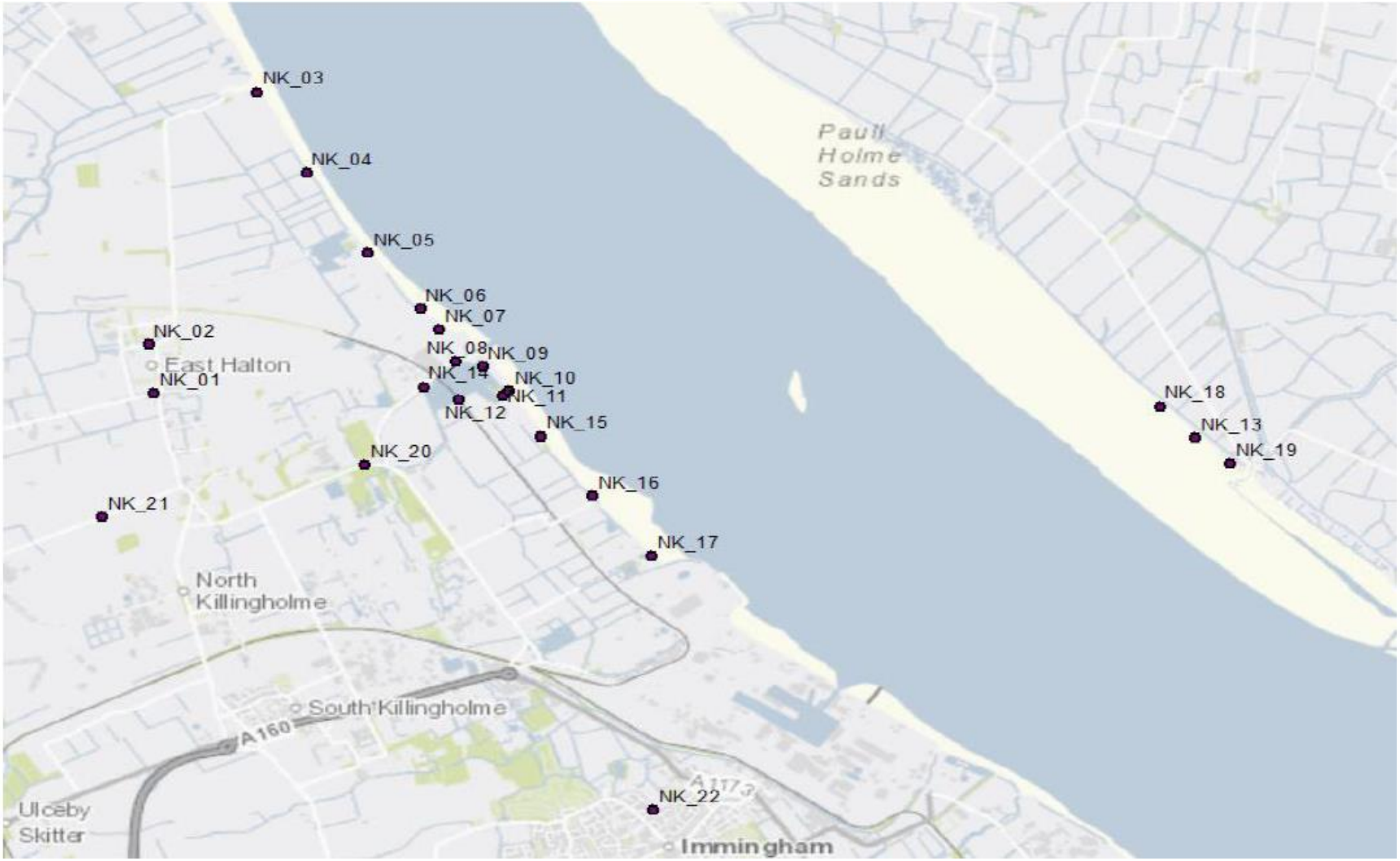


Figure 1: Map showing air quality monitoring points established by WSP (NK01 – NK22)

Table 1: Details of each monitoring location

NK01 – Roadside Pollutants – NO_2 Location – 513865, 419649	NK02 – Roadside Pollutants – NO_2 Location – 513808, 420176	NK03 – Estuary waterfront Pollutants – NO_2 Location – 514777, 422923	NK04 – Estuary waterfront Pollutants – NO_2 Location – 515214, 422054
			

