

# Lower Thames Crossing

## 6.3 Environmental Statement Appendices

### Appendix 14.2 – Water Features Survey Factual Report (1 of 2)

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# Lower Thames Crossing

## Appendix 14.2 – Water Features Survey Factual Report

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# 1 Introduction

## 1.1 Objectives

1.1.1 The objective of this Water Features Survey (WFS) factual report is to record and identify the baseline characteristics of surface water and groundwater features present that may be affected by the construction and operational phases of the A122 Lower Thames Crossing (the Project). The spatial extent of the survey was agreed in consultation with the Environment Agency and includes surface water features within 500m of the Order Limits (desk study and site visits) and groundwater features within 3km of the Order Limits (1km for site visits and 3km for desk study reporting).

## 1.2 Scope

1.2.1 Four phases of sitework have been completed for the WFS, in September 2017 (Phase 1), July 2018 (Phase 2), July 2019 (Phase 3) and October 2019 (Phase 4) on behalf of the Applicant. Additional sitework has been completed more recently at the Thames Estuary and Marshes Ramsar site (November 2021 to June 2022), and in the vicinity of the M25 motorway (October 2021 to April 2022).

1.2.2 Abstraction licence and discharge permit locations and details were obtained from the Environment Agency, most recently in May 2022. To supplement desk and field survey data, questionnaires were also issued to landowners in 2019 to request information about non-licensed abstractions. Historical well location information has been obtained from the British Geological Survey (BGS) (2020) Onshore GeoIndex website. This information is reported in Section 2.

1.2.3 A factual summary of the WFS conducted in Phases 1 to 4, and the desk study are presented in this document. The information is presented as follows:

- a. Tables summarising groundwater and surface water features visited and identified through desk study, presented in the format of the Water Resources Act 1991 Section 32 Form WR36
- b. Drawings showing the locations of the surveyed and desk study features
- c. Photographs of a selection of the surveyed features

1.2.4 In addition, information describing the water management regime, water quality and ecohydrology of the Filborough and Shorne Marshes, part of the Thames Estuary and Marshes Ramsar site, is included. This information has been collected from a range of sources including:

- a. Consultation with the RSPB, Natural England, the North Kent Marshes Internal Drainage Board and the Thames and Medway Canal Association
- b. Water level and water quality sampling of the ditch network during Project ground investigations
- c. Project-specific vegetation surveys

- 1.2.5 The results of water quality surveys of the Western Ditch are reported. This is a watercourse that is proposed to receive surface water drainage from the southern tunnel entrance compound and convey runoff, following treatment and attenuation, to discharge to the River Thames.
- 1.2.6 Information is also provided, including a series of photographs and field observations, to describe an agricultural irrigation system that the Project would interact with in the vicinity of the crossing of the Project and the M25 motorway. This information has been collected in consultation with the landowner and during monthly site walkover surveys.


## 2 Water Features Survey site work and desk study


- 2.1.1 Groundwater features identified from the desk study and field surveys, within a 3km radius of the Order Limits are presented in Table A.1 of Annex A and comprise licensed and unlicensed groundwater abstractions, permits to discharge to ground, historical wells and historical springs.
- 2.1.2 Surface water features present within a 500m radius of the Order Limits, identified from the desk study and field surveys, are presented in Table A.2 of Annex A. The water features comprise licensed surface water abstractions, permits to discharge to surface watercourses, Environment Agency designated main rivers, ordinary watercourses, canals, ditches, lakes and ponds.
- 2.1.3 During the site surveys of surface waterbodies, their dimensions, bed material and surrounding land use, and the presence of any hydraulic structures were noted. Field parameters (pH, temperature, dissolved oxygen and electrical conductivity) were recorded where it was safe to collect a water sample. Water was sampled in a container and then analysed with a multiprobe. The flow velocity of watercourses was estimated from the speed of travel an object on the surface over a set distance.
- 2.1.4 Where a well or borehole was surveyed, the current condition of the source, its use and yield were recorded and where possible, groundwater level and depth of well data collected, by manual dipping. The topography and land use local to the source and the land cover (soil/hardstanding/vegetation) was also recorded.
- 2.1.5 Each feature was assigned a unique identifier reference. The features are represented on the drawing series in Annex B. For ease of reference, the colour coding used in Annex A Table A.1 and Table A.2 to distinguish between different categories of features, is the same as colours used on the water feature location plans, provided in Annex B.

## 3 Photographs

- 3.1.1 All photographs taken during the WFS were taken with the following camera specification and lens:
- a. Camera specification: iPad 5th Generation
  - b. Lens type: Rear camera: 8.0 MP AF, iSight with Five Element Lens, Hybrid IR filter, video stabilisation, face detection, HDR,  $f/2.4$  aperture. Front camera: 1.2 MP, 720p HD,  $f/2.2$  aperture.

### 3.2 South of the River Thames

Date:	14 September 2017 (P1)
Location:	Shorne Woods Country Park
Surveyor:	AJ, BC
	
GP-2S04ZZZ1 – Petrol interceptor, located in the green keeper shed.	

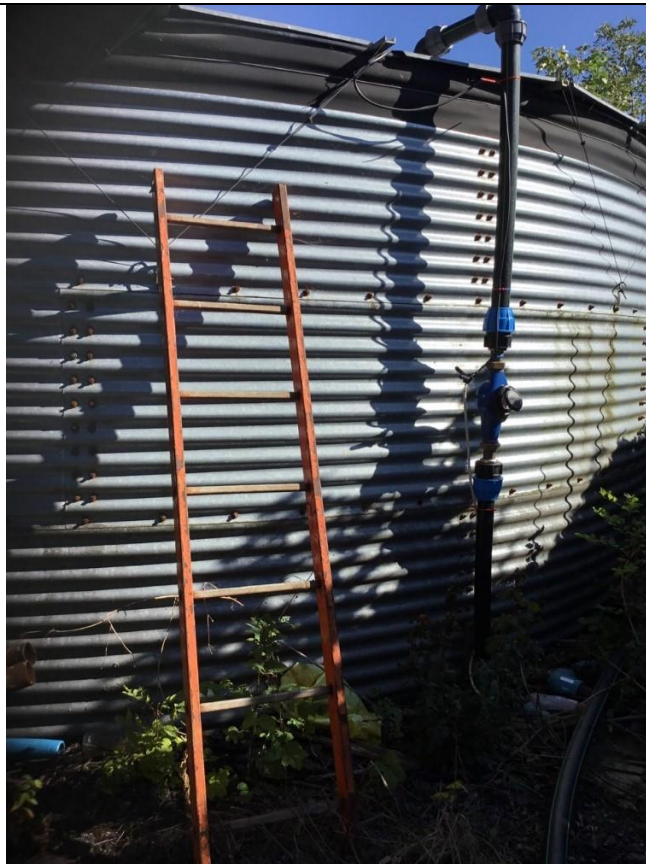
Date:	27 July 2018 (P2)
Location:	Private property in Thong
Surveyor:	AJ, SD
	
GH-2S04ZZ10 – Currently unused well on a private property	
Date:	13 September 2017 (P1)



Location:	Southern Valley Golf Course
Surveyor:	AJ, BC



GD-2S05ZZZ1– Abstraction borehole, located along the track to the course, between the green keeper shed and the reception.



GD-2S05ZZZ1– Abstracted water tank, located next to the green keeper shed.



GD-2S05ZZZ1– Possible location of a discharge to ground, between the reception and the abstraction borehole, dense vegetation.

Date:	17 July 2018 (P2)
Location:	Shorne Marshes
Surveyor:	AJ, SD



GP-2S06ZZZ1– Pond within the marshes




AS-1S05ZZZ1– Gravesham Borough Council, between the Firefighting training centre and the Milton Rifle Range. Drainage ditch, unused pipe




CN-1S05ZZZ1– Thames and Medway Canal



SY-1S05ZZZ5– Shorne Marshes, surface discharge from the northern part of the Ramsar (Denton New Cut) into the Thames and Medway Canal

Date:	14 September 2017 (P1)
Location:	Milton Rifle Range
Surveyor:	AJ, BC
	
GH-2S06ZZZ1– BGS well record found in a gated field, east of the rifle range.	

Date:	19 July 2018 (P2)
Location:	London Cemetery
Surveyor:	AJ, SD
	
PS-1S06ZZZ1– Landscaped pond in a cemetery	

### 3.3 Filborough Marshes

Date:	13 September 2017 (P1)
Location:	Filborough Marshes
Surveyor:	BC



DI-1S06ZZZ2 – Filborough Marshes – land drainage channel



DI-1S06ZZZ2 – Filborough Marshes – land drainage channel



PS-1S06ZZZ5 Filborough Marshes – Recreational fishing lake on private land



DI-1S06ZZZ1 – Filborough Marshes drain network. Algae and small trees present on southern ditches

### 3.4 North of the River Thames

Date:	12 September 2017
Location:	West Mardyke
Surveyor:	SD



MR-1N17ZZZ4– West Mardyke on Golf course, North Ockendon



SN-1N17ZZZ1– Culvert of the West Mardyke below the M25 and adjacent to the Thames Chase Forest Centre



Date:	18 to 21 September 2017 (P1)
Location:	Tilbury Marshes
Surveyor:	AJ, BC



OW-1N07ZZZ6 (SW-26) – Tilbury Marshes, within pastoral land at site of historical landfill



OW-1N07ZZZ7 (SW-28) – Nearly dried up ditch along a parcel of land – western boundary of Tilbury Marshes historical landfill



OW-1N07ZZZ8 – Drainage ditch between landfills



MR-1N07ZZZ1– Main river with the dimensions of a drainage ditch (West Tilbury Main)

## 4 Manor Farm, North Ockendon

- 4.1.1 A visit to Manor Farm, North Ockendon and the surrounding area was made on 24 May 2021. A number of surface water features are located in this area, where the Project's northbound carriageway would cross beneath the M25 motorway. Two of these water features are used for recreational purposes at Stubbers Adventure Centre outdoor pursuits facility; another of these waterbodies is understood to be used as a storage facility for water, arising from a reported spring. An Environment Agency licence covers a surface water abstraction from this reservoir to meet agricultural irrigation needs.
- 4.1.2 The focus of the site visit was to record baseline information for the existing agricultural irrigation system.
- 4.1.3 According to information provided by the landowner, the system facilitates the collection of groundwater by a series of (deep) land drains and gravity-fed ditches in a general east to west direction, transferred via ducts under the M25. The water is piped to the reservoir adjacent to Stubbers Adventure Centre, where it is stored, and the lake is also used for fishing. Subsequently, this water is pumped out for irrigation purposes, including via pipework back under the M25 to the fields on the east side of the M25.
- 4.1.4 An annotated photographic record of key features is provided in Annex E. Further details regarding the assessment of the effects of A122 Lower Thames Crossing/M25 junction on groundwater levels and flows, are provided in Annex 12 of the Hydrogeological Risk Assessment (Appendix 14.5).
- 4.1.5 Since the May 2021 survey, the waterbodies and land drains have been visited on several further dates during the period from October 2021 to May 2022. During each visit flow conditions were observed and depths of water in the network were recorded. Reports from the surveys are included in Annex F. In general, the ditch network was observed to be heavily vegetated and repeatedly no standing water or measurable flows were noted. In the December 2021 survey, some water was noted as seeping from the deep drain to the east, but this was only sustained along a short reach of approximately 10 metres.

## 5 Filborough and Shorne Marshes

### 5.1 Introduction

5.1.1 To the south of the River Thames, the Order Limits of the Project are located within the Thames Estuary and Marshes Ramsar (herein called the Ramsar). The Ramsar is an internationally important wetland, which also contains the South Thames Estuary and Marshes Site of Special Scientific Interest (SSSI); the Shorne Marshes Royal Society for the Protection of Birds (RSPB) nature reserve; and the grazing marsh local wildlife site (LWS).

### 5.2 Habitats and condition

5.2.1 The main habitat of the Ramsar comprises coastal and floodplain grazing marsh, as well as areas of coastal saltmarsh and mudflats immediately neighbouring the River Thames to the north.

5.2.2 The SSSI areas are mostly mapped as being in 'favourable condition'. However, parts of the Filborough Marshes are shown as 'unfavourable no change' and 'unfavourable declining' (Natural England, 2009).

### 5.3 Surface water features

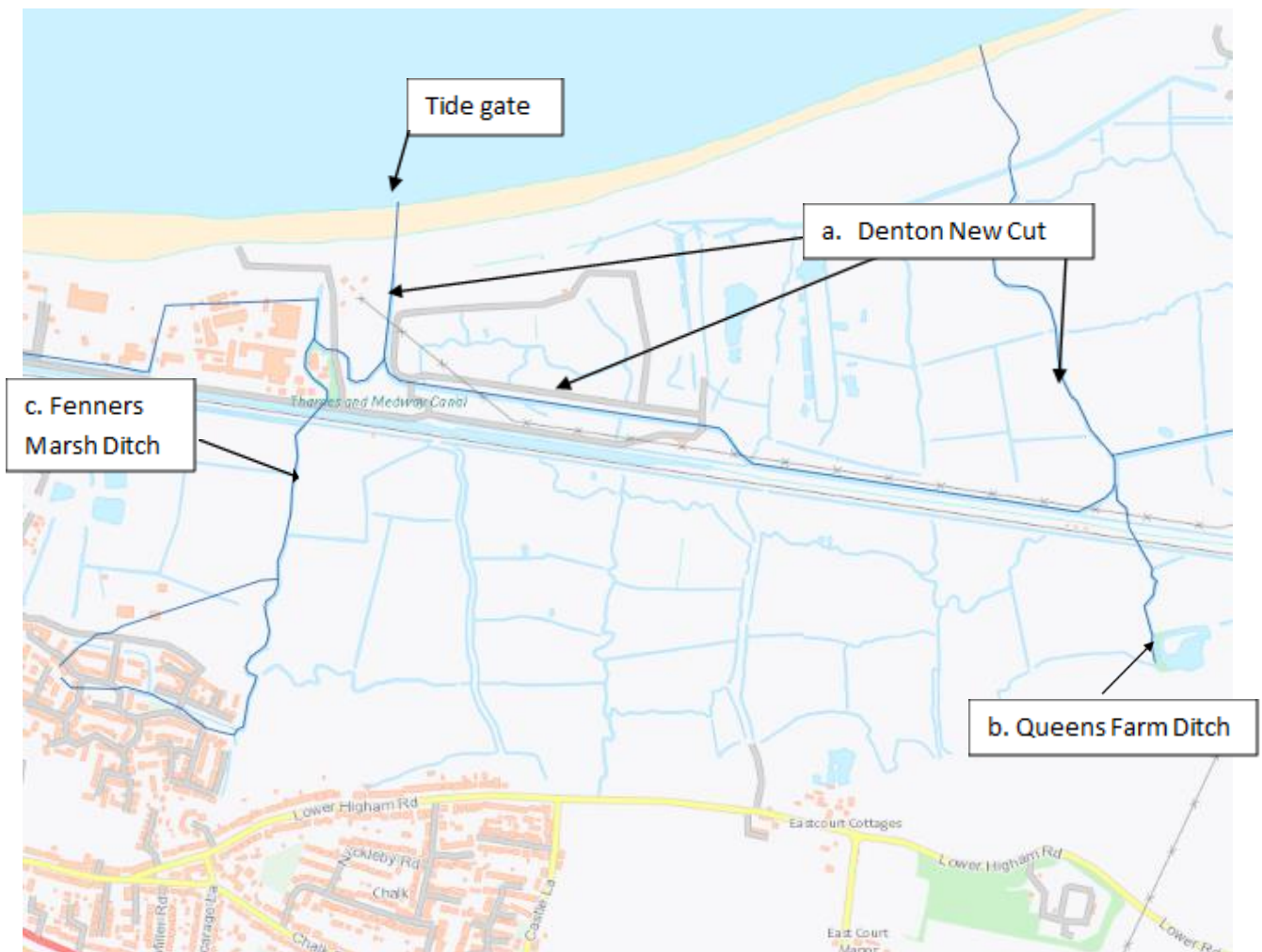
5.3.1 The Ramsar is crossed by and contains the Thames and Medway Canal (now disused), three main rivers and an extensive ditch network. The three main rivers are described below and illustrated in Plate 5.1:

- a. The Denton New Cut flows east to west through the Ramsar with a single outfall to the River Thames.
- b. A ditch flows northwards from the pond at Queens Farm to the Denton New Cut within the RSPB reserve at Shorne Marsh. This ditch is herein referred to as the Queens Farm Ditch.
- c. A ditch flows northwards from housing in east Denton (at Lodding Salts Road and Fenner's Marsh Road area) and then joins the watercourses flowing eastwards from Denton and then joins the Denton New Cut, this ditch is herein referred to as the Fenner's Marsh Ditch.

5.3.2 There is an orthogonal pattern of drainage ditches (ordinary watercourses). The ditches are typically 1-3m wide and heavily vegetated. No discernible flow was observed in any of the ditches during the Project's Water Features Survey.

5.3.3 The River Thames flood defence bund lies along the northern edge of the marsh and is within the SSSI, Ramsar and LWS.

**Plate 5.1 Main rivers within and near the Ramsar (Environment Agency, 2015)**



## 5.4 Surface water level management

- 5.4.1 The North Kent Marshes Internal Drainage Board is responsible for management of flood risk in the North Kent marshes. Flood management of main rivers (Environment Agency, 2015), are the responsibility of the Environment Agency.
- 5.4.2 Key components of surface water and drainage in the general area are as follows (RSPB, 2018):
- a. All unrestricted ditch flow enters the Denton New Cut.
  - b. There is only one outfall to the River Thames, a tide gate indicated on Plate 5.1, which is fed by Denton New Cut and operated by the Environment Agency.
  - c. The tide gate opens automatically at low tide times and is shut during high tides.

## 5.5 Shorne Marshes RSPB reserve

5.5.1 Water levels in the ditch network within the reserve are managed through sluice operation at the Milton Stop Weir (as shown in Annex C) on the Denton New Cut main river, which manages water inflow, and sluices within the reserve that manage water outflow. The water levels are managed to align with wading bird winter feeding (November to April) and spring-summer (May to October) breeding schedules. During inflow periods, waters are abstracted from a ditch connected to the Denton New Cut and then pumped to ditches around the RSPB reserve.

### Denton New Cut

5.5.2 Denton New Cut is the main conduit for water draining from Shorne and Filborough Marshes to the River Thames outfall (as shown in Annex C). Water flows from east to west.

5.5.3 Licensed surface water abstractions by the RSPB and Gravesham Borough Council would be expected to affect water levels in Denton New Cut.

5.5.4 Milton Stop Weir (as shown in Annex C) is used to trigger RSPB surface water abstraction within the reserve which is connected by a main ditch to Denton New Cut. The weir level is set at 0.76mAOD and the RSPB abstraction is permitted to operate when water levels are higher than the weir level.

## 5.6 Filborough Marshes

5.6.1 The Filborough Marshes contain one main river (Queens Farm ditch). The ditch crosses the North Kent railway and the Thames and Medway Canal via a culvert. Two other culverts beneath the railway and canal connect ditches from Filborough Marshes with the Denton New Cut. The three culverts have stop boards which are used by the farmer landowner to control water levels in the ditch network. Surface water level monitoring undertaken during Project ground investigation in June to July 2019, shows that water levels at the southern end of Filborough Marshes are higher than in Denton New Cut. Near the Denton New Cut outfall, water levels rise and fall twice daily due to the sluice closing at high tides.

### Thames and Medway Canal

5.6.2 The Thames and Medway canal was built between Gravesend and Medway to connect the River Thames and River Medway. The canal is now disused and was partly filled but several open sections remain. The average dimensions of the canal water body are approximately 3m wide by 1m deep (Thames and Medway Canal Association, 2019), however there are sections as little as 1m wide by 0.2m deep. Walkover observations are that the canal becomes narrower at the eastern end. Parts of the canal section appear heavily vegetated, especially towards the eastern end.

5.6.3 Water levels differ between the canal sections indicating hydraulic disconnection (Thames and Medway Canal Association, 2019).

5.6.4 The Gravesend section of the canal receives top-up water from Denton New Cut, with a Gravesham Borough Council operated surface water abstraction (Licence number SO/040/0001/001/R01). The licensed abstraction rate

is 1,728m<sup>3</sup>/day (20l/s). Pumping is controlled on a timer which is set for night-time pumping. Actual pumping rates tend to be less than licensed rates and are usually greatest during summer months when evaporation rates are higher. Occasional canal repairs may cause variations to the abstraction regime. A maximum canal water level, in this section, has been set at 2.7mAOD, since May 2017 (Thames and Medway Canal Association, 2019).

## 6 Water quality monitoring

- 6.1.1 Field sampling and laboratory tests have been completed at nine sites within the Ramsar. The monitoring locations consist of six sites on ditches within Filborough Marshes and three sites along the Denton New Cut. The sites in the Denton New Cut are focused towards the outfall to the River Thames at the western end of the watercourse.
- 6.1.2 Water monitoring was conducted from 13 June 2019 to 25 July 2019 and included measurement of electrical conductivity (EC), pH, temperature and dissolved oxygen (DO). Results are shown in Table 6.1. Note that data was not recorded for points F and I due to insufficient depths of water to collect a sample.

**Table 6.1 Surface water features water quality monitoring**

Point		Electrical Conductivity	pH	Temperature	Dissolved oxygen
		( $\mu\text{S/cm}$ )	-	( $^{\circ}\text{C}$ )	(% Saturation)
A (Ramsar South, Filborough Marshes)	Max	926	8.32	28.88	89.27
	Mean	723	7.47	17.61	45.81
	Median	717	7.40	16.95	45.84
	Min	664	6.89	14.10	0.29
	Lab 1	797	7.37	12.70	9.19
	Lab 2	943	7.74	12.30	9.46
B (Ramsar, Filborough Marshes)	Max	1,183	9.29	26.42	288.75
	Mean	750	7.78	18.96	87.61
	Median	715	7.64	18.40	61.69
	Min	536	6.85	15.53	2.33
	Lab 1	693	7.31	12.90	6.40
	Lab 2	844	7.73	11.95	8.78
C (Ramsar North, Filborough Marshes)	Max	1,289	9.25	25.96	260.79
	Mean	770	7.75	19.80	93.59
	Median	697	7.52	19.15	91.12
	Min	475	7.01	16.38	6.87
	Lab 1	684	7.06	11.90	6.89
	Lab 2	932	7.62	11.10	9.70
D (Ramsar North, Filborough Marshes)	Max	1,012	8.83	27.40	227.74
	Mean	742	7.13	18.88	36.13
	Median	714	7.01	18.53	18.83
	Min	486	6.56	15.12	0.00



Point		Electrical Conductivity	pH	Temperature	Dissolved oxygen
		( $\mu\text{S/cm}$ )	-	( $^{\circ}\text{C}$ )	(% Saturation)
	Lab 1	757	7.18	12.30	7.29
	Lab 2	934	7.66	11.85	8.75
E (Ramsar South, Filborough Marshes)	Max	1,034	9.67	27.61	190.27
	Mean	729	7.81	18.94	81.13
	Median	709	7.54	18.31	62.75
	Min	527	7.11	15.03	18.92
	Lab 1	31	6.92	10.80	5.45
	Lab 2	950	7.82	11.90	10.80
G (Steam west of Denton New Cut)	Max	32,703	8.46	27.12	163.12
	Mean	12,091	7.75	19.83	93.42
	Median	10,191	7.69	19.60	92.21
	Min	1,813	7.26	15.77	40.12
	Lab 1	6,813	7.53	14.30	7.95
	Lab 2	1,240	7.12	12.00	9.38
H (Denton New Cut discharge)	Max	40,815	8.43	30.80	164.44
	Mean	19,624	7.73	20.42	93.55
	Median	17,890	7.68	19.97	86.01
	Min	2,580	7.05	16.19	27.85
	Lab 1	5,526	7.65	13.00	8.14
	Lab 2	2,710	7.55	10.65	9.09
J (Denton New Cut discharge)	Max	36,477	8.68	29.90	143.38
	Mean	6,655	7.70	20.66	74.23
	Median	2,929	7.66	20.53	72.75
	Min	965	7.16	15.66	27.91
	Lab 1	635	7.78	14.80	7.73
	Lab 2	1,364	8.10	10.43	8.26
K (Ramsar, Filborough Marshes)	Max	1,057	8.15	28.15	78.86
	Mean	776	7.44	18.38	43.88
	Median	744	7.40	17.79	45.57
	Min	597	6.90	15.05	17.78

6.1.3 The water quality monitoring results identify generally consistent pH, temperature and dissolved oxygen values between the locations. pH values are generally neutral to slightly acidic, ranging from 6.8 to 9.7, with an average (mean and median) of 7.1 to 7.7. Temperature values range from 14 to 30 $^{\circ}\text{C}$ , with an average (mean and median) of 17 to 20 $^{\circ}\text{C}$ . Dissolved oxygen ranges

from 0 to 290%, with an average (mean and median) of between 40 and 90% - these high DO concentrations are coincident with heavily vegetated and slow moving or stagnant waters.

- 6.1.4 There are two distinct trends within the EC data set, such that the measurements taken in the small ditches (Points A-E and K) have a range of 500 to 1,200 $\mu$ S/cm (microsiemens per centimetre) and an average (mean and median) of 700 to 800 $\mu$ S/cm.
- 6.1.5 Meanwhile, the measurements taken in the Denton New Cut and its western tributaries (Points G, H and J) have a range of 1,000 to 40,000 $\mu$ S/cm, with an average (mean and median) at Points G and H of 12,000 and 20,000 $\mu$ S/cm respectively and at Point J of 3,000 and 6,000 $\mu$ S/cm for the median and mean respectively.
- 6.1.6 These results are generally consistent between the field and laboratory tests. However, the laboratory tests do identify significantly lower temperatures, with a range of 10 to 15°C.

## 6.2 In situ monitoring

- 6.2.1 *In situ* monitoring has included use of a bespoke floating drone (also known as Roboduck) developed on behalf of National Highways, by Arcadis Consulting, for the Project. Recording of continuous measurements of water quality were undertaken along ditches that were vegetation free and of sufficient depth. Monitoring was completed from 27-29 January 2020. The monitoring locations are shown on Plate 6.1 and the data collected are presented in Annex D.

### Plate 6.1 Water quality monitoring locations



6.2.2 The Roboduck data identifies similar trends to the field sampling and laboratory testing results. The dataset identifies a range of neutral to slightly acidic pH, from 6.74 to 8.82, with an average (mean and median) of around 8.0. In addition, the EC values in the small ditches in the Filborough Marshes, have a range of 700-1,500 $\mu$ S/cm and an average (mean and median) of around 800  $\mu$ S/cm. The value of EC increases with proximity to the Denton New Cut, which is identified with an average (mean and median) of 3,500 $\mu$ S/cm and a maximum of 3,700 $\mu$ S/cm.

## 6.3 Water quality summary

6.3.1 The overall results of the field tests, laboratory results and Roboduck datasets strongly support the hypothesis that water of consistently low electrical conductivity flows from the east along Denton New Cut (as sampled at Point J). The data tentatively supports the hypothesis that water of higher electrical conductivity flows from the tributary main river (sampled at Point J).

6.3.2 The Gravesend section of the Thames and Medway Canal appears to have distinctive water quality attributes. The canal water quality measurements show:

- higher specific electrical conductivity values
- elevated DO percentages of over 150%, increasing to over 200% at the eastern end, coincident with increased floating vegetation (January 2020)
- pH of greater than 8 pH units (January 2020)

6.3.3 The Roboduck monitoring measured a specific electrical conductivity of 5,200 to 5,400 $\mu$ S/cm, increasing towards the east. Grab samples taken of the canal water in July 2018 show specific electrical conductivity values exceeding 10,000 $\mu$ S/cm near the top-up location but lesser values further east.

## 6.4 Surveys of the Western Ditch

6.4.1 The Project proposes to discharge treated, attenuated rainfall runoff from the southern tunnel entrance compound to a watercourse, referred to as the Western Ditch. The ditch borders the Thames Estuary and Marshes Ramsar site and, due to the risk of chalk fines entrainment in the runoff and the sensitivity of the receiving water environment, the discharge would be made under the conditions set by an Environment Agency Discharge Permit.

6.4.2 To inform setting the Discharge Permit conditions, in consultation with the Environment Agency and Natural England it was agreed that surveys were needed to define the baseline water chemistry characteristics of the watercourse. Sampling locations were agreed and are illustrated in Plate 6.2.

**Plate 6.2 Western Ditch sampling locations**



- 6.4.3 To capture seasonal variations, monthly sampling rounds were carried out during the period from November 2021 to June 2022.
- 6.4.4 Sampling parameters were agreed with Natural England and the Environment Agency and comprise field measurement of pH, dissolved oxygen (%) and salinity, in addition to laboratory analysis of grab samples for Biological Oxygen Demand (BOD), total ammonia, unionised ammonia, suspended solids, total phosphorous and turbidity.
- 6.4.5 Results for the parameters recorded in the field are shown in Table 6.2 below.

**Table 6.2 Western Ditch field water quality monitoring results**

Point		Electrical Conductivity	pH	Temperature	Dissolved oxygen
		(µS/cm)	-	(°C)	(% Saturation)
Sample 1*	Max	9248	7.70	9	90.5
	Mean	5334	7.66	8.95	75.4
	Min	1420	7.62	8.9	60.3
Sample 2	Max	8685	7.89	16.4	106.7
	Mean	4147	7.66	9.7	86.1
	Min	1061	7.27	4.8	58.9
Sample 3	Max	27666	7.87	17.8	94
	Mean	12059	7.65	9.3	87.6
	Min	2012	7.15	3.2	79.5
Sample 4**	Max	3333	7.83	11.6	66.3
	Mean	2607	7.48	9.6	40.6
	Min	2220	7.04	7.6	17.8
Sample 5	Max	1557	8.11	16.7	124.7
	Mean	960	7.77	9.2	74.8
	Min	685	7.35	2.8	48
Sample 6	Max	1361	7.90	14.8	106.2
	Mean	912	7.80	8.72	49.7
	Min	660	7.20	4.6	6.8
Sample 7	Max	1046	7.86	17.9	136.7
	Mean	694	7.79	10.6	100.2
	Min	541	7.56	4.2	70
Sample 8	Max	658	7.78	14.3	99.9
	Mean	497	7.64	8.2	70.0
	Min	455	7.47	5.4	58.0

\*based on only 2 samples, ditch was dry during other survey rounds

\*\* based on 4 samples, ditch was not safely accessible during other survey rounds

6.4.6 The results identify generally consistent pH, temperature and dissolved oxygen values between the locations to the south of the Thames and Medway Canal and those to the north of the canal. At the sampling sites to the south of the canal (sites 5 to 8 inclusive), which is the reach of interest, intended to receive the construction phase discharge, pH values are generally neutral to slightly alkaline, ranging from 7.2 to 8.2, and temperature values range from 2.8 to 17.9°C. Dissolved oxygen ranges from 6.8 to 136.7%, with an average (mean) of between 50 and 100% - these high DO concentrations are coincident with heavily vegetated and slow moving or stagnant waters. To the north of the canal (sampling sites 1 to 4) potential influence of saline waters from the River Thames are evident in the data, with markedly higher conductivity values recorded.

6.4.7 The complete set of data from laboratory analysis of samples collected at sites 1 to 8 is presented in Annex G. Table 6.3 presents a summary for sample sites 5 to 8, south of the Thames and Medway canal.

**Table 6.3 Summary of Western Ditch laboratory analysis results for sites 5 to 8**

Point		BOD	Phosphate (Ortho as PO4)	Suspended Solids (total)	Ammoniacal Nitrogen as N
		(mg/l)	(µg/l)	(mg/l)	(µg/l)
Sample 5	Max	6.09	1530	93.2	731
	Mean	4.48	425	39.4	-
	Min	2.50	<50	5.6	<200
Sample 6	Max	17.60	1930	43.3	393
	Mean	6.86	519	21.18	-
	Min	2.90	<50	6.2	<200
Sample 7	Max	18.50	228	259	<200
	Mean	10.63	99	100.4	-
	Min	4.40	<50	12.8	<200
Sample 8	Max	4.58	80	101	<200
	Mean	2.58	63	31.6	-
	Min	<1	<50	2.9	<200

6.4.8 Comparing the data with Water Framework Directive standards for the applicable river typology, it is noted that the mean BOD recorded at sample sites 5 and 8 meet the criteria for Good status, whereas the higher average BOD at sites 6 and 7 correspond to moderate and poor status respectively. In most samples ammoniacal nitrogen was recorded in concentrations of less than 200µg/l (the limit of detection applied by the laboratory). The limit aligns with High WFD status for this parameter. With regard to suspended solids concentrations, the mean values at each site are less than 100mg/l, which is the Environment Agency default permitting standard for waste water treatment works discharges.

## References

British Geological Survey (2020). BGS GeoIndex (Onshore). Accessed May 2022.  
<http://mapapps2.bgs.ac.uk/geoindex/home.html>

Desk-study feature locations received from the Environment Agency:

- a. Location and details of Monitoring Boreholes (December 2017).
- b. Surface Water Discharge Consents (first dataset in 2015, updates in February 2018, July 2019, March 2020 and May 2022).
- c. Groundwater Discharge Consents (first dataset in 2015, update in February 2018, July 2019, March 2020 and May 2022).
- d. Licensed Surface Water Abstractions (first dataset in 2015, update in February 2018, July 2019, March 2020 and May 2022).
- e. Licensed Groundwater Abstractions (first dataset in 2015, update in February 2018, July 2019, March 2020 and May 2022).

Environment Agency. (2022). Main river map. Retrieved from Statutory Main River Map ([arcgis.com](http://arcgis.com))

Natural England. (2009). Designated sites view. Retrieved May 2022 from <https://designatedsites.naturalengland.org.uk/UnitDetail.aspx?UnitId=1023905>

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Thames and Medway Canal Association. (2019) History and management of the Thames and Medway Canal (personal communication)

# Annex A Water features tables

Legend to Features Table A.1 and Table A.2.

**Table A.1 Groundwater Features**

Colour	Feature type
	Observation borehole (level or quality)
	Groundwater abstraction, well, deregulated / no licence
	Well, historical, abandoned or decommissioned
	Groundwater abstraction, well, licensed
	Discharge to ground, permit
	Spring
	Groundwater abstractions, well, unknown licence status
	Irrigation reservoir

**Table A.2 Surface Water Features**

Colour	Feature type
	Surface water abstraction, licensed
	Surface waterbody, canal
	Surface waterbody, ditch
	Surface waterbody, EA designated main river
	Surface waterbody, ordinary watercourse
	Surface waterbody, lake or pond
	Surface waterbody, moat
	Surface water feature, other
	Surface water discharge, permit



