VikingCCS

Viking CCS Pipeline

Environmental Statement Volume IV – Appendix 11-1: Water Environment Supporting Baseline Info

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11 Water Environment - Baseline Supporting Information

11.1 Introduction

11.1.1 This Appendix provides supporting information for the Water Environment Baseline Environment and Study Area for the Viking CCS Pipeline (hereafter referred to as the Proposed Development) Environmental Statement (ES).

11.2 Study Area

11.2.1 For the purposes of this assessment, a general study area (zone of Influence) of 500m from the Proposed Development DCO Site Boundary has been considered in order to identify water bodies that are hydrologically connected to the Proposed Development and have the potential to be directly impacted by the activities associated with it. This has been extended to 2 km to check for hydrological connectivity to any designated sites that may need consideration.

11.2.2 Given that watercourses flow, water quality and flood risk impacts may propagate downstream, where relevant, the assessment will also consider a wider study area to include as far downstream as a potential impact may influence the quality or quantity of the water body (which in this case is typically for a few kilometres). Professional judgement has been applied to identify the extent to which such features are considered within the assessment.

11.3 Groundwater

Table 1: Groundwater Level Monitoring Sample Points

Sample Point	NGR	Borehole depth (m)	Borehole diameter (mm)	Aquifer monitored
Immingham	TA 21278 14951	89.4	150	Northern Lincolnshire Chalk
Washingdales	TA 19486 07128	101.48	100	Northern Lincolnshire Chalk
Grainsby	TF 26040 98230	84	105	Northern Lincolnshire Chalk
Stewton Lane	TF 34690 86450	116	150	Spilsby Sandstone
Upper Hall East	TF 39480 86130	57	100	Southern Lincolnshire Chalk
Upper Hall West	TF 39480 86130	70.43	80	Carstone Formation

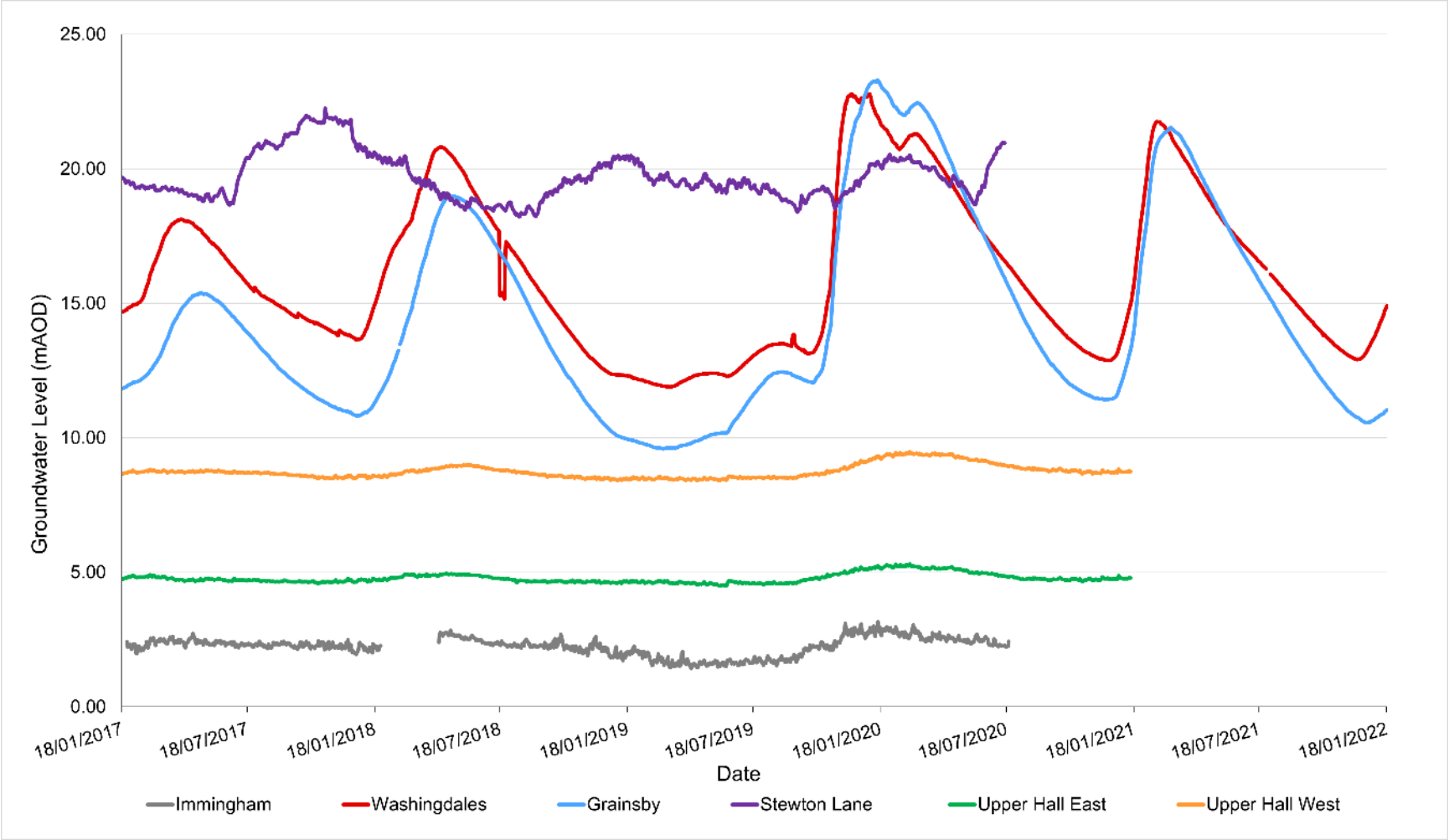

Figure 1: Groundwater Level Monitoring throughout the Study Area

11.4 Rainfall

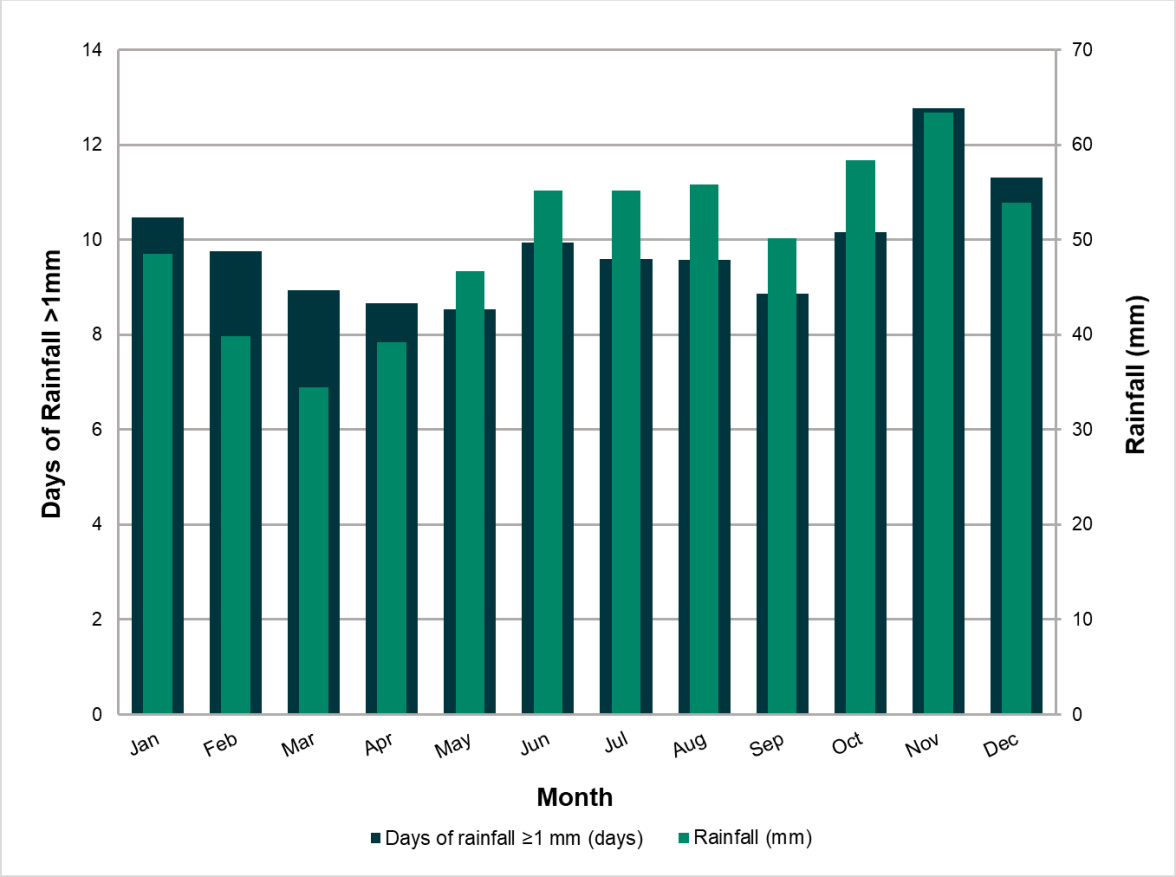

Figure 2: Cleethorpes Weather Station: Monthly Rainfall and Days of Rainfall >1 mm (1991-2020)

