Hampshire Water Transfer and Water Recycling Project

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1 Introduction

1.1 Proposed Development Overview

Water for Life Hampshire (WfLH) is a programme being undertaken by Southern Water Services Limited (hereafter referred to as 'the Applicant') to address the sustainability objectives of reduced abstractions on Hampshire's two main rivers – The Test and Itchen – and ensuring a resilient water supply for the Applicant's customers during times of drought. The Hampshire Water Transfer and Water Recycling Project (HWTWRP) (hereafter referred to as the 'Proposed Development') is the Strategic Resource Option project being delivered as part of the WfLH programme (Southern Water, 2024).

The Proposed Development comprises the construction, operation, maintenance and renewal of:

- Water Recycling Plant site (WRP) situated approximately 300 m northwest of Budds Farm Wastewater Treatment Works (WTW) There would be three pumping stations at the Proposed WRP including the proposed High Lift Pumping Station (HLPS).
- Proposed Underground Pipeline to transfer at peak operation (i.e. during severe drought conditions) approximately 90 Ml/d of water from Havant Thicket Reservoir to Otterbourne Water Supply Works (WSW) via the proposed HLPS. During normal (i.e. non-peak/drought) operation, the pipeline would transfer at least 20 Ml/d of water from Havant Thicket Reservoir to Otterbourne WSW.
- Proposed Underground Pipelines between Budds Farm WTW and the proposed WRP to accommodate approximately 80 Ml/d peak transfer volumes in each direction.
- Proposed Pipeline to transfer at peak operation approximately 60 Ml/d of recycled water from the proposed WRP to Havant Thicket Reservoir.
- Proposed additional Above Ground Plant (AGP) comprising Intermediate Pumping Stations (IPS) and Break Pressure Tanks (BPT) located along the Proposed Underground Pipeline between Havant Thicket Reservoir and Otterbourne WSW.

The Proposed Development will also comprise:

- Use of the Havant Thicket Reservoir for the storage of recycled water.
- Use of the existing Eastney Transfer Tunnel (TT), Eastney Pumping Station (PS) and Eastney Long Sea Outfall (LSO) for the release of reject water.

The pipeline construction method provided by the Applicant includes open cut to between 3 m and 6 m below ground level (bgl), trenchless construction (pipejacking or directional drilling) beneath rivers, streams and roads to between approximately 5 m and 15 m bgl (depending on location) and larger diameter tunnelling up to 70 m bgl. At present tunnelled Sections may be incorporated between:

- The WRP and Havant Thicket Reservoir (Havant Tunnel).
- The WRP and Purbrook Shaft (Purbrook Tunnel).
- The WRP and Bedhampton (Bedhampton Tunnel)
- Highbridge Shaft and Otterbourne Shaft (Otterbourne Tunnel).

1.2 Desk Study Objectives

A geotechnical and geo-environmental desk study has been produced to provide information on the expected ground conditions and to identify potential sources of contamination (PSCs) associated with the Proposed Development which may affect design, environment, and health and safety of the construction workers. The report will also provide recommendations concerning geo-environmental issues and outline recommendations for the scope of further assessment including ground investigation works.

This desk study comprises discussion of the following:

- Environmental setting including geology, hydrogeology and hydrology;
- Categorisation of natural ground subsidence hazards including shrink-swell clays, running sands, compressible deposits, collapsible deposits, landslides and ground dissolution of soluble rocks;
- Mining, ground workings and natural cavities (including Britpits, non-coal mining and mining cavities);
- Existing ground investigation data summary from Havant Thicket and BGS historical logs across the route;
- Geotechnical considerations such as excavations within each expected stratum, trenchless construction, and ground aggressivity for concrete design (excluding the tunnels);
- Summary of the site history including historical land-use, waste occurrence and landfills;
- Identification of sites with high potential for the presence of contaminant sources and production of a preliminary conceptual site model at these locations; and
- Considerations for the outline proposed further works.

1.3 Scope of Works

This desk study includes an update to the Proposed Development which is referred to as the Draft Order Limits (DoL) (January 2024), and incorporates the following:

- the addition of the pipeline option from the proposed WRP site to Bedhampton Springs (within Section B area);
- revisions to the locations of AGP sites including the new location of IPS-G.

The Proposed Underground Pipeline between Budds Farm WTW and the proposed WRP is not covered in this Desk Study.

Should the Proposed Development change, this desk study report may require updating. Any interpretations and recommendations given in this report may not necessarily address all geotechnical and geo-environmental conditions which may surround the Proposed Development.

1.4 Limitations and Exclusions

The following limitations and exclusions apply to this study:

- Site walkovers have been limited to selected exploratory hole locations for ground investigation or PSCs, accessed via road or public footpath and do not include all PSCs at this stage of the Proposed Development ; therefore, the findings may be limited.
- The BGS boreholes available across the route are often limited in their descriptions, sometimes without depths, or strata labels or only show water well information. Those that have been reviewed have been carefully selected at regular intervals to show as much detail as possible where available.
- The BGS boreholes are also limited in number within approximately 250 m of the DoL, with only one or two locations summarised in some Sections.
- This desk study excludes consideration of ecology, unexploded ordnance (UXO) and archaeology.

2 Proposed Development Location and Description

2.1 Proposed Development Location

The extent of the Proposed Development assessed in this desk study is defined by the Draft Order Limits (DoL), which include an approximately 40 km length corridor for the Proposed Underground Pipeline between Havant Thicket Reservoir and Otterbourne WSW. The pipeline route is shown within **Figures 1.0 and 1.1 (Sheets 1 – 32)**.

The proposed reservoir in the eastern extent of the DoL is north of Havant and located at national grid reference (NGR) 471011E, 109124N. The western extent of the DoL, Otterbourne WSW, is located at NGR 446584E, 123201N. The proposed WRP and High Lift Pumping Station (HLPS) is located south of Bedhampton at NGR 470327E, 105655N.

2.2 Proposed Development Description

The DoL have been divided into Sections A – M (Section I does not exist to prevent mislabelling as Section L) to partition the approximately 40 km long corridor. These Sections are listed and briefly described in **Table 2.1** and shown in **Figures 1.0** and **1.1 (Sheets 1 – 32)**. Tunnel shafts are located in Sections B, C, D, E, L and M, and shown in **Figure 1.1**. Sheets 14, 29, 30 do not show the DoL as they were proposed for an alternative route which was not used.

Table 2.1: Pipeline Sections

Section	Site Location Description	AGP	Figure 1.1 Sheet No.
A	Havant Thicket Reservoir within Staunton Country Park / Leigh Park	None	Sheet 1 - 2
B	Leigh Park southwest through Havant and Bedhampton to WRP site and pipeline option from WRP site to Bedhampton Springs	None	Sheets 2 – 5
C	WRP site	None	Sheet 5
D	WRP west along the B2177 (Portsdown Hill Road)	None	Sheets 5 - 7
E	West of Widley across fields / minor roads to south of Boarhunt road.	BPT-E	Sheets 7 – 11, 28-29
F	Boarhunt road northwest under a trenchless crossing at River Wallington and then north towards southern Wickham.	IPS-F	Sheets 11 - 13, 29-32
G	South of Wickham under a trenchless crossing at River Meon and across Wickham Park Golf Club, then northeast until the A334 (Winchester Road)	IPS -G	Sheets 13 – 15, 31
H	From the A334 (Winchester Road) north towards eastern Shedfield and through Shirrell Heath	None	Sheets 16 – 18
J	Shirrell Heath northwest across fields / minor roads to B3035 (Botley Road)	None	Sheets 18 – 20
K	B3035 (Botley Road) northwest via Waltham Chase, Newton to southwest of Lower Upham	BPT-K	Sheets 20 – 23
L	Lower Upham northwest towards Colden Common up to B3335 (Highbridge Road) southwest of Brambridge	None	Sheets 23 – 27
M	B3335 (Highbridge Road) northwest tunnelling beneath the River Itchen, then northwards to Otterbourne WSW.	None	Sheets 27 – 28

Notes:
AGP – Above Ground Plant
IPS – Intermediate Pumping Station.
BPT – Break Pressure Tank

Note: During early 2024, the pipeline Sections A – C (inclusive) were later renamed to longer title names as per the latest Applicants nomenclature[1]. However, due to brevity within this desk study report, Sections A – C (inclusive) remain in use.

[1] Section A was renamed to: Havant Thicket Reservoir; Section B: Pipeline between the WRP and Havant Thicket Reservoir (The Applicant option) and Section C: Water Recycling Plant.

3 Environmental Setting

3.1 Geology

The British Geological Survey (BGS) geological maps of the area[2] and the digitized online BGS Geology Viewer (BGS, 2021) have been reviewed. Extracts of the digital mapping of the area are included within **Figure 2.0 and Figure 3.0 and Figure 3.1.** The Groundsure Report is included in **Appendix I.**

The stratigraphy for the site is summarised in **Table 3.1** and further detailed in **Section 3.1.1** to **Section 3.1.4**

Table 3.1: Stratigraphy

Age	Group	Formation		Subdivision
Quaternary		Alluvium		
		Head Deposits		
		River Terrace Deposits		
		Clay-with-flints Formation		
Tertiary	Bracklesham Group	Earnley Sand Formation		
		Wittering Formation		
	Thames Group	London Clay Formation		Whitecliff Sand Member/ Durley Sand Member
				Portsmouth Sand Member
				Bognor Sand Member
		Harwich Formation		Swanscombe Member
				Oldhaven Member
	Lambeth Group	Reading Formation		Upper Mottled Clay
				Lower Mottled Clay
Upper Cretaceous	White Chalk Subgroup	Portsdown Chalk Formation		
		Culver Chalk Formation	Spetisbury Chalk Formation	
			Tarrant Chalk Formation	
		Newhaven Chalk Formation		
		Seaford Chalk Formation		
		Lewes Nodular Chalk Formation		

**Table 3.1 has been updated since the previous version of this desk study to include Harwich Formation with its subdivisions in addition to Reading Formation subdivisions to maintain consistency between Phase 0, Phase 1 and Phase 2 ground investigation rotary core logging terminology.*

3.1.1 Superficial Deposits

The routes are underlain by superficial deposits with Alluvium and Head deposits being the most frequent. **Figure 2.0 and Figure 2.1** (Sheets 1 – 32) show Artificial and Superficial geology across the Proposed Development.

- Alluvium is expected within river valleys and streams along the River Itchen, River Hamble and River Meon, Alluvium is a general term for unconsolidated detrital material deposited by a river or stream –

[2] Sheet 315 Southampton (BGS, 1987), Sheet 316 Fareham (BGS, 1998), Sheet 331 Portsmouth (BGS, 1994)

normally soft to firm compressible silty clay, but can contain layers of silt, sand, peat, and basal gravel. Alluvium is expected across Sections B, F, G, J to M inclusive.

- Head deposits are widely distributed across the route located in linear layers, often infilling minor chalk valleys, extending from upslopes of the downs down to the margins of Alluvium floodplain, noted within all Sections A to M inclusive. Head deposits are comprised of poorly sorted stratified deposits formed by hill wash and soil creep comprising variably gravel, sand, silt, clay, locally with lenses of peat and organic material.

- River Terrace Deposits are expected on floodplains and estuaries in coastal settings. Many different terraces feature across the routes with varying compositions that comprise gravel, sand and clay expected in Sections B, C, F, G, H, J, K, L and M.

- Clay-with-flints is only noted within Section M surrounding Head deposits at Otterbourne WSW. It comprises reddish orange to orange clay with nodules and rounded gravel of flint derived from Tertiary formations below. Yellow fine to medium grained sand and reddish-brown silt beds are commonly also encountered.

3.1.2 Bedrock Geology

The geological mapping indicates that there are multiple geological groups encountered throughout the site; the Bracklesham Group, Thames Group, Lambeth Group and Chalk Group (upper part – White Chalk Subgroup only). **Figures 3.0-3.1** show Bedrock geology and linear features across the Proposed Development.

- Bracklesham Group deposits consist of Wittering Formation across Sections G, H and J generally comprising greyish brown laminated clay deposits with wavy to lenticular bedded sand interbedded with clay and rare glauconitic sand (total thickness 25 – 65 m). Earnley Sand Formation consisting of glauconitic silty sands and sandy silts is found in Section G.

- Thames Group deposits consist of London Clay Formation, which is noted in Sections A, B, D, F, G, H, J, K, L and M. London Clay Formation generally comprises bioturbated or poorly laminated, overconsolidated blue-grey or grey-brown, slightly calcareous, silty to very silty clay, clayey silt and sometimes silt, with some layers of sandy clay (total thickness 77 – 120 m). It also includes a few thin beds of shells and fine sand partings or beds of sand such as the Bognor Sand Member, Portsmouth Sand Member, Whitecliff Sand Member, and the Durley Sand Member- all of which are generally glauconitic fine to medium grained sand that locally contain bands of silt. The Bognor Sand Member, Portsmouth Sand Member, and Whitecliff Sand Member is recorded within Sections A, B, D, G, H and J.

- Lambeth Group deposits consist of the Reading Formation, which is noted from Sections B, D, E, F, K, L and M. Reading Formation generally comprises vertically and laterally variable sequences mainly of overconsolidated clay, often mottled and some silty or sandy clays (total thickness 30 – 35 m).

- Underlying the Lambeth Group is the White Chalk Subgroup; this comprises the oldest of all the geological units expected across the site. In general, it is the uppermost formations of the White Chalk Subgroup that crop out within Sections C, D, E, F and M (Portsdown, Spetisbury, and Tarrant Chalk Formations near Boarhunt and Portsdown Hill, and Culver Formation in the northwest by Otterbourne). In the southeast part of the route near Havant the White Chalk Subgroup has not been separately differentiated by the BGS into formations – though it is expected that in this area (e.g., around Budds Farm) the deeper Newhaven, Seaford and/or Lewes Nodular Chalk Formations)

may crop/subcrop out. These formations are characterised as chalk with discrete marl seams, nodular chalk, sponge-rich and flint seams throughout (total thickness 190 – 290 m).

3.1.3 Linear Features

The oldest units comprising the White Chalk Subgroup, Lambeth Group and Thames Group contain axial plane traces of the Bere Forest Syncline trending east – west across Section B within the recreation ground in Bedhampton and across Bere Farm Lane north of Bucks Copse. The Portsdown Anticline trends east – west across Section B to the north of the A27 dual carriageway, Section D along the A2030 east of Farlington and also at Section F approximately 70 m south of Knowle Road near Knowle. These structures are part of the wider scale deformation in the area.

There are also four faults in parallel within 400 m of each other trending east – west between the anticlinal and synclinal axes.

3.1.4 Artificial Geology

A variety of artificial ground is recorded by the BGS on site within:

- Sections C, D, F, H, L and M.

A summary of artificial geology within 50 m of the DoL follows, the most common is Made Ground underlying roads surrounding towns and village areas:

- South of Havant, Bedhampton in Section C
- At the A3(M) southeast of Waterlooville in Section D
- North of Crockerhill and east of Albury Farm in Section F
- To the north of Crowdhill, east and west of Winchester Road at Crowd Hill Landfill in Section L
- On the Southwestern Main Line railway to Southampton in Section M

Infilled ground is recorded by the BGS:

- At Shirrell Heath in Section H
- North of Highbridge, where the routes cross at the River Itchen and south of Kiln Lane in Section M

Worked ground is recorded by the BGS:

- Section M north of Highbridge

There are also several parts of the route where artificial ground is encountered within 250 m of the route. These are shown in **Figure 2.1**.

3.2 Natural Cavities

Dissolution is a common weathering mechanism in chalk. Typical features associated with dissolution in chalk include an irregular interface with the cover material, downward tapering pipes infilled with compressible material and voids. If undetected, dissolution features pose a risk to construction through differential settlement or collapse.

The highest risk areas are generally found where surface water originates on Tertiary beds and soft water infiltrates through those into the chalk – e.g., the Lambeth Group overlying Chalk, though the overall risk is dependent not only on stratigraphic sequence but also on hydrogeological and geomorphological factors. The SHR_N (Subsidence Hazard Rating number) determined by the approach proposed by Edmonds would, at its worst case, be >400, indicating a high hazard category (i.e., statistically 22.8% solution features recorded in

the natural cavity database occurred in at sites with these characteristics, >466 solution features per 100 km^2) (Edmonds, 2001). The risk would generally reduce significantly upslope.

The Natural Cavities Database has been consulted and showed that most dissolution pipes have been mapped between Sections F and G to the east and southeast of Knowle (Groundsure, 2023). Approximately nine solution pipes have been mapped, which may feature across the pipeline route itself where Quaternary River Terrace Deposits are overlying Chalk strata (within 300 m of the proposed pipeline route). There were also five solution pipes recorded within Section K approximately 160 m and 480 m northwest off-site where Lambeth Group overlies Chalk strata. The chalk has been recorded within the Groundsure reports (Groundsure, 2024). These areas are recommended to have further detailed studies to identify locations of the solution pipes shown more accurately as the existing drawings cover a wide area over many acres/hectares. Caution is advised when constructing the proposed pipeline in these areas to be mindful of potentially unrecorded or unmapped cavities below ground affecting construction.

3.3 Man-Made Cavities

3.3.1 Non-Coal Mining Records (Chalk)

The Groundsure Report identifies historic chalk mining beneath pipeline Sections B – G and J – M. These mine workings were classed either A, B or C depending on the extent of underground mining expected; definitions of these classes A, B and C are given below (Groundsure, 2024).

Class A — Sporadic underground mining of restricted extent may have occurred. The potential for difficult ground condition is unlikely, localised and are at a level where they do not need to be considered.

Class B — Localised small scale underground mining may have occurred. The potential for difficult ground conditions is unlikely or localised and are at a level where they do not need to be considered.

Class C — Small scale underground mining may have occurred; mine adits, shafts and tunnels may be present. The potential for difficult ground conditions is at a level where they should be considered.

Pipeline Sections E and L contain the most records of chalk mining with 5 and 6 records each respectively, classed A, B or C. In total there were 30 non-coal mining records (of chalk) beneath the pipeline route itself or up to 300 m from it. The precise size and depth of these cavities is not known. Approximate locations are given within the Groundsure Reports (Groundsure, 2024).

The pipeline route may go close to military tunnels close to Fort Purbrook to the south of Section E and Crookhorn Redoubt within Section E (Bob Hunt, 2021).

This may be further covered by separate archaeological studies separate to this desk study.

3.3.2 Britpits

BritPits (British Pits) is a database maintained by the British Geological Survey of currently active and closed surface and underground mineral workings, which also includes mineral handling sites, such as wharves and rail depots as shown within **Figure 4.0** and **Figure 4.1** (Sheets 1 – 32). Every mineral working recorded for the Site in the Groundsure report has ceased operation.

Across all Sections, with the exception of Section A, B and M, mineral workings comprising variously quarries, sand pits, clay pits or chalk pits are recorded. A total of 37 mineral workings are located on site and a further 118 are off-site up to 500 m away. The precise size and depth of these mineral workings has not been

determined. Approximate locations are detailed within the Groundsure Report within pipeline Sections D, E, F, G, J, K and L (Groundsure, 2024).

Table 3.2: Mineral Workings within 200 m of the Proposed Development

Mineral Working type	Pipeline Sections	Quantity	On site (within the Section boundary)	Off-site (up to 200 m away)
Brick and Tile Works, clay and shale	F, L, K	3	0	2
Chalk	D, E, F	39	7	32
Sand /sand and Gravel	F, H, J	4	0	4
Secondary	D	1	0	1
Total		**47**	**7**	**39**

3.4 Hydrogeology

3.4.1 Aquifers

The geological formations have been checked against government databases for their aquifer designation category and are summarised below using information on MAGIC (MAGIC, 2024).

Head deposits are classified by the Environment Agency (EA) as a Secondary Aquifer (Undifferentiated). This is a classification assigned where it has not been possible to attribute to either category A or B. Secondary A Aquifers are generally capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers, whereas Secondary B Aquifers are mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like fissures.

Alluvium and River Terrace Deposits are classified as Secondary A Aquifers.

Clay-with-flints Formation and Thames Group are mainly classified as an unproductive stratum (London Clay Formation), though beds of sand (e.g., Bognor Sand Member / Whitecliff Sand Member) are considered to be Secondary A Aquifers.