Table A-1 Groundwater features surveyed during Phases 1 to 4 of the Water Feature Survey within the 3km radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within Order Limits? (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Abstraction Rate (m <sup>3</sup> /d)	Diameter of Borehole (mm)	Pump Suction Depth (m)	Dip Tube installed (Y/N)	Datum Description and Level (m)	Depth to bottom (m)	Depth to Rest Water Level (m)	Depth to Rest Water Level (Date)	Depth to Pumped Water Level (m)	Depth to Pumped Water Level (Date)	General Description	Notes	
HE540039-CJV-EWE-ZZZ-BH-2N09ZZ1	Not visited	BH	Observation borehole (groundwater level or quality)	Unknown	Within 3km of the boundary	N	Not visited	565XXX	180XXX	Chadwell St. Mary and Linford	Chalk level monitoring borehole	no abstraction	not visited	no pump	Y	not visited	not visited	not visited	n/a	not visited	not visited	EA monitoring borehole in the Chalk aquifer. Not visited. Located in the field.	-	
HE540039-CJV-EWE-ZZZ-BH-2N22ZZ1	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	Within 3km of the boundary	N	Unknown	568XXX	184XXX	North Ockendon and East Upminster	Chalk aquifer groundwater monitoring	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	EA monitoring borehole drilled in the Chalk.	-
HE540039-CJV-EWE-ZZZ-BH-2S01ZZ1	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	0	N	Jul-18	570XXX	168XXX	A2/M2	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	0	Knights place EA monitoring borehole. Advised not necessary to visit. Access not granted yet.	
HE540039-CJV-EWE-ZZZ-BH-2S02ZZ1	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	Unknown	Unknown	Jul-18	0	0	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	0	OWLETT EA monitoring borehole. Necessary to visit/send a letter/leave at it is ? No access granted yet.	
HE540039-CJV-EWE-ZZZ-BH-2S04ZZ1	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	0	N	Jul-18	568XXX	170XXX	South Portal	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	0	Orchard Lea farm EA monitoring borehole. Necessary to visit/send a letter/leave at it is ? No access granted yet.	
HE540039-CJV-EWE-ZZZ-BH-2S06ZZ1	AJ	BH	Observation borehole (groundwater level or quality)	Unknown	0	N	19/07/2018	568XXX	172XXX	South Portal	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	We have looked for it with the grid reference didn't find it. Wrong location?	EA borehole with water level data logger - DO NOT access hole. Landowner uncertain
HE540039-CJV-EWE-ZZZ-BH-2N10ZZ1	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	Within 1km of the boundary	N	Not visited	560XXX	179XXX	North Ockendon and East Upminster	Chalk level monitoring borehole	no abstraction	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	EA monitoring borehole in the Chalk aquifer. Not visited. Located in the field.	-
HE540039-CJV-EWE-ZZZ-BH-2N09ZZ2	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	Within 1km of the boundary	N	Not visited	567XXX	182XXX	Chadwell St. Mary and Linford	Chalk level monitoring borehole	no abstraction	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	EA monitoring borehole in the Chalk aquifer. Not visited. Located in the field.	-
HE540039-CJV-EWE-ZZZ-BH-2S02ZZ2	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	Within 1km of the boundary	N	Not visited	566XXX	168XXX	A2/M2	Chalk level monitoring borehole	no abstraction	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	EA monitoring borehole in the Chalk aquifer. Not visited. Located in the field.	-
HE540039-CJV-EWE-ZZZ-BH-2S06ZZ2	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	Within 1km of the boundary	N	Not visited	562XXX	173XXX	A2/M2	Chalk level monitoring borehole	no abstraction	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	EA monitoring borehole in the Chalk aquifer. Not visited. Located in the field.	-
HE540039-CJV-EWE-ZZZ-BH-2S06ZZ2	LTC	BH	Observation borehole (groundwater level or quality)	Unknown	Within 1km of the boundary	N	Not visited	564XXX	171XXX	A2/M2	Chalk level monitoring borehole	no abstraction	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	EA monitoring borehole in the Chalk aquifer. Not visited. Located in the field.	-
HE540039-CJV-EWE-ZZZ-GD-2S06ZZ1	AJ	GD	Groundwater abstraction, well, degauged/no licence	None	0	Y	13/09/2017	567332	171718	South Portal	Other (specify in notes)	25	Unknown	90	Unknown	Unknown	100	55	Unknown	Unknown	Unknown	Unknown	Access permitted, ask for head growkeeper at reception on arrival. Diameter 6 inch. Irrigation. Pump operates when level is too low. Reading from tank. Temp 16 ec 518 ph 7.28 do 96.4. The data on borehole are approximate	-
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ10	SD	GH	Well, historical, abandoned or decommissioned	Unknown	0	Y	20/09/2017	567308	177892	North Portal and Tilbury Marshes	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	567,289.611 177,899.702 Meters. Overgrown boundary between field and industrial estate. No evidence of well.	BGS Well Records. Unable to find. Not in field and boundary is extremely overgrown with nettles. No evidence of well.	
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ11	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	Y	18/07/2019	567261	177888	North Portal and Tilbury Marshes	n/a	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	n/a	Not measured	Not measured	567,260.320 177,889.780 Meters. BGS Well Records. Historical well. Fenced area indicates potential borehole location. Vegetation too dense to investigate further during the survey	BGS Well Records	
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ13	SD	GH	Well, historical, abandoned or decommissioned	Unknown	0	Y	20/09/2017	567058	177656	North Portal and Tilbury Marshes	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	567,058.707 177,656.020 Meters. BGS Well Records. No access. Overgrown and locked gate to path.	Historical Shaft with Bores and or Adits in Chalk. No access. Overgrown and locked path.	
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ14	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	14.7743755	N	24/10/2019	566766	177716	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	566,766.653 177,719.520 Meters. Looks like a disused outhouse, likely decommissioned. BGS Well Records. Historical well.	BGS Well Records
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ19	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	0	Y	08/10/2019	567083	177753	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	On the rail tracks	-
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ20	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	Y	12/07/2019	567180	177760	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well. The borehole owner has informed that it is not in use currently. Last active 36 years ago. Not connected to public sewage	-
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ21	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	TQ67/12	N	09/10/2019	567320	177650	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical Well. Capped off 30 years ago - Landowner correspondence 09/10/19	-
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ22	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	18/07/2019	567320	177650	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well. Appears to be abandoned or decommissioned	-
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ23	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 1km of the boundary	N	Unknown	568050	177531	North Portal and Tilbury Marshes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical groundwater wells. Digitised by Arcadis from IGS 1968 and IGS 1970 maps (BGS)	-
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ21	AJ	GH	Well, historical, abandoned or decommissioned	Unknown	0	N	20/09/2017	568059	176122	North Portal and Tilbury Marshes	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	568,008.746 176,139.347 Meters. BGS Well Records. Not found.	BGS Well Records. Not sure we found it there was a rock at the borehole location	
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ22	AJ	GH	Well, historical, abandoned or decommissioned	n/a	Within 3km of the boundary	Y	21/09/2017	567350	176487	North Portal and Tilbury Marshes	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	567,350.000 176,487.000 Meters. BGS Well Records. Not found. Didn't find	-	
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ24	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	64.04671559	N	24/10/2019	568310	177685	North Portal and Tilbury Marshes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	568,310.000 177,685.000 Meters. BGS Well Records. Historical well. Not present. 09/10/19 emailed land management company, waiting for response	-
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ25	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	61.12318272	N	24/10/2019	568304	177701	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	568,304.000 177,701.000 Meters. BGS Well Records. Historical well. Not present. 09/10/19 emailed land management company, waiting for response. BGS Well Records. Historical well. Not present.	BGS Well Records
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ26	SD	GH	Well, historical, abandoned or decommissioned	Unknown	0	N	20/09/2017	567678	177886	North Portal and Tilbury Marshes	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	567,678.000 177,886.000 Meters. Middle of field. Feature not found. BGS Well Records.	BGS Well Records. Feature not found.	
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ27	SD	GH	Well, historical, abandoned or decommissioned	Unknown	0	Y	20/09/2017	567561	177918	North Portal and Tilbury Marshes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	567,521.199 177,919.149 Meters. At corner between fields. Long grass. No sign of well. Concrete post showing field boundaries, but no wells here. BGS Well Records.	BGS Well Records. Feature not found.
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ28	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	567566	178187	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well	-
HE540039-CJV-EWE-ZZZ-GH-2N07ZZ29	SD	GH	Well, historical, abandoned or decommissioned	Unknown	0	Y	20/09/2017	567495	177968	North Portal and Tilbury Marshes	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	567,495.000 177,968.000 Meters. Concrete slab between two fields with two manholes and one small well cover. Pipe coming up from ground in corner. Could not open covers so could not take measurements. BGS Well Records.	BGS Well Records. Feature found slightly north of previous point. Node moved.	
HE540039-CJV-EWE-ZZZ-GH-2N08ZZ1	MP	GH	Well, historical, abandoned or decommissioned	Unknown	0	Y	19/09/2017	566961	178825	Chadwell St. Mary and Linford	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	566,961.283 178,813.987 Meters. BGS Well Records. Land access denied - landowner Ockendon. Not found.	BGS Well Records. Land access denied - landowner Ockendon. Not found.
HE540039-CJV-EWE-ZZZ-GH-2N09ZZ2	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	118.4964555	Y	09/10/2019	567159	179273	Chadwell St. Mary and Linford	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	567,159.000 179,273.000 Meters. BGS Well Records. 09/10/19 Pumping Stn already contacted - stakeholder. Associated with feature HE540039-CJV-EWE-ZZZ-GL-2N09ZZ1.	BGS Well Records
HE540039-CJV-EWE-ZZZ-GH-2N09ZZ23	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	135.7405816	Y	09/10/2019	567174	179301	Chadwell St. Mary and Linford	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	09/10/19 Pumping Stn already contacted - stakeholder. Associated with feature HE540039-CJV-EWE-ZZZ-GL-2N09ZZ1.	BGS Well Records
HE540039-CJV-EWE-ZZZ-GH-2N09ZZ24	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	42.58340172	N	09/10/2019	566644	179523	Chadwell St. Mary and Linford	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	09/10/19 Waiting for response to email	BGS Well Records. Landowner is Tarmac Building Products - No access permission
HE540039-CJV-EWE-ZZZ-GH-2N09ZZ25	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	Y	Unknown	566691	179207	Chadwell St. Mary and Linford	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical shaft with bores and/or adits in the Chalk. BGS Well Records. Historical well.	-
HE540039-CJV-EWE-ZZZ-GH-2N10ZZ1	SD	GH	Well, historical, abandoned or decommissioned	n/a	Within 3km of the boundary	Y	21/09/2017	563078	180741	A2/LTC Junction	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	563,078.000 180,741.000 Meters. Field of overgrown grass. No indication of wells. Feature not found.	BGS Well Records. Landowner is Thurrock BC - access is granted but be aware of the traveller site located to the south east - do not park near that. Feature not found.	
HE540039-CJV-EWE-ZZZ-GH-2N11ZZ1	SD	GH	Well, historical, abandoned or decommissioned	n/a	Within 3km of the boundary	Y	22/09/2017	563618	180912	A2/LTC Junction	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	563,618.000 180,912.000 Meters. BGS Well Records. Not found. 563,635.464 180,909.099 Meters	BGS Well Records. Landowner is Thurrock BC - access permitted. Within recently developed housing. Cannot access as is now built up. Well unlikely to be retained. Field behind owned by riding stable.	
HE540039-CJV-EWE-ZZZ-GH-2N11ZZ2	SD	GH	Well, historical, abandoned or decommissioned	n/a	Within 3km of the boundary	N	18/09/2017	562514	181214	A2/LTC Junction	n/a	n/a	not found	n/a	N	not found	not found	not found	n/a	not found	not found	562,514.000 181,214.000 Meters. BGS Well Records. Within recently developed area of housing. Cannot access, land is now built on. Well unlikely to be present due to the new development. Field behind is owned by riding stable. 562,504.368 181,194.448 Meters	BGS Well Records	
HE540039-CJV-EWE-ZZZ-GH-2N11ZZ3	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	TQ68/6A	N	09/10/2019	561117	181868	South Ockendon and NW Orsett	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	09/10/19 No response after initial phone call and email. BGS Well Records. Historical well. Waiting for response to questionnaire.	BGS Well Records
HE540039-CJV-EWE-ZZZ-GH-2N17ZZ20	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	TQ68/30	N	24/10/2019	562100	185550	North Ockendon and East Upminster	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well. 29 m deep. Drilled in the London Clay. Access not granted.	-
HE540039-CJV-EWE-ZZZ-GH-2N17ZZ21	PSM	GH	Well, historical, abandoned or decommissioned	Unknown	TQ68/36	N	09/10/2019	560629	182361	South Ockendon and NW Orsett	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	09/10/19 No response after initial phone call and email. BGS Well Records. Historical well. 200 m deep. Drilled in the Chalk. 0.7 km approx south of scheme in Ockendon Landfill area. Waiting for response to questionnaire.	BGS Well Records
HE540039-CJV-EWE-ZZZ-GH-2N18ZZ10	PSM,LD	GH	Well, historical, abandoned or decommissioned	Unknown	322.0681854	N	04/09/2019	565834	175727	North Portal and Tilbury Marshes	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well. Decommissioned.	-
HE540039-CJV-EWE-ZZZ-GH-2N18ZZ21	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	27/06/2019	566243	175366	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well. Decommissioned.	BGS Well Records
HE540039-CJV-EWE-ZZZ-GH-2N18ZZ22	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	27/06/2019	566236	175451	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well. Decommissioned.	BGS Well Records
HE540039-CJV-EWE-ZZZ-GH-2N18ZZ23	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	27/06/2019	566228	175524	North Portal and Tilbury Marshes	n/a	n/a	Unknown	Unknown	Unknown	Unknown								

Table A-1 Groundwater features surveyed during Phases 1 to 4 of the Water Feature Survey within the 3km radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within Order Limits? (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Abstraction Rate (m <sup>3</sup> /d)	Diameter of Borehole (mm)	Pump Suction Depth (m)	Dip Tube Installed (Y/N)	Datum Description and Level (m)	Depth to bottom (m)	Depth to Rest Water Level (m)	Depth to Rest Water Level (Date)	Depth to Pumped Water Level (m)	Depth to Pumped Water Level (Date)	General Description	Notes	
HE540039-CJV-EWE-ZZZ-GH-2S04ZZ1	AJ	GH	Well, historical, abandoned or decommissioned	Unknown	0	N	12/09/2017	567981	169798	A2/M2	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Access OK Park manager advises there is a pond here, he has no knowledge of a well. KCC archaeology officer says it's a borehole not a well. Didn't find it search all around the people we talked weren't aware of its existence	
HE540039-CJV-EWE-ZZZ-GH-2S05ZZ1	LTC	GH	Well, historical, abandoned or decommissioned	TQ67/88	Within 3km of the boundary	N	05/06/2019	566960	174120	Thames and Medway Canal Area	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk. See HE540039-CJV-EWE-ZZZ-GL-2S05ZZ1	
HE540039-CJV-EWE-ZZZ-GH-2S05ZZ2	PSMMA	GH	Well, historical, abandoned or decommissioned	TQ67/39	639.8065716	N	23/10/2019	566990	174290	Thames and Medway Canal Area	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Grass and vegetation over location. No evidence for borehole being present.	
HE540039-CJV-EWE-ZZZ-GH-2S05ZZ3	PSMMA	GH	Well, historical, abandoned or decommissioned	TQ67/42	755.6160937	N	23/10/2019	566570	174290	Thames and Medway Canal Area	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk. Confirmed not present. Concreted over	
HE540039-CJV-EWE-ZZZ-GH-2S05ZZ4	PSMMA	GH	Well, historical, abandoned or decommissioned	TQ67/51	782.5053438	N	23/10/2019	566540	174280	Thames and Medway Canal Area	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk. Confirmed not present. Concreted over. Old footprint of a building.	
HE540039-CJV-EWE-ZZZ-GH-2S06ZZ1	AJ	GH	Well, historical, abandoned or decommissioned	n/a	Within 3km of the boundary	N	14/09/2017	568266	174001	Thames and Medway Canal Area	n/a	not found	n/a	N	not found	not found	not found	not found	n/a	not found	not found	not found	Well is surrounded by a fence and gate. Flat topography and very high vegetation around. See picture. flat topography.	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ10	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Jul-20	568410	170640	South Portal	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical groundwater wells. Digitised from LTC Historical Mapping Review	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ11	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 1km of the boundary	N	Unknown	564450	174460	Gravesend and surrounding areas	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical groundwater wells. BGS Onshore GeolIndex	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ12	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 1km of the boundary	N	Unknown	564450	174460	Gravesend and surrounding areas	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical groundwater wells. BGS Onshore GeolIndex	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ13	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 1km of the boundary	N	Unknown	564040	174440	Gravesend and surrounding areas	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical groundwater wells. BGS Onshore GeolIndex	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ14	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 1km of the boundary	N	Unknown	563900	174500	Gravesend and surrounding areas	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical groundwater wells. BGS Onshore GeolIndex	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ15	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174130	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ16	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565820	174130	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Superficial deposits	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ17	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174130	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ18	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ19	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ20	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ21	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ22	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ23	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ24	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ25	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ26	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ27	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565750	174100	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ28	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565493	174188	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2S2ZZ29	LTC	GH	Well, historical, abandoned or decommissioned	Unknown	Within 3km of the boundary	N	Unknown	565730	173930	Gravesend and surrounding areas	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	BGS Well Records. Historical well in the Chalk	
HE540039-CJV-EWE-ZZZ-GH-2N14ZZ1	LTC	GH	Well, historical, abandoned or decommissioned	Previously: 08/37/55/0043	893.38591	N	11/10/2019	557200	183610	North Ockendon and East Upminster	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Previously. Water sourced in the River Terrace Gravels. No abstraction. Only a groundwater monitoring point. Max Annual Quantity, m3 Unknown. Now not registered as an abstraction anymore.	
HE540039-CJV-EWE-ZZZ-GH-2N14ZZ2	LTC	GH	Well, historical, abandoned or decommissioned	Previously: TH037/0055/011	Within 3km of the boundary	N	Mar-20	558776	182123	South Ockendon and NW Orsett	n/a	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Previously: GW Source, THAMES GROUNDWATER, SINGLE POINT, BOREHOLE AT ARSDALE AVENUE, SOUTH OCKENDON, Max Yearly Abstraction Volume m3=83000	
HE540039-CJV-EWE-ZZZ-GL-2N07ZZ1	PSM	GL	Groundwater abstraction, well, licensed	8/37/56*G0026	0	Y	08/10/2019	568800	177798	North Portal and Tilbury Marshes	Mineral Washing	409,100	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	08/10/19 Waiting for response from land agent. Groundwater abstraction, gravel pit in the fluvial sands and gravels. Waiting for response to questionnaire. Max Annual Quantity, m3 1909???	
HE540039-CJV-EWE-ZZZ-GL-2N07ZZ2	LTC	GL	Groundwater abstraction, well, licensed	8/37/56*G0073	Within 3km of the boundary	Y	18/07/2019	567200	177802	North Portal and Tilbury Marshes	General Use Relating to Secondary Category (Medium Loss)	5,500	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Four boreholes abstracting from the Chalk. Appears to be decommissioned. Max Annual Quantity, m3 1100000	
HE540039-CJV-EWE-ZZZ-GL-2N07ZZ3	GI team	GL	Groundwater abstraction, well, licensed	8/37/56*G0006	Within 3km of the boundary	Y	14/05/2019	567001	177804	North Portal and Tilbury Marshes	General Farming and Domestic	Not measured	Not measured	Not measured	Not measured	8.9	4.9	14/05/2019	Not measured	Not measured	Not measured	Not measured	This borehole feeds the reservoir above. It is at a location at the southern end of the reservoir. Water sampling will be done prior to ground investigation to establish a baseline water quality followed by regular sampling.	
HE540039-CJV-EWE-ZZZ-GL-2N07ZZ4	LTC	GL	Groundwater abstraction, well, licensed	8/37/56*G0006	58.31806941	N	09/10/2019	566798	177598	North Portal and Tilbury Marshes	General Farming & Domestic	1,300	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Groundwater abstraction in the fluvial sands and gravels. No direct response from landowner. Max Annual Quantity, m3 182000. 08/10/19 Waiting for Letter response	
HE540039-CJV-EWE-ZZZ-GL-2N09ZZ1	LTC	GL	Groundwater abstraction, well, licensed	8/37/56*G0044	Confidential	Y	09/10/2019	Confidential	Confidential	Chadwell St. Mary and Linford	Unknown	Various rates: 2.160m3/day, 8.365m3/day, 1.9065m3/day	3600 (3.6m)	45mbl	Unknown	Unknown	64.9mbl	Unknown	Unknown	Unknown	Unknown	Unknown	08/10/19 Pumping S/n already contacted - stakeholder. Groundwater abstraction from the Chalk at pumping station for public supply. Understood this well is currently not used for public supply. Max Annual Quantity, m3 3728000	
HE540039-CJV-EWE-ZZZ-GL-2N09ZZ2	SD	GL	Groundwater abstraction, well, licensed	AN037/0056/012	Within 3km of the boundary	N	21/09/2017	565985	180732	A2/LTC Junction	Irrigation of the golf course	240	260	3 pumps, see photo	Y	not measured	44.38	24.48	21/09/2017	not measured, no access	not measured, no access	not measured	Borehole in corner of golf course with pumps in shelter and two large groundwater storage tanks. Three pumps in shelter to extract groundwater. EA inspection report received. Only pumping when water is required for irrigation.	
HE540039-CJV-EWE-ZZZ-GL-2N09ZZ5	PSM	GL	Groundwater abstraction, well, licensed	none	621.9997284	N	10/10/2019	566280	180300	Chadwell St. Mary and Linford	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	10/10/19 Appears to be a lake formed from a quarry excavation, unknown land ownership. Groundwater abstraction associated with lake?	
HE540039-CJV-EWE-ZZZ-GL-2N11ZZ1	SD	GL	Groundwater abstraction, well, licensed	8/37/56*G0032	Within 3km of the boundary	Y	18/09/2017	562614	182734	South Ockendon and NW Orsett	unknown, possibly field irrigation	unknown	3x3 metres	No pumped observed	unknown	not measured	not measured	0.75	18/09/2017	n/a	n/a	n/a	No evidence of well in field or in surrounding area, only a tank feature. Concrete capped tank at ground level with sealed manhole cover (Concrete cap tank 3m3m). EA information: well depth 29m; stratigraphy comprises Head deposits overlying Alluvium (BGS technical report WA/91/28)	
HE540039-CJV-EWE-ZZZ-GL-2N11ZZ2	LTC	GL	Groundwater abstraction, well, licensed	8/37/56*G0032	Within 3km of the boundary	Y	24/10/2019	562902	182903	South Ockendon and NW Orsett	General Farming & Domestic	42	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Borehole for general irrigation farming purpose. Borehole drilled in the fluvial sands/gravels. Unable to access. EA information: Well depth 12m; stratigraphy comprises Head deposits overlying Alluvium. (BGS technical report WA/91/28) Max Annual Quantity, m3 11140. 24/10/19 Unable to access
HE540039-CJV-EWE-ZZZ-GL-2N17ZZ1	LTC	GL	Groundwater abstraction, well, licensed	8/37/56*G0032	123.4320298	N	24/10/2019	563000	184003	South Ockendon and NW Orsett	General Farming & Domestic	42	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Borehole for general irrigation farming purpose. Borehole drilled in the fluvial sands/gravels. Unable to access. EA information: stratigraphy comprises Head deposits overlying Alluvium (BGS technical report WA/91/28) Max Annual Quantity, m3 11140. 24/10/19 Unable to access
HE540039-CJV-EWE-ZZZ-GL-2N2ZZ137	LD/PSM	GL	Groundwater abstraction, well, licensed	TH037/0055/005	Within 3km of the boundary	N	Mar-20	555176	182797	North Ockendon and East Upminster	Industrial, Commercial And Public Services, Extractive, Mineral Washing	432	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, THAMES GROUNDWATER, SINGLE POINT, RAINHAM QUARRY-BOREHOLE, Max Yearly Abstraction Volume m3=20000
HE540039-CJV-EWE-ZZZ-GL-2N2ZZ133	LD/PSM	GL	Groundwater abstraction, well, licensed	8/37/56*G0062	Within 3km of the boundary	N	Mar-20	566280	180300	Chadwell St. Mary and Linford	Industrial, Commercial And Public Services, Extractive, Dust Suppression	50	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, GROUND WATER SOURCE OF SUPPLY, SINGLE POINT, GRAVEL PIT AT MUCKING MARSH MUCKING ESSEX, Max Yearly Abstraction Volume m3=6000
HE540039-CJV-EWE-ZZZ-GL-2S01ZZ1	PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0511/G	Confidential	N	10/10/2019	Confidential	Confidential	A2/M2	Operational groundwater supply works	2000	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	This is an active operational groundwater supply works with a licensed daily limit of 2M/day.	
HE540039-CJV-EWE-ZZZ-GL-2S01ZZ2	PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0511/G	Confidential	N	10/10/2019	Confidential	Confidential	A2/M2	Operational groundwater supply works	2000	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	This is an active operational groundwater supply works with a licensed daily limit of 2M/day. Public water supply borehole, from the Chalk aquifer.	
HE540039-CJV-EWE-ZZZ-GL-2S05ZZ1	APC	GL	Groundwater abstraction, well, licensed	none	Within 3km of the boundary	N	05/06/2019	568825	174152	Thames and Medway Canal Area	Mineral Washing (aggregate and concrete)	336	280	Not measured	Not measured	Top of flange	18.38	3.84	05/06/2019	3.89	3.89	Abstraction borehole, Point B, drilled into the River Terrace Gravels		
HE540039-CJV-EWE-ZZZ-GL-2S06ZZ2	APC	GL	Groundwater abstraction, well, licensed	none	Within 3km of the boundary	N	05/06/2019	566929	174152	Thames and Medway Canal Area	Mineral Washing (aggregate and concrete)	336	310	Not measured	Not measured	Top of dip tube	17.89	3.76	05/06/2019	3.85	3.85	Abstraction borehole, Point A, drilled into the River Terrace Gravels		
HE540039-CJV-EWE-ZZZ-GL-2S06ZZ4	LTC	GL	Groundwater abstraction, well, licensed	9/40/01/0508/G	619.6318319	N	10/10/2019	566670	174000	Thames and Medway Canal Area	General Washing	340	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Abstraction borehole, Point C, drilled into the River Terrace Gravels	
HE540039-CJV-EWE-ZZZ-GL-2S06ZZ1	LTC	GL	Groundwater abstraction, well, licensed																					

Table A-1 Groundwater features surveyed during Phases 1 to 4 of the Water Feature Survey within the 3km radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within Order Limits? (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Abstraction Rate (m³/d)	Diameter of Borehole (mm)	Pump Suction Depth (m)	Dip Tube Installed (Y/N)	Datum Description and Level (m)	Depth to bottom (m)	Depth to Rest Water Level (m)	Depth to Rest Water Level (Date)	Depth to Pumped Water Level (m)	Depth to Pumped Water Level (Date)	General Description	Notes		
HE540039-CJV-EWE-ZZZ-GL-2SZZZ17	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0086/GR	Within 3km of the boundary	N	Mar-20	570170	173730	North and East Higham	Water Supply, Private Water Undertaking, General Use Relating To Secondary Category (Medium Loss)	727	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, BOREHOLE 2 AT NURALITE (UK) LTD, HIGHAM, ROCHESTER, Max Yearly Abstraction Volume m³=318000	Licence Holder Name: LEJ Properties Ltd		
HE540039-CJV-EWE-ZZZ-GL-2SZZZ18	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0092/A/GR/R1	Within 3km of the boundary	N	Mar-20	562759	174599	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Paper And Printing, Boiler Feed	1309	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, BOREHOLE AT KIMBERLY CLARK, NORTHFLEET, Max Yearly Abstraction Volume m³=320000	Licence Holder Name: Kimberly-Clark Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ19	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0092/A/GR/R1	Within 3km of the boundary	N	Mar-20	562772	174114	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Paper And Printing, Boiler Feed	1309	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT B, BOREHOLE AT KIMBERLY CLARK, NORTHFLEET, Max Yearly Abstraction Volume m³=320000	Licence Holder Name: Kimberly-Clark Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ20	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0092/B/GR	Within 3km of the boundary	N	Mar-20	562410	173660	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Paper And Printing, Process Water	19656	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, BOREHOLE 1, H5 CHALK, NORTHFLEET, Max Yearly Abstraction Volume m³=4710000	Licence Holder Name: Kimberly-Clark Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ21	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0092/B/GR	Within 3km of the boundary	N	Mar-20	562450	173660	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Paper And Printing, Process Water	19656	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, BOREHOLE 2, H5 CHALK, NORTHFLEET, Max Yearly Abstraction Volume m³=4710000	Licence Holder Name: Kimberly-Clark Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ22	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0092/B/GR	Within 3km of the boundary	N	Mar-20	562260	173750	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Paper And Printing, Process Water	19656	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, BOREHOLE 3, SPRINGHEAD LAKE, NORTHFLEET, Max Yearly Abstraction Volume m³=4710000	Licence Holder Name: Kimberly-Clark Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ23	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0092/B/GR	Within 3km of the boundary	N	Mar-20	562980	174260	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Paper And Printing, Process Water	19656	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, BOREHOLE 4, CRETE HALL ROAD, NORTHFLEET, Max Yearly Abstraction Volume m³=4710000	Licence Holder Name: Kimberly-Clark Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ24	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0498/G	Within 3km of the boundary	N	Mar-20	566925	174152	Thames and Medway Canal Area	Industrial, Commercial And Public Services, Mineral Products, Mineral Washing	336	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, S DRIFT, UNDERGROUND GRAVEL STRATA (THAMES BALLAST), Max Yearly Abstraction Volume m³=83969	Licence Holder Name: J Club Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ25	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0498/G	Within 3km of the boundary	N	Mar-20	566925	174152	Thames and Medway Canal Area	Industrial, Commercial And Public Services, Mineral Products, Mineral Washing	336	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, S DRIFT, UNDERGROUND GRAVEL STRATA (THAMES BALLAST), Max Yearly Abstraction Volume m³=83969	Licence Holder Name: J Club Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ26	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0498/G	Within 3km of the boundary	N	Mar-20	566929	174152	Thames and Medway Canal Area	Industrial, Commercial And Public Services, Mineral Products, Mineral Washing	336	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, BOREHOLE B, UNDERGROUND STRATA RIVER TERRACE GRAVELS, Max Yearly Abstraction Volume m³=83969	Licence Holder Name: J Club Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ27	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0500/G	Within 3km of the boundary	N	Mar-20	561240	171480	Agriculture, General Agriculture, Spray Irrigation - Direct	286	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, BOREHOLE, NR. COURT LODGE FARM, SOUTHFLEET, Max Yearly Abstraction Volume m³=86376	Licence Holder Name: D & M Gedney Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ28	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0500/G	Within 3km of the boundary	N	Mar-20	561240	171480	Gravesend and surrounding areas	Agriculture, General Agriculture, Vegetable Washing	286	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, BOREHOLE, NR. COURT LODGE FARM, SOUTHFLEET, Max Yearly Abstraction Volume m³=86376	Licence Holder Name: D & M Gedney Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ29	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0504/G/R01	Within 3km of the boundary	N	Mar-20	561660	172811	Gravesend and surrounding areas	Agriculture, General Agriculture, Spray Irrigation - Direct	910	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT B, BOREHOLE, H5 CHALK, SOUTHFLEET, Max Yearly Abstraction Volume m³=5910	Licence Holder Name: D T G Elliott & Son Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ30	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0504/G/R01	Within 3km of the boundary	N	Mar-20	561660	172811	Gravesend and surrounding areas	Agriculture, General Agriculture, Spray Irrigation - Direct	910	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT B, BOREHOLE, H5 CHALK, SOUTHFLEET, Max Yearly Abstraction Volume m³=5910	Licence Holder Name: D T G Elliott & Son Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ31	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0504/G/R01	Within 3km of the boundary	N	Mar-20	561660	172710	Gravesend and surrounding areas	Agriculture, General Agriculture, Spray Irrigation - Direct	910	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, BOREHOLE, H5 CHALK, SOUTHFLEET, Max Yearly Abstraction Volume m³=5910	Licence Holder Name: D T G Elliott & Son Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ32	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0504/G/R01	Within 3km of the boundary	N	Mar-20	561660	172710	Gravesend and surrounding areas	Agriculture, General Agriculture, Spray Irrigation - Direct	910	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, BOREHOLE, H5 CHALK, SOUTHFLEET, Max Yearly Abstraction Volume m³=5910	Licence Holder Name: D T G Elliott & Son Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ33	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0518/G	Within 3km of the boundary	N	Mar-20	561180	170440	Gravesend and surrounding areas	Agriculture, General Agriculture, Spray Irrigation - Direct	2184	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, BOREHOLE AT HOOK PLACE FARM, SOUTHFLEET, Max Yearly Abstraction Volume m³=227500	Licence Holder Name: Watts Farms Fresh Produce Holdings Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ34	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0523/G	Within 3km of the boundary	N	Mar-20	560840	170430	Gravesend and surrounding areas	Agriculture, General Agriculture, Spray Irrigation - Direct	982	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT B, BOREHOLE AT HOOK GREEN FARM, SOUTHFLEET, Max Yearly Abstraction Volume m³=74066	Licence Holder Name: Beslee Farms	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ35	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0523/G	Within 3km of the boundary	N	Mar-20	561310	172000	Gravesend and surrounding areas	Agriculture, General Agriculture, Spray Irrigation - Direct	982	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT C, BOREHOLE, JOYCE HALL FARM IN SOUTHFLEET, Max Yearly Abstraction Volume m³=74066	Licence Holder Name: Beslee Farms	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ36	LD/PSM	GL	Groundwater abstraction, well, licensed	SO/040/0001/019	Within 3km of the boundary	N	Mar-20	564325	171869	A2/LTC Junction	Industrial, Commercial And Public Services, Sports Grounds/Facilities, Spray Irrigation - Storage	50	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, MID KENT GOLF CLUB BOREHOLE, Max Yearly Abstraction Volume m³=10000	Licence Holder Name: Mid Kent Golf Club Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ37	LD/PSM	GL	Groundwater abstraction, well, licensed	01/154/R01	Within 3km of the boundary	N	Mar-20	562230	173450	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Laundry, Laundry Use	400	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A, BOREHOLE AT SPRINGHEAD ENTERPRISE PARK, Max Yearly Abstraction Volume m³=120000	Licence Holder Name: Berendsen UK Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ38	LD/PSM	GL	Groundwater abstraction, well, licensed	01/158/R01	Within 3km of the boundary	N	Mar-20	560976	175941	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Mineral Products, Mineral Washing	105	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, BOREHOLE AT SWANSCOMBE MARSHES, Max Yearly Abstraction Volume m³=26300	Licence Holder Name: Cemex UK Materials Ltd	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ39	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0050/GR	Within 3km of the boundary	N	Mar-20	559580	173210	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Construction, General Use Relating To Secondary Category (Medium Loss)	6546	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A AT EASTERN QUARRY SWANSCOMBE, Max Yearly Abstraction Volume m³=1700204	Licence Holder Name: L S Eastern Quarry Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ40	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0050/GR	Within 3km of the boundary	N	Mar-20	559580	173210	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Construction, Process Water	6546	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A AT EASTERN QUARRY SWANSCOMBE, Max Yearly Abstraction Volume m³=1700204	Licence Holder Name: L S Eastern Quarry Limited	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ41	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0051/GR	Within 3km of the boundary	N	Mar-20	562210	173750	Gravesend and surrounding areas	Agriculture, General Agriculture, Spray Irrigation - Direct	4374	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A AT BLUE LAKE NORTHFLEET CEMENT WORKS, Max Yearly Abstraction Volume m³=1186000	Licence Holder Name: Lafarge Cement UK PLC	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ42	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0051/GR	Within 3km of the boundary	N	Mar-20	562210	173750	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Construction, Non-Evaporative Cooling	4374	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A AT BLUE LAKE NORTHFLEET CEMENT WORKS, Max Yearly Abstraction Volume m³=1186000	Licence Holder Name: Lafarge Cement UK PLC	
HE540039-CJV-EWE-ZZZ-GL-2SZZZ43	LD/PSM	GL	Groundwater abstraction, well, licensed	9/40/01/0051/GR	Within 3km of the boundary	N	Mar-20	562210	173750	Gravesend and surrounding areas	Industrial, Commercial And Public Services, Construction, General Use Relating To Secondary Category (Medium Loss)	4374	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Groundwater, SINGLE POINT, POINT A AT BLUE LAKE NORTHFLEET CEMENT WORKS, Max Yearly Abstraction Volume m³=1186000	Licence Holder Name: Lafarge Cement UK PLC	
HE540039-CJV-EWE-ZZZ-GP-2N07Z21	LTC	GP	Discharge to ground, permit	PRELF11902	Within 3km of the boundary	Y	18/07/2019	567101	177706	North Portal and Tibury Marshes	Not specified	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Water outlet into the land at the site address. No feature present at the location. Likely soak away. Looks like it is abandoned	-	
HE540039-CJV-EWE-ZZZ-GP-2N10Z21	PSM	GP	Discharge to ground, permit	Unknown	Within 3km of the boundary	Y	18/07/2019	564164	180665	A2/LTC Junction	Sewage - not water company	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	n/a	Not measured	Not measured	Discharge in land via soakaway. Part of private ornamental ponds. No knowledge of discharge permit. Dich at west of properties. Dry during survey	-	
HE540039-CJV-EWE-ZZZ-GP-2N10Z22	LTC	GP	Discharge to ground, permit	PR2L/F489	Within 3km of the boundary	Y	19/06/2019	563568	180726	A2/LTC Junction	Sewage - not water company	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Discharge into land via soakaway.	-
HE540039-CJV-EWE-ZZZ-GP-2N14Z21	PSM	GP	Discharge to ground, permit	Unknown	Within 3km of the boundary	N	18/07/2019	557960	184140	North Ockendon and East Upminster	Sewage - not water company	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	n/a	Not measured	Not measured	Discharge in land via soakaway. Septic tank - EA discharge consent	-	
HE540039-CJV-EWE-ZZZ-GP-2N17Z21	AJ	GP	Discharge to ground, permit	Unknown	Within 3km of the boundary	N	24/07/2018	556778	189410	M25/LTC Junction	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Personal land, ken Howard back garden	-	
HE540039-CJV-EWE-ZZZ-GP-2N19Z21	LTC	GP	Discharge to ground, permit	PREAF01384	Within 3km of the boundary	N	Unknown	565340	178380	Chadwell St. Mary and Linford	Specified underground waters via Soakaway	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Outlet via soakaway	-
HE540039-CJV-EWE-ZZZ-GP-2N19Z22	LTC	GP	Discharge to ground, permit	Unknown	Within 3km of the boundary	N	Unknown	565340	178380	Chadwell St. Mary and Linford	Trade	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Discharge to specified underground waters via soakaway. Not visited because it is outside of the survey area.	-
HE540039-CJV-EWE-ZZZ-GP-2N22Z26	LTC	GP	Discharge to ground, permit	CTLU.0675	Within 3km of the boundary	N	Unknown	556480	183620	North Ockendon and East Upminster	Sewage - not water company	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Discharge to groundwater via a soakaway. Not visited because it is outside of the survey area.	-
HE540039-CJV-EWE-ZZZ-GP-2N22Z27	LTC	GP	Discharge to ground, permit	PR2LFS16366	Within 3km of the boundary	N	Unknown	566493	181559	A2/LTC Junction	Sewage - not water company	n/a	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Discharge to land. Not visited because it is outside of the survey area.	-
HE540039-CJV-EWE-ZZZ-GP-2S01Z21	SD	GP	Discharge to ground, permit	Unknown	Within 3km of the boundary	N	24/07/2018	569300	169300	A2/M2	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Nothing obvious. Just greener area amongst trees	-
HE540039-CJV-EWE-ZZZ-GP-2S04Z21	AJ	GP	Discharge to ground, permit	P20522	Within 3km of the boundary	N	14/09/2017	568380	170013	A2/M2	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Petrol interceptor	Permit number P20522
HE540039-CJV-EWE-ZZZ-GP-2S04Z22	AJ	GP	Discharge to ground, permit	P20522	130	N	14/09/2017	568290	169980	A2/M2	Industrial	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Underneath French drained and various soakaways. Decomposed of the sewage, fault sewage.	-
HE540039-CJV-EWE-ZZZ-GP-2S04Z23	PSM	GP	Discharge to ground, permit	P04328	Within 3km of the boundary	Y	08/10/2019	567250	171151	A2/LTC Junction	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Access not granted	Sewage discharge at the nursery?
HE540039-CJV-EWE-ZZZ-GP-2S04Z24	PSM	GP	Discharge to ground, permit	P21323	91.48962545	N	08/10/2019	568498	171002	South Portal	Unknown	Unknown													

Table A-1 Groundwater features surveyed during Phases 1 to 4 of the Water Feature Survey within the 3km radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within Order Limits? (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Abstraction Rate (m³/d)	Diameter of Borehole (mm)	Pump Suction Depth (m)	Dip Tube Installed (Y/N)	Datum Description and Level (m)	Depth to bottom (m)	Depth to Rest Water Level (m)	Depth to Rest Water Level (Date)	Depth to Pumped Water Level (m)	Depth to Pumped Water Level (Date)	General Description	Notes		
HE540039-CJV-EWE-ZZZ-GS-2N09ZZZ1	LTC	GS	Spring	Unknown	Within 1km of the boundary	Y	Unknown	566428	179426	Chadwell St. Mary and Linstead	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-	
HE540039-CJV-EWE-ZZZ-GS-2N11ZZZ1	LTC	GS	Spring	Unknown	Within 1km of the boundary	N	Unknown	562080	182340	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2N11ZZZ1	LTC	GS	Spring	Unknown	Within 1km of the boundary	Y	Unknown	562615	182716	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2N11ZZZ2	LTC	GS	Spring	Unknown	Within 1km of the boundary	Y	Unknown	562983	182929	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2N12ZZZ1	LTC	GS	Spring	Unknown	Within 1km of the boundary	Y	Unknown	561379	183632	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2N14ZZZ1	GI team	GS	Spring	Unknown	Within 3km of the boundary	N	15/05/2019	558722	184803	North Ockendon and East Upminster	Farming irrigation	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	n/a	Not measured	Not measured	Information collected by the LTC Ground Investigation team on site. The spring is a water supply source for large farming business. Water sample will be taken prior to ground investigation to establish a baseline water quality followed by regular sampling.	-		
HE540039-CJV-EWE-ZZZ-GS-2N14ZZZ2	PSM	GS	Spring	Unknown	Within 1km of the boundary	N	22/03/2019	558952	185023	North Ockendon and East Upminster	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Spring. Based on Plan provided by Manor Farm. Reference drawing HE540039-CJV-HDG-M25_GNE000000-SK-CD-00002. Other related drainage drawings include: HE540039-CJV-HDG-M25_GNE000000-SK-CD-00003, HE540039-CJV-HDG-M25_GNN000000-SK-CD-00002, HE540039-CJV-HDG-M25_GNN000000-SK-CD-00003.	-
HE540039-CJV-EWE-ZZZ-GS-2N15ZZZ1	LTC	GS	Spring	Unknown	Within 1km of the boundary	N	Unknown	558033	185579	North Ockendon and East Upminster	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2N17ZZZ1	LTC	GS	Spring	Unknown	Within 1km of the boundary	N	Unknown	562410	184688	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2N17ZZZ2	LTC	GS	Spring	Unknown	Within 1km of the boundary	Y	Unknown	562256	183664	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2N17ZZZ3	LTC	GS	Spring	Unknown	Within 1km of the boundary	N	Unknown	562803	184006	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2N17ZZZ4	LTC	GS	Spring	Unknown	Within 1km of the boundary	N	Unknown	562226	183970	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2NZZZZZ1	LTC	GS	Spring	Unknown	Within 1km of the boundary	N	Unknown	561309	181881	South Ockendon and NW Orsett	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Historical springs. Digitised from LTC Historical Mapping Review	-
HE540039-CJV-EWE-ZZZ-GS-2S04ZZZ1	AJ	GS	Spring	Unknown	0	N	12/09/2017	567771	170082	A2/LTC Junction	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Possible spring. They weren't aware of a spring. Walked into the woods didn't find any sources where the little valley is. Everything seems quite dry and the vegetation is very wild hard to have access to the soil. But if spring exists it's not used	567.760.535 170.078.866. Digitised by Arcadis from IGS 1968 and IGS 1970 maps (BGS)
HE540039-CJV-EWE-ZZZ-GS-2SZZZZZ1	LTC	GS	Spring	Unknown	Within 3km of the boundary	N	Jun-20	561883.138	174946.8197	Gravesend and surrounding areas	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Source: IGS 1968. Digitised by Arcadis from IGS 1968 and IGS 1970 maps (BGS)	-
HE540039-CJV-EWE-ZZZ-GS-2SZZZZZ2	LTC	GS	Spring	Unknown	Within 3km of the boundary	N	Jun-20	561828.105	172779.3487	Gravesend and surrounding areas	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Source: IGS 1968. Digitised by Arcadis from IGS 1968 and IGS 1970 maps (BGS)	-
HE540039-CJV-EWE-ZZZ-RE-2N07ZZZ1	LTC	RE	Irrigation reservoir	Unknown	Within 1km of the boundary	Y	Sep-17	567020	177769	North Portal and Tibury Marshes	Farming irrigation	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	n/a	Not measured	Not measured	Reservoir has been visited and assessed by the LTC	-		
HE540039-CJV-EWE-ZZZ-RE-2N14ZZZ1	GI team	RE	Irrigation reservoir	Unknown	Within 3km of the boundary	Y	15/05/2019	557760	184396	North Ockendon and East Upminster	Farming irrigation	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	Not measured	n/a	Not measured	Not measured	Information collected by the Ground Investigation team on site. This reservoir is used in times of drought and to supplement rainfall for large farming business. The reservoir is fed by the spring discussed above. Note this reservoir is also shown as a surface water feature of ID HE540039-CJV-EWE-ZZZ-PS-1N14ZZZ7	-		