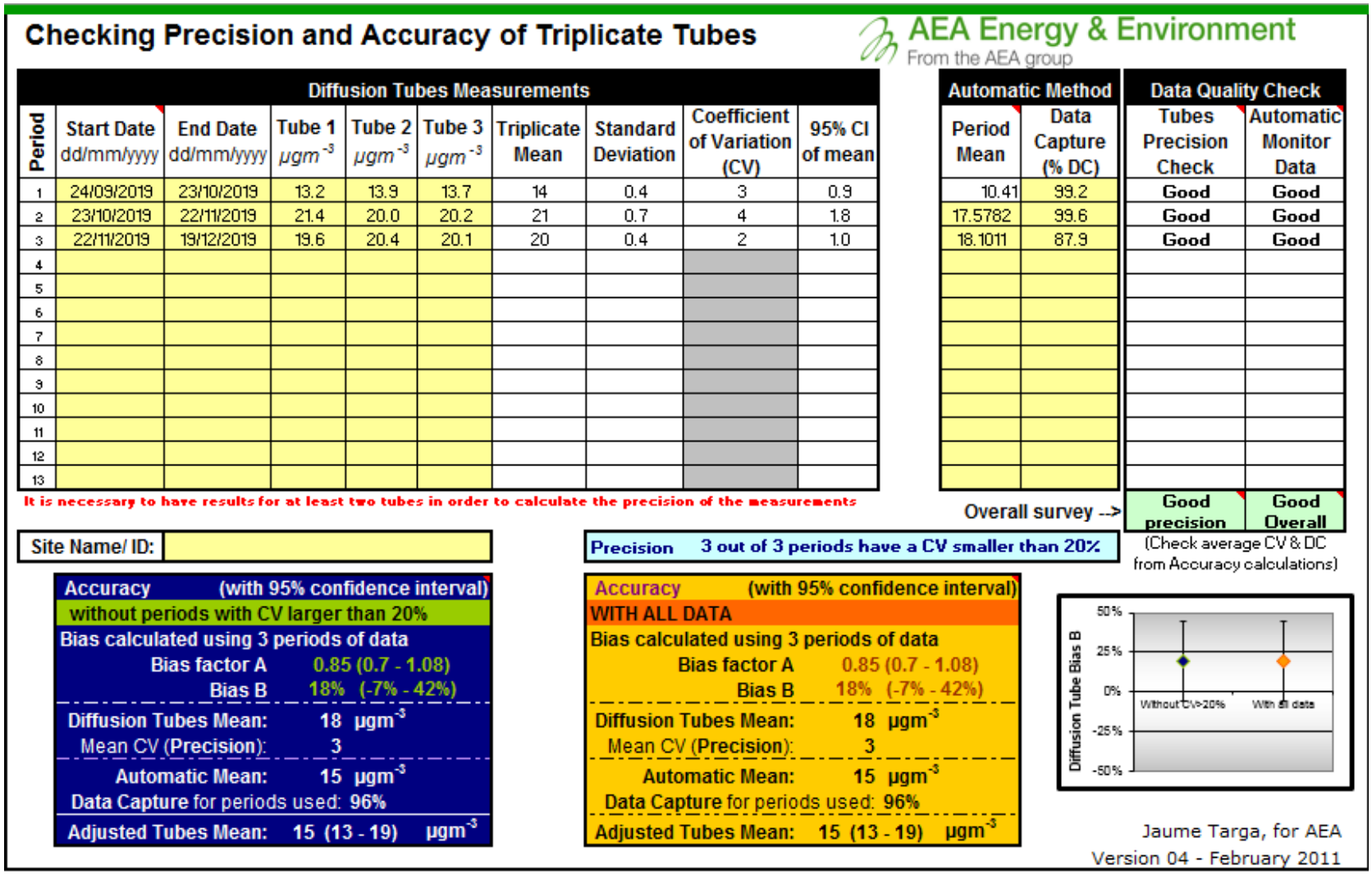
NK05 – Estuary waterfront Pollutants – NO_2 Location – 515757, 421175	NK06 – Estuary waterfront Pollutants – NO_2 Location – 516224, 420581	NK07 – Estuary waterfront Pollutants – NO_2 Location – 516387, 420347	NK08 – NK Haven Pits Pollutants – NO_2, NH_3 Location – 516541, 420001
			

NK09 – NK Haven Pits Pollutants – NO_2 Location – 516767, 419938	NK10 – NK Haven Pits Pollutants – NO_2 NO_X NH_3 Location – 517001, 419674	NK11 – NK Haven Pits Pollutants – NO_2 Location – 516941, 419622	NK12 – NK Haven Pits Pollutants – NO_2 NO_X SO_2 NH_3 Location – 516559, 419587
			

NK13 – Estuary waterfront (North shore) Pollutants – NO_2 Location – 523057, 419169	NK14 – NK Haven Pits Pollutants – NO_2 NO_X SO_2 NH_3 Location – 516240, 419723	NK15 – Estuary waterfront Pollutants – NO_2 Location – 517291, 419184	NK16 – Estuary waterfront Pollutants – NO_2 Location – 517738, 418529
			

NK17 – Estuary waterfront Pollutants – NO_2 Location – 518272, 417879	NK18 – Estuary waterfront (North shore) Pollutants – NO_2 Location – 522742, 419509	NK19 – Estuary waterfront (North) Pollutants – NO_2 Location – 523377, 418879	NK20 – Roadside Pollutants – NO_2 SO_2 Location – 515724, 418873
			

NK21 – Roadside Pollutants – NO_2 SO_2 Location – 513406, 418313	NK22 - Urban Background (Co-located with Immingham AURN) Pollutants – NO_2, NO_X Location – 518285, 415111
	



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	24/09/2019	23/10/2019	13.2	13.9	13.7	14	0.4	3	0.9
2	23/10/2019	22/11/2019	21.4	20.0	20.2	21	0.7	4	1.8
3	22/11/2019	19/12/2019	19.6	20.4	20.1	20	0.4	2	1.0
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
10.41	99.2	Good	Good
17.5782	99.6	Good	Good
18.1011	87.9	Good	Good
Overall survey -->		Good precision	Good Overall

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision 3 out of 3 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 3 periods of data	
Bias factor A	0.85 (0.7 - 1.08)
Bias B	18% (-7% - 42%)
Diffusion Tubes Mean:	18 µgm^{-3}
Mean CV (Precision):	3
Automatic Mean:	15 µgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	15 (13 - 19) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 3 periods of data	
Bias factor A	0.85 (0.7 - 1.08)
Bias B	18% (-7% - 42%)
Diffusion Tubes Mean:	18 µgm^{-3}
Mean CV (Precision):	3
Automatic Mean:	15 µgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	15 (13 - 19) µgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