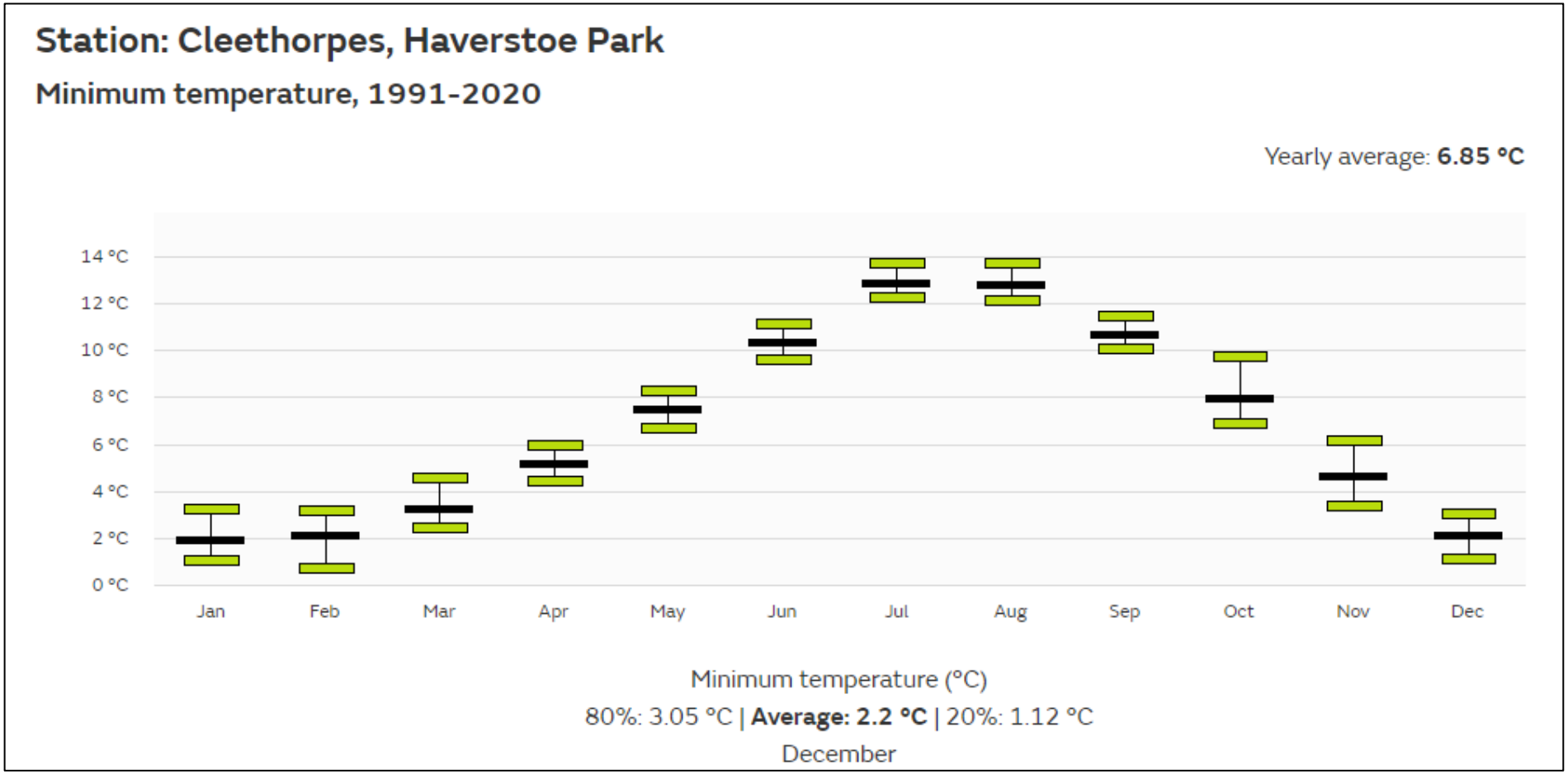

Figure 3: Cleethorpes Weather Station Minimum Air Temperature Graph (1991 – 2010)

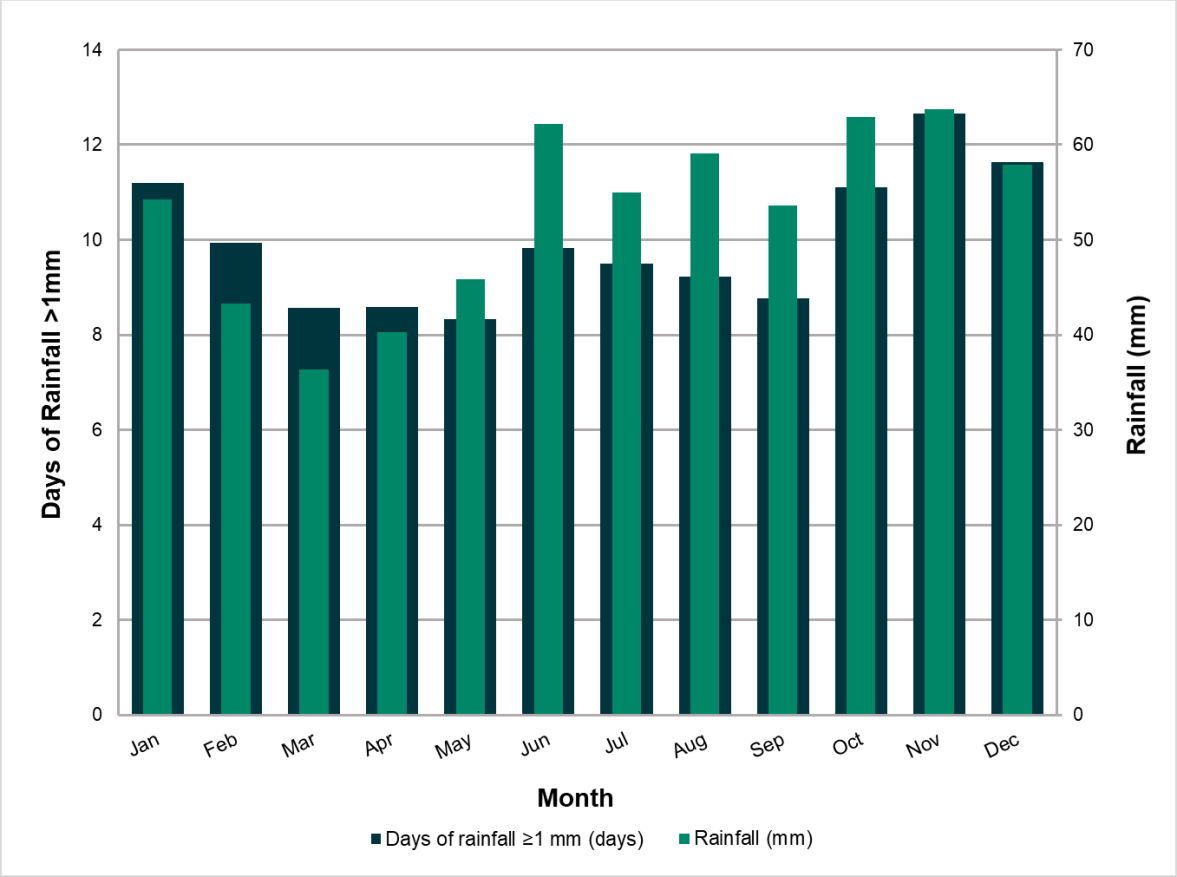

Figure 4: Manby Weather Station: Monthly Rainfall and Days of Rainfall >1 mm (1991-2020)

11.5 Surface water flow

Section 1

11.5.1 There are no gauging stations within the DCO Site Boundary for this section.

Section 2

11.5.2 Outside of the DCO Site Boundary is a gauging station for Laceby Beck / River Freshney Catchment (to N Sea) Water Body (GB104029067530) which lies to the east of the village of Laceby (station ID 029021). The station level is approximately 15.7 m AOD and is a broad trapezoidal flume. The average annual mean flow at this station is 0.116 m^3/s with a maximum daily flow rate of 9.68 m^3/s on the 25/06/2007. The flow that is exceeded 95% of the time (Q95) is 0.375 m^3/s.