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-AS-1N09ZZZ1	LD/PSM	AS	Surface water abstraction, licensed	8/37/56*/S/0085/R01	Within OL	Y	Mar-20	566477	179408	Chadwell St. Mary and Linford	Agriculture, General Agriculture, Spray Irrigation - Storage	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, SURFACE WATER SOURCE OF SUPPLY, SINGLE POINT, DITCH TRIB OF R.THAMES, Max Yearly Abstraction Volume m3=127272Max Daily Abstraction Volume m3=3600, Phase 4 update.	Licence Holder Name C H COLE & SONS
HE540039-CJV-EWE-ZZZ-AS-1N09ZZZ1	PSM/MA	AS	Surface water abstraction, licensed	Unknown	Within OL	Y	16/07/2019	566470	179420	Chadwell St. Mary and Linford	Unknown	No	Unknown features are dry	N/A	N/A	N/A	N/A	Ditch in south, outfall to west, large pond or lake to north	Dense vegetation and shrubs surrounding features. Base of ditch approx 1m below ground level gravely silt.	Unknown dense vegetation preventing access	Unknown	Outfall noticed to West. Likely discharge into the pond/lake	-
HE540039-CJV-EWE-ZZZ-AS-1N11ZZZ1	PSM	AS	Surface water abstraction, licensed	Unknown	Within OL	Y	24/10/2019	563400	182900	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	24/10/2019 Unable to access	-
HE540039-CJV-EWE-ZZZ-AS-1N14ZZZ1	PSM	AS	Surface water abstraction, licensed	Unknown	Within 500m of the boundary	N	16/07/2019	558599	183601	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Access denied. Landowner states this is a dry ditch in the summer.	-
HE540039-CJV-EWE-ZZZ-AS-1N14ZZZ2	LTC	AS	Surface water abstraction, licensed	08/37/55/0076	Within 500m of the boundary	N	21/09/2017	558197	184406	North Ockendon and East Upminster	Spray Irrigation, storage	No	not found	not found	not found	not found	not found	not found	not found	not found	Unknown	No feature was observed at the EA location. No visible storage observed in the agricultural field	-
HE540039-CJV-EWE-ZZZ-AS-1N14ZZZ3	SD	AS	Surface water abstraction, licensed	08/37/55/0072	Within OL	Y	21/09/2017	558601	184600	North Ockendon and East Upminster	Spray Irrigation, storage	No	no access	no access	no access	no access	no access	no access	no access	no access	Unknown	EA location was not accessible, no feature was observed from the path. EA data states a storage, no visible storage observed.	-
HE540039-CJV-EWE-ZZZ-AS-1N14ZZZ4	LD/PSM	AS	Surface water abstraction, licensed	08/37/55/0020	Within 500m of the boundary	N	Mar-20	558600	183600	South Ockendon and NW Orsett	Agriculture, General Agriculture, Spray Irrigation - Storage	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, THAMES SURFACE WATER - NON TIDAL, SINGLE POINT, KEMPS FARM, UPMINSTER - TRIB OF WENNINGTON COMMON SEWER, Max Yearly Abstraction Volume m3=6819.15, Max Daily Abstraction Volume m3=6819.15	Licence Holder Name MEE
HE540039-CJV-EWE-ZZZ-AS-1N15ZZZ1	SD	AS	Surface water abstraction, licensed	Unknown	Within 500m of the boundary	N	12/09/2017	558001	185599	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Could not access. Private property-see photo of lake.
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ10	AJ	AS	Surface water abstraction, licensed	Unknown	Within 500m of the boundary	N	Jul-18	559370	186719	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Surface water abstraction not in use anymore.	-
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ11	PSM	AS	Surface water abstraction, licensed	Unknown	112.9134882	N	16/10/2019	561100	185100	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Several surveys from other disciplines have taken place. All ponds man made. One groundwater abstraction of 15000 l/day (15m3/day) for irrigation. No need to visit.	-
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ12	LD/PSM	AS	Surface water abstraction, licensed	8/37/56*/S/0076	Within 500m of the boundary	N	Mar-20	561100	185100	North Ockendon and East Upminster	Industrial, Commercial And Public Services, Golf Courses, Make-Up Or Top Up Water	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, SURFACE WATER SOURCE OF SUPPLY, SINGLE POINT, TRIB OF R MARDYKE - N OCKENDON, Max Yearly Abstraction Volume m3=15000Max Daily Abstraction Volume m3=691	Licence Holder Name TOP MEADOW GOLF CLUB
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ13	LD/PSM	AS	Surface water abstraction, licensed	8/37/56*/S/0076	Within 500m of the boundary	N	Mar-20	561100	185100	North Ockendon and East Upminster	Industrial, Commercial And Public Services, Golf Courses, Spray Irrigation - Storage	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, SURFACE WATER SOURCE OF SUPPLY, SINGLE POINT, TRIB OF R MARDYKE - N OCKENDON, Max Yearly Abstraction Volume m3=15000Max Daily Abstraction Volume m3=691	Licence Holder Name TOP MEADOW GOLF CLUB
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ14	LD/PSM	AS	Surface water abstraction, licensed	8/37/56*/S/0087/R01	Within 500m of the boundary	N	Mar-20	559368	186718	North Ockendon and East Upminster	Agriculture, Aquaculture Fish, Make-Up Or Top Up Water	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, SURFACE WATER SOURCE OF SUPPLY, SINGLE POINT, WEST ARM R MARDYKE, UPMINSTER, Max Yearly Abstraction Volume m3=7000Max Daily Abstraction Volume m3=432	Licence Holder Name G J SKINNER & S MOULD
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ15	LD/PSM	AS	Surface water abstraction, licensed	8/37/56*/S/0088A/R01	Within OL	Y	Mar-20	562039	183003	South Ockendon and NW Orsett	Agriculture, General Agriculture, Spray Irrigation - Storage	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, SURFACE WATER SOURCE OF SUPPLY, SINGLE POINT, RIVER MARDYKE AT ORSETT - ABSTRACTION PT B, Max Yearly Abstraction Volume m3=20000Max Daily Abstraction Volume m3=3333	Licence Holder Name C H COLE & SONS (CHERRY ORCHARD)
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ1	SD	AS	Surface water abstraction, licensed	8/37/56*/S/0066	Within OL	Y	14/09/2017	562001	183003	South Ockendon and NW Orsett	Spray Irrigation	No	no visible flow	no access	no access	no access	no access	none observed	Grass, brambles	N/A	Unknown	Drainage ditch present at the location. Not accessible due to dense vegetation. No evidence of abstraction found.	-
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ2	SD	AS	Surface water abstraction, licensed	8/37/56*/S/0066	Within OL	Y	14/09/2017	562002	183701	South Ockendon and NW Orsett	Spray Irrigation	No	no visible flow	no access	no access	no access	no access	none observed	Grass	N/A	Unknown	Dried up drainage ditch present at the location. No evidence of abstraction either in field or at river.	-
HE540039-CJV-EWE-ZZZ-AS-1N17ZZZ3	MP	AS	Surface water abstraction, licensed	8/37/56*/S/0066	Within 500m of the boundary	N	14/09/2017	562396	184002	South Ockendon and NW Orsett	Spray Irrigation	No	not found	not found	not found	not found	not found	not found	not found	not found	Unknown	EA location in an agricultural field. Not visible.	-
HE540039-CJV-EWE-ZZZ-AS-1NZZZZZ1	LD/PSM	AS	Surface water abstraction, licensed	8/37/56*/S/0088A/R01	Within 500m of the boundary	N	Mar-20	560974	181098	A13 Junction	Agriculture, General Agriculture, Spray Irrigation - Storage	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, SURFACE WATER SOURCE OF SUPPLY, SINGLE POINT, RIVER MARDYKE AT ORSETT - ABSTRACTION PT A, Max Yearly Abstraction Volume m3=20000Max Daily Abstraction Volume m3=3333	Licence Holder Name C H COLE & SONS (CHERRY ORCHARD)
HE540039-CJV-EWE-ZZZ-AS-1NZZZZZ2	LD/PSM	AS	Surface water abstraction, licensed	8/37/56*/T/0091	Within 500m of the boundary	N	Mar-20	566020	175240	North Portal and Tilbury Marshes	Production Of Energy, Electricity, Non-Evaporative Cooling	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, TIDAL WATER SOURCE OF SUPPLY, SINGLE POINT, INTAKES ON RIVER THAMES, Max Yearly Abstraction Volume m3=160000000Max Daily Abstraction Volume m3=4600000	Licence Holder Name INNOGY PLC
HE540039-CJV-EWE-ZZZ-AS-1S05ZZZ1	BC	AS	Surface water abstraction, licensed	Unknown	Within 500m of the boundary	N	14/09/2017	567469	174080	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No access to sample	-
HE540039-CJV-EWE-ZZZ-AS-1S06ZZZ1	LTC	AS	Surface water abstraction, licensed	Unknown	Within 500m of the boundary	N	Jul-18	568191	173907	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Surface water abstraction at Denton new cut. Visit when rifling range accessible.	-
HE540039-CJV-EWE-ZZZ-AS-1S06ZZZ2	AJ	AS	Surface water abstraction, licensed	Unknown	Within 500m of the boundary	N	Sep-17	568024	174375	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Couldn't walk further than this because of vegetation and fences. All the ditches are dry around
HE540039-CJV-EWE-ZZZ-AS-1SZZZZZ1	PSM/LP	AS	Surface water abstraction, licensed	SO/040/0001/001/R01	Within 500m of the boundary	N	17/07/2019	567455	173992	Thames and Medway Canal Area	Pumping and abstraction from the ditch further north	No	Abstraction volumes to be provided	N/A	N/A	N/A	N/A	Unknown	N/A	N/A	Unknown	Pump outlet. When in use 100mm higher than normal water level at that point. Points won't work if levels are too low in the dyke.	-
HE540039-CJV-EWE-ZZZ-AS-1SZZZZZ2	PSM/LP	AS	Surface water abstraction, licensed	SO/040/0001/001/R01	Within 500m of the boundary	N	17/07/2019	567480	174084	Thames and Medway Canal Area	Pumping / abstraction from here to top up the canal	No	Very slow - flow towards the north	N/A	N/A	N/A	N/A	Ditch	Dense vegetation on banks. Bed not visible	Unknown	Unknown	Weir and pump area. Level dropped "1 foot" (approx 30cm) between Aug and Nov 18. Will let us know approx vols.	-
HE540039-CJV-EWE-ZZZ-AS-1SZZZZZ3	LD/PSM	AS	Surface water abstraction, licensed	01/150/R01	Within 500m of the boundary	N	Mar-20	568022	174370	Thames and Medway Canal Area	Environmental, Remedial River/Wetland Support, Make-Up Or Top Up Water	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Surface Waters, AREA, AREA 1, DITCHES AT SHORNE MARSHES, Max Yearly Abstraction Volume m3=244799Max Daily Abstraction Volume m3=2160	Licence Holder Name The Royal Society for the Protection of Birds

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes	
HE540039-CJV-EWE-ZZZ-AS-1SZZZ4	LD/PSM	AS	Surface water abstraction, licensed	01/150/R01	Within 500m of the boundary	N	Mar-20	568022	174370	Thames and Medway Canal Area	Environmental, Remedial River/Wetland Support, Make-Up Or Top Up Water	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Surface Waters, AREA, AREA 1, DITCHES AT SHORNE MARSHES RSPB RESERVE, Max Yearly Abstraction Volume m3=244799Max Daily Abstraction Volume m3=2160	Licence Holder Name The Royal Society for the Protection of Birds	
HE540039-CJV-EWE-ZZZ-AS-1SZZZ5	LD/PSM	AS	Surface water abstraction, licensed	01/150/R01	Within 500m of the boundary	N	Mar-20	568113	173966	Thames and Medway Canal Area	Environmental, Remedial River/Wetland Support, Make-Up Or Top Up Water	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	GW Source, Southern Region Surface Waters, AREA, AREA 1, DITCHES AT SHORNE MARSHES, Max Yearly Abstraction Volume m3=244799Max Daily Abstraction Volume m3=2160	Licence Holder Name The Royal Society for the Protection of Birds	
HE540039-CJV-EWE-ZZZ-CN-1S05ZZZ1	BC	CN	Surface waterbody, canal (artificial linear waterway)	N/A	Within 500m of the boundary	N	13/09/2017	567297	173998	Thames and Medway Canal Area	Other	Yes	0.1	8.77	14.6		130	14046	Other (specify in notes)	Grass, reeds, brambles	10	Unknown	Canal. Footbridge with stone bank. Natural bank along the canal with a lot of vegetation. Hydraulic structure only where the footbridge is. No access to the bank because of vegetation and danger.	Unknown
HE540039-CJV-EWE-ZZZ-CN-1SZZZZ1	PSM/LP	CN	Surface waterbody, canal (artificial linear waterway)	SO/040/0001/001/R01	Within 500m of the boundary	N	17/07/2019	567578	173956	Thames and Medway Canal Area	Canals and dams, now used for general recreation	Yes	No flow observed	8.95	24.5	228.4	4908	Clay lined have been historical leaks but none known now	Clay lined. Unknown thickness. Fields in south have drains that are present beneath the canal. No connection between canal and field drains. Banks comprise occasional gabions but generally covered with vegetation	20m approx	0	Thames and Medway Canal. Dams used in the war to bend timber and latterly to find out where leaks would be. Clay lined, less leaks now. Location of leaks unknown. Pumps at night and at set times at night. 3.72mood water level. Max 2m deep but ave 1.5m. C	-	
HE540039-CJV-EWE-ZZZ-CN-1SZZZZ2	PSM/LP	CN	Surface waterbody, canal (artificial linear waterway)	N/A	Within 500m of the boundary	N	17/07/2019	566422	174136	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Thames and Medway Canal. Western end of canal. Built over in 1970 for the construction of new industrial units. Canal association want to reopen it.	-	
HE540039-CJV-EWE-ZZZ-DI-1N07ZZZ1	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	19/09/2017	567324	176446	North Portal and Tibury Marshes	Marshes drainage/Agricultural	No	dry	dry	dry	dry	dry	no access	no access	no access	Unknown	Manmade ditch to drain water from landfill. No water present during survey. Full of reeds and weeds. Access only in the northern parts.	-	
HE540039-CJV-EWE-ZZZ-DI-1N09ZZZ1	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	15/09/2017	565851	179965	Chadwell St. Mary and Linford	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	2	Unknown	Dry ditch along agriculture lands	-	
HE540039-CJV-EWE-ZZZ-DI-1N09ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	564561	180770	A13 Junction	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown	0.6	Unknown	Drainage ditch between culture field and horse park.	Dry ditch. No sampling.	
HE540039-CJV-EWE-ZZZ-DI-1N11ZZZ1	PSM	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	08/10/2019	565178	181173	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Aerial imagery shows feature is a ditch or stream	Desk study	
HE540039-CJV-EWE-ZZZ-DI-1N11ZZZ1	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	565178	181173	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	No description available but surveyed	Difficult access	
HE540039-CJV-EWE-ZZZ-DI-1N11ZZZ2	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	562583	181334	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-DI-1N11ZZZ2	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	562577	181455	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-DI-1N11ZZZ2	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	562563	181612	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown brambles and nettles	0.7	1	Dry drainage ditch. Overgrown. Bushes.	-	
HE540039-CJV-EWE-ZZZ-DI-1N11ZZZ2	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	19/09/2017	562503	181708	A13 Junction	Agricultural	Yes	0	7.48	14.2	48	1006	Unknown	Overgrown grasses and ivy.	0.5	0.8	Overgrown drainage ditch along a track. Bushes and trees on both banks. Water depth <0.15m.	-	
HE540039-CJV-EWE-ZZZ-DI-1N11ZZZ3	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	561698	181259	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-DI-1N11ZZZ3	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	561851	181307	A13 Junction	Unknown	No	0	N/A	N/A	N/A	N/A	Unknown	Overgrown	0.5	Unknown	Drainage ditch. Dry. Short section.	Dry ditch	
HE540039-CJV-EWE-ZZZ-DI-1N12ZZZ1	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	561040	183631	South Ockendon and NW Orsett	Unknown	No	0	N/A	N/A	N/A	N/A	Unknown	Reedy and overgrown brambles	1.2	0.6	Overgrown, very reedy stream leading to pond. Water at base but appears stagnant. Water depth <0.3m. Advised that this	Overgrown so no access to sample. Advised that surface water is pumped from area 3 to this channel and when full, overflows to fill pond to NW.	
HE540039-CJV-EWE-ZZZ-DI-1N12ZZZ1	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	561129	183855	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-DI-1N12ZZZ1	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	561183	183774	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Unable to access	
HE540039-CJV-EWE-ZZZ-DI-1N12ZZZ5	PSM	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	09/10/2019	560601	183203	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	09/10/19 No response after initial phone call and email	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZ10	PSM	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	328.0030281	N	24/10/2019	557963	183405	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	24/10/19 Route to pond through land where contact records unavailable	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ2	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	13/09/2017	558406	184652	North Ockendon and East Upminster	Drainage	No	dry	dry	dry	dry	dry	none observed	Very overgrown and grassy	1	Unknown	Dry overgrown section, ditch not clearly defined as so overgrown. Runs alongside field with M25 approx 20m to west. Grassy embankment between road and ditch.	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558513	184630	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558503	184491	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Could not access this section of field.	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	13/09/2017	558406	184652	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	2	0.6	No water. Overgrown ditch with lots of brambles and nettles. Similar to south side. Ditch between agricultural field and small wooded area.	-	

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558213	183930	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Unsure of access this area south of the road. Assumed the ditch is the same	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	13/09/2017	558299	184272	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Very overgrown and grassy	1	0.8	Dry overgrown section, ditch not clearly defined as so overgrown. Runs alongside field with M25 approx 20m to west. Grassy embankment between road and ditch.	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558337	184559	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Could not access this section of ditch. Assumed to be similar to other sections. Dry and overgrown.
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	13/09/2017	558281	184139	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	1	0.3	This section of the ditch is shallow, indistinct, dry and heavily vegetated. Medium sized stones (not naturally placed) provide the bed for westernmost 20-30m, then grassy as it goes alongside field. Manholes to the north of the ditch could indicate cul	Possible culvert from beneath M25 here? Crossing through this ditch, perpendicular. Could be leading into the attenuation pond.	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ3	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	558103	184278	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Ditch same throughout.
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ3	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	558037	184150	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ3	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	558184	184340	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Hedge, alluvium (agricultural field)	2	1.3	Dry ditch along the road and field, covered by hedge	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ3	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	558059	184221	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Ditch same as other sections, see this description.
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ3	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	558052	183783	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Could not access further down the road. Ditch assumed to be same as previous (northern) section.
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ3	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	558038	183979	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	As bed. Overgrown	1	0.7	Ditch extremely overgrown, cannot see water and therefore assumed dry. Ditch runs alongside road to fishing lake.	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ3	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	558043	184077	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ4	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	558242	184436	North Ockendon and East Upminster	Drainage	No	dry	dry	dry	dry	dry	unknown	Clay silt, slightly sandy and grass	1.5	Unknown	Overgrown dry ditch, embankment (~6m steep slope with small trees) on motorway side, other side is a fence.	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ4	MP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558242	184436	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Clay silt, slightly sandy and grass	1.5	0.4	Overgrown dry ditch, embankment (~6m steep slope with small trees) on motorway side, other side is a fence. Southern extent of ditch not surveyed due to access restrictions.	Photos of feature include a dry ditch, motorway embankment, the fence. Southern extent of ditch not surveyed due to access restrictions.	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ6	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	13/09/2017	558691	184657	North Ockendon and East Upminster	Unknown	Yes	0	6.75	14.9	30	802	Unknown	Somewhat overgrown but mostly silty mud.	2.5	0.6	Ditch alongside fields in slightly wooded area. Corner of ditch (south) has stagnant water less than 0.2m deep. Cannot see if this is hydraulically linked to fishing pond, appears not. Ditch dry in north. Pipe enters ditch but not clear where this origin	-	
HE540039-CJV-EWE-ZZZ-DI-1N14ZZZ7	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	558981	183211	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-DI-1N15ZZZ1	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	13/09/2017	558475	185357	North Ockendon and East Upminster	Drainage	No	dry	dry	dry	dry	dry	none observed	Overgrown trees	2	Unknown	Dry ditch at end of field within hedgerow.	-	
HE540039-CJV-EWE-ZZZ-DI-1N15ZZZ1	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	13/09/2017	558475	185357	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	2	1	Dry ditch at end of field within hedgerow.	Had to knock on flat 6 to gain access to field.	
HE540039-CJV-EWE-ZZZ-DI-1N15ZZZ2	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	13/09/2017	558453	185195	North Ockendon and East Upminster	Drainage	No	dry	dry	dry	dry	dry	unknown	dry soil	0.5	Unknown	Dry overgrown shallow ditch. Filled with nettles. Ditch not clearly defined.	-	
HE540039-CJV-EWE-ZZZ-DI-1N15ZZZ2	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	558453	185195	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	0.5	0.1	Dry overgrown shallow ditch. Filled with nettles. Ditch not clearly defined.	-	
HE540039-CJV-EWE-ZZZ-DI-1N17ZZZ11	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	25/07/2018	558454	189673	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	Dry ditch along the agriculture land.	-
HE540039-CJV-EWE-ZZZ-DI-1N17ZZZ11	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	558482	189371	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Seems wider than a ditch. On a land where the landowners don't want surveyor (not sure if the situation will evolve), need to survey ?
HE540039-CJV-EWE-ZZZ-DI-1N17ZZZ15	PSM/M/A	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	371.4267714	N	22/10/2019	556979	190312	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	Feature not seen however thick vegetation at point location suggests ditch present. Base map and other open source maps indicate presence of a ditch/watercourse.	-
HE540039-CJV-EWE-ZZZ-DI-1N17ZZZ16	PSM/M/A	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	476.089135	N	22/10/2019	556877	190280	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No feature visible	-
HE540039-CJV-EWE-ZZZ-DI-1N17ZZZ25	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	560422	182794	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-DI-1N17ZZZ28	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	25/07/2018	559056	187020	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	Dry ditch full of dense vegetation	-
HE540039-CJV-EWE-ZZZ-DI-1N18ZZZ1	SD	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	21/09/2017	566094	176953	North Portal and Tilbury Marshes	Industrial	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown	Unknown	Unknown	Unknown	Overgrown dry ditch between railway and field. Cannot see bed clearly as so overgrown but appears dry.	Only observed stretch of ditch within 500m buffer.
HE540039-CJV-EWE-ZZZ-DI-1S01ZZZZ2	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	24/07/2018	569369	169102	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	Dry man made ditch	-

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-DI-1S02ZZZ1	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	20/07/2018	565693	170264	A2/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	The ditch is dry and full of high vegetation.	-
HE540039-CJV-EWE-ZZZ-DI-1S05ZZ15	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	14/09/2017	567373	174047	Thames and Medway Canal Area	Other	Yes	0	7.8	13.3	87	2151	Other (specify in notes)	Grass, reeds, brambles	4	0	Pastoral land and drainage channels to either side. Weed, algae and grass growing in channel. Topography flat.	-
HE540039-CJV-EWE-ZZZ-DI-1S05ZZZ1	BC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	13/09/2017	567235	173719	Filborough and Shorne Marshes	Agricultural	Yes	0	7.03	14.6	5	990	Other (specify in notes)	Grass and vegetation over clay	2	1	Ditch covered with algae and pond weed. Pretty shallow ditch. Occasional pipes used to cross over. Between agricultural land and railway. Search for spring from the north to the southern part, no evidence of spring.	The southwest part is difficult to access because of the presence of agitated horses
HE540039-CJV-EWE-ZZZ-DI-1S05ZZZ2	BC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	13/09/2017	567433	173545	Filborough and Shorne Marshes	Agricultural	Yes	0	7.03	14.6	5	990	Other (specify in notes)	Overgrown and hedge	2	1	Ditch covered with algae and pond weed. Pretty shallow ditch. Occasional pipes used to cross over. Between agricultural land and railway. The west south part is difficult to access because of the presence of agitated horses. Search of spring from the north	-
HE540039-CJV-EWE-ZZZ-DI-1S05ZZZ3	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	14/09/2017	567717	174024	Thames and Medway Canal Area	Other	Yes	0	7.8	13.3	87	2151	Other (specify in notes)	Grass, reeds, brambles	4	0	Pastoral land and drainage channels to either side. Weed, algae and grass growing in channel. Topography flat.	Unknown
HE540039-CJV-EWE-ZZZ-DI-1S05ZZZ4	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	567631	174202	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-DI-1S05ZZZ4	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	14/09/2017	567773	174128	Thames and Medway Canal Area	Other	Yes	0	7.8	13.3	87	2151	Other (specify in notes)	Grass, reeds, brambles	4	0	Pastoral land and drainage channels to either side. Weed, algae and grass growing in channel. Topography flat.	Unknown
HE540039-CJV-EWE-ZZZ-DI-1S06ZZ10	BC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	13/09/2017	568190	173868	Thames and Medway Canal Area	Other	Yes	0.1	8.77	14.6	130	14046	Other (specify in notes)	Grass, reeds, brambles	10	9	Canal. Footbridge with stone bank. Natural bank along the canal with a lot of vegetation. Hydraulic structure only where the footbridge is. No access to the bank because of vegetation and danger.	-
HE540039-CJV-EWE-ZZZ-DI-1S06ZZZ1	BC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Part of a network that is within the OL	N	13/09/2017	568650	173596	Filborough and Shorne Marshes	Unknown	Yes	0	9.11	18.9	117	2713	Other (specify in notes)	Grass and reeds	2	0	Between pastoral fields. Some ditches are dry, some newly dry and some wet. Ditches roughly 2.5m, up to approx 1m depth. Algae small trees present on southern ditches. Algae reeds and small bushes on the rest. Sample taken at southern pond. Topography flat until the London road then little hill toward the road where we didn't see any springs	-
HE540039-CJV-EWE-ZZZ-DI-1S06ZZZ2	BC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	13/09/2017	567910	173619	Filborough and Shorne Marshes	Agricultural	Yes	0	9.4	18.2	140	1447	Other (specify in notes)	Grass, reeds and small bushes	2	1	Pastoral land and drainage channels to either side. Weed, algae and grass growing in channel. Small trees to northwest.	-
HE540039-CJV-EWE-ZZZ-DI-1S06ZZZ3	BC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Part of a network that is within the OL	N	14/09/2017	568626	174001	Thames and Medway Canal Area	Other	Yes	0	8	14.1	79	2703	Other (specify in notes)	Grass and reeds	4	0	Ditch, shallow, covered in reeds, between nature reserve including a herd of cattle.	Nature reserve
HE540039-CJV-EWE-ZZZ-DI-1S06ZZZ4	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	13/09/2017	568296	174053	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry ditch full of reeds	-
HE540039-CJV-EWE-ZZZ-DI-1S06ZZZ5	LTC	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	568135	174105	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-DI-1S06ZZZ5	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	14/09/2017	568172	174224	Thames and Medway Canal Area	Agricultural	Yes	0	8.4	13.7	123	1708	Other (specify in notes)	Grass, reeds	Unknown	Unknown	Dry ditch as well. On the west side all the ditches are dry. Sampled the little lake on the west side.	-
HE540039-CJV-EWE-ZZZ-DI-1S06ZZZ6	AJ	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	14/09/2017	568049	174245	Thames and Medway Canal Area	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry ditch in the middle of the range. Dry culvert full of grass	-
HE540039-CJV-EWE-ZZZ-DI-1SZZZZ2	PSM/LP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	17/07/2019	567494	174273	Thames and Medway Canal Area	Used to top up canal	No	Slow flow - towards Thames (north)	N/A	N/A	N/A	N/A	Unknown	Grass banks. Bed not visible	Approx 5m	Unknown	Main drain to canal. Unknown whether there is mixing with the estuary water. Level quite low.	-
HE540039-CJV-EWE-ZZZ-DI-1SZZZZ8	PSM/LP	DI	Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	N/A	Within OL	Y	17/07/2019	567526	174044	Thames and Medway Canal Area	Channel feeder	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Ditch. Coordinates approximate.	-
HE540039-CJV-EWE-ZZZ-MR-1N07ZZ20	LTC	MR	Surface waterbody, EA designated main river	n/a	Within OL	Y	20/09/2017	567630.16	176411.66	North Portal and Tilbury Marshes	Marshes drainage	Yes	no visible flow	7.6	12.8	7	3773	Culverts	Mud, grass, reeds	no access	Unknown	Between landfills, one of which maybe grazing land.	-
HE540039-CJV-EWE-ZZZ-MR-1N07ZZZ1	BC	MR	Surface waterbody, EA designated main river	N/A	Within OL	Y	19/09/2017	567263	176729	North Portal and Tilbury Marshes	Agricultural	Yes	0	7.97	12.4	59	4000	Unknown	Reeds, grass, trees landfill we think	Unknown	Unknown	No visible flow, shallow, full of vegetation, between landfills, apparently quicksand in area.	-
HE540039-CJV-EWE-ZZZ-MR-1N11ZZZ1	LTC	MR	Surface waterbody, EA designated main river	n/a	Within OL	Y	18/09/2017	562556	182797	South Ockendon and NW Orsett	Main River	Yes	no visible flow	6.83	13.8	60	821	unknown	Overgrown	1 to 2	Unknown	Overgrown river between two agricultural fields. Small pools of water at either side of crossing. No flow. Water <0.2 m	-
HE540039-CJV-EWE-ZZZ-MR-1N11ZZZ1	MP	MR	Surface waterbody, EA designated main river	N/A	Within OL	Y	18/09/2017	562673	182788	South Ockendon and NW Orsett	Agricultural	Yes	0	6.83	13.8	60	821	Unknown	Overgrown	2	2	Overgrown drainage ditch between two agricultural fields. Small pools of water at either side of crossing. No flow. Water <0.2m	Have not accessed pond to south of drain (all part of same feature)
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ1	MP	MR	Surface waterbody, EA designated main river	Unknown	Within OL	Y	Sep-17	561973	183482	South Ockendon and NW Orsett	Ditch	Yes	0.15	7.41	15.6	58	898	Unknown	Silty, sandy	3	0.5	Upstream sampling. Drainage ditch joining the river Mardyke.	Photos of feature include tributary (drainage ditch) and culvert connecting DI-1N17ZZZ4 to Mardyke river
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ1	MP	MR	Surface waterbody, EA designated main river	Unknown	Within OL	Y	Jul-18	562098	183952	South Ockendon and NW Orsett	Watercourse	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown	5	0.5	Main river Mardyke. Overgrown.	Sample and photo point for the Mardyke, not a new feature added. No access to the connection tributary/Mardyke river, overgrown, steep slope. Cannot see the water, so flow and depth are very approximate.
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ1	MP	MR	Surface waterbody, EA designated main river	Unknown	Within OL	Y	Jul-18	562056	184095	South Ockendon and NW Orsett	Watercourse	Yes	0.01	Unknown	Unknown	Unknown	Unknown	Unknown	Overgrown	4	0.4	River Mardyke. Along field. East embankment steeper and higher than West embankment. Connection of a tributary (drainage ditch).	Additional node for same feature ID. No access to sampling up and down stream. Too steep and overgrown.
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ1	MP	MR	Surface waterbody, EA designated main river	Unknown	Within OL	Y	Jul-18	561994	183570	South Ockendon and NW Orsett	Watercourse	Yes	0.15	Unknown	Unknown	Unknown	Unknown	Unknown	Overgrown	5	0.5	Overgrown river. Very slow flow.	Mardyke river's photo within the solid red lines. No access for sampling.
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ1	LTC	MR	Surface waterbody, EA designated main river	n/a	Within OL	Y	14/09/2017	561968	183483	South Ockendon and NW Orsett	Main River	Yes	0.2	7.3	14.4	42	1012	unknown	Silty, sandy	1 to 5	Unknown	Main river flowing. Stream and ditch connected to it. Adjacent agricultural land is elevated 4-5 m above the river.	-
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ1	MP	MR	Surface waterbody, EA designated main river	N/A	Within OL	Y	14/09/2017	561658	182543	South Ockendon and NW Orsett	Unknown	Yes	0.2	7.28	14.4	42	7.28	Unknown	Overgrown and hedge	5	2	Main river flowing S. Stream and ditch connected to it. Lands around are 4-5m up from the river.	Sampling downstream tributary connection. Attempted to sample before and after each tributary but access very difficult. Only surveyed stretch within buffer.
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ2	LTC	MR	Surface waterbody, EA designated main river	n/a	Within OL	Y	18/09/2017	562343	183490	South Ockendon and NW Orsett	Main River	Yes	0.005	7.99	15.2	79	1095	Culvert	Grass and weeds	1 to 3	Unknown	River between fields. Flowing west to Mardyke river. Short culvert section beneath bridge crossing prior to confluence with Mardyke.	-



Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes	
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ2	MP	MR	Surface waterbody, EA designated main river	N/A	Within OL	Y	18/09/2017	562980	183409	South Ockendon and NW Orsett	Agricultural	Yes	0.005	7.99	15.2	79	1095	Other (specify in notes)	Overgrown grass.	3	1	Drainage ditch between fields. Estimated flow at 0.005m <sup>3</sup> /s, flowing W to Mardyke river. Short culvert section beneath bridge crossing prior to confluence with Mardyke.	-	
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ3	LTC	MR	Surface waterbody, EA designated main river	n/a	Within 500m of the boundary	N	19/09/2017	562770	184214	South Ockendon and NW Orsett	Main River	Yes	0.003	7.84	12.4	63	1068	none observed	Mud, clay, silt	2		Stream within hedgerows flowing to the west, used as drainage between two fields. Connecting to the Mardyke river. Water depth of around 0.1 m across length.	-	
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ4	LTC	MR	Surface waterbody, EA designated main river	n/a	Within OL	Y	12/09/2017	561793	185129	North Ockendon and East Upminster	Main River	Yes	0.5	7.51	16.9	70	496	Large squared concrete culvert	Concrete initially then overgrown	1 to 2		Water depth around 0.2-0.3m throughout channel.	Three inflows, two from ordinary watercourses and third from large square concrete culvert beneath golf course. Channel is concrete and wide (2m) for first few metres then quickly becomes narrower, natural and overgrown with overhanging trees and bed wit.	-
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ4	SD	MR	Surface waterbody, EA designated main river	N/A	Within OL	Y	12/09/2017	558269	186563	North Ockendon and East Upminster	Unknown	Yes	0.5	7.5	17.8	80	759	Unknown	Grassy with areas of overhanging branches	1.3	1	Steady flowing stream with reedy clusters and overhanging branches. Water depth less than 0.1m.	-	
HE540039-CJV-EWE-ZZZ-MR-1N17ZZZ4	SD	MR	Surface waterbody, EA designated main river	N/A	Within OL	Y	12/09/2017	558693	186567	North Ockendon and East Upminster	Unknown	Yes	0.5	7.51	16.9	70	496	Other (specify in notes)	Concrete initially then overgrown	2	2	Three inflows- two from ordinary watercourses and third from large square concrete culvert beneath golf course. Channel is concrete and wide (2m) for first few metres then quickly becomes narrower, natural and overgrown with overhanging trees and very re	Entrance is large concrete structure with gate across originating from beneath the golf course.	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ10	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	21/09/2017	567190	177300	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry drainage ditch. Ground became damp towards the ponds, 100m to the North.	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ11	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	21/09/2017	567161	178045	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Brambles, reeds and grass	Unknown	Unknown	Dry ditch.	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ20	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	217.1368184	N	08/10/2019	568355	178361	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 No access	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ21	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	369.6276793	N	08/10/2019	568862	178188	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 No response from land agent	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ22	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	386.22653	N	08/10/2019	569348	178055	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 No response from land agent	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ21	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	569130	176545	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ21	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	568984	176320	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ22	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	26/07/2018	568876	176488	North Portal and Tilbury Marshes	Unknown	Yes	Unknown	7.99	22.5		44862	Unknown	Unknown	Unknown	Unknown	Ditch connected to the moat with a pipe. Higher EC than the moat. This measurement has been taken close to the moat.	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ23	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	08/10/2019	568940	177344	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/2019 Contact details not available	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ24	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	21/09/2017	568552	176675	North Portal and Tilbury Marshes	Agricultural	Yes	0	7.56	14.5	80	16368	Unknown	Muddy	Unknown	Unknown	Ditch man made full of reeds. Dry at the moment. Water appeared a few meters further. Quite deep ditch at least more than average	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ25	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	20/09/2017	568104	176909	North Portal and Tilbury Marshes	Agricultural	Yes	0	8.1	13.2	34	14567	Unknown	Mud	Unknown	Unknown	Very standard drainage ditch with a lot of vegetation shallow water not easy to access	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ26	LTC	OW	Surface waterbody, ordinary watercourse	N/A	Within 500m of the boundary	N	19/09/2017	568075	176594	North Portal and Tilbury Marshes	Marshes drainage	Yes	no visible flow	8.47	17.1	200	7040	No	Mud, grass	no access	Unknown	Pastoral land, streams, landfill and arable land.	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ27	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	20/09/2017	567630	176765	North Portal and Tilbury Marshes	Marshes drainage	Yes	no visible flow	7.67	11.9	15	2946	No	Mud, grass, reeds	no access	Unknown	Virtually dry drainage ditch along path/small road and neighbouring pastoral land and landfill.	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ27	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	20/09/2017	567630	176765	North Portal and Tilbury Marshes	Agricultural	Yes	0	7.67	11.9	15	2946	Cuvert	Grass and reeds	Unknown	Unknown	Drainage along path/small road and neighbouring pastoral and landfill. Dry after a few meter	-	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ28	BC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	19/09/2017	567631	176448	North Portal and Tilbury Marshes	Agricultural	Yes	Unknown	7.6	12.8	7	3773	Unknown	Reeds, grass and trees	Unknown	Unknown	Between landfills, one of which maybe grazing land. Landfill towards power station is raised by 4m.	South estuary ph 7.85 temp 17.4 do 70'ec 338731!	
HE540039-CJV-EWE-ZZZ-OW-1N07ZZ29	BC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	21/09/2017	567249	177207	North Portal and Tilbury Marshes	Agricultural	No	0	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	Dry ditch. No sign of water along the ditch. Between arable and landfill.	Ditch which is dry.	
HE540039-CJV-EWE-ZZZ-OW-1N09ZZ21	BC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	15/09/2017	566814	179295	Chadwell St. Mary and Linford	Unknown	Yes	0.08	8.3	14.8	97	596	Unknown	Trees and plants	1	0	Stream between pond and pastoral land. Reasonable flow rate. Occasional bit of rubbish.	-	
HE540039-CJV-EWE-ZZZ-OW-1N09ZZ25	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	306	N	08/10/2019	567667	179704	Chadwell St. Mary and Linford	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Contact details not available	-	

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes	
HE540039-CJV-EWE-ZZZ-OW-1N11ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	19/09/2017	563494	182086	A13 Junction	Unknown	Yes	0	7.64	14.3	62	855	Unknown	Overgrown brambles.	1	1	Mostly dry ditches. Short sections of ditches alongside agricultural fields. Stagnant water at corner opposite house, approx 0.3m deep.	Changed from moat to ditches	
HE540039-CJV-EWE-ZZZ-OW-1N11ZZZ2	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	19/09/2017	561877	181977	South Ockendon and NW Orsett	Unknown	No	0	N/A	N/A	N/A	N/A	Unknown	Very overgrown	1	1.2	Overgrown ditch between two fields. Almost entirely dry. One small puddle with <0.1m water.	-	
HE540039-CJV-EWE-ZZZ-OW-1N11ZZZ2	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	561806	182174	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Where within 500m buffer, ditch as HE540039-CJV-EWE-ZZZ-OW-1N11ZZZ4	-	
HE540039-CJV-EWE-ZZZ-OW-1N11ZZZ5	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	188.6447872	N	09/10/2019	561622	182462	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	09/10/19 No response after initial phone call and email	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZ10	PSM/LH	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	441.2677579	N	08/10/2019	558037	183266	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Waiting for email response	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	15/09/2017	559661	183797	South Ockendon and NW Orsett	Mardyke Tributary	No	dry and muddy	dry and muddy	dry and muddy	dry and muddy	dry and muddy	dry and muddy	unknown	Overgrown hedges	0.6	Unknown	Series of wet muddy depressions in wooded area. Linked with 30cm diameter pipe beneath track	-
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	559813	183823	South Ockendon and NW Orsett	Agricultural	Yes	0	7.32	13.2	25	904	Unknown	Overgrown and hedge	2	0.4	Drainage of field with hedge on sample S side	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	559975	183833	South Ockendon and NW Orsett	Unknown	No	0	N/A	N/A	N/A	N/A	Unknown	Very overgrown brambles.	1	0.4	Heavily overgrown ditch. Very difficult to access, dense brambles on both banks and ditch filled with nettles.. Could not see water therefore assumed dry.	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	559901	183924	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Hedge on E side and grass/field on W side	1.5	1.5	Ditch along field and wood	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	559868	184058	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	See description and photos of southern section of ditch.	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	560046	183831	South Ockendon and NW Orsett	Unknown	No	0.1	N/A	N/A	N/A	N/A	Unknown	Very overgrown-brambles	1	0.4	Stream flowing east with densely vegetated and overgrown banks.	Flowing E. Unable to get close enough to sample or see bed material.	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	558464	183535	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	No description available but surveyed	Landowner - Ingrebourne Valley - Access permission pending. Not owned by Ingrebourne valley. Unsure of owner.	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	558621	183588	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Advised that this area is owned by Ingrebourne Land however met with Chris Stock and not owned by Ingrebourne valley. Unsure of owner. Have not visited.	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	558814	183651	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Could not safely access this section of ditch from the east. Overgrown and deep ditches to cross. Cannot see evidence of a ditch from what we can see from opposite field.	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	559955	183920	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	0.6	0.3	Series of wet muddy depressions in wooded area. Linked with 30cm diameter pipe beneath track.	Unable to find ditch in location given. Found series of muddy patches/ditches have assumed these make up the indicated ditch and have moved feature. Photos have not uploaded	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	560144	183850	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Within Veolia land- unable to access	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	560381	183921	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Could not access from Veolia land and blocked by fence from land to north.	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	561191	184218	South Ockendon and NW Orsett	Agricultural	Yes	0	7.87	15.6	70	1037	Unknown	Overgrown and hedge	2.3	1.8	Highly vegetated overgrown drainage ditch between two agricultural fields. Not easy to access but areas we can see contain shallow stagnant water (<0.2m).	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560541	183954	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown grasses	1.5	0.6	Dry heavily vegetated drainage ditch.	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560857	183995	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	15/09/2017	559240	183716	South Ockendon and NW Orsett	Unknown	Yes	0	6.99	10.3	30	1230	Unknown	Steep, brambles and grasses	2.4	1.3	Man made steep sided drainage ditch between two agricultural fields, hedges on southern side. Mostly overgrown but recently trimmed. Approx 0.2m depth of stagnant water in ditch. Some areas dry. More overgrown and less defined in second field (to west)	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	559661	183797	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown hedges	1.4	0.7	This part of the ditch is dry. Similar to before, heavily overgrown. Ditch beneath hedgerow in photos.	-	

