

## 11.5 Baseline Environment

### 11.5.1 Section 1 – Landfall to Bainton

#### 11.5.1.1 Water Features Crossed by the English Onshore Scheme

There are a total of 44 water features crossed by Section 1 of the English Onshore Scheme which are listed in **Table 11-6**. These lie mainly within the drainage catchment of the River Hull and consist of a mix of main rivers, ordinary watercourses, and minor drains. These catchments are within the East Riding of Yorkshire Local Authority and Beverly and North Holderness IDB. These are shown on **Figure 11-1**.

Potential cable crossing types are described within **Chapter 3: Description of the English Onshore Scheme**. The proposed route will be installed by a combination of open cut and trenchless methods. Open cut methods will be utilised more commonly across the underground cable route as it will be utilised when installing the cables within open agricultural land. Trenchless methods will typically be utilised where obstacles including main rivers and environmentally designated watercourses/sites require to be crossed. A summary of all watercourses crossed is listed in **Table 11-6** below.

In addition, the haul road will also cross separately within the working width (i.e. the temporary area required to facilitate the installation of the underground DC cables). Main rivers Nafferton Beck, Nafferton Drain, and Kelk Beck will be crossed by a clear span temporary bridge, with the remaining watercourses crossed by temporary culvert installation. West Beck (River Hull) and Driffield Canal will not be crossed by a haul road crossing and instead traffic diverted along the existing road network. All crossings will be designed in line with EA, IDB and LLFA requirements in accordance with the Environmental Permitting (England and Wales) Regulations 2016.

**Table 11-6: Water Features crossed by Section 1 of the English Onshore Scheme**

Name of Water Feature	HDD crossing Ref (if applicable)	NGR	Operators
Auburn Beck from Source to North Sea (GB104026066650)	HDD_001	TA 16412 63510	N/A
Drain in headwaters of Earls Dyke from Source to North Sea GB104026066640	-	TA 14959 62834	N/A
Drain in headwaters of Carr Dyke	-	TA 14566 61832	N/A
The Earl's Dike	HDD_003 (potential to be open cut)	TA 14382 61322	Beverley and North Holderness IDB No. 88
Burton Drain	HDD_004 (potential to be open cut)	TA 13491 60467	Beverley and North Holderness IDB No. 86
Drain in headwaters of Burton Drain	-	TA 12898 60336	N/A
Drain in headwaters of Gransmoor Drain (Burton Agnes to Lissett Area) GB104026066630	-	TA 11879 59686	N/A
Drain in headwaters of Gransmoor Drain (Burton Agnes to Lissett Area) GB104026066630	HDD_006	TA 11452 59204	N/A
Gransmoor Drain (Burton Agnes to Lissett Area) GB104026066630	HDD_006	TA 11361 59213	Beverley and North Holderness IDB No. 82
Tributary of Gransmoor Drain (Burton Agnes to Lissett Area) GB104026066630	HDD_006	TA 11212 59190	N/A

Name of Water Feature	HDD crossing Ref (if applicable)	NGR	Operators
Drain in headwaters of Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck GB104026067101	-	TA 10655 59098	N/A
Kelk Beck (Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck (GB104026067101))	HDD_008	TA 09226 59271	Main River (EA) Chalk stream (Natural England (NE)) SSSI (NE)
Drain in headwaters of Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck GB104026067101	HDD_008	TA 08990 58714	N/A
Drain in headwaters of Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck GB104026067101	-	TA 08665 58701	N/A
Warren Hill Drain	HDD_009 (potential to be open cut)	TA 08257 58729	Beverley and North Holderness IDB No. 51
Drain in headwaters of Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck GB104026067101	HDD_009 (potential to be open cut)	TA 08055 58660	N/A
White Dike Branch	HDD_010 (potential to be open cut)	TA 07665 58434	Beverley and North Holderness IDB No. 49
White Dike	HDD_010 (potential to be open cut)	TA 07542 58342	Beverley and North Holderness IDB No. 50
Drain in headwaters of Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck GB104026067101	HDD_011 (potential to be open cut)	TA 07385 57782	N/A
Nafferton Drain In headwaters of Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck GB104026067101	HDD_012	TA 07205 57614	Main River (EA)
Drain in headwaters of Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck GB104026067101	HDD_013 (potential to be open cut)	TA 06968 57520	N/A
Drain in headwaters of Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck GB104026067101	-	TA 06773 57415	N/A
Nafferton Beck Nafferton from Source to Driffield Canal (GB104026067090)	HDD_014	TA 06517 57376	Main River (EA) Chalk stream (NE)
Drain in headwaters of Nafferton Beck from Source to Driffield Canal GB104026067090	HDD_014	TA 06497 57349	N/A
Drain in headwaters of Driffield Navigation Water Body GB70410028	-	TA 05640 56519	N/A
Driffield Navigation Water Body (GB70410028)	-	TA 05629 56495	Main River (EA)
Drain in headwaters of West Beck Upper GB104026067080	HDD_015	TA 05569 56370	N/A
West Beck Upper (GB104026067080)	HDD_015	TA 05512 56282	Main River

Name of Water Feature	HDD crossing Ref (if applicable)	NGR	Operators
			Chalk stream (NE) SSSI (NE)
Wanlass Drain	HDD_015	TA 05478 56228	Beverley and North Holderness IDB No. 43
Drain in headwaters of West Beck Upper GB104026067080	HDD_016 (potential to be open cut)	TA 05241 55792	N/A
Drain in headwaters of West Beck Lower to River Hull GB104026067040	-	TA 04311 55683	N/A
Drain in headwaters of West Beck Lower to River Hull GB104026067040	HDD_017 (potential to be open cut)	TA 03748 55429	N/A
Drain in headwaters of Skerne Beck GB104026067041	HDD_018 (potential to be open cut)	TA 03538 54894	N/A
Drain in headwaters of Skerne Beck GB104026067041	HDD_018 (potential to be open cut)	TA 03537 54714	N/A
Tributary of Knorka Dike	HDD_019 (potential to be open cut)	TA 03256 54276	N/A
Knorka Dike (Drain)	HDD_019 (potential to be open cut)	TA 02769 54503	Beverley and North Holderness IDB No. 42
Northfield Beck	HDD_21	TA 02316 53889	N/A
Drain in headwaters of Skerne Beck GB104026067041	HDD_22	TA 01837 53208	N/A
Drain in headwaters of Skerne Beck GB104026067041	HDD_22	TA 01850 52997	N/A
Drain in headwaters of Skerne Beck GB104026067041	-	TA 01132 52987	N/A
Drain in headwaters of Skerne Beck GB104026067041	-	TA 00422 52791	N/A

### 11.5.1.2 WFD Surface Water Bodies

The EA has provided the most recent WFD classifications for watercourses within the study area. In total, there are 13 designated WFD surface water bodies in Section 1 of the study area, seven of which are crossed by the English Onshore Scheme. Their status is listed in **Table 11-7**.

Of the seven crossed water bodies, six are designated heavily modified or artificial. Whereas the WFD water body Lowthorpe/Kelk/ Foston Bks from Source to Frodingham Beck is not designated heavily modified or artificial.

**Table 11-7: WFD Surface Water Bodies within the 2 km Study Area of Section 1 of the English Onshore Scheme**

WFD ID	Water Body Name	Type	Current Status (2019)			Failing Elements	Reasons for not achieving good status	2027 Ecological Objective
			Ecological	Chemical	Overall			
<b>GB640402491000 (directly crossed)</b>	Yorkshire South	Coastal Water	Moderate	Fail	Moderate	PBDE Benzo(g-h-i)perylene Mercury and its compounds Tributyltin compounds	Physical modification	Good
<b>GB104026066650 (directly crossed)</b>	Auburn Beck from Source to North Sea	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Suspect data	Good
<b>GB104026066640 (not crossed)</b>	Earls Dyke from Source to North Sea	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Land drainage-operational management (physical modification) Trade/industry discharge (point source) Poor nutrient management (diffuse source) Sewage discharge (point source)	Good
<b>GB104026066630 (directly crossed)</b>	Gransmoor Drain (Burton Agnes to Lissett Area)	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Land drainage-operational management (physical modification) Sewage discharge (point source)	Good
<b>GB104026067101 (directly crossed)</b>	Lowthorpe/Kelk/Foston Bks from Source to Frodingham Beck	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Barriers-ecological discontinuity (physical modification) Poor soil management (diffuse source) Land drainage-operational management (physical modification)	Good
<b>GB104026067090 (directly crossed)</b>	Nafferton Beck from Source to Driffield Canal	Surface Water	Moderate	Fail	Moderate	Cypermethrin (Priority hazardous) PBDE Mercury and its compounds	Poor soil management (diffuse source) Physical modification Sewage discharge (point source) Private sewage treatment (point source)	Moderate (only 2015 objective available for ecology)

WFD ID	Water Body Name	Type	Current Status (2019)			Failing Elements	Reasons for not achieving good status	2027 Ecological Objective
			Ecological	Chemical	Overall			
<b>GB70410028 (directly crossed)</b>	Driffield Navigation Water Body	Canal	Good	Good	Good	N/A	N/A	Met
<b>GB104026067080 (directly crossed)</b>	West Beck Upper	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Land drainage-operational management (physical modification) Trade/industry discharge (point source) Surface water abstraction (flow) Barriers-ecological discontinuity (physical modification) Commercial fin fisheries (physical modification) Riparian/in-river activities (diffuse source) Physical modification	Good
<b>GB104026067040 (not crossed)</b>	West Beck Lower to River Hull	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Physical modification Suspect data	Good (only 2021 objective available for ecology)
<b>GB104026067041 (directly crossed)</b>	Skerne Beck	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Physical modification	Good
<b>GB104026067010 (not crossed)</b>	Scurf Dike from Source to River Hull	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	None given	Good (only 2015 objective available for ecology)
<b>GB104026067031 (not crossed)</b>	Wellsprings Drain/Eastburn Beck/Driffield Trout Stream	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Land drainage-operational management (physical modification) Barriers-ecological discontinuity (physical modification)	Good
<b>GB104026066980 (not crossed)</b>	Middleton on the Wolds and Watton Beck	Surface Water	Moderate	Fail	Moderate	PBDE Mercury and its compounds	None given	Good (only 2015 objective available for ecology)

### 11.5.1.3 Main Rivers

There are five main rivers crossed by Section 1 of the English Onshore Scheme:

- Driffield Canal;
- Kelk Beck;
- Nafferton Drain;
- Nafferton Beck; and
- West Beck (River Hull).