Figure 2. Bias adjustment for NO_2 tubes

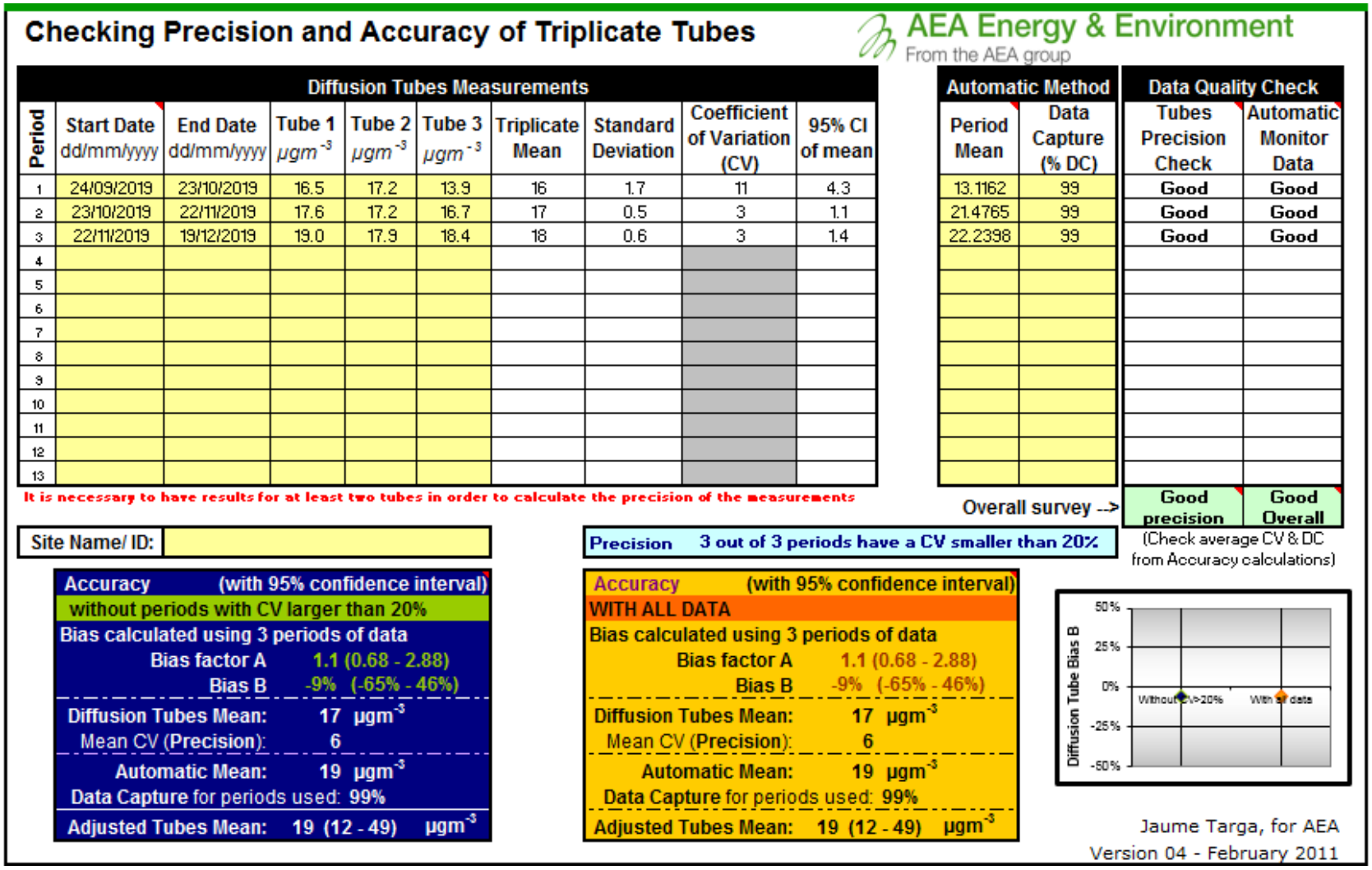


Figure 3. Bias adjustment for NO_X tubes (NO_X as NO_2)

Table 2 Nitrogen Dioxide Monitoring Results

Location	Raw Results (µg/m³)			Period Average (µg/m³) 24 Sep 19 – 19 Dec 19	Bias Adjusted Period Average (Factor = 0.85)	2019 Annual Average (µg/m³)
	24 Sep 19 – 23 Oct 19	23 Oct 19 – 21 Nov 19	21 Nov 19 – 19 Dec 19			
NK1a	14.3	16.7		15.5	13.2	14.3
NK1b	15.1	17.8		16.4	14.0	15.1
NK1c	15.0	17.8		16.4	13.9	15.1
NK1 Average	14.8	17.5		16.1	13.7	14.8
NK2	9.8		21.0	15.4	13.0	13.3
NK3	13.1			13.1	11.1	14.0
NK4	8.1			8.1	6.9	8.7
NK5	16.4	19.7	4.8	13.7	11.7	11.6
NK6	27.0	25.0	31.2	27.7	23.6	23.4
NK7	31.9	29.7	34.2	31.9	27.1	27.0
NK8	17.7	21.8	23.7	21.0	17.9	17.8
NK9			29.2	29.2	24.8	21.1
NK10	21.8	20.0	30.8	24.1	20.5	20.4
NK11		18.9	21.1	20.0	17.0	15.3
NK12a	19.6	19.1	25.6	21.4	18.2	18.1
NK12b	20.0	21.3	27.3	22.8	19.4	19.3
NK12c	18.0	22.4	23.5	21.3	18.1	18.0
NK12 Average	19.2	20.9	25.5	21.8	18.6	18.5
NK13	19.8	19.3	24.0	21.0	17.8	17.8
NK14	20.3	20.3	23.2	21.2	18.1	18.0
NK15	18.8	17.6		18.2	15.4	16.7
NK16	0.5	10.8	26.3	12.4	10.5	10.5
NK17	25.0	22.0	29.6	25.5	21.7	21.6
NK18	18.0	18.3	24.6	20.2	17.2	17.1
NK19	21.2	15.2	29.8	22.0	18.7	18.6
NK20	25.3	32.1	29.6	29.0	24.6	24.5
NK21	12.6	10.2	21.4	14.7	12.5	12.4
NK22a	13.2	21.4	19.6	18.1	15.3	15.3
NK22b	13.9	20.0	20.4	18.1	15.4	15.3
NK22c	13.7	20.2	20.1	18.0	15.3	15.2
NK22 Average	13.6	20.6	20.0	18.0	15.3	15.2
Laboratory Blank	0.1	0.2	0.0	0.1	0.1	0.1

Table 3 Nitrogen Oxides Monitoring (NO_X as NO_2)