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	15/09/2017	559583	183929	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	Man made drainage ditch alongside agricultural field. Dry. Becoming more overgrown to the south, filled with hedges	-	
HE540039-CJV-EWE-ZZZ-OW-1N13ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	558900	183714	South Ockendon and NW Orsett	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Very overgrown. Hedgerow on one bank.	1	0.8	Small, dry and very overgrown drainage ditch between two agricultural fields.	-	
HE540039-CJV-EWE-ZZZ-OW-1N14ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	557536	184866	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-OW-1N14ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	20/09/2017	557615	184737	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	3	Unknown	Series of wide dry ditches/ponds between two fields. Narrow pond area in the middle, connected to drainage ditch on NE.	Dry pond connected to dry drainage ditch on NE (out off buffer zone).	
HE540039-CJV-EWE-ZZZ-OW-1N15ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	12/09/2017	558020	185683	North Ockendon and East Upminster	Mardyke Tributary	No	dry	dry	dry	dry	dry	unknown	Hedge on one bank, grassy slope on other	1.5	Unknown	Dry overgrown grassy ditch between areas of golf course.	-	
HE540039-CJV-EWE-ZZZ-OW-1N15ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558262	186011	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	No photos taken as difficult to access through thick hedgerow. Dry ditch.	
HE540039-CJV-EWE-ZZZ-OW-1N15ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558193	186237	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Dry ditch.	
HE540039-CJV-EWE-ZZZ-OW-1N15ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558216	186181	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	As bed. Hedge on one bank, grassy slope on other.	1.5	0.5	Dry overgrown grassy ditch between areas of golf course.	-	
HE540039-CJV-EWE-ZZZ-OW-1N15ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	557987	185657	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	As bed.	0.8	0.5	Overgrown dry ditch within sparsely wooded area. Entire ditch is dry, becoming less overgrown further north.	-	
HE540039-CJV-EWE-ZZZ-OW-1N15ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558016	185679	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-OW-1N15ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	12/09/2017	558066	185727	North Ockendon and East Upminster	Unknown	No	0	N/A	N/A	N/A	N/A	Unknown	Hedgerow on one bank, wooded area along other.	1.8	0.5	Dry ditch between hedgerows and trees.	-	
HE540039-CJV-EWE-ZZZ-OW-1N15ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	558191	185847	North Ockendon and East Upminster	Unknown	No	0	N/A	N/A	N/A	N/A	Unknown	Hedges.	2	1	Dry ditch. Dry across whole length. One bank comprises hedgerow alongside path, other is wooded/overgrown.	Could not get clear photo through hedge.	
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	14/09/2017	561949	184447	South Ockendon and NW Orsett	Mardyke Tributary	No	not measured	Water sampled closer to the main river	Water sampled closer to the main river	Water sampled closer to the main river	Water sampled closer to the main river	none observed	Grass banks.	not measured	Unknown	Unknown	Mardyke tributary, no water sample on that branch.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	562323	184555	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-	
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ2	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	08/10/2019	560276	185022	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	08/10/19 Greater than 500m from Order Limits	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ5	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	199.2552561	N	10/10/2019	559111	188356	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	10/10/19 Emailed with locations - land agent has responded but decision to allow survey with landowner. No response from landowner	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ5	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	559111	188356	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	No description available but surveyed	Mardyke tributary. On a land where the landowners don't want surveyor (not sure if the situation will evolve), need to survey ?	
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ5	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	10/10/2019	558557	188955	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unknown	10/10/19 Emailed with locations - land agent has responded but decision to allow survey with landowner. No response from landowner	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ5	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	558405	189056	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	No description available but surveyed	Mardyke tributary. On a land where the landowners don't want surveyor (not sure if the situation will evolve), need to survey ?	
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ5	PSM/MA	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	16/07/2019	558430	186544	North Ockendon and East Upminster	Natural river	No	Unknown	N/A	N/A	N/A	N/A	Unknown	High vegetation	Unknown	Unknown	Water level very low. Cannot see it.	-	
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ5	PSM/MA	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	16/07/2019	558662	186540	North Ockendon and East Upminster	Natural river	No	Slow flow	N/A	N/A	N/A	N/A	Ditches to the north	Highly vegetated bank. Bed unknown. Water translucent.	Approx 1m	Unknown	Depth of river bed from base of bridge is 2.64m. High water level 1.45m. River fairly dry and highly vegetated. Bank to bank 7.6m wide.	-	
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	18/09/2017	562526	183099	South Ockendon and NW Orsett	Ditch	Yes	Unknown	7.44	15.5	130	999	Unknown	Clayey mud	2.5	2.6	Sample point for ditch. Approx 1m width steep sided ditch then shallow sided and grassy for next 3m. No flow. Water 0.1m deep	-	

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	562495	183181	South Ockendon and NW Orsett	Ditch	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Confluence of two ditch channels. Water in both no flow	Additional note for photo of same ID. No sample taken.
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	562379	183487	South Ockendon and NW Orsett	Watercourse	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Additional note for photo of same ID.
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	562512	183208	South Ockendon and NW Orsett	Ditch	Yes	Unknown	7.27	19.6	174	960	Unknown	Clayey silt	2.5	2.5	NE/SW running branch of ditch. <0.2m stagnant water at base.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	18/09/2017	562465	182925	South Ockendon and NW Orsett	Unknown	Yes	no visible flow	7.58	14.8	74	900	Culvert	Grass and weeds	1 to 3	Unknown	Very overgrown drainage ditch. Short (<5 m) culvert beneath crossing. Stagnant water either side of culvert. Other areas of east to west running ditch are overgrown.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560391	182891	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	561020	183366	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Where visible, appears to be overgrown ditch with no water.	Ditch on opposite side of fence. Cannot access.
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560939	183031	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	Dry overgrown drainage ditch alongside either side road.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560962	182922	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	0.6	Unknown	Dry overgrown vegetated drainage ditches alongside road.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560913	183068	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	0.5	0.3	Small shallow overgrown ditch. Dry. See photo of feature to north. Same feature.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560897	183110	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	As ditch to north.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560925	183027	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	See description of feature to north.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560874	183167	South Ockendon and NW Orsett	Unknown	No	0	N/A	N/A	N/A	N/A	Unknown	Grassy	Unknown	Unknown	Very shallow drainage by side of road. Dry	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	560881	183183	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown grasses	0.5	Unknown	Dry overgrown ditch alongside road. Reedy base but no water.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ1	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	18/09/2017	562455	183043	South Ockendon and NW Orsett	Agricultural	Yes	0	7.58	14.8	74	900	Culvert	Very overgrown grass and weeds	3	2	Very overgrown drainage ditch. Short (<5m) culvert beneath crossing. Stagnant water either side of culvert. Other areas of east/west running ditch are so overgrown cannot see if any water is here. Stagnant water is <0.5m	This description refers to E/W running section of ditch. Other branches of ditch have been recorded as points.
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ2	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	561928	182984	South Ockendon and NW Orsett	Agricultural	Yes	0	7.62	13	69	1236	Unknown	Overgrown and hedge	3	2	Steep sided drainage ditch between two agricultural fields. Stagnant ~0.2m water at bottom. Very overgrown. Assumed runs length of field but unable to confirm.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ4	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	12/09/2017	557976	186374	South Ockendon and NW Orsett	Mardyke Tributary	Yes	no visible flow	7.27	14.8	60	833	unknown	Same as bed-overgrown	0.6	Unknown	Mostly dry overgrown ditch. Some areas of shallow stagnant water (<0.1 m deep).	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ4	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	561746	183451	South Ockendon and NW Orsett	Agricultural	Yes	0	7.59	12.6	66	856	Other (specify in notes)	Overgrown and hedge	2	0.3	Ditch bed overgrown (reeds, grass), stagnant surface waters	Next to crossing field (culvert of 7m).
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ4	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	561873	183471	South Ockendon and NW Orsett	Agricultural	Yes	0.05	7.77	13.2	83	853	Culvert	Overgrown and hedge	1	0.2	Open ditch joining the main river by E, a pipe (3-4m length) leading the drain to the river (pic 3)	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ4	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	12/09/2017	557851	186130	South Ockendon and NW Orsett	Unknown	Yes	0	N/A	N/A	N/A	N/A	Unknown	Very overgrown with brambles.	0.6	1	Entirely overgrown ditch between two fields. Where bed is visible, the ditch is dry. Banks appear steep.	Dimensions are estimates as cannot clearly identify ditch amongst brambles.
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ4	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	13/09/2017	557700	186080	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	As bed. Overgrown.	0.8	0.5	Dry shallow ditch in sparsely wooded area overgrown with ivy and nettles.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ4	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	12/09/2017	558110	186298	South Ockendon and NW Orsett	Unknown	Yes	0	7.27	14.8	60	833	Unknown	Same as bed-overgrown	0.6	0.5	Mostly dry overgrown ditch. Some areas of shallow stagnant water (<0.1m deep).	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ5	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	562566	183817	South Ockendon and NW Orsett	Unknown	No	no visible flow	dry	dry	dry	dry	unknown	Grass and weeds	1	Unknown	Dry drainage ditch. Connecting to the river Mardyke. No access to the river for sampling, overgrown and steep embankment.	-

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ5	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	12/09/2017	558226	186400	South Ockendon and NW Orsett	Unknown	Yes	0	7.81	19.6	151	870	Culvert	Grassy, shallow slope	1	0.5	Grassy ditch through golf course. Channel is only open for approx 20m from 1N15ZZZ1. Culverted in a 0.5m diameter pipe prior to becoming an open channel. Open channel is very reedy with lots of algae. Mostly dry with some stagnant water (<0.3m deep) in s	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ6	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	15/09/2017	561423	183623	South Ockendon and NW Orsett	Mardyke Tributary	No	dry	dry	dry	dry	dry	none observed	Overgrown hedges	2	Unknown	Ditch between two agricultural field, half of the ditch is covered by a hedge	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ6	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	561733	183618	South Ockendon and NW Orsett	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	1.5	0.75	Ditch between two agricultural field, half of the ditch is covered by a hedge (pic 2)	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ6	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	561757	183815	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	1.5	1.5	As rest of ditch, dry and grassy. Overgrown bed. Culverted beneath path.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ6	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	561604	183709	South Ockendon and NW Orsett	Unknown	Yes	0	6.99	12.1	36	1604	Culvert	Grassy, overgrown.	3	2	Ditch between two fields. Some stagnant water, <0.3m deep, overgrown banks. Short culvert section beneath track at western end of ditch, before end. Pipe around 30cm diameter. Ditch becomes more overgrown and dry to the east.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ6	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	561788	183800	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Grassy with overgrown areas	2	1	Same as previously, dry drainage ditch.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ6	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Jul-18	561432	183554	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Unable to access
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ6	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	561926	183884	South Ockendon and NW Orsett	Agricultural	Yes	0	6.81	13.5	23	778	Unknown	Grassy with some small hedges	2	2	Overgrown mostly dry drainage ditch between two agricultural fields. Mostly filled with grasses. Some small pools of stagnant water along ditch. Water <0.1m deep where noted.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ8	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	562176	184241	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ9	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	14/09/2017	561717	184028	South Ockendon and NW Orsett	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Grassy.	1.1	0.8	Small grassy drainage ditch between two agricultural fields. Dry.	-
HE540039-CJV-EWE-ZZZ-OW-1N17ZZZ9	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	Sep-17	561804	184249	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	566678	175607	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ1	BC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	20/09/2017	566674	175639	North Portal and Tilbury Marshes	Industrial	Yes	0	7.5	13.1	55	14200	Unknown	Grassy, reeds. Raised land.	Unknown	Unknown	Sickle shaped, man made ditch, landfill to east, unkept grass to west, also 4m raised to the west.	Salt water, factory? Drainage
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	566632	175715	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	566639	175724	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	566700	175543	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ1	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Jul-18	566654	175723	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ2	BC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	19/09/2017	566862	175836	North Portal and Tilbury Marshes	Agricultural	Yes	0	8.4	15	98	8100	Unknown	PFA and gravel	Unknown	Unknown	Shallow, reeds, probably used to drain water from surroundings, looks like a pit dug into peat material.	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ3	BC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	20/09/2017	566450	175889	North Portal and Tilbury Marshes	Agricultural	Yes	0	7.7	14.5	59	8700	Unknown	Grass and reeds	Unknown	Unknown	man made ditch, between road and landfill. Landfill is raised.	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ4	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	327.299969	N	17/10/2019	566339	175564	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	17/10/19 Aerial mapping shows a watercourse flowing to Thames. Remote access	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ6	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	20/09/2017	566710	176215	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Man made ditch full of reeds. Just a couple of centimetres of water so not enough for sampling. Surrounded by agricultural lands. Very low topography, difference of 4m.	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ7	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	20/09/2017	566217	176568	North Portal and Tilbury Marshes	Agricultural	Yes	0	7.9	13.5	65	3910	Unknown	Reeds, grass	Unknown	Unknown	Normal amount of reeds surrounded by agricultural lands shallow depth of water	-

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ8	BC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	19/09/2017	566675	176977	North Portal and Tilbury Marshes	Agricultural	Yes	0	8	13.3	66	2500	Culvert	Grass	Unknown	Unknown	Between arable lands, full of reeds grass and drainage pipes evident.	-
HE540039-CJV-EWE-ZZZ-OW-1N18ZZZ9	MP	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within OL	Y	21/09/2017	566355	177374	North Portal and Tilbury Marshes	Unknown	Yes	0	8.42	20.8	177	1517	Unknown	Overgrown and hedge	1	1	In NW -Dry ditch along road and fields with rubbish and debris. In NE, ditch is mostly dry with small area of stagnant water <0.1m deep. Sample taken here. (Last two photos).	Sample taken from small shallow stagnant puddle. Unlikely to be representative-ignore?
HE540039-CJV-EWE-ZZZ-OW-1N19ZZZ10	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	26/07/2018	565383	177167	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	At north point, dry overgrown and heavily vegetated ditch between road and field.	-
HE540039-CJV-EWE-ZZZ-OW-1N19ZZZ11	PSM/M/A	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	394.4107799	N	22/10/2019	565319	175732	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	22/10/19 Aerial mapping shows that feature is a drainage ditch on an agricultural field. Unable to confirm whether it was natural or in use.	-
HE540039-CJV-EWE-ZZZ-OW-1N19ZZZ13	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	141.0918961	N	11/10/2019	565767	176392	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	11/10/19 Email response. Watercourse will be backfilled under Tilbury 2 proposals	-
HE540039-CJV-EWE-ZZZ-OW-1N19ZZZ4	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	11/10/2019	565480	176368	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	11/10/19 Email response. This is a water course ? not pond. In any case will be retained. Natural watercourse.	-
HE540039-CJV-EWE-ZZZ-OW-1N19ZZZ5	SD	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	565809	177210	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Surveyed at northern point. Dry ditch filled with reeds. Assumed agricultural drainage	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ15	PSM/M/A	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	442.3979308	N	23/10/2019	568346	170447	South Portal	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unable to directly access. Inferred to be dry due to feature at northern end of Shorne Woods also dry	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ17	PSM	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	104.0923492	N	17/10/2019	568513	171238	South Portal	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	17/10/19 Response from landowner states that the feature is a dry ditch which doesn't flow anywhere.	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ18	PSM/M/A	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	23/10/2019	568407.149	170596.575	South Portal	Dry brook	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Clay bank and bed	Approx 2.5m	Unknown	Dry brook	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ21	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	568368	170115	A2/M2	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Grass	Unknown	Unknown	Swamp at the moment, not enough water to sample.	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ21	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	568291	170138	A2/M2	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Other (specify in notes)	Grass	Unknown	Unknown	Swamp at the moment, not enough water to sample.	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ21	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	568284	170137	A2/M2	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Other (specify in notes)	Grass	Unknown	Unknown	Swamp at the moment, not enough water to sample.	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ21	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	568232	170173	A2/M2	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Other (specify in notes)	Grass	Unknown	Unknown	Dry ditch	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ21	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	568252	170170	A2/M2	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Other (specify in notes)	Grass	Unknown	Unknown	Dry ditch	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ22	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	568225	170165	A2/M2	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Other (specify in notes)	grass	Unknown	Unknown	Northern ditch fed by pond not accessible for sampling.	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ22	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	568228	170080	A2/M2	Unknown	No	0	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Not enough water to sample. Ditch gets drier further north.	-
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ22	LTC	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	Sep-17	568274	170013	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	Ditch fed by ponds. Nearly dry at this point. Full of mud and vegetation, too muddy for sample	Ditch appears fed by up stream pond according to map. Geology is London Clay Fm. Topographically high area.
HE540039-CJV-EWE-ZZZ-OW-1S04ZZ25	AJ	OW	Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	N/A	Within 500m of the boundary	N	18/09/2017	568233	170283	A2/M2	Agricultural	Yes	0	7.6	15.9	76	502	Other (specify in notes)	Grass	Unknown	Unknown	The ditch water flow is stopped by a dam, no water is flowing from the pond.	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZ10	PSM	PS	Surface waterbody, lake or pond	N/A	198	N	08/10/2019	567672	178390	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 No access	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZ11	PSM	PS	Surface waterbody, lake or pond	N/A	132	N	08/10/2019	568898	177945	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 No response from land agent	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZ12	PSM	PS	Surface waterbody, lake or pond	N/A	180	N	08/10/2019	568723	177974	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 No response from land agent	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZ13	PSM	PS	Surface waterbody, lake or pond	N/A	231.0410935	N	08/10/2019	568598	178281	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 No response from land agent	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZ15	SD	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	21/09/2017	566764	177507	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown brambles, reeds and trees	Unknown	Unknown	Small pond in corner of concrete farm area, banks completely overgrown and steep. Pond approx 5m x 7m in size. Water depth estimated at 0.5m	Unable to sample due to overgrown steep banks.
HE540039-CJV-EWE-ZZZ-PS-1N07ZZ16	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	Jul-18	567337	177494	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Full of thresher, dry	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZ17	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	Jul-18	567324	177507	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Very high carbon water too contaminated to sample but very shallow water. Very organic looking water. Muddy trees	-

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ1	BC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	21/09/2017	568518	176933	North Portal and Tibury Marshes	Other	Yes	0	8.43	15.1	100	2020	Unknown	Muddy	Unknown	Unknown	Topography very low compared to the fields around maybe 6 metres so probably groundwater fed. The access was quite difficult. The water is very muddy.	Small pond. Geology and topo maps suggest pond is possibly spring fed. Possibly head waters to OW Unknown probably nothing not really accessible
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ2	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	19/09/2017	567520	176450	North Portal and Tibury Marshes	Marshes drainage	No	no visible flow	dry	dry	dry	dry	No	Landfill	no access	Unknown	No waterbody. Now is landfill.	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ3	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	19/09/2017	567536	176589	North Portal and Tibury Marshes	Marshes drainage	No	no visible flow	dry	dry	dry	dry	No	Landfill	no access	Unknown	No waterbody. Now is landfill.	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ4	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	19/09/2017	567491	176691	North Portal and Tibury Marshes	Marshes drainage	No	no visible flow	dry	dry	dry	dry	No	Landfill	no access	Unknown	No waterbody. Now is landfill.	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ5	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	20/09/2017	567671	177027	North Portal and Tibury Marshes	Agricultural	Yes	0	8.03	12.8	24	14118	Unknown	Mud	Unknown	Unknown	Doesn't look like a pond but a drainage ditch which is a bit larger than usual.	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ6	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	20/09/2017	567468	177120	North Portal and Tibury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry and in the wood behind bushes	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ7	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	21/09/2017	567042	177825	North Portal and Tibury Marshes	Marshes drainage pond/Agricultural	Yes	no visible flow	7.48	14.1	117	973	Surface water abstraction	Bed: Sand; Bank: Mud, sand, grass	no access	Unknown	Substantial lake in the middle of Coles farmland. Might be groundwater fed as the topography is 3 metres lower than the ground. Sand all around. Around one metre drop from previous water level marks on the sand bank. Lake is used as a reservoir.	-
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ7	BC	PS	Surface waterbody, lake or pond	8/37/56°G/0006	Within OL	Y	19/09/2017	567001	177804	North Portal and Tibury Marshes	General Farming and Domestic	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Annually 182000. First visit. The lake appears to be groundwater fed and the abstraction is directly from the lake water. No borehole observed.	Irrigation Reservoir
HE540039-CJV-EWE-ZZZ-PS-1N07ZZZ7	GI team	PS	Surface waterbody, lake or pond	8/37/56°G/0006	Within OL	Y	14/05/2019	567001	177804	North Portal and Tibury Marshes	General Farming and Domestic	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Annually 182000. Second visit. This reservoir is a water supply for farming irrigation in times of drought.	Irrigation Reservoir
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ10	PSM	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	08/10/2019	567331	179899	Chadwell St. Mary and Linford	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Ornamental pond dry for over 20 years (correspondence received 17/08/19)	-
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ12	PSM	PS	Surface waterbody, lake or pond	N/A	78.92038537	N	18/10/2019	567746	180098	Chadwell St. Mary and Linford	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	18/10/19 Would not like a visit. Was a gravel pit.	-
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ13	PSM	PS	Surface waterbody, lake or pond	N/A	374.8515062	N	08/10/2019	567927	179839	Chadwell St. Mary and Linford	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Contact details not available	-
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ15	PSM	PS	Surface waterbody, lake or pond	N/A	482.8154317	N	08/10/2019	568161	180117	Chadwell St. Mary and Linford	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Contact details not available	-
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ21	SD	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	20/09/2017	566571	179420	Chadwell St. Mary and Linford	Unknown	Yes	0	7.77	15.3	117	803	Unknown	Reeds and marshy grass	Unknown	Unknown	Large shallow pond with occasional trees in centre. Water depth <0.5m throughout. Approx 5x20m in size.	-
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ22	PSM	PS	Surface waterbody, lake or pond	N/A	138.9463439	N	09/10/2019	566529	179898	Chadwell St. Mary and Linford	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	09/10/19 waiting for email response	-
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ23	AJ	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	15/09/2017	565285	180155	Chadwell St. Mary and Linford	Agricultural	Yes	0	7.25	12.7	18	643	Other (specify in notes)	Brambles, grass and reeds	Unknown	Unknown	Very reedy pond present on an agricultural land next to a main road.	-
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ24	MP	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	20/09/2017	564859	180399	A13 Junction	Unknown	Yes	Unknown	6.99	14.3	20	380.4	Unknown	Overgrown and hedge	Unknown	Unknown	Two ponds of water with low bank between. Water not hydraulically connected currently but would be given enough water. Around ponds, agricultural fields. Depth of water <0.2m.	-
HE540039-CJV-EWE-ZZZ-PS-1N09ZZ25	PSM/MA	PS	Surface waterbody, lake or pond	N/A	114.1297084	N	24/10/2019	564665	180327	A13 Junction	Ornamental natural pond	Yes	Recycled water from the pond	7.7	11.2	83.9	305.6	Jetty, pumped outfall	Banks lined with granite blocks. Bed material unknown due to opaque green water	37.55m approx	0	Landowner informs LTC that pond is natural. Koi carp present in pond	-
HE540039-CJV-EWE-ZZZ-PS-1N10ZZZ1	PSM/SB	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	18/07/2019	562521	180740	A13 Junction	Drainage	Yes	Unknown	7.14	18.4	32.6	745	Unknown	Bank materials grass and gravelly silt	22.5x10m	0	Surface water drainage ponds. Were natural but have been developed by landowners to alleviate surface flooding at the farm. No obvious in flows or out flows. Water levels relatively low compared to ground level	-
HE540039-CJV-EWE-ZZZ-PS-1N10ZZZ2	PSM	PS	Surface waterbody, lake or pond	N/A	272.4262285	N	08/10/2019	562414	180811	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 No access	-
HE540039-CJV-EWE-ZZZ-PS-1N10ZZZ3	PSM/SB	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	18/07/2019	562526	180717	A13 Junction	Drainage pond	Yes	Unknown	7.86	20.1	44.9	1221	Unknown	Bank materials grass and gravelly silt	18.4x4.5	0	Surface water drainage run off pond - no flow observed. feature ID.	-
HE540039-CJV-EWE-ZZZ-PS-1N11ZZ10	PSM	PS	Surface waterbody, lake or pond	N/A	499	N	09/10/2019	561287	182342	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	09/10/19 No response after initial phone call and email	-
HE540039-CJV-EWE-ZZZ-PS-1N11ZZ21	PSM/RS	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	15/07/2019	562552	181280	A13 Junction	Natural recharge	Yes	Recharge from groundwater	7.52	19.4	30.9	1237	Unknown	Bed: dark natural organic; bank: sandy clay, highly vegetated	9.8 x 13 (approx)	0	Recharge from groundwater. Used to have carps and moorhens. Fluctuates considerably. Up to 1m. Rounded pond. When drainage was installed to the south.	-
HE540039-CJV-EWE-ZZZ-PS-1N11ZZ22	PSM	PS	Surface waterbody, lake or pond	N/A	217	N	12/10/2019	563280	181791	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	12/10/19 Ornamental pond.	-
HE540039-CJV-EWE-ZZZ-PS-1N11ZZ23	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	19/09/2017	563261	182059	A13 Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Trees and mud	Unknown	Unknown	Dry pond between fields. Approx 5x7m in size.	-
HE540039-CJV-EWE-ZZZ-PS-1N11ZZ24	PSM	PS	Surface waterbody, lake or pond	N/A	134.0066997	N	08/10/2019	563184	183008	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Contact details not available	-
HE540039-CJV-EWE-ZZZ-PS-1N11ZZ210	PSM	PS	Surface waterbody, lake or pond	N/A	278.2956324	N	16/10/2019	560212	183036	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Waiting for email and phone call response	-
HE540039-CJV-EWE-ZZZ-PS-1N12ZZZ2	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Sep-17	560975	183812	South Ockendon and NW Orsett	Domestic	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	Man made storage for clean surface water runoff from area 3. Unable to go down to the lake to sample. Currently water is being pumped out so pond much smaller than shown. Once water is pumped out, this area is to be redeveloped within the next year and n	Reported that clean surface water runoff from Area 3 (to the west) is pumped into the stream to the south. When this is full, water spills into this depression. Previously contained clean surface water runoff. Currently water pumped out
HE540039-CJV-EWE-ZZZ-PS-1N12ZZZ4	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	20/09/2017	560861	183585	South Ockendon and NW Orsett	Domestic	Yes	0	7.56	15.3	65	1793	Unknown	Reeds	Unknown	1	Small pond at the end of stream. Approximately 5x8m in size. Approx 0.5-1m deep. Reedy edges but otherwise open. This pond is reportedly fed by the Mardyke and water extracted for dust suppression throughout the landfill.	Man made ponds fed by Mardyke used for dust suppression
HE540039-CJV-EWE-ZZZ-PS-1N12ZZZ5	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Sep-17	561117	183811	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Unable to get down to this area.
HE540039-CJV-EWE-ZZZ-PS-1N12ZZZ6	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	561081	183534	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Unable to access
HE540039-CJV-EWE-ZZZ-PS-1N12ZZZ7	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	20/09/2017	561029	183403	South Ockendon and NW Orsett	Unknown	Yes	0	7.97	12.4	72	672	Unknown	Overgrown vegetation	Unknown	Unknown	Small pond, approximately 0.5m deep water. Very overgrown, cannot see size.	Possibly spring fed? No channels feeding and advised level does not fluctuate.
HE540039-CJV-EWE-ZZZ-PS-1N12ZZZ8	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	560886	183426	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Could not access
HE540039-CJV-EWE-ZZZ-PS-1N12ZZZ9	PSM	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	16/10/2019	560371	183132	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Waiting for email and phone call response	-
HE540039-CJV-EWE-ZZZ-PS-1N13ZZZ1	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	14/09/2017	559991	183844	South Ockendon and NW Orsett	Unknown	No	no visible flow	dry	dry	dry	dry	unknown	Muddy, overgrown	no access	Unknown	Mostly dry overgrown and grassy pond. Small area of water, inaccessible. Banks thick with brambles, very difficult to access.	-
HE540039-CJV-EWE-ZZZ-PS-1N13ZZZ2	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	20/09/2017	559668	184031	South Ockendon and NW Orsett	Pond in a private garden	No	no access	no access	no access	no access	no access	no access	no access	no access	Unknown	Unable to access as pond is in a private back garden, fenced off	-
HE540039-CJV-EWE-ZZZ-PS-1N13ZZZ3	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	14/09/2017	559884	184044	South Ockendon and NW Orsett	Unknown	Yes	no visible flow	7.12	15.6	12.1	1159	unknown	Muddy, overgrown	Approx. 55	Depth unknown, estimated at 2 m.	Pond surrounded by high grass, reeds and trees. No special uses. Depth unknown, estimated at 2 m.	-

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-PS-1N13ZZ3	MP	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	14/09/2017	559895	184064	South Ockendon and NW Orsett	Unknown	Yes	0	7.12	15.6	121	1159	Unknown	Overgrown	55	2	Pond surrounded by high grass, reeds and trees. No special uses.	Depth unknown, estimated at 2m.
HE540039-CJV-EWE-ZZZ-PS-1N13ZZ4	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	14/09/2017	560449	184275	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown brambles and small trees	Unknown	Unknown	Dry depression in copse area, filled with broken trees and brambles. Does not appear to have been recently wet. At the corner of several agricultural fields. Approx 5x10m	-
HE540039-CJV-EWE-ZZZ-PS-1N13ZZ5	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	14/09/2017	559948	183871	South Ockendon and NW Orsett	Unknown	Yes	no visible flow	7.3	14.2	24	1110	unknown	Muddy, overgrown	Approx. 45	1	Pond within wooded area with algae across the surface.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ10	PSM	PS	Surface waterbody, lake or pond	N/A	342.4894358	N	08/10/2019	557751	183647	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Waiting for Letter response	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ11	PSM/SB	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	19/07/2019	558162	183576	South Ockendon and NW Orsett	Natural pond	Yes	Flow from ground, unknown rate	7.99	19.4	90.1	850	Unknown	Likely sand and gravels at base. Grass on east. Steep embankment to M25 on west	20x70m approx. depth approx 2m	0	Sump in house, go quite shallow. Main pond is gw fed. Dug ornamental pond at front of property.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ12	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	559499	184108	South Ockendon and NW Orsett	Unknown	No	dry	dry	dry	dry	dry	none observed	Nettles, overgrown	not measured	Unknown	Dry pond, full of nettles.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ13	PSM	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	16/10/2019	559058	184331	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Called landowner. Pond not there. Several surveys have been completed. Site going to be used as a depot.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ14	PSM	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	24/10/2019	559185.05	184556.3	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	24/10/2019 Unable to access. Likely in reference to feature to 91m to north west. North Ockendon Pk. Local Wildlife Site. Unable to visit due to access permissions	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ14	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	13/09/2017	558710	184811	North Ockendon and East Upminster	Unknown	Yes	no visible flow	7.13	16.3	62	619	unknown	Overgrown and boarded by trees in the north	not measured	Unable to estimate depth, likely to be around 1m or more.	Pond with slightly overgrown banks. Alongside road to Hall farm. Man made barrier between two sections of pond which are likely to be connected however no hydraulic structures such as culverts noted. Unable to estimate depth, likely to be around 1m or mo	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ20	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	557447	184882	North Ockendon and East Upminster	Amusement park lake	Yes	no visible flow	7.32	19.3	not measured	1234	unknown	Muddy	Not measured	Unknown	Amusement park lake. Full of algae.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ21	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	15/09/2017	558908	183685	South Ockendon and NW Orsett	Unknown	Yes	Unknown	7.57	11	52	851	Unknown	Overgrown reeds and brambles.	Unknown	Unknown	Pond between agricultural fields. 8mx5m in size. Water level fairly high. Banks entirely overgrown.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ22	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	13/09/2017	557941	183823	North Ockendon and East Upminster	Domestic	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Fishing lake with jetties around edge for fishing, trees periodically around banks. Approximate 100x150m. Bank reinforced with wooden beams. Depth unknown	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ23	MP	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Sep-17	558298	184116	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Heavily vegetated, field and made ground	30	2	Heavily vegetated likely surface water attenuation pond with shallow sides. Pipe leading in to shale bedded areas. Pipe approx 0.5m diameter leading from m25 side.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ24	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	13/09/2017	558768	184647	North Ockendon and East Upminster	Domestic	Yes	no visible flow	7.82	16.3	105	801	unknown	Grasses and reeds with some areas propped up	Approx. 10-15m wide and 80-100m long	Unknown depth (likely to be >1m).	Lake of unknown depth (likely to be >1m). Agricultural fields on two sides, wooded area to the north. Areas of bank propped up using wood and corrugated metal.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ25	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	13/09/2017	558737	184717	North Ockendon and East Upminster	Unknown	No	no visible flow	no access	no access	no access	no access	no access	Grassy and overgrown	Approx. 100m long and 10m wide	Depth unknown	Lake with grassy and overgrown banks backing onto houses on one side. Depth unknown. No access. No sample taken. Immediately north of above water feature.	Could not access directly as locked gate however could see clearly from road. No sample taken.
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ26	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	13/09/2017	558470	184662	North Ockendon and East Upminster	Unknown	Yes	no visible flow	6.31	16.4	60	154	unknown	Grassy	Approx. 10m long and 3m wide.	Unknown	Mostly dried up pond. Small area of shallow (<0.1m) stagnant boggy water in the east of the pond. Rest of pond is dry and with lots of reeds.	-
HE540039-CJV-EWE-ZZZ-PS-1N14ZZ27	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	21/07/2018	557756	184382	North Ockendon and East Upminster	Unknown	Yes	no visible flow	8.16	19.2	92	927	unknown	Silt and clay assumed	Approx. 50x100m	Assumed >1m	Reservoir for farm irrigation system. Note this feature is also shown as a groundwater feature since it receives spring water. Large lake with jetties around the edge. Agricultural land on one side and other big pond. Size estimated to be 50x100m. See ID	-
HE540039-CJV-EWE-ZZZ-PS-1N15ZZ1	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	14/09/2017	557920	185030	North Ockendon and East Upminster	Unknown	No	no visible flow	dry	dry	dry	dry	unknown	Overgrown with nettles	Approx. 10x15m	Unknown	Dry, vegetated pond with reeds in the centre.	-
HE540039-CJV-EWE-ZZZ-PS-1N15ZZ2	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	13/09/2017	558828	185579	North Ockendon and East Upminster	Unknown	No	no visible flow	dry	dry	dry	dry	unknown	Overgrown	not measured	Unknown	Dry pond overgrown with weeds and nettles alongside track between fields.	-
HE540039-CJV-EWE-ZZZ-PS-1N15ZZ3	MP	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	12/09/2017	558256	186122	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Grass and mud.	8	Unknown	Dry pond in wooded area.	Depth gauge and bridge over indicate that this area does contain water during some periods of the year.
HE540039-CJV-EWE-ZZZ-PS-1N15ZZ4	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	13/09/2017	558828	185606	North Ockendon and East Upminster	Unknown	No	no visible flow	no sample	no sample	no sample	no sample	unknown	Very overgrown with brambles and willows	Approx. 5x10m	Unknown	Stagnant pond with debris and litter with layer of algae on surface with overhanging willows and steep bank. Approximately 5x10m. Water estimated to be between 0.3-0.5m deep. No sampling made.	-
HE540039-CJV-EWE-ZZZ-PS-1N16ZZ1	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	558987	189010	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	pond 400m from Order Limits, need to survey ?	-
HE540039-CJV-EWE-ZZZ-PS-1N16ZZ2	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	559208	189942	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	pond 460m from Order Limits, need to survey ?	-
HE540039-CJV-EWE-ZZZ-PS-1N16ZZ3	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	558736	189288	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Pond, necessary to visit ?	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ11	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	26/07/2018	559270	187037	North Ockendon and East Upminster	Unknown	Yes	Unknown	8.28	23.1		1467	Unknown	Unknown	Unknown	Unknown	Small fishing lake at the entrance of the fishing park.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ14	PSM	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	10/10/2019	558862	187665	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	10/10/19 Emailed with locations - land agent has responded but decision to allow survey with landowner. No response from landowner	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ15	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	558294	187375	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	3	Dry pond in a private backyard. Has been dried for 2 months. Approximately 3 metre deep.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ16	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Sep-17	558279	187892	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	NO T VISITED BUT INFO FROM LANDOWNER	Spoke with landowner - said that the pond has been filled in.
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ18	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	24/07/2018	557968	188342	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry pond. 1/2 metre deep. Wet ground.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ19	PSM	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	10/10/2019	558670	188288	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	10/10/19 Emailed with locations - land agent has responded but decision to allow survey with landowner. No response from landowner	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ22	PSM	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	10/10/2019	558389	188926	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	10/10/19 Emailed with locations - land agent has responded but decision to allow survey with landowner. No response from landowner	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ26	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	558269	189440	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry pond in the woodlands adjacent to the agricultural land. Approximately 4 metre deep.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ27	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	558281	189496	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry pond in the woodlands adjacent to the agricultural land. Approximately 3 metre deep	-



Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ28	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	558411	189827	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Not a pond, a grove of trees.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ29	SD	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	24/07/2018	557604	189669	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry pond. Slightly boggy base.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ30	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	24/07/2018	557187	189776	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry pond in the horse staple.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ50	PSM	PS	Surface waterbody, lake or pond	N/A	97	N	16/10/2019	561069	185045	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Several surveys have taken place. All ponds man made. One groundwater abstraction of 15000 l/day (15m3/day) for irrigation. No need to visit	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ51	PSM	PS	Surface waterbody, lake or pond	N/A	136	N	16/10/2019	560670	185013	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Several surveys have taken place. All ponds man made. One groundwater abstraction of 15000 l/day (15m3/day) for irrigation. No need to visit	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ52	PSM	PS	Surface waterbody, lake or pond	N/A	108	N	16/10/2019	561121	185118	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Several surveys have taken place. All ponds man made. One groundwater abstraction of 15000 l/day (15m3/day) for irrigation. No need to visit	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ53	PSM	PS	Surface waterbody, lake or pond	N/A	313	N	16/10/2019	560503	184945	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Several surveys have taken place. All ponds man made. One groundwater abstraction of 15000 l/day (15m3/day) for irrigation. No need to visit	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ54	PSM	PS	Surface waterbody, lake or pond	N/A	335	N	16/10/2019	560447	185031	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	16/10/19 Several surveys have taken place. All ponds man made. One groundwater abstraction of 15000 l/day (15m3/day) for irrigation. No need to visit	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZ56	PSM	PS	Surface waterbody, lake or pond	N/A	22	N	08/10/2019	561088	185415	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Contact details not available	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZZ1	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	14/09/2017	561654	183421	South Ockendon and NW Orsett	Unknown and dry	No	dry	dry	dry	dry	dry	no access	no access	no access	Unknown	Cannot access this area. Advised ponds are dry.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZZ2	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	14/09/2017	561648	183467	South Ockendon and NW Orsett	Unknown and dry	No	dry	dry	dry	dry	dry	no access	no access	no access	Unknown	Cannot access this area. Advised ponds are dry.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZZ3	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	14/09/2017	561618	183544	South Ockendon and NW Orsett	Unknown and dry	No	dry	dry	dry	dry	dry	no access	no access	no access	Unknown	Cannot access this area. Advised ponds are dry.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZZ8	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	27/07/2018	559308	186848	North Ockendon and East Upminster	Unknown	Yes	Unknown	8.28	24.9		1025	Unknown	Unknown	Unknown	Unknown	Large fishing lake with small jetty structure all around.	-
HE540039-CJV-EWE-ZZZ-PS-1N17ZZZ9	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	26/07/2018	558428	186761	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	We were advised by the receptionist this pond is dry	-
HE540039-CJV-EWE-ZZZ-PS-1N18ZZZ1	PSM	PS	Surface waterbody, lake or pond	N/A	57.49508475	N	11/10/2019	565921	176673	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	11/10/19 Email response. Retained. Natural water feature	-
HE540039-CJV-EWE-ZZZ-PS-1N19ZZZ2	PSM	PS	Surface waterbody, lake or pond	N/A	19.94521618	N	11/10/2019	565681	176122	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	11/10/19 Email response. Backfilled. Was a natural feature	-
HE540039-CJV-EWE-ZZZ-PS-1N19ZZZ5	PSM/SB	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	18/07/2019	566520	177618	North Portal and Tilbury Marshes	Ornamental	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Lined with plastic	2m diameter	Unknown	Met the site caretaker at the location. Said that the pond was dug 5 years ago for ornamental purposes. Is now overgrown and cannot access	-
HE540039-CJV-EWE-ZZZ-PS-1N19ZZZ6	PSM/M/A	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	16/07/2019	566026	177670	North Portal and Tilbury Marshes	Natural pond	No	Unknown cannot see water level. Dense vegetation	N/A	N/A	N/A	N/A	Unknown	Bank and bed densely vegetated	Approx 100m long	Unknown	Due to dry weather and presence in a slight valley, water level can't be seen. Fence present around feature. Dense vegetation present too	-
HE540039-CJV-EWE-ZZZ-PS-1N19ZZZ7	PSM/M/A	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	16/07/2019	566050	177882	North Portal and Tilbury Marshes	Natural looking pond	Yes	None observed level low compared to perceived high water level point	7.23	22.8	41.6	1545	Unknown	Bank gravelly silt	Diameter >50m likely approx 70m	0	Large pond or lake. Dense vegetation around edges. Tall reeds growing in the middle of the feature.	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZ12	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	12/09/2017	567780	169444	A2/M2	Unknown	Yes	0	6.62	13.1	28	87.5	Unknown	Overgrown and hedge	Unknown	0	Two distinct ponds with very different aspects. 1- Extremely orangey brown shallow (Photo 2) 2- Pond with a lot of vegetation and a lot clearer than 1 (Photo 3). Both located in the woods.	Pond 2- Temperature 15.6 °C, pH 6.4, DO 19 %, EC 130 µ/cm and clayey material.
HE540039-CJV-EWE-ZZZ-PS-1S01ZZ13	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	567815	169238	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Small pond. Ground elevation approx 100 mAOD according to OS 1:25 000 map (www.streetmap). High above LTC and above after table. Survey not required as >500 m buffer.	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZ14	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	567718	169167	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	small pond at approx 100 mAOD according to 1:25 000 OS map (www.streetmap). Therefore high above LTC works and high above water table. Survey not required.	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ1	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	Sep-17	569705	169490	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ2	AJ	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	24/07/2018	569555	169475	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Gated pond. No access	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ3	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	24/07/2018	569392	169359	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	H51 attenuation hole. Dimension 3x6m wide area, for 6m deep. One side rock infiltration, the other side concrete with 2 culverts of 1m and 1/2m. Very dry and full of vegetation.	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ4	PSM	PS	Surface waterbody, lake or pond	N/A	338.9466187	N	22/10/2019	569464	170008	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	22/10/19 Man made ponds. Synthetic lining or brick lined. Could have been natural historically but have been developed over 100 years. Landowners own property (western location) topped up by underground tanks which are supplied by rainwater. Variation	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ5	PSM	PS	Surface waterbody, lake or pond	N/A	218.161471	N	22/10/2019	569174	169916	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	22/10/19 Man made ponds. Synthetic lining or brick lined. Could have been natural historically but have been developed over 100 years. Landowners own property (western location) topped up by underground tanks which are supplied by rainwater. Variation	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ6	LTC	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	Sep-17	569010	169626	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ7	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	23/07/2018	568434	169490	A2/M2	Unknown	Yes	Unknown	7.76	24.6		448	Unknown	Silty mud	Unknown	Unknown	Fishing pond. Unclear if its part of the school or not. Some small jetties are built around the pond for fishing access.	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ8	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	23/07/2018	568434	169304	A2/M2	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry pond	-
HE540039-CJV-EWE-ZZZ-PS-1S01ZZZ9	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	23/07/2018	568021	169184	A2/M2	Unknown	Yes	Unknown	6.53	22		666	Unknown	Muddy	Unknown	1	Pond in the school background. Full of algae.	-
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ10	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	20/07/2018	567153	169201	A2/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Overgrown and hedge	Unknown	Unknown	Dry pond. Full of vegetation. Adjacent to a hill. Located at approx 90 mAOD. Therefore likely to be above LTC works. Therefore if a groundwater feature then unlikely to be affected by LTC.	-