Within the 2 km study area there are a further two main rivers that are not crossed by the English Onshore Scheme:

- White Dyke; and
- Skerne Beck.

However, both of these watercourses receive flows directly from upstream channels which are crossed (White Dyke ordinary watercourse and Northfield Beck respectively).

### 11.5.1.4 Standing Water Bodies

There are no standing water bodies crossed in Section 1 of the English Onshore Scheme. However there are 27 standing water bodies<sup>2</sup> within the 2 km study area as shown in **Table 11-8**.

**Table 11-8: Surface Water Bodies within the 2 km Study Area of Section 1 of the English Onshore Scheme**

ID	Water Body	NGR
1	Pond near East Flashdale Farm	TA 15434 64710
2	Pond near East Flashdale Farm	TA 15357 64624
3	Pond off Lancaster Road	TA 14471 64126
4	Pond near Demming Farm	TA 13942 62149
5	Pond near Burtoncarr Farm	TA 12995 61055
6	Pond near Searchlight Cottage	TA 14232 60519
7	Pond near Searchlight Cottage	TA 13987 60637
8	Pond in Gransmoor Wood	TA 11894 60675
9	Pond on Spring Hill	TA 14739 60114
10	Pond near Tithe Plantation	TA 12532 58474
11	Pond near Tithe Plantation	TA 12875 58752
12	Pond near Tithe Plantation	TA 13151 58753
13	Pond near Tithe Plantation	TA 13269 58635
14	Pond near Gransmoor Drain	TA 11446 58540
15	Reservoir in Gransmoor Quarry	TA 11263 59346
16	Kelk Lake Water	TA 10401 60331
17	Pond near Centre Farm	TA 10012 59131
18	Pond near River Hull	TA 04254 56593
19	Pond off Meggison's Turnpike	TA 03783 54103
20	Pond south of Corpslanding Road	TA 02956 52885
21	Pond near Neswick Farm	SE 98131 52893
22	Pond near Garden Covert	SE 97476 53199
23	Pond near Neswick Gardens	SE 97251 52939

<sup>2</sup> Some standing water bodies are included within the assessment of multiple sections due to the overlap of the 2 km study area.

ID	Water Body	NGR
24	Pond near Neswick Gardens	SE 97212 52918
25	Pond near Neswick Cottage	SE 96943 52449
26	Pond south of Applegarth Lane	SE 96655 52276
27	Pond north of Lockington Road	SE 97254 48384

None of these are associated with surface water dependent designated and non-statutory designated sites.

### 11.5.1.5 Water Dependent Biodiversity Sites

There are no international sites of nature conservation interest within Section 1 of the English Onshore Scheme and five national statutory protected areas within the 2 km study area:

- Fraisthorpe Bathing Waters;
- Earls Dyke from Source to North Sea Nitrate Vulnerable Zone (NVZ) S825;
- Barmston Sea Drain from Skipsea Drain to N Sea NVZ S259;
- River Hull from Arram Beck to Humber NVZ S254; and
- River Hull and Headwaters SSSI.

#### Surface Water Dependent Statutory Designated Sites

Within the 2 km study area of Section 1 of the English Onshore Scheme there are five surface water dependent designated sites:

- **Fraisthorpe Bathing Waters** (located approximately 230 m east of the landfall and crossed by both the English Onshore Scheme and Marine Scheme). This is a rural sandy beach and its bathing water quality is affected by storm, emergency and surface water outfalls flowing from Auburn Beck.
- **Earls Dyke from Source to North Sea NVZ S825** (crossed by the English Onshore Scheme). The designation covers the entire Earls Dyke from Source to North Sea surface water body catchment area. The entire catchment is considered to be affected by pollution. The water body is primarily groundwater fed, however the main source of pollution is considered to be from arable agricultural runoff.
- **Barmston Sea Drain from Skipsea Drain to North Sea NVZ S259** (crossed by the English Onshore Scheme). This designation covers Gransmoor Drain (Burton Agnes to Lissett Area) WFD surface water body plus additional downstream WFD surface water catchments. The water quality in this area is considered to be improving, however it is still not to standard. Nitrogen pollution is seasonal, and thus attributed mainly to arable agriculture pollution sources although some point source (consented) discharges are contributing to the poor water quality. The surface water body considered to be affected by the pollution from the NVZ area is approximately 5 km downstream of the English Onshore Scheme and therefore it is considered there would be limited hydraulic interaction between the two.
- **River Hull from Arram Beck to Humber NVZ S254** (crossed by the English Onshore Scheme). This designation covers the entire Upper Hull Operational Catchment and the northern section of the Lower Hull Operational Catchment. Sources of pollution are split between consented discharges and agriculture. The designated surface water body affected by pollution from this NVZ catchment is the Beverley and Barmston Drain which is approximately 7 km downstream of the English Onshore Scheme and therefore it is considered there would be limited hydraulic interaction between the two.
- **River Hull Headwaters SSSI** (crossed by the English Onshore Scheme in two locations). This is the most northerly chalk stream system in Britain. Surface geology influences the character of the river with gravel, sand and silt sediments deposited on the riverbed in varying proportions. This variation in the riverbed sediments is reflected in the species composition of the aquatic vegetation which is abundant throughout the headwaters during the summer. The river valley also supports a diverse breeding bird community. Kelk Beck and West Beck (River Hull) are part of this designation.



## Surface Water Dependent Non-Statutory Designated Sites

EA records indicates three chalk streams within the study area, only one of which is not otherwise designated:

- Kelk Beck (designated as a SSSI as part of River Hull Headwaters SSSI);
- Nafferton Beck; and
- West Beck (River Hull) (designated as a SSSI as part of River Hull Headwaters SSSI).

The bedrock underlying the chalk streams comprises the Flamborough Chalk Formation, which provides a high level of water feeding into the chalk streams. As such, the water received from this groundwater aquifer is of high quality. Chalk streams have characteristic features that support special habitats or species which are therefore dependent on this quality.

### 11.5.1.6 People, Property and Infrastructure

This section of the English Onshore Scheme mainly avoids urban/developed areas with the English Onshore Scheme centreline passing close to Wansford, Skerne and Hutton Cranswick. The section crosses major roads and railways including the A164 and Yorkshire Coast Line near Hutton Cranswick, the B1249 near Wansford and the A165 south of Bridlington.

### Abstractions and Discharges

According to Abstraction Licensing data (accessed July 2021) and provided by the EA, there are 18 licensed surface water abstractions<sup>3</sup> within the 5 km study area detailed in **Table 11-9**.

**Table 11-9: Abstraction Licences within 5 km of Section 1 of the English Onshore Scheme**

Source	Licence Number	Use	Location	Max. Annual Volume (m <sup>3</sup> )
Surface Water	2/26/30/039	Spray Irrigation - Direct	GYPSEY RACE	2,100
Surface Water	2/26/30/038	Spray Irrigation - Direct	GYPSEY RACE	2,500
Surface Water	2/26/31/065	Spray Irrigation - Direct	LOWTHORPE BECK	27,276
Surface Water	2/26/31/159	Spray Irrigation - Direct	FOSTON BECK - FOSTON ON THE WOLDS - DRIFFIELD	154,564
Surface Water	2/26/31/137	Spray Irrigation - Direct	NAFFERTON LOWLAND DRAIN	11,455
Surface Water	2/26/31/084	Fish Farm/Cress Pond Throughflow	WEST BECK AT CLEAVES FARM, SKERNE, DRIFFIELD, N HUMBERSIDE	400,000
Surface Water	2/26/31/103	Fish Farm/Cress Pond Throughflow	WEST BECK AT CLEAVES FARM, SKERNE, DRIFFIELD, N HUMBERSIDE	1,200,000
Surface Water	2/26/31/055	Spray Irrigation - Direct	NAFFERTON HIGHLAND DRAIN	11,455
Surface Water	2/26/31/116	Fish Farm/Cress Pond	DRIFFIELD CANAL	22,806,000
Surface Water	2/26/31/064	Spray Irrigation - Direct	DRIFFIELD CANAL	27,276
Surface Water	2/26/31/089	Spray Irrigation - Direct	MAIN DRAIN	13,360
Surface Water	2/26/31/118	Fish Farm/Cress Pond Throughflow	WEST BECK - WHINHILL LOCK DRIFFIELD	46,644,000
Surface Water	2/26/31/168	Spray Irrigation - Direct	SPRING - WHIN MILL LOCK	4,911

<sup>3</sup> Some abstraction licenses are included within the assessment of multiple sections due to the overlap of the 5 km study area.



Source	Licence Number	Use	Location	Max. Annual Volume (m <sup>3</sup> )
Surface Water	2/26/31/17	Fish Farm/Cress Pond Throughflow	DRIFFIELD CANAL - WHINHILL LOCK	8,514,000
Surface Water	2/26/32/281	Spray Irrigation - Direct	SKERNE BECK	909
Surface Water	NE/026/031/017	Spray Irrigation - Direct	DRAIN - HUTTON CRANSWICK	56,000
Surface Water	NE/026/032/032	Spray Irrigation - Direct	WATTON BECK	43,000
Surface Water	NE/026/032/031	Spray Irrigation - Direct	CAWKELD SINKS	43,000

The EA has provided a list of all licensed discharges (accessed July 2021) for the study area. The licensed discharges within 5 km of the English Onshore Scheme, have been summarised in **Appendix 11D**. It has been assumed that each discharge is to the nearest watercourse where not explicitly stated.