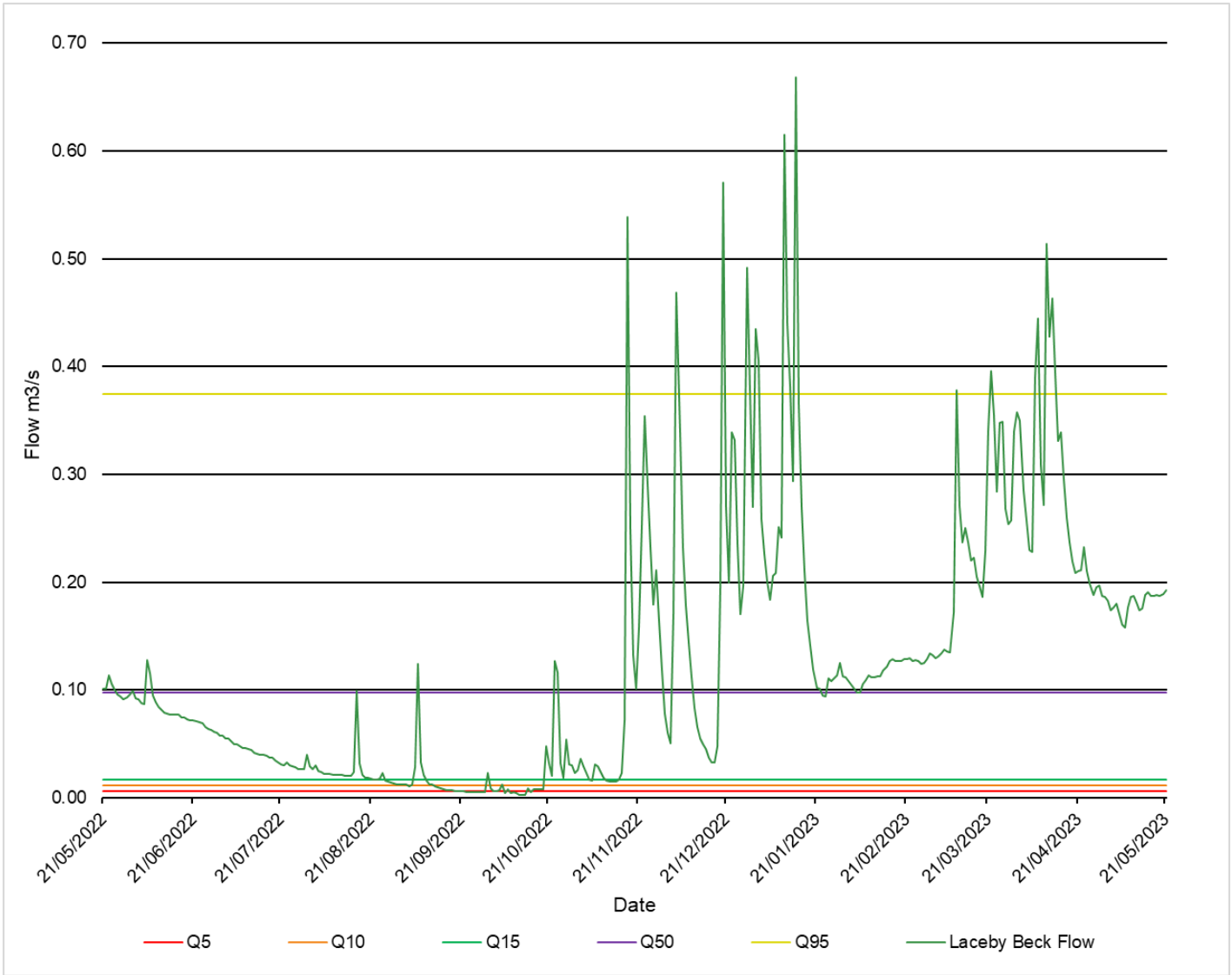

Figure 5: Gauged mean daily flow for the Laceby Beck at (21 May 2022 - 21 May 2023)

11.5.3 The nearest gauging station Waithe Beck (GB104029062100) on the National River Flow Archive is Waithe Beck at Brigsley (gauging station reference 29001) which lies in the village of Brigsley. The station level is approximately 15.7 m AOD and is a broad trapezoidal flume. The average annual mean flow at this station is 0.300 m^3/s with a maximum daily flow rate of 6.42 m^3/s on the 25/06/2007 The flow that is exceeded 95% of the time (Q95) is 0.578 m^3/s.

11.5.4 Gauged mean daily flow for May 2022 – 2023 are shown in **Figure 6**.

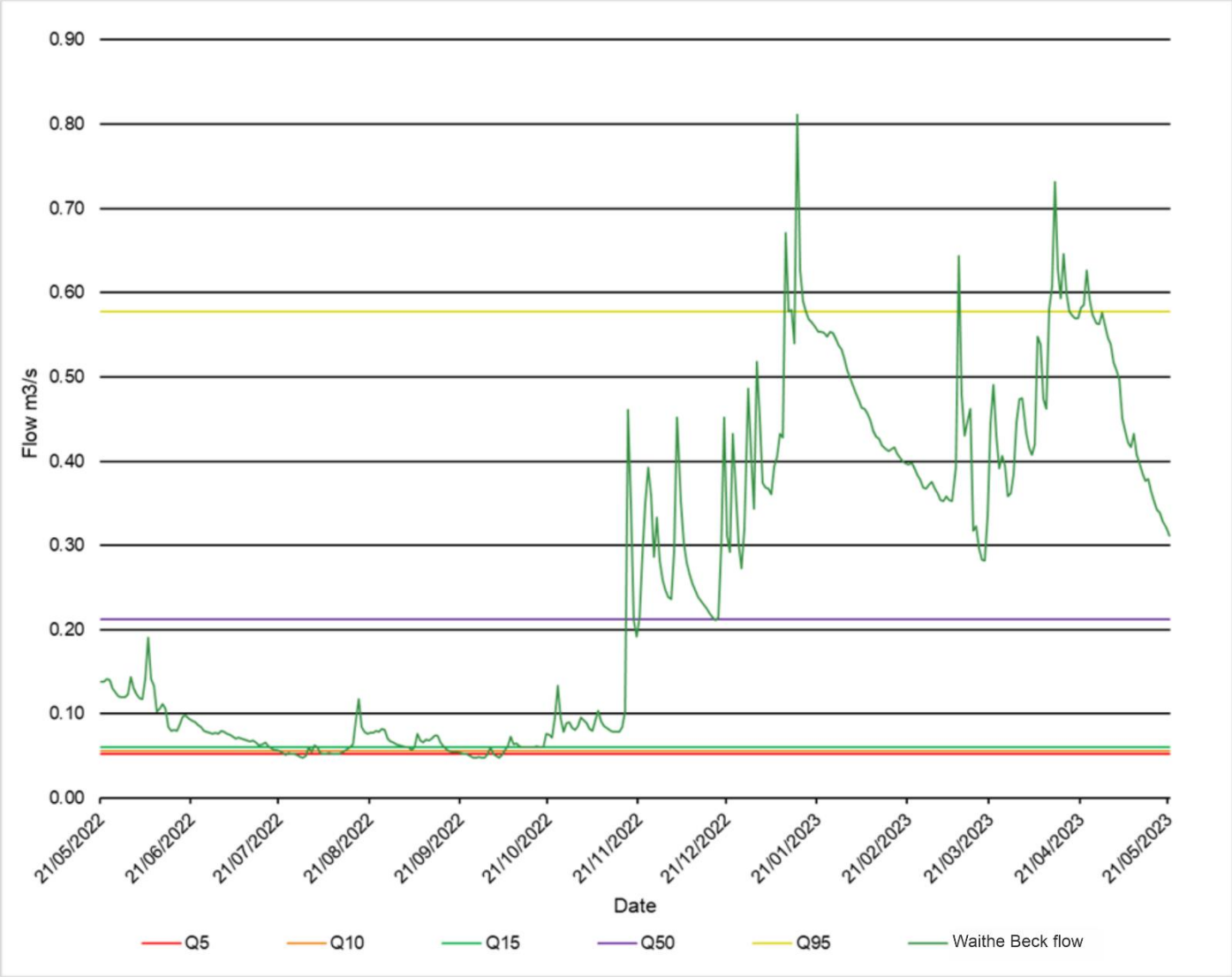

Figure 6: Gauged mean daily flow for the Waithe Beck at Brigsley Gauging Station (21 May 2022 - 21 May 2023)

Section 3

11.5.5 There are no gauging stations within the DCO Site Boundary for this section.

Section 4

11.5.6 The nearest gauging station for Louth Canal (GB104029061990) on the National River Flow Archive is Lud at Louth (gauging station reference 29003) which lies in the town of Louth. The station level is approximately 15.4 m AOD and is a crump profile weir, 4.6 m wide, at upstream end of long culvert. The average annual mean flow at this station is 0.456 m^3/s with a maximum daily flow rate of 5.635 m^3/s on the 20/07/2007. The flow that is exceeded 95% of the time (Q95) is 0.0.676 m^3/s.