Bracklesham Group and Lambeth Group bedrock have been designated as Secondary A Aquifers.

The Chalk bedrock is classified as a Principal Aquifer, characterised by layers with high intergranular and/or fracture permeability capable of a high level of water storage. They may support water supply and/or river base flow at a strategic scale.

Aquifers are shown within **Figure 5.0, Figure 5.1** (Sheets 1 – 32)**, Figure 6.0** and **Figure 6.1** (Sheets 1 – 32).

3.4.2 Source Protection Zones

The following Source Protection Zones (SPZ) are encountered in the DoL (Groundsure, 2024) (MAGIC, 2024).

- SPZ 1: Surrounding the proposed Havant Thicket Reservoir southwards to Brockhampton across Sections A and B, northwest around Compton Cottage Farm in Section K and from Highbridge to Otterbourne WSW in Section M, the Site is within a groundwater SPZ 1 (Inner Catchment)[3].
- SPZ 2: West of Boarhunt up to Albany Farm in Section F and in Section K from Coach House Cottage to Mount Pleasant Farm, the Proposed Development is within a groundwater SPZ 2 (Outer Zone)[4].
- SPZ 3: West of Boarhunt and surrounding Albany Business Centre to Crockerhill in Section F, the Proposed Development is within a groundwater SPZ 3 (Total Catchment)[5].

The SPZs are shown within **Figure 7.0**.

3.4.3 Groundwater Drinking Water Safeguard Zones

The DoLs pass through three groundwater Drinking Water Safeguard Zones (DWSgZ) (MAGIC, 2024) (Environment Agency, 2024). Details are as follows:

- Ref: Groundwater GWSGZ0138 (Sections A and B) – Bedhampton & Havant Springs DWSgZ, under pressure from nitrates.
- Ref: Groundwater GWSGZ0145 (Section F) – Maindell DWSZ, under pressure from nitrates.
- Ref: Groundwater GWSGZ0148 (Section M) – Otterbourne DWSZ, under pressure from nitrates.

3.4.4 Groundwater Nitrate Vulnerable Zones

Within 250 m of the DoLs, the following six Nitrate Vulnerable Zones (NVZs) are encountered (Environment Agency, 2024):

- Eutrophic Water ET2 – Chichester, Langstone and Portsmouth Harbours Eutrophic NVZ (Sections A – F inclusive)
- Fareham G58 (Sections E, F and G)
- Groundwater G143 – Hampshire Chalk (Sections H – M inclusive)
- Hamble Estuary Eutrophic NVZ Eutrophic Water ET3 (Sections G – M inclusive)
- Surface Water S810 – Upper Hamble NVZ (Section K)
- Surface Water S811 Bow Lake NVZ (Section L)

The majority of the route within the DoL which is underlain by the Lambeth Group and the White Chalk Subgroup has a medium to high and high groundwater vulnerability with a soluble rock risk. This is contrasted with the Thames Group, which generally shows an unproductive groundwater vulnerability (or medium for the Sand members) and superficial deposits with a low to medium groundwater vulnerability to a pollutant discharged at ground level based on the hydrological, geological, hydrogeological and soil properties within a single square kilometre (MAGIC, 2024).

3.4.5 Water Abstraction Points

[3] An SPZ 1 is the 50-day travel time of pollutants to source within a 50 m default minimum radius.
[4] An SPZ 2 is defined by a 400-day travel time from a point below the water table to provide delay, dilution, and attenuation of slowly degrading pollutants.
[5] An SPZ 3 is the area around a supply source within which all the groundwater ends up at the abstraction point.

The groundwater abstraction points within DoL are summarised in **Table 3.3** and **Figure 7.0**. A full list of groundwater abstractions within 500 m of the DoL can be found within the **Appendix D**.

Table 3.3: Groundwater abstraction points recorded within the Draft Order Limits

Sections	Status	Details	Groundsure Reference	Annual Volume (m^3)
A	Active	Dewatering, Process Water and Dust Suppression	Report 15A- ID A	418,077
A	Active	Dewatering, Process Water and Dust Suppression	Report 15A- ID B	418,077
A	Active	Dewatering, Process Water and Dust Suppression	Report 14A- ID D	418,077
B	Active	Potable Water Supply - Direct	Report 14A- ID A	35,770,000
G	Active	Spray Irrigation - Direct	Report 5A- ID A	5,000
G	Historical	Spray Irrigation - Direct	Report 5A- ID A	10,000

3.5 Hydrology

The DoL crosses the following surface water bodies; these are shown on **Figure 8.0** and **Figure 8.1**:

- Watercourses within and surrounding Staunton Country Park near the proposed Havant Thicket Reservoir (within Section A)
- Hermitage Stream within the centre of Havant northeast of Barncroft Way and Priorsdean Crescent in a southwest direction (within Section B)
- Wallington River approximately 330 m west of Whitedell Lane (within Section F)
- The River Meon approximately 105 m west of Mayles Lane to the south of Wickham (within Section G)
- The River Hamble southwest of Bishop's Waltham (within Section K)
- Bow Lake approximately 275 m west of B3354 and approximately 300 m southwest of Fishers Pond (within Section L)
- The River Itchen approximately 590 m northwest of Highbridge (within Section M)

The majority of the DoL is within eight surface water NVZs (Environment Agency, 2024). The exception is west of Forest Lane (Section F) to the east of Titchfield Lane (Section G) and Blind Lane (Section H) along the route of the River Meon.

No surface water abstractions are recorded in the Groundsure report within the DoL. The nearest surface water abstraction is located approximately 175m N of Section E. A full list of surface water abstractions within 1 km of the DoL can be found in the **Appendix D**.

3.6 Flooding

The Proposed Development passes through Flood Zones 1 to 3 (**Figure 8.0** and **Figure 8.1** sheets 1 – 32), with low lying areas in the following sections:

- Hermitage Stream in Sections A and B
- Brockhampton Mill Lake adjacent to Section C
- River Wallington in Section F, River Meon in Section G
- River Hamble in Section K
- Bow Lake in Section L and River Itchen in Section M located in Flood Zones 2 and 3

Land and property within Flood Zone 3 has a high probability of flooding without the local flood defences – annual probability of 1 in 100 or greater of river flooding (Environment Agency, 2024b).

Land within Flood Zone 2 has a medium probability of flooding without local flood defences – annual probability of 1 in 1000 of river flooding.

Land within Flood Zone 1 has a less than 1 in 1,000 annual probability of river flooding. There are scattered areas within Flood Zone 1 on higher ground and not surrounding streams and rivers, however these areas are not evenly distributed.

3.7 Environmentally Sensitive Areas

Statutory designated areas were focussed on including conserved wetland sites (RAMSAR sites), Special Areas of Conservation (SAC), designated ancient woodlands, Sites of Special Scientific Interest (SSSI) and National Parks.

Table 3.5 summarises the environmentally sensitive areas within 250 m of the Proposed Development (Groundsure, 2024) apart from Designated Ancient Woodland which are reported up to 50 m from the DoL; these areas are shown on **Figure 9.0**. The complete list of Designated Ancient Woodland areas up to 250 m are included in the Groundsure report.

Table 3.5: Environmental Sensitive Areas

Section	Name	Distance (approx.)	Type
A / B	Sir George Staunton/Country Park	Within DoL	Conservation Area[1]
A	Round Wood, Cabbagefield Row, Forest of Bere and Unknown woodlands	Within DoL	Designated Ancient Woodland
M	Great Copse	Within DoL	Designated Ancient Woodland
B	Old Bedhampton Conservation Area	<50 m from DoL	Conservation Area
C	Chichester and Langstone Harbour / Solent Maritime	<50 m from DoL	SSSI, RAMSAR, SAC, SPA
E	Portsdown	50 – 250 m from DoL	SSSI
F	Carpenters Copse	<50 m from DoL	Designated Ancient Woodland
G	Dash Wood, Woodland (unknown name),	<50 m from DoL	Designated Ancient Woodland
H	Ancient Woodland (unknown name)	<50 m from DoL	Designated Ancient Woodland
H	Shirrel Copse	<50 m from DoL	Designated Ancient Woodland
K	Kimbers Copse	<50 m from DoL	Designated Ancient Woodland
L	Fisher's Pond Wood, Hill Copse, Lord's Wood, Woodland (unknown name)	<50 m from DoL	Designated Ancient Woodland
M	River Itchen	<50 m from DoL	SSSI, SAC
M	Otterbourne Park Wood	<50 m from DoL	Designated Ancient Woodland
M	Oakwood Copse and many unknown woodlands	<50 m from DoL	Designated Ancient Woodland
H, K, L, M	South Downs	<50m from DoL	National Park

Note:
SSSI – Site of Special Scientific Interest
SAC – Special Area of Conservation
SPA – Special Protection Areas

[1] For conservation areas please consult the appropriate SSP archaeology / heritage report.

3.8 Natural Ground Subsidence Hazards

Natural ground subsidence hazards have been provided by the British Geological Survey in the Groundsure Report.

3.8.1 Collapsible Deposits

The potential hazard presented by natural deposits that could collapse when a load (such as a building) is placed on them or they become saturated with water.

The table below outlines the hazard rating per Section, with the collapsible deposits hazard map for the route shown within **Figure 11.0**.

Table 3.6: Table displaying the hazard ratings of Collapsible Deposits per Section

Section	Hazard rating	Details
A, B, C, D	Negligible to low	Deposits with potential to collapse when loaded and saturated are not thought to be present. to Deposits with potential to collapse when loaded and saturated are possibly present in places.
E	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
F, G	Negligible to very low	Deposits with potential to collapse when loaded and saturated are not thought to be present. to Deposits with potential to collapse when loaded and saturated are unlikely to be present.
H	Very low	Deposits with potential to collapse when loaded and saturated are unlikely to be present.
J, K, L, M	Negligible to very low	Deposits with potential to collapse when loaded and saturated are not thought to be present. to Deposits with potential to collapse when loaded and saturated are unlikely to be present.

3.8.2 Compressible Deposits

The potential hazard presented by types of ground that may contain layers of very soft materials like clay or peat that may compress if loaded by overlying structures, or if the groundwater level changes, potentially resulting in depression of the ground and disturbance of foundations.

The table below outlines the compressible deposits hazard rating per Section, with the hazard map for the route shown within **Figure 11.1**.

Table 3.7: Table displaying the hazard ratings of Compressible Deposits per Section

Section	Hazard rating	Details
A	Negligible	Compressible strata are not thought to be present.
B, C	Negligible to Moderate	Compressible strata are not thought to occur. to

		Compressible are strata probably present; uneven settlement possible. Land use should consider specifically the compressibility and variability of the site.
D	Negligible to Very low	Compressible strata are not thought to occur. to Compressible strata and uneven settlement problems are not likely to be significant on the site for most land uses.
E, F, G, H, J, K, L & M	Negligible to Moderate	Compressible strata are not thought to occur. to Compressibility and uneven settlement hazards are probably present. Land use should consider specifically the compressibility and variability of the strata

3.8.3 Running Sands

The potential hazard presented by water bearing sands/silts or by rocks that contain loosely packed sandy layers that can become fluidised by water flowing through them. Such sands/silts can 'run', removing support from overlying ground and buildings and causing potential damage.

The table below outlines the hazard rating for running sands per Section, with the hazard map for the route shown within **Figure 11.2**.

Table 3.8: Table displaying the hazard ratings of Running Sands per Section

Section	Hazard rating	Details
A & B	Very low to Low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly. To Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.
C	Very low to Moderate	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly. To Running sand conditions are probably present. Constraints may apply to land uses involving excavation or the addition or removal of water.
D, E, F, G	Negligible to Low	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions. To Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.

Section	Hazard rating	Details
H, J, K, L	Very low to Low	Running sand conditions are unlikely. No identified constraints on land use due to running conditions unless water table rises rapidly. To Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.
M	Negligible to Low	Running sand conditions are not thought to occur whatever the position of the water table. No identified constraints on lands use due to running conditions. To Running sand conditions may be present. Constraints may apply to land uses involving excavation or the addition or removal of water.

3.8.4 Ground Dissolution of Soluble Rocks

The potential hazard presented by ground dissolution, which occurs when water passing through soluble rocks produces underground cavities and cave systems. These cavities reduce support to the ground above and can cause localised collapse of the overlying rocks and deposits.

The table below outlines the hazard rating per Section, with the hazard map for the route shown within **Figure 11.3**.

Table 3.9 Table displaying the hazard ratings of Ground Dissolution of Soluble Rocks per Section

Section	Hazard rating	Details
A	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.
B	Negligible to Moderate	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present to Soluble rocks are present within the ground. Many dissolution features may be present. Potential for difficult ground conditions are at a level where they should be considered. Potential for subsidence should be considered.
C	Negligible to Very low	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present. to Soluble rocks are present within the ground. Few dissolution features are likely to be present. Potential for difficult ground conditions or localised subsidence are at a level where they need not be considered.

Section	Hazard rating	Details
D, E	Negligible to Moderate	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present. to Soluble rocks are present within the ground. Many dissolution features may be present. Potential for difficult ground conditions are at a level where they should be considered. Potential for subsidence should be considered.
F	Negligible to High	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present. to Soluble rocks are present within the ground. Numerous dissolution features may be present. Potential for difficult ground conditions should be investigated. Potential for localised subsidence should be considered. High hazard rating is concentrated at Chalk Pit Farm House and within the 125 m site buffer to the east.
G, H, J, K, L	Negligible	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present.
M	Negligible to High	Soluble rocks are either not thought to be present within the ground, or not prone to dissolution. Dissolution features are unlikely to be present. to Soluble rocks are present within the ground. Numerous dissolution features may be present. Potential for difficult ground conditions should be investigated. Potential for localised subsidence should be considered. High hazard rating is concentrated in a linear NW-SE trend from Otterbourne town through fields north of Kiln Lane and across the SW mainline railway. Additionally, to the north of Brambridge Park close to fields south of the River Itchen. It may be possibly due to Lambeth Group deposits overlying Culver Chalk Formation across this same trendline.

3.8.5 Shrink-Swell Clays

The potential hazard presented by clay soils that absorb water when wet (making them swell) and lose water as they dry (making them shrink). This shrink-swell behaviour is controlled by the type and amount of clay in the soil, and by seasonal changes in the soil moisture content (related to rainfall and local drainage).

The table below lists the shrink-swell clay hazard rating per pipeline Section, with the hazard map for the route shown within **Figure 11.4**.

Table 3.10: Table displaying the hazard rating of Soil Plasticity per Section

Sections	Hazard rating	Details
A	Negligible to Low	Ground conditions predominantly non-plastic to medium plasticity clay.
B, D & E	Negligible to Moderate	Ground conditions predominantly non-plastic to high plasticity clay.
C	Negligible to Low	Ground conditions predominantly non-plastic to medium plasticity clay.
F & G	Negligible to Moderate	Ground conditions predominantly non-plastic to high plasticity (High plasticity possibly due to the Wittering Formation and London Clay Formation deposits as bedrock across the Section).
H & J	Negligible to Moderate	Ground conditions predominantly non-plastic to high plasticity (High plasticity possibly due to the Wittering Formation deposits as bedrock across the Section).
K, L & M	Negligible to Moderate	Ground conditions predominantly non-plastic to high plasticity (High plasticity possibly due to the Lambeth Group deposits as bedrock across the Section).

3.8.6 Landslides

The potential for land sliding (slope instability) to be a hazard was assessed using 1:50,000 scale digital maps of superficial and bedrock deposits, combined with information from the BGS National Landslide Database and scientific and engineering reports.

The table below outlines the hazard rating per Section, with the landslide hazard map for the route shown within **Figure 11.5.**

Table 3.11: Table displaying the hazard ratings of Landslides per Section

Section	Hazard rating	Details
A, B	Very low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered.
C	Very low to Low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered. to Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.
D, E, F, G	Negligible to Low	Slope instability problems are not thought to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered. to Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.
H, J, K, L & M	Very low to Low	Slope instability problems are not likely to occur but consideration to potential problems of adjacent areas impacting on the site should always be considered. to Slope instability problems may be present or anticipated. Site investigation should consider specifically the slope stability of the site.

4 Review of Existing Ground Investigation Data

4.1 The Applicant's Records

A ground investigation was carried out in 2018 at Otterbourne WSW by SOCOTEC comprising 16 No. trial pits (TP-A to TP-P), two hand excavated observation pits (OP1 and OP2) and eight boreholes (BHA to BHGA) to investigate ground conditions at the location of a series of proposed structures. A Factual Report for the ground investigation was produced by SOCOTEC (SOCOTEC UK Limited, 2018) and a geotechnical and geo-environmental interpretative (GIR) was produced by SSP (SSP, 2018).

Only ground conditions and chemical data from TP-M, which is the nearest exploratory hole to the termination point of the proposed pipeline and the DoL (approximately 50 m northwest and 10 m north respectively), is discussed below. All other exploratory hole locations, including the nearest borehole installation BH-D with gas and groundwater data, were at too great a distance to be of relevance (BH-D was approximately 150 m northwest of the proposed pipeline and approximately 100 m north of the DoL.

Table 4.1 shows the encountered ground conditions in trial pit (TP-M).

Table 4.1: Summary Table of ground conditions in TP-M at Otterbourne WSW (closest to the pipeline / Draft Order Limits)

Exploratory Hole ID		TP-M SOCOTEC 2018 GI***
Distance from route		50 m NW
Ground Level (m OD)		+27.41
Strata	**Typical Description**	**Top of strata (m bgl)**
Topsoil/Made Ground	Grass over firm brown slightly gravelly CLAY with rootlets. Gravel is of occasional brick and flint.	0.00
Head Deposits	Firm to stiff orangish brown slightly sandy gravelly CLAY with occasional rootlets. Gravel is of flint. Medium cobble content of flint.	0.20
White Chalk Subgroup	Structureless CHALK with flint (CIRIA Grade Dm)	1.70
	Groundwater (m bgl)	No groundwater encountered
End of Hole (m bgl)		**4.00**

***Trial pit summary log from SOCOTEC GI at Otterbourne WSW in 2018 within **Appendix C**.

Ground conditions were as expected and consistent with the geological mapping summarised earlier in this report.

A single sample of topsoil / Made Ground collected from TP-M at 0.10 m below ground level (bgl) underwent chemical analysis for the assessment of potential contamination, including for metals (arsenic, cadmium, chromium (total), copper, lead, mercury, nickel, zinc and selenium), pH, cyanide (total, complex and free), total phenols (catechol, cresols, dimethyl phenols, naphthols, phenol, resorcinol, trimethylphenols), speciated polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and xylene (BTEX), polychlorinated biphenyls (PCBs), sulphide, total organic carbon (TOC), moisture content and an asbestos screen.

To evaluate potential risks to human health receptors (including future site users of the WSW), the soil analytical results for TP-M at 0.1 m bgl were assessed against the commercial standard for LQM's and CIEH's Suitable for Use Values (S4ULs) (Nathanail, McCaffrey, Gillet, Ogden, & Nathanail, 2015). As a S4UL for lead is unavailable, lead results were compared against the respective Defra Category 4 Screening Level (C4SL) for a commercial end use, adopting a 1% soil organic matter (SOM) value (SP1010 Defra, 2014). Cyanide (free and total) was compared to a Stantec-derived GAC based on the former UK guidance on Updated Technical Background to the contaminated land exposure assessment (CLEA) Model (EA, 2009) and Contaminants in Soil: Collation of Toxicological Data and Intake Values for Humans are adopted as the screening values. No exceedances of the corresponding commercial assessment criteria were detected in the samples. Asbestos was not detected in this sample of Made Ground / topsoil.

4.1.1 The Applicant's Records – Section A boreholes

A ground investigation was carried out in 2019, commissioned by Portsmouth Water Ltd to obtain information for a proposed reservoir, the Havant Thicket Winter Storage Reservoir. The Investigation Supervisor on behalf of Portsmouth Water was Atkins. The GI comprised cable percussion and rotary boreholes, and trial pits, all with in-situ testing.

There were three exploratory hole locations within 100 m and one location within 150 m of the pipeline route, which are summarised in **Table 4.1**. Locations are shown on **Figure 2.1 (Sheet 1)** and **Figure 3.1 (Sheet 1)**.