### Historic Flood Risk

This section of the English Onshore Scheme is within the extents of the EA's Historic Flood Map (HFM) which includes the recorded flood extents of previous flood incidents. The HFM within this section is associated with unnamed ordinary watercourses and not designated main rivers.

### Flood Alert and Flood Warning Areas

Flood Alert Areas (FAA) are geographical locations where it is possible for flooding to occur, based on previously modelled data, with Flood Warning Areas (FWA) defined as where flooding is expected to occur. Within these locations the EA operates an alerts and warnings service. These areas provide contextual information as to where flooding may occur though the location of these does not directly impact upon the assessment of flood risk.

This section of the English Onshore Scheme overlaps with three FAA:

- The North Sea coast from Bridlington to Barmston;
- North Holderness including Skipsea, Hornsea and Lisset; and
- Upper Hill area including Kilham, Nafferton, Driffield, Bainton, North Dalton, Leconfield, Leven, Brandesburton, North Frodingham and Beeford, North Frodingham and Beeford.

This section of the English Onshore Scheme overlaps with one FWA:

- River Hull and tributaries at Frodingham, Hempholme and Burshill.

### Fluvial Flood Risk

This section of the English Onshore Scheme overlaps with the extents of both Flood Zone 2 and Flood Zone 3 from fluvially dominant sources, according to EA mapping and the ERYC SFRA. Flood Map for Planning is included in **Figure 11-2**. Fluvial risk is concentrated along watercourses that cross the English Onshore Scheme. In particular this includes West Beck, River Hull and other ordinary watercourses southwest of Driffield, Gransmoor Drain and Kell Beck near Lowthorpe and ordinary watercourses west of Fraisthorpe.

Modelled flood extents from the EA's River Hull and Holderness Drain Flood Mapping Study (2013) (Ref 11-20) are shown to overlap into the direct impact area and cross the proposed English Onshore Scheme underground DC cable route. The model includes both defended and undefended outputs as well as incorporating fluvial and tidal risk. In this section fluvial is considered the primary risk. In the defended scenario 50% AEP no flooding is shown to occur. The 5% AEP event shows land between the River Hull and Main Drain inundated with this overlapping the proposed underground DC cable route, though flood extents are primarily focused to the west of the English Onshore Scheme proposed underground DC cable route. Flood extents in the 1% AEP event were modelled to be largely the same extent of risk as with the 5% AEP event. Flooding extends to include land east of the underground DC cable route in the 0.1% AEP event. In the undefended scenario, modelled flood extents cover largely

the same areas though to a lesser extent than the defended outlines. This is most notable in the 0.1% AEP event where flooding only extends onto land west of the English Onshore Scheme proposed underground DC cable route and not to the east.

Flood depths and hazard outputs are not available to be provided for this location as these were only modelled for surrounding areas to Northern Hull and Beverley.

### Tidal Flood Risk

This section of the English Onshore Scheme is also within the extents of Flood Zone 2 and 3 from tidally dominant sources. These are concentrated at the eastern end of this section as the English Onshore Scheme makes landfall. Tidal risk is focused on the shoreline and along Burton Drain north of Lisset. As such, the TJP is located outside of Flood Zone 2 and 3 at this location.

### Surface Water Flood Risk

Flooding from surface water can be caused by rainfall being unable to infiltrate into the natural ground or enter the drainage system due to blockage, or from flows being above design capacity. This can result in temporary localised ponding and flooding. The natural topography and location of buildings/structures can influence the direction and depth of water flowing off impermeable and permeable surfaces.

This section of the English Onshore Scheme is within areas of surface water risk, according to EA mapping (see **Figure 11-3**). Surface water flood risk is very dispersed across the entire length of this section, with numerous pockets of high risk near Skerne, Wansford and north of Barmston. Two major pathways are seen near Fraisthorpe where surface water follows Demming Drain and Stonehills Drain and another follows Northfield Beck and Knorka Dike near Skerne.

### Groundwater Flood Risk

Groundwater flooding occurs when the water levels in the ground rise above the surface. It is most likely to occur in low-lying areas underlain by drift and rocks.

When groundwater flooding occurs, it can have a number of different impacts. In low-lying depressions, groundwater can be above the ground surface and cause ponding that can last for long periods of time. Elsewhere, it may result in watercourses flowing where there are normally none and in other areas it may cause waterlogging of the ground. It is difficult to predict how groundwater flooding will affect an area however, groundwater will typically emerge and flow to low points where it will pond or form 'new' watercourses. Consequently, existing surface water flooding datasets may in some locations be a suitable proxy for the areas that might be affected within those areas at risk from groundwater flooding.

British Geological Society Mapping shows this area is mostly underlain by chalk bedrock and superficial deposits of glacial till meaning this section is permeable to both infiltration and groundwater. In addition, soilscape mapping of the predominant soil profile supports this.

The ERYC SFRA, using the Areas Susceptible to Groundwater Flooding (AStGWF) dataset which splits land into 1 km<sup>2</sup> tiles shows many of the tiles in this section, between Bridlington and Driffield, having a ≥75% coverage of areas at high risk of groundwater flooding.

### Sewer and Drains Flood Risk

Flooding from sewers occurs when the sewer capacity is exceeded due to heavy rainfall, blockage or due to inadequate design. Sewers are generally designed to cope with mid to low order rainfall events (i.e. not to flood during events up to the 1 in 30-year return period).

Data supplied by Yorkshire Water indicated that they had no records of sewers or drains within the study area and therefore no records on the DG5 register (a list of properties that have flooded previously as a result of hydraulic inadequacy of the public sewer network) of hydraulic failure incidents resulting from sewers and drains.

### Reservoir Flood Risk

This section of the English Onshore Scheme is not shown to overlap with areas at risk from reservoir flood mapping, according to EA mapping (see **Figure 11-4**).

## Residual Flood Risk (Flood Defences)

This section of the English Onshore Scheme is not shown to overlap with the EA Flood Map for Planning's Areas Benefitting from Defences (ABD) layer.

There are assets included in the EA's Spatial Flood Defences layer shown that overlap with this section of the English Onshore Scheme. These mainly include areas of privately owned and operated high ground, presumed to not be formal defences, as well as one area of embankments operated by the EA. The defences are focused in the centre of the section near Driffield and Nafferton.

This section lies outside any recorded Flood Storage Areas (FSA), according to EA mapping.

## 11.5.2 Section 2 – Bainton to Market Weighton

### 11.5.2.1 Water Features Crossed by the English Onshore Scheme

There are a total of five water features crossed by Section 2 of the English Onshore Scheme which are listed in **Table 11-10**. These lie mainly within the drainage catchment of the River Hull and River Foulness and consist of minor drains only. These catchments are within the East Riding of Yorkshire Local Authority. These are shown in **Figure 11-1**.

Section 2 is not located within the district area of an IDB.

Assumed underground DC cable crossing types are described within **Chapter 3: Description of the English Onshore Scheme**. All crossings in Section 2 will be crossed by open cut techniques.

In addition, the haul road will also cross separately within the working width by temporary culvert installation.

All crossings will be designed in line with LLFA requirements in accordance with the Environmental Permitting (England and Wales) Regulations 2016.

**Table 11-10: Water Features Crossed by Section 2 of the English Onshore Scheme**

Name of Water Feature	NGR	Operators
Drain in headwaters of Bowman Drain	SE 88725 40436	N/A
Drain in headwaters of Bowman Drain	SE 88181 40189	N/A
Bowman Drain	SE 88084 39971	N/A
Drain in headwaters of Bowman Drain	SE 87883 39689	N/A
Drain in headwaters of Bowman Drain	SE 87858 39676	N/A

### 11.5.2.2 WFD Surface Water Bodies

The EA has provided the most recent WFD classifications for watercourses within the study area. In total, there are three designated WFD surface water bodies in the study area, none of which are crossed by Section 2 of the English Onshore Scheme. Their status is listed in **Table 11-11**<sup>4</sup>.

<sup>4</sup> Some WFD water bodies are included within the assessment of multiple sections due to the overlap of the 2 km study area.

**Table 11-11: WFD Surface Water Bodies within the 2 km Study Area of Section 2 of the English Onshore Scheme**

WFD ID	Water Body Name	Current Status (2019)			Failing Elements	Reasons for not achieving good status	2027 Ecological Objective
		Ecological	Chemical	Overall			
<b>GB10402606690 (not crossed)</b>	Foulness from Black Beck to Market Weighton Canal	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Septic tanks (diffuse source) Trade/industry discharge (point source) Poor nutrient management (diffuse source)	Good
<b>GB104026067031 (not crossed)</b>	Wellsprings Drain/Eastburn Beck/Driffield Trout Stream	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Land drainage-operational management (physical modification) Barriers-ecological discontinuity (physical modification)	Good
<b>GB104026066980 (not crossed)</b>	Middleton on the Wolds and Watton Beck	Moderate	Fail	Moderate	PBDE Mercury and its compounds	None given	Good (only 2015 objective available for ecology)

### 11.5.2.3 Main Rivers

There are no main rivers crossed by Section 2 of the English Onshore Scheme, however the Back Delfin/Market Weighton Canal is located within the 2 km study area. This river is also crossed by Section 3 of the English Onshore Scheme.

### 11.5.2.4 Standing Water Bodies

The English Onshore Scheme does not cross any standing water bodies, however there are 22 standing water bodies<sup>5</sup> within the 2 km study area, as shown in **Table 11-12**.

**Table 11-12: Standing Water Bodies within the 2 km Study Area of Section 2 of the English Onshore Scheme**

ID	Water Body	NGR
21	Pond near Neswick Farm	SE 98131 52893
22	Pond near Garden Covert	SE 97476 53199
23	Pond near Neswick Gardens	SE 97251 52939
24	Pond near Neswick Gardens	SE 97212 52918
25	Pond near Neswick Cottage	SE 96943 52449
26	Pond south of Applegarth Lane	SE 96655 52276
27	Pond north of Lockington Road	SE 97254 48384
28	Pond south of Beverley Road	SE 94847 49295
29	Pond south of A614	SE 94936 49671
30	Pond east of Pickering Park Road	SE 94552 49551
31	Pond south of A1079	SE 87692 40698
32	Pond near Crossfield House	SE 87985 40120
33	Pond near the White Lodge	SE 88168 39633
34	South Park Cascade	SE 88446 38778
35	Pond near Castle Farm	SE 88595 38623
36	Pond near Bowman Drain	SE 86644 39961
37	Pond near river Farm	SE 86040 39646
38	Pond near Common Farm	SE 85912 38629
39	Pond near Common Farm	SE 85672 38450
40	Pond near Common Farm	SE 85470 38412
41	Pond near Common Farm	SE 85490 38210
42	Pond near Common Farm	SE 85398 38033

None of these are associated with surface water dependent designated and non-statutory designated sites.