11.5.7 Gauged mean daily flow for September 2019 – 2020 are shown in Figure **Figure 7.**

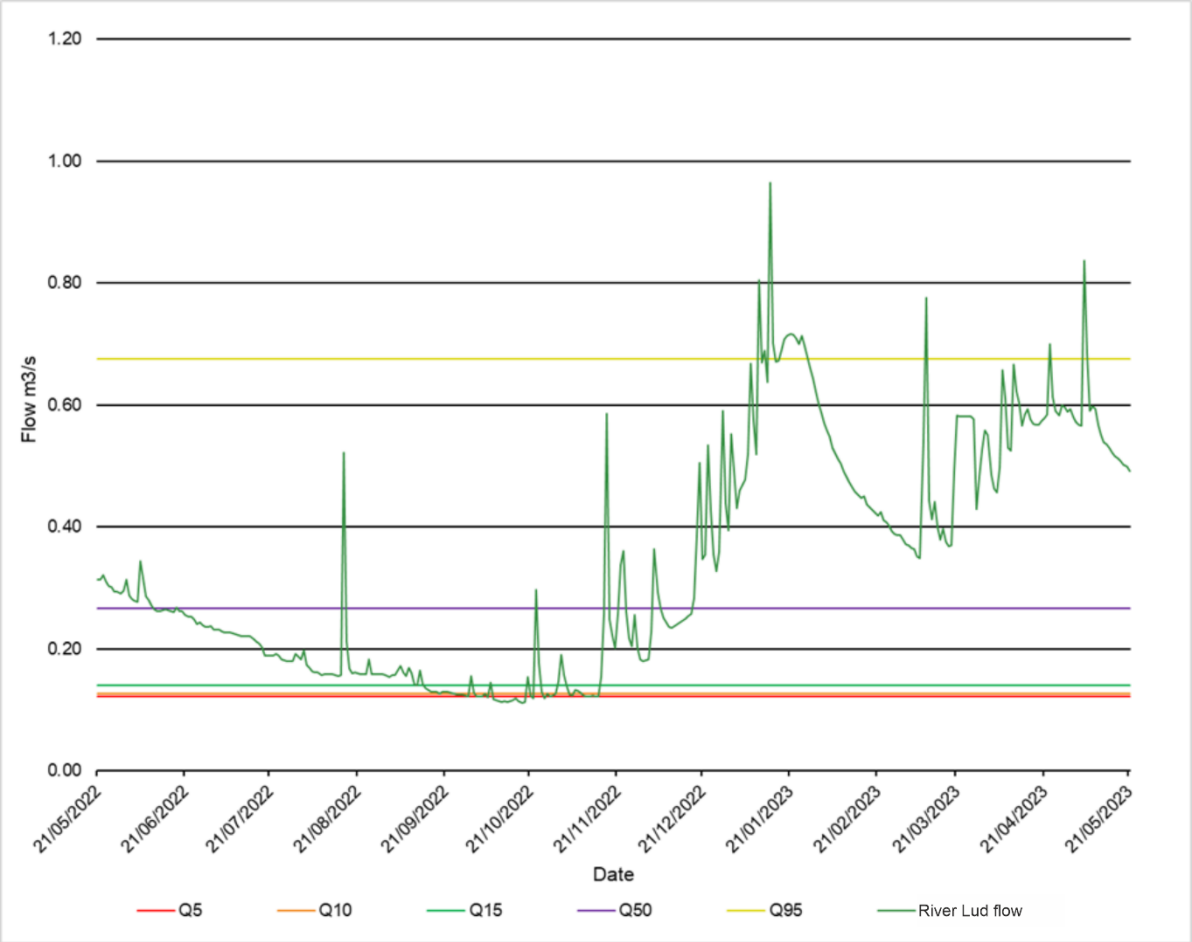

Figure 7: Gauged Mean Daily Flow for the Lud at Louth Gauging Station (21/05/2022 – 21/05/2023)

11.5.8 The nearest gauging station for Great Eau (GB105029061660) on the National River Flow Archive is Great Eau at Claythorpe Mill (gauging station reference 29002) which lies in the hamlet of Claythorpe. The station level is approximately 6.6 m AOD and is a simple low flow, crump profile weir 3.073m wide with flanking broad-crest sectors. The average annual mean flow at this station is 0.64 m^3/s with a maximum daily flow rate of 4.073 m^3/s on the 13/04/1970. The flow that is exceeded 95% of the time (Q95) is 0.249 m^3/s.

11.5.9 Gauged mean daily flow for September 2019 – 2020 are shown in **Figure 8**.

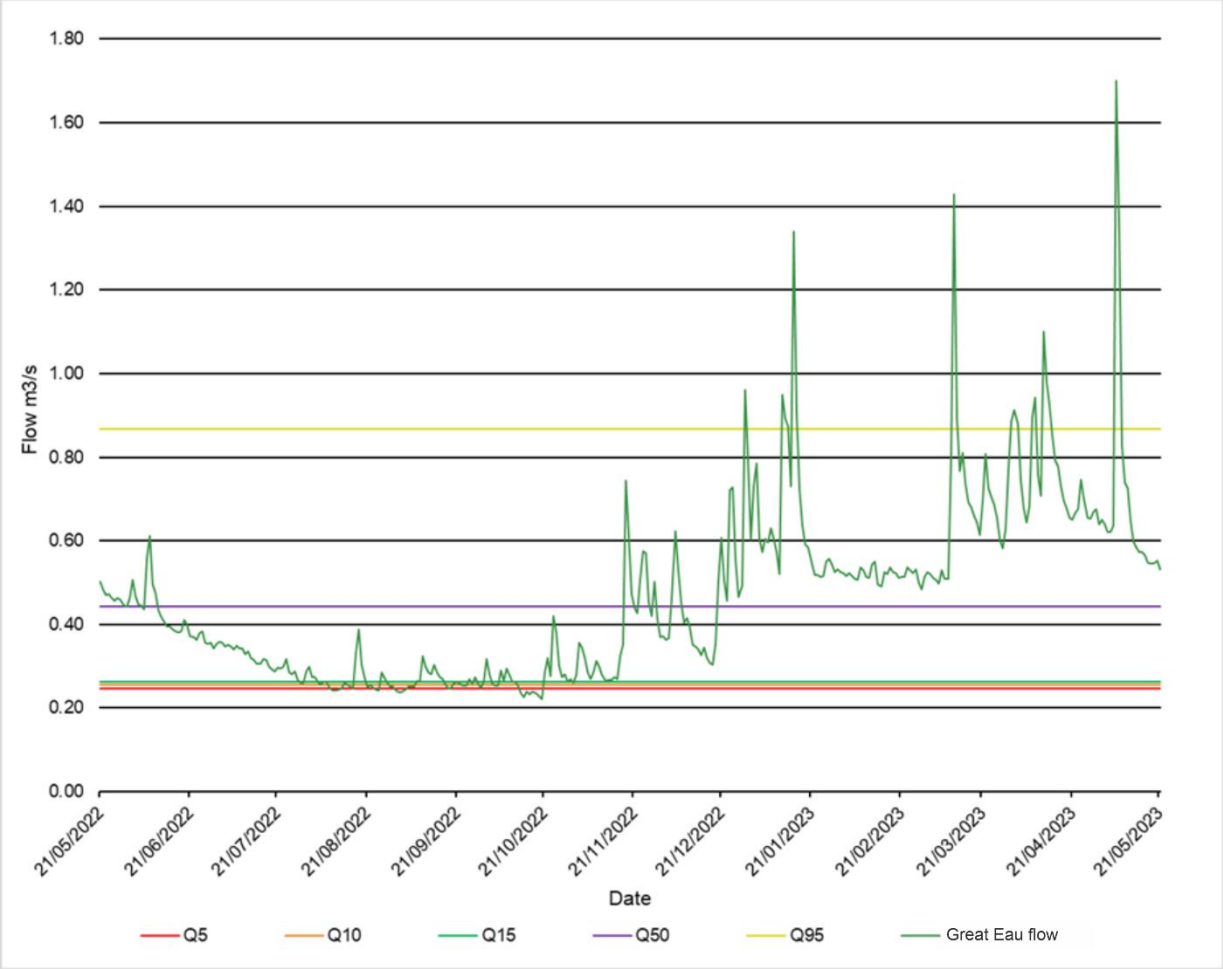

Figure 8: Gauged Mean Daily Flow for the Great Eau at Claythorpe Mill Gauging Station (30 September 2019 - 30 September 2020)

Section 5

11.5.10 There are no gauging stations within the DCO Site Boundary for this section.

11.6 Water Quality

11.6.1 The Environment Agency's Water Quality Archive website contains surface water quality data for several waterbodies that either lie within the DCO Site Boundary or are hydraulically connected to a waterbody that lies within. Summary water quality data stations for the years 2018 – 2022 are presented in **Table 2** which occur in or near the Study Area.

Table 2: Summary of Available Water Quality Data from the Environment Agency's Water Quality Archive

Section	Waterbody	Monitoring station	NGR	Duration of sampling	Number of samples
3	Laceby Beck	R. Freshney Laceby Bridge	TA 21718 06486	2018 - 2022	420
	Waithe Beck	Waithe Beck Brigsley Bridge	TA 25221 01690	2020 - 2022	424
	Bond Croft Drain	N Thoresby STW F E	TF 29075 98961	2018 - 2022	143
4	Poulton Drain	Poulton Drain Catchment Trib Louth Canal	TF 33942 94339	2020 - 2021	145
	Yarburgh Beck	Black Dyke Catchment Trib Louth	TF 35061 92723	2020 and 2022	72
	Louth Canal	Louth STW Crude Sewage at Inlet	TF 35708 90191	2018 - 2022	150
		Louth STW F/E	TF 35882 90315	2018 - 2022	394
		Louth Canal Alvingham Lock	TF 36484 90849	2019 - 2022	457
	Grayfleet Drain	Grayfleet Drain U S Saltfleetby	TF 42382 90247	2020 - 2022	288
5	Long Eau	Long Eau Three Bridges	TF 43887 88189	2020 and 2022	72
	Great Eau	Gt. Eau Cloves Bridge	TF 46836 90356	2019 - 2022	179
		Withern Mill Trout Farm	TF 42350 82040	2018 - 2020	121

11.6.2 The results for the last five years from the Environmental Agency Water Quality Archive shown in **Table 3** and **Table 7**.