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Easting	National Grid Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ11	AJ	PS	Surface waterbody, lake or pond	N/A	Further than 500m from the boundary	N	20/07/2018	566246	169182	A2/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	The pond is gated and full of high vegetation. Not accessible to sample	Small pond next to lake in Jeskyn's Country Park. Located on Thane Fm/Chalk boundary. Overlying head deposits. Between 75 and 80 mAOD contour according to 1:25 000 OS map.
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ12	PSM	PS	Surface waterbody, lake or pond	N/A	81.29498925	N	18/10/2019	565002	170722	A2/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	18/10/19 Waiting for email response (Highways attenuation pond, difficult to access)	-
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ21	AJ	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	12/09/2017	566794	169974	A2/LTC Junction	Other	No	0	N/A	N/A	N/A	N/A	Other (specify in notes)	The pond was gated and not accessed	Unknown	Unknown	Pond owned and used by Highways England for the A2 drainage. The pond was gated and we did not have access, but it was clear it was dry at that time.	Highway drainage pond
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ22	AJ	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	12/09/2017	566807	170119	A2/LTC Junction	Other	No	0	N/A	N/A	N/A	N/A	Other (specify in notes)	The pond was gated and not accessed	Unknown	Unknown	Pond owned and used by Highways England for the A2 drainage. The pond was gated and we did not have access, but it was clear it was dry at that time.	Highway drainage pond
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ23	AJ	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	12/09/2017	566617	170078	A2/LTC Junction	Other	No	0	N/A	N/A	N/A	N/A	Other (specify in notes)	Pond owned and used by Highways England for the A2 drainage. The pond was gated and we did not have access, but it was clear it was dry at that time.	Unknown	Unknown	Pond owned and used by Highways England for the A2 drainage. The pond was gated and we did not have access, but it was clear it was dry at that time.	Highway drainage pond
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ24	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Sep-17	566122	169892	A2/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Surface water Attenuation pond presents in the middle of the forest community car park. A ditch and culvert exiting the pond on the south east side. The pond is dry at the moment.	-
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ25	AJ	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	20/07/2018	565978	170526	A2/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No water was observed. The attenuation pond must be dry	-
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ26	AJ	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	20/07/2018	565734	170518	A2/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Man made pond. Not connected to the ground. A culvert is visible, Probably going under the A2. No water was visible at the time of the survey. We observed from 5 meters because the pond is gated.	-
HE540039-CJV-EWE-ZZZ-PS-1S02ZZ28	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	20/07/2018	566196	169238	A2/LTC Junction	Unknown	Yes	Unknown	7.23	19.6		316	Unknown	Not observed because the water is too high, but seems muddy.	Unknown	1	Jeskyns Community Woodland landscape pond. Reeds present at the borders. The water is approximately 1 meter deep. The ground is fairly flat around, with a small hill at the north.	Ground elevation between 75 and 80 mAOD according to OS 1:25 000 map. Hydro geology viewer shows geology to be at boundary of Thanet Fm and Chalk Grp. Overlying head deposits
HE540039-CJV-EWE-ZZZ-PS-1S03ZZZ1	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	12/09/2017	567435	169552	A2/LTC Junction	Domestic	Yes	0.0005	7.67	13.4	86	521	Other (specify in notes)	Mud	Unknown	0	A source flowing into the pond from a hydraulic pipe. There were two of them but flowing just from one. On private land little pond water slipping away quite fast. Couldn't investigate the source because on private land. In the middle of a little valley.	Because the water was in movement the DO reading seems accurate. Seems abandoned but on a private land next to a public forest path
HE540039-CJV-EWE-ZZZ-PS-1S03ZZZ2	AJ	PS	Surface waterbody, lake or pond	N/A	Within OL	Y	12/09/2017	567515	169940	A2/LTC Junction	Domestic	Yes	0	7.85	17.8	91	792	Other (specify in notes)	A bit more clayey than the bed.	Unknown	0	Lake in the backyard of an inn for fishing with a lot of vegetation. The bank of the lake is natural except of the presence of a jetty. Few animals swimming.	-
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ0	PSM/MA	PS	Surface waterbody, lake or pond	N/A	344.2230123	N	23/10/2019	568481	170644	South Portal	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	23/10/19 Brook flowing to north at eastern side of pond. Pond inaccessible but seen from bank from east. 15/10/19 Quarter of an acre in size, ecologists have visited. Landowner says previous owners have expanded it. Groundwater monitoring point in the vicin	-
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ1	PSM	PS	Surface waterbody, lake or pond	N/A	441	N	29/10/2019	568729	170714	South Portal	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	29/10/19 Landowner unsure whether pond still exists or not but is a natural pond. On edge of a field which is let out to horse grazing.	-
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ2	PSM	PS	Surface waterbody, lake or pond	N/A	123	N	08/10/2019	568529	170994	South Portal	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Number not recognised	-
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ1	AJ	PS	Surface waterbody, lake or pond	N/A	300	N	24/07/2018	568591	170104	A2/M2	Unknown	Yes	0	7.04	22.9		984	Unknown	Silty muddy	Unknown	1	Fishing lake in the country park. Full of reeds.	-
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ2	AJ	PS	Surface waterbody, lake or pond	N/A	420	N	24/07/2018	568571	170219	A2/M2	Unknown	Yes	0	7.32	21		809	Unknown	Silty muddy	Unknown	1	Fishing lake in the country park, full of reeds.	-
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ3	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	18/09/2017	568303	169911	A2/M2	Domestic	No	Unknown	N/A	N/A	N/A	N/A	Other (specify in notes)	Grass, bramble and reeds	Unknown	Unknown	Fenced and vegetation all around not accessible. A lot less water than the pond on the other side of the path. Shallow muddy pond	Geology is London Clay Fm. On top of broad hill. Elevation approx 100 mAOD. Unlikely to be groundwater fed. However adjacent lakes appear to be head water to ditch/ small stream going northwards Part of the country club landscape
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ4	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	18/09/2017	568295	169969	A2/M2	Domestic	Yes	0	7.04	12.2	76	506	Other (specify in notes)	Grass, brambles and reeds	Unknown	Unknown	All the ponds are clearly connected. Part of the country park. Full of algae and plenty of reeds. Few hydraulic structure bridge and jetty.	Part of the country club landscape
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ5	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	18/09/2017	568155	169939	A2/M2	Domestic	Yes	0	7.45	15.2	60	387	Other (specify in notes)	Grass, brambles and reeds	Unknown	Unknown	Still wide pond, part of the country club, surrounded by trees.	Part of the country club landscape
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ6	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	12/09/2017	568056	169836	A2/M2	Unknown	Yes	0	6.57	12.8	37	655	Other (specify in notes)	Mud	15	1	Surrounded by a lot of vegetation and protected by a fence. Quite hard to access.	The ranger we talked to didn't know its existence.
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ7	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	18/09/2017	568236	170146	A2/M2	Domestic	Yes	0	7.47	13.7	71	485	Other (specify in notes)	Grass and brambles	Unknown	Unknown	No actual hydraulic continuity with southern ditch. Very muddy dog pond.	Part of the country club landscape. Probably a dog pond.
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ8	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	18/09/2017	568243	170165	A2/M2	Domestic	Yes	0	7.5	13.3	76	456	Other (specify in notes)	Grass and brambles	Unknown	Unknown	Northern ditch discharges in the pond	Part of the country club landscape. Probably a dog pond.
HE540039-CJV-EWE-ZZZ-PS-1S04ZZZ9	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	13/09/2017	567553	170520	A2/LTC Junction	Other	No	Unknown	N/A	N/A	N/A	N/A	Other (specify in notes)	Overgrown and hedge	Unknown	Unknown	Abundant vegetation in a deep hole. Completely dried out pond covered with trees and grass. Gated from the farm lands.	Didn't talk to the land owner.
HE540039-CJV-EWE-ZZZ-PS-1S06ZZZ1	LTC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	19/07/2018	568382	172398	South Portal	Other	Yes	0	9.99	25.9		3025	Unknown	Impermeable	Unknown	Unknown	Man made and lined pond not linked to the ground. No vegetation. Landscape use.	-
HE540039-CJV-EWE-ZZZ-PS-1S06ZZZ2	AJ	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	19/07/2018	568238	172453	South Portal	Other	Yes	0	6.97	19.6		1066	Unknown	Full of vegetation and algae. Sludgy and muddy	4	Unknown	Pond present in a church backyard full of algae and vegetation. The depth of the water is less than a meter.	-
HE540039-CJV-EWE-ZZZ-PS-1S06ZZZ3	AJ	PS	Surface waterbody, lake or pond	N/A	Further than 500m from the boundary	N	19/07/2018	568672	172994	South Portal	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	The landlord has advised the pond has been dried for years due to next door pumping. No access possible	-
HE540039-CJV-EWE-ZZZ-PS-1S06ZZZ5	BC	PS	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	13/09/2017	568389	173271	Filborough and Shorne Marshes	Domestic	Yes	0	8.5	15.9	100	753	Other (specify in notes)	Rocks, reeds, islands	Unknown	Unknown	No description available but surveyed	Lake, fishing boats on a private land Recreational, fishing on private land
HE540039-CJV-EWE-ZZZ-SD-1N14ZZZ1	MP	SD	Surface water abstraction, deregulated/no licence	N/A	Within OL	Y	Sep-17	557855	184278	North Ockendon and East Upminster	Agricultural	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Pipes and pumping building at side of lake with pipes across field for irrigation.	-
HE540039-CJV-EWE-ZZZ-SI-1N14ZZZ1	AJ	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	558710	183467	South Ockendon and NW Orsett	Unknown	Yes	Unknown	7.63	20.5		805	Unknown	Unknown	Unknown	Unknown	Large lake in the woodlands adjacent to the field lands. Full of algae, brown water. Doesn't look like they are using the lake for irrigation.	Kemp Farm. Unsure of access
HE540039-CJV-EWE-ZZZ-SI-1N14ZZZ5	LTC	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	557562	184318	North Ockendon and East Upminster	Amusement park lake	Yes	no visible flow	8.38	25	not measured	1696	unknown	Muddy	Not measured	Unknown	Amusement park lake. Jetties. People in the lake.	-
HE540039-CJV-EWE-ZZZ-SI-1N15ZZZ1	LTC	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Sep-17	558003	185602	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	No access - private property. Attempted access from the west but this is private. Cannot access from the north, overgrown.
HE540039-CJV-EWE-ZZZ-SI-1N15ZZZ2	MP	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Sep-17	558024	185631	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unable to clearly see pond although evidence of water in pond. Very overgrown around pond.	No safe access for sampling. Possible access from the east, via private land as assuming can access SW pond and further access to this pond may be available.

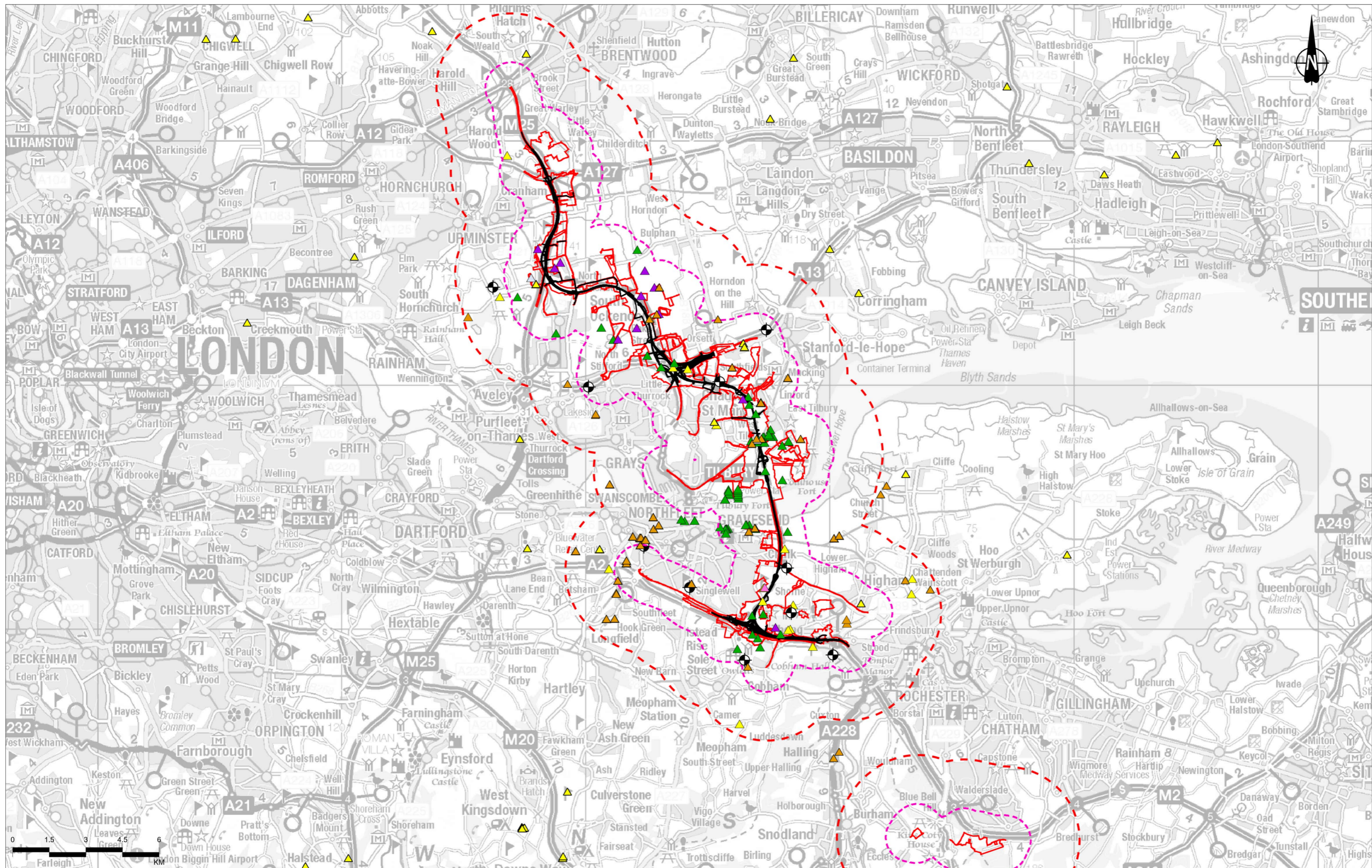
Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-SI-1N15ZZ3	MP	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	12/09/2017	558231	185915	North Ockendon and East Upminster	Unknown	Yes	0	7.48	15.5	77	584.9	Unknown	Silty mud. Some reedy areas.	Unknown	0	Stagnant pond in wooded area alongside path. Inflow and exit channel dry. Some reedy areas and algae. Approx 15mx10m. Water depth <0.3m.	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ10	AJ	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	26/07/2018	559397	186994	North Ockendon and East Upminster	Unknown	Yes	Unknown	8.41	25.8		1347	Unknown	Unknown	Unknown	Unknown	Fishing lake. Seems like they have a monitoring probe installed.	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ11	AJ	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	25/07/2018	558665	187368	M25/LTC Junction	Unknown	Yes	Unknown	7.96	23.9		2262	Unknown	Unknown	Unknown	1	Moat in a private back garden. Lots of vegetation and ducks.	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ12	LTC	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Sep-17	557724	188641	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	NOT VISITED BUT INFORMATION FROM LANDOWNER	Site is a builders merchant - All Seasons Soils in operation 7am-4pm. Landowner said the pond has dried up and he plans to fill it in soon.
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ20	AJ	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	26/07/2018	558180	186760	North Ockendon and East Upminster	Unknown	Yes	Unknown	8.86	24.1		721	Unknown	Unknown	Unknown	Unknown	Man made golf course pond with a fountain. Irrigation pond. Two pipes, water flowing into the lake. Seems to be a pump house.	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ26	AJ	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	559467	186907	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry pond in the fishing park	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ30	LTC	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	Jul-18	559553	187004	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ31	MP	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	12/09/2017	558053	186270	North Ockendon and East Upminster	Unknown	Yes	0	8.7	17.2	110	582	Unknown	Grassy banks.	Unknown	2	Artificial lake in golf course at least 1m deep. Approximately 50 x 100m.	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ32	PSM/MA	SI	Surface waterbody, lake or pond	N/A	Within OL	Y	21/10/2019	558785	186370	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No safe access possible. Very overgrown. Several drainage ditches running north to south. Unknown bed material	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ33	SD	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	12/09/2017	558348	186592	North Ockendon and East Upminster	Unknown	Yes	0	8.49	16.3	102	583	Unknown	Grassy banks	Unknown	2	Artificial lake in golf course. Lake estimated to be approximately 20x50m with an estimated depth of around 1m.	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ34	SD	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	12/09/2017	558623	186635	North Ockendon and East Upminster	Unknown	Yes	Unknown	8.21	16.6	131	635	Unknown	Grassy banks	Unknown	2	Artificial lake in golf course approximately 20x30m in size with an estimated depth of 1-2m.	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ35	AJ	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	26/07/2018	558185	186599	North Ockendon and East Upminster	Unknown	Yes	Unknown	8.37	25.2		824	Unknown	Unknown	Unknown	Unknown	Man made golf course pond	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ36	AJ	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	26/07/2018	558239	186781	North Ockendon and East Upminster	Unknown	Yes	Unknown	8.42	26.1		565	Unknown	Unknown	Unknown	Unknown	Man made golf course pond	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ37	AJ	SI	Surface waterbody, lake or pond	N/A	Within OL	Y	25/07/2018	558923	186664	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry highways attenuation pond. Full of reeds. Two culverts are visible with a connection to the highway.	-
HE540039-CJV-EWE-ZZZ-SI-1N17ZZ38	AJ	SI	Surface waterbody, lake or pond	N/A	Within 500m of the boundary	N	27/07/2018	559434	186810	North Ockendon and East Upminster	Unknown	Yes	Unknown	7.98	25.7		1075	Unknown	Unknown	Unknown	Unknown	Fishing lake in the park	-
HE540039-CJV-EWE-ZZZ-SI-1S06ZZ25	AJ	SI	Surface waterbody, lake or pond	N/A	Further than 500m from the boundary	N	19/09/2017	569093	173513	Filborough and Shorne Marshes	Agricultural	Yes	0	7.5	13.3	11	625	Unknown	Unknown	Unknown	Unknown	Surrounded by agricultural lands. No sign of springs. The topography is flat from top of marshes till here, south of the pond there is a slight change of topography around 1.5 m higher.	Lake (looks like irregular concentric shaped water filled dug areas from map)
HE540039-CJV-EWE-ZZZ-SJ-1N07ZZ21	AJ	SJ	Surface waterbody, moat	N/A	Within 500m of the boundary	N	Sep-17	569158	176777	North Portal and Tilbury Marshes	Unknown	Yes	Unknown	8.91	24.6		39217	Unknown	Unknown	Unknown	Unknown	Moat around the fort, close to the Thames with high conductivity. Salty lake with a connection to the river. The embankment is muddy	-
HE540039-CJV-EWE-ZZZ-SN-1N17ZZ21	PSM/MA	SN	Surface water feature, other (any feature that does not fit under any of the other types)	N/A	Within OL	Y	16/07/2019	558770	186553	North Ockendon and East Upminster	Unknown	Yes	Slow trickle	7.69	16	69.7	878	Culvert under M25	Culvert. Very silty. High veg	Unknown	Unknown	Culvert of the West Mardyke.	-
HE540039-CJV-EWE-ZZZ-SN-1N17ZZ22	LTC	SN	Surface water feature, other (any feature that does not fit under any of the other types)	N/A	Within 500m of the boundary	N	Jul-18	557646	185937	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Unsure how to access, cannot access from east of railway as cannot cross safely. Access from west appears to be long walk from farm, do we have permission?	-
HE540039-CJV-EWE-ZZZ-SN-1NZZZZ22	PSM	SN	Surface water feature, other (any feature that does not fit under any of the other types)	N/A	Within 500m of the boundary	N	24/10/2019	557764.234	185286.551	North Ockendon and East Upminster	Unknown	No	no access	no access	no access	no access	no access	no access	no access	no access	no access	Unknown	24/10/2019 Unable to access. Fields south of Cranham Marsh. Local Wildlife Site
HE540039-CJV-EWE-ZZZ-SN-1S2ZZZ21	PSM/LP	SN	Surface water feature, other (any feature that does not fit under any of the other types)	N/A	Within 500m of the boundary	N	17/07/2019	567483	174296	Thames and Medway Canal Area	Drainage outlet	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Drain outlet. Separate out drain system.	-
HE540039-CJV-EWE-ZZZ-SY-1N09ZZ21	BC	SY	Surface water discharge, permit	Unknown	Within OL	Y	15/09/2017	566400	179500	Chadwell St. Mary and Linford	Other	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Reeds	20	Unknown	Dried up reed bed. No water. Probably collects all discharge water from nearby pond.	Discharge water from field and nearby lake.
HE540039-CJV-EWE-ZZZ-SY-1N13ZZ21	PSM/SB	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	19/07/2019	559640	183999	South Ockendon and NW Orsett	Natural pond but has been landscaped. Shared between 1 and 2 Evergreens.	Yes	Likely flow from ground.	7.87	19.8	41.8	1662	Inlet to the south of pond. Unknown where this drains from	Grass banks. Muddy beds	17.7m approx diameter	0.6	Landowner stated that water level was almost at level of the ground previous to summer 2018. Hasn't recovered since then. Water level 0.5mblg pond depth 0.6mblg from SW bank. Natural pond but has been landscaped. Shared between 1 and 2 Evergreens.	-
HE540039-CJV-EWE-ZZZ-SY-1N13ZZ23	SD	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	14/09/2017	560079	184201	South Ockendon and NW Orsett	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Concrete structure with manhole between field and house surrounded by high concentrations of nettles indicating possible high nutrient content. Strong sewage smell. Sump?	-
HE540039-CJV-EWE-ZZZ-SY-1N14ZZ24	MP	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	Sep-17	557874	184195	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Not found. Assumed discharge of surface water runoff to the pond but no evidence.
HE540039-CJV-EWE-ZZZ-SY-1N15ZZ24	SD	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	Sep-17	558389	186119	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Manhole in proximity of surface water discharge point. Could not open manhole. Located adjacent to the office building for Thames Chase Forest Centre.	No clear evidence of surface water discharge. In addition, possible sump noted in vicinity of point.
HE540039-CJV-EWE-ZZZ-SY-1N15ZZ22	SD	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	Sep-17	558410	186125	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No description available but surveyed	Could not find any evidence of surface water feature here.
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ10	PSM	SY	Surface water discharge, permit	CANM.0238	274.1127274	N	08/10/2019	557108	190162	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Waiting for Letter response. Sewage on private land	-
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ15	AJ	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	Jul-18	558751	187400	M25/LTC Junction	Domestic	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Culvert and man made ditch connecting the moat to a discharge zone. In case of the moat overflowing, the water will discharge in a ditch along the M25	-
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ16	PSM	SY	Surface water discharge, permit	Unknown	Within OL	Y	08/10/2019	561123	185233	North Ockendon and East Upminster	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Contact details not available	-
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ22	PSM/MA	SY	Surface water discharge, permit	EPRDB3697AE	434.073541	N	22/10/2019	559478	188826	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Dry ditch. Extends to the south. No water in visible part.	-
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ24	PSM	SY	Surface water discharge, permit	Unknown	317.4074144	N	08/10/2019	559400	188600	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Waiting for Letter response	-
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ25	PSM	SY	Surface water discharge, permit	Unknown	370.6707646	N	08/10/2019	559411	188432	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Waiting for Letter response	-
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ26	PSM/MA	SY	Surface water discharge, permit	EPRTB3790NK	Within OL	Y	22/10/2019	559440	188410	M25/LTC Junction	Warley Brook/ drainage run off	Yes	No flow discernible	7.3	9.8	21.6	117	Pipes draining into and across	Bed very silty. Banks vegetated but have recently been cut back	Approx 4m	0	Stagnant odour discerned	-
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ27	PSM	SY	Surface water discharge, permit	Unknown	376.5501078	N	08/10/2019	559400	188400	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	08/10/19 Waiting for Letter response	-
HE540039-CJV-EWE-ZZZ-SY-1N17ZZ24	PSM	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	10/10/2019	558640	188288	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	10/10/19 Emailed with locations - land agent has responded but decision to allow survey with landowner. No response from landowner	-

Table A-2 Surface water features surveyed during Phases 1 to 4 of the Water Features Survey within the 500m radius of the LTC Order Limits

Water Feature ID	Surveyor	Location Type	Water Feature Type	Environmental Permit/Licence number	Distance from Order Limits (m)	Within OL (Y/N)	Date of Survey	National Grid Reference Easting	National Grid Reference Northing	Geographic Zone	Use (Agricultural/Domestic/Industrial with details)	Water Sample Taken (Y/N)	Estimated flow velocity (m/s)	pH (pH Units)	Temperature (°C)	Dissolved Oxygen (% Saturation)	Electrical Conductivity (µS/cm)	Hydraulic Structure	Bed and Bank Materials	Estimated Channel Width (m)	Estimated Channel Depth by Observation (m)	General Description	Notes
HE540039-CJV-EWE-ZZZ-SY-1N17ZZZ9	PSM/SB	SY	Surface water discharge, permit	PRENF20450	Within 500m of the boundary	N	18/07/2019	557742	190050	M25/LTC Junction	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Biodigester. Discharged into a ditch. Built into building regs.	-
HE540039-CJV-EWE-ZZZ-SY-1N18ZZZ1	PSM	SY	Surface water discharge, permit	PRENF10899	31.36430966	N	11/10/2019	566000	176123	North Portal and Tilbury Marshes	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	11/10/19 Email response. No new discharges at these locations proposed under Tilbury2. No discharge consent numbers.	-
HE540039-CJV-EWE-ZZZ-SY-1S05ZZZ1	AJ	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	14/09/2017	567386	174106	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	No access to sample	-
HE540039-CJV-EWE-ZZZ-SY-1S05ZZZ2	PSM	SY	Surface water discharge, permit	Unknown	295.2513544	N	14/10/2019	567009	174131	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	14/10/19 Waiting for email response	-
HE540039-CJV-EWE-ZZZ-SY-1S05ZZZ3	AJ	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	Jul-18	566925	174344	Thames and Medway Canal Area	Unknown	No	Unknown	N/A	N/A	N/A	N/A	Unknown	Unknown	Unknown	Unknown	Surface discharge to the Thames. Culvert going into the river, feature visible because of low tide.	-
HE540039-CJV-EWE-ZZZ-SY-1S05ZZZ6	AJ	SY	Surface water discharge, permit	Unknown	Within 500m of the boundary	N	Jul-18	567489	174269	Thames and Medway Canal Area	Unknown	Yes	Unknown	7.71	19.4	0	24922	Culvert	Unknown	3	Unknown	Denton New Cut discharging into the River Thames from an approximate 3 m diameter culvert. The flow is quite strong compared to the southern ditches. the EC is very high.	-

## Annex B Water features location plans

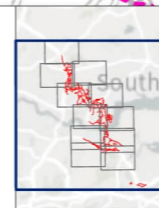


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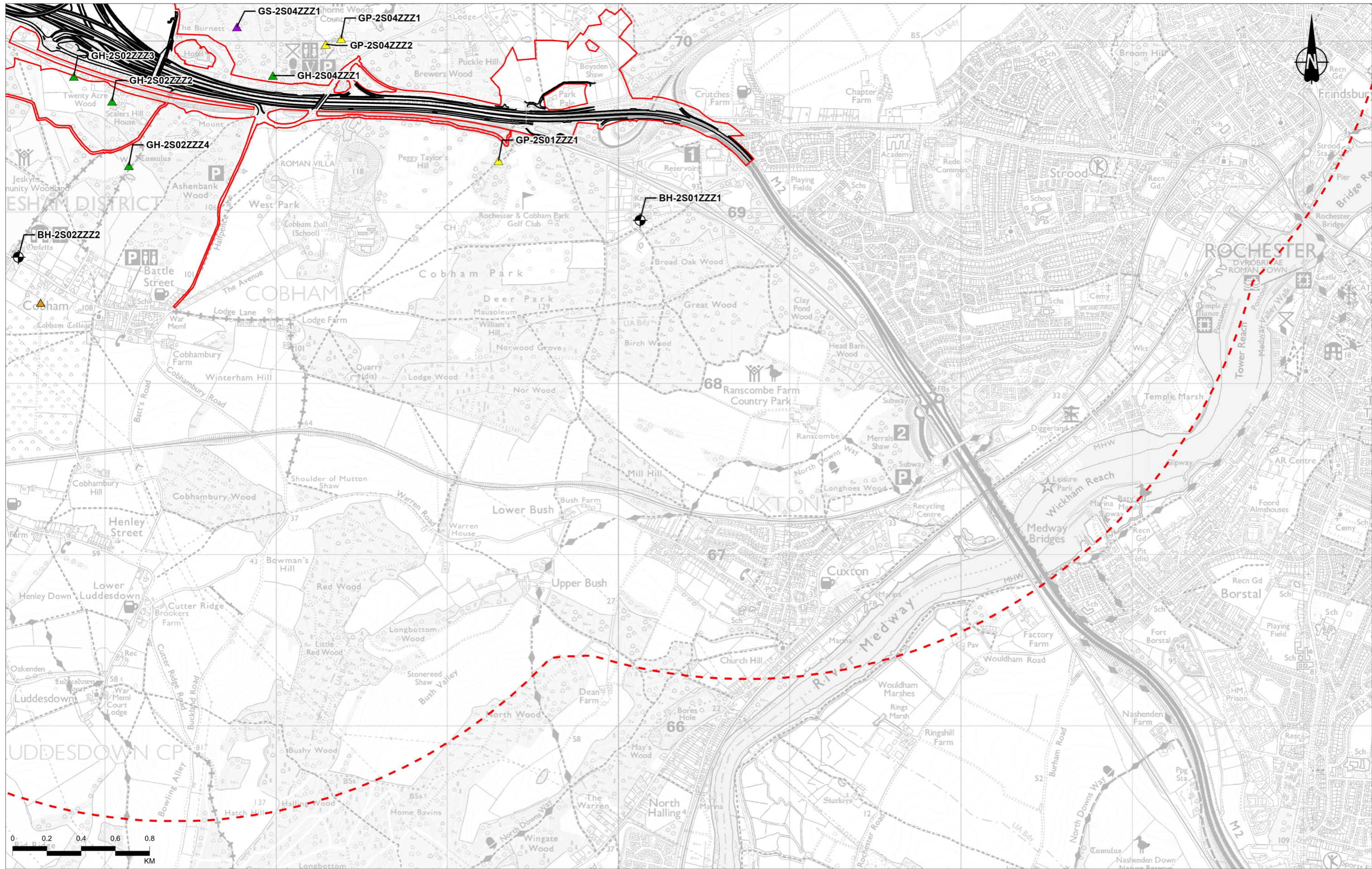
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	Route alignment
	Order Limits
	Order Limits 1km Buffer
	Order Limits 3km Buffer
	GP - Discharge to ground, permit
	GH - Well, historical, abandoned or decommissioned
	GL - Groundwater abstraction, well, licensed
	GD - Groundwater abstraction, well, deregulated/no licence
	RE - Irrigation reservoir
	BH - Observation borehole (groundwater level or quality)
	GS - Historical spring

Client	national highways
Project	LOWER THAMES CROSSING
Status	DCO APPLICATION
Application Document Number	TR010032/APP/6.3
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Groundwater
Drawing Number	HE540039-CJV-EWE-SZP_EGNE0000000-DR-LE-50150
Original Size	A3
Revision	P01
Scale	1:140,289



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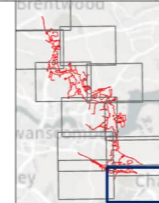
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Drawing Number	HE540039-CJV-EWE-SZP_EGNE0000000-DR-LE-50150
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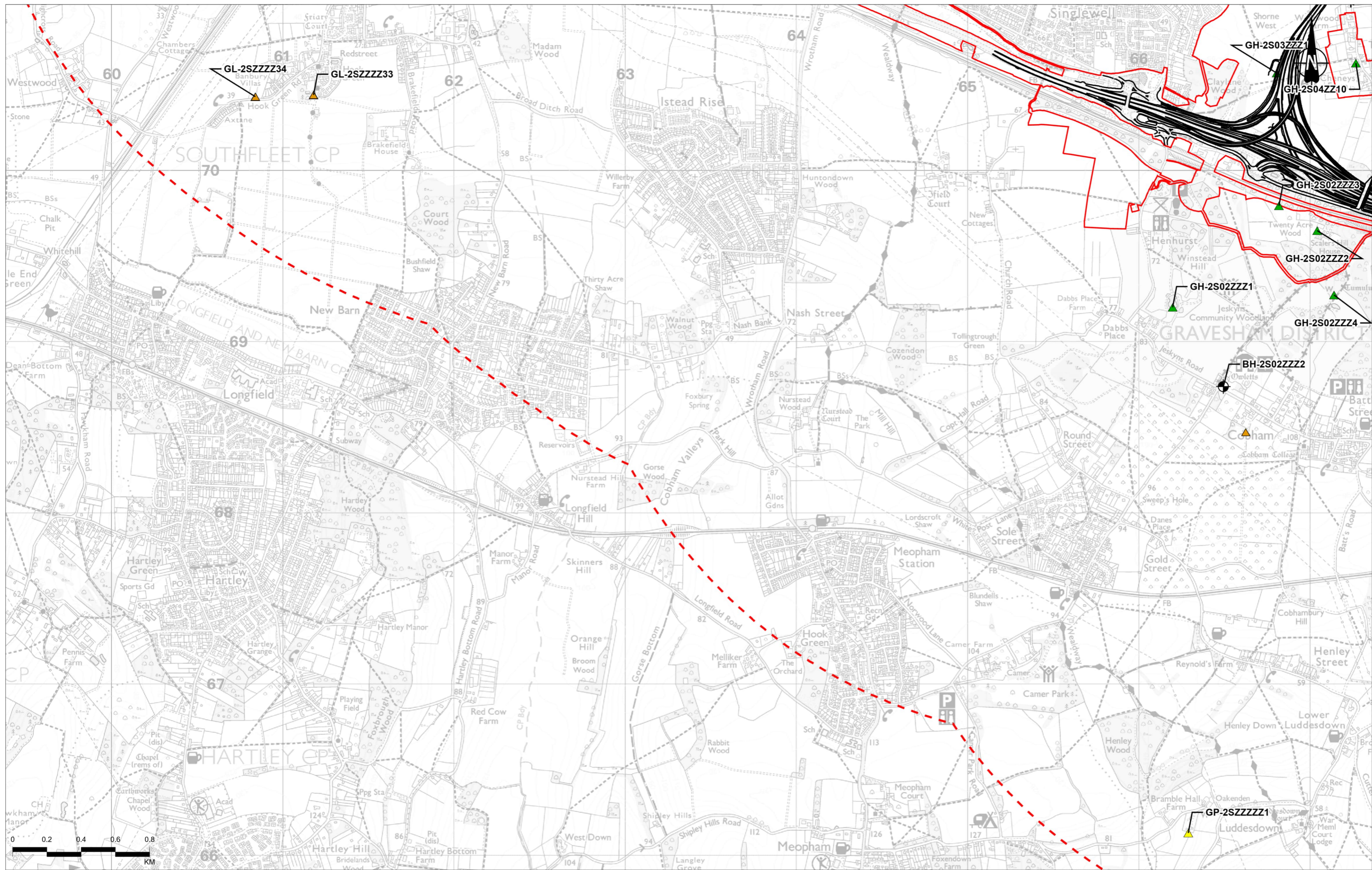
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	Route alignment
	Order Limits
	Order Limits (DR3.3) Buffer 3km
	GP - Discharge to ground, permit
	GH - Well, historical, abandoned or decommissioned
	GL - Groundwater abstraction, well, licensed
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Application Document Number	TR010032/APP/6.3	Scale	1:20,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Groundwater Page 2 of 12				
Drawing Number	HE540039-CJV-EGT-SZP_EGNE0000000-DR-LE-50150				