### 11.5.2.5 Water Dependent Biodiversity Sites

There are no international sites of nature conservation and two national statutory protected areas within the 2 km study area:

- River Hull from Arram Beck to Humber NVZ S254; and
- Market Weighton Canal/Bk from Source to Humber NVZ S250.

#### Surface Water Dependent Statutory Designated Sites

Within the 2 km study area there are two surface water dependent statutory designated sites.

- **River Hull from Arram Beck to Humber NVZ S254** (crossed by the English Onshore Scheme). This designation covers the entire Upper Hull Operational Catchment and the northern section of

<sup>5</sup> Some standing water bodies are included within the assessment of multiple sections due to the overlap of the 2 km study area.

the Lower Hull Operational Catchment. Sources of pollution are split between consented discharges and agriculture. The designated surface water body affected by pollution from this NVZ catchment is the Beverley and Barmston Drain (GB104026067211) which is approximately 7 km downstream of the English Onshore Scheme and therefore it is considered there would be limited hydraulic interaction between the two.

- **Market Weighton Canal/Bk from Source to Humber NVZ S250** (crossed by the English Onshore Scheme). This designation falls within the Foulness Operational Catchment. Sources of pollution are split between consented discharges, agriculture, and losses from woodland and urban areas with the majority produced by agricultural runoff. The designated surface water body affected by pollution from this NVZ catchment is the eastern branch of the Foulness from Black Beck to Market Weighton Canal which is crossed by the English Onshore Scheme at Back Delfin south of Market Weighton.

### Surface Water Dependent Non-Statutory Designated Sites.

No surface water dependent non-statutory designated sites have been identified within the 2 km study area.

EA records indicate that no chalk streams are present within the 2 km study area.

### 11.5.2.6 People, Property and Infrastructure

This section of the English Onshore Scheme mainly avoids urban/developed areas, with the English Onshore Scheme centreline passing close to Market Weighton. The section does cross major roads including the A1034 and A1079 near Market Weighton and the B1248 near Bainton.

#### Abstractions and Discharges

According to Abstraction Licensing data (accessed July 2021) and provided by the EA, there are 18 surface water abstraction licences within the 5 km study area. These are included in **Table 11-13** below.

**Table 11-13: Abstraction Licences within 5 km of Section 2 of the English Onshore Scheme**

Source	Licence Number	Use	Location	Max. Annual Volume (m <sup>3</sup> )
Surface Water	NE/026/0032/031	Spray Irrigation - Direct	CAWKELD SINKS	43,000
Surface Water	2/26/34/151	Spray Irrigation - Storage	BOWMAN DRAIN - HOUGHTON FARMS - SCANTON	273,000
Surface Water	2/26/34/126	Spray Irrigation - Storage	DRAIN - SANCTON	22,728
Surface Water	2/26/34/095	Spray Irrigation - Storage	SHIPTON BECK	68,190
Surface Water	2/26/34/079	Spray Irrigation - Storage	EASTINGS DRAIN	28,770
Surface Water	2/26/34/049	Spray Irrigation - Direct	HOLME ROAD DRAIN	163,656
Surface Water	2/26/34/113	Spray Irrigation - Storage	TRIBUTARY OF EAST INGS DRAIN	18,180
Surface Water	2/26/34/089	Spray Irrigation - Storage	BEILS BECK	29,280
Surface Water	NE/026/0034/039	Spray Irrigation - Direct	BEIL'S BECK - NORTH CLIFFE	16,000
Surface Water	NE/026/0034/040	Spray Irrigation - Direct	BACK DELFIN - AVENUE FARM - NORTH CLIFFE	15,000
Surface Water	2/26/34/081	Spray Irrigation - Direct	BACK DELPHIN - HOLME ON	16,720

Source	Licence Number	Use	Location	Max. Annual Volume (m³)
			SPALDING MOOR	
Surface Water	NE/026/0032/015	Spray Irrigation - Direct	RESERVOIR - NORTH CLIFFE MARKET WEIGHTON	80,130
Surface Water	2/26/34/080	Spray Irrigation - Direct	RESERVOIR - NORTH CLIFFE MARKET WEIGHTON	32,860
Surface Water	2/26/34/118	Spray Irrigation - Storage	LOWMATH DRAIN	36,368
Surface Water	NE/026/0032/031	Spray Irrigation - Direct	CAWKELD SINKS	43,000
Surface Water	2/26/34/151	Spray Irrigation - Storage	BOWMAN DRAIN - HOUGHTON FARMS - SCANTON	273,000
Surface Water	2/26/34/126	Spray Irrigation - Storage	DRAIN - SANCTON	22,728
Surface Water	2/26/34/095	Spray Irrigation - Storage	SHIPTON BECK	68,190

The EA has provided a list of all licenced discharges (accessed July 2021). The licensed discharges within the 5 km study area have been summarised in **Appendix 11D**. It has been assumed that each discharge is to the nearest watercourse where not explicitly stated.

### Historic Flood Risk

This section of the English Onshore Scheme is outside the extents of the HFM.

### Flood Alert and Flood Warning Areas

This section of the English Onshore Scheme overlaps with one FAA: Upper Hill area including Kilham, Nafferton, Driffield, Bainton, North Dalton, Leconfield, Leven, Brandesburton, North Frodingham and Beeford, North Frodingham and Beeford.

This section of the English Onshore Scheme does not overlap with any FWAs.

### Fluvial Flood Risk

This section of the English Onshore Scheme lies mostly outside the extents of Flood Zone 2 and 3 from fluvially dominant sources, see **Figure 11-2**, with small overlaps recorded on Bracken Beck south of Bainton and Bells Beck south of Market Weighton.

### Tidal Flood Risk

This section of the English Onshore Scheme does not overlap with extents of Flood Zone 2 and 3 from tidally dominant sources.

### Surface Water Flood Risk

This section of the English Onshore Scheme is within areas of surface water risk, according to EA mapping (see **Figure 11-3**). Within this section, surface water risk is mainly contained to existing watercourses which intersect the section. These include Bowman Drain near Market Weighton and Bracken Beck, west of Kilnwick. There are also several additional flow paths of surface water risk which follow roads and paths which also intersect the section. All these pathways are mainly medium and low risk, though the path following Bowman Drain does include areas of high risk.



## Groundwater Flood Risk

The ERYC SFRA, using the AStGWF dataset which splits land into 1 km<sup>2</sup> tiles shows many of the tiles in this section between Bainton and Market Weighton, have a <25 % coverage of areas at high risk of groundwater flooding, with the centre of the section having no data available.

British Geological Society Mapping shows this area to be the same as Section 1 and is thus mostly underlain by chalk bedrock and superficial deposits of glacial till meaning Section 2 is permeable to both infiltration and groundwater. Soilscape mapping of the predominant soil profile for the section also supports this.

## Sewer and Drains Flood Risk

Flooding from sewers occurs when the sewer capacity is exceeded due to heavy rainfall, blockage or due to inadequate design. Sewers are generally designed to cope with mid to low order rainfall events (i.e. not to flood during events up to the 1 in 30-year return period).

Data supplied by Yorkshire Water indicated that they had no records of sewers or drains in the near vicinity of the English Onshore Scheme and as such there are additionally no records of DG5 hydraulic failure incidents resulting from sewers and drains.

## Reservoir Flood Risk

This section of the English Onshore Scheme is not shown to overlap with areas at risk from reservoir flood mapping, according to EA mapping (see **Figure 11-4**).

## Residual Flood Risk (Flood Defences)

This section of the English Onshore Scheme is not shown to overlap with the Flood Map for Planning's ABD layer.

This section lies outside any recorded FSA, according to EA mapping.

According to the EA's Spatial Flood Defences layer, this section does not overlap with any recorded flood defences.

## 11.5.3 Section 3 – Market Weighton to River Ouse

### 11.5.3.1 Water Features Crossed by the English Onshore Scheme

There are a total of 50 water features crossed by Section 3 of the English Onshore Scheme, which are listed in **Table 11-14**. These lie primarily within the drainage catchment of the River Foulness and River Ouse, and consist of a mix of main rivers, ordinary watercourses, and minor drains. These catchments are within the East Riding of Yorkshire Local Authority, Ouse and Humber, and Selby Area IDBs. These are shown in **Figure 11-1**.

Potential cable crossing types are described within **Chapter 3: Description of the English Onshore Scheme**. Main rivers, larger or sensitive ordinary watercourses, and IDB maintained ordinary watercourses will be crossed via trenchless techniques. Minor drains and ordinary watercourses will be crossed by open cut techniques.

In addition, the haul road will also cross separately within the working width by bridge or temporary culvert installation. Main river Back Delfin/Market Weighton Canal and ordinary watercourse River Foulness will be crossed by a clear span temporary bridge, with the remaining ordinary watercourses and drains crossed by temporary culvert. The haul road will not cross the River Ouse, and instead construction traffic will be diverted along the existing road network.

All crossings will be designed in line with EA, IDB and LLFA requirements in accordance with the Environmental Permitting (England and Wales) Regulations 2016. Early consultation with additional design details for proposed crossing locations will be undertaken with relevant agencies and operators pre-construction.