Location	Raw Results (µg/m³)			Period Average (µg/m³) 24 Sep 19 – 19 Dec 19	Bias Adjusted Period Average (Factor = 1.1)	2019 Annual Average (µg/m³)
	24 Sep 19 – 23 Oct 19	23 Oct 19 – 21 Nov 19	21 Nov 19 – 19 Dec 19			
NK10	17.6	12.1	15.4	15.0	16.5	16.4
NK12	17.6	11.7	15.3	14.9	16.3	16.2
NK14	25.1	17.9	25.1	22.7	25.0	24.8
NK22A	16.5	17.6	19.0	17.7	19.5	19.4
NK22B	17.2	17.2	17.9	17.4	19.2	19.1
NK22C	13.9	16.7	18.4	16.3	17.9	17.8
NK22 Average	15.8	17.2	18.5	17.1	18.9	18.7

Table 4 Ammonia Monitoring (Data provided were calibrated by CEH using 2018 UKEAP uptake rate)

Location	Raw Results (µg/m³)			Period Average (µg/m³) 24 Sep 19 – 19 Dec 19
	24 Sep 19 – 23 Oct 19	23 Oct 19 – 21 Nov 19	21 Nov 19 – 19 Dec 19	
NK8	0.98	0.61	0.76	0.8
NK10	0.87	0.32	1.46*	0.6
NK12	0.69	0.33	0.65	0.6
NK14	1.23	0.80	1.04	1.0
*Reading discarded due to rainwater ingress into sampler. Flagged as nvalid by laboratory				

Table 5 Sulphur Dioxide Monitoring

Location	Raw Results (µg/m³)			Period Average (µg/m³) 24 Sep 19 – 19 Dec 19
	24 Sep 19 – 23 Oct 19	23 Oct 19 – 21 Nov 19	21 Nov 19 – 19 Dec 19	
NK12	3.18	3.48	6.59	4.4
NK20	2.60	4.02	3.77	3.5
NK21	0.61	0.90	3.26	1.6

Appendix 4.2

AIR QUALITY MODELLING

MODEL DETAILS

Modelling was undertaken using ADMS 5.2 (model version 5.2.2).

MODEL INPUTS - EMISSIONS

The emissions parameters used in the dispersion model for each scenario are shown in **Table 1**, below.

Table 1 - Modelled emissions parameters

Parameter	Unit	Scenario B - Existing	Scenario B - Updated	Scenario E1 - Existing	Scenario E1 - Updated
Height	m	80			
Diameter	m	6.2			
Exhaust Velocity	m/s	24.6		27.6	
Volume Flux (Actual)	m^3/s	738		834	
Temperature	C	87.6		96.6	
Normalised Flow (at reference conditions*)	Nm^3/s	683		581	
NOx BAT level (at reference conditions)	mg/Nm^3	50	30	50	30
NOx Emission rate	g/s	34.2	20.6	29.1	14.5
SO_2 Emission rate	g/s	N/A		3.4	
PM_{10} Emission rate	g/s	N/A		0.9	

*Reference conditions refer to NTP, 15% O_2, dry.

MODEL INPUTS - BUILDINGS

The building and stack parameters used in the dispersion model for each scenario are shown in **Table 2**, below. Other than the buildings, no further topography was used in the dispersion modelling.

Table 2 - Modelled building parameters

Building	Scenario	Height (m)	Width (m)	Length (m)	X	Y	Angle °
HRSG	All	35	30	50	515734	419636	65
Turbine Hall	All	30	45	65	515753	419580	65
Main Stack	All	80	6 (Diameter)		515693	419715	65
Hybrid Cooling Tower (Bank 1)	All	20	20	135	515596	419727	65
Hybrid Cooling Tower (Bank 2)	All	20	20	135	515641	419748	65
Administrative Building	All	10	30	70	515850	419545	65
Warehouse	All	20	30	60	515474	419865	65
Water Treatment Plant	All	8	25	55	515826	419763	65
GIS Building	All	12	15	30	515709	419533	65
Covered Fuel Store	E1 only	35	110	250	515730	420097	22
Biomass Storage Silo 1	E1 only	45	25 (Diameter)		515517	420040	N/A
Biomass Storage Silo 2	E1 only	45	25 (Diameter)		515490	420027	N/A
Limestone Storage Silos	E1 only	45	25 (Diameter)		515462	420014	N/A
Gasifier	E1 only	65	60	100	515616	419980	65

Fuel milling / drying / preparation	E1 only	50	35	10	515527	420103	22
Air Separation Unit (Cold Box)	E1 only	45	15	10	515561	419877	65
Air Separation Unit (Compressor Building)	E1 only	20	20	65	515537	419916	65
Oxygen Storage Tank	E1 only	20	20 (Diameter)		515548	419829	N/A
Nitrogen Storage Tank	E1 only	20	20 (Diameter)		515580	419844	N/A
Wastewater treatment plant	E1 only	20	40	50	515507	419804	65
Main Electrical Switching Station	E1 only	15	25	60	515515	419949	65

MODEL INPUTS - METEOROLOGY

Table 3, below shows the dispersion model input parameters for the dispersion modelling.

Table 3 - Modelled meteorological input parameters

Parameter	Value	Commentary
Surface Albedo	0.23	Model default used to represent ground which is not often covered with snow
Surface Roughness (at dispersion site)	0.5m	Used to represent parkland/open suburbia. Sensitivity testing undertaken using 0.3m and 0.2m roughness lengths. 0.5 gave the most conservative results and was used in the assessment.
Priestley-Taylor Parameter	1	Model default – used to represent moist grassland
Minimum Monin-Obukhov Length	10m	Used to reflect small towns
Precipitation	-	Taken from Meteorological data

DATA WORKUP – PARAMETERS

The parameters (i.e. deposition velocities, NOx to NO_2 conversion) used in the workup of the data are presented in **Table 4**, below.