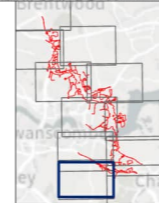


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**Legend**

- Route alignment
- ▭ Order Limits
- - - Order Limits (DR3.3) Buffer 3km
- ▲ GP - Discharge to ground, permit
- ▲ GH - Well, historical, abandoned or decommissioned
- ▲ GL - Groundwater abstraction, well, licensed
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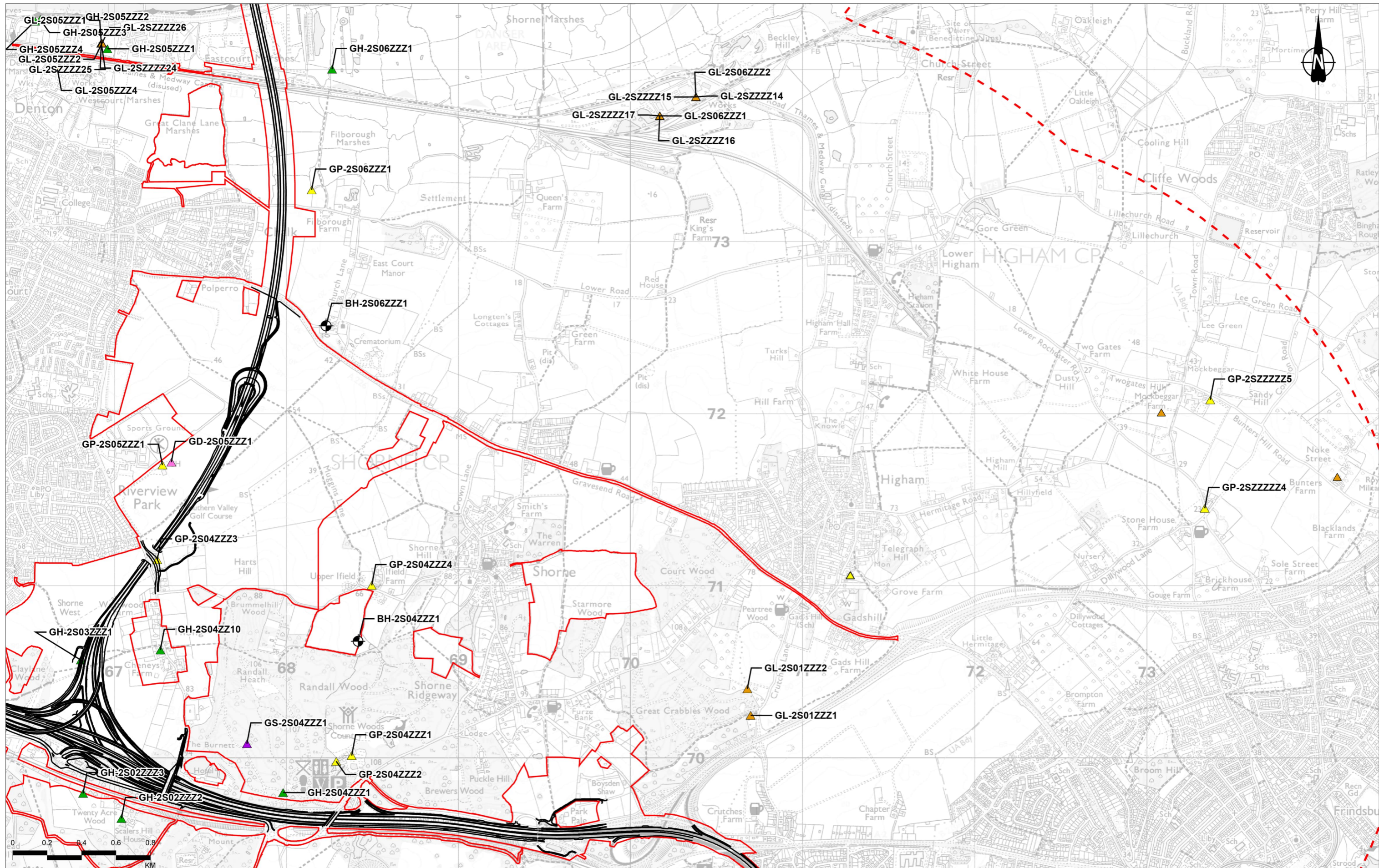


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Application Document Number	TR010032/APP/6.3	Scale	1:20,000		
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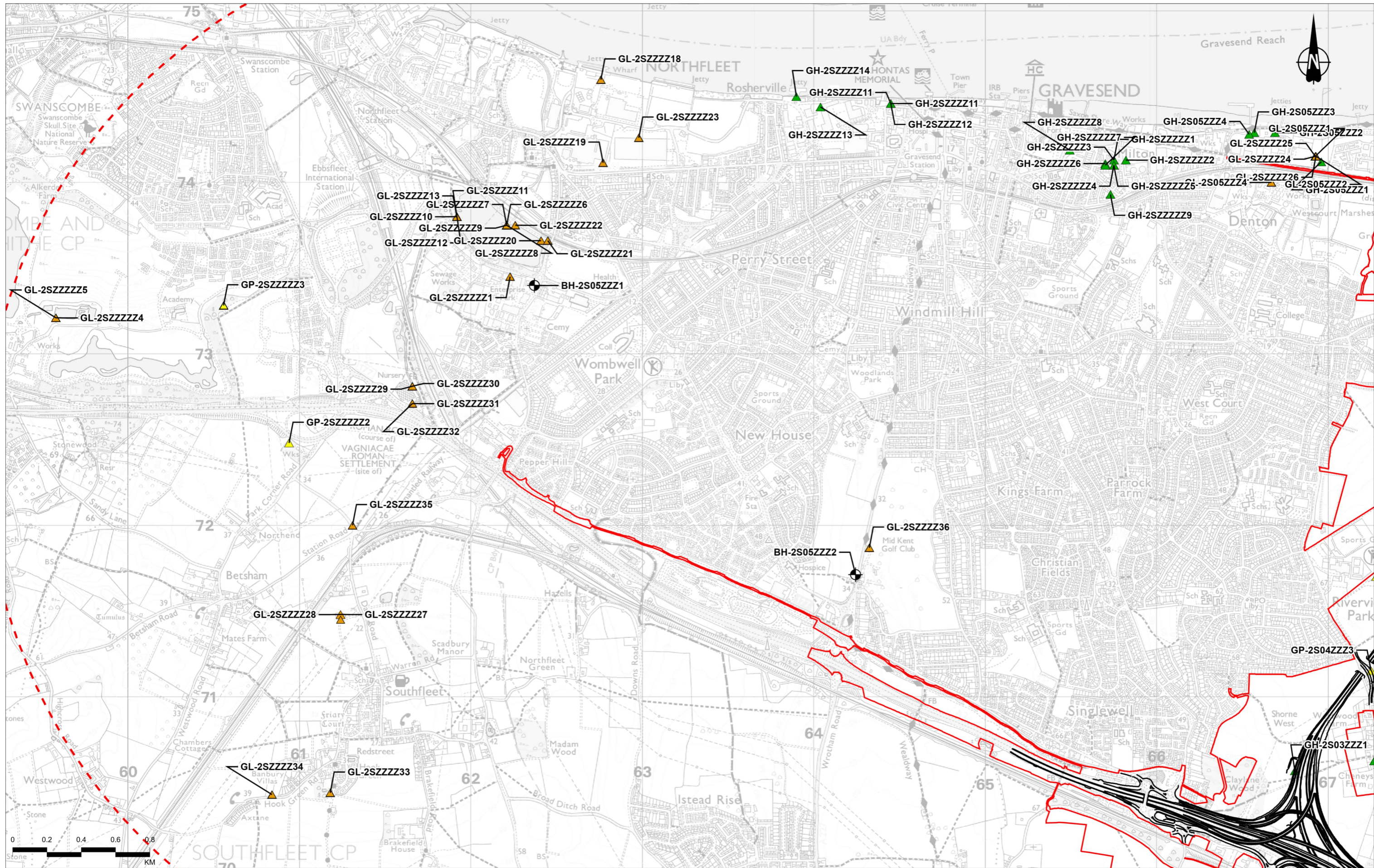
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Legend	
	Route alignment
	Order Limits
	Order Limits (DR3.3) Buffer 3km
	GP - Discharge to ground, permit
	GH - Well, historical, abandoned or decommissioned
	BH - Observation borehole (groundwater level or quality)
	GS - Historical spring
	GL - Groundwater abstraction, well, licensed
	GD - Groundwater abstraction, well, deregulated/no licence

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Project	LOWER THAMES CROSSING
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Drawing Number	HE540039-CJV-EGT-SZP_EGNE00000000-DR-LE-50150

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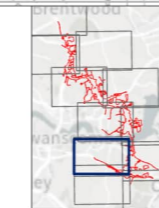
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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprvd

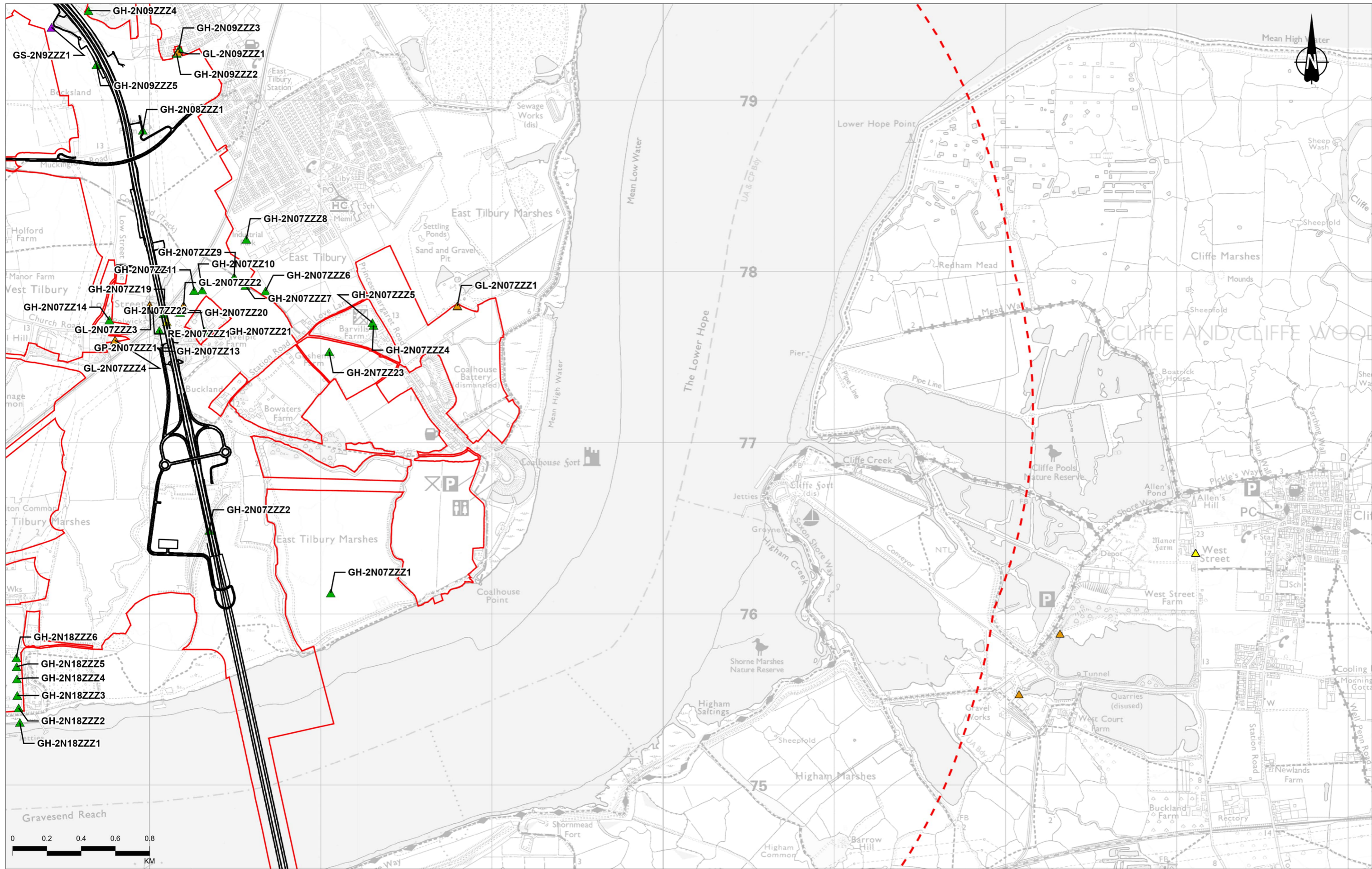
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	Order Limits
	Order Limits (DR3.3) Buffer 3km
	GP - Discharge to ground, permit
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Application Document Number	TR010032/APP/6.3	Scale	1:20,000		
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Drawing Number	HE540039-CJV-EGT-SZP_EGNE00000000-DR-LE-50150				

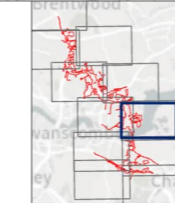


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P01	S8	21/10/2022	DCO Application	SW	LD	BF

**Legend**

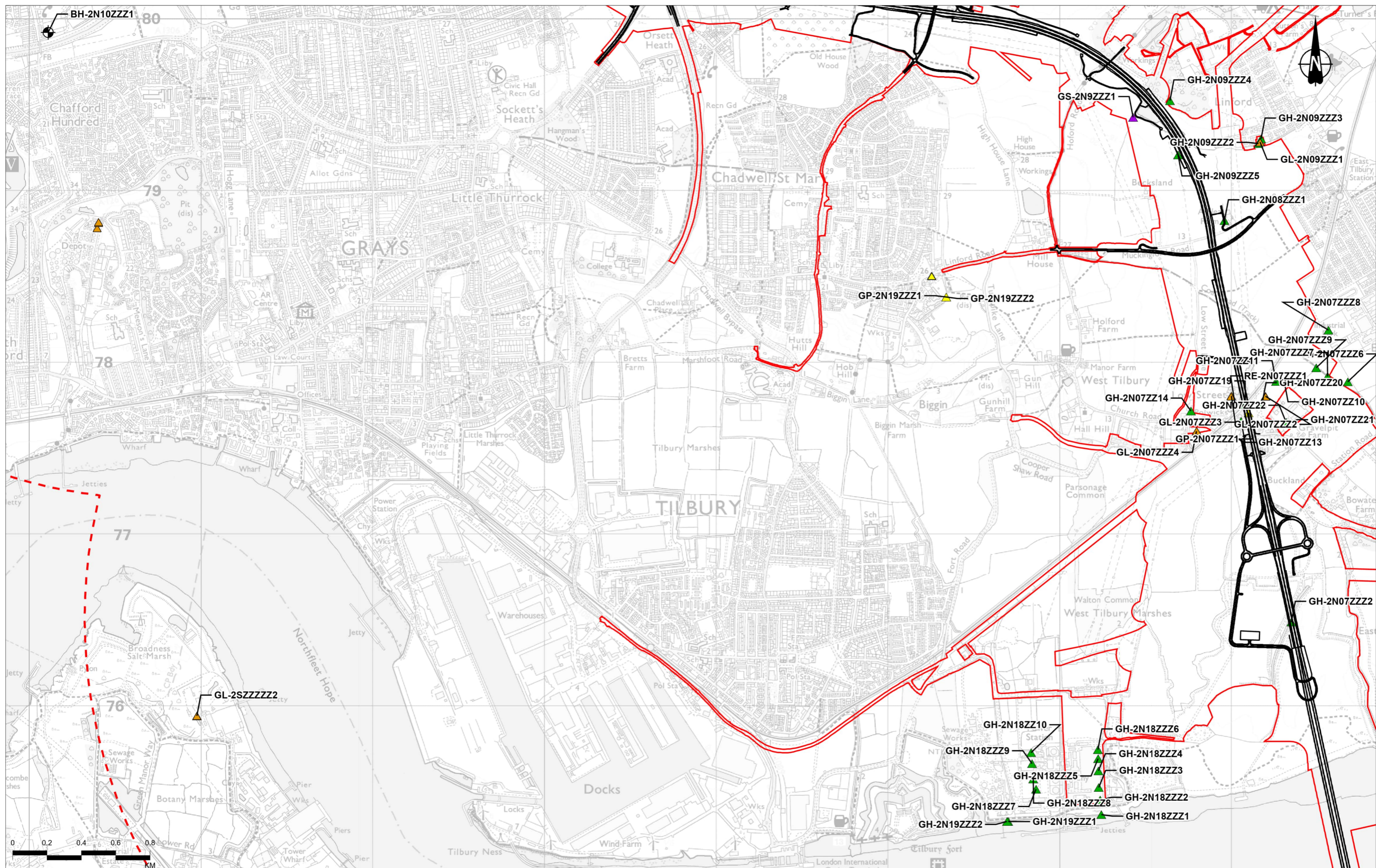
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- Order Limits
- Order Limits (DR3.3) Buffer 3km
- ▲ GH - Well, historical, abandoned or decommissioned
- ▲ GL - Groundwater abstraction, well, licensed
- ▲ RE - Irrigation reservoir
- ▲ GP - Discharge to ground, permit
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Application Document Number	TR010032/APP/6.3	Scale	1:20,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Groundwater Page 6 of 12				
Drawing Number	HE540039-CJV-EGT-SZP_EGNE0000000-DR-LE-50150				



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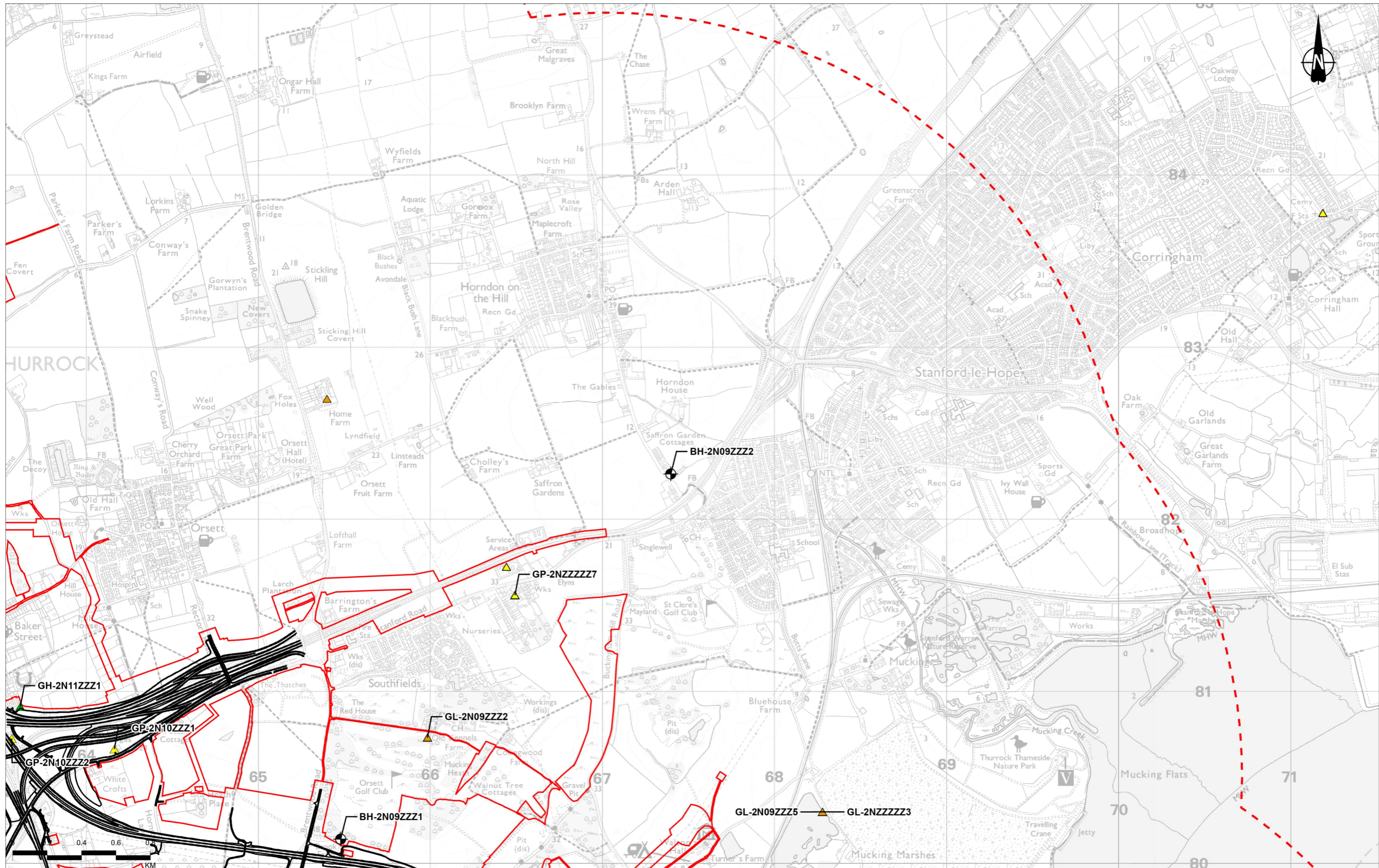
- Legend**
- Route alignment
  - Order Limits
  - Order Limits (DR3.3) Buffer 3km
  - GP - Discharge to ground, permit
  - GH - Well, historical, abandoned or decommissioned
  - GL - Groundwater abstraction, well, licensed
  - RE - Irrigation reservoir
  - BH - Observation borehole (groundwater level or quality)
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P01	S8	21/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprvd



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Drawing Title	Appendix 14.2 - Water Feature Survey Results - Groundwater Page 7 of 12				
Drawing Number	HE540039-CJV-EGT-SZP_EGNE0000000-DR-LE-50150				

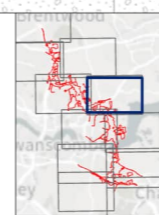


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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprvd
P01	S8	21/10/2022	DCO Application	SW	LD	BF

**Legend**

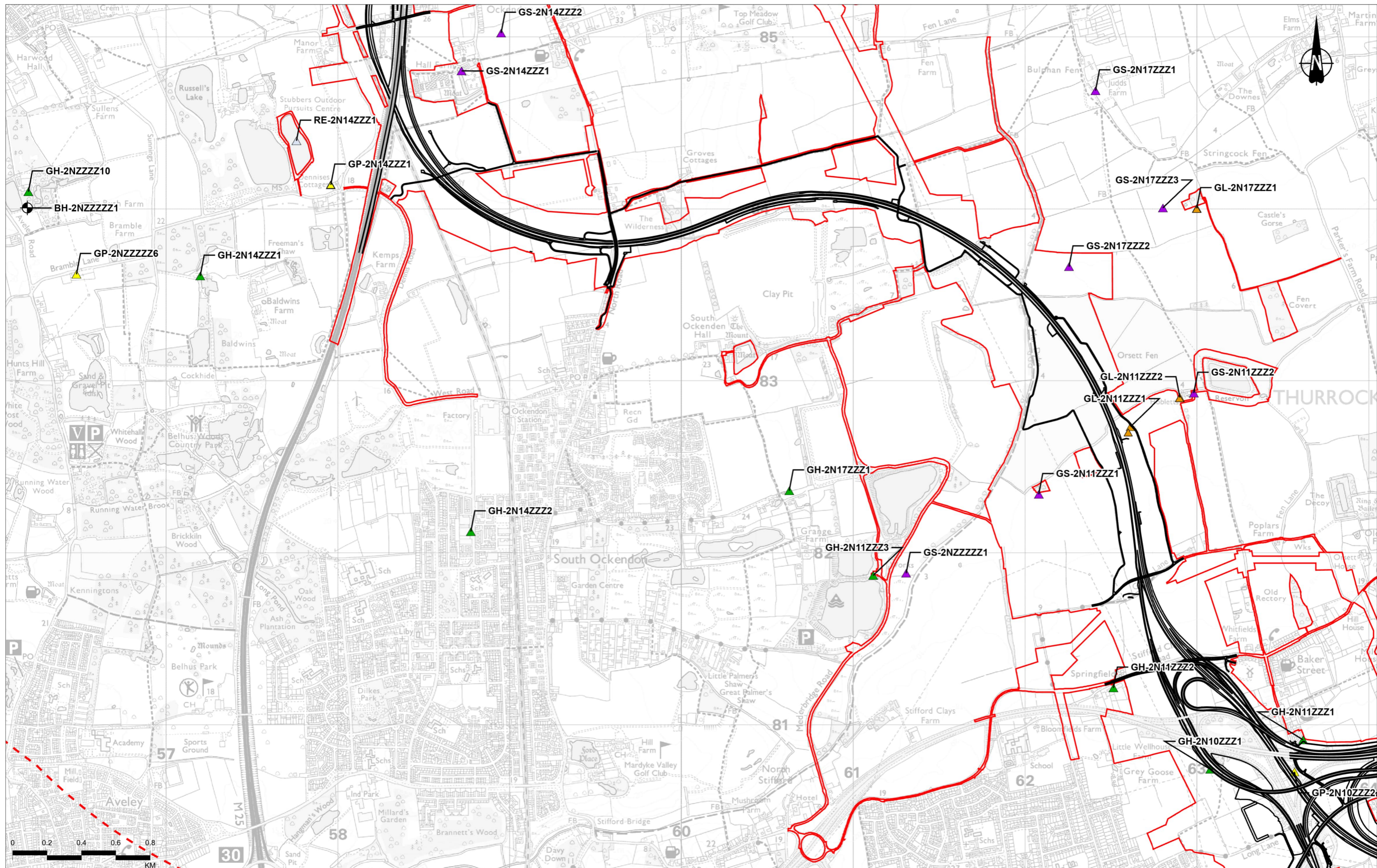
- Route alignment
- Order Limits
- Order Limits (DR3.3) Buffer 3km
- GP - Discharge to ground, permit
- GH - Well, historical, abandoned or decommissioned
- GL - Groundwater abstraction, well, licensed
- BH - Observation borehole (groundwater level or quality)



Client: national highways

Project: LOWER THAMES CROSSING

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:20,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Groundwater Page 8 of 12				
Drawing Number	HE540039-CJV-EGT-SZP_EGNE0000000-DR-LE-50150				

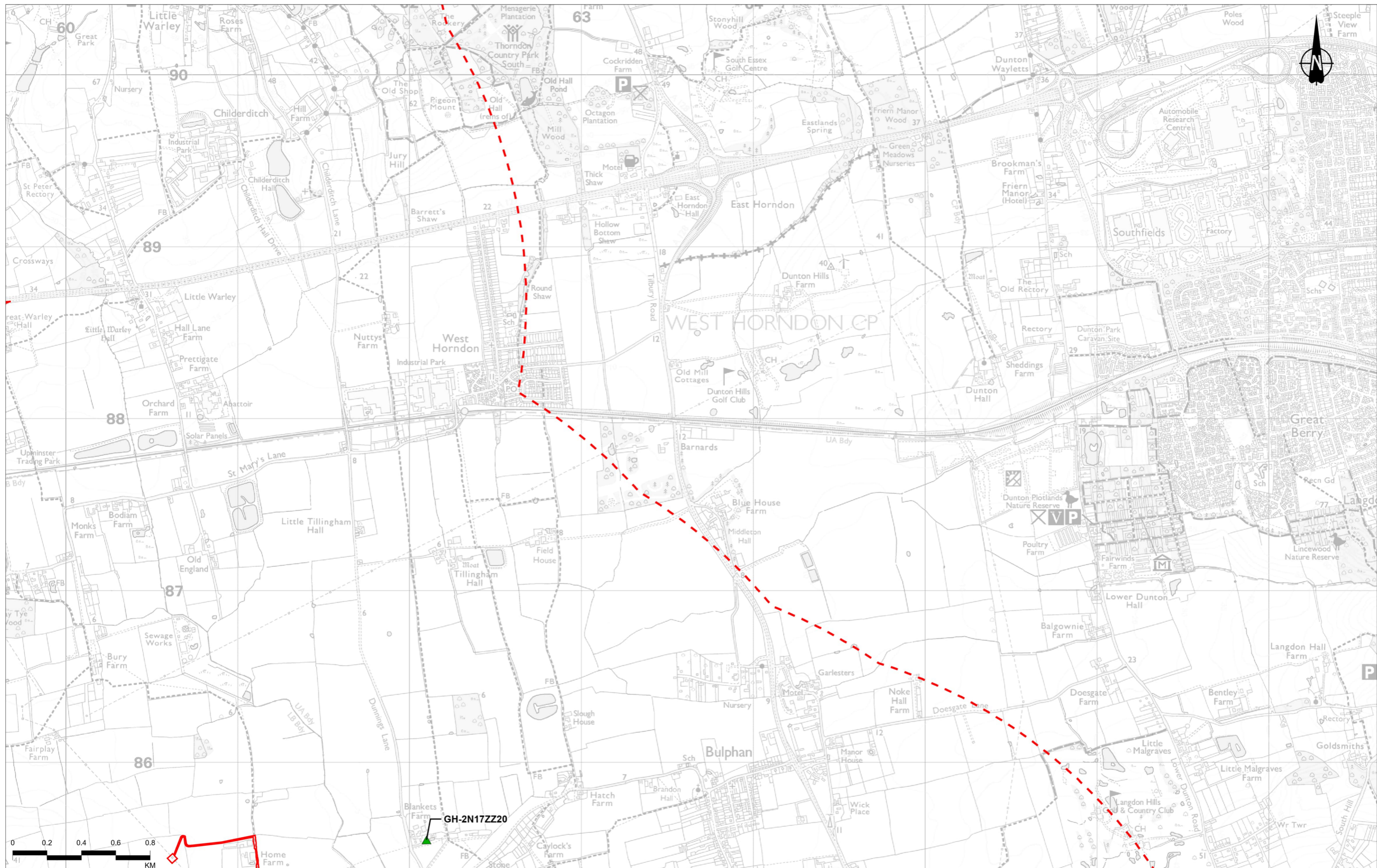


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- Legend**
- Route alignment
  - Order Limits
  - Order Limits (DR3.3) Buffer 3km
  - ▲ GP - Discharge to ground, permit
  - ▲ GH - Well, historical, abandoned or decommissioned
  - ▲ GL - Groundwater abstraction, well, licensed
  - ▲ RE - Irrigation reservoir
  - ⊕ BH - Observation borehole (groundwater level or quality)
  - ▲ GS - Historical spring

P01	S8	21/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv

	Client	Status	DCO APPLICATION	Original Size	A3	Revision	P01
	Project	Application Document Number	TR010032/APP/6.3	Scale	1:20,000	Drawing Title	
LOWER THAMES CROSSING		Appendix 14.2 - Water Feature Survey Results - Groundwater					
		Page 9 of 12					
		Drawing Number HE540039-CJV-EGT-SZP_EGNE0000000-DR-LE-50150					

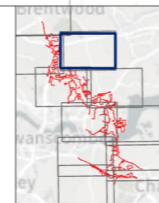


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**Legend**

- Route alignment
- ▭ Order Limits
- - - Order Limits (DR3.3) Buffer 3km
- ▲ GH - Well, historical, abandoned or decommissioned

P01	S8	21/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Approved



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**national highways**

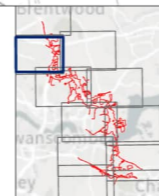
Project  
**LOWER THAMES CROSSING**

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:20,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Groundwater Page 10 of 12				
Drawing Number	HE540039-CJV-EGT-SZP_EGNE0000000-DR-LE-50150				



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- Legend**
- Route alignment
  - ▭ Order Limits
  - - - Order Limits (DR3.3) Buffer 3km
  - ▲ GP - Discharge to ground, permit
  - ▲ GS - Historical spring



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 national highways  
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**LOWER THAMES CROSSING**

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:20,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Groundwater Page 11 of 12				
Drawing Number	HE540039-CJV-EGT-SZP_EGNE00000000-DR-LE-50150				

P01	S8	21/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Checked	Approved

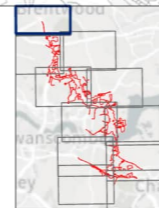




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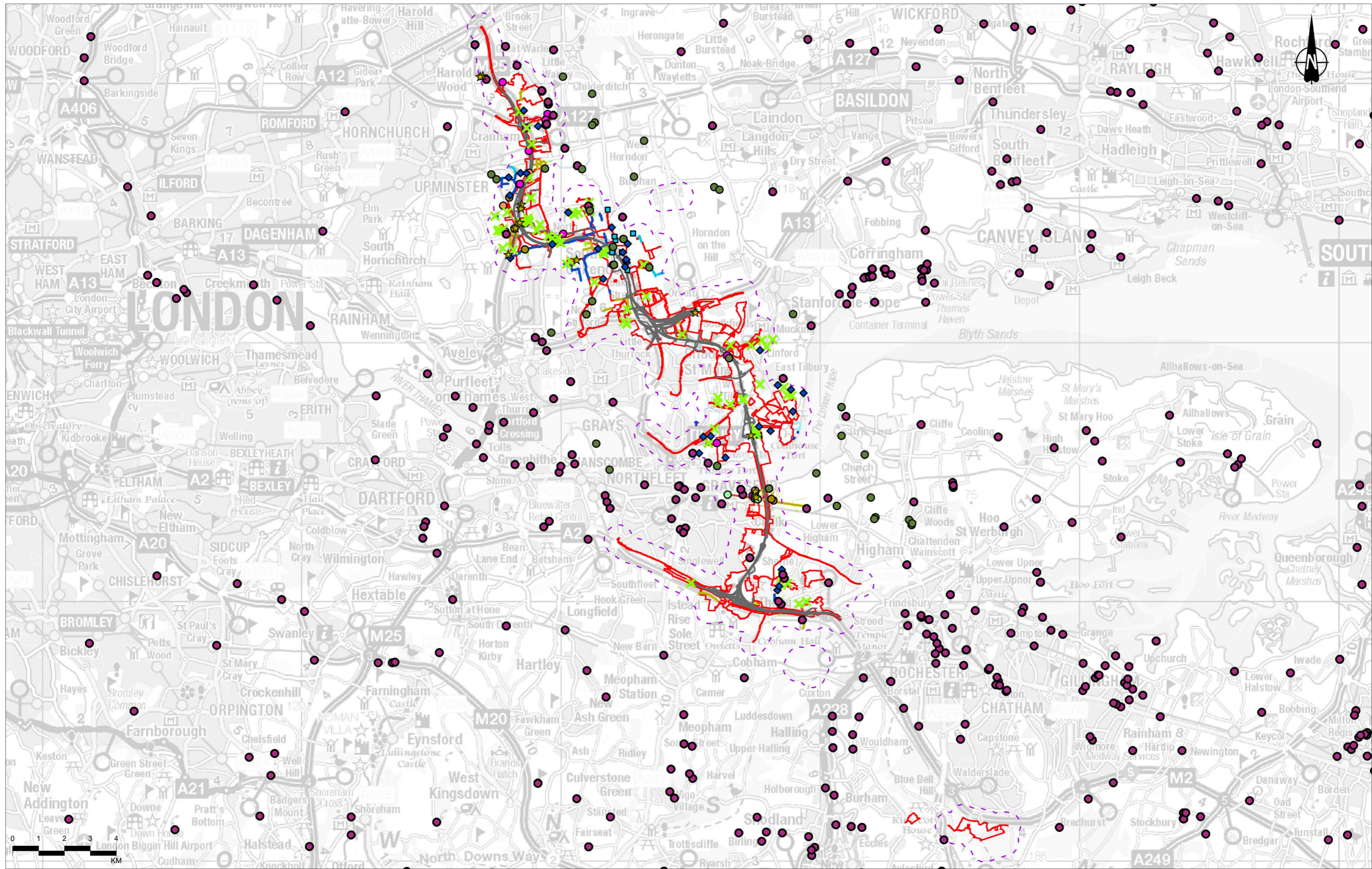
P01	S8	21/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Checked	Approved

- Legend**
- Route alignment
  - Order Limits
  - Order Limits (DR3.3) Buffer 3km



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**LOWER THAMES CROSSING**

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:20,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Groundwater Page 12 of 12				
Drawing Number	HE540039-CJV-EGT-SZP_EGNE0000000-DR-LE-50150				



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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprvd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

Legend	Water Feature Type	Water Feature Type
SN - Surface water feature, other (any feature that does not fit under any of the other types)	MR - Surface waterbody, EA designated main river	MR - Surface waterbody, EA designated main river
MR - Surface waterbody, EA designated main river	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
CN - Surface waterbody, canal (artificial linear waterway)	CN - Surface waterbody, canal (artificial linear waterway)	CN - Surface waterbody, canal (artificial linear waterway)
DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
PS/SI - Surface waterbody, lake or pond	PS/SI - Surface waterbody, lake or pond	PS/SI - Surface waterbody, lake or pond
OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
MR - Surface waterbody, EA designated main river	MR - Surface waterbody, EA designated main river	MR - Surface waterbody, EA designated main river
OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
PS/SI - Surface waterbody, lake or pond	PS/SI - Surface waterbody, lake or pond	PS/SI - Surface waterbody, lake or pond
SN - Surface water feature, other (any feature that does not fit under any of the other types)	SN - Surface water feature, other (any feature that does not fit under any of the other types)	SN - Surface water feature, other (any feature that does not fit under any of the other types)
SJ - Surface water discharge, permit	SJ - Surface water body, moat	SJ - Surface water body, moat

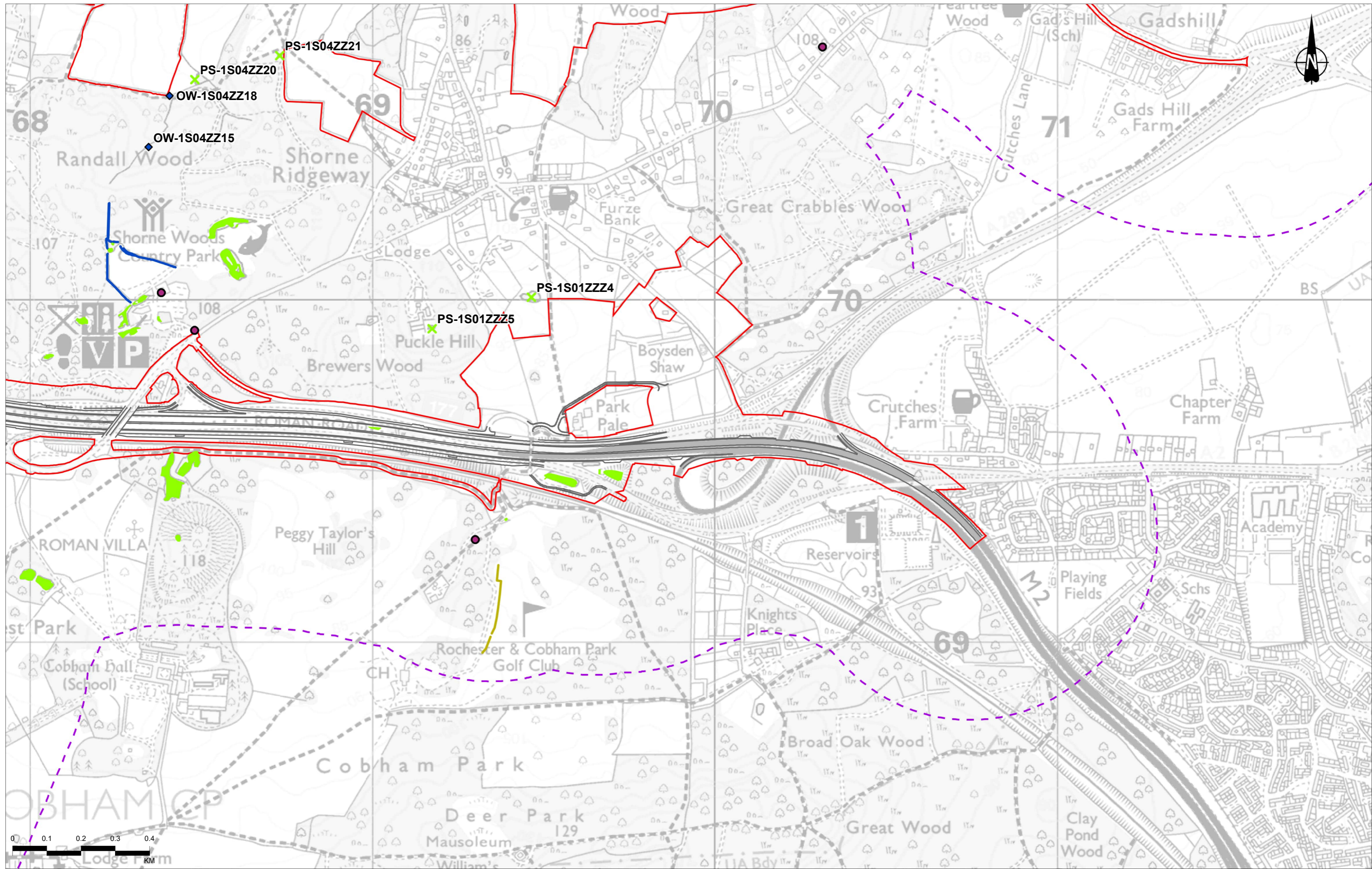
Client: national highways

Project: LOWER THAMES CROSSING

Status	DCO APPLICATION	Original Size	Revision
Application Document Number	TR010032/APP/6.2	A3	P01
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 1 of 23		
Drawing Number	HE540039-CJV-EGN-SZP_EGNE0000000-DR-LE-50149		

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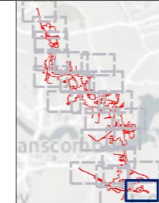
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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