**Table 11.14: Water Features Crossed by Section 3 of the English Onshore Scheme**

Name of Water Feature	HDD crossing reference (if applicable)	National Grid Reference (NGR)	Operator
Drain in headwaters of Bowman Drain	-	SE 87530 39443	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 86934 38965	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 85715 37986	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	HDD_027	SE 84669 37267	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	HDD_027	SE 84483 37215	N/A
Back Delfin/ Market Weighton Canal (Foulness from Black Beck to Market Weighton Canal GB104026066690)	HDD_027	SE 84325 37174	Main River (EA)
Market Weighton Canal relic channel	HDD_027	SE 84324 37307	N/A
Egremont Drain	HDD_027	SE 84277 37326	In Ouse & Humber IDB
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 83989 37249	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 83708 37153	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 83414 36851	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 8262 3639	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 8255 3628	N/A
Drain in headwaters of Holme Main Drain	-	SE 82222 36094	N/A
Drain in headwaters of Holme Main Drain	-	SE 81855 35498	N/A
Holme Main Drain	HDD_029 (potential to be open cut)	SE 81608 35316	In Ouse & Humber IDB
Drain in headwaters of Holme Main Drain	HDD_029 (potential to be open cut)	SE 8160 35285	N/A
Drain in headwaters of Holme Main Drain	-	SE 81212 35021	N/A
Drain in headwaters of Holme Main Drain	-	SE 81016 34902	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 80487 34416	N/A
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 80274 34289	N/A

Name of Water Feature	HDD crossing reference (if applicable)	National Grid Reference (NGR)	Operator
Dunn's Drain	HDD_030	SE 79765 33961	In Ouse & Humber IDB
River Foulness (Foulness from Black Beck to Market Weighton Canal (GB104026066690))	HDD_030	SE 79615 33910	In Ouse & Humber IDB
Drain in headwaters of Foulness from Black Beck to Market Weighton Canal GB104026066690	-	SE 79528 33015	N/A
Feathered Drain	HDD_031	SE 78811 32360	In Ouse & Humber IDB
Bishopsoil Drain/Carr Drain	HDD_031	SE 79356 32470	In Ouse & Humber IDB
Drain in headwaters of Bishopsoil Drain/Carr Drain	-	SE 78840 32156	N/A
Drain in headwaters of Bishopsoil Drain/Carr Drain	-	SE 78319 31714	N/A
Drain in headwaters of Bishopsoil Drain/Carr Drain	HDD_032	SE 78213 31622	N/A
Drain in headwaters of Bishopsoil Drain/Carr Drain	-	SE 78128 31633	N/A
Drain in headwaters of Bishopsoil Drain/Carr Drain	-	SE 77882 31615	N/A
Drain in headwaters of Bishopsoil Drain/Carr Drain	-	SE 76029 30828	N/A
Drain in headwaters of Bishopsoil Drain/Carr Drain	-	SE 75507 30682	N/A
Drain in headwaters of Near Drain	HDD_033 (potential to be open cut)	SE 75216 30705	N/A
Drain in headwaters of Black Dyke	-	SE 75026 30690	N/A
Drain in headwaters of Black Dyke	-	SE 74681 30315	N/A
Duck Swang Drain	-	SE 74216 30397	N/A
Drain in headwaters of Black Dyke	-	SE 73249 30179	N/A
Black Dyke	HDD_035 (potential to be open cut)	SE 72562 29637	In Ouse & Humber IDB
New Drain	HDD_036	SE 72193 29188	In Ouse & Humber IDB
Asselby Marsh	HDD_037 (potential to be open cut)	SE 71524 28806	In Ouse & Humber IDB
Asselby Marsh Lane Drain	HDD_037 (potential to be open cut)	SE 71407 28697	In Ouse & Humber IDB
Drain in headwaters of Ouse from R Wharfe to Upper Humber GB104027064270	-	SE 70883 27969	N/A
Drain in headwaters of Ouse from R Wharfe to Upper Humber GB104027064270	-	SE 70647 27553	N/A
Drain in headwaters of Ouse from R Wharfe to Upper Humber GB104027064270	-	SE 70132 27488	N/A

Name of Water Feature	HDD crossing reference (if applicable)	National Grid Reference (NGR)	Operator
Seave Carr	-	SE 69681 27530	In Ouse & Humber IDB
Lowfield Drain	HDD_039 (potential to be open cut)	SE 69624 27439	In Ouse & Humber IDB
Bank Field Lane Drain	HDD_040 (potential to be open cut)	SE 69124 27391	In Ouse & Humber IDB
Drain in headwaters of Ouse from R Wharfe to Upper Humber GB104027064270	HDD_040 (potential to be open cut)	SE 69034 27378	N/A
River Ouse	HDD_041	SE 68576 27379	Main River (EA)

### 11.5.3.2 WFD Surface Water Bodies

The EA has provided the most recent WFD classifications for watercourses within the study area. In total, there are three designated WFD surface water bodies<sup>6</sup> in the study area, two of which are crossed by the English Onshore Scheme. Their status is listed in **Table 11-15**.

Only the River Ouse from River Wharfe to Upper Humber is designated heavily modified.

<sup>6</sup> Some WFD surface water bodies are included within the assessment of multiple sections due to the overlap of the 2 km study area.

**Table 11-15: WFD Surface Water Bodies within the Study Area of Section 3 of the English Onshore Scheme**

WFD ID	Water Body Name	Current Status (2019)			Failing Elements	Reasons for not achieving good status	2027 Ecological Objective
		Ecological	Chemical	Overall			
<b>GB10402606690 (directly crossed)</b>	Foulness from Black Beck to Market Weighton Canal	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Septic tanks (diffuse source) Trade/industry discharge (point source) Poor nutrient management (diffuse source)	Good
<b>GB104027068311 (not crossed)</b>	Derwent from Elvington Beck to River Ouse	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Physical modification	Good
<b>GB104027064270 (directly crossed)</b>	Ouse from R Wharfe to Upper Humber	Moderate	Fail	Moderate	DDT PBDE PFOS Mercury and its compounds	Sewage discharge (point source) Contaminated water body bed sediments (diffuse source)	Good

### 11.5.3.3 Main Rivers

There are two main rivers crossed by Section 3 of the English Onshore Scheme:

- Back Delfin; and
- River Ouse.

In addition, within the study area there is the River Derwent (a main river) that is not crossed by Section 3 of the English Onshore Scheme.

### 11.5.3.4 Standing Water Bodies

There are 44 standing water bodies<sup>7</sup> within the 2 km study area as shown in **Table 11-16**. None of these are crossed by the English Onshore Scheme.

**Table 11-16: Standing Water Bodies within the 2 km Study Area of Section 3 of the English Onshore Scheme**

ID	Water Body	NGR
38	Pond near Common Farm	SE 85912 38629
39	Pond near Common Farm	SE 85672 38450
40	Pond near Common Farm	SE 85470 38412
41	Pond near Common Farm	SE 85490 38210
42	Pond near Common Farm	SE 85398 38033
43	Pond near Avenue Farm	SE 86084 37877
44	Pond near Avenue Farm	SE 85658 37711
45	Pond near North Cliffe Woods	SE 86725 36775
46	Pond near Carr Farm	SE 85034 37155
47	Pond near Carr Farm	SE 84799 36987
48	Pond near Low Plantation	SE 83342 38148
49	Pond near Low Plantation	SE 83035 38244
50	Pond near Marl Farm	SE 84022 37072
51	Pond near Marl Farm	SE 83729 37365
52	Pond near Marl Farm	SE 83518 37164
53	Pond south of Lock Lane	SE 83679 36738
54	Pond near Tollingham Warren	SE 83642 36046
55	Pond near Tollingham Warren	SE 83458 36201
56	Pond near Tollingham Warren	SE 83050 36399
57	Pond near Skiff Farm	SE 82434 36400
58	Pond near Tollingham Cottages	SE 82509 36184
59	Pond near Ladies Parlour	SE 82836 36046
60	Pond south of Rose-Lea	SE 81677 37109
61	Pond near New Burse Farm	SE 81229 35723
62	Pond near New Burse Farm	SE 80879 35683
63	Pond near The Willows	SE 80052 35099
64	Pond near Warham Farm	SE 78575 33956
65	Pond near Oak Tree Farm	SE 76953 33085
66	Pond near Oak Tree Farm	SE 76811 33168
67	Pond near Oak Tree Farm	SE 76717 32647
68	Pond near Brickyard Farm	SE 75265 31051
69	Pond near Brindleys Plantation	SE 74367 31731

<sup>7</sup> Some standing water bodies are included within the assessment of multiple sections due to the overlap of the 2km study area.

ID	Water Body	NGR
70	Pond near Barnhill Farm	SE 73383 28967
71	Pond near Parks Farm	SE 72706 29199
72	Reservoir near Bishop's Meadows	SE 70443 29209
73	Brock Holes	SE 67371 25483
74	Pond south of Wren Hall	SE 66993 26873
75	Pond near Drax Abbey Farm	SE 66985 28229
76	Pond near Hook's Fields	SE 66563 28855
77	Pond near Hook's Fields	SE 66555 28612
78	Pond near Hook's Fields	SE 66206 28455
79	Pond within Drax Power Station	SE 66387 27551
80	Pond within Drax Power Station	SE 66235 26735
81	Pond within Drax Power Station	SE 65992 27449

None of these are associated with surface water dependent statutory designated and non-statutory designated sites.

### 11.5.3.5 Water Dependent Biodiversity Sites

There is one international site of nature conservation interest and five national statutory protected areas within the 2 km study area:

- Barn Hill Meadows SSSI;
- River Derwent SAC and SSSI;
- South Cliffe Common SSSI;
- Market Weighton Canal/Bk from Source to Humber NVZ S250; and
- Foulness from Black Beck to Market Weighton Canal NVZ S249.