Further details of the Applicant's records of existing borehole logs from SOCOTEC within Section A can be located within **Appendix B**. Descriptions of encountered conditions are as expected and consistent with the geological mapping summarised earlier. Head deposits were encountered to a maximum depth of 3.40 m bgl with London Clay Formation to a maximum depth of 12.20 m bgl. Groundwater was encountered at 11.50 m bgl (+13.40 m OD), which rose to 1.20 m bgl (+23.70 m OD) at ATK-CP04 and a seepage was encountered at TPM-04 at 0.50 m bgl (+21.29 m OD) (SOCOTEC, 2020).

Table 4.2: Summary Table to show existing ground investigation data for Havant Thicket HLPS with nearest records to the pipeline route along Section A

Strata	Typical Description	ATK-BH02	ATK-CP03	ATK-CP04	TPM-04
Ground Level (m OD)		21.45	22.72	24.90	21.79
Distance from pipeline DoL		On Site	On Site	On Site	On Site
		Top of strata (m bgl)			
Topsoil	Dark brown sandy slightly organic CLAY with rare angular to subrounded fine to coarse gravel of flint.	-	-	-	0.00
	Soft brown slightly sandy CLAY with frequent rootlets.	0.00	0.00	0.00	-
Head Deposits	Firm locally soft greyish brown and orangish brown slightly sandy CLAY locally with roots, rootlets and organic material (<40 mmx20 mm)	0.20	0.10	0.50	0.30
	Firm orangish brown mottled grey slightly sandy CLAY with frequent plant material (up to 40 mm), locally gravelly. Gravel is of chert, mudstone and quartzite. Locally pyritic.	1.20	0.50	1.20	-
London Clay Formation	Firm to stiff grey and brown mottled yellowish brown slightly sandy CLAY. Sand is fine to coarse. Rare white crystals of gypsum/selenite.	-	1.70	1.70	-
	Stiff locally fissured brown locally mottled bluish grey and grey silty CLAY, with rare pyrite flecks locally from 4.50 m onwards.	3.40	3.50	2.50	2.30
	Very stiff locally fissured grey slightly sandy silty micaceous CLAY with occasional lenses/pockets (up to 35 mm) of dark grey fine sand and silt.	5.10	-	-	-
	Stiff to very stiff dark grey slightly sandy CLAY. Sand is fine. Occasional pyrite flecks.	-	8.00	6.00	-
Possible Harwich Formation	Stiff dark grey occasionally mottled black sandy gravelly CLAY. Sand is fine. Gravel is angular to subangular fine to coarse of fossiliferous limestone.	-	-	11.50	-
	Strong massive dark grey and grey fine to medium grained fossiliferous LIMESTONE. Recovered as subangular coarse gravel and cobbles.	-	-	12.00	-
Groundwater (m bgl)		Not encountered	Not encountered	11.50 and rose to 1.20 m after 20 minutes	Seepage at 0.50 m
End of Hole (m bgl)		9.20	9.00	12.20	3.90

Two of the exploratory holes in Section A had either a standpipe piezometer or vibrating wire piezometer installed for groundwater monitoring purposes over an 8-week period. The groundwater elevations ranged as follows:

- ATK-BH02: 0.09 m bgl (+21.54 m OD) to +0.53m (+21.98 m OD) above ground level (artesian)
- ATK-CP04: +0.18 m (+25.08 m OD) to +0.48m (+25.38 m OD) above ground level (artesian)

During drilling at ATK-CP04 a rising head permeability test was conducted following the water rise from 11.50 m to 1.20 m bgl, with a calculated permeability coefficient, k, as 1.2 x 10^{-6} m/s. There was no variable head test conducted at ATK-BH02 (SOCOTEC, 2020).

The investigation concluded that artesian ground conditions may be encountered and should be allowed for during construction at the northern end of Section A within 40 m west (ATK-BH02) and within 90 m north (ATK-CP04) of the pipeline route.

Gas monitoring wells were not installed during this ground investigation.

4.1.2 Section C Boreholes – WRP and Budds Farm

Boreholes were drilled in September 2022 prior to the submission of this latest version of the desk study. They were drilled as part of a Phase 0 Ground Investigation for tunnelling purposes between the proposed Water Recycling Plant (WRP) and Budd's Farm Water Treatment Works (WTW). These boreholes were drilled by SOCOTEC and formed part of a ground investigation supervised by AECOM as the Investigation Supervisor.

Table 4.3: Summary Table to show existing Draft Ground Investigation data with nearest records to the pipeline route along Section C

Strata	Typical Description	BHRP01	BHRP02	BHW001	BHW002
Distance from pipeline DoL		On Site	On Site	150 m SE	130 m SE
Ground Level (m OD)		+13.40	+10.27	+8.12	+8.43
		Top of strata (m bgl)			
Made Ground	Dark brown clayey gravelly SAND with local roots/rootlets. Gravel of concrete, glass, brick.	0.00	0.00	-	0.00
	Light brown gravelly sandy SILT/ CLAY with brick and clinker.	1.20	0.05	0.00	-
	Medium dense yellowish brown mottled light grey gravelly SAND. In BHW001 strong CONCRETE between 2.5 – 3.17 m.	-	1.20	2.00	0.25
	Very soft and soft black and grey sandy gravelly CLAY with glass, ceramic, wood, plastic, chalk, flint/ Landfill matrix of SAND/CLAY with minor gravel components.	1.50	3.00	3.17	2.60
	Light yellowish brown sandy silty GRAVEL with low cobble content. Gravel of chalk and chert.	-	11.40	-	7.20
	Firm to stiff cream clayey gravelly SILT. Gravel of chalk and flint/CLAY/ SAND.	14.35	-	-	-
Alluvium	Light orangish brown gravelly silty SAND/Medium dense GRAVEL of flint and quartzite.	-	-	8.75	9.00
White Chalk Subgroup	Structureless gravelly SILT. Gravel of chalk and flint /GRAVEL/CIRIA Grade Dm / Dc.	16.65	17.0	13.30	14.80
White Chalk Subgroup	Weak low density white CHALK. CIRIA Grade C3.	-	-	23.00	-

	Very weak medium density white with frequent black specks CHALK (NI/80/340). CIRIA Grade B3.	30.2	-	26.90	-
	Very weak medium density white rare black specks CHALK with rare nodules of flint. (NI/130/730). CIRIA Grade A3.	36	-	-	-
	Very weak locally weak medium to high density white CHALK. (NI/180/600). CIRIA Grade C3.	38.9	26.49	-	30.83
	Very weak to weak low to medium density white CHALK (180/200/250) CIRIA Grade B2.	-	30.60	36.50	-
	Weak medium to high density white CHALK with rare stylolites and rare to occasional nodules of flint. (NI/110/290). CIRIA Grade B3. Below 45.24m in BHRP01, unable to assign CIRIA Grade. In BHRP02 CIRIA Grade B3 until 53.5 m then CIRIA Grade B2 to depth.	41.62	44.20	-	36.45
Groundwater (m bgl)		13.60	8.50	7.20	7.30
End of Hole (m bgl)		**65.25**	**60.7**	**41.0**	**40.0**

Geotechnical and geo-environmental samples were collected as well as installations were instructed for some of these boreholes, which are all discussed in the Phase 0 GI report produced by SOCOTEC supervised by AECOM (Socotec, 2023). These boreholes are shown within **Figure 2.1 Sheet 4** and **Figure 3.1 Sheet 4**.

These boreholes were drilled after a GI that took place on the same site where Delta Simon's have provided borehole data, which SSP now has reliance on (Delta Simon, 2021). If further analysis into the data regarding ground condition summaries and / or geo-environmental data is required, this will be detailed in a next version of this desk study.

4.2 BGS Borehole Data

The BGS holds records of boreholes that are freely available with many along the route concentrated across Sections A, B and D.

There are fewer boreholes within 250 m of the pipeline within Sections E to L. It must be noted that not all boreholes shown on the BGS portal have been utilised due principally to quality issues (e.g., water wells with no strata details or the records are illegible) or clusters of boreholes showing identical ground conditions and as such one hole is utilised to summarise conditions. Where there are minimal boreholes within a 250 m buffer of the routes, a 500 m buffer was chosen in order to get an indication of what to expect during intrusive works (assuming that the BGS maps suggested similar ground conditions). For example, Section E, F, G, H and M presented boreholes available within a 500 m buffer (up to 370 m from the route). BGS borehole logs shown in this Section are reproduced in **Appendix A**.

Section A and Section C boreholes are currently summarised above in Section **4.1**. A summary of geological materials encountered in Section B will not be included in this study as this has already been covered by the outline tunnelling study carried out by AECOM (AECOM, 2022). The remaining Sections D to M of the pipeline are discussed below.

4.2.1 Section D

All the locations are on or within 160 m of the pipeline route that progress west from the Water Recycling Plant (WRP) towards Widley. This is what is expected and consistent with the geological mapping summarised earlier. The selected borehole records show Alluvium deposits are encountered to a maximum depth of 1.68 m comprising silt, peat and chalk with peat. Head deposits are encountered to a maximum depth of 4.30 m bgl with River Terrace Deposits encountered to a maximum depth of 3.96 m. White Chalk Subgroup is the bedrock across the site encountered between 0.38 m and 15.24 m depth.

Table 4.4: Summary of the geology encountered within historic boreholes along Section D

Strata	Typical Description	SU60NE7	SU60NE88	SU60NE90	SU60NE93
Distance from pipeline DoL		On site	On site	100 m N	160 m N
Ground Level (m OD)		*+5.9	*+71.0	*+86.8	*+84.9
		Top of strata (m bgl)			
Topsoil	Gravelly topsoil	0.00	0.00	0.00	0.00
Alluvium	CHALK and PEAT	-	-	-	-
	Blue SILT	-	-	-	-
	PEAT	-	-	-	-
Head Deposits	Brown friable mottled gravelly CLAY. Gravel is chalk.	0.30	0.38	-	-
	Firm brown sandy gravelly CLAY. Gravel is chalk and flint.	2.10	-	-	-
River Terrace Deposits	Brown GRAVEL	-	-	-	-
White Chalk Subgroup	Weak contaminated CHALK in a putty matrix with some brown sandy clay.	4.30	-	-	-
	Weak medium density CHALK.	6.00	-	0.38	-
	CHALK and flint	-	1.07	0.76	-
	CHALK	-	1.75	-	0.38
Groundwater (m bgl)		5.32	Not recorded	Not recorded	Not recorded
End of Hole (m bgl)		**8.72**	**1.98**	**1.76**	**1.98**

*denotes mOD values not available, freemaptools.com/elevation-finder.html used

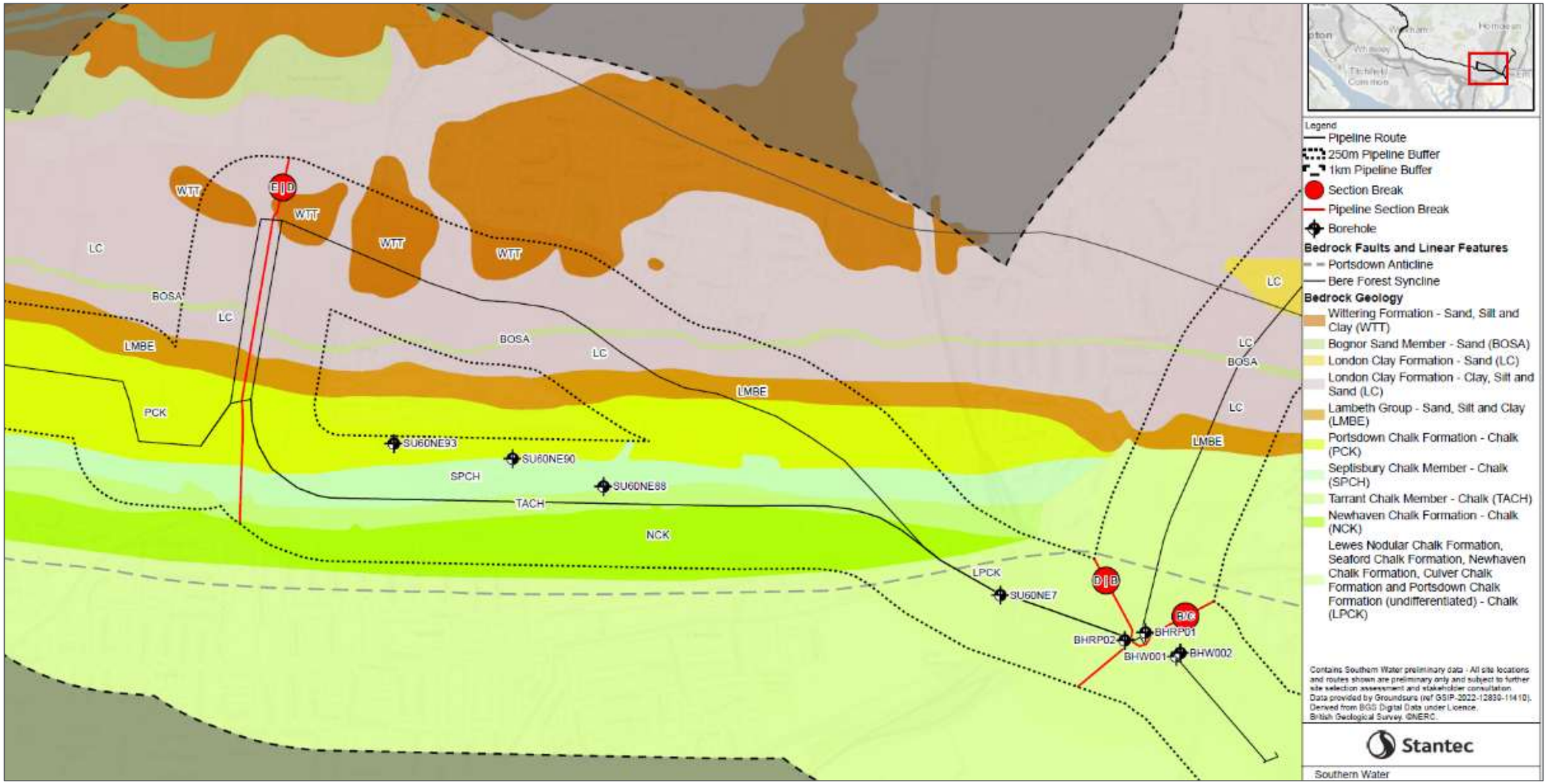

Figure 3.1 Sheet 5 of 32: Closest BGS boreholes on site to Section D.

*Boreholes shown towards the far east of the figure are within Section C and not summarised in Table 4.3 above. This **Figure 3.1 Sheet 5 of 32** shows an example of what is presented within the Figures at the end of this study.*

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4.2.2 Section E

Table 4.5 summarises materials encountered in Section E. This summary is not representative of the whole Section but only at one location due to the absence of BGS borehole records publicly available and is displayed on **Figure 2.1 (Sheet 8** and **9 of 32)** and **3.1 (Sheet 8** and **9 of 32)**.

Table 4.5: Summary of geology encountered within historic boreholes along Section E

Strata	Typical Description	SU60NW140
Distance from pipeline DoL		250 m N
Ground Level (m OD)		*+49.0
		Top of strata (m bgl)
Reading Formation	Reading Beds (running sands)	0 m – 38.50 m**
White Chalk Subgroup	Locally very soft highly weathered CHALK and flint	38.50
Groundwater (m bgl)		38.50
End of Hole (m bgl)		**50.00**

*denotes mOD values not available, freemaptools.com/elevation-finder.htm used
** This record is very simplistic, topsoil, Head deposits, River Terrace Deposits were not recorded but possibly were not considered important for the record of this observation well.

4.2.3 Section F

Table 4.6 summarises the geology in Section F. This summary is not representative of the whole Section but only at two locations due to the absence of BGS borehole records publicly available. The selected borehole records show Head Deposits are encountered to a maximum depth of 2.80 m bgl with River Terrace Deposits encountered to a maximum depth of 4.20 m. White Chalk Subgroup is the bedrock across the site encountered between 2.80 m and 7.95 m depth. The ground conditions and borehole locations are displayed within **Figure 2.1 (Sheet 10 and 11 of 32)** and **Figure 3.1 (Sheet 10 and 11 of 32)**.

Table 4.6: Summary of geology encountered within historic boreholes along Section F

Strata	Typical Description	SU50NE202	SU50NE204	SU50NE203
Distance from pipeline DoL		200 m SW	270 m NE	110 m NE
		Top of Strata (m bgl)		
Ground Level (m OD)		+6.80	+7.60	+7.13
Topsoil	Topsoil and local ash	0.00	0.00	0.00
Head Deposits	Chalk with flint	-	-	0.15
	Reddish brown sandy clayey SILT with gravel	-	-	0.35
	Stiff light brown silty CLAY with organic remains	-	-	0.65
	Medium dense to dense clayey brown GRAVEL	-	-	2.00
Alluvium	Brown clayey SILT and clayey SAND	0.40	-	-
River Terrace Deposits	Medium dense sandy GRAVEL of flint	1.15	0.20	-
White Chalk Subgroup	Locally very soft highly weathered CHALK and flint	4.30	4.20	2.80
Groundwater (m bgl)		4.50	5.35	4.80
End of Hole (m bgl)		**8.95**	**7.95**	**7.45**

4.2.4 Section G

Table 4.7: Summary of geology encountered within historic boreholes along Section G

Strata	Typical Description	SU50NE251	SU51SE5
Distance from pipeline DoL		370 m SW	145 m NW
Ground Level (m OD)		*41.0	+53.34
		Top of Strata (m bgl)	
Topsoil	Topsoil and clay	0.00	-
Made Ground	Old well	-	0.0
River Terrace Deposits	Medium dense sandy GRAVEL	0.20	-
Earnley Sand Formation	CLAY with sand and pebble beds	-	27.4
Wittering Formation	SAND with irregular angular pebbles	-	51.8
Groundwater (m bgl)		Not encountered	Not described
End of Hole (m bgl)		**1.60**	**52.12**

*denotes mOD values not available, freemaptools.com/elevation-finder.htm used

Ground conditions are as expected and consistent with the geological mapping summarised earlier. This summary is not representative of the whole Section but only at one location due to the absence of BGS borehole records publicly available. The ground conditions and borehole location are displayed within **Figure 2.1 (Sheet 12, 13 and 14 of 32) and Figure 3.1 (Sheet 12 and 13 of 32).**

4.2.5 Section H

Table 4.8: Summary of geology encountered within historic boreholes along Section H

Strata	Typical Description	SU51SE153
Distance from pipeline DoL		275 m SE
Ground Level (m OD)		
		Top of Strata (m bgl)
Topsoil	Brown topsoil	0.00
River Terrace Deposits	Brown silty clay and fine gravel	1.00
Wittering Formation*	Buff yellow, brown fine Sand	2.00
	Grey clay	14.00
	Buff brown sand	17
London Clay*	Grey clay	18
Lambeth Group	Grey, red, yellow clay	106.00
White Chalk Subgroup	White chalk with flints	135.00
Groundwater (m bgl)		28.00
End of Hole (m bgl)		**245.00**

*Not presented on logs but interpreted here.

Ground conditions are as expected and consistent with the geological mapping summarised earlier. This summary is not representative of the whole Section but only at one location due to the absence of BGS borehole records publicly available. The ground conditions and borehole location are displayed within **Figure 2.1 (Sheet 17 and 18 of 32)** and **Figure 3.1 (Sheet 17 and 18 of 32)**.