Table 4 – Parameters used in the workup of ecological impacts

Parameter		Unit	Value
NOx to NO_2 conversion	Long Term (Annual Mean)	N/A	0.7
	Short Term (Daily/Hourly Mean)	N/A	0.35
Nitrogen Deposition Velocity from NOx	Short Vegetation	mm/s	1.5
	Long Vegetation	mm/s	3
Sulphur Deposition Velocity from SO_2	Short Vegetation	mm/s	12
	Long Vegetation	mm/s	24

MODEL RECEPTORS & OUTPUTS

Cartesian grid at resolution 100m, extending 10k from site, at ground level. Habitat sites were modelled at a nominal 10m resolution for sites within 15km.

For NOx:

- Annual mean
-
- 99.79th percentile of hourly concentrations for NOx/NO_2 (18th highest hourly average concentration)

For PM_{10}:

- Annual Mean
- 90.41st percentile of daily mean concentrations for PM_{10} (35th highest daily average concentration)

For SO_2:

- Annual Mean
- 99.2th – daily (3rd highest daily average concentration)
- 99.73th – hourly (24th highest hourly average concentration)

WIND ROSE

Figure 1, below, shows the wind rose data used in the dispersion modelling for 2015 to 2019 meteorological data were taken from Humberside Airport, with cloud cover data taken from Scampton airfield. Meteorological data were input into the model as hourly sequential data.

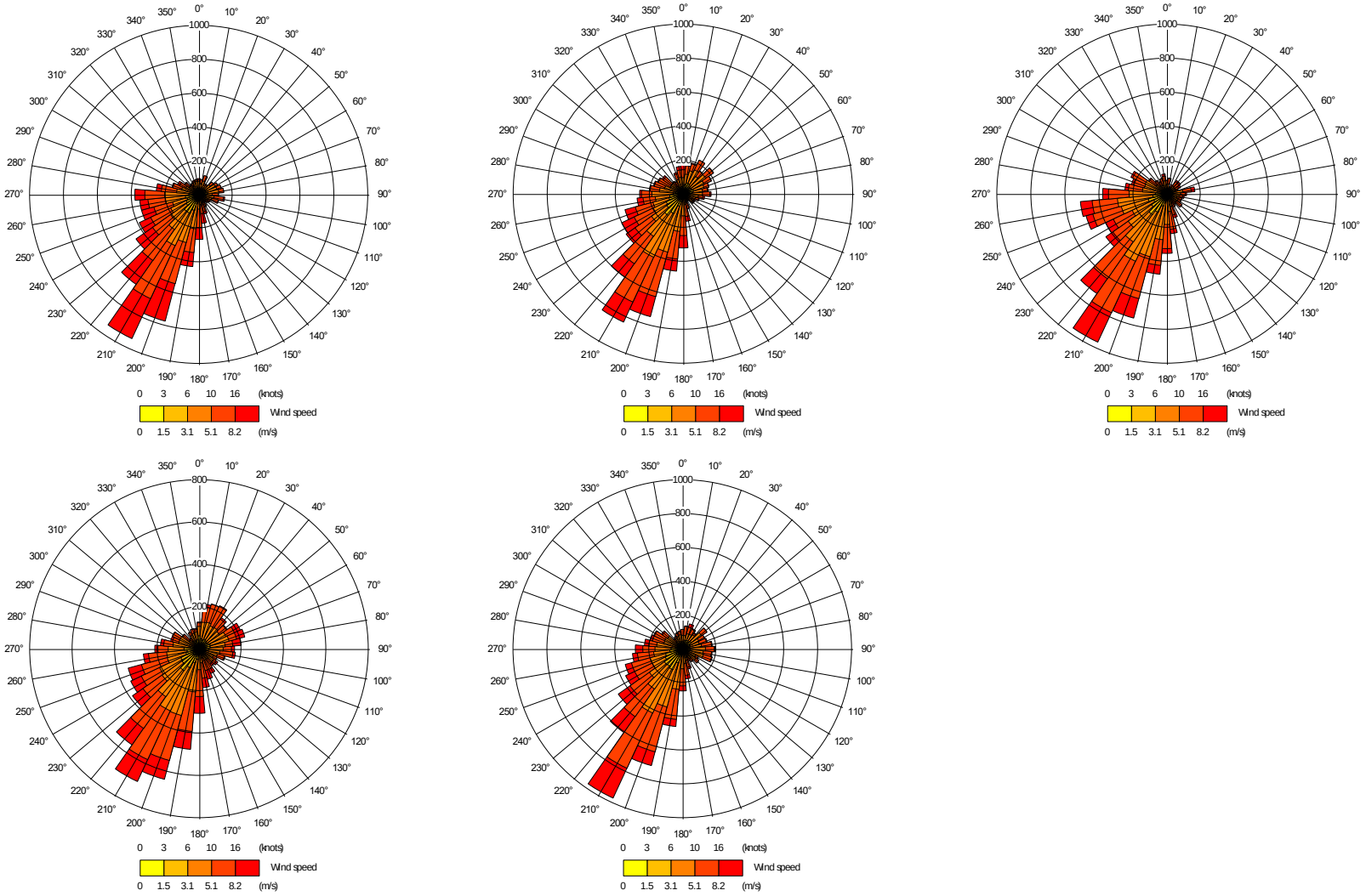


Figure 1 - Windrose data from 2015 to 2019.

SUMMARY OF RESULTS – HUMAN RECEPTORS

Tables 5 to 7, below, set out the a summary of the impacts at human receptors for NOx, SO_2, and PM_{10} respectively.

Table 5 – Summary of NO_2 results at human receptors.

Scenario and Emission Limits		Annual Mean AQS = 40µg/m³		Hourly Mean AQS = 40µg/m³	
		Max Process Contribution	%AQS	Max Process Contribution	%AQS
Scenario B	ES Limits	1.24	3.1%	5.69	2.8%
	BAT Conclusions	0.75	1.9%	4.56	2.3%
Scenario E1	ES Limits	0.93	2.3%	7.21	3.6%
	BAT Conclusions	0.46	1.2%	5.03	2.5%

Table 6 – Summary of SO_2 results at human receptors.