#### Surface Water Dependent Statutory Designated Sites

There are five surface water dependent designated sites within the study area:

- **Barn Hill Meadows SSSI** (850 m south east of the English Onshore Scheme): An ancient hay meadow characterised as a species rich lowland neutral grassland with damp areas associated with the Old Derwent floodplain. Barn Hill Meadows SSSI is located approximately 850 m south east of Section 3 of the English Onshore Scheme, and approximately 1 km downstream of the crossing point with Black Dyke. It is not located within a catchment area for a WFD water body.
- **River Derwent SAC and SSSI** (1.4 km north of the English Onshore Scheme): This lowland section of river from mouth to the confluence with the River Ouse supports diverse communities of aquatic flora and fauna, many elements of which are nationally significant. Although not directly crossed, the River Derwent SSSI is located approximately 1.3 km north of Section 3 of the English Onshore Scheme via land and 1.7 km downstream from crossing points on the Asselby Marsh Drain and New Drain. This SSSI is also located within the WFD water body Derwent from Elvington Beck to River Ouse (GB104027068311).
- **South Cliffe Common SSSI** (1.3 km south of the English Onshore Scheme): A mixture of heathland and wet acidic grassland. It is important as a remnant of once much more widespread habitats, now substantially reduced by agricultural improvement and conifer planting. It forms one of only six extensive heathlands developed on sand remaining in Humberside. There are several small drains which run through the site. In addition, it is located within the upstream reaches of WFD water body Foulness from Black Beck to Market Weighton Canal (GB1040266690). South Cliffe SSSI is located approximately 1.3 km south from Section 3 of the English Onshore Scheme via land, however only indirectly connected by the drainage channels which confluence with the Market Weighton Canal 1.7 km downstream of the crossing point with the English Onshore Scheme. Therefore, impacts are limited by the natural drainage regime of the catchment.



- **Market Weighton Canal/Bk from Source to Humber NVZ S250** (crossed by the English Onshore Scheme). This designation falls within the Foulness Operational Catchment. Sources of pollution include consented discharges, agriculture, and losses from woodland and urban areas with the majority produced by agricultural runoff. The designated surface water body affected by pollution from this NVZ catchment is the eastern branch of the Foulness from Black Beck to Market Weighton Canal which is crossed by the English Onshore Scheme at Back Delfin south of Market Weighton.
- **Foulness from Black Beck to Market Weighton Canal NVZ S249** (crossed by the English Onshore Scheme). This designation falls within the Foulness Operational Catchment. Sources of pollution include consented discharges, agriculture, domestic properties and losses from woodland and urban areas. The designated surface water body affected by pollution from this NVZ catchment is the western branch of the Foulness from Black Beck to Market Weighton Canal (GB104026066690) WFD water body which is crossed by Section 3 of the English Onshore Scheme at the River Foulness.

### Surface Water Dependent Non-Statutory Designated Sites

No surface water dependent non-statutory designated sites have been identified within 2 km of the English Onshore Scheme.

EA records indicate that no chalk streams are present within 2 km of the English Onshore Scheme.

### 11.5.3.6 People, Property and Infrastructure

This section of the English Onshore Scheme mainly avoids urban/developed areas, with the English Onshore Scheme passing close to Asselby, Brind and Newsholme. This section of the English Onshore Scheme crosses major roads and railways including the A63 near Newsholme, the Hull Line railway near Howden and the A614 south of Holme-on-Spalding-Moor.

### Abstractions and Discharges

According to Abstraction Licensing data (accessed July 2021) as provided by the EA, there are 47 licensed surface water abstractions within the 5 km study area<sup>8</sup>, as shown in **Table 11-17** below.

**Table 11-17: Abstraction Licences within 5 km of Section 3 of the English Onshore Scheme**

Source	Licence Number	Use	Location	Max. Annual Volume (m <sup>3</sup> )
Surface Water	2/27/28/083	Potable Water Supply - Direct	RIVER DERWENT - LOFTSOME BRIDGE	30,400,000
Surface Water	2/26/34/151	Spray Irrigation - Storage	BOWMAN DRAIN - HOUGHTON FARMS - SCANTON	273,000
Surface Water	2/26/34/126	Spray Irrigation - Storage	DRAIN - SANCTON	22,728
Surface Water	2/26/34/095	Spray Irrigation - Storage	SHIPTON BECK	68,190
Surface Water	2/26/34/079	Spray Irrigation - Storage	EASTINGS DRAIN	28,770
Surface Water	2/26/34/049	Spray Irrigation - Direct	HOLME ROAD DRAIN	163,656
Surface Water	2/26/34/113	Spray Irrigation - Storage	TRIBUTARY OF EAST INGS DRAIN	18,180
Surface Water	2/26/34/089	Spray Irrigation - Storage	BEILS BECK	29,280

<sup>8</sup> Some abstraction licenses are included within the assessment of multiple sections due to the overlap of the 5 km study area.

Source	Licence Number	Use	Location	Max. Annual Volume (m³)
Surface Water	NE/026/0034/039	Spray Irrigation - Direct	BEIL'S BECK - NORTH CLIFFE	16,000
Surface Water	NE/026/0034/040	Spray Irrigation - Direct	BACK DELFIN - AVENUE FARM - NORTH CLIFFE	15,000
Surface Water	2/26/34/081	Spray Irrigation - Direct	BACK DELPHIN - HOLME ON SPALDING MOOR	16,720
Surface Water	NE/026/0032/015	Spray Irrigation - Direct	RESERVOIR - NORTH CLIFFE MARKET WEIGHTON	80,130
Surface Water	2/26/34/080	Spray Irrigation - Direct	RESERVOIR - NORTH CLIFFE MARKET WEIGHTON	32,860
Surface Water	2/26/34/118	Spray Irrigation - Storage	LOWMATH DRAIN	36,368
Surface Water	2/26/34/043	Spray Irrigation - Storage	RIVER FOULNESS 2	72,720
Surface Water	NE/026/0034/036	Spray Irrigation - Direct	UNNAMED DRAIN - BAR FARM - HOLME UPON SPALDING MOOR	16,002
Surface Water	2/26/34/082	Spray Irrigation - Direct	CATCHPIT - SUPERFICIAL DRIFT - HARSWELL	36,370
Surface Water	2/26/34/058	Spray Irrigation - Direct	RIVER FOULNESS	20,540
Surface Water	2/26/34/132	Spray Irrigation - Storage	OLD COURSE OF RIVER FOULNESS	6,800
Surface Water	2/26/34/098	Spray Irrigation - Direct	TRIBUTARY OF THROLAM DRAIN	36,360
Surface Water	2/26/34/083	Spray Irrigation - Direct	RIVER FOULNESS-HOLME HOUSE-HOLME ON SPALDING MOOR	117,100
Surface Water	NE/026/0034/013	Spray Irrigation - Direct	PLOUGH FURROW DRAIN NORTH	36,160
Surface Water	NE/026/0034/018	Spray Irrigation - Direct	MARKET WEIGHTON CANAL	180,000
Surface Water	2/26/34/183	Spray Irrigation - Direct	HOLME MAIN DRAIN-HOLME-ON-SPALDING MOOR	50,000
Surface Water	2/26/34/140A	Spray Irrigation - Storage	RIVER FOULNESS-SANDHILL	20,000

Source	Licence Number	Use	Location	Max. Annual Volume (m³)
			FARM-NEWPORT 2	
Surface Water	NE/026/0034/003	Spray Irrigation - Direct	RIVER FOULNESS AT SANDHOLME	50,000
Surface Water	2/27/24/326	Spray Irrigation - Storage	RIVER FOULNESS-HASHOLME GRANGE-HOLME ON SPALDING MOOR	47,000
Surface Water	2/26/34/086	Spray Irrigation - Direct	RIVER FOULNESS	30,840
Surface Water	NE/026/0034/027	Spray Irrigation - Direct	RIVER FOULNESS	16,430
Surface Water	2/26/34/086	Spray Irrigation - Direct	RIVER FOULNESS	30,840
Surface Water	2/26/34/084	Spray Irrigation - Direct	POINTS C AND A - RIVER FOULNESS	6,160
Surface Water	NE/027/0024/069	Spray Irrigation - Direct	POINT A - DUNCOATS BECK	80,000
Surface Water	2/27/28/140	Spray Irrigation - Storage	FLEET DYKE - WRESSLE	27,273
Surface Water	NE/027/0028/032	Spray Irrigation - Direct	RIVER DERWENT-DUFFIELD SELBY	13,490
Surface Water	NE/027/0028/048	Spray Irrigation - Direct	RIVER DERWENT NEAR WRESSLE	80,000
Surface Water	NE/027/0028/009/A	Spray Irrigation - Direct	RIVER DERWENT AT BRACKENHOLME	60,000
Surface Water	NE/027/0024/072	Spray Irrigation - Direct	RIVER AIRE AT AIRMYN NEAR GOOLE	18,000
Surface Water	2/27/18/124/R01	Spray Irrigation - Direct	TOWNSHIP DRAIN - GOOLE	36,500
Transitional Water	2/27/24/467/R01	Spray Irrigation - Direct	RIVER OUSE 2 - TIDAL	75,000
Transitional Water	2/27/24/194	Spray Irrigation - Direct	RIVER OUSE - TIDAL	41,000
Surface Water	NE/027/0028/048	Spray Irrigation - Direct	RIVER DERWENT - NEAR WRESSLE	40,000
Transitional Water	2/27/24/155	Boiler Feed	RIVER OUSE - TIDAL - LONG DRAX	96,230,000
Surface Water	NE/027/0024/050/R01	Spray Irrigation - Direct	LENDALL DRAIN AT DRAX ABBEY FARM	45,000

Source	Licence Number	Use	Location	Max. Annual Volume (m <sup>3</sup> )
Transitional Water	2/27/24/195	Spray Irrigation - Direct	DRAX ABBEY FISH POND - TIDAL	10,000
Transitional Water	2/27/24/194	Spray Irrigation - Direct	CARR DYKE/LENDALL DRAIN - TIDAL	82,000
Transitional Water	NE/027/0024/016	Spray Irrigation - Direct	RIVER OUSE - TIDAL	40,000
Transitional Water	2/27/24/271	Spray Irrigation - Direct	RIVER OUSE - TIDAL	18,180

The EA has provided a list of all licensed discharges (accessed July 2021). The licensed discharges within the 5 km study area have been summarised in **Appendix 11D**. It has been assumed that each discharge is to the nearest watercourse where not explicitly stated.