4.2.6 Section J

Table 4.9: Summary of geology encountered within historic boreholes along Section J

Strata	Typical Description	SU51SE152
Distance from pipeline DoL		225 m NE
Ground Level (m OD)		+52.69
		Top of Strata (m bgl)
Topsoil	Topsoil and clay	0.00
Head deposits	Orangish brown CLAY with silt	1.00
London Clay Formation	Dark brownish grey CLAY	3.00
	Grey CLAY with shells	12.00
	Grey CLAY	24.00
	Grey CLAY with shells	48.00
	Grey CLAY	55.00
Reading Formation	Grey, green, red and various coloured clays	75.00
	Flint band	101.00
White Chalk Subgroup	Grey CHALK and flint	104.00
	CHALK (cleaner) with lots of flint	180.00
	Groundwater (m bgl)	25.00
End of Hole (m bgl)		**210.00**

4.2.7 Section K

Table 4.10: Summary of geology encountered within historic boreholes along Section K

Strata	Typical Description	SU51NW29	SU51NW2	SU51NW3
Distance from pipeline DoL		110 m SW	140 m S	130 m SW
Ground Level (m OD)		*45.0	76.20	53.34
		Top of Strata (m bgl)		
Topsoil	Topsoil and clay	0.00	-	-
London Clay Formation	Brown buff CLAY	1.50	0.00	-
	Greyish brown CLAY	2.00	-	-
	Blue CLAY	-	-	0.00
Reading Formation	Grey, green, red, yellow CLAY	32.00	57.90	33.50
White Chalk Subgroup	CHALK with flint	35.00	80.90	56.40
	Groundwater (m bgl)	11.00**	Not recorded	Not recorded
End of Hole (m bgl)		**105.00**	**94.18**	**71.63**

*denotes mOD values not available, freemaptools.com/elevation-finder.htm used
**Weak artesian pressure was encountered at 80 – 90 m. Casing was grouted to 75.5 m as a precaution. 11.00 m bgl is the resting groundwater level.

Ground conditions are as expected and consistent with the geological mapping summarised earlier. This summary is not representative of the whole Section but only at one location due to the absence of BGS borehole records publicly available.

The ground conditions and borehole location are displayed within **Figure 2.1 (Sheet 21)** and **Figure 3.1 (Sheet 21)**.

4.2.8 Section L

Table 4.11: Summary of geology encountered within historic boreholes along Section L

Strata	Typical Description	SU51NW41	SU42SE58
Distance from pipeline DoL		65 m SW	200 m SW
		Top of Strata (m bgl)	
Ground Level (m OD)		50.0	36.6
Topsoil	Topsoil and local ash.	0.00	0.00
London Clay Formation	Greyish brown CLAY	0.00	0.00
Reading Formation	Shells/shelly LIMESTONE	31.00	-
	Grey silty CLAY	32.00	-
	Grey, green, red, yellow CLAY	34.00	24.80
	Red flint GRAVEL	-	55.00
White Chalk Subgroup	White CHALK	36.00	-
	CHALK with flint	42.00	-
	Grey CHALK	42.00	55.20
	Groundwater (m bgl)	10.50	24.00
End of Hole (m bgl)		**77.30**	**83.40**

Ground conditions are as expected and consistent with the geological mapping summarised earlier. This summary is not representative of the whole Section but only at two locations due to the absence of BGS borehole records publicly available.

There are not many boreholes closely spaced along the route and are very widely distributed along Section L. The selected borehole records show London Clay Formation is encountered to a maximum depth of 31.00 m bgl with Reading Formation encountered to between depths of 36.00 m bgl and of 55.00 m bgl. White Chalk Subgroup is encountered to 83.40 m bgl.

The ground conditions and borehole location are displayed **within Figure 2.1 (Sheet 22, 23 and 25)** and **Figure 3.1 Sheet 22, 23 and 25**.

4.2.9 Section M

Table 4.12: Summary of geology encountered within historic boreholes along Section M

Strata	Typical Description	SU42SE29	SU42SE30	SU42SE184	BH-E SOCOTEC 2019 GI***
Distance from pipeline DoL		120 m NE	190 m NE	180 m NE	300 m E
Ground Level (m OD)		+19.50	+21.37	*+33	+22.18
		Top of strata (m bgl)			
Topsoil	Topsoil	0.00	0.00	-	0.00
Made Ground	Tarmac	-	-	0.00	-
	Brown clayey SAND and coarse gravel	-	-	0.10	0.30
	Light brown sandy locally organic CLAY with gravel of chalk and brick	-	-	0.20	0.60
Alluvium	Firm brown sandy silty CLAY with gravel	-	0.35	-	-
Head deposits	Soft light brown to grey CLAY	-	-	-	2.00
	Light brown and white clayey silty fine SAND/sandy SILT	-	-	-	3.00
River Terrace Deposits	Brown GRAVEL with silty clay	0.20	1.10	-	-
	Sandy GRAVEL	-	-	-	4.00
London Clay Formation	Locally firm brownish grey locally brown CLAY	2.10	4.20	-	-
White Chalk Subgroup	White CHALK with flint	-	-	0.50	7.00
Groundwater (m bgl)		10.00	**Dry	**Dry	5.30
End of Hole (m bgl)		**10.50**	**10.00**	**3.50**	**20.00**

*denotes mOD values not available, freemaptools.com/elevation-finder.htm used
**Borehole was dry, only water was added to assist boring.
***Borehole summary log from SOCOTEC GI at Otterbourne WSW in 2018 and is located within **Appendix C**.

For further geotechnical information pertinent to this Section, a geotechnical interpretative report: 41524404 Otterbourne WSW GIR based on G8024 is available upon request produced by SSP. This included the SOCOTEC BH-E borehole, which was drilled in 2018 located within **Appendix C**.

All the locations are within approximately 300 m of the route that progresses northwest of Colden Common to Otterbourne WSW. Ground conditions are as expected and consistent with the geological mapping summarised earlier. The selected borehole records show Made Ground is likely to be encountered to a maximum depth of 2.00 m bgl (associated with Otterbourne WSW). Alluvium is encountered at SU42SE30 to 1.10 m bgl associated with the River Itchen adjacent to this location. Head Deposits at BH-E are encountered to 4.00 m bgl with River Terrace Deposits are to a maximum depth of 7.00 m. London Clay Formation encountered to 10 m bgl. At two locations White Chalk Subgroup is encountered between 0.50 m bgl and 20 m bgl. The ground conditions and borehole location are displayed within **Figure 2.1 (Sheet 26 and 27 of 32)** and **Figure 3.1 (Sheet 26 and 27 of 32)**.

5 Geotechnical Considerations

5.1 Ground Conditions

It is understood that approximately 40 km of up to 1200 mm diameter (material TBC) is to carry the pumped water flows from the proposed WRP to Otterbourne WSW.

There is likely to be a range of Topsoil, Made Ground, Alluvium, Head deposits, River Terrace Deposits, Thames Group, Lambeth Group and White Chalk Subgroup that will be encountered close to surface, which will change depending on the area.

5.2 Excavations

In general, excavations are expected to be within the capability of conventional excavation plant. The need for trench support will depend on proximity of excavations to existing structures and services and also requirements for man-entry between 3 m – 6 m depth where open cut sections of the pipeline are proposed. Trench boxes are expected to be sufficient to maintain a safe working environment though locally where space permits battered excavations may be possible. Where trenchless construction is proposed, estimated depths are expected to range between 5 – 15 m bgl and larger diameter tunnelling up to 70 m bgl.

Note that chalk and soils with a high content of chalk or derived from chalk (e,g, the Head deposits on the chalk hillscape) are highly susceptible to softening in the presence of water and can degrade into an unworkable slurry. It is recommended that, where required, dewatering is carried out in advance of excavation and excavations are protected from the ingress of surface water. It would be prudent to be undertaking excavations in those areas during the summer when the risk of inclement weather is lower.

Strata specific information is detailed in the ensuing Sections:

5.2.1 Made Ground

Given the variable nature of Made Ground, no discussion is provided on these materials.

5.2.2 Alluvium

Alluvium is expected close to the rivers such as the Hermitage Stream in Section C, River Hamble in Section K and River Itchen in Section M. It is expected that excavation will be within the capabilities of conventional plant.

A high groundwater level may be assumed in these deposits based on existing borehole data and groundwater may be in direct hydraulic continuity with the watercourses. Large amounts of sump pumping may draw out fines, risking the base loosening and boiling in the base/ instability of the excavation or settlement in the surrounding ground may occur. Full excavation support is recommended.

5.2.3 River Terrace Deposits

It is expected that excavation will be within the capabilities of conventional plant.

A high groundwater level and high permeability may be assumed in these deposits and groundwater may be in direct hydraulic continuity with any nearby watercourses. Large amounts of sump pumping may draw out fines risking the base loosening, boiling in the base/ instability of the excavation and/or settlement in the surrounding ground. Full excavation support is recommended.

5.2.4 Head Deposits

It is expected that excavation will be within the capabilities of conventional plant.

Generally, these deposits are above the present-day flood plain and a high groundwater table is unlikely. Where below groundwater the soil may become mobile and flow into any unsupported excavations, so full excavation support may be needed. There may also be a possibility of relic shear surfaces being a solifluction deposit which risks excavation stability so full excavation support will be required.

5.2.5 Sand bands within Bracklesham Group, London Clay Formation or Lambeth Group

Consisting largely of fine sand interbedded with clay/silt, it is expected that excavation will be within the capabilities of conventional plant and where groundwater is below construction depth, no particular complications are expected.

Fine sands are likely to be highly mobile in the presence of groundwater with the possibility of running sand. Where confined by overlying Bracklesham Group, London Clay / Lambeth Group clays, subartesian conditions may exist. In this situation, groundwater control will be needed.

5.2.6 Bracklesham Group, London Clay Formation and Lambeth Group (clays)

Where London Clay Formation, Bracklesham Group or Lambeth Group deposits comprised of firm to very stiff clay above the water table is encountered within the excavations without sandy or gravel horizons, the excavation may not require full support. It is expected that excavation will be within the capabilities of conventional plant.

Deeper areas within Section A showed strong limestone encountered approximately 12 m bgl (+13.40 m OD) of possible Harwich Formation below London Clay Formation, which will not be easy to get through using conventional plant. However, Lambeth Group has a highly variable composition consisting of stiff fissured clay with multiple sand and gravel horizons with associated groundwater, so full excavation support may be necessary in these situations (see 4.2.5 above).

5.2.7 White Chalk Subgroup

Chalk close to the surface would be weathered (i.e., broken down by frost) and comprise structureless chalk, which would be of relatively low permeability when compared with structured chalk at greater depth. Perched groundwater is also possible on top of the structureless chalk, and subartesian groundwater conditions are possible.

5.3 Trenchless Construction

Numerous roads and rivers are expected to be encountered along the route including the A27, A3(M) and A3 dual carriageways with rivers including River Wallington, River Meon, River Hamble, Bow Lake, River Itchen and smaller watercourses. It should be possible to carry out trenchless works in all the anticipated strata bearing in mind the following:

5.3.1 Made Ground

Given the variable nature of Made Ground, no discussion is provided on these materials.

5.3.2 Alluvium and Head Deposits

In soft clays and peat loss of alignment can occur. At the interface between ground of contrasting strength (i.e., between soft clay and underlying harder material) loss of alignment can also occur. It is likely that a system providing full face support (e.g., horizontal directional drilling (HDD), slurry supported Tunnel Boring Machine (TBM) or Earth Pressure Balance (EPBM) micro-tunnel) would be needed to maintain stability.

5.3.3 River Terrace Deposits and Sand Bands within Tertiary Bedrock Deposits

Open-face tunnelling may be suitable above the water table within River Terrace Deposits and the Bracklesham Group, Thames Group and Lambeth Group all within Tertiary bedrock deposits. However, below the water table the deposits would be highly mobile and a system providing full face support (e.g., Horizontal directional drilling (HDD), slurry supported Tunnel Boring Machine (TBM) or Earth Pressure Balance (EPBM) would be needed to maintain stability.

Subartesian groundwater conditions may exist with confined sand bands, which would require close control of mud pressure balance to ensure bore stability / prevent blow-out (drilling fluid surfacing at ground level).

5.3.4 London Clay Formation and Lambeth Group

It is expected that London Clay Formation would be homogeneous firm/stiff silty clay, and no evidence of groundwater seepages have been recorded in the available records – this stratum is considered optimum for soft-ground tunnelling; both open-face and closed face tunnelling methods are likely to be suitable though noting however that persistent bands of sand do exist at various levels (see 5.2.5).

It is expected that Lambeth Group would contain predominantly mottled clay, though possibly with bands of shells, gravel and sandy materials (see 5.2.5). Due to natural variability, it is likely that this strata would require a system providing full face support (e.g. HDD, slurry supported TBM, EPBM) to maintain stability.

5.3.5 Upper Chalk

Structureless chalk (Dm/Dc) and Chalk is highly fractured can contain groundwater, Chalk would be self-supporting and suitable for open face. HDD, slurry supported Tunnel Boring Machine (TBM) or Earth Pressure Balance (EPBM) techniques could also be used. The presence of flints is always an issue particularly with them getting caught on the string. The structureless chalk as noted would probably be of lower permeability.

5.4 Ground Aggressivity

Made Ground and natural soils can be aggressive towards buried concrete or ferrous metals. Limited testing was completed as part of the SOCOTEC investigation in late 2019 over a limited depth and area so is considered insufficient to review. The SOCOTEC testing results should not be used for preliminary design purposes as GI is recommended along the pipeline route to accurately determine the BRE classifications.

Bracklesham Group, London Clay and Lambeth Group are noted to be pyritic throughout, and are therefore likely to be moderately aggressive, whereas chalk and chalk derived Head deposits are alkaline, naturally low in sulphates and unlikely to be aggressive.

The pipe material has not been determined for the scheme, but the current preference is a continuous mould polyethylene pipe or ductile iron. If ductile iron is used, in situ resistivity testing is needed throughout the route to assess the ground for corrosivity. Thrust restraint parameters will be determined as the design develops, if required.

5.5 Flotation

Flotation of the pipeline route at the end of Section A needs to be checked further as the London Clay Formation and Head deposits are shown to produce groundwater being recorded above ground level. Flotation will also be assessed at the shafts for trenchless crossings where drilling and / or groundwater monitoring results in (sub)artesian groundwater conditions.

5.6 Artesian Groundwater Conditions

Two boreholes drilled by SOCOTEC in Section A, both within approximately 40 m and 90 m of the pipeline route (late 2019), encountered artesian groundwater conditions, as outlined in Section 4.1.1 (SOCOTEC, 2020).

It is recommended that allowance is made for the risk of artesian groundwater during shallow excavations. Around the area towards the beginning of Section A, relief wells could be drilled to lower the groundwater level to below ground level.

5.7 Foundations

Non-pipeline infrastructure that includes IPS-F, IPS-G, BPT-E and BPT-K requires various geotechnical design parameters to be recommended to inform foundation design.

Table 5.1: Foundation design parameters per strata

Strata	Bulk unit weight, γ (kN/m^3)*	Effective Angle of Shearing Resistance ($\varphi'_{cv.k}$)*	Spangler Modulus, E'_3 for pipeline (MN/m^2)**	Ultimate bearing resistance, q_u for IPS/BPT infrastructure *
Head Deposits (cohesive) and Alluvium	16 - 20	21°	3 - 4	Head Deposits at IPS-F : 800 kPa
River Terrace Deposits and sand bands within Tertiary bedrock deposits	16 - 19	32°	8 - 10	At IPS-G, 800 kPa
Wittering Formation/ Earnley Sand Formation	16 - 20	23°	3 - 4	At IPS-G, 800 kPa
London Clay Formation and Harwich Formation	18 - 23	24°	6 - 10	At BPT-K : 1100 kPa
Lambeth Group	18 - 23	23°	6 - 10	N / A
White Chalk Subgroup****	18 - 20	34° - 39°	10 - 11	At BPT-E and IPS-F: 4.3 – 16 MN/m2 ***

* (BSI, 2020) γ for values above the groundwater table, φ'cv.k estimated from Table 2, qu estimated from 5.4.1.3.1.
** (BSI, 2020a) Table 13 Guide values of Spangler modulus for native soils, E'3
*** (Lord et al., 2002) Based medium/high density and Upper Chalk
**** Spangler Modulus for White Chalk Subgroup based on equivalent of extremely weak to very weak rock

6 Environmental Data and Site History

6.1 Methodology

A review of the environmental data and site history has been completed using the Groundsure Insights Report (digital and pdf) purchased by the Applicant (Groundsure, 2024). The Groundsure report is included in **Appendix I**.

A search area of the DoL plus a 250 m buffer in Sections B to M and the Proposed Underground Pipeline.

A search area of the DoL plus a 290 m buffer in Section A was agreed with the Applicant for the Groundsure report. The distance of 290 m was used in Section A on the assumption of a 40 m wide working area for pipeline construction plus a 250 m search buffer. Search distances presented in Section 6 of this report consider **the DoL of Section A to be the 40 m working area around the Proposed Underground Pipeline** instead of the entire Havant Thicket reservoir. Distances provided are approximate.

The following additional information sources have also been used:

- Historical maps available online (National Library of Scotland, 2021 - 2023)
- Historical aerial imagery and street view available within Google Earth, (Google Earth Pro, 2024) and Google Maps (Google Maps, 2023)
- Portsdown Tunnels - Havant military forts information (Bob Hunt, 2021)
- Current and historic landfill information online (data.gov.uk, 2024)
- Pollution incidents to controlled waters (data.gov.uk, 2024)
- Local Authority and Environment Agency Consultation (where received)
- Detailed Unexploded Ordnance Risk Assessment – Water for Life Havant Thicket to Otterbourne (Zetica UXO Risk Assessments (P6662-17-R1-A to P6662-17-R13-A), 2024)
- The Naval Camps of Bedhampton and Leigh Park (Hind, 2017)

The search distances for potential sources for contamination from the pipeline route are approximate. The search extents used are detailed in **Table 6.1**. The results are provided in this Section and are included on a GIS layers. A selection of figures summarising this information are presented in the Figures section.

Table 6.1: Search Distances

Areas of concern/sites of interest	Search distance from the DoL (m)
Historical maps to determine PSCs* (non-landfill)	50
Infilled land/ landfills	250
Discharge consents	50
Pollution incidents	50
Licensed Industrial Activities (Part A1)	50
COMAH sites	50
Discharges of Substances identified as List I and List II Dangerous Substances (active and non-active)	50
Licensed Waste Sites	50
Trade directories *(where applicable and not just a registered address at a residential property)*	50

*PSC Potential source of contamination (see list in appendix)

COMAH sites – Sites regulated under the Control of Major Accidents and Hazards Regulations

6.2 Environmental Licenses and Consents

Environmental licenses and consents data are presented in the Groundsure report. Extracted tables from the digital format are included in **Appendix D**.

A summary of the environmental licenses and consents within 50 m of the pipeline route is present in **Table 6.2**. **Figures 10.0-10.1** show the locations of Environmental and Consents data across the pipeline route.

Information on Waste licensing is presented in **Section 6.3**.

Table 6.2: Summary Table for Licenses, Consents and Discharges within 50 m of Draft Order Limits

Consent/License	Within the DoL	No. within 50 m of the DoL	DoL Sections
COMAH Sites	0	0	-
Regulated Explosive Sites	0	0	-
Licensed Industrial Activities (Part A1)	**4**	**3**	B and C
Licensed Part (A2) and Part B installations	0	**1**	C
Discharges of Substances identified as List I Dangerous Substances[1]	**3**	**2**	C and G
Discharges of Substances identified as List II Dangerous Substances[1]	**43**	**2**	C and G
Hazardous Substances Storage/usage [2]	0	0	-
Historical Licensed Industrial Activities (IPC) [3]	0	0	-
Radioactive Substances Authorisations	0	0	-
Licenced Discharges to Controlled Waters	**6**	**46**	L, K, J, G, F, C and B
Pollution Incidents	**12**	**11**	B, C, G, H, J and K
Pollutant Release to Surface Waters (Red list) [4]	0	**1**	C
Pollutant Release to Public Sewer [5]	0	0	-

Notes

[1] European Directive E 2006/11/EC regulated under the Environmental Damage (Prevention and Remediation) Regulations 2015

[2] Consents granted for a site to hold certain quantities of hazardous substances at or above defined limits in accordance with the Planning (Hazardous Substances) Regulations 2015.

[3] Integrated pollution control (IPC) records of substance release to air, land and water. This data is part of a historic archive as the IPC regime has now been superseded.

[4] Discharges of specified substances under the Environmental Protection (Prescribed Processes and Substances) Regulation 1991

[5] Discharges of special category effluents to public sewer

6.3 Landfills and Waste Sites

Historical and recent landfills and waste sites are presented in the Groundsure report for sites within 250 m from the pipeline route. Extract tables from the digital format are included in **Appendix D**. In addition, Stantec/SSP contacted Havant Borough Council, Portsmouth City Council and Winchester City Council for information on landfills and contaminated land. Digital data (GIS) was provided and are shown on **Figure 12.0-12.1**. Landfill data held by Hampshire County Council was also forwarded in digital format.