Scenario and Emission Limits		Daily Mean AQS = 125µg/m³		Hourly Mean AQS = 350µg/m³	
		Max Process Contribution	%AQS	Max Process Contribution	%AQS
Scenario B	ES Limits	-	-	-	-
	BAT Conclusions	-	-	-	-
Scenario E1	ES Limits	1.00	0.8%	2.37	0.7%
	BAT Conclusions	1.00	0.8%	2.37	0.7%

Table 7 – Summary of PM_{10} results at human receptors.

Scenario and Emission Limits		Annual Mean AQS = 40µg/m³		Daily Mean AQS = 50µg/m³	
		Max Process Contribution	%AQS	Max Process Contribution	%AQS
Scenario B	ES Limits	-	-	-	-
	BAT Conclusions	-	-	-	-
Scenario E1	ES Limits	0.04	0.1%	0.13	0.3%
	BAT Conclusions	0.04	0.1%	0.13	0.3%

SUMMARY OF RESULTS – ECOLOGICAL SITES

For ecological sites, the results are provided as a function of designated site and habitat type. **Table 8**, below, sets out the naming convention adopted for the habitat type. A summary of the ecolgical results is provided in **Tables 9-10**, below

Table 8 – Naming convention for habitat types.

Habitat Type	ID
Coastal and floodplain grazing marsh	CFM
Coastal saltmarsh	CSM
Deciduous woodland	DWL
Lowland fens	LLF
Mudflats	MUD
No main habitat but additional habitats	NMH
Reedbeds	RDB
Saline lagoons	SLG

Table 9 – Scenario B (ES limits) modelled ecological results.

Designation	Habitat	Maximum NOx PC (µg/m^3)	NOx PEC at Maximum PC (µg/m^3)	Relevant Critical Load (kgN/ha/yr)	Maximum N Dep Impact (kgN/ha/yr)	Maximum N Dep PC as % of Critical Load	N Dep PEC at Maximum PC (kg N/ha/yr)
Humber Estuary	CFM	0.07	15.21	20	0.010	0.04%	23.02
	CSM	1.31	41.02	20	0.179	0.66%	15.68
	DWL	0.07	21.17	10	0.017	0.14%	22.00
	LLF	0.11	34.34	15	0.014	0.07%	23.02
	MUD	1.33	44.05	20	0.180	0.67%	15.69
	NMH	1.30	43.74	20	0.177	0.65%	15.68
	RDB	0.04	17.22	20	0.005	0.02%	13.46
	SLG	0.04	16.25	20	0.005	0.02%	13.46
	CSM	0.07	34.34	20	0.009	0.04%	13.71
	DWL	0.07	21.17	10	0.017	0.14%	22.00

	LLF	0.03	34.34	15	0.004	0.02%	15.19
	MUD	0.11	45.56	20	0.015	0.06%	15.35
	NMH	0.07	38.87	20	0.009	0.03%	13.71
North Killingholme Haven Pits	CSM	0.56	14.58	20	0.024	0.28%	39.50
	DWL	0.53	14.58	10	0.012	1.07%	23.39
	NMH	0.60	14.42	20	0.013	0.30%	28.85
	SLG	0.60	20.37	20	0.078	0.30%	15.41

Table 10 – Scenario B (BAT Conclusions) modelled ecological results.

Designation	Habitat	Maximum NOx PC (µg/m^3)	NOx PEC at Maximum PC (µg/m^3)	Relevant Critical Load (kgN/ha/yr)	Maximum N Dep Impact (kgN/ha/yr)	Maximum N Dep PC as % of Critical Load	N Dep PEC at Maximum PC (kg N/ha/yr)
Humber Estuary	CFM	0.06	15.18	20	0.006	0.03%	23.01
	CSM	1.07	40.32	20	0.108	0.54%	15.61
	DWL	0.05	21.14	10	0.010	0.10%	21.99
	LLF	0.09	34.33	15	0.009	0.06%	23.01
	MUD	1.07	44.01	20	0.108	0.54%	15.61
	NMH	1.06	43.70	20	0.107	0.53%	15.61
	RDB	0.03	17.20	20	0.003	0.02%	13.46
	SLG	0.03	16.23	20	0.003	0.02%	13.46
	CSM	0.05	34.33	20	0.005	0.03%	13.70
	DWL	0.05	21.14	10	0.010	0.10%	21.99

	LLF	0.02	34.33	15	0.002	0.01%	15.19
	MUD	0.09	45.51	20	0.009	0.05%	15.34
	NMH	0.05	38.85	20	0.005	0.03%	13.70
North Killingholme Haven Pits	CSM	0.47	14.53	20	0.014	0.24%	39.49
	DWL	0.44	14.53	10	0.007	0.89%	23.39
	NMH	0.50	14.39	20	0.008	0.25%	28.85
	SLG	0.50	20.06	20	0.047	0.25%	15.38

Table 11 – Scenario E1 (ES limits) modelled ecological results.

Designation	Habitat	Maximum NOx PC (µg/m^3)	NOx PEC at Maximum PC (µg/m^3)	Relevant Critical Load (kgN/ha/yr)	Maximum N Dep Impact (kgN/ha/yr)	Maximum N Dep PC as % of Critical Load	N Dep PEC at Maximum PC (kg N/ha/yr)
Humber Estuary	CFM	0.07	15.20	20	0.008	0.04%	23.01
	CSM	1.31	40.56	20	0.132	0.66%	15.64
	DWL	0.07	21.15	10	0.014	0.14%	21.99
	LLF	0.11	34.34	15	0.011	0.07%	23.02
	MUD	1.33	44.03	20	0.134	0.67%	15.64
	NMH	1.30	43.72	20	0.131	0.65%	15.64
	RDB	0.04	17.21	20	0.004	0.02%	13.46
	SLG	0.04	16.24	20	0.004	0.02%	15.97
	CSM	0.07	34.34	20	0.007	0.04%	13.71
	DWL	0.07	21.15	10	0.014	0.14%	21.99

	LLF	0.03	34.34	15	0.003	0.02%	15.19
	MUD	0.11	45.53	20	0.012	0.06%	15.34
	NMH	0.07	38.86	20	0.007	0.03%	13.71
North Killingholme Haven Pits	CSM	0.56	14.56	20	0.019	0.28%	39.50
	DWL	0.53	14.56	10	0.010	1.07%	23.39
	NMH	0.60	14.41	20	0.010	0.30%	28.85
	SLG	0.60	20.16	20	0.057	0.30%	15.39

Table 12 – Scenario E1 (BAT Conclusions) modelled ecological results.