### Historic Flood Risk

This section of the English Onshore Scheme is within the extents of the HFM, associated with the River Foulness, River Derwent, River Ouse, New Drain and other unnamed ordinary watercourses.

### Flood Alert and Flood Warning Areas

This section of the Scheme overlaps with three FAA:

- River Foulness and the Market Weighton Canal and their tributaries;
- Local roads and low-lying land around Stamford Bridge, Pocklington, Wressle, Wilberfoss and Elvington; and
- The tidal foreshore and agricultural land adjacent to the river in the Cawood, Kelfield, Wistow and Selby areas; and East Riding of Yorkshire, North Yorkshire, York.

This section of the English Onshore Scheme overlaps with one FWA:

- Villages and properties on both banks of the lower River Derwent, including Thorganby, Bubwith, Menthorpe, Brighton, Wressle, Loftsome Bridge, Brind and Brackenholme, Loftsome Bridge, Brind and Brackenholme.

### Fluvial Flood Risk

This section of the English Onshore Scheme overlaps with extents from both Flood Zone 2 and 3 from fluvially dominant sources, see **Figure 11-2**, with the overlaps focused in three main areas. The first is south of Market Weighton on the Market Weighton Canal, East Ings Drain and Bells Beck. The second is along Fleet Drain, a tributary of the River Derwent north of Wressle, though only Flood Zone 2 intersects with the English Onshore Scheme. The third is focused on New Drain northwest of Howden. As there are flood defences that overlap with this section, it should be noted that flood zones represent undefended flood extent scenarios.

Modelled flood extents from the Mill Dike (Market Weighton) EA Flood Mapping Study (2007) (Ref 11-17) are shown to overlap into the direct impact area in the 10% AEP event up to the 0.1% AEP event, with these overlaps focussed on a section of the Market Weighton Canal near Sand Lane. Flooding extends west from the canal to floodplain near Cliffe Lane. In all events, the areas of greatest depth are located within channel with depths on the floodplain 0.9-0.12 m in the 10% AEP event, 0.8-1 m in the 1% AEP event and 1.1-1.2 m in the 0.1% AEP event.

In all modelled events, flood extents do not extend further south towards the English Onshore Scheme than Sand Lane though this is due to that being the modelled extent of the canal rather than a lack of flood risk to this area. The Flood Map for Planning shows areas south of Sand Lane to be within Flood Zone 3 which overlap with the cable route. Therefore, assessments were based on the worst case scenario, using the Flood Map for Planning.

This section of the English Onshore Scheme also overlaps with areas from joint fluvial and tidal sources though only in Flood Zone 2. These areas are along the River Foulness near Welham Bridge and along New Drain near Howden.

### Tidal Flood Risk

This section of the English Onshore Scheme overlaps with extents from both Flood Zone 2 and 3 from tidally dominant sources. These overlaps are focused in the centre of this section as it overlaps with the River Foulness east of Spaldington.

### Surface Water Flood Risk

This section of the English Onshore Scheme is within areas of surface water risk, according to EA mapping (see **Figure 11-3**). Within this section there are multiple areas shown to be at low risk through these are dispersed across the section. There are three main areas where surface water risk appears to be following existing watercourses:

- Black Dyke near Newsholme;
- the River Foulness and Bishopsail Drain west of Spaldington; and
- Bells Beck, Bowman Drain and the Market Weighton Canal south of Market Weighton. This area includes areas of high risk though this is mainly confined to the channel.

### Groundwater Flood Risk

The ERYC SFRA, using the AStGWF dataset which splits land into 1 km<sup>2</sup> tiles shows many of the tiles in this section, between Market Weighton and the River Ouse, have a ≥75% coverage of areas at high risk of groundwater flooding. The area between Market Weighton and Bursea has tiles of <25% coverage of areas at high risk of groundwater flooding from the River Ouse.

British Geological Society Mapping shows this area is mostly underlain by mudstone, siltstone and sandstone with superficial deposits of clay meaning this section is impermeable to both infiltration and groundwater which correlates with the AStGWF dataset. Soilscape mapping near Market Weighton and along the River Ouse includes soils that are naturally wet with high water tables and naturally high groundwater. This is most likely due to the proximity to large watercourses such as the Ouse and Foulness and the large number of field drainage channels and smaller watercourses south of Market Weighton.

### Sewer and Drains Flood Risk

Flooding from sewers occurs when the sewer capacity is exceeded due to heavy rainfall, blockage or due to inadequate design. Sewers are generally designed to cope with mid to low order rainfall events (i.e. not to flood during events up to the 1 in 30-year return period).

Data supplied by Yorkshire Water indicated that they had no records of sewers or drains in the near vicinity of the English Onshore Scheme and as such there are additionally no records of DG5 hydraulic failure incidents resulting from sewers and drains.

### Reservoir Flood Risk

The EA long term flood risk identifies that this section of the English Onshore Scheme overlaps with areas within reservoir flood risk extents (see **Figure 11-4**). These areas are focused along the River Ouse and Market Weighton Canal. It is not currently clear from the mapping of the source of these reservoir flood extents. It should be noted that these maps do not indicate likelihood of flooding but instead indicate the potential flood extents if a reservoir were to fail.

### Residual Flood Risk (Flood Defences)

This section of the English Onshore Scheme is shown to overlap with the Flood Map for Planning's ABD layer, mainly focused at the western end of the section between the River Ouse and the A63.

There are assets included in the Spatial Flood Defences layer shown that overlap with this section of the English Onshore Scheme. These include embankments along the River Ouse, owned and operated by the EA, areas of high ground, presumed to not be formal defences, alongside the River Foulness operated by the Ouse and Humber IDB and high ground along Market Weighton Canal.

This section lies outside any recorded FSA, according to EA mapping.

## 11.5.4 Section 4 – River Ouse to Drax Substation

### 11.5.4.1 Water Features Crossed by the English Onshore Scheme

There are a total of 11 water features crossed by Section 4 of the English Onshore Scheme which are listed in **Table 11-18**. These lie mainly within the drainage catchment of the River Ouse and consist of a mix of main rivers, ordinary watercourses, and minor drains. These catchments are within the Selby Local Authority, and Selby Area IDB. These are shown in **Figure 11-1**.

Potential crossing types are described within **Chapter 3: Description of the English Onshore Scheme**. Main rivers, larger or sensitive ordinary watercourses, and IDB maintained ordinary watercourses will be crossed via trenchless techniques. Minor drains and the majority of ordinary watercourses will be crossed by open cut techniques.

In addition, the haul road will also cross separately, with all watercourses in this section crossed by temporary culvert installation with the exception of the River Ouse which will not be crossed by the haul road.

All crossings will be designed in line with EA, IDB and LLFA requirements in accordance with the Environmental Permitting (England and Wales) Regulations 2016.

**Table 11-18: Water Features Crossed by Section 4 of the English Onshore Scheme**

Name of Water Feature	HDD Crossing Reference (if applicable)	NGR	Operator
<b>River Ouse</b>	HDD_041	SE 68576 27379	N/A
<b>Black Tom Drain</b>	HDD_042 (potential to be open cut)	SE 68094 27200	Selby Area IDB
<b>Drain in headwaters of Ouse from R Wharfe to Upper Humber GB104027064270</b>	-	SE 67925 27035	Selby Area IDB
<b>Drain in headwaters of Ouse from R Wharfe to Upper Humber GB104027064270</b>	-	SE 67821 26969	N/A
<b>Drain in headwaters of Ouse from R Wharfe to Upper Humber GB104027064270</b>	-	SE 67710 27019	Selby Area IDB
<b>Back Lane Drain</b>	HDD_043	SE 67479 27076	Selby Area IDB

### 11.5.4.2 WFD Surface Water Bodies

The EA has provided the most recent WFD classifications for watercourses within the study area. In total, there are two designated WFD surface water bodies<sup>9</sup> in the study area, one of which is crossed by the English Onshore Scheme. Their status is listed in **Table 11-19**.

Both are designated heavily modified.

<sup>9</sup> Some WFD surface water bodies are included within the assessment of multiple sections due to the overlap of the 2 km study area.

**Table 11-19: WFD Surface Water Bodies within the 2 km Study Area of Section 4 of the English Onshore Scheme**

WFD ID	Water Body Name	Current Status (2019)			Failing Elements	Reasons for not achieving good status	2027 Ecological Objective
		Ecological	Chemical	Overall			
<b>GB104027064270 (directly crossed)</b>	Ouse from R Wharfe to Upper Humber	Moderate	Fail	Moderate	DDT PBDE PFOS Mercury and its compounds	Sewage discharge (point source) Contaminated water body bed sediments (diffuse source)	Good
<b>GB104027068311 (not crossed)</b>	Derwent from Elvington Beck to River Ouse	Moderate	Fail	Moderate	PBDE Mercury and its compounds	Physical modification	Good



### 11.5.4.3 Main Rivers

There is one main river, the River Ouse, that is crossed by Section 4 of the English Onshore Scheme. The River Derwent is not crossed by the English Onshore Scheme but lies within the 2 km study area.

### 11.5.4.4 Standing Water Bodies

There are no standing water bodies crossed by Section 4 of the English Onshore Scheme, however there are nine standing water bodies<sup>10</sup> within the 2 km study area as shown in **Table 11-20**.

**Table 11-20: Standing Water bodies within the 2 km Study Area of Section 4 of the English Onshore Scheme**

ID	Water Body	NGR
73	Brock Holes	SE 67371 25483
74	Pond south of Wren Hall	SE 66993 26873
75	Pond near Drax Abbey Farm	SE 66985 28229
76	Pond near Hook's Fields	SE 66563 28855
77	Pond near Hook's Fields	SE 66555 28612
78	Pond near Hook's Fields	SE 66206 28455
79	Pond within Drax Power Station	SE 66387 27551
80	Pond within Drax Power Station	SE 66235 26735
81	Pond within Drax Power Station	SE 65992 27449

None of these are associated with surface water dependent designated and non-statutory designated site sites.