Table 3: Environment Agency Water Quality Monitoring Summary for Laceby Beck, Waithe Beck and Bond Croft Drain

Determinand	Units	Laceby Beck					Waithe Beck					Bond Croft Drain				
		R.FRESHNEY LACEBY BRIDGE					WAITHE BECK BRIGSLEY BRIDGE					N THORESBY STW F E				
		Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile
Alkalinity to pH 4.5 as CaCO3	mg/l	141.00	270.00	226.35	267.00	190.00	197.00	240.00	214.07	229.30	200.00					
Ammonia un-ionised as N	mg/l	0.0002	0.0052	0.0008	0.0012	0.0003	0.0004	0.0018	0.0006	0.0010	0.0004					
Ammoniacal Nitrogen as N	mg/l	0.03	0.39	0.05	0.08	0.03	0.03	0.06	0.03	0.05	0.03					
BOD: 5 Day ATU	mg/l	1.00	2.20	1.25	1.58	1.00	1.00	1.20	1.07	1.16	1.00	3.34	26.80	8.02	13.89	4.21
Conductivity at 25 C	us/cm	473.0	1256.0	889.6	1175.6	706.9	620.0	696.0	656.5	685.4	631.0					
Nitrate as N	mg/l	4.78	19.30	10.47	12.14	7.45	6.77	12.00	9.02	11.00	7.36					
Nitrite as N	mg/l	0.004	0.071	0.022	0.043	0.007	0.007	0.044	0.019	0.029	0.011					
Nitrogen, Total Oxidised as N	mg/l	4.80	19.30	10.49	12.14	7.49	6.79	12.00	9.03	11.00	7.37					

Determinand	Units	Laceby Beck					Waithe Beck					Bond Croft Drain				
		R.FRESHNEY LACEBY BRIDGE					WAITHE BECK BRIGSLEY BRIDGE					N THORESBY STW F E				
		Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile
Orthophosphate, reactive as P	mg/l	0.01	0.25	0.06	0.10	0.01	0.03	0.17	0.08	0.14	0.03					
Oxygen, Dissolved as O2	mg/l	7.98	13.30	10.82	12.18	9.25	9.31	13.20	11.25	12.66	9.78					
Oxygen, Dissolved, % Saturation	%	75.10	114.90	95.41	106.25	86.61	80.90	110.10	98.38	105.20	94.08					
pH	pH units	7.61	8.36	7.90	8.16	7.69	8.01	8.47	8.28	8.36	8.19					
Solids, non-volatile at 105 C	mg/l						3.18	30.00	15.03	23.60	4.94	1.00	51.00	11.88	19.30	4.70
Temperature of Water	cel	5.70	14.10	9.87	13.21	6.20	5.00	16.10	9.71	16.00	5.10		6.80	21.70	18.28	12.75
Turbidity	ntu						1.70	27.00	11.60	18.20	4.25					

Table 4: Environment Agency Water Quality Monitoring Summary for Poulton Drain and Yarburgh Beck

Determinand	Units	Poulton Drain					Yarburgh Beck				
		POULTON DRAIN CATCHMENT TRIB LOUTH CANAL					BLACK DYKE CATCHMENT TRIB LOUTH				
		Min	Max	Mean	90th Tile	10th %ile	Min	Max	Mean	90th %ile	10th %ile
Alkalinity to pH 4.5 as CaCO3	mg/l	110.00	340.00	251.67	317.00	156.00	210.00	280.00	251.67	270.00	230.00
Ammonia un-ionised as N	mg/l	0.00034	0.00107	0.00060	0.00093	0.00039	0.0004	0.0012	0.0007	0.0011	0.0004
Ammoniacal Nitrogen as N	mg/l	0.030	0.078	0.037	0.045	0.030	0.030	0.087	0.045	0.076	0.030
Conductivity at 25 C	us/cm	464.00	907.00	765.25	855.30	573.80	677.00	872.00	775.33	842.00	711.00
Nitrate as N	mg/l	0.91	11.00	5.88	9.70	2.30	2.09	7.09	5.28	6.58	3.69
Nitrite as N	mg/l	0.008	0.050	0.021	0.035	0.009	0.008	0.033	0.019	0.032	0.010
Nitrogen, Total Oxidised as N	mg/l	0.92	11.00	5.90	9.73	2.32	2.10	7.10	5.30	6.60	3.70
Orthophosphate, reactive as P	mg/l	0.027	0.170	0.087	0.155	0.045	0.041	0.084	0.059	0.077	0.043
Oxygen, Dissolved as O2	mg/l	76.50	108.60	96.01	106.97	78.86	11.90	14.10	12.60	13.60	11.95
Oxygen, Dissolved, % Saturation	%	7.55	13.00	11.31	12.77	8.91	97.60	119.60	103.58	112.60	97.75
pH	pH units	7.98	8.49	8.20	8.43	8.05	8.25	8.56	8.35	8.48	8.25
Temperature of Water	cel	3.70	15.90	8.45	10.65	5.41	4.30	10.10	6.87	9.10	4.70

Table 5: Environment Agency Water Quality Monitoring Summary for Louth Canal

Determinand	Units	Louth Canal													
		LOUTH STW CRUDE SEWAGE AT INLET					LOUTH STW F/E					LOUTH CANAL ALVINGHAM LOCK			
		Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile
Alkalinity to pH 4.5 as CaCO3	mg/l											160.00	220.00	202.48	220.00	185.20
Ammonia un-ionised as N	mg/l											0.00001	0.01250	0.00275	0.00676	0.00047
Ammoniacal Nitrogen as N	mg/l						0.11	3.13	0.89	2.01	0.12	0.030	0.484	0.128	0.349	0.032
BOD: 5 Day ATU	mg/l	46.10	328.00	152.69	212.10	92.74	3.39	20.30	8.85	11.48	5.86	1.30	3.50	2.04	3.02	1.36
Conductivity at 25 C	us/cm											617.00	765.00	694.28	711.20	673.60
Nitrate as N	mg/l											9.31	14.40	12.22	13.06	10.90
Nitrite as N	mg/l											0.020	0.212	0.083	0.151	0.025
Nitrogen, Total Oxidised as N	mg/l											9.40	14.50	12.30	13.18	11.00
Orthophosphate, reactive as P	mg/l											0.05	0.31	0.14	0.21	0.07

Determinand	Units	Louth Canal													
		LOUTH STW CRUDE SEWAGE AT INLET					LOUTH STW F/E					LOUTH CANAL ALVINGHAM LOCK			
		Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile
Oxygen, Dissolved as O2	mg/l											7.25	14.20	11.92	13.40	10.24
Oxygen, Dissolved, % Saturation	%											70.80	144.30	108.55	124.84	97.78
pH	pH units											2.00	8.57	8.01	8.45	8.03
Phosphorus, Total as P	mg/l	1.95	10.40	5.00	6.31	3.52	0.73	2.40	1.36	1.84	0.95					
Solids, non-volatile at 105 C	mg/l						7.00	42.00	18.42	26.00	12.00					
Temperature of Water	cel						8.40	19.10	13.09	17.49	9.50	5.60	16.40	11.10	14.46	7.44

Table 6: Environment Agency Water Quality Monitoring Summary for Grayfleet Drain and Long Eau

Determinant	Units	Grayfleet Drain					Long Eau				
		GRAYFLEET DRAIN U S SALTFLEETBY					LONG EAU THREE BRIDGES				
		Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile
Alkalinity to pH 4.5 as CaCO3	mg/l	160.00	300.00	255.56	300.00	207.00	185.00	250.00	233.00	250.00	204.60
Ammonia un-ionised as N	mg/l	0.00001	0.01610	0.00269	0.00655	0.00037	0.0004	0.0019	0.0008	0.0013	0.0004
Ammoniacal Nitrogen as N	mg/l	0.03	1.30	0.18	0.45	0.03	0.030	0.066	0.039	0.058	0.030
BOD: 5 Day ATU	mg/l	1.00	6.00	1.97	3.00	1.10	1.00	5.26	1.56	1.96	1.00
Conductivity at 25 C	us/cm	591.00	901.00	758.50	860.10	667.50	679.00	842.00	730.92	750.20	697.40
Nitrate as N	mg/l	0.19	13.00	5.66	9.73	0.75	6.64	13.10	9.57	11.72	7.90
Nitrite as N	mg/l	0.01	0.19	0.05	0.12	0.02	0.03	0.13	0.07	0.11	0.04
Nitrogen, Total Oxidised as N	mg/l	2.60	11.00	7.43	10.70	3.65	6.77	13.20	9.64	11.80	7.96
Orthophosphate, reactive as P	mg/l	0.01	0.32	0.09	0.16	0.03	0.12	0.29	0.18	0.24	0.13
Oxygen, Dissolved as O2	mg/l	2.65	15.50	10.04	12.50	5.35	5.02	20.50	11.19	14.26	7.44
Oxygen, Dissolved, % Saturation	%	26.60	120.50	84.07	101.47	54.66	45.80	222.60	105.05	146.50	65.48
pH	pH units	2.00	8.31	7.73	8.26	7.66	7.75	8.95	8.17	8.43	8.00
Temperature of Water	cel	3.50	18.90	8.85	15.83	4.37	6.00	19.20	11.76	18.00	6.54