A summary of landfills recorded within 250 m and waste sites within 50 m of the DoL is presented in **Table 6.3.** Further details are included in this Section.

Table 6.3: Summary Table of Landfill and Waste Sites

Waste Site	Within the DoL	0-50 m from DoL	50-250 m from DoL	Further details	Pipeline Sections
Active/Recent Landfills	**1**	0	**1**	Section 6.3.1	B, H
Historic Landfills	**6**	**2**	**1**	Section 6.3.2; Appendix D	C, F, H, J, L, M
Licensed Waste Sites	**2**	**3**	-	Section 6.3.3	C, D, F

6.3.1 Active or Recent Landfill Sites

There are 2 active or recent landfills recorded within 250 m buffer of the DoL, the details provided by the Groundsure Report and Winchester City Council are summarised in **Table 6.4**.

Table 6.4: Active or Recent Landfill Sites within 250 m of the Draft Order Limits

Pipeline ID	Information Source	Distance from DoL (m)	Site Name	Waste Type	Status
B	Groundsure (EA) Havant Borough Council	Within DoL	Portsmouth Water Ltd at Bedhampton Waterworks	Inert; non degradable construction waste	Issued
H	Groundsure (EA) Winchester City Council	75m NE	Suez Recycling and Recovery Southern Ltd at Sandpit, Wickham; referred to as Firth Lane by Winchester City Council	Co-disposal landfill	Closure

6.3.2 Historic Landfill Sites

Historical landfill data is presented in the Groundsure report for sites within 250 m of the DoL. The Groundsure data provided is from Local Authorities, the Environment Agency (EA) and BGS records. Extracted tables from the digital format are included in **Appendix D**.

In addition, Stantec/SSP contacted Fareham Borough Council, Havant Borough Council, Portsmouth City Council and Winchester City Council for information on landfills and contaminated land. Digital data (GIS) were provided and are shown on **Figures 12.0-12.1**. Landfill data held by Hampshire County Council was also forwarded in digital format.

A summary of the historical landfills recorded within 50 m of the pipeline DoL is presented in **Table 6.5.** A list of historical landfills 250 m of the pipeline DoL is presented in **Appendix D**.

Table 6.5: Summary Table for Historic Landfills within 50 m of the Draft Order Limits

Pipeline Section	Information Source **	Distance (m)	Site Name	Waste Type
C	Groundsure (EA; BGS), Havant Borough Council	Within DoL	Harts Farm Way Storehouse Lake Tip (BGS) is positioned within the boundary of Harts Farm Way	Domestic Waste; incinerator ash; unknown
C	Groundsure (EA	Within DoL	Land South of Budds Farm Sewage Works	Household
F	Groundsure (EA), Fareham Borough Council	Within DoL	Albany Farm (2)*	Construction, demolition, builders waste; Inert; stockpile soil, raised land unknown landfill
J	Groundsure (EA), Hampshire County Council	Within DoL	Land at Rossgarth	Inert; earth spoil, construction demolition waste, gassing stated
J	Groundsure (EA), Hampshire County Council	Within DoL	Ash House Farm	Commercial, Household (GS) East area - earth spoil West area – domestic, builders, gassing noted
L	Groundsure (EA),	Within DoL	Crowd Hill	Inert, industrial.
M	Groundsure (EA), Winchester City Council	Within DoL	Bugle Farm	Waste Unknown
H	Groundsure (EA),	30	Shirrell Heath Sand Pit	Inert, Commercial

* Numbers given to the site for this reporting only in order to identify the two landfills with same name.
** Information sources include Groundsure report and Local Authorities (where available). The waste types are listed as provided from the information source.

6.3.3 Licensed Waste Sites

Licensed waste sites data is presented in the Groundsure report for sites within 250 m of the DoL. These are active or recently closed waste facilities under the Environment Agency. Licensed waste sites within 50m of the DoL are shown in **Table 6.6.** Extracted tables for licensed waste sites within the 50 m buffer of the DoL are presented in **Appendix D**.

Table 6.6: Summary Table for Licensed Waste Sites within 50 m of the Draft Order Limits

DoL Section	Licence Name	Distance (m)	Address	Type	Status
C	Southern Water Services Limited	Within DoL	Budds Farm Water Treatment Works, Southmoor Lane, PO9 1JW	Biological Treatment Facility	Issued
C	Southern Water Services Limited	Within DoL	Southmoor Lane, Budds Farm, Havant, Hampshire, PO9 1JW	Landfill Gas Engine (<3 mW)	Issued
B	Portsmouth Water Ltd	20	Bedhampton Waterworks, Meyrick Road, Havant, PO9 1NN	Inert LF	IPPC / Issued
B	Portsmouth Water Ltd	35	Bedhampton Waterworks, Meyrick Road, Havant, PO9 1NN	Landfill taking Non-Biodegradable Wastes	IPPC / Issued
C	Sita Solent Ltd	40	Havant Lorry Park, Southmoor Lane, Havant, Hampshire, PO9 1JW	Household, Commercial & Industrial Waste T Stn	Transferred / surrendered

6.4 Recent Industrial Land Uses

Recent industrial land uses are presented in the Groundsure report for sites within 250 m of the DoL. These are current potentially contaminated industrial sites. Twenty-two sites are identified in the Groundsure report in the DoL and include electricity substations, tanks, works, solar panel sites, telecommunication masts and sewage treatment works. Recent industrial land uses within 50 m of the DoL are presented in **Appendix D**.

6.5 Pollution Incidents

Pollution incidents are presented in the Groundsure report for incidents 250 m from the DoL. These are sourced from Environment Agency data. Twelve pollution incidents are recorded in the DoL and eleven are recorded within 50 m of the DoL. A summary of pollution incidents within the DoL are presented in **Table 6.7** and shown on **Figure 10.0 and Figure 10.1 (Sheets 1 – 32).**

Table 6.7: Pollution Incidents within the DoL

Section	Direction	Date	Air*	Land*	Water*	Pollutant Type	Pollutant
C	E	2001-08-28	Category 4	Category 4	Category 3	Pollutant Not Identified	Not Identified
B	W	2003-06-12	Category 4	Category 4	Category 3	Oils and Fuel	Petrol
B	W	2003-07-24	Category 4	Category 4	Category 3	Sewage Materials	Grey Water
B	W	2002-08-24	Category 4	Category 3	Category 3	Sewage Materials	Crude Sewage
B	W	2002-09-22	Category 4	Category 4	Category 1	Sewage Materials	Crude Sewage
B	W	2002-09-09	Category 4	Category 4	Category 3	Sewage Materials	Crude Sewage
B	E	2003-01-01	Category 4	Category 4	Category 3	Sewage Materials	Crude Sewage
B	W	2002-10-12	Category 3	Category 3	Category 2	Sewage Materials	Crude Sewage
B	W	2002-09-07	Category 4	Category 3	Category 4	Sewage Materials	Crude Sewage
B	W	2003-06-09	Category 4	Category 4	Category 4	Sewage Materials	Crude Sewage
B	W	2003-09-10	Category 4	Category 4	Category 3	Sewage Materials	Crude Sewage
J	N	2019-07-21	Category 3	Category 3	Category 1	Sewage Materials	Crude Sewage

*Categories as defined by the Environment Agency - Category 1 (major impact); Category 2 (significant), Category 3 (minor impact); Category 4 (no impact)

6.6 Regulatory Consultation

The Local Councils listed below were contacted for information held on contaminated land sites/land use in their areas. Data identifying known potentially contaminated sites, waste and landfill sites was forwarded as digital GIS shape files. Additional information on certain sites such as Harts Farm Landfill (Havant Borough Council) was also provided.

- Fareham Borough Council
- Havant Borough Council
- Portsmouth City Council
- Winchester City Council
- Environment Agency

Digital data showing Hampshire County Council Landfills was also obtained. The information received from the councils are presented on **Figures 12.0-12.1**.

6.7 Site History

Table 6.8 provides a summary of the site history per pipeline Section.

Table 6.8: Summary of Overall History of the Proposed Underground Pipeline Sections DoL.

Section	Site History Summary
A	• The earliest mapping indicated the Section was located within an undeveloped area. • A surface water feature was recorded along the southern boundary. • No significant changes are recorded within the historical maps.
B	• The earliest mapping indicated the Section was located within Leigh Park, later mapped as Great Copse and Billy Lawn (northern area), the southern area was located within the Village of Bedhampton. • Bedhampton Corn Mill was recorded within the southern area to the south of the railway line on 1888-1913 mapping. A series of waterways, ponds and sluices were also located in this area. • Portsmouth Water Works was located upgradient of the Corn Mill. • Rapid development was recorded across the Section in c.1937-61, including two sewage works within the central and southern area of the Section. • Several naval camps were located in this area during World War II including Stockheath, Belmont and Fraser Naval Camps. These were used for as overflow facilities for the naval bases in Portsmouth. After the war some camps continued to house displaced civilians.
C	• The earliest mapping indicates the Section to be located within an undeveloped landing place and Broad Marsh. • Landfilling appears on historical aerial photography from 1946 south of Budds Farm WTW until approximately the 1980s. Landfilling started at Harts Farm Landfill in the late 1960 until the late 1980s. • Further details on the historical development of Harts Farm Landfill and western area of Budds Farm Wastewater Treatment Works are in **Section 6.7.1 and 6.7.2** respectively.
D	• The earliest recorded mapping indicates the Section to be relatively undeveloped, with sporadic Old Chalk Pits and quarrying activities are recorded across the Section (majority are unrecorded by 1955-61). • The Borough of Portsmouth Waterworks Reservoir was recorded along the southwestern area of the Section, unrecorded by c.1955-61. • South of the reservoir was Collyer's Pit (c.1888 to 1955). Residential development was recorded between 1931-61 and 1955-61 along the southern area of the Section. • Fort Purbrook is shown in the central portion of the northern part of the Section (c. 1860 to present day).
E	• The earliest mapping indicated the Section was located within an undeveloped area with Old Chalk Pits recorded across the Section (majority are no longer recorded by 1955-61). • A reservoir was recorded c.1937-61 within the central area, east of Offwell Farm (no longer shown by 1949-197 and 1955-61). • A Water works (covered reservoir) is present in the eastern corner of the Site pretty much situated on the boundary between Sections D and E and has been present since c. 1969. A small reservoir was also shown just to the south between 1938 – 1951 and was part of the Portsmouth Waterworks.
F	• The earliest mapping indicated the Section was located within an undeveloped area with Old Gravel and Old Chalk Pits across the Section, an Old Clay Pit is recorded within the northeastern area of the Section (unrecorded by 1949-197 and 1955-61). • A route change to the pipeline within the northern part of Section F shows the Albany Farm which has been located on site since c. 1856 and associated historic landfills located to the east of the farm which input activities were recorded between c. 1856 to 1989.

Section	Site History Summary
	• Further north the Wellborne business park is located which historically has been a brickfield between 1892 and 1914 and saw mills between 1949 and 1970. Its present day uses include a brick and stone supply works and a gift shop. To the northeast of this business park an Old Clay is recorded between 1909 and 1939.
G	• The earliest map around 1885 shows the River Meon flowing south and the Portsmouth branch railway line in the central part of Section G at the southern end of Wickham Golf course. Titchfield Lane is present and occasional farms or woodland are present. • Maps around 1900 show gravel pits across the section including adjacent to Titchfield Lane. • By 1930s – 1950s Cold Harbour adjacent to Titchfield Lane has been developed with more and larger buildings similar to the present day. The gravel pits at this time are largely shown to be no longer active, with markings on maps indicating the areas vegetated or smaller or small depressions in the land. • A Sewage Works is present just southeast of Wickham Golf course and has been present on Site since c. 1965.
H	• The earliest mapping indicated the Section was located within an undeveloped area with the northern area of the Section within Shirrell Copse, south of Shirrell Heath, partial deforestation recorded on c.1937-61 mapping. • Allotment gardens are recorded within the northern area, east of Shirrell Copse (c.1892-1914, unrecorded by c. 1937-61 and 1945-65 mapping); additional allotment gardens are recorded within the northern area of the Section (c.1892-1914, unrecorded by c. 1937-61 and 1945-65 mapping). • The Section has remained undeveloped from the c.1888-1913 mapping to present.
J	• The earliest mapping (c.1850-1890) indicated the Section was located within a largely undeveloped area with mostly farms and farmland present. • A Roman Road was also recorded on c.1888-1913 mapping, north to south, west of Woodman's Farm. Excluding the sand pits, the Section has remained undeveloped from the c.1888-1913 mapping to present. • Small pits (mainly sand) are show on maps between 1900 to 1950s with larger mineral excavations shown including Philimore Pit and Land at Rossgath Landfill appearing from the 1960s onwards. A former large orchard is shown on the 1896 map located in the north of the Section, north of Woodmans Farm although this is no longer shown by 1965. • In the central part of Section J just to the northwest of Sandy Lane Ash House Farm Landfill/Sand pit is shown between 1868 and 1991.
K	• The earliest mapping 1885-1900 indicated the Section was located within an undeveloped area with a Roman Road (recorded within Section J) bisecting the Section north to south. Land is predominately used for farmland with some woodland present. Small areas of mineral extract (clay, gravel) are shown in the south, central and north of the section. • The southern part of Section K at the boundary between K and J shows a former railway for which historical mapping records as being active between 1868 and 1957 and disused by 1964. • By the 1950s – 1960s most pit and brick works are no longer shown. Winters Hill Hall, a stately home was used during the World War I and II as a command centre for civilian and possible military use with Nissen huts reported in the south of the grounds. Some development (residential, industrial) is shown around areas such as Newtown, east of the Section K with additional buildings shown in the section.
L	• The earliest mapping from the late 1800s from indicates the Section is largely woodland and farms. Fisher's Pond is shown within Colden Common Wood. Bow Lake and the associated watercourse flowing east to west is also present. • Brick works and a brick field are recorded in the West section L are no longer shown by the 1930s. A row of industrial premises including garages, workshops and a scrap yard is shown along Portsmouth Road during the 1980s until the present day. The remaining areas of the Section have little development from the c.1888-1913 mapping to present.
M	• The earliest mapping from the late 1800s shows woodland, farmland or other undeveloped land. Sand, gravel, and clay pits are visible on both sides of the River Itchen. The land between the River Itchen and the Itchen Navigation are shown as 'liable to floods'.

Section	Site History Summary
	• There are no significant changes during the early 1900s most smaller pits are no longer shown. Highbridge Gravel Pit, a large excavation south of Bugle Farm is shown in the 1930s. Highbridge Gravel Pit is shown as 'disused' by 1963 and includes land adjacent to the north and south of Bugle Farm. The remaining areas in the section are largely undeveloped between the mid-1900s to the present.

*Pipeline Section 'I' has not been used in the Proposed Development to avoid confusion with Section L.

6.7.1 Harts Farm Landfill - Section C

Harts Farm landfill is a former waste disposal site at the location of the proposed Water Recycling Plant (WRP). Sections B and D are in the northern portion of the landfill at tunnel shaft WRP East (Section B) and tunnel shaft WRP West (Section D). Section C from the Budds Farm WTW will also connect to the WRP within the footprint of the former landfill in the south.

The landfill dates back to the late 1960s and accepted household and commercial waste through the 1980s. A summary of the site history is provided in this section. Further information for the proposed infrastructure area is presented in a separate Geotechnical and Geo-environmental Desk Study (SSP, 2021) and a Ground Investigation Report (Delta Simmons, 2021b).

Pre-Landfilling Activities

Earliest mapping dated 1866, show the Site to be undeveloped marshy ground crossed by the Hermitage Stream. Historical aerial photography available through Historic England's archives (Historic England, 2023) dated 1946 and 1948 shows that the land within approximately 40 m of the Site's northern boundary appears to be higher-lying and in use for agriculture. Historical mapping records that approximately the western-most 100 m of the site appears to be vegetated and crossed by streams and is labelled as "Broad Marsh". The remainder of the land within the Site appears to have comprised marshland and the channel of the Hermitage Stream.

Landfill Construction and Waste Deposition – 1960s to 1980s

Planning permission HWU.14239/3G, dated September 1968 granted permission for "*use of land at Storehouse Lake, Bedhampton, as a controlled tip, quay, slip-way and dinghy park and construction of a channel diversion and road*". A 'red-line' plan showing the extent of this permission is not provided, however it is likely to apply to the area recorded by the Environment Agency (EA) as an historical landfill. Drawing 639/59 (see extract below) shows the location of a proposed bund wall, channel re-alignment works, proposed access road and indicates the areas where "level to be raised by controlled tipping" (appears to be the higher-lying land in the west of the site) and "area to be reclaimed by controlled tipping" (appears to be the lower lying coastal marshland). It appears that the proposed bund was constructed with a sheet-piled wall on the seaward (southern / eastern) edge.

Historical aerial photographs available through Cambridge University's Air Photos Archive[6] (unknown date) show construction and filling of the landfill to have progressed. Pertinent details shown on these photos include:

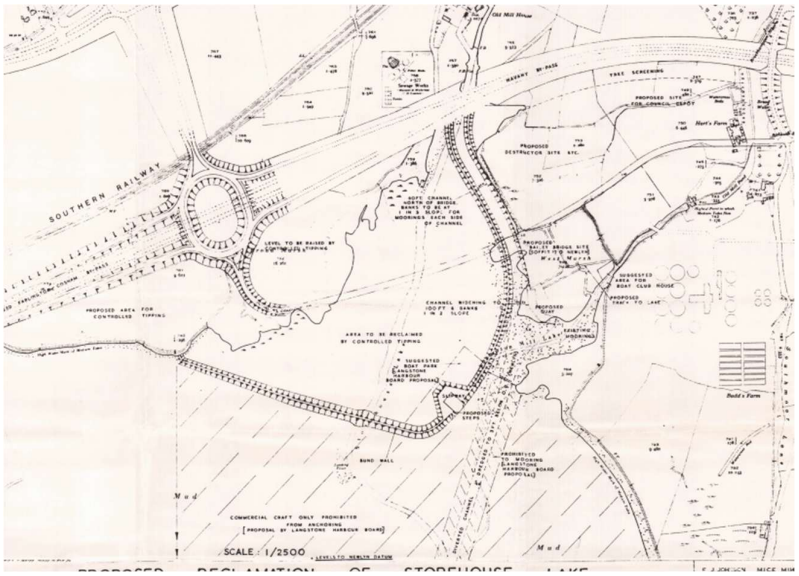
- Harts Farm Way was constructed on an embankment along the Site's southern boundary and a further haul/access road was present on an embankment approximately 60 m west of the edge of

[6] These cannot be reproduced within this report however the relevant photos are available at the links below.
https://www.cambridgeairphotos.com/data/thumbnails/640/bmv90.jpg,
https://www.cambridgeairphotos.com/data/thumbnails/640/bmv91.jpg,
https://www.cambridgeairphotos.com/data/thumbnails/640/bmv92.jpg

the new channel (extending northwards from what is now a small layby on Harts Farm Way near the south-eastern corner of the Site).

- The land in the western half of the Site appears to have been reworked and potentially partially infilled.
- The land in the eastern half of the Site between the haul road embankment to the east, the Harts Farm Way embankment to the south and the higher lying/reworked/filled land to the west appears to have been reworked/filled to a lesser extent.
- The former channel of the Hermitage Stream appears to have been partially infilled in the Site's north-eastern corner, and a possible culvert beneath Harts Farm Way is noted.
- To the south of Harts Farm Way and to the north of the bund, the former channel of the Hermitage Stream is shown, and appears to contain water. A possible culvert/outfall in the bund wall at the southern end of the former channel is noted.

Further aerial photos[7] (date unknown) show the western half of the former landfill was filled and grassed/revegetated whilst filling activities in the eastern half of the Site were still ongoing. The land to the south of the Site appeared to also have been infilled with the former stream channel no longer visible.



Extract of Drawing 639.59 Reclamation General Plan

The EA has stated that the site is recorded as a 'dilute and disperse facility', so any engineering was likely to be minimal". The site was infilled (or deposited as land raise) between around 1969 and 1987 and the site is known to have taken household waste, as was as some commercial/industrial waste.