Designation	Habitat	Maximum NOx PC (µg/m^3)	NOx PEC at Maximum PC (µg/m^3)	Relevant Critical Load (kgN/ha/yr)	Maximum N Dep Impact (kgN/ha/yr)	Maximum N Dep PC as % of Critical Load	N Dep PEC at Maximum PC (kg N/ha/yr)
Humber Estuary	CFM	0.04	15.17	20	0.004	0.02%	23.01
	CSM	0.65	39.90	20	0.066	0.33%	15.57
	DWL	0.03	21.12	10	0.007	0.07%	21.99
	LLF	0.06	34.32	15	0.006	0.04%	23.01
	MUD	0.66	43.99	20	0.067	0.33%	15.57
	NMH	0.65	43.68	20	0.065	0.33%	15.57
	RDB	0.02	17.19	20	0.002	0.01%	13.46
	SLG	0.02	16.22	20	0.002	0.01%	15.96
	CSM	0.04	34.32	20	0.004	0.02%	13.70
	DWL	0.03	21.12	10	0.007	0.07%	21.99

	LLF	0.01	34.32	15	0.001	0.01%	15.19
	MUD	0.06	45.48	20	0.006	0.03%	15.34
	NMH	0.03	38.85	20	0.003	0.02%	13.70
North Killingholme Haven Pits	CSM	0.28	14.51	20	0.010	0.14%	39.49
	DWL	0.26	14.51	10	0.005	0.53%	23.38
	NMH	0.30	14.38	20	0.005	0.15%	28.85
	SLG	0.30	19.87	20	0.028	0.15%	15.36

Table 13 – Scenario E1 (BAT Conclusions) modelled ecological results.

Designation	Habitat	Maximum SO_2 PC ($\mu g/m^3$)	SO_2 PEC at Maximum PC ($\mu g/m^3$)	Maximum SO_2 PC as % of Critical Level	SO_2 PEC at Maximum PC as % of Critical Level
Humber Estuary	CFM	0.01	2.54	0.04%	12.7%
	CSM	0.15	3.71	0.77%	18.6%
	DWL	0.01	3.14	0.04%	15.7%
	LLF	0.01	2.53	0.07%	12.7%
	MUD	0.16	3.72	0.78%	18.6%
	NMH	0.15	3.71	0.76%	18.6%
	RDB	0.00	1.85	0.02%	9.3%
	SLG	0.00	2.79	0.02%	14.0%
	CSM	0.01	3.14	0.04%	15.7%
	DWL	0.01	3.14	0.04%	15.7%

	LLF	0.00	2.15	0.02%	10.8%
	MUD	0.01	5.43	0.07%	27.2%
	NMH	0.01	3.14	0.04%	15.7%
North Killingholme Haven Pits	CSM	0.01	2.65	0.06%	13.3%
	DWL	0.01	2.65	0.06%	13.3%
	NMH	0.01	2.07	0.03%	10.3%
	SLG	0.07	5.05	0.33%	25.2%

Figures 2 and 3, below show the annual mean and hourly imapcts to NO_2 concentrations respectively.

Figure 2 - Annual Mean NO_2 Process Contribution (µg/m^3). Contour interval = 0.05.