Table 7: Environment Agency Water Quality Monitoring Summary for Great Eau

Determinand	Units	Great Eau									
		GT.EAU CLOVES BRIDGE					WITHERN MILL TROUT FARM				
		Min	Max	Mean	90th %ile	10th %ile	Min	Max	Mean	90th %ile	10th %ile
Alkalinity to pH 4.5 as CaCO3	mg/l	130.00	240.00	201.00	220.00	164.80					
Ammonia un-ionised as N	mg/l	0.0004	0.0024	0.0010	0.0018	0.0004	0.06	0.26	0.16	0.22	0.10
Ammoniacal Nitrogen as N	mg/l	0.030	0.130	0.054	0.083	0.030					
BOD: 5 Day ATU	mg/l	1.00	3.28	1.70	2.91	1.00	1.39	2.30	1.73	1.98	1.40
Conductivity at 25 C	us/cm	479.00	870.00	683.57	794.20	581.30					
Nitrate as N	mg/l	6.43	12.00	9.30	11.35	7.37					
Nitrite as N	mg/l	0.03	0.12	0.05	0.08	0.03					
Nitrogen, Total Oxidised as N	mg/l	6.55	12.00	9.35	11.42	7.43	9.46	12.00	10.65	12.00	9.83
Orthophosphate, reactive as P	mg/l	0.010	0.092	0.039	0.083	0.010	0.01	8.05	1.48	8.00	0.01
Oxygen, Dissolved as O2	mg/l	7.09	14.1	11.185	13.17	8.21					
Oxygen, Dissolved, % Saturation	%	65.30	144.60	102.07	138.24	75.60	78.20	101.40	89.92	95.11	81.27
pH	pH units	7.68	8.98	8.11	8.43	7.81	7.86	8.18	8.02	8.11	7.92
Solids, non-volatile at 105 C	mg/l	5.90	17.60	10.93	16.99	6.28	7.40	15.40	10.95	14.23	7.67

11.7 Water resources

Abstractions

11.7.1 Abstraction data obtained from the EA indicates that there are 32 No. groundwater abstractions, 15 No. surface water abstractions and 1 No. tidal water abstractions within 2 km of the DCO Site Boundary. Additionally, North East Lincolnshire Council has provided information on an additional 19 No. private water abstractions within 2km of the DCO Site Boundary. Further details can be seen in *ES Volume IV Appendix 9-1 GIS Output Tables (Application Document 6.4.9.1)*. No abstractions fall within the DCO Site Boundary.

11.7.2 Within the 500m buffer of the study area, there two groundwater abstraction licenses (4/29/09/*G/0045 and 4/29/14/*G/0114) and one surface water license (4/29/14/*S/0073).

Discharges

11.7.3 The EA has provided a list of all licensed discharges (accessed June 2022) for the study area. There were no licensed discharges within 2 km of the DCO Site Boundary, however there is one that lies downstream of the Laceby Beck / River Freshney Catchment (to N Sea) waterbody. The discharge has a rate of 732 m^3/day (dry weather flow) and is located at TA 22090 07150.

Table 8: Abstraction Licenses within 2km of the Study Area

Licence No.	Orig. Effective Date	Version Start Date	Use Description	Period Start	Period End	Source Type	Point Name	NGR	Max Annual Quantity (m^3)	Max Daily Quantity (m^3)
4/29/09/*G/0003	01/06/1966	31/01/2022	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BOREHOLE 1 - LITTLE LONDON	TA18831143	6637306	18184
4/29/09/*G/0003	01/06/1966	31/01/2022	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BOREHOLE 2 - LITTLE LONDON	TA18761147	6637306	18184
4/29/09/*G/0003	01/06/1966	31/01/2022	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BOREHOLE 3 - LITTLE LONDON	TA18801140	6637306	18184
4/29/09/*G/0003	01/06/1966	31/01/2022	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BOREHOLE 4 - LITTLE LONDON	TA18971147	6637306	18184
4/29/09/*G/0045	01/06/1966	05/10/2017	Raw Water Supply	01-Apr	31-Mar	GW	RECEPTION BORE	TA1819715977	1400000	5480
4/29/09/*G/0045	01/06/1966	05/10/2017	Raw Water Supply	01-Apr	31-Mar	GW	TIMBER YARD BORE	TA1857816651	1400000	5480
4/29/09/*G/0129	08/05/1985	13/07/2012	General Use Relating to Secondary Category (Low Loss)	01-Jan	31-Dec	GW	INLAND CAVERN BORE 2	TA17771744	14000	1056
4/29/09/*G/0129	08/05/1985	13/07/2012	General Use Relating to Secondary	01-Jan	31-Dec	GW	RIVERSIDE CAVERN BORE 1	TA18171780	14000	1056

Licence No.	Orig. Effective Date	Version Start Date	Use Description	Period Start	Period End	Source Type	Point Name	NGR	Max Annual Quantity (m^3)	Max Daily Quantity (m^3)
			Category (Low Loss)							
4/29/09/*G/0129	08/05/1985	13/07/2012	General Use Relating to Secondary Category (Low Loss)	01-Jan	31-Dec	GW	RIVERSIDE CAVERN BORE 2	TA18181780	14000	1056
4/29/09/*G/0129	08/05/1985	13/07/2012	General Use Relating to Secondary Category (Low Loss)	01-Jan	31-Dec	GW	INLAND CAVERN BORE 1	TA17761744	14000	1056
4/29/09/*T/0010	01/06/1966	01/06/1966	General Washing/Process Washing	01-Jan	31-Dec	TW	RIVER HUMBER - IMMINGHAM DOCKS	TA19361646	104560	6546.38
4/29/10/*G/0005	01/07/1966	31/03/2022	Transfer Between Sources (Pre Water Act 2003)	01-Apr	31-Mar	GW	BARNOLDBY PUMPING STATION BORE A	TA24450378	104560	6546.38
4/29/10/*G/0005	01/07/1966	31/03/2022	Transfer Between Sources (Pre Water Act 2003)	01-Apr	31-Mar	GW	BARNOLDBY PUMPING STATION BORE B	TA24510379	104560	6546.38

Licence No.	Orig. Effective Date	Version Start Date	Use Description	Period Start	Period End	Source Type	Point Name	NGR	Max Annual Quantity (m^3)	Max Daily Quantity (m^3)
4/29/10/*G/0005	01/07/1966	31/03/2022	Transfer Between Sources (Pre Water Act 2003)	01-Apr	31-Mar	GW	BARNOLDBY PUMPING STATION BORE C	TA24400387	104560	6546.38
4/29/10/*G/0005	01/07/1966	31/03/2022	Transfer Between Sources (Pre Water Act 2003)	01-Apr	31-Mar	GW	BARNOLDBY PUMPING STATION BORE D	TA24500350	104560	6546.38
4/29/10/*G/0005	01/07/1966	31/03/2022	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BARNOLDBY PUMPING STATION BORE A	TA24450378	104560	6546.38
4/29/10/*G/0005	01/07/1966	31/03/2022	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BARNOLDBY PUMPING STATION BORE B	TA24510379	104560	6546.38
4/29/10/*G/0005	01/07/1966	31/03/2022	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BARNOLDBY PUMPING STATION BORE C	TA24400387	104560	6546.38
4/29/10/*G/0005	01/07/1966	31/03/2022	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BARNOLDBY PUMPING STATION BORE D	TA24500350	104560	6546.38

Licence No.	Orig. Effective Date	Version Start Date	Use Description	Period Start	Period End	Source Type	Point Name	NGR	Max Annual Quantity (m^3)	Max Daily Quantity (m^3)
4/29/10/*S/0099	01/01/1991	01/04/2008	Make-Up Or Top Up Water	01-Oct	31-Mar	SW	DITCH AT BARNOLDBY LE BECK	TA231034	8400	23.01
4/29/10/*S/0103	01/01/1995	01/04/2021	Spray Irrigation - Storage	01-Jan	31-Mar	SW	LACEBY BECK AT LACEBY	TA22370500	9000	500
4/29/10/*S/0103	01/01/1995	01/04/2021	Spray Irrigation - Storage	01-Jan	31-Mar	SW	LACEBY BECK AT LACEBY	TA22690431	9000	500
4/29/11/*G/0043	01/07/1966	27/04/2021	Process Water	01-Jan	30-Apr	GW	BOREHOLE IN HAWERBY CUM BEESBY	TF27339689	454454	5700
4/29/11/*G/0043	01/07/1966	27/04/2021	Process Water	01-May	31-Aug	GW	BOREHOLE IN HAWERBY CUM BEESBY	TF27339689	454454	5700
4/29/11/*G/0043	01/07/1966	27/04/2021	Process Water	01-Sep	31-Jan	GW	BOREHOLE IN HAWERBY CUM BEESBY	TF27339689	454454	5700
4/29/11/*G/0043	01/07/1966	27/04/2021	Drinking, Cooking, Sanitary, Washing, (Small Garden) - Household	01-Jan	31-Dec	GW	BOREHOLE IN HAWERBY CUM BEESBY	TF27339689	454454	5700
4/29/11/*G/0106	01/07/1966	01/09/1990	General Farming & Domestic	01-Jan	31-Dec	GW	R.CAUDWELL B/HNO.23 CADEBY	TF27409650	927	25