On the basis of the ground investigations undertaken (Delta Simmons, 2021b) it appears that different types of waste were deposited in different areas of the Site. Wastes of a more 'commercial' type appear to have been deposited in the west and wastes of a more 'domestic' type appear to have been deposited in the eastern half. Information suggests that that the landfill area was not lined and does not appear to have an engineered cap. It is unknown if there is any structure such as a bund separating the western from the eastern areas of fill.

[7] https://www.cambridgeairphotos.com/data/thumbnails/640/rc8ge064.jpg, https://www.cambridgeairphotos.com/data/thumbnails/640/rc8ge065.jpg

The depth to the base of the waste material (where encountered) ranges between 5.5 m bgl to 13.9 m bgl (east area) and 8.2-11.5 m bgl (west area).

Post-Landfilling – 1990s to Present

Historical mapping dated 1987 and 1998 records a hard-surfaced area in the centre of the Site. The land in the west of the Site appears to have been approximately level and was labelled as “Playing Field”. Planning permission 98/54097/2/HBC granted permission for “Land raising by one metre”. Historical aerial imagery dated 1999 (available through Google Earth) appears to show these land-raising works being undertaken in the western half of the Site. These works were shown to be complete by the next photograph dated 2004.

By 2005 all vegetation was cleared from the western half of the Site.

During 2007 alterations to the junction between Harts Farm Way and the A27 were carried out, and the south-western quadrant of the Site appears to have been used for stockpiling and as a construction compound.

By 2011 the Site appears to have been almost entirely restored to its existing condition, with the exception of a limited area immediately west of the access road in the centre of the parcel. Cabins and vehicles can be seen on this image and are assumed to be the works compound associated with the cover re-engineering works.

By 2015 the restoration works are shown to be completed.

During 2022 trees and vegetation were cleared from around the hard-surfaced area in the centre of the Site, from an area to the north of the hard-surfaced area, and in the north-eastern corner of the Site. The Site is shown in its existing configuration.

6.7.2 Budds Farm Wastewater Treatment Works - Section C

The Pipeline Section C from the western area of Budds Farm Wastewater Treatment Works (WTW) will connect to the proposed WRP site via a tunnel/directional drill bore beneath Langstone Harbour. The proposed works at Budds Farm WTW will include tunnelling, open cut excavation and shaft launch / reception pit construction in the landfilled area at the southwestern corner of Budds Farm.

The proposed pipeline route at Budds Farm WTW is mapped as a historical landfill that is reported to have accepted household wastes (Land south of Budds Farm Sewage Works, Landfill Holder Reference EAHLD20826; Site Reference FHA10, HAV4). The landfilling activities were part of the reclamation of land adjacent to Langstone Harbour. Historical maps show that Sludge beds were located in this area, and these may have also been infilled as part of landfill activities.

Several previous geotechnical ground investigations were completed in this area of Budds Farm WTW during the 1990’s. Exploratory hole logs indicated significant thicknesses of Made Ground (up to 5.3 m in depth) with deposits of possible screenings from the WTW, household landfill waste and sewage sludge. None of these investigations collected soil or groundwater contamination data, and only limited gas data were collected. Further details are presented in a separate Geotechnical and Geo-environmental Desk Study (SSP, 2021) covering both the proposed WRP site and the pipeline route to and within Budds Farm.

Ground investigation in the area of the proposed Pipeline Route at Budds Farm WTW is therefore recommended to confirm current ground conditions and the contamination status of soils and groundwater and assess the current the ground gas regime.

6.7.3 Military Sites - Section B (Tunnel Route)

The detailed unexploded ordnance (UXO) risk assessment report commissioned by the Applicant (Zetica UXO Risk Assessments (P6662-17-R1-A to P6662-17-R13-A), 2024) refers to several military camps that were in operation during World War II and located within the vicinity of pipeline Section B. The exact camp boundary markings are not provided in the UXO report and further information would be required to determine if these historical camps encroached on the pipeline route; however, it is likely that training activities extended into the wider area. These camps were initially used as overflow camps for the Portsmouth naval bases. Camps within Section B pipeline included the following:

- Belmont Camp
- Fraser Camp
- HMS Daedalus III Camp
- Stockheath Camp

Land was used for barracks, training grounds, classrooms, administrative buildings, laundry and canteens. Storage of supplies including clothing, ammunition and bulk storage of fuels/oils are also likely to have been associated with these camps.

After the war some naval bases continued to house displaced families and it is reported that this occurred at Bedhampton and Leigh Park naval camps (Stockheath Camp).

An online resource booklet 'Naval Camps of Bedhampton and Leigh Park (Hind, 2017) provides further information on the daily activities the servicemen and women undertook at these sites. An outdoor swimming pool (part of Stockheath Camp) was located approximately 110 m southwest of the proposed Havant Thicket Shaft location, shown on historical maps (1952 map) and referenced in information about the camp (Hind 2017). Information in the Hind document states that the pool was infilled. Nissen huts are also documented at several of these camps.

In addition to the aforementioned camps, Leigh Park House was acquired by the Royal Navy in August 1940 and was assigned to be used by the Admiralty Mine Design Department (MDD) as Headquarters. Historical records indicate it had its own home guard and military manoeuvres were conducted in the park and woodlands in the northern part of the Site, east/southeast of where Havant Reservoir is to be located. Post WWII the MDD retained ownership of Leigh Park House and continued designing mines and depth charges. The MDD was renamed to the Underwater Countermeasures and Weapons Establishment and left Leigh Park House in 1956, with the house being demolished in 1959.

The approximate location of these camps and Leigh Park House are shown on **Figures 13.1**.

6.7.4 Military Sites - Section E

A series of former military forts are located along Portsdown Hill. These sites formed part of the Palmerston Portsmouth defences dating from the 1800s. The sites (except for the entrance to Farlington Redoubt) are located greater than 50 m from the pipeline route in Sections D and E, however several are within or close to the 250 m buffer zone and are noted below. The Defence research site DSTL Portsdown West is also located on Portsdown Hill Road.

- Farlington Redoubt adjacent to the pipeline DoL (closest point) in Section D
- Fort Purbrook approximately 45 m north of the pipeline DoL in Section D
- Fort Widley approximately 150 m south of the pipeline DoL in Section E
- Fort Southwick (including Portsdown Fuel Oil Reservoir) approximately 440 m south of the pipeline DoL in Section E
- Fort Nelson approximately 480 m southwest of the pipeline DoL in Section E

Several of these sites are reported to have underground structures built for storage or to connect to surrounding areas. Information from the online resource Portsdown Tunnels (Bob Hunt, 2021) notes that pipelines ran from the Portsdown Fuel Oil Reservoir, adjacent to Fort Southwick, to the oil fuel depot at Gosport Port for the fuelling of navy ships. A pipeline was also reported to run from the Portsdown Oil Fuel Reservoir to Fort Southwick. The facility is noted to have been decommissioned in the 1990s (The Time Chamber, 2022). Underground tunnels extending outside of the building footprint may be present.

Other tunnels are reported to lead from the structures into the countryside and are potentially camouflaged with grass and scrub. Two possible tunnels may run north and northeast from Fort Purbrook (Bob Hunt, 2021). The extent of these tunnels is not confirmed but the tunnel route running northeast has been documented in this web site indicating that it may run from Fort Purbrook towards Crookhorn Lane possibly up to or close to the 50 m buffer zone of the pipeline route in Section D (southern route). The tunnel is reported to be accessed from a shaft (with a brick chimney, a ventilation tower) east of the fort and runs in a north easterly direction, the tunnel can be accessed from another shaft approximately 20 ft (6.1 m) deep to the northeast. The tunnel is reported to be cut into the chalk, 7ft (2.1 m) high and 3 ft to 4 ft (0.9 m to 1.2 m) wide. A 6-inch (0.15 m) iron sewage pipe is reported to run through this tunnel. The information estimates the length of tunnel to be 450 yards (410 m). It is suspected that a tunnel linking Fort Purbrook and Farlington Redoubt was present.

The possible site of Crookham Redoubt (not fully constructed and demolished), is also documented to be within the current day Portsmouth golf course to the north of Fort Purbrook possibly within 50 m of the pipeline Section D (southern section).

Historical maps show that the area to the east of Farlington Redoubt, as Camp Down. Pipeline Section D (southern route) crosses this area. A search on Camp Down reveals that Camp Down Semaphore Telegraph site (early 1800s) (Historic England, 2023) was sited within Farlington Redoubt. Based on these searches, the land around Farlington redoubt is likely to have been used for military purposes between the 1800s to the early 1900s. It is not known whether this area was targeted in the past. A specialist unexploded ordnance assessment should be completed.

Historical maps (1949-1972) show Morelands Camp approximately 230 m north of the pipeline DoL in Section D (lower). It is unknown if this is site was associated with military activities. Although it is not located within the 50 m buffer zone for identifying potential sources of contamination it is important to note within the historical development of site area. Further historical information may be required if the pipeline route is positioned closer to these sites.

A plane crash site is located south Pigeon House Farm. Information from the Royal Haskoning DHV WWII Crash Site Pigeon House Farm Note / Memo (Royal Haskoning DHV, 2023) reports the crash to have occurred on the 6th November 1940 when a Hawker Hurricane was shot down. The aircraft had a forceful collision with the ground and burned for 3 days before the wreckage and its surrounding crater were filled in with earth by workers on the farm. No attempt was made by the army or Royal Air Force to recover the wreckage or body of the pilot. Some wreckage and human remains were excavated and removed in 1979 although this was insufficient for the site to be considered cleared. The crash site is classed as a War Grave by the Ministry of

Defence (MOD). Any works within 100m of the crash site would require a licence granted by the MoD (as part of Protection of Military Remains Act 1986). Due to the exclusion area around the crash site (100m or greater) this has not been considered a high potential source of contamination due to any construction works needing to avoid this area.



Figure 4 Map showing the location of the potential site of the WWII wreckage (blue circle) compared to the HER location (yellow highlight) and extent of geophysical survey (green hatch) and site boundary (purple shade). OS mapping from MOATA SW: Water for Life Hampshire © Crown copyright and database rights (2022) OS (WU298530)

Extract from Royal Haskoning Crash Site – Pigeon House Farm Note / Memo - Figure 4 – Potential Location of WWII Crash Site (blue circle)

6.7.5 Wintershill Hall Estate – Section K

The pipeline route in Section K passes along the eastern boundary of the grounds of Wintershill Hall. Wintershill Hall, a privately-owned stately home, was used during World War I as a base for the Hampshire Ambulance Service. During World War II, after brief use as a school, it was used as the Headquarters for the Hampshire Fire Service. Information from the estate website (Wintershill.net, 2023) states that Nissen huts were present on the lower lawn and used for offices and additional accommodation during this time. The information also states that a new sewage system was installed to cope with the additional numbers living at the estate. After the war the House was used to house orphan children rescued from concentration camps.

Historical maps do not show the location of the Nissen huts; sensitive sites during World Wars I and II were generally omitted from maps for security reasons. Asbestos cement sheeting has been used in construction materials of some Nissen hut styles and there may be a potential for asbestos fibres to have been released to soils during demolition.

It is unknown whether fuel storage or vehicle maintenance were undertaken within the estate. It is likely that if these activities were undertaken these would have been close to the main buildings. Historical maps do not provide any details to the location of any of these potential structures. It is unknown what activities were undertaken at the site by the Hampshire Fire Service.

6.7.6 Firth Farm Hurricane Plane Crash Site – Section H

A Mark 1 Hawker Hurricane (N2603) crashed on 1st November 1940, piloted by Hugh Desmond Clark, who survived the crash. The crash site is not considered a war grave and has been mostly excavated in 2019 by a field team from the University of Winchester. The SSP archaeologist noted that the plane had hit the ground at some speed and there is a large debris field around the aircraft. A licence from the Ministry of Defence is likely to be needed to excavate within 100m of the crash site, although this would be to cover any debris related to the crash. Due to the exclusion area around the crash site (100m or greater) this has not been considered a high potential source of contamination.



Extract from Water for Life - MOATA GIS Portal Firth Farm Hurricane Plane Crash Site (red dot). Proposed Underground Pipeline (black line) and Draft Order Limits (red lines). Not to scale.

7 Land Contamination Risk Assessment

7.1 Methodology

The information presented in this report has been collated and evaluated to develop a preliminary Conceptual Site Model (CSM) for the Proposed Development. The aim of the preliminary CSM is to identify potential contaminant linkages on Site and in the surrounding areas. This has been undertaken in accordance with the procedures outlined in 'Land Contamination: Risk Management (LCRM) published by the EA (Environment Agency, 2021).

For a risk of pollution or environmental harm to occur because of ground contamination, all the following elements must be present to form a potential contaminant linkage:

- Source; a substance that is capable of causing pollution of harm;
- Pathway; a route by which the contaminant can reach a receptor; and
- Receptor; something which could be adversely affected by the contaminant including human health, properties, and controlled waters.

The preliminary CSM will allow for recommendations to be made based on the identification and assessment of potential contaminant linkages.

7.2 Potential Sources of Contamination

Potential sources of contamination (PSCs) have been identified within the DoL and within a 50 m buffer (250 m for potentially infilled ground and licensed historical and active landfills) by reviewing the site history, information presented in Groundsure report (2024), online databases and information received from the local regulatory authorities (**Section 6.1**).

As part of the screening process, land uses with a perceived 'high' potential for contamination were identified. A list of these sites are presented in **Table 7.1**. The PSCs with a high potential for contamination are more likely to impact human health, construction works and the wider environment, thus require more information to manage the risk and cost for the proposed scheme.

Table 7.1: Land Uses with a High Potential for Contaminants

Site Name
Electricity substation (large transmission substations)
Fuel / chemical pipelines[1]
Fuel filling station / garages
Infilled land (BGS Made Ground or other pits), ponds, watercourses
Lagoons
Landfill (EA / Local authority)
Military sites
Railway depot
Scrap / recycling yard
Sewage treatment works
Waste management facility (treatment / processing)
Waste transfer station (depending on site history / former land use)
Water works (not including reservoirs or small pumping station)
Works (manufacture / processing), including industrial estates but not business estates
Water supply works (if site history suggests other activities)
COMAH sites
Pollution incidents

[1] does not include proposed pipeline route or those under construction.

A summary of the potential sources of contamination (PSCs) identified on Site and in the surrounding area (50 m radius, 250 m for potentially infilled ground and licensed historical and active landfills) is provided in **Appendix E** and **Figure 12.0** and **Figure 12.1 (Sheets 1 – 32)**.

The Southampton to London pipeline constructed by Esso for the transport of aviation fuel. The pipeline was completed in November 2023 (Esso, 2024) and has not been considered a potential source as it has been constructed to modern standards. The Esso pipeline crosses Section K of the Proposed Underground Pipeline between Havant Thicket Reservoir and Otterbourne WSW south of Winters Hill to the west of Bishop's Waltham. Further information on the pipeline specification, leak prevention and detection should be sought from Esso should their there be concerns of impact to the Proposed Underground Pipeline.

7.2.1 Proposed Infrastructure Sites (Above Ground Plant)

Options for the proposed Above Ground Plant (AGP) areas such as break pressure tanks (BPT) and intermediate pumping stations (IPS) across the pipeline route sections have been determined. **Table 7.2** details the proposed AGP sites and their location within the proposed Underground Pipeline sections. Individual desk studies for the proposed AGP sites are presented in **Appendix G** and include a preliminary CSM specific for each AGP location.

The AGP construction compound is an area selected for storage of materials and plant during construction phase and assessment of this area may be required during later stages of the Proposed Development.

Should the location of the current AGP sites change, revisions to these desk studies including identification and confirmation of additional PSCs is likely to be required.

Table 7.2: List of Above Ground Plant

Pipeline Section	Infrastructure ID	Further Desk Study Assessment
A	Havant Reservoir[1]	-
B/C	Havant WRP[1]	-
E	BPT-E / IPS-E	Appendix G1
F	IPS-F	Appendix G2
G	IPS-G	Appendix G4
K	BPT-K	Appendix G5
M	Otterbourne WSW[1]	-

[1] The proposed sites of Havant Reservoir, Havant WRP and Otterbourne WSW are outside the scope of this report.

7.2.2 Proposed Tunnel Shafts Locations

Proposed tunnel shaft locations have been identified along the tunnel sections. **Table 7.3** details the proposed structures and their location within the pipeline sections. Individual desk studies for the proposed shaft sites are presented in **Appendix H** and include a preliminary CSM specific for each site. Tunnel shaft locations can be viewed in **Figure 1.1**.

Table 7.3: List of Proposed Shaft Locations

Pipeline Section	Shaft Name	Tunnel Name(s)	Further Desk Study Assessment
A	Havant Thicket Shaft	Havant	Appendix H1
B	Bedhampton Shaft (optional)	Havant	Appendix H2
B	Mill Lane West	Havant Bedhampton	Appendix H10
B	Mill Lane East	Bedhampton	Appendix H9
C	WRP East Shaft	Havant Bedhampton	Appendix H3
C	WRP West Shaft	Purbrook	Appendix H4
D	Portsdown Hill Shaft (optional)	Purbrook	Appendix H5
E	Purbrook Shaft	Purbrook	Appendix H6
L	Highbridge Shaft	Otterbourne	Appendix H7
M	Otterbourne Shaft	Otterbourne	Appendix H8

7.3 Potential Pathways

During and post construction of the new Site infrastructure, the following potential pathways are considered.

- Dermal contact, ingestion and inhalation of dusts, fibres, gases and vapours.
- Gas and vapour migration and accumulation in voids and buildings structures.
- Surface water runoff from stockpiles to surface watercourses and migration through groundwater.
- Leaching through unsaturated soil to groundwater.

7.4 Potential Receptors

Potential receptors have been identified for each of the locations with high potential for contamination. These are presented in **Appendix F** for the pipeline route and in **Appendices G** and **H** for infrastructure and tunnel shaft locations respectively.

Based on the proposed construction works, end use and surrounding land uses, the following potential receptors have been considered:

- Construction and maintenance workers
- Future site users (workers and maintenance workers)
- Adjacent land users
- On Site existing and future property (buildings and buried services)
- Surface water (watercourses or water bodies)
- Groundwater (Principal Aquifer and Secondary A, B or Undifferentiated aquifers)
- Ecological receptors (flora and fauna) to address statutory designated areas and Ancient Woodlands (250 m)

The proposed pipeline has not been included as a potential receptor to contaminants that could be present in soils or groundwaters. The pipe material will be selected during design to prevent impact from existing PSCs.

7.5 Preliminary Risk Assessment

The above CSM framework has been used to undertake a preliminary qualitative risk assessment**.** The method of risk evaluation adopted in this document is consistent with CIRIA (CIRIA C552, 2001). Hence, risk is considered to be a function of both the probability (likelihood) of contamination occurring at the study site and also the potential severity (consequence) of the impacts associated with this contamination. Further details regarding the risk assessment methodology used are included in **Appendix F**.

For each of the identified sites located within the search radius, a preliminary risk assessment has been completed and presented in **Appendix F**. A summary of these risk assessments is provided in **Table 7.4**.

A summary of the risk assessment for the AGP and the Tunnel Shaft locations are presented in **Table 7.5** and **Table 7.6** respectively. A preliminary risk assessment for each AGP and tunnel shaft location is presented **Appendices G and H** respectively.

Areas of infilled land, infilled ponds, infilled watercourses and historical and active landfill areas located between 50 to 250 m from the DoLs or 290 m from the Proposed Pipeline Route in Section A have been identified and are shown on **Figures 12.0 and 12.1**. A preliminary risk assessment has not been included at this stage for these areas. The risks to potential receptors are likely to be associated with the migration of gases and this assessment is to be undertaken in subsequent phases of design.