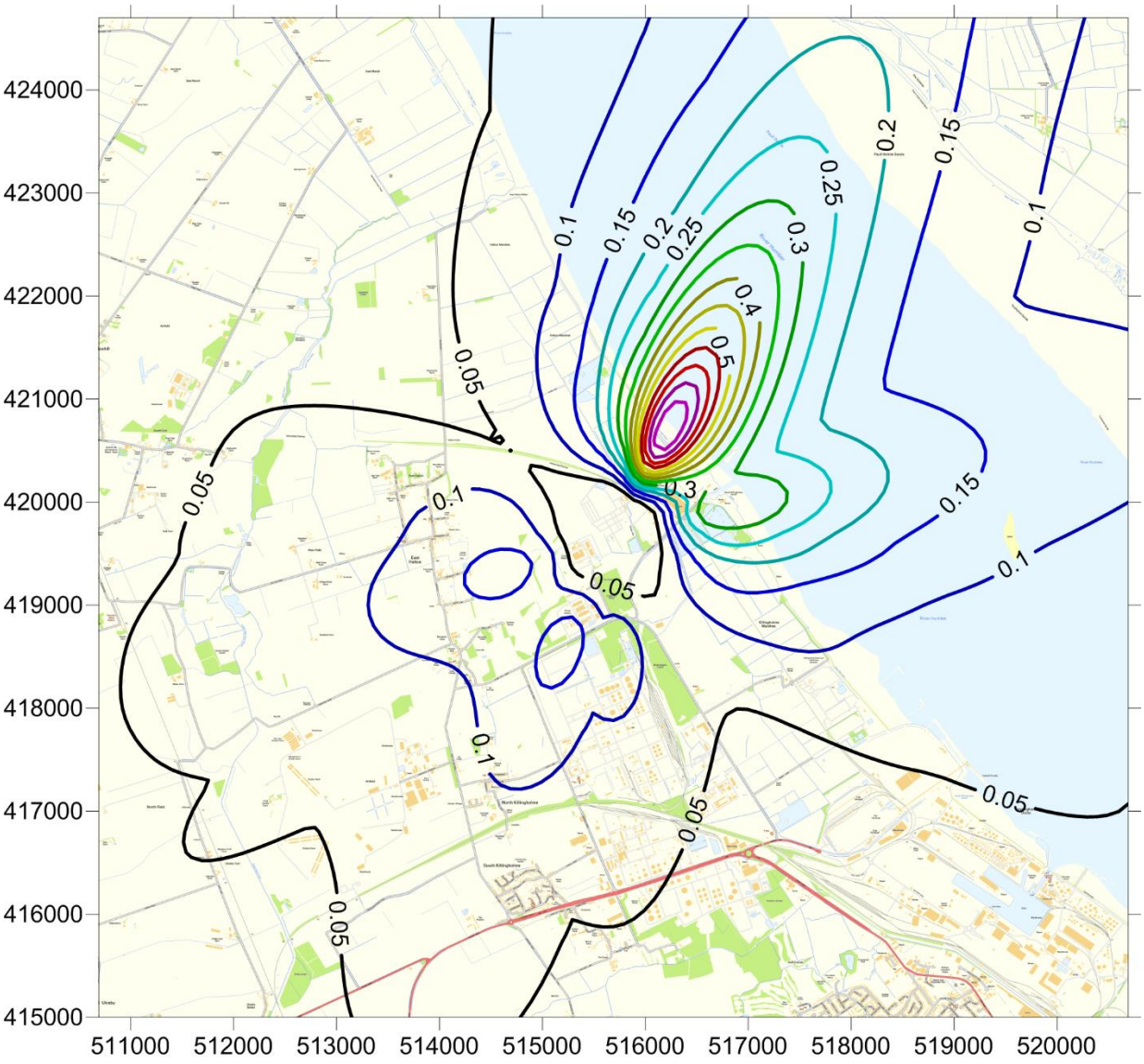
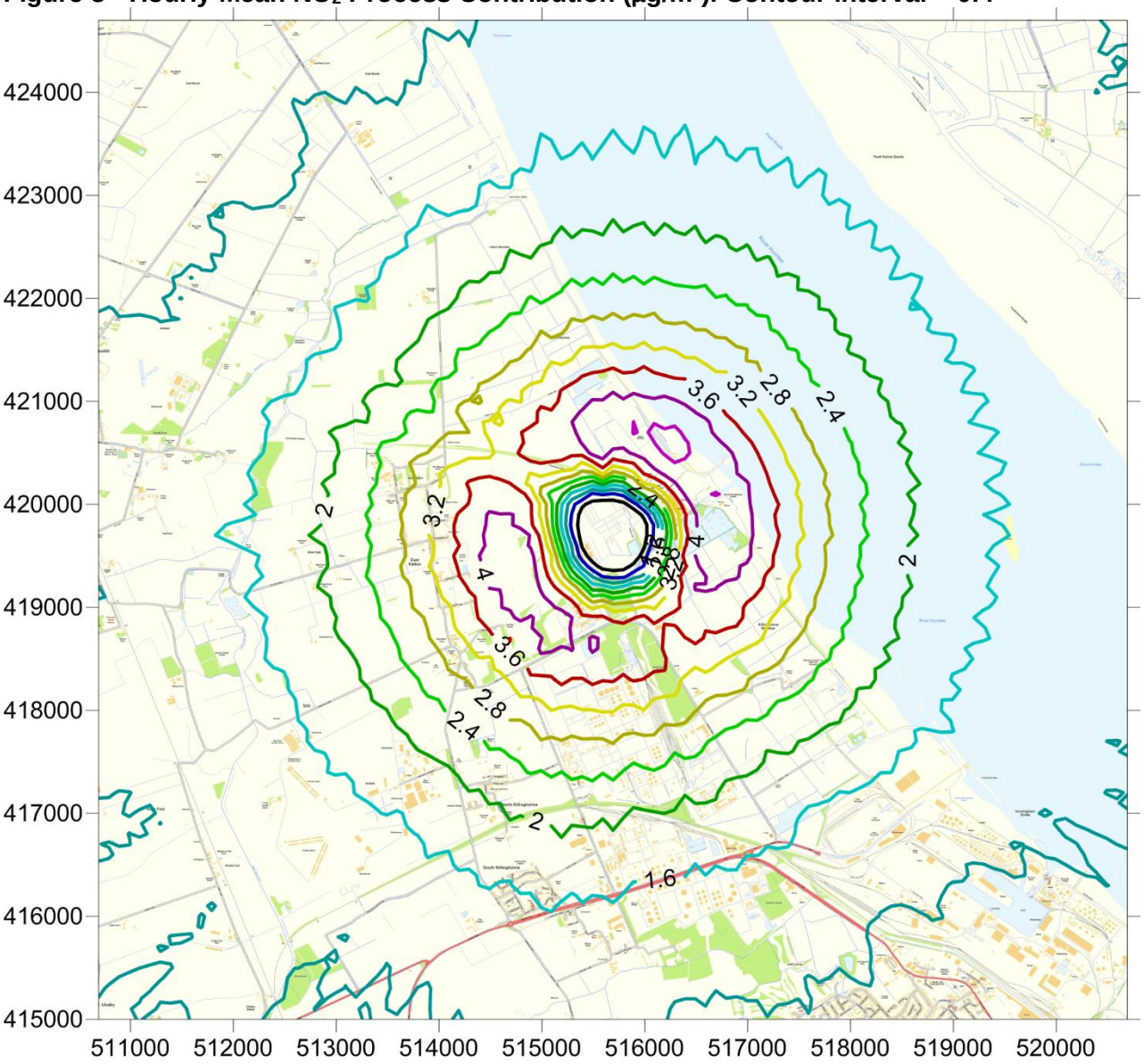


Figure 3 - Hourly Mean NO_2 Process Contribution (µg/m^3). Contour interval = 0.4



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