Licence No.	Orig. Effective Date	Version Start Date	Use Description	Period Start	Period End	Source Type	Point Name	NGR	Max Annual Quantity (m^3)	Max Daily Quantity (m^3)
4/29/11/*G/0206	01/03/1970	01/04/2008	General Farming & Domestic	01-Jan	31-Dec	GW	BOREHOLE - LUDBOROUGH	TF30059707	27277	91
4/29/13/*G/0006	01/12/1965	01/05/1997	General Farming & Domestic	01-Jan	31-Dec	GW	BOREHOLE AT KEDDINGTON	TF35208780	11365	163
4/29/13/*G/0115/R02	01/04/2018	01/04/2018	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BOREHOLE AT GRIMOLDBY	TF39328815	3700000	10000
4/29/13/*G/0115/R02	01/04/2018	01/04/2018	Potable Water Supply - Direct	01-Apr	31-Mar	GW	BOREHOLE AT MANBY	TF40438688	4091	218
4/29/13/*S/0103	01/05/1966	01/05/1997	Spray Irrigation - Direct	01-May	31-Aug	SW	MONKS DIKE KEDDINGTON	TF352882	4091	218
4/29/14/*G/0114	01/11/1971	24/06/2021	Process Water	01-Jan	31-Dec	GW	CONOCO B/H1 THEDDLETHORPE ST.H	TF48928725	20000	1000
4/29/14/*G/0114	01/11/1971	24/06/2021	Process Water	01-Jan	31-Dec	GW	CONOCO B/H2 THEDDLETHORPE ST.H	TF48938724	20000	1000
4/29/14/*S/0035	01/10/1966	01/04/2006	Transfer Between Sources (Pre Water Act 2003)	01-Apr	31-Oct	SW	GREAT EAU SALTFLEETBY ALL STS.	TF46508940	1636596	9092

Licence No.	Orig. Effective Date	Version Start Date	Use Description	Period Start	Period End	Source Type	Point Name	NGR	Max Annual Quantity (m^3)	Max Daily Quantity (m^3)
4/29/14/*S/0035	01/10/1966	01/04/2006	Transfer Between Sources (Pre Water Act 2003)	01-Apr	31-Oct	SW	LONG EAU SALTFLEETBY ST.PETER	TF43858820	1636596	9092
4/29/14/*S/0073	01/10/1966	01/04/2006	Transfer Between Sources (Pre Water Act 2003)	01-Apr	05-Nov	SW	GREAT EAU WITHERN WITH STAIN	TF43848429	1636594	9092
4/29/14/*S/0073	01/10/1966	01/04/2006	Transfer Between Sources (Pre Water Act 2003)	01-Apr	05-Nov	SW	GREAT EAU WITHERN WITH STAIN	TF45158500	1636594	9092
4/29/14/*S/0073	01/10/1966	01/04/2006	Transfer Between Sources (Pre Water Act 2003)	01-Apr	05-Nov	SW	GREAT EAU THEDDLETHORPE A ST	TF45798746	1636594	9092
4/29/14/*S/0073	01/10/1966	01/04/2006	Transfer Between Sources (Pre Water Act 2003)	01-Apr	05-Nov	SW	GREAT EAU THEDDLETHORPE A.STS.	TF45308570	1636594	9092

Licence No.	Orig. Effective Date	Version Start Date	Use Description	Period Start	Period End	Source Type	Point Name	NGR	Max Annual Quantity (m^3)	Max Daily Quantity (m^3)
4/29/14/*S/0073	01/10/1966	01/04/2006	Transfer Between Sources (Pre Water Act 2003)	01-Apr	05-Nov	SW	GREAT EAU THEDDLETHORPE A.STS.	TF46018910	1636594	9092
4/29/14/*S/0073	01/10/1966	01/04/2006	Transfer Between Sources (Pre Water Act 2003)	01-Apr	05-Nov	SW	GREAT EAU THEDDLETHORPE A.STS.	TF46708965	1636594	9092
4/29/14/*S/0095	01/04/1966	01/04/2006	Spray Irrigation - Direct	01-Apr	31-Jul	SW	LONG EAU LITTLE CARLTON	TF41558710	1437	409.15
AN/029/0009/001/R01	01/04/2018	01/04/2018	Process Water	01-Apr	31-Mar	GW	BOREHOLE 2 S.KILLINGHOLME	TA1562016950	619000	1700
AN/029/0009/001/R01	01/04/2018	01/04/2018	Process Water	01-Apr	31-Mar	GW	BOREHOLE 1 S.KILLINGHOLME	TA1573016670	619000	1700
AN/029/0010/002/R01	31/05/2018	31/05/2018	Transfer Between Sources (Post Water Act 2003)	01-Apr	31-Mar	GW	BOREHOLE AT LACEBY, NE LINCOLNSHIRE	TA22050712	619000	1700

Pollution Incidents

11.7.4 Data from the Environment Agency for the Proposed Development indicates that there have been 25 pollution incidents of Category 3 (Minor) within 2km of the DCO Site Boundary and one of Category 2 (Significant) between 2018 and 2022. Within the 500m buffer, there are only 2 incidents (incidents 1666629 and 1991013) both of which are of Category 3.

Table 9: Pollution Incidents within the Study Area that have occurred from 2018 – 2022

Notification Identifier	Notification Date	Water - Incident Category	National Grid Reference	Incident Status	Category of pollutant	Catchment
1849989	21/09/2020	Category 3 (Minor)	TA 16594 09838	Closed	Sewage Materials	North Beck Drain
1858186	21/10/2020	Category 3 (Minor)	TA 21676 06829	Closed	Sewage Materials	Laceby Beck / River Freshney Catchment (to N Sea)
1869218	07/12/2020	Category 3 (Minor)	TA 13620 14470	Closed	Oils and Fuel	Skitter Beck / East Halton Beck
1899037	02/03/2021	Category 3 (Minor)	TA 19265 14808	Closed	Pollutant Not Identified	North Beck Drain
1667971	07/12/2018	Category 3 (Minor)	TF 33943 95257	Closed	Sewage Materials	Poulton Drain Catchment (trib of Louth Canal)
1671774	03/01/2019	Category 3 (Minor)	TA 13876 17433	Closed	Oils and Fuel	Skitter Beck / East Halton Beck
1681021	18/02/2019	Category 3 (Minor)	TA 21540 06562	Closed	Sewage Materials	Laceby Beck / River Freshney Catchment (to N Sea)
1685289	06/03/2019	Category 3 (Minor)	TA 16958 09835	Closed	Sewage Materials	North Beck Drain
2026546	24/01/2022	Category 2 (Significant)	TA 23978 03366	Closed	Sewage Materials	Laceby Beck / River Freshney Catchment (to N Sea)
1635015	20/07/2018	Category 3 (Minor)	TA 23258 03187	Closed	Sewage Materials	Laceby Beck / River Freshney

Notification Identifier	Notification Date	Water - Incident Category	National Grid Reference	Incident Status	Category of pollutant	Catchment
						Catchment (to N Sea)
1666629	29/11/2018	Category 3 (Minor)	TA 16306 13941	Closed	Oils and Fuel	North Beck Drain
1767971	09/01/2020	Category 3 (Minor)	TF 32760 96222	Closed	Specific Waste Materials	Land Dike Drain to Louth Canal (West)
1790667	13/03/2020	Category 3 (Minor)	TA 15947 18817	Closed	Oils and Fuel	North Beck Drain
1819560	20/06/2020	Category 3 (Minor)	TA 21720 06474	Closed	Contaminated Water	Laceby Beck / River Freshney Catchment (to N Sea)
1825751	09/07/2020	Category 3 (Minor)	TA 22266 05037	Closed	Pollutant Not Identified	Laceby Beck / River Freshney Catchment (to N Sea)
1753361	11/11/2019	Category 3 (Minor)	TF 31674 92006	Closed	Sewage Materials	Poulton Drain Catchment (trib of Louth Canal)
1754162	13/11/2019	Category 3 (Minor)	TA 15956 18824	Closed	Oils and Fuel	North Beck Drain
1756806	23/11/2019	Category 3 (Minor)	TA 23344 03124	Closed	Sewage Materials	Laceby Beck / River Freshney Catchment (to N Sea)
1767971	09/01/2020	Category 3 (Minor)	TF 32760 96222	Closed	Contaminated Water	Land Dike Drain to Louth Canal (West)
2018826	21/12/2021	Category 3 (Minor)	TA 19575 12721	Closed	Contaminated Water	North Beck Drain
1681529	20/02/2019	Category 3 (Minor)	TF 43200 89197	Closed	Sewage Materials	Long Eau

Notification Identifier	Notification Date	Water - Incident Category	National Grid Reference	Incident Status	Category of pollutant	Catchment
1742067	29/09/2019	Category 3 (Minor)	TF 40583 86331	Closed	Sewage Materials	Long Eau
1895313	24/02/2021	Category 3 (Minor)	TF 37051 90528	Closed	Oils and Fuel	South Dike and Grayfleet Drain
1935354	08/05/2021	Category 3 (Minor)	TF 37959 88879	Closed	Oils and Fuel	South Dike and Grayfleet Drain
1991013	09/09/2021	Category 3 (Minor)	TF 48003 87793	Closed	Pollutant Not Identified	Trusthorpe Pump Drain

11.8 Aquatic Ecology and Designated Sites

11.8.1 Aquatic ecology data from the Environment Agency has shown that a total of nine monitoring points have been surveyed across the catchments within the study area buffer from 2018 – 2023.

11.8.2 Designated sites are shown in **Figure 9**.

11.8.3 Several locations lie outside of the 500m study area; however, they lie on waterbodies that are hydraulically linked to those that fall within the boundary.