Table 7.4: Summary of Risk Classification for Construction and Maintenance Activities for PSCs with high potential for contamination within 50 m of the Draft Order Limits

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
428	A	**Infilled Drain (428):** Potential to have been infilled with unknown made ground.	Moderate / Low	Moderate / Low	Very Low	Moderate / Low	Moderate / Low	Very Low
501 (425)	A / B	**Former Naval Camp - Stockheath (501)** and **Infilled Swimming Pool (425)**	Low	Low	Low	Very Low	Moderate / Low	Very Low
462	B	**Landfill – Bedhampton Waterworks (462):** Inert Landfill registered to Portsmouth Water.	Moderate	Moderate / Low	Low	Moderate	High	Moderate
382 and 603	B (Tunnel)	**Garage/Depot/Works (382):** Potential for leaks and spillages. Possible cut and fill areas. **Tank (603:** Shown within the southeastern corner of PSC 382.	Low	Low	Very Low	Low	Moderate / Low	Very Low
383	B (Tunnel)	**Building (potential works) and railway siding:** Potential for leaks and spillages.	Low	Low	Low	Low	Moderate / Low	Very Low
385, 389, 386, 393, 409, 411, 416	B (Tunnel)	**Infilled pond (PSC 385, 393, 409), Infilled Watercourse (PSCs 389, 386), Infilled Land – Drain (PSC 411, 416):** Potential for Made Ground or infill of unknown material.	Low	Low	Low	Low	Moderate / Low	Very Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
388	B (Tunnel)	**Sewage Works (PSC 388):** Potential for leaks and spillages. Potential for Made Ground or infill of unknown material.	Low	Low	Low	Low	Moderate / Low	Very Low
403, 610	B (Tunnel)	**Wastewater Treatment Works (PSC 403) and garage within footprint (PSC 610):** Potential for unauthorised infill material and areas of Made Ground.	Low	Low	Low	Low	Moderate / Low	Very Low
502, 503, 504	B	**Former Naval Camps - HMS Deadalus III (PSC 502), Fraser (PSC 503) and Belmont (PSC 504)**.	Low	Low	Low	Very Low	Moderate / Low	Very Low
464	B	**Unspecified Ground Workings:** Potential unspecified ground workings potential for infilled land.	Low	Low	Very Low	Low	Moderate / Low	Very Low
387	B	**Works – Corn Mills:** Historical including mills, dams and ponds that have now been infilled.	Low	Low	Low	Low	Moderate / Low	Very Low
395, 396, 397, 398, 399, 400, 401, 582	B	**Water Works - Tanks (395, 396, 397, 398, 399,400, 401) and Filter Beds or Potential Tanks (582)**	Moderate	Moderate / Low	Low	Moderate	Moderate	Moderate / Low
429	B	**Infilled Land – Marshland** Potentially filled with unknown Made Ground	Low	Low	Low	Low	Moderate / Low	Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
466	B, C, D (Tunnel, shafts)	**Harts Farm Landfill:** EAHLD20831; Site Reference FHA15, 1760/1/13/6	Very High	Moderate / Low	Moderate	High	High	Moderate
370	C (Tunnel Section)	**Infilled Land – Made Ground (BGS)**	Low	Low	Low	Moderate / Low	Moderate / Low	Moderate / Low
375, 378, 379, 460, 461	C (Tunnel, shafts)	**Land south of Budds Farm Sewage Works (PSC 460):** EAHLD20826; Site Reference FHA10, HAV4. **Budds Farm Sewage Treatment Works (378) with Lagoons (379). Infilled Land – BGS Made Ground (PSC 461) and infilled land - watercourse (PSC 375)**	Very High	Moderate	High	High	High	Moderate
381	C	**Aggregate/Cement Works**	Low	Low	Low	Moderate / Low	Moderate / Low	Moderate / Low
372 / 459	D (Tunnel)	**Marshland (372) and BGS Made Ground (459):** Potential for Made Ground or infill of unknown material.	Low	Low	Low	Low	Moderate / Low	Moderate / Low
302, 306, 311, 313, 322, 323, 329, 330, 361	D (Tunnel)	**Chalk Pits (potentially infilled):** Potential for Made Ground or infill of unknown material.	Low	Low	Low	Very Low	Low	Very Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
314	D (Tunnel)	**The Dell pit (314)** Potential for Made Ground or infill of unknown material.	Low	Low	Moderate / Low	Very Low	Low	Very Low
500	D (Tunnel)	**Military Belmont Camp II**	Low	Low	Low	Very Low	Moderate / Low	Very Low
340	D (Tunnel)	**Military – Fort Purbrook**	Low	Low	Low	Very Low	Moderate / Low	Very Low
307, 308, 319, 366, 584	D (Tunnel)	**Water Works – Treatment works (307), Water Works – Reservoir 308, 319, 366), Tank - 584**	Low	Low	Very Low	Very Low	Low	Very Low
304	D (Tunnel)	**Military – Farlington Redoubt.** Former military fort.	Low	Low	Very Low	Very Low	Moderate / Low	Very Low
305	D (Tunnel)	**Waste Facility Physical Treatment:** Potential for leaks and spillages.	Low	Low	Low	Very Low	Moderate / Low	Very Low
262, 280, 499	E	**Infilled Land - Pond (280), Potentially Infilled Pit (262), and Infilled Land (499):** Potential for Made Ground and infill of unknown material.	Moderate / Low	Moderate / Low	Low	Low	Moderate	Low
264, 268, 269, 270, 271, 275, 276, 278, 288, 289, 290, 292, 294, 432	E	**Pit - Chalk (264, 268, 269, 270, 271, 275, 276, 278, 288, 289, 290, 292, 294); Pit – Unspecified (432):** Potential for Made Ground or infill of unknown material.	Moderate	Low	Low	Low	Moderate	Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
279, 282	E	**Kilns** (historic kilns on chalk pit (**PSC No.278**): Potential for Made Ground or infill of unknown material.	Low	Low	Low	Low	Moderate / Low	Low
451	E	**Fuel Filling Station** (former)	Moderate / Low	Moderate / Low	Low	Low	Moderate	Low
1, 621	F	**Crockerhill Brickfield / Saw Mills / Industrial Park (621)**	Moderate	Moderate	Moderate / Low	Very Low	Moderate / Low	Low
2	F	**Pit – Clay:** Potential for Made Ground or infill of unknown material.	Moderate	Moderate	Low	Very Low	Low	Low
5	F	**Albany Farm Landfill:** Site Reference FFA2, 10/2	High	Moderate	Moderate	Low	Moderate	Low
6	F	**Albany Farm Landfill (second area):** Site Reference FFA3, 10/2	High	Moderate	Moderate	Low	High	Low
7	F	**Pit - Unspecified:** Potential for Made Ground or infill of unknown material.	Moderate	Moderate	Moderate	Very Low	Moderate	Low
9, 14, 25	F	**Pits – Chalk, Gravel, Clay (14); Crockerhill Chalk Pit (9); Chalk Pit (25):** Potential to be infilled with Made Ground of an unknown nature.	Moderate	Moderate	Low	Very Low	Moderate	Low
15	F	**Infilled Land - Disturbed Ground**: Potential for Made Ground or infill of unknown material.	Moderate	Moderate	Low	Very Low	Moderate	Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
24, 22	F	**Chalk Pit (24) and Sand Pit (22):** Potential for Made Ground or infill of unknown material.	Moderate / Low	Moderate / Low	Low	Very Low	Moderate	Low
594	F	**Infilled Land – Pond:** Potential for Made Ground or infill of unknown material	Moderate	Moderate	Low	Very Low	Moderate / Low	Low
31	G	**Former Ponds**: Potential for Made Ground and infill areas.	Moderate / Low	Moderate / Low	Low	Very Low	Moderate	Low
33	G	**Drokes Farm Motor Company**: Storage/use of petroleum hydrocarbons and chemicals.	Moderate / Low	Moderate / Low	Low	Low	Moderate	Low
35	G	**Infilled Land – Pond:** Potential for Made Ground or infill of unknown material.	Moderate / Low	Moderate / Low	Low	Very Low	Moderate / Low	Very Low
36, 37, 52	G	**Old Gravel Pits:** Potential for Made Ground or infill of unknown material.	Moderate / Low	Moderate / Low	Low	Moderate	Moderate	Low
46	G	**Park Place Sand and Gravel Pit:** Potential for Made Ground or infill of unknown material.	Moderate	Moderate / Low	Low	Moderate / Low	Moderate	Low
257	G	**Infilled Land - Tank (unknown contents) within Nursery**: Potential for leaks and spillages. Potential for infill.	Moderate / Low	Moderate / Low	Low	Very Low	Moderate	Low
475	G	**Garage (vehicle maintenance)/depot**: Potential for leaks and spillages.	Moderate	Moderate / Low	Low	Very Low	Moderate	Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
485	G	**Wastewater Treatment Works:** Potential for leaks and spillages. Potential for Made Ground or infill of unknown material.	Moderate	Moderate	Low	Low	Moderate / Low	Low
626, 627	G	**Infilled Land – Drains:** Potential for Made Ground or infilled of an unknown material.	Low	Low	Low	Low	Moderate / Low	Low
45	H	**Gravel Pit (Gravel Pit Copse):** Potential for Made Ground and infill areas.	Moderate / Low	Moderate/ Low	Low	Very Low	Moderate / Low	Low
80, 81	H	**Tank -** Potential for leaks and spillages.	Moderate / Low	Moderate / Low	Very Low	Very Low	Moderate / Low	Low
90	H	**Shirrell Heath Sand Pit Landfill:** EAHLD2048 Site Ref. FW1, 5/1	Moderate	Moderate / Low	Moderate / Low	Low	Moderate / Low	Low
78	H	**Infilled Land – Disturbed Ground:** Potential for areas of Made Ground and infill areas.	Moderate/Low	Moderate/Low	Low	Low	Moderate/Low	Low
103	H	**Old Sand Pit:** Potential for Made Ground and infill areas.	Low	Low	Low	Very Low	Low	Low
445	H	**Worked Ground:** Potential for Made Ground and infill areas.	Moderate / Low	Moderate / Low	Low	Very Low	Moderate / Low	Low
512	H	**Farm – Pig Farm (potential)**	Moderate / Low	Moderate / Low	Low	Low	Moderate / Low	Very Low
96, 535	J	**Industrial Estate (current) (historically Woodmans Farm)**	Moderate / Low	Moderate / Low	Low	Very Low	Moderate / Low	Very Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
		including former tank (535): Storage/use of petroleum hydrocarbons and chemicals						
97	J	**Ash House Landfill:** Site Reference FW38, FW17, 5/74	High	Moderate	Moderate	Low	Moderate	Low
102	J	**Sand Pit:** Potential for Made Ground/infill of unknown material	Moderate / Low	Low	Low	Very Low	Moderate	Very Low
114	J	**Water Works – Sewage Pumping Station:** Potential for leaks and spillages	Low	Low	Very Low	Low	Low	Low
443	J	**Land at Rossgarth Landfill:** Reference EAHLD20420	Moderate	Moderate	Moderate / Low	Low	Moderate / Low	Very Low
107, 108, 109, 118 and 531	K	**Infilled Land – Marshland (107, 108 and 118); Infilled Land – Drain (109); Infilled Land - Watercourse (531).):** Potential for Made Ground/infill of unknown material	Moderate / Low	Moderate / Low	Low	Moderate / Low	Moderate / Low	Low
119	K	**Infilled Chanel:** Potential for Made Ground/infill of unknown material	Moderate / Low	Moderate / Low	Low	Moderate / Low	Moderate / Low	Moderate / Low
120, 121, 122, 123, 124,	K	**Infilled Channels:** Potential for Made Ground/infill of unknown material	Low	Low	Low	Low	Low	Low
132	K	**Former Pond:** Potential for Made Ground/infill of unknown material	Moderate	Moderate	Low	High	Low	Low
474	K	**Wintershill Hall** - Potential storage and use of fuels during World Wars I and II at grounds of **Wintershill Hall**	Moderate / Low	Moderate / Low	Moderate / Low	Low	Low	Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
529	K	**Worked Ground – Stockpile:** Made Ground with potential for infill of unknown material.	Moderate / Low	Moderate / Low	Low	Very Low	Very Low	Low
530	K	**Worked Ground – Unspecified:** Potential for Made Ground/infill of unknown material	Moderate / Low	Moderate / Low	Moderate / Low	Moderate / Low	Moderate / Low	Low
168	L	**Works – Brick Works:** Made Ground with potential for infill areas.	Moderate	Moderate	Low	Moderate / Low	Low	Low
174,	L	**Infilled Land – Drains:** Potential for Made Ground/infill of unknown material	Low	Low	Very Low	Very Low	Very Low	Very Low
175	L	**Infilled Land – Drains:** Potential for Made Ground/infill of unknown material	Low	Low	Very Low	Low	Low	Low
440, 441, 472	L	**BGS Made Ground (440) and Crowd Hill Landfills (441 and 472) :** EAHLD20508; Site Reference FEA22, EAST 5	High	Moderate	Moderate / Low	Low	Low	Moderate
520	L	**Infilled Land – Marshland:** Potential for Made Ground/infill of unknown material.	Low	Low	Low	Low	Low	Low
524	L	**Infilled Land – Watercourse:** Potential for Made Ground/infill of unknown material	Moderate/Low	Moderate/Low	Low	Moderate/Low	Low	Low
208	M	**Otterbourne WSW**: Potential for Made Ground, infill areas/ sludge lagoons	Moderate / Low	Low	Moderate / Low	Moderate / Low	Moderate	Low

PSC	Pipeline Section	PSCs	Risk Classification (without mitigation measures) for Potential Receptors					
			Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
`209	M (Tunnel)	**Bugle Farm Landfill:** EAHLD20430; Site Reference FW26	Low	Low	Low	Moderate / Low	Moderate / Low	Low
220	M	**Filter beds:** Made Ground with potential for infill of unknown material	Moderate / Low	Moderate / Low	Low	Moderate / Low	Moderate	Low
437, 438	M	**Infilled Land – BGS Made Ground**	Low	Low	Low	Moderate / Low	Moderate / Low	Moderate / Low
516	M	**Pit – Old Gravel Pit:** Potential for Made Ground/infill of unknown material	Low	Low	Low	Low	Moderate / Low	Very Low

Table 7.5: Summary of Risk Classification for Construction and Maintenance Activities for PSCs within 50 m and infilled land between 50m and 250m of the proposed AGP

Infrastructure Microsite	PSCs	Risk Classification (without mitigation measures) for Potential Receptors [1]					
		Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
BPT-E / IPS -E	**Parchow Groundworks Ltd Depot (PSC No. 476)** located approximately 50 m northwest. **Potentially Infilled Pits/Land** and Potentially Imported Material for the reservoir 50m to 250m **(PSCs 262, 273, 358, 319, 314 and 499).**	Moderate/Low	Low	Moderate/Low	Very Low	Low	Low

Infrastructure Microsite	PSCs	Risk Classification (without mitigation measures) for Potential Receptors [1]					
		Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
	Former Chalk Pits, potential for infill material 50 m to 250 m **(PSCs 313, 324 and 323)**.						
IPS-F	**Albany Farm Historic Landfill & Old Chalk Pit** (infilled) located approximately <10 m south **(PSC 5)**. **Albany Farm Historic Landfill** and Former Chalk Pit located approximately 95 m northwest **(PSC 6)** (second location). Landfills accepted inert waste. Potential for uncontrolled infilling. **Chalk Pit** potentially infilled **(PSC 25** and **PSC 14)** located approximately 50 m north and 105 m northwest respectively.	Moderate	Moderate / Low	High	Low	Moderate	Low
IPS-G	**Garage (PSC 475)** located approximately 10 m southwest. A **Barn (PSC 513)** is approximately 15m southwest. **Garden Centre/Nursery (PSC 34)** located 20 m southwest. **Former tank** within footprint of **PSC 34 (PSC 257)** located 70 m west. **Park Place Farm Sand Pit (PSC 46) located approximately 160m south / southeast. Infilled Ponds (PSCs 31, 35)** located 105 m northwest, 190 m northeast.	Moderate/Low	Low	Moderate/Low	Very Low	N/A	Very Low
BPT-K	World War I and II historic activities at **Wintershill Hall** estate grounds **(PSC 474)**, building footprint located approximately 35 m.	Moderate/Low	Moderate/Low	Moderate/Low	Very Low	Very Low	Low

Infrastructure Microsite	PSCs	Risk Classification (without mitigation measures) for Potential Receptors [1]					
		Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
	WWI: used as the base for the Hampshire Ambulance Service. WWII: used as a school and headquarters of the Hampshire Fire Service. Nissen huts documented to have been present in the grounds (the exact location unconfirmed). Asbestos cement sheeting commonly used in construction materials, potential for asbestos fibres to be released to soils during demolition. **Infilled Pond (PSC 146)** approximately 245m north.						

Notes

1. The highest risk classification is used for the collective PSCs identified at each AGP location.

Table 7.5: Summary of Risk Classification for Construction and Maintenance Activities for PSCs within 50 m and infilled land between 50m and 250m of the proposed AGP

AGP Name	PSCs	Risk Classification (without mitigation measures) for Potential Receptors [1]					
		Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
BPT-E / IPS -E	**Parchow Groundworks Ltd Depot (PSC No. 476)** located approximately 50 m northwest. **Potentially Infilled Pits/Land** and Potentially Imported Material for the reservoir 50m to 250m **(PSCs 262, 273, 358, 319, 314 and 499).** Former Chalk Pits, potential for infill material 50 m to 250 m **(PSCs 313, 324 and 323)**.	Moderate/Low	Low	Moderate/Low	Very Low	Low	Low
IPS-F	**Albany Farm Historic Landfill & Old Chalk Pit** (infilled) located approximately <10 m south **(PSC 5)**. **Albany Farm Historic Landfill** and Former Chalk Pit located approximately 95 m northwest **(PSC 6)** (second location). Landfills accepted inert waste. Potential for uncontrolled infilling. **Chalk Pit** potentially infilled **(PSC 25** and **PSC 14)** located approximately 50 m north and 105 m northwest respectively.	Moderate	Moderate / Low	High	Low	Moderate	Low
IPS-G	**Garage (PSC 475)** located approximately 10 m southwest. A **Barn (PSC 513)** is approximately 15m southwest.	Moderate/Low	Low	Moderate/Low	Very Low	N/A	Very Low

AGP Name	PSCs	Risk Classification (without mitigation measures) for Potential Receptors [1]					
		Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
	Garden Centre/Nursery (PSC 34) located 20 m southwest. **Former tank** within footprint of **PSC 34 (PSC 257)** located 70 m west. **Park Place Farm Sand Pit (PSC 46) located approximately 160m south / southeast. Infilled Ponds (PSCs 31, 35)** located 105 m northwest, 190 m northeast.						
BPT-K	World War I and II historic activities at **Wintershill Hall** estate grounds **(PSC 474)**, building footprint located approximately 35 m. WWI: used as the base for the Hampshire Ambulance Service. WWII: used as a school and headquarters of the Hampshire Fire Service. Nissen huts documented to have been present in the grounds (the exact location unconfirmed). Asbestos cement sheeting commonly used in construction materials, potential for asbestos fibres to be released to soils during demolition. **Infilled Pond (PSC 146)** approximately 245m north.	Moderate/Low	Moderate/Low	Moderate/Low	Very Low	Very Low	Low

Notes

1. The highest risk classification is used for the collective PSCs identified at each AGP location.

Table 7.6: Summary of Risk Classification for Construction and Maintenance Activities for PSCs within 50 m and infilled land between 50m and 250m of the proposed Tunnel Shaft Locations

Tunnel Shaft	PSCs	Risk Classification (without mitigation measures) for Potential Receptors [1]					
		Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
Havant Thicket Shaft	Off-Site: **PSC 501**: **Stockheath Naval Camp** with **Infilled Swimming Pool (PSC 425)** (approximately 110 m southwest), **PSC 464: Unspecified Pit** (approximately 180m south), **PSC 424: Infilled Pond** (approximately 140 m northeast), **PSC 463: Former Ground Workings** (approximately 235 m northeast).	Moderate/Low	Low	Moderate/Low	Low	Moderate/Low	Low
Bedhampton Shaft	**PSC 415: Hooks Farm** (approximately 35m west)	Moderate/Low	Moderate/Low	Moderate/Low	Low	Moderate/Low	Low
Mill Lane East	**PSC 387: Works - Corn Mills** (on Site). **PSC 383: Building with railway siding** (approximately 45 m northwest). Potential for Made Ground/Fill during construction **PSC 417: Infilled Watercourse** (approximately 170m west) **PSC 384: Infilled Pond / Watercourse** (approximately 125 m northwest) **PSC 429: Marshland** (approx. 200 m south) **PSC 393: Infilled Pond** (approximately 180 m northeast) **PSC 386: Infilled Watercourse** (approximately. 215 m northeast). **PSC 416: Bedhampton Waterworks Landfill** (approximately 185 m northeast)	Moderate	Moderate	Moderate	Moderate	Moderate	Low