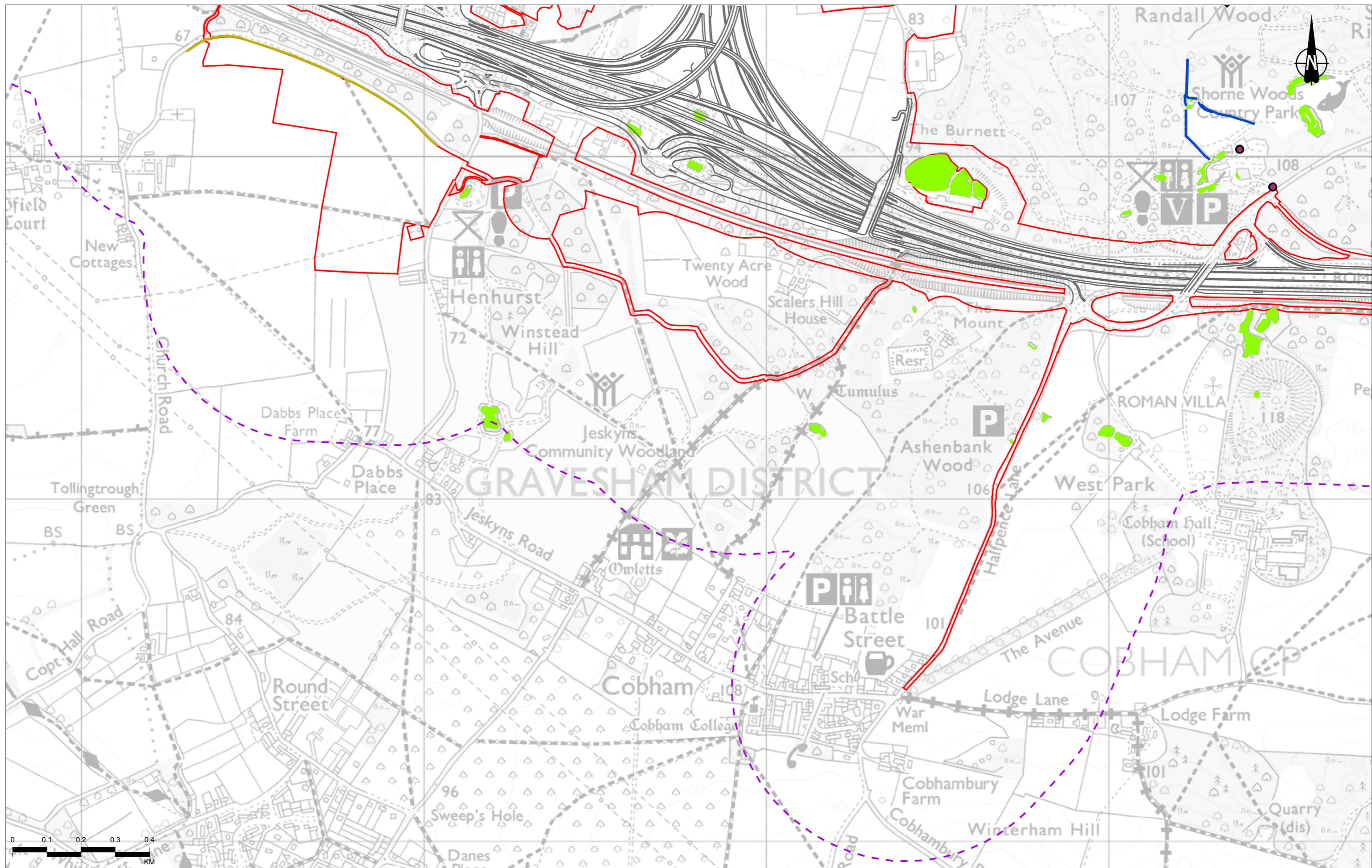
Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licensed Abstraction
	Water Discharge Permits
	Water Feature Type
	PS/SI - Surface waterbody, lake or pond
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	Water Feature Type
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	Water Feature Type
	PS/SI - Surface waterbody, lake or pond



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**LOWER THAMES CROSSING**

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 2 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				

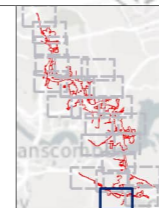


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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprvd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

- Legend**
- Route alignment
  - Order Limits
  - - - Order Limits 500m Buffer
  - Licenced Abstraction
  - Water Discharge Permits
  - ◆ Water Feature Type
  - ◆ OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)

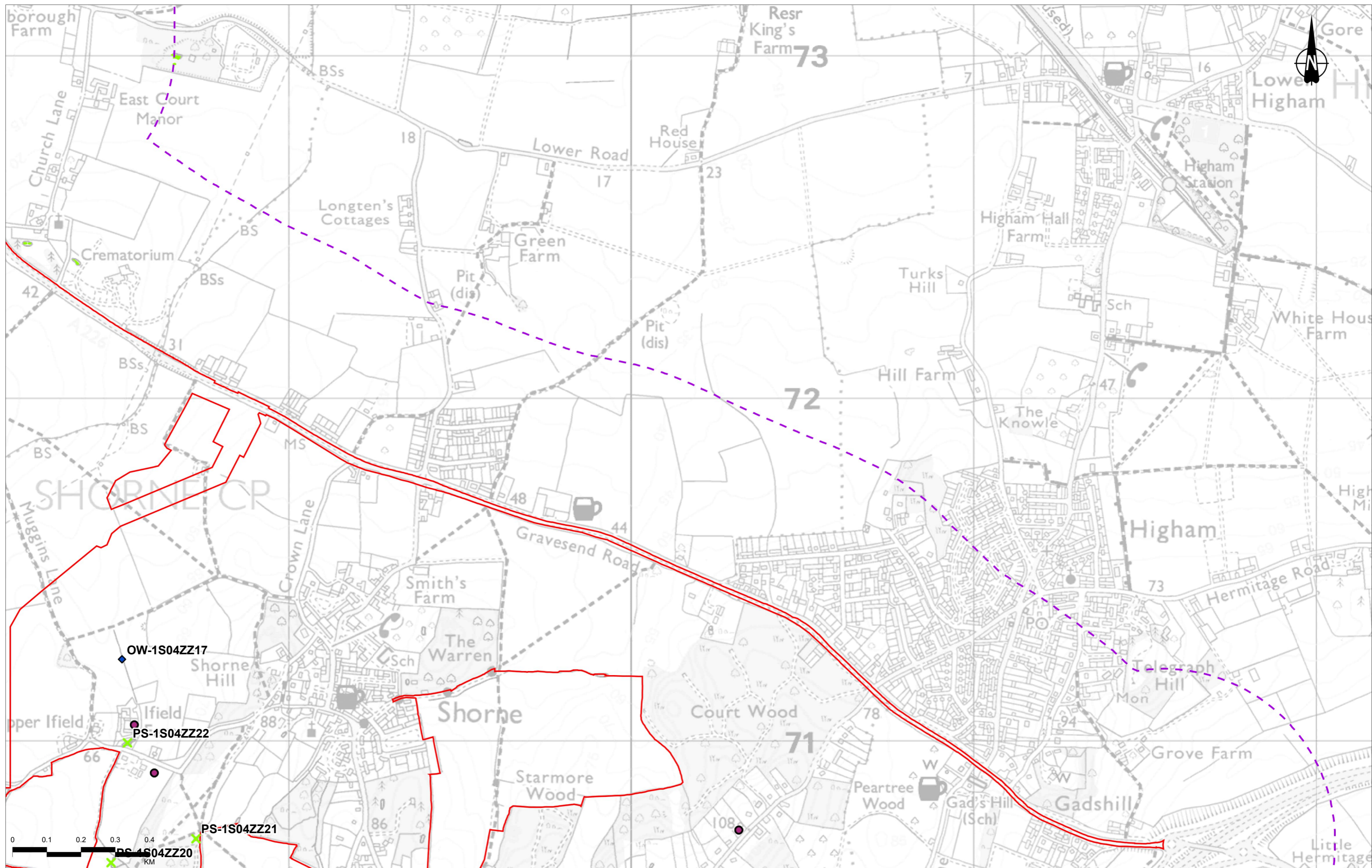
- Water Feature Type**
- DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
  - OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
  - Water Feature Type
  - PS/SI - Surface waterbody, lake or pond



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Project  
**LOWER THAMES CROSSING**

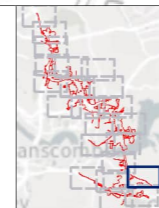
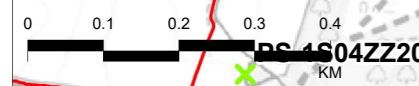
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Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 3 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE0000000-DR-LE-50149				



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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

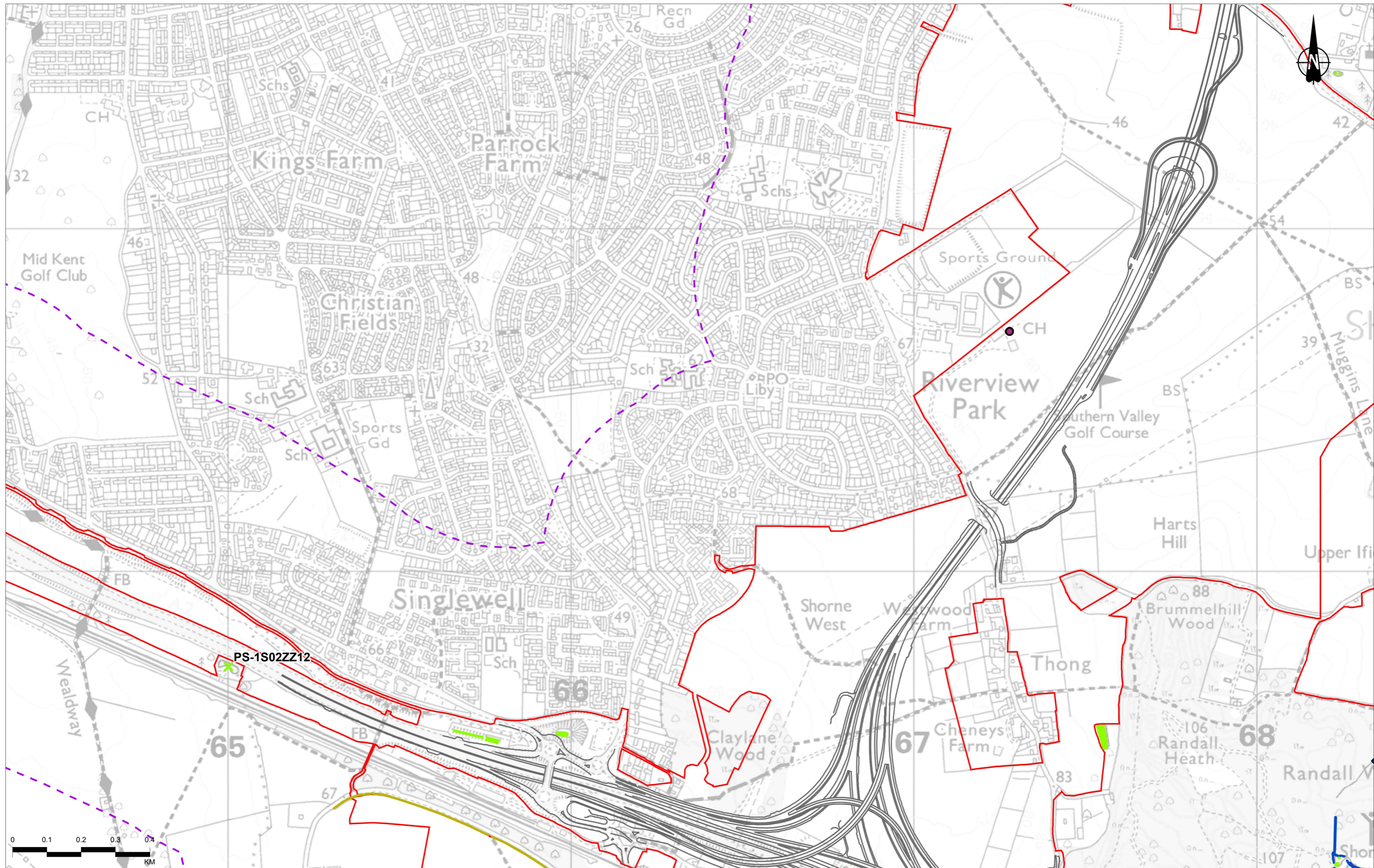
- Legend**
- Route alignment
  - ▭ Order Limits
  - Order Limits 500m Buffer
  - Licenced Abstraction
  - Water Discharge Permits
  - Water Feature Type
  - ✕ PS/SI - Surface waterbody, lake or pond
  - ◆ OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
  - Water Feature Type
  - PS/SI - Surface waterbody, lake or pond



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**LOWER THAMES CROSSING**

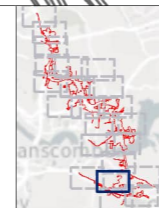
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Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 4 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				



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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

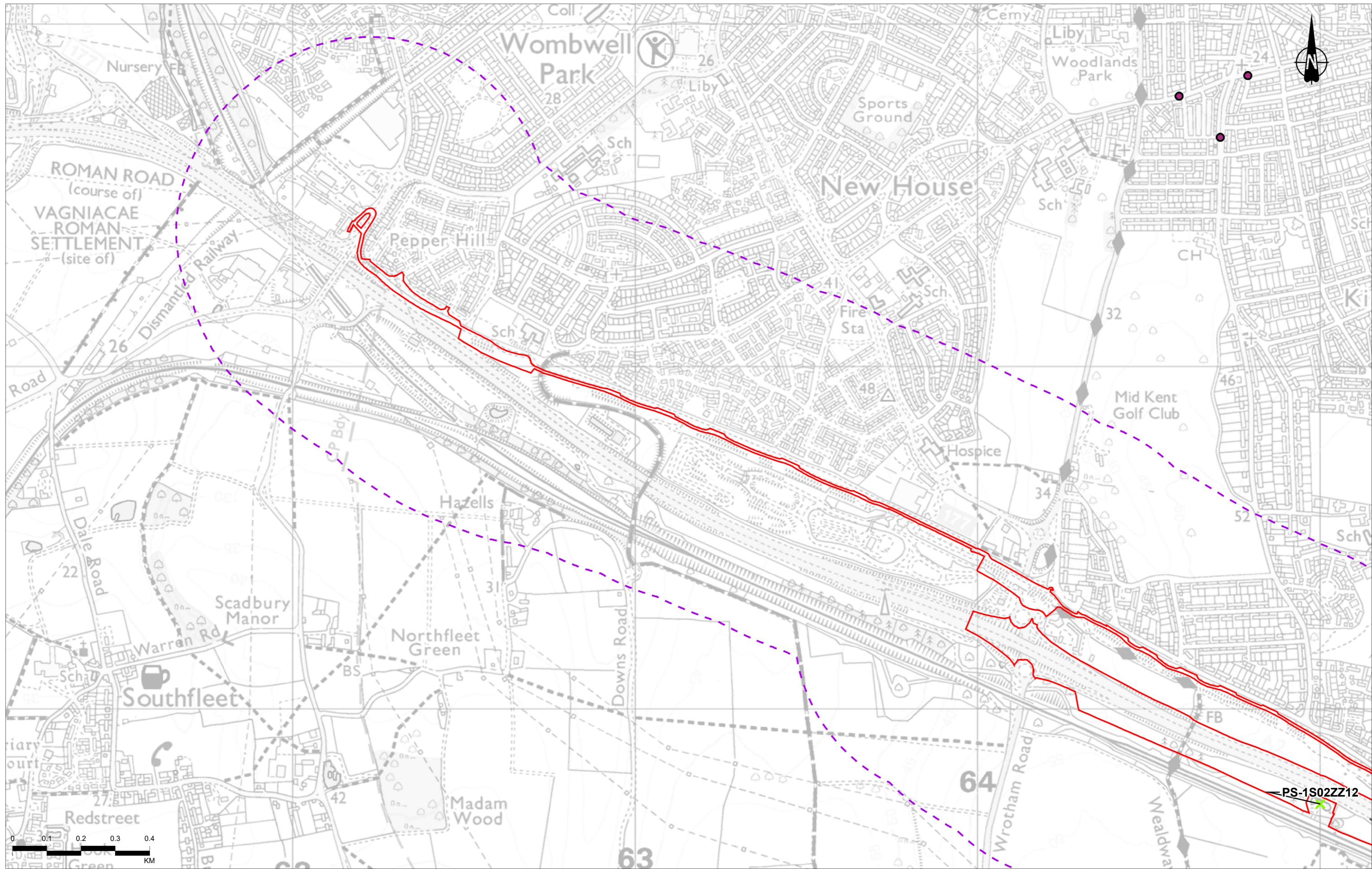
Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licensed Abstraction
	Water Discharge Permits
	Water Feature Type
	PS/SI - Surface waterbody, lake or pond
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	Water Feature Type
	PS/SI - Surface waterbody, lake or pond



Client: **national highways**

Project: **LOWER THAMES CROSSING**

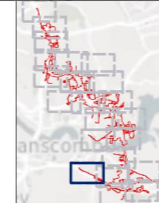
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Drawing Number	HE540039-CJV-EGN-SZP_EGNE0000000-DR-LE-50149				



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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

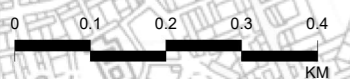
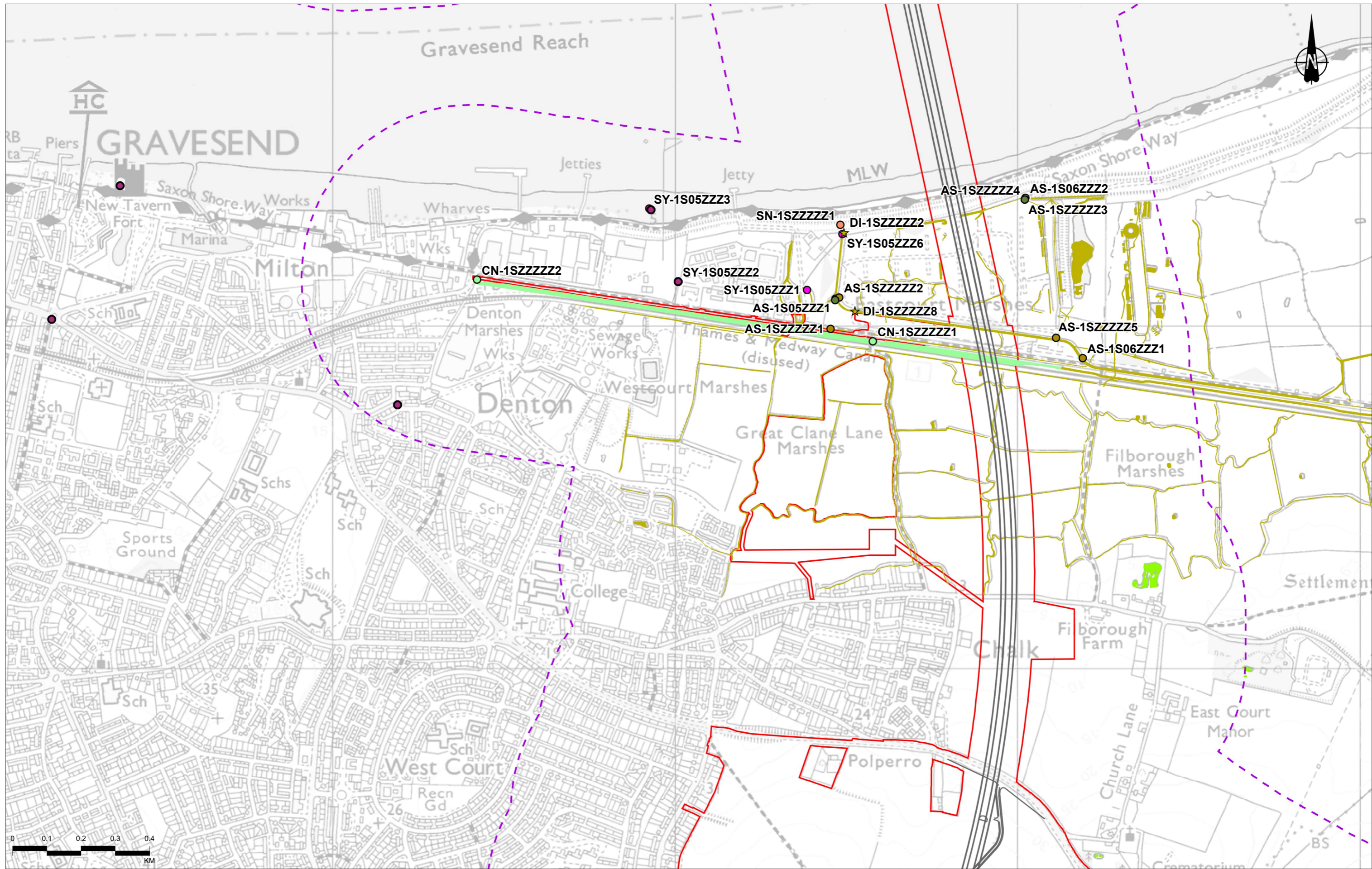
- Legend**
- Route alignment
  - ▭ Order Limits
  - ┌┐ Order Limits 500m Buffer
  - Licenced Abstraction
  - Water Discharge Permits
  - Water Feature Type
  - ✕ PS/SI - Surface waterbody, lake or pond



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Project  
**LOWER THAMES CROSSING**

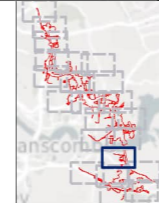
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Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 6 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				



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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprvd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licensed Abstraction
	Water Discharge Permits
Water Feature Type	
	AS - Surface water abstraction, licensed
	SY - Surface water discharge, permit
	SN - Surface water feature, other (any feature that does not fit under any of the other types)
	CN - Surface waterbody, canal (artificial linear waterway)
Water Feature Type	
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	CN - Surface waterbody, canal (artificial linear waterway)
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	PS/SI - Surface waterbody, lake or pond

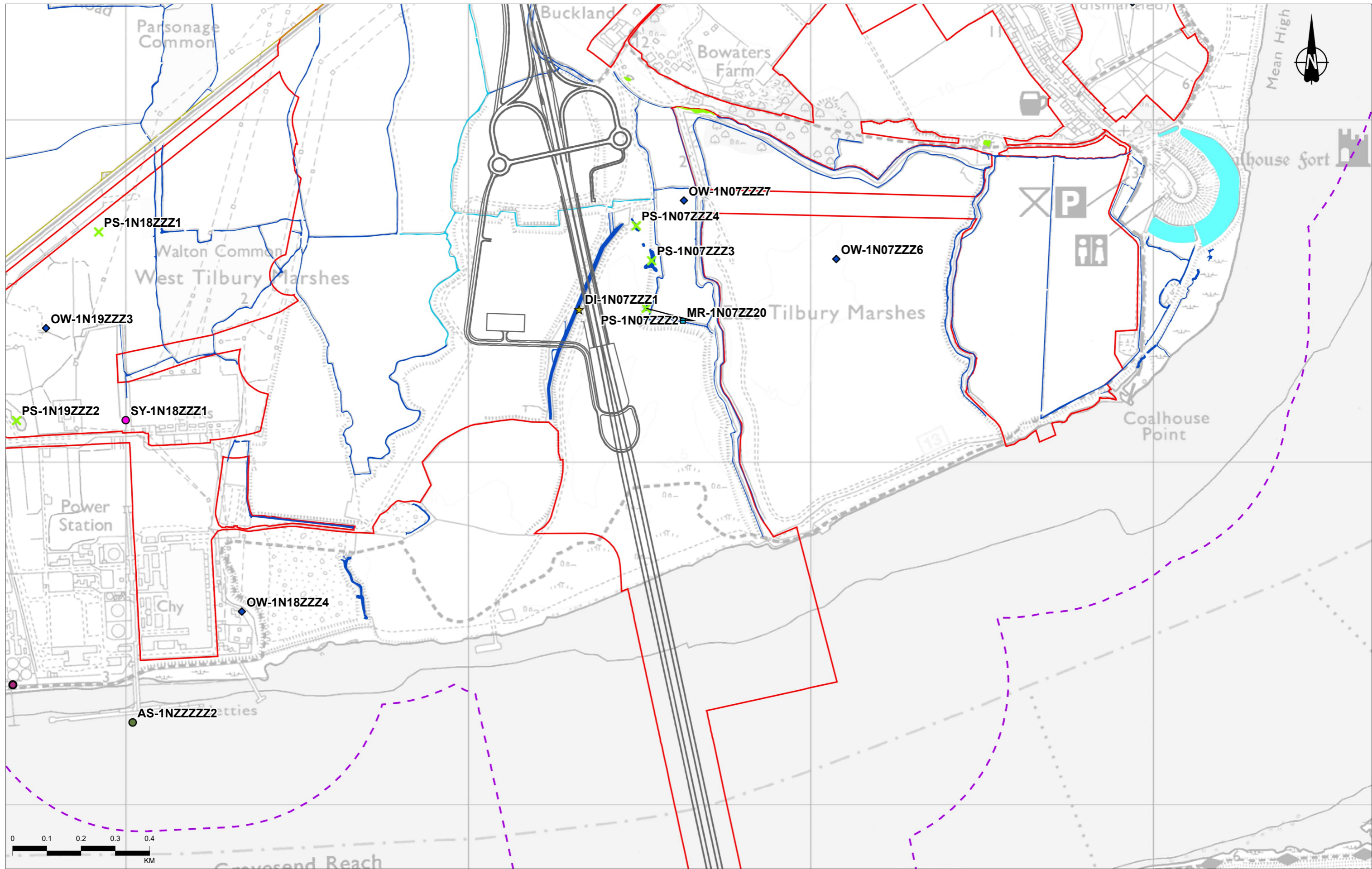


Client  
**national highways**

Project  
**LOWER THAMES CROSSING**

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 7 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				





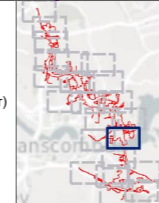
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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

- Legend**
- Route alignment
  - Order Limits
  - Order Limits 500m Buffer
  - Licensed Abstraction
  - Water Discharge Permits
  - Water Feature Type
  - AS - Surface water abstraction, licensed

- SY - Surface water discharge, permit
- MR - Surface waterbody, EA designated main river
- DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
- PS/SI - Surface waterbody, lake or pond
- OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
- AS - Surface water abstraction, licensed
- OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)

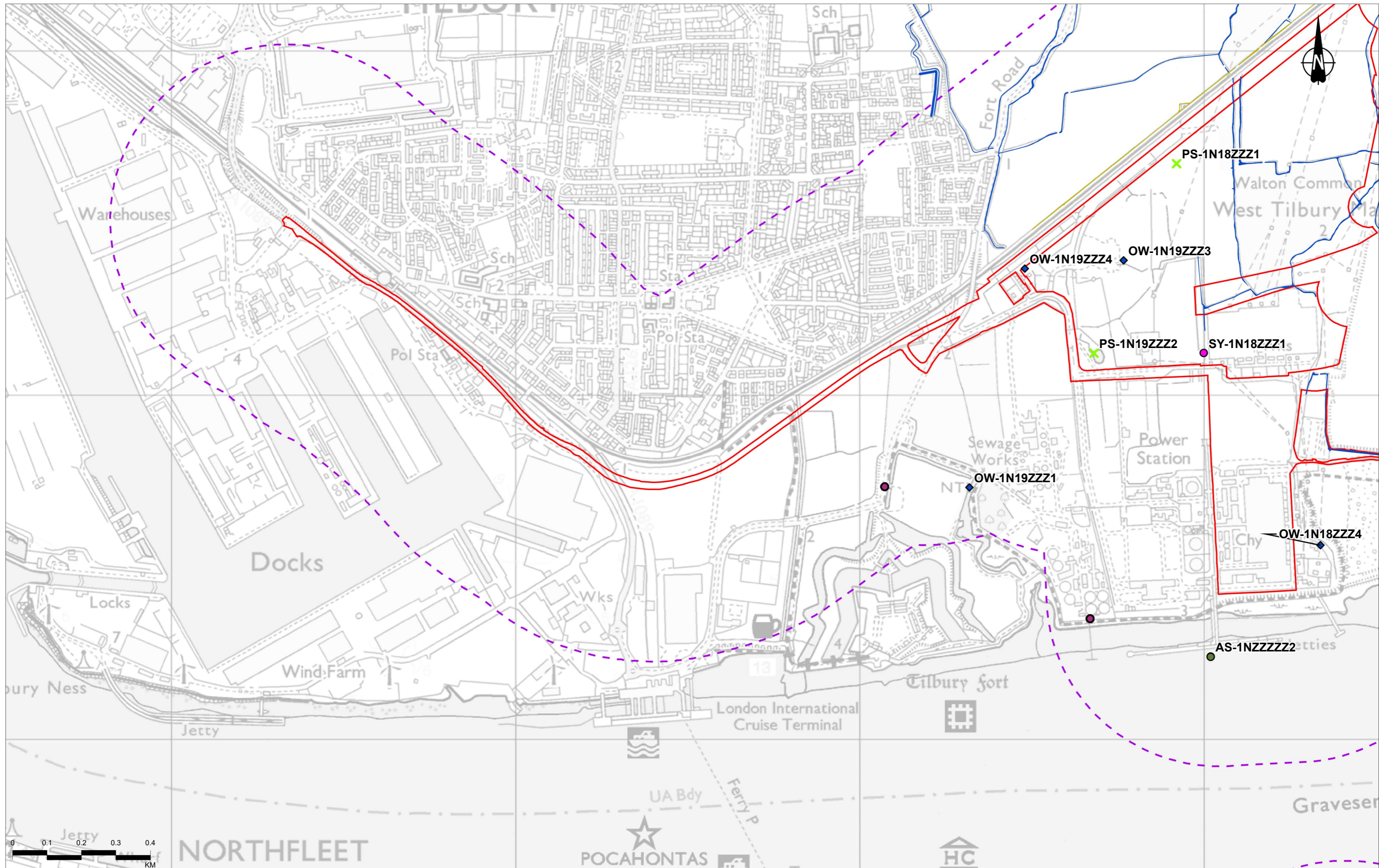
- Water Feature Type**
- DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
  - MR - Surface waterbody, EA designated main river
  - OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
  - PS/SI - Surface waterbody, lake or pond
  - SJ - Surface water body, moat



Client: **national highways**

Project: **LOWER THAMES CROSSING**

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 8 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				



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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licensed Abstraction
	Water Discharge Permits
	Water Feature Type
	AS - Surface water abstraction, licensed
	SY - Surface water discharge, permit
	PS/SI - Surface waterbody, lake or pond
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	Water Feature Type
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	Water Feature Type
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)

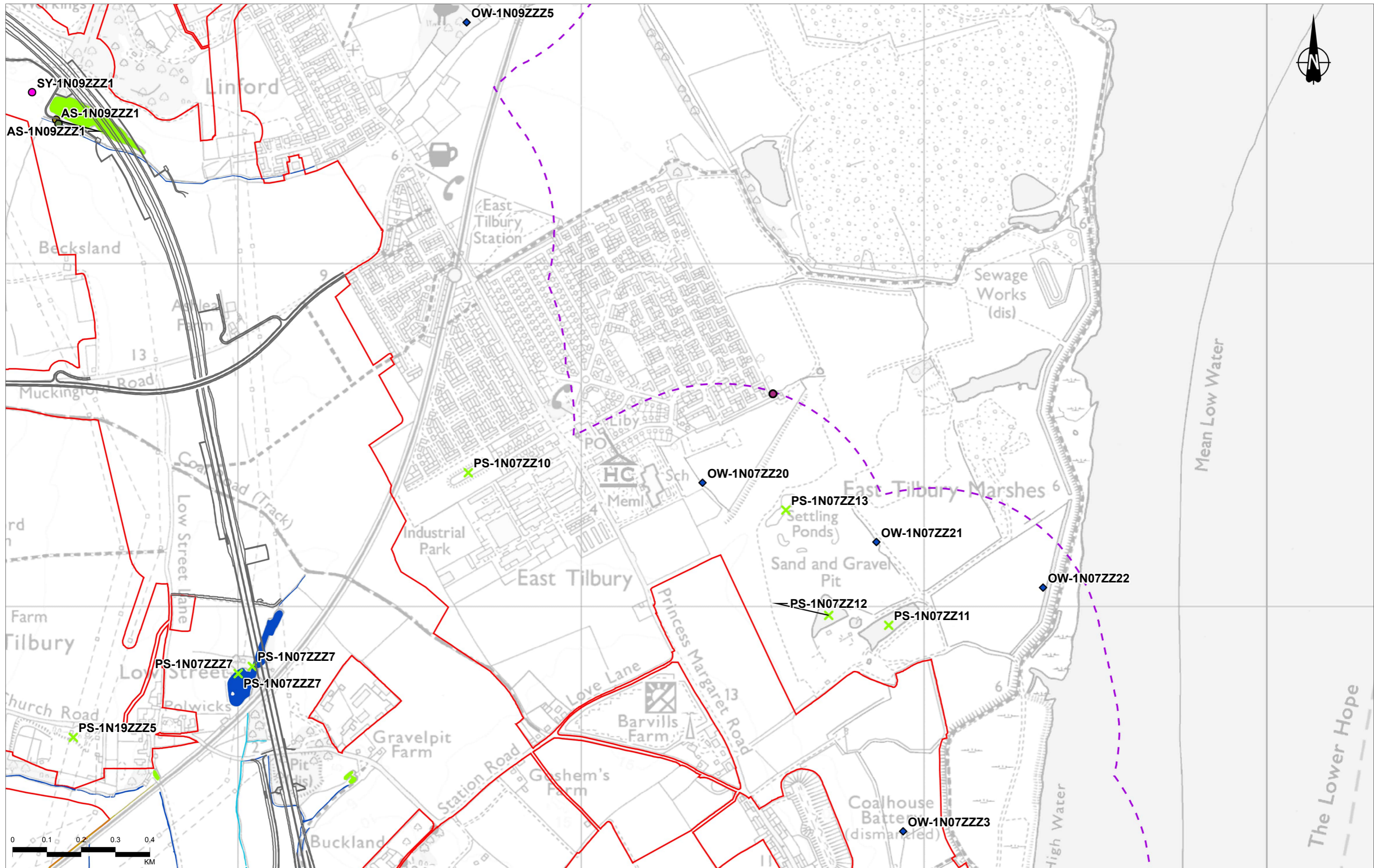


Client:

Project: LOWER THAMES CROSSING

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 9 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				

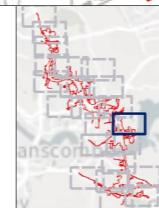
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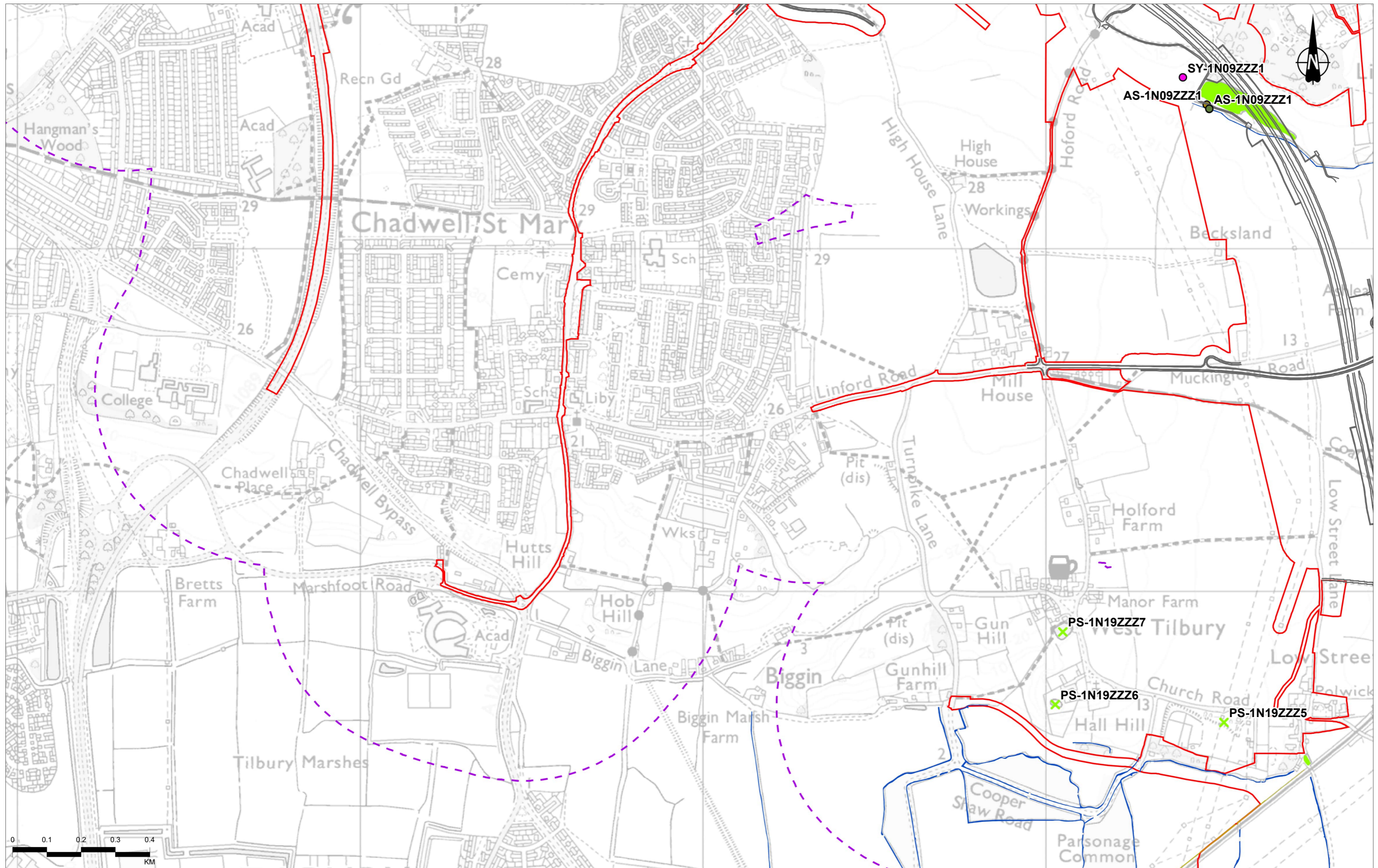
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P01	S8	07/10/2022	DCO Application	SW	LD	BF

Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licenced Abstraction
	Water Discharge Permits
Water Feature Type	
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	MR - Surface waterbody, EA designated main river
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
Water Feature Type	
	AS - Surface water abstraction, licenced
	PS/SI - Surface waterbody, lake or pond
	SY - Surface water discharge, permit



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 Project  
**LOWER THAMES CROSSING**

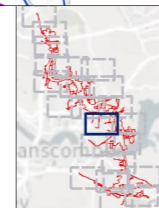
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Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 10 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE0000000-DR-LE-50149				



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P01	S8	07/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd

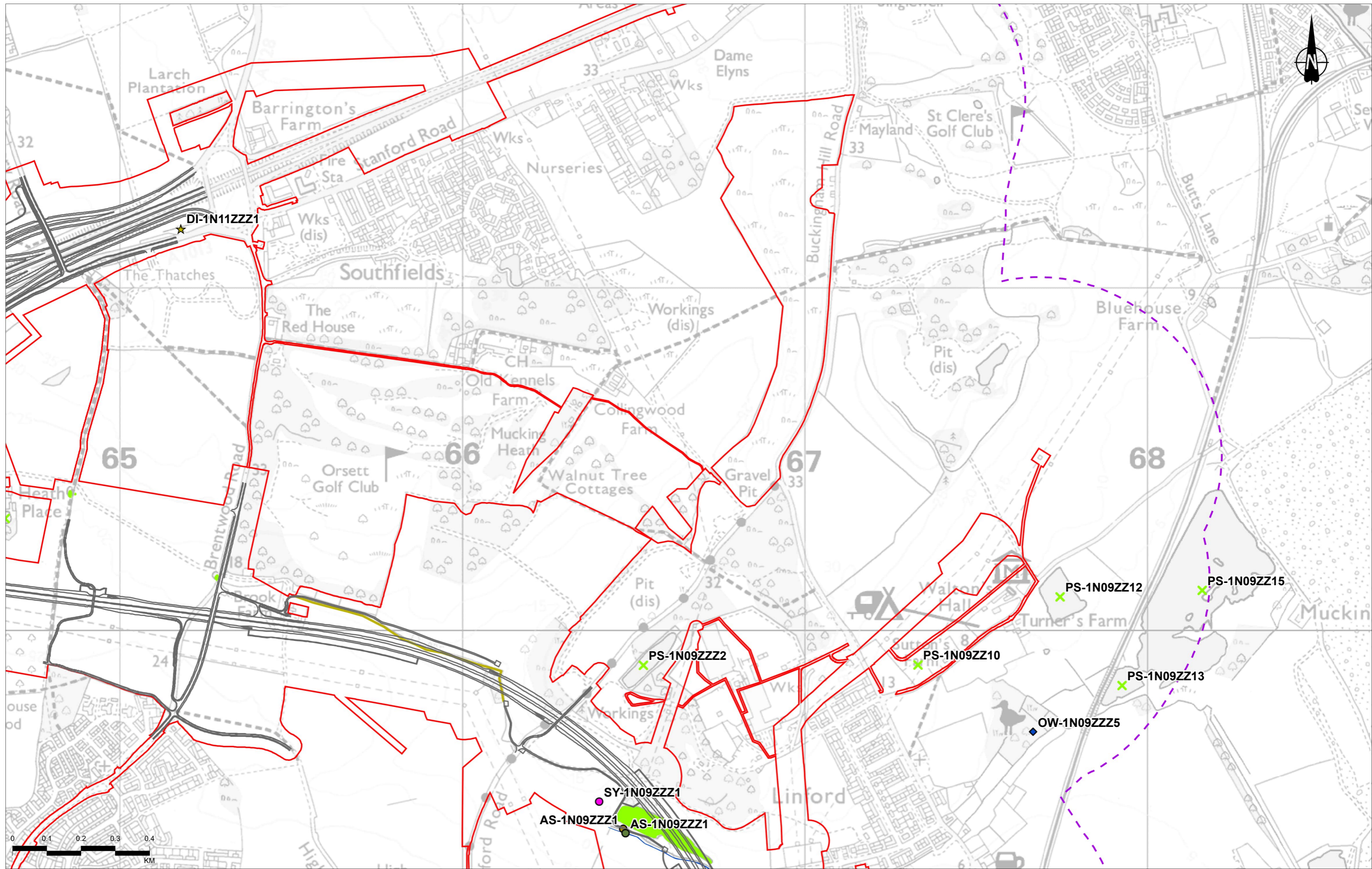
Route alignment	SY - Surface water discharge, permit
Order Limits	PS/SI - Surface waterbody, lake or pond
Order Limits 500m Buffer	<b>Water Feature Type</b>
Licenced Abstraction	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
Water Discharge Permits	MR - Surface waterbody, EA designated main river
<b>Water Feature Type</b>	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
AS - Surface water abstraction, licensed	PS/SI - Surface waterbody, lake or pond