11.8.4 There are no fish surveys available from the Environment Agency within Section 1.

Table 10: Fish Monitoring Locations and their Associated WFD Catchments

Section	Site Name	NGR	Waterbody	WFD Operational catchment	WFD Catchment	WFD ID
2	Laceby Acres	TA 22716 07913	Laceby Beck	Becks Northern	Laceby Beck / River Freshney catchment	GB10402 9067530
3	Thorganby	TF 20937 97586	Waithe Beck		Waithe Beck upper catchment	GB10402 9062040
	Brigsley	TA 25251 01640	Waithe Beck		Waithe Beck lower catchment (to Tetney Lock)	GB10402 9062100
	Waithe	TA 29144 00855	Waithe Beck			

Section	Site Name	NGR	Waterbody	WFD Operational catchment	WFD Catchment	WFD ID
4	Alvingham High Bridge	TF 37453 92134	Louth Canal		Louth Canal	GB10402 9061990
5	Little Carlton Mill	TF 40125 85379	The Beck	Seeping and Eaus	Long Eau	GB10502 9061670
	Walk Farm	TF 42296 86984	Long Eau			
	Three Bridges No1	TF 43700 88100	Long Eau			
	Gayton Engine	TF 45794 88002	Great Eau		Great Eau (downstream of South Thorseby)	GB10502 9061660

Table 11: Distribution of Fish Species Present within the Study Area

Site Species	Laceby Acres	Thorganby	Brigsley	Waithe	Alvinham High Bridge	Little Carlton Mill	Walk Farm	Three Bridges No1	Gayton Engine
Brown trout	✓	✓	✓	✓	✓				
Bullhead	✓								
European eel		✓	✓	✓	✓	✓	✓	✓	✓
Lamprey						✓			
Stone Loach			✓	✓	✓			✓	
Dace			✓	✓	✓			✓	
Gudgeon					✓				
Rudd								✓	
Roach					✓			✓	
3 spined stickleback	✓				✓	✓			✓
Pike								✓	✓
Perch				✓					

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North Killingholme Haven Pits SSSI

Humber Estuary SAC

Humber Estuary SPA

Humber Estuary Ramsar

Humber Estuary SSSI

Kirmington Pits SSSI

Section 1

Section 2

N

1 0.5 0 1 2 3 4 5 km

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PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- 500m Study Area
- 2km Study Area
- Route Section Break
- Chalk River
- Ramsar
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)

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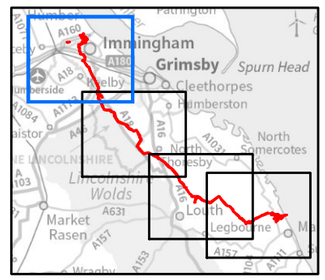

FIGURE TITLE

Figure 11-9 (1 of 4)
Statutory Designated Sites

ISSUE PURPOSE

ENVIRONMENTAL STATEMENT

PROJECT NUMBER / REFERENCE

60668955 / VCCS_230914_ES_11-9

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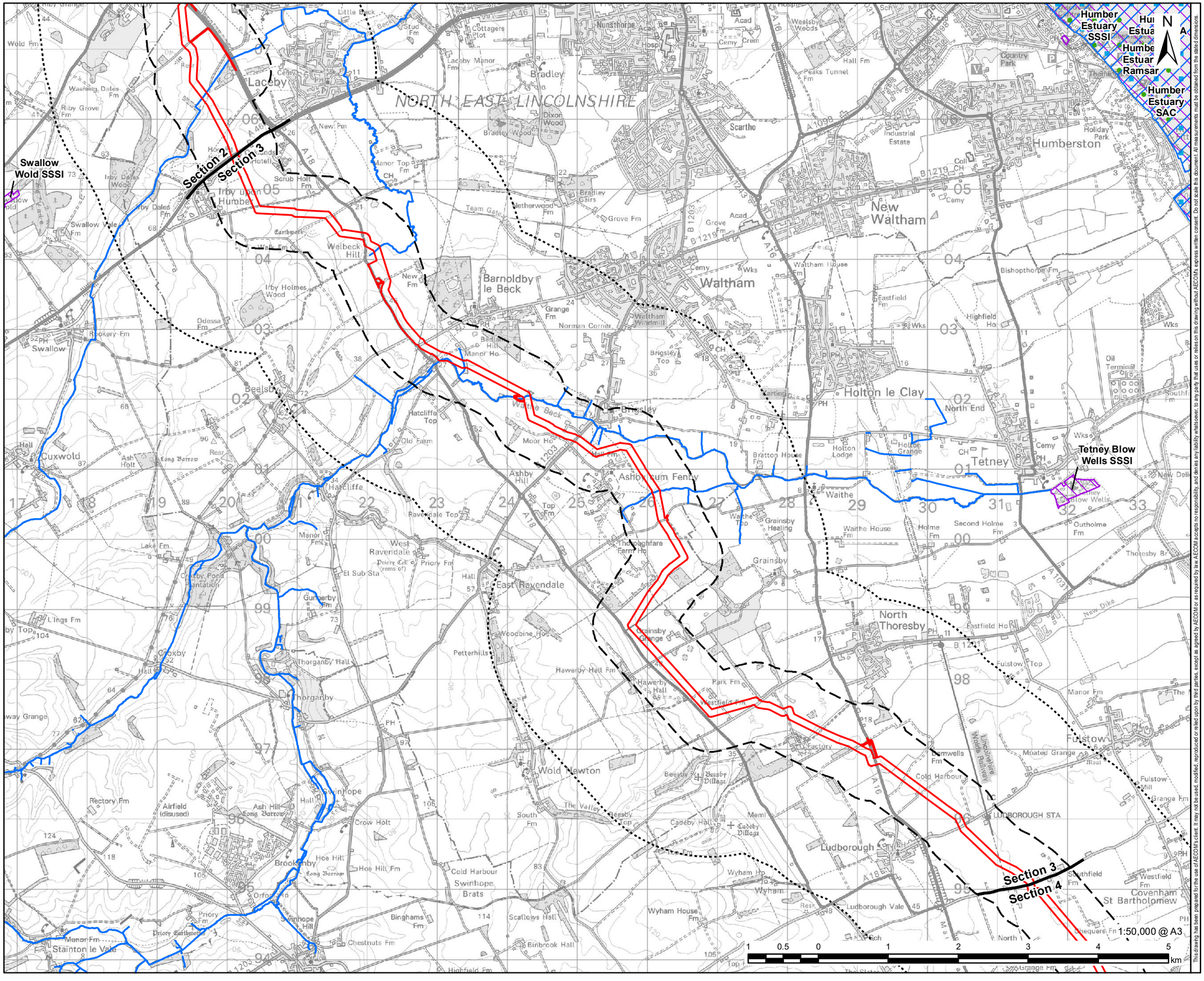

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PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- 500m Study Area
- 2km Study Area
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FIGURE TITLE

Figure 11-9 (2 of 4)
Statutory Designated Sites

ISSUE PURPOSE

ENVIRONMENTAL STATEMENT

PROJECT NUMBER / REFERENCE

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Section 3
Section 4
Section 4
Section 5

Welton-Le-Wold Old Gravel Pits SSSI

Donna Nook NNR

Humber Estuary Ramsar

Humber Estuary SSSI

Humber Estuary SAC

1:50,000 @ A3

1 0.5 0 1 2 3 4 5 km

VikingCCS

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PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- 500m Study Area
- 2km Study Area
- Route Section Break
- Chalk River
- Ramsar
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)

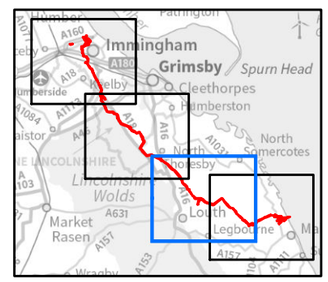

FIGURE TITLE

Figure 11-9 (3 of 4)
Statutory Designated Sites

ISSUE PURPOSE

ENVIRONMENTAL STATEMENT

PROJECT NUMBER / REFERENCE

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Humber Estuary SAC
Humber Estuary SSSI
Saltfleetby-Theddlethorpe Dunes & Gibraltar Point SAC
Saltfleetby - Theddlethorpe Dunes NNR
Humber Estuary Ramsar
Humber Estuary SPA
Saltfleetby - Theddlethorpe Dunes SSSI
Greater Wash SPA
Saltfleetby Theddlethorpe Dunes NNR
Section 4
Section 5
Muckton Wood SSSI
MABLETHORPE
Trusthorpe
Sutton on Sea
Immingham
Grimsby
Spurn Head
Cleethorpes
Louth
Legbourne
Market Rasen
North Somercotes
Lincolnshire Wolds

1:50,000 @ A3

1 0.5 0 1 2 3 4 5 km

N

VikingCCS

AECOM

PROJECT

Viking CCS Pipeline

LEGEND

- DCO Site Boundary
- 500m Study Area
- 2km Study Area
- Route Section Break
- Chalk River
- Ramsar
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)

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FIGURE TITLE

Figure 11-9 (4 of 4)
Statutory Designated Sites

ISSUE PURPOSE

ENVIRONMENTAL STATEMENT

PROJECT NUMBER / REFERENCE

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