### 11.5.4.5 Water Dependent Biodiversity Sites

There are no international sites of nature conservation interest and two national statutory protected areas within the study area:

- River Derwent SSSI; and
- Aire from River Calder to River Ouse NVZ S274.

#### Surface Water Dependent Statutory Designated Sites

There are two surface water dependent sites within the study area:

- **River Derwent SSSI** (1.2 km north of the English Onshore Scheme): This lowland section of river from river mouth to the confluence with the Ouse supports diverse communities of aquatic flora and fauna, many elements of which are nationally significant. This SSSI is also located within the WFD water body Derwent from Elvington Beck to River Ouse (GB104027068311). Although not directly crossed, the River Derwent SSSI is located approximately 1.2 km north of Section 4 of the English Onshore Scheme via land and 1.4 km upstream from crossing points on the River Ouse. As such, any impacts are therefore limited due to the natural drainage regime away from the SSSI.
- **Aire from River Calder to River Ouse NVZ S274** (located approximately 0.9 km south of the English Onshore Scheme). This designation covers the entire Aire from River Calder to River Ouse WFD water body catchment. Sources of pollution are considered to be primarily from consented discharges with some agricultural input. This catchment is outside of any connected hydrological catchment.

#### Surface Water Dependent Non-Statutory Designated Sites

No surface water dependent non-statutory designated sites have been identified within the 2 km study area.

EA records indicate that no chalk streams are present within the study area.

<sup>10</sup> Some standing water bodies are included within the assessment of multiple sections due to the overlap of the 2km study area.

### 11.5.4.6 People, Property and Infrastructure

This section of the English Onshore Scheme mainly avoids urban/developed areas with the English Onshore Scheme passing close to the village of Drax and includes the eastern part of the existing Drax Power Station.

#### Abstractions and Discharges

According to Abstraction Licensing data (accessed July 2021) as provided by the EA, there are 13 licensed surface water abstractions<sup>11</sup> within the 5 km study area, as shown in **Table 11-21** below.

**Table 11-21: Abstraction Licences within 5 km of Section 4 of the English Onshore Scheme**

Source	Licence Number	Use	Location	Max. Annual Volume (m <sup>3</sup> )
Surface Water	2/27/28/083	Potable Water Supply - Direct	RIVER DERWENT - LOFTSOME BRIDGE	30,400,000
Surface Water	NE/027/0024/072	Spray Irrigation - Direct	RIVER AIRE AT AIRMYN NEAR GOOLE	18,000
Surface Water	2/27/18/124/R01	Spray Irrigation - Direct	TOWNSHIP DRAIN - GOOLE	36,500
Transitional Water	2/27/24/467/R01	Spray Irrigation - Direct	RIVER OUSE 2 - TIDAL	50,000
Transitional Water	2/27/24/194	Spray Irrigation - Direct	RIVER OUSE - TIDAL	41,000
Surface Water	NE/027/0028/048	Spray Irrigation - Direct	RIVER DERWENT - NEAR WRESSLE	40,000
Surface Water	2/27/28/140	Spray Irrigation - Storage	FLEET DYKE - WRESSLE	27,273
Transitional Water	2/27/24/467/R01	Spray Irrigation - Direct	RIVER OUSE 2 - TIDAL	75,000
Transitional Water	2/27/24/155	Boiler Feed	RIVER OUSE - TIDAL - LONG DRAX	96,230,000
Surface Water	NE/027/0024/050/R01	Spray Irrigation - Direct	LENDALL DRAIN AT DRAX ABBEY FARM	45,000
Transitional Water	2/27/24/195	Spray Irrigation - Direct	DRAX ABBEY FISH POND - TIDAL	10,000
Transitional Water	2/27/24/194	Spray Irrigation - Direct	CARR DYKE/LENDALL DRAIN - TIDAL	82,000
Surface Water	NE/027/0018/004/R01	Spray Irrigation - Direct	WEIGH BRIDGE DRAIN - CLAYPIT LANE	90,000

The EA has provided a list of all licensed discharges (accessed July 2021). The licensed discharges within the 5 km study area, have been summarised in **Appendix 11D**. It has been assumed that each discharge is to the nearest watercourse where not explicitly stated.

#### Historic Flood Risk

This section of the English Onshore Scheme is within the extents of the HFM and is associated with the River Ouse.

<sup>11</sup> Some licenses are included within the assessment of multiple sections due to the overlap of the 5km study area

### Flood Alert and Flood Warning Areas

This section of the English Onshore Scheme overlaps with two FAA:

- The tidal foreshore and agricultural land adjacent to the river in the Cawood, Kelfield, Wistow and Selby areas; and East Riding of Yorkshire, North Yorkshire, York; and
- River Aire from Temple Hirst to Airmyn.

This section of the English Onshore Scheme overlaps with one FWA:

- Drax including Hales Lane, Main Road, Back Lane and Castle Hill Lane.

### Fluvial Flood Risk

This section of the English Onshore Scheme overlaps with the extents of both Flood Zone 2 and 3 from fluvially dominant sources, see **Figure 11-2**. These overlaps are focused on the River Ouse and from ordinary watercourses in the west of the section.

### Tidal Flood Risk

This section of the English Onshore Scheme does not overlap with either Flood Zone 2 or 3 from tidally dominant sources.

This section does overlap with Flood Zone 2 and 3 from joint fluvial and tidal sources from the River Ouse.

### Surface Water Flood Risk

This section of the English Onshore Scheme is within areas of surface water risk, according to EA mapping (see **Figure 11-3**). Within this section there are multiple areas shown to be at low risk through these are dispersed across the section. The proposed converter station site is mostly outside areas of surface water risk with only small areas overlapping with medium and low risk.

### Groundwater Flood Risk

The Selby District Council (SDC) SFRA, using the AStGWF dataset which splits land into 1 km<sup>2</sup> tiles shows many of the tiles in this section between the River Ouse and the Drax Substation, <25% coverage of areas at high risk of groundwater flooding. British Geological Society Mapping shows this area is mostly underlain by sandstone bedrock and superficial deposits of clay and silt, meaning this section is somewhat impermeable to both infiltration and groundwater. Soilscape mapping of the predominant soil profile in this section shows it to be slowly permeable clay-based soils which supports this.

### Sewer and Drains Flood Risk

Flooding from sewers occurs when the sewer capacity is exceeded due to heavy rainfall, blockage or due to inadequate design. Sewers are generally designed to cope with mid to low order rainfall events (i.e. not to flood during events up to the 1 in 30-year return period).

Data supplied by Yorkshire Water indicated that they had no records of sewers or drains in the near vicinity of the English Onshore Scheme. Additionally, data taken from the Yorkshire Water DG5 register include in the SDC SFRA, shows no internal sewer flooding records around and in the vicinity of the Drax Power Station with the surrounding area being in the lowest band of 0-2 external sewer records.

### Reservoir Flood Risk

The EA long term flood risk identifies that this section of the English Onshore Scheme overlaps with areas within reservoir flood risk extents (see **Figure 11-4**). These areas are focused along the River Ouse. It is not currently clear from the mapping of the source of these reservoir flood extents. It should be noted that these maps do not indicate likelihood of flooding but instead indicate the potential flood extents if a reservoir were to fail.

### Residual Flood Risk (Flood Defences)

This section of the English Onshore Scheme is shown to overlap with the Flood Map for Planning's ABD layer.

There are assets included in the Spatial Flood Defences layer that overlap with this section of the English Onshore Scheme. These defences consist of embankments along both banks of the River Ouse, owned and operated by the EA.

This section lies outside any recorded FSA, according to EA mapping.

### 11.5.5 Receptor Values

The sensitivity values for the receptors within the study area of the English Onshore Scheme described above are listed in **Table 11-22** below.

**Table 11-22: Receptor Sensitivity Values**

Receptor	Attribute	Sensitivity Value
<b>Main rivers, ordinary watercourses and IDB maintained drains</b>	Water quality and fluvial geomorphology	Medium
<b>Minor drains</b>	Water quality and fluvial geomorphology	Low
<b>Standing water bodies</b>	Water quality	Low
<b>Surface water dependent habitat (statutory designated sites)</b>	Biodiversity (as a function of water quantity or quality)	High
<b>Surface water dependent habitat (non-statutory designated sites)</b>	Biodiversity (as a function of water quantity or quality)	Medium
<b>People, Property and Infrastructure: Surface water abstractions</b>	Water supply	Low
<b>People, Property and Infrastructure: Discharges to surface water</b>	Dilution and Removal of Waste Products	Low
<b>People, Property and Infrastructure: Drainage Infrastructure</b>	Field drainage/ under drainage infrastructure	Low
<b>People, Property and Infrastructure: Floodplain</b>	Flood Risk	High
<b>People, Property and Infrastructure: Urban Areas/Settlements</b>	Flood Risk	High

### 11.5.6 Future Baseline

It is expected that construction of the English Onshore Scheme will start late 2024 and last for approximately five years to 2029.

By 2024, there is no anticipated change in WFD status of any water bodies as there are no targets set within this timeframe. However, by 2027, it is expected that the targets to achieve good ecological status through improvement of the chemical and biological quality element status will be achieved in all water bodies although each water body lists these as unachievable due to disproportionate burdens - unfavourable balance of costs and benefits or unrealistic timeframe for ecological recovery.

By 2024 it is assumed that population growth and increased development will have resulted in increased pressure upon surface water features from people, property and infrastructure for water supply and for the dilution and removal of waste products. It is therefore anticipated that water abstractions and discharges will be of slightly larger volumes. However, given that the future baseline year is only three years later than the current baseline, this increased pressure is unlikely to result in a considerable change to the baseline.

The impacts of climate change on the future baseline environment must be investigated in order to assess the risk from flooding for the lifetime of the development. The impact of climate change was assessed from tidal, fluvial and pluvial sources. As such, for the lifetime of the development, impacts of

climate change upon flood risk are expected to result in higher peak flows and higher peak rainfall during storm events. Latest climate change allowances, latest update October 2021 (Ref 11-1), have been applied following the NPPF.