Tunnel Shaft	PSCs	Risk Classification (without mitigation measures) for Potential Receptors [1]					
		Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
Mill Lane West	Off-Site. **PSC 391: Railway Line** in cutting (approximately 25 m northwest). PSC 387: **Former Bedhampton Corn Mill** (approximately 20 m southeast); **PSC 417**: **Infilled Watercourse** (approximately 75 m northwest) **PSC 429: Marshland** (approximately 140m southeast); **PSC 372: Marshland** (approximately 230 m south closest point).	Moderate/Low	Moderate/Low	Moderate/Low	Low	Low	Low
WRP East Shaft and WRP West Shaft	On-Site. **PSC 372: Marshland**, **PSC 466: Harts Farm Way Landfill** includes **PSC 459 (BGS recorded Artificial Ground (Made Ground)**. Off-site. **PSC 375 infilled land** (extension of Harts Farm Way) to the south.	Very High	Moderate/Low	Very High	High	High	Moderate
Portsdown Hill Shaft	On Site **PSC 308: Land north of reservoirs** (Portsmouth Water). Off Site **PSC 306: Chalk Pit** and **PSC 361: Chalk Pit** approximately 35m northeast (at closest point). **PSC 307** and **PSC 309: Reservoirs and filtration works** (Portsmouth Water), approximately 180 m southeast and 50 m south respectively.	Moderate/Low	Moderate/Low	Moderate/Low	Low	Moderate	Low
Purbrook Shaft	Off-Site. **PSC 358: Active Reservoir (covered)** (approximately 100 m south) potentially imported material during reservoir construction; **PSC 319: Former Reservoir** (approximately 140 m south); **PSC 314: The Dell Pit** (approximately 65 m east; **PSC 499: Infilled Land** (approximately 100m northwest); **PSC 262: Pit Unspecified** (approximately 165 m northwest); **PSC 315: Infilled Pond** (approximately 195 m north);	Moderate/Low	Low	Moderate/Low	Very Low	Low	Very Low

Tunnel Shaft	PSCs	Risk Classification (without mitigation measures) for Potential Receptors [1]					
		Construction, maintenance workers and future site users	Adjacent Land Users	On Site existing and future property (buildings and buried services)	Surface Water	Groundwater	Ecology
	PSC 313: Chalk Pit (approximately 240m south) (not shown in Figure H6.3); **PSC 367: Chalk Pit** (approximately 160 m north)						
Highbridge Shaft	**Bugle Farm Landfill** (**PSC 209**) distance 200 m northwest. Unknown waste type. **Artificial Ground (infilled ground)** approximately 210 m northwest **(PSC 438)**. Extent of artificial ground extends over Bugle Farm Landfill.	Moderate/Low	Low	Moderate/Low	Low	Low	Low
Otterbourne Shaft	No PSCs identified	N/A	N/A	N/A	N/A	N/A	N/A

Notes:

1. The highest risk classification is used for the collective PSCs identified at each tunnel shaft location.

8 Conclusions

Potential sources of contamination have been identified across the various pipeline Sections. Preliminary risk assessments have been undertaken for those sites within a 50 m radius where it is considered there is a 'high' potential source of contamination which may cause significant impact to the Proposed Development (i.e., through additional cost of remediation or mitigation).

More than 100 PSCs have a risk classification of Moderate/Low or higher for either one or more of the identified potential receptors. These areas require further assessment either by further desk study and/or ground investigation.

A risk classification of High has been recorded for Harts Farm Landfill, Land at Budds Farm Sewage Treatment Works Landfill and Crowd Hill Landfill; these are sites where shaft construction associated with tunnels or where open cut excavation is proposed.

Several of the risk classifications for PSCs within the proposed tunnel sections at Havant, Purbrook and Otterbourne (Sections B, C, D and some of M) are downgraded as the method of tunnelling or trenchless construction would not create a pollutant-receptor linkage due to the depth of these works. The risk classification may change where tunnel routes are altered, especially where proposed shafts are located into higher risk areas.

The current scheme is still appraising alternative pipe routes following consultation with stakeholders. The desk study will need to be revised to assess areas where the pipe routes are changed.

The proposed AGP infrastructure areas across the pipeline route sections have been determined. Potential sources of contamination have been identified at or near to these sites and preliminary risk assessments have been undertaken for PSCs within 50m radius (250m radius for potentially infilled land).

The majority of the risk assessments have a risk classification of Moderate/Low for Construction workers/ future site users and existing/future buildings receptors.

A risk classification of High for AGP IPS-F has been determined for existing/future buildings based on the potential for ground gas migration from adjacent landfill sites; a risk classification of Moderate was determined for groundwater at these sites.

Risk classifications for surface water and ecological receptors were all determined as Low or Very Low.

Further geo-environmental assessments are likely to be required following any route changes and alterations to the AGP locations.

The proposed shaft locations for tunnelling have been identified in Section B, C, D, E, L and M. Potential sources of contamination have been identified similar to the AGP locations (50 m for PSCs, 250 m for infilled land).

Shafts WRP East and WRP West have been assessed as having Very High for risk to construction workers, maintenance workers, future site users and On Site existing and future property (buildings and buried services). These shafts are situated in the former Harts Farm Way historical landfill site which has elevated contaminant concentrations and ground gas present.

All other shaft locations had a risk classification Moderate/Low or lower except for a Moderate risk to groundwater at the Portsdown Hill Shaft.

9 Recommendations

9.1 Impact Assessment

Impact analysis should be performed during outline design when details of the crossing locations, pipework, and depth are more certain. This analysis would need to cover any critical services or sensitive structures and would need to be reviewed following ground investigation (see below). It is expected that this information would be required when consulting with key stakeholders (e.g., Network Rail, National Highways and the Environment Agency).

The input from the Desk Study should be used to feed into a Ground Investigation Specification and inform where exploratory holes will be excavated and soil / groundwater samples taken to allow human health risk assessment screening, waste management classification and groundwater quality assessment.

9.1.1 Desk Study Revision

The Proposed Development is still appraising the route following consultation responses and mandatory route changes (such as at the plane crash sites). Additional route changes may be necessary in Sections, E, F, G and H due to engineering considerations in addition to finalising the location and layout of AGP IPS-E/BPT-E, IPS-F, IPS-G, BPT-K. Changes to the route which fall outside of the current DoL would require revision of this report.

9.2 Ground Investigation

The ground investigation records provided are sufficient at the WRP to the southeast and typically at those locations along the route or within 50 m of the route Sections. Along the route, there are large gaps without BGS historic borehole data to confirm the geology. As a result, borehole records have been reviewed within a 250 m buffer in places across all Sections to identify if records are available. These data are relevant but not always at the location required so ground investigation for geotechnical considerations is highly recommended.

Limited ground investigation has been conducted along the proposed pipeline route with regards to nearby potential sources of contamination (PSCs), therefore a site-specific ground investigation is recommended for both trenchless and open-cut construction. This is to aid design, inform on health and safety of the construction crew, and for to inform requirements for excavated materials management.

Upon completion of the ground investigation and monitoring programme, an interpretative report should be produced detailing the results. Requirements for any mitigation, further investigation, materials re-use / disposal options and ground remediation, if necessary, would be outlined in this report.

9.2.1 Ground Investigation for Trenchless Construction

For crossing of a National Highways / local council critical (A) road, or other third-party asset, particular requirements should be confirmed with the stakeholder. In general, recommended ground investigation would comprise two boreholes (one either side of the crossing point) extending to at least 3 m below the anticipated invert depth of the proposed tunnel (or two diameters below any proposed shaft depth), with appropriate laboratory testing to verify strata and the installation of standpipes to confirm groundwater levels. The ground information will confirm constructability and also be used in any settlement analysis.

For river crossings the EA will likely have a minimum depth requirement below the channel which will need to be confirmed (approximately 5 – 15 m below ground level), and the depth selected would also need to be deep

enough to allow directional drilling to occur, if adopted, without risk of the pressurised drilling fluid reaching the river channel. It would be preferable to carry out trenchless work entirely within competent bedrock strata (rather than any Alluvium or River Terrace Deposits) in this instance. A ground investigation is recommended to confirm this depth.

9.2.2 Ground Investigation for Open-cut Construction

Ground investigation is generally expected to comprise dynamic sampler boreholes or machine excavated trial pits to approximately pipe invert depth, with an average spacing of around 200 m for geotechnical investigation, ensuring all types of ground condition and any significant potential sources of contamination (PSCs) are targeted (see **Section 7.0**). Typically, PSCs with an increased risk of significant impact to the Proposed Development and within 15 m of the proposed pipeline routes would be targeted for investigation. Any ground investigation targeting PSCs could include (but are not limited to) the following:

- Chemical testing of soils for contaminants including pH, metals, petroleum hydrocarbons, PAHs, PCBs, VOCs (including BTEX and MTBE), phenols, pesticides, sulphates, sulphide, soil organic matter, cyanides, PFAS (selected samples) and asbestos. Waste acceptance criteria (WAC) testing should also be completed if disposal to landfill is a possibility.
- Where soils are proposed for re-use on site (i.e., under a Materials Management Plan, permit or exemption), soil leachate testing may be required to inform on potential risks to controlled waters (i.e., groundwater).
- Monitoring of groundwater and grounds gas from borehole standpipes.
- If groundwater is present, samples should be retrieved for chemical testing purposes to help inform on dewatering.

Geotechnically ground investigations should be undertaken to determine the following:

- Strata levels, recover disturbed and undisturbed samples to test for moisture content, plasticity tests, particle size distribution (PSD), undrained shear strength, compaction, dry density, saturation moisture content of chalk, one-dimensional consolidation testing and concrete aggressivity testing information.
- Standard Penetration Testing (SPT).
- In-situ resistivity testing

A list of potential contaminants of concern are provided within the risk assessment tables (Appendix F).

9.2.3 Ground Investigation for Non pipeline Infrastructure

Cable percussive and rotary core boreholes are proposed for the proposed Break Pressure Tanks (BPT-E and BPT-K) and Intermediate Pumping Stations (IPS-F, IPS-G).

Where there is likely to be bedrock at surface such as London Clay Formation, Lambeth Group or Chalk; these locations are likely to be investigated by rotary coring only. There will be locations where Cone Penetration Testing (CPT) will be used to correlate geotechnical design parameters including friction angle, permeability, consolidation coefficients, seismic velocities, and small strain stiffness.

Geophysical surveys will be recommended where BPTs and IPSs are to be founded within the White Chalk Subgroup. Electromagnetic Surveying (EM) and Electromagnetic Resistivity Tomography (ERT) surveys will be proposed to identify any natural cavities within the chalk, where suspected. As the footprint of BPT and IPS are large (between 600 m^2 and 2000 m^2 as a minimum), any locations that contain anomalies can be targeted with ERT to survey these to a maximum of 20 m depth. This would inform areas to avoid; or areas of likely ground improvement, when deciding final locations.

Ground investigation for significant PSCs should be undertaken at AGP sites similar to the conditions in **Section 8.2.2**.

9.2.4 Ground Investigation for Pipeline Linear Route

The GI for the pipeline linear route (that excludes trenchless crossings and non-pipeline infrastructure) itself will comprise boreholes and hand dug trial pits; spacing and depth to comply with Eurocode 7: Part 2. The typical distance between exploratory locations would be 150 – 250 m.

In-situ soil resistivity tests will be recommended at each hand dug trial pit to confirm soil corrosivity information prior to pipeline construction, should ductile iron be proposed for any pipeline section.

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Appendices

Appendix A – BGS Borehole Records

British Geological Survey

BGS ID: 416316 : BGS Reference: SU51NW2
British National Grid (27700) : 452780,118380

316
SU51/14
75

SU51NW/2
SU 76 1838

IGS No.
SU51NW2

Upham.

Geol. Map 316, new ser.

WINTERSHILL HOUSE. 1891.

Specimens and information from Messrs. DUKE & OCKENDEN. Old well, and new boring.

SU 5276 1838

		Thickness. Feet.	Depth. Feet.
LONDON CLAY	London Clay. Specimens of brownish-grey sandy clay and clay, from 78 to 172 feet, with carbonaceous matter at 150 and bit of pyrites at 170; buff calcareous earth at 181; grey clay at 186	190	190
READING BEDS + ? UPPER CHALK	[Reading Beds.] Mottled clays of various colours and tints (purplish, grey, brown, red, crimson, puce, maroon). Specimens at 196, 197, 201, 202, 207, 211, 212, 215, 216, 220 (last 6 a trifle sandy), 223, 226, 230, 236 (these 4 rather pure clays), 242 and 243; (pale-grey clayey sand, compacted), 250, 260 ...	74?	264
	[Reading Beds with admixture of Chalk.] Pale greenish-grey slightly sandy clay, with whitish earth in part (which, with the clay near is calcareous), at 264	1?	265
	Brownish and grey clay, with red spots, bits of chalk (?) and of flint; calcareous at 265		
	Chalk. Specimens at 269, 274, 278		
	[Mixture of Chalk with a little earth.] Cream-coloured calcareous earth. Specimen at 285		309?
	Light-brownish clay, calcareous, ? with wee bits of chalk; specimens at 286, 287, the latter more chalky		
	Impure chalk, or chalk mixed with a little earth; specimens at 290, 295, 300, 305		
	[Mixture of clay with Chalk.] Buff calcareous clay, with very small bits of chalk; and brown and buff calcareous clay, with bits of chalk; specimens at 309		

The lower part of the section is very difficult to understand, there being no likeness to any of the older Tertiary beds, and the mixture with chalk being unique.

HOLE PROBABLY DRILLED INTO A SUBTERTIARY PIPE OR FISSURE

DM 16/12/76

Data Bank

Mr. Sabey Montefiore, Winterslow House.

British Geological Survey

BGS ID: 416316 : BGS Reference: SU51NW2
British National Grid (27700) : 452780,118380

RECORD OF WELL (SHAFT OR BORE)

316
SU51/14 751

At

Town or Village Bishops Waltham

County Hants Six-inch quarter sheet

For Mr. [redacted]

Exact site of well { Attach a tracing from a map, or a sketch-map, if possible.

Level of ground surface above sea-level (O.D.) feet.

Is well-top at ground level ? If not, state how far above ; below ; feet.

Shaft ft., diameter ft. Details of headings

Bore 350 ft. ; diameter of bore : at top 4½ ins. ; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

TEST DETAILS
Month
Year

Rest-level of water ft. above below well-top. Suction at ft. Yield on hours' days'
pumping gallons per (max. capacity of pump g.p.h.),
with depression of feet. Recovery to in mins. hours.

WORKING CONDITIONS

Rest-level of water in (month), (year), ft. above below well-top.
Highest " in (month), (year), ft. above below "
Lowest " in (month), (year), ft. above below "

British Geological Survey

BGS ID: 416317 : BGS Reference: SU51NW3
British National Grid (27700) : 452440, 118600

RECORD OF WELL (SHAFT OR BORE)

318 a/a

~~SU61/15~~
SU51 NW/3
5244 1860

At Sivers Farm SU5244 1860

Town or Village Upham

County Hants Six-inch quarter sheet 58 SE/w

For Mr.

Exact site of well see 6" map indicated. (Attach a tracing from a map, or a sketch-map, if possible.)

Level of ground surface above sea-level (O.D.) +175 feet. (53.34m)

Is well-top at ground level? If not, state how far above / below; feet.

Shaft — ft., diameter ft. Details of headings

Bore 235 ft.; diameter of bore: at top 5 ins.; at bottom ins.

Lengths, diameters, perforations, etc., of lining tubes

Water struck at depths, below well-top, of (feet)

Good supply for 2½" hand pump down 100 ft.

TEST DETAILS — Month — Year —

Rest-level of water ft. above / below well-top. Suction at ft. Yield on hours' / days'

pumping gallons per (max. capacity of pump g.p.h.),

with depression of feet. Recovery to in mins. / hours.

WORKING CONDITIONS

Rest-level of water in (month) (year) ft. above / below well-top.

Highest " in (month) (year) ft. above / below "

Lowest " in (month) (year) ft. above / below "

Suction at ft. Rate of pumping galls. per for hours per day.

with average depression of ft. Recovery to in mins. / hours

Quality of water (*attach copy of analysis if available*)

Well made by Date of well (April 1936)

Information from Southern Counties Agricultural Trading Society

ADDITIONAL NOTES.

6" - Hants 58 SE/w. O.D. +175. (53.34m) Hand-pump. Visited.

ADDITIONAL NOTES.

6"- Hants 58 SE/m. O.D. + 175. Hand-pump. (53.34m)
Visited.
"S.C.A.H." 22.4.41 Data
Subsequent information received from S.C.A.T.S. Jan. 1942:—
Lining tubes:— 185 ft x 5 in. (probably from surface)

(For Survey use only) GEOLOGICAL CLASSIFICATION	NATURE OF STRATA If measurements start below ground surface, state how far... ...	THICKNESS Feet	THICKNESS Inches	DEPTH Feet	DEPTH Inches
London Clay	Blue clay	110	—	110	—
Reading Beds	Reading Beds	55	—	165	—
	Black clay	8	—	173	—
	Reading Beds	10	—	183	—
	Rock	2	—	185	—
U. Ch.	Chalk	50	—	235	— (71.62 m)

MB.
19.8.41

British Geological Survey
BGS ID: 416317 : BGS Reference: SU51NW3
British National Grid (27700) : 452440,118600

(For Survey use only) GEOLOGICAL CLASSIFICATION | NATURE OF STRATA If measurements start below ground surface, state how far... ... | THICKNESS Feet | THICKNESS Inches | DEPTH Feet | DEPTH Inches

London Clay | Blue clay | 110 | — | 110 | —
Reading Beds | Reading Beds | 55 | — | 165 | —
| Black clay | 8 | — | 173 | —
| Reading Beds | 10 | — | 183 | —
| Rock | 2 | — | 185 | —
U. Ch. | Chalk | 50 | — | 235 | —

MB.
19.8.41

Agreed
DM 4/1/77

British Geological Survey

BGS ID: 416354 : BGS Reference: SU51SE5
British National Grid (27700) : 456210,111790

SU51/38
SU51SE/5
5621 1179

SU 5621 1179

10
IGS NO
SU51SE5

Wickham.

Geol. Map 316, new ser.

1. COLD HARBOUR, about ¼ of a mile W.N.W. of the church. 1895. Made and communicated by Mr. CONWAY, of Wickham (through Mr. N. C. H. NISBETT).

			Thickness. Feet.	Depth Feet.
OLD WELL		Old well. Sandy bottom	—	90
BRACKLESHAM BEDS	[Bracklesham Beds?]	Sandy clay	20	110
		Sand, as above	3	113
		Red clay	2	115
		Blue clay with sandy veins	2	117
		Clay	8	125
		Clay, but more loamy and with large pebbles (2 or 3 inches diameter) ...	5	130
		Clay, as above, but browner, and with iron-pyrites	27	157
		Clay, as above, but with small pebbles	8	165
		Rather darker, with pebbles and sand	2	167
		Clay, like the 27 feet bed, above ...	3	170
BAGSHOT BEDS	Black [Bagshot] Water	Sand, with irregular angular [?] pebbles.	1	171

DM
16/12/76

stated by visiting - Disused.

4.III.41

Hants 66S.E(E) O.D.175'
(=53.34m)

Eastern LS 316
Southern EA.

SU51/74

G. STOW PLC

BOREHOLE RECORD

file:	PWWALCHS98
EA No.	980060

A. SITE DETAILS

SU51SE

Borehole drilled for	PORTSMOUTH WATER PLC	
Location	BLACKHORSE FM , WALTHAM CHASE	
NGR (8 fig.)	SU 5627 1432	B/H Type: EXPLORATION WELL
Ground level (if known) ..	52.685 m AOD	
Drilling Company	G. STOW PLC	
Date of drilling	Started: 23/09/98	Completed: 07/10/98

B. CONSTRUCTION DETAILS

Borehole datum (if not ground level) GL m A G L

Borehole drilled diameter					
500	mm from	0