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**LOWER THAMES CROSSING**

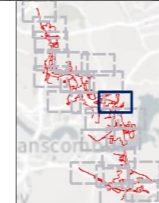
Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 11 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				



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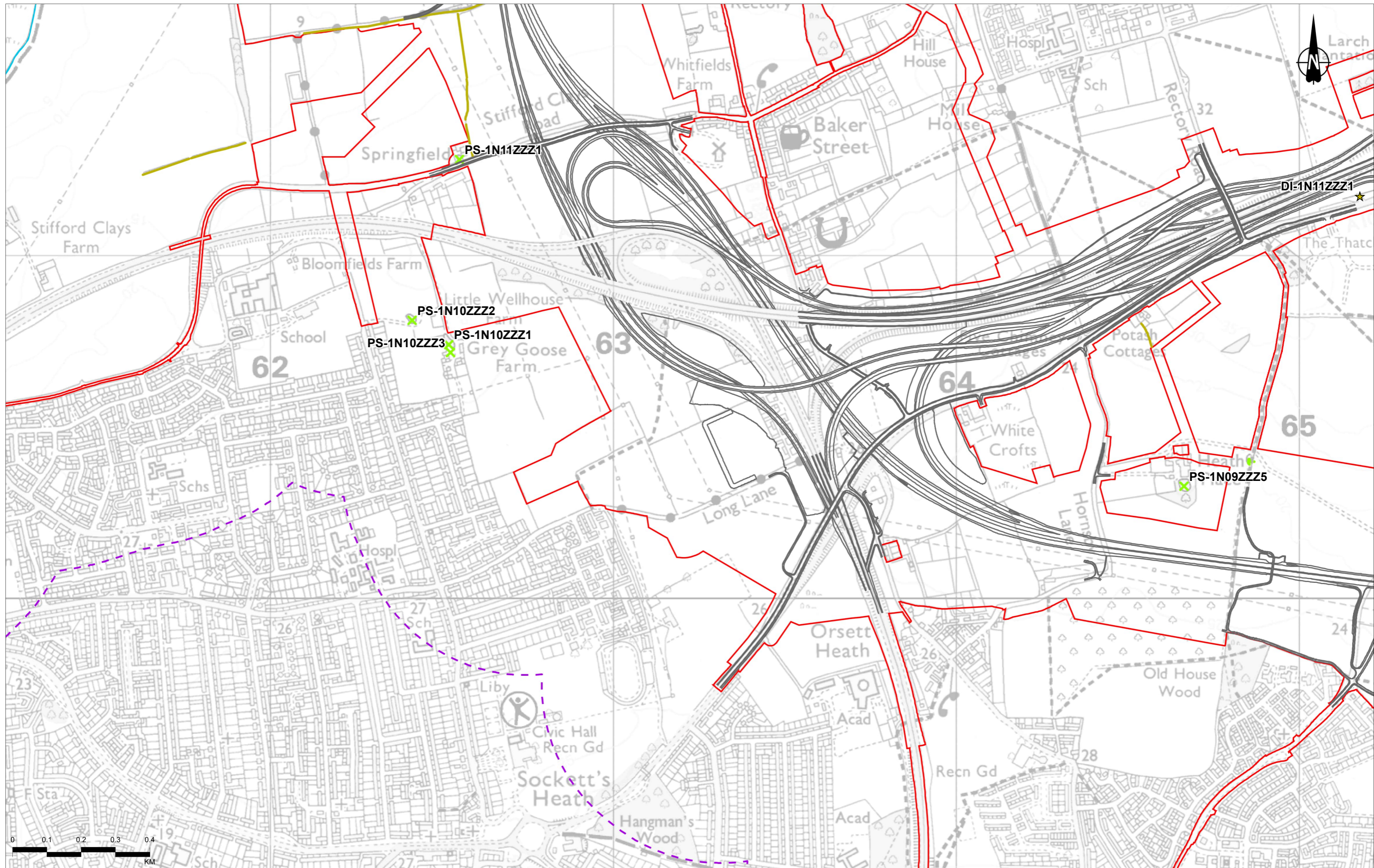
P01	S8	07/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd

Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licensed Abstraction
	Water Discharge Permits
	Water Feature Type
	AS - Surface water abstraction, licensed
	SY - Surface water discharge, permit
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	PS/SI - Surface waterbody, lake or pond
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	PS/SI - Surface waterbody, lake or pond



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Project	LOWER THAMES CROSSING

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 12 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				

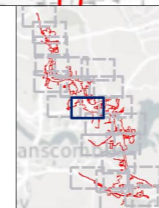


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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

- Legend**
- Route alignment
  - Order Limits
  - Order Limits 500m Buffer
  - Licensed Abstraction
  - Water Discharge Permits
  - Water Feature Type
  - ★ DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)

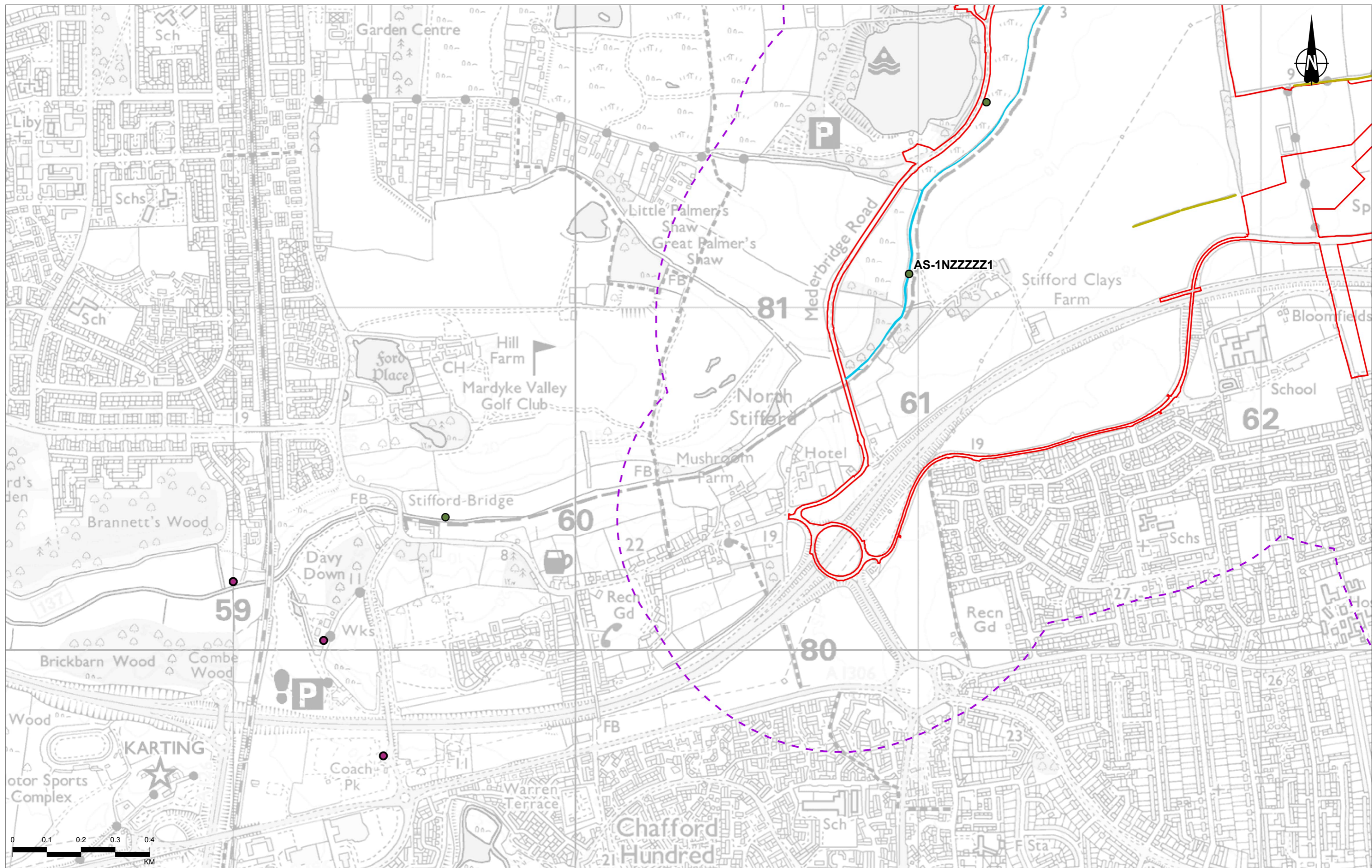
- ✕ PS/SI - Surface waterbody, lake or pond
- Water Feature Type
- DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
- Water Feature Type
- PS/SI - Surface waterbody, lake or pond



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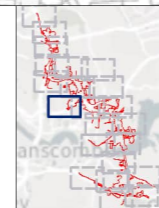
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Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 13 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				



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P01	S8	07/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd

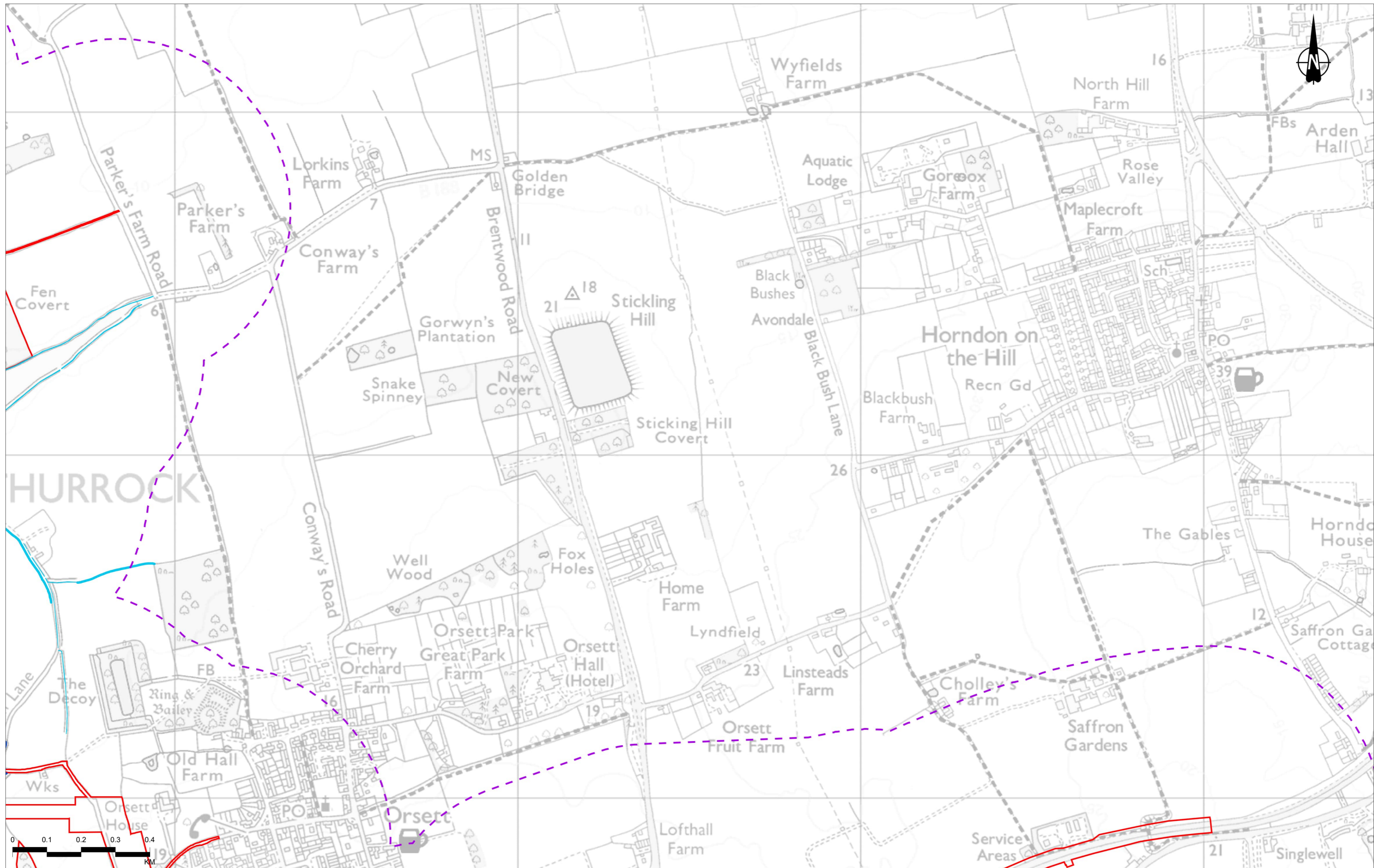
- Legend**
- Route alignment
  - ▭ Order Limits
  - - - Order Limits 500m Buffer
  - Licenced Abstraction
  - Water Discharge Permits
  - AS - Surface water abstraction, licensed
  - Water Feature Type
  - Water Feature Type
  - DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
  - Water Feature Type
  - MR - Surface waterbody, EA designated main river



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Project  
**LOWER THAMES CROSSING**

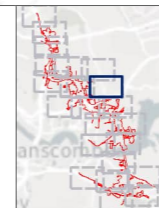
Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 14 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				



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- Legend**
- Route alignment
  - ▭ Order Limits
  - - - Order Limits 500m Buffer
  - Licenced Abstraction
  - Water Discharge Permits
- Water Feature Type**
- MR - Surface waterbody, EA designated main river
  - Water Feature Type
  - MR - Surface waterbody, EA designated main river

P01	S8	07/10/2022	DCO Application	SW	LD	BF
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd

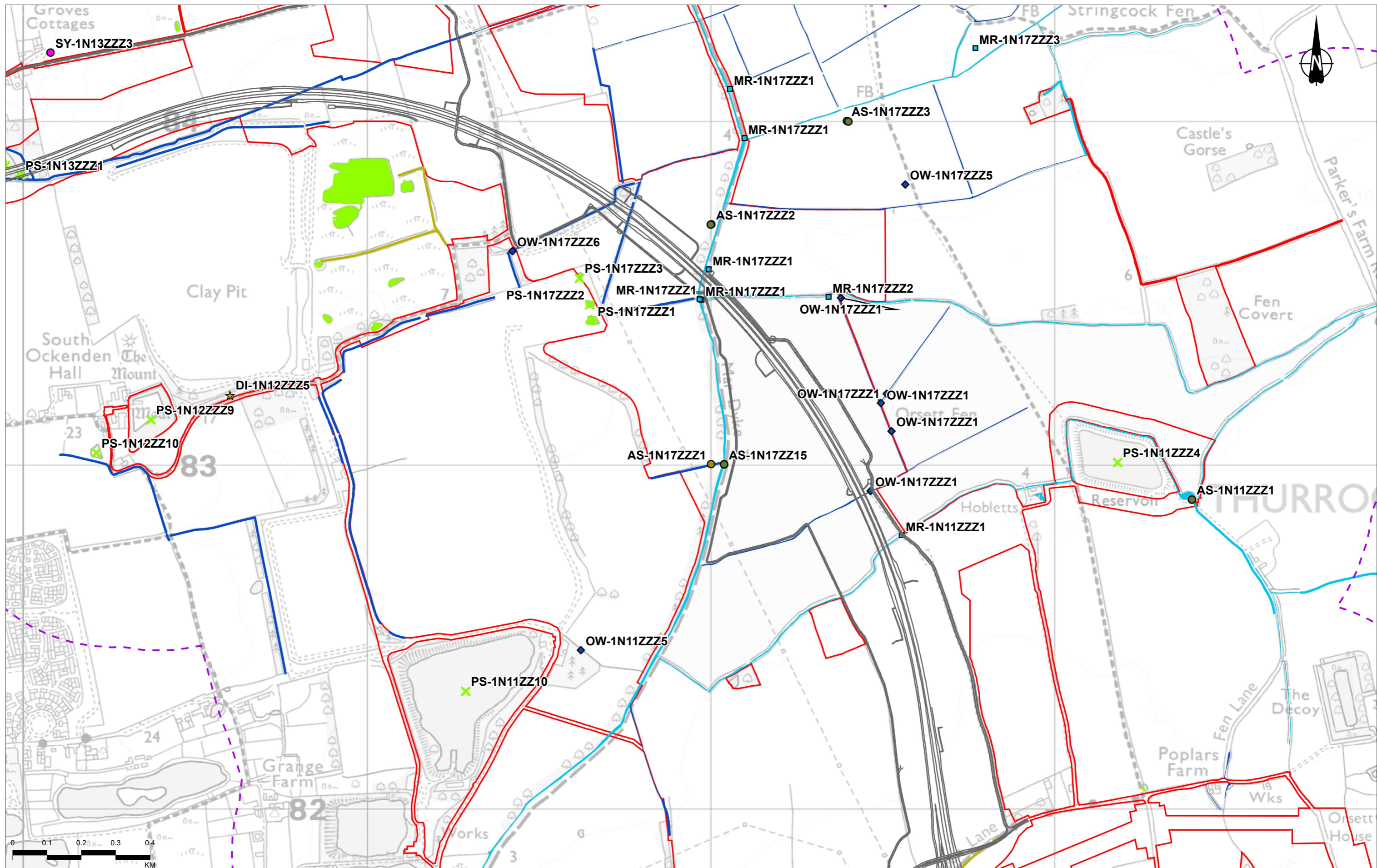


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Project  
**LOWER THAMES CROSSING**

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
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Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				

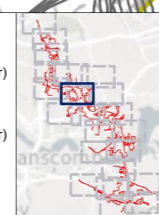




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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

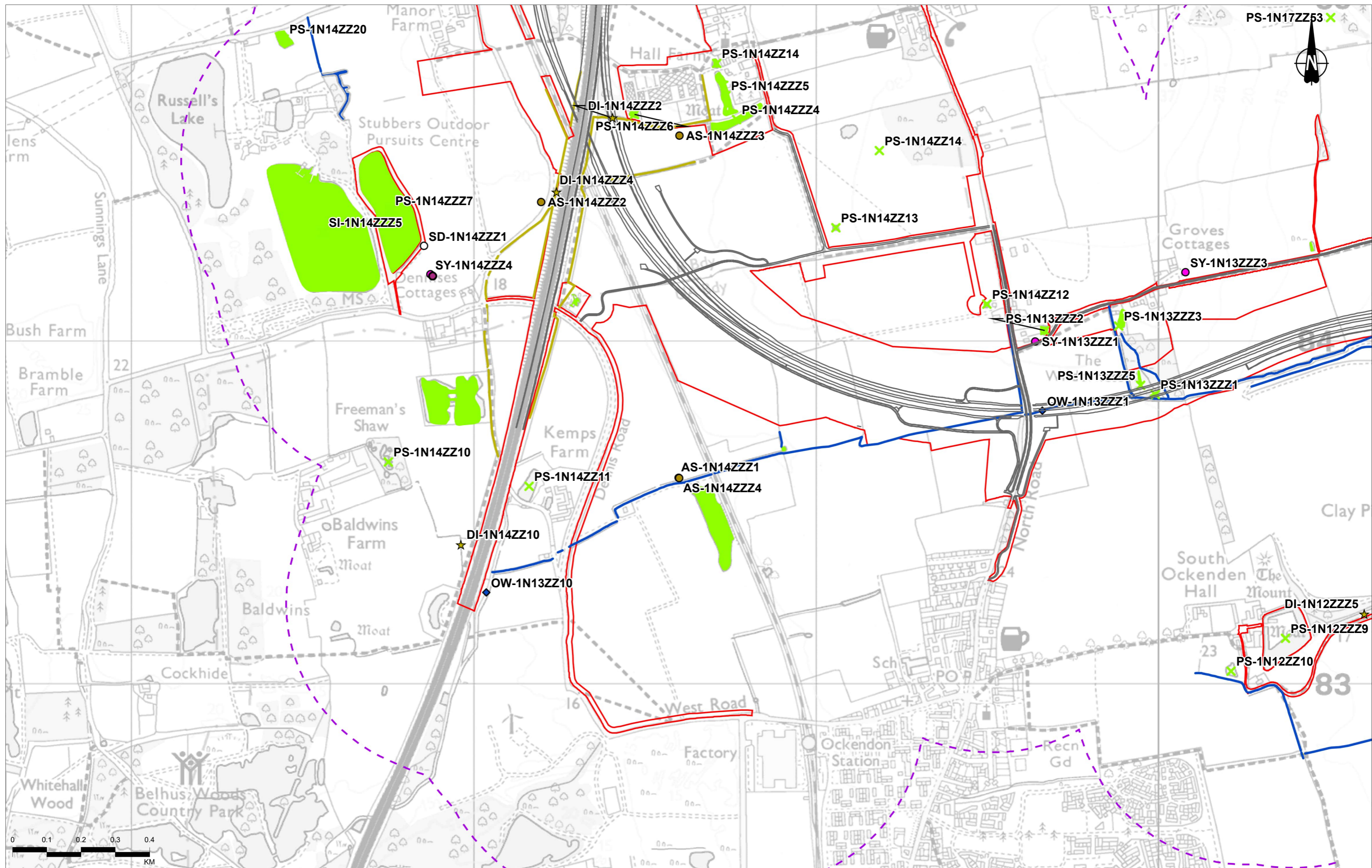
Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licensed Abstraction
	Water Discharge Permits
	Water Feature Type
	AS - Surface water abstraction, licensed
	SY - Surface water discharge, permit
	MR - Surface waterbody, EA designated main river
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	PS/SI - Surface waterbody, lake or pond
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	MR - Surface waterbody, EA designated main river
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	PS/SI - Surface waterbody, lake or pond



Client: national highways

Project: LOWER THAMES CROSSING

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 16 of 23				
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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chckd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

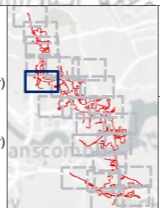
**Legend**

- Route alignment
- Order Limits
- Order Limits 500m Buffer
- Licensed Abstraction
- Water Discharge Permits
- Water Feature Type
- SD - Surface water abstraction, deregulated/no licence

- AS - Surface water abstraction, licensed
- SY - Surface water discharge, permit
- DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
- DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
- PS/SI - Surface waterbody, lake or pond
- OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)

**Water Feature Type**

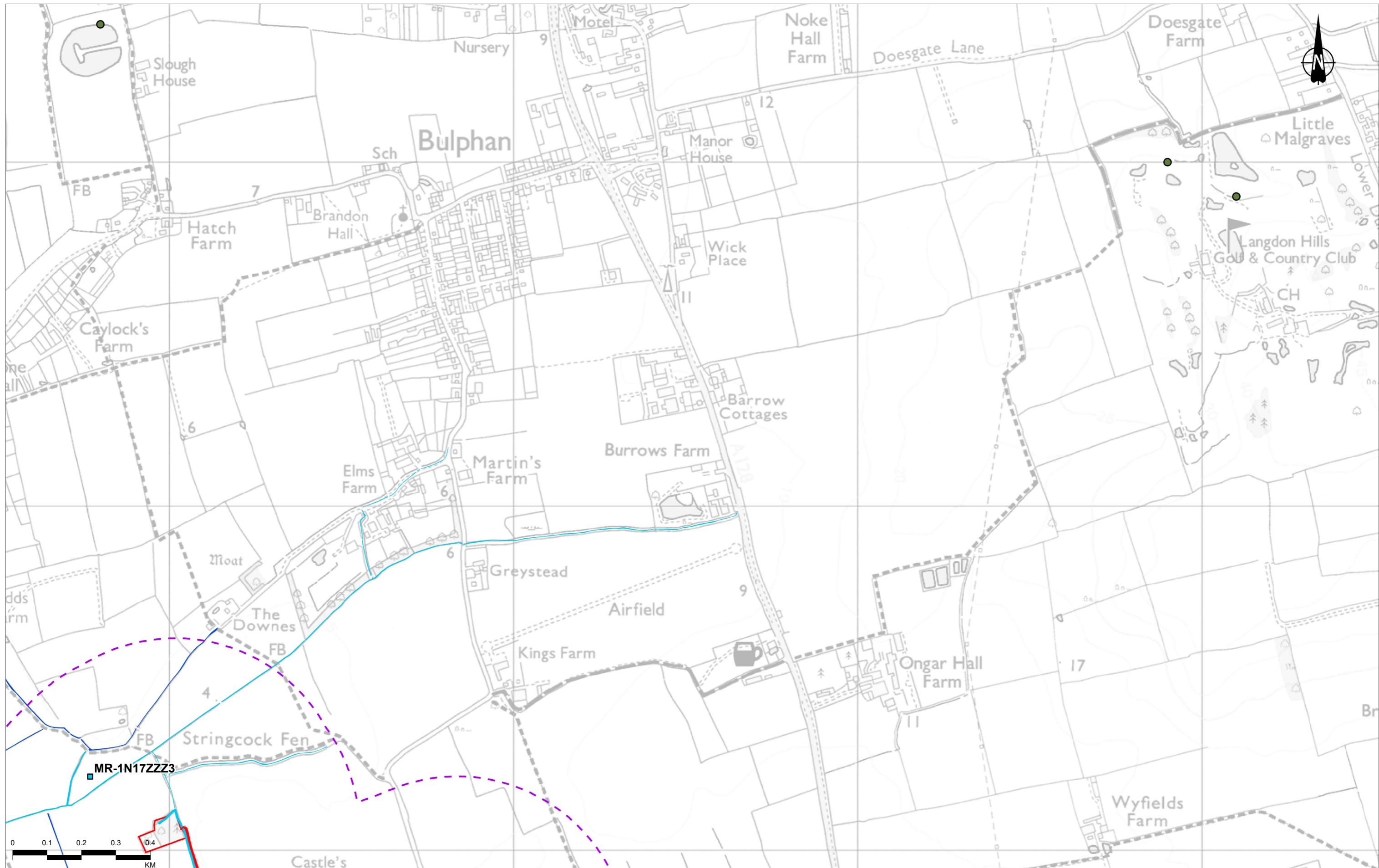
- DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
- OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
- DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
- OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
- PS/SI - Surface waterbody, lake or pond



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Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 17 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				

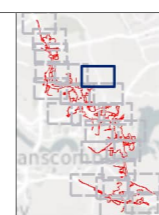


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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

- Legend**
- Route alignment
  - Order Limits
  - Order Limits 500m Buffer
  - Licensed Abstraction
  - Water Discharge Permits
  - Water Feature Type
  - MR - Surface waterbody, EA designated main river

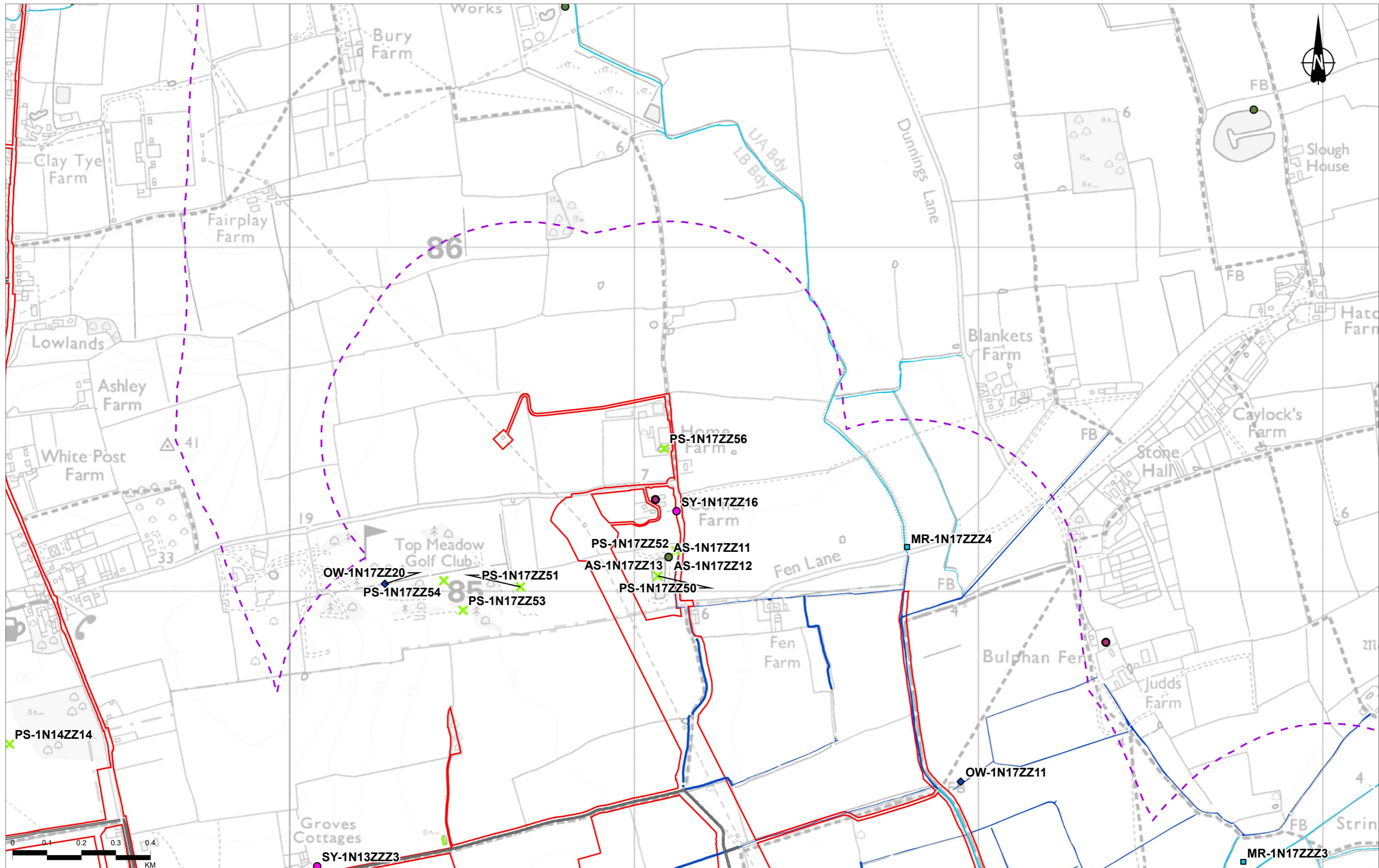
- Water Feature Type**
- MR - Surface waterbody, EA designated main river
  - MR - Surface waterbody, EA designated main river
  - OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)



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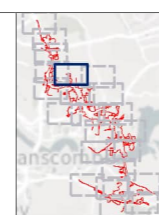
Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 18 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				



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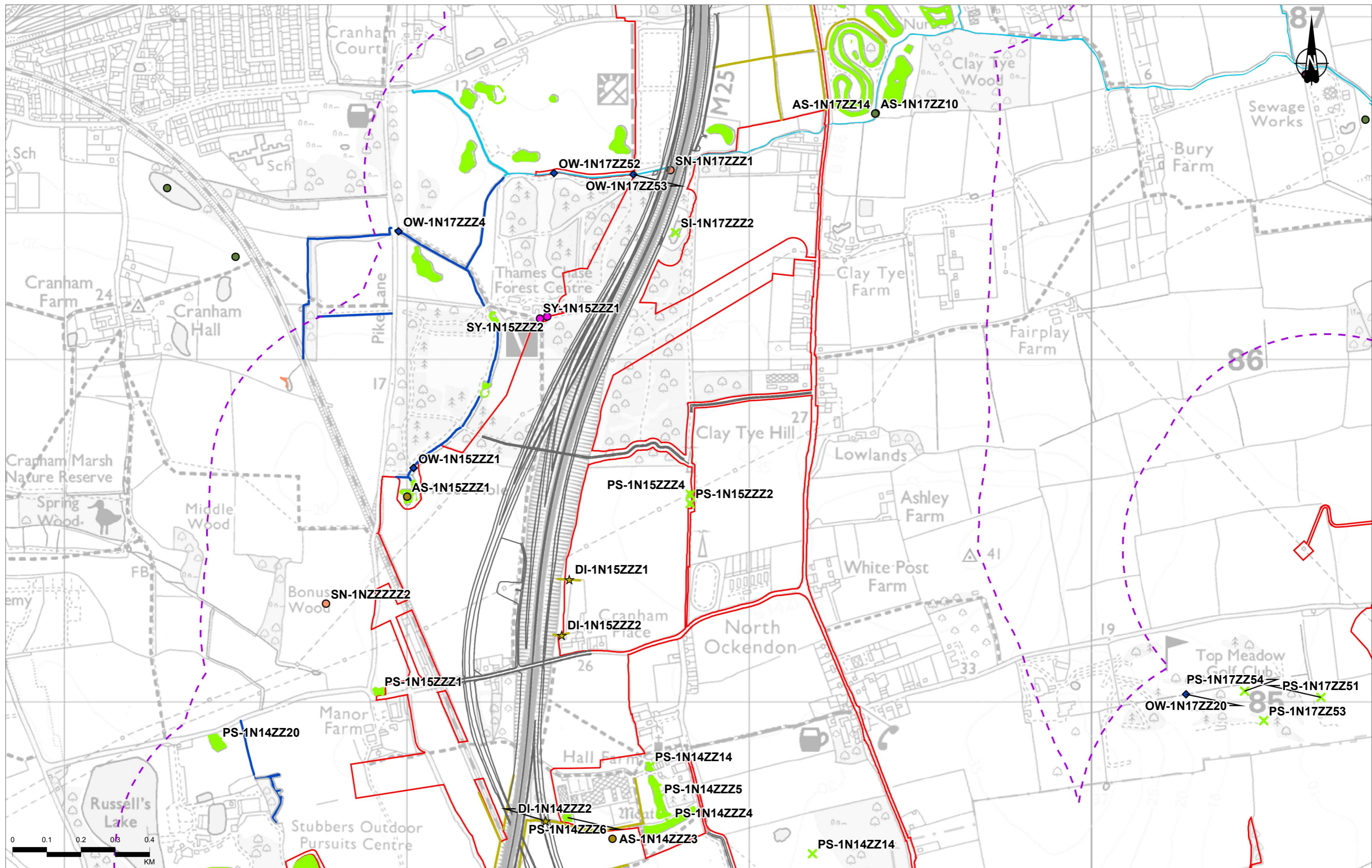
Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licensed Abstraction
	Water Discharge Permits
Water Feature Type	
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	MR - Surface waterbody, EA designated main river
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	MR - Surface waterbody, EA designated main river
	PS/SI - Surface waterbody, lake or pond
	AS - Surface water abstraction, licensed
	SY - Surface water discharge, permit
	MR - Surface waterbody, EA designated main river



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Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 19 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				



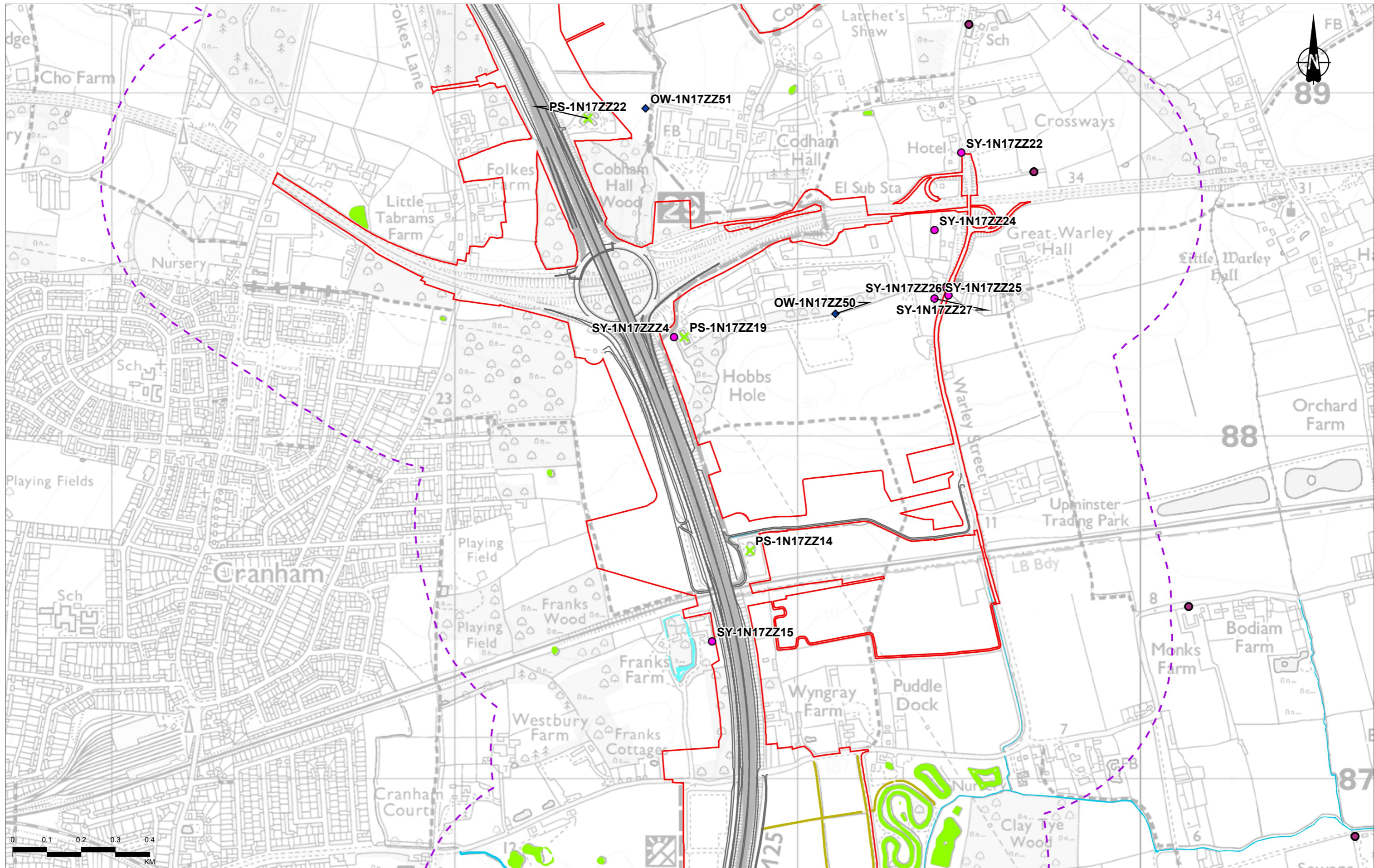
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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprvd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licenced Abstraction
	Water Discharge Permits
Water Feature Type	
	AS - Surface water abstraction, licenced
	SY - Surface water discharge, permit
	SN - Surface water feature, other (any feature that does not fit under any of the other types)
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	MR - Surface waterbody, EA designated main river
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	PS/SI - Surface waterbody, lake or pond
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)

	Client	Status	DCO APPLICATION	Original Size	A3	Revision	P01
	Project	Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
<b>LOWER THAMES CROSSING</b>		Drawing Title	<b>Appendix 14.2 - Water Feature Survey Results - Surface Water</b> Page 20 of 23				
		Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				

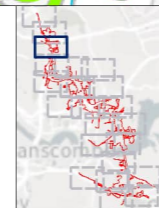
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Rev	Status	Rev. Date	Purpose of revision	Drawn	Chkd	Apprv'd
P01	S8	07/10/2022	DCO Application	SW	LD	BF

Legend	
	Route alignment
	Order Limits
	Order Limits 500m Buffer
	Licensed Abstraction
	Water Discharge Permits
	Water Feature Type
	AS - Surface water abstraction, licensed
	SY - Surface water discharge, permit
	PS/SI - Surface waterbody, lake or pond
	OW - Surface waterbody, ordinary watercourse (natural bed/bank profile, not designated main river)
	Water Feature Type
	DI - Surface waterbody, ditch (artificial bed/bank profile, not designated main river)
	MR - Surface waterbody, EA designated main river
	Water Feature Type
	MR - Surface waterbody, EA designated main river
	PS/SI - Surface waterbody, lake or pond
	SJ - Surface water body, moat



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Project: **LOWER THAMES CROSSING**

Status	DCO APPLICATION	Original Size	A3	Revision	P01
Application Document Number	TR010032/APP/6.3	Scale	1:10,000		
Drawing Title	Appendix 14.2 - Water Feature Survey Results - Surface Water Page 21 of 23				
Drawing Number	HE540039-CJV-EGN-SZP_EGNE00000000-DR-LE-50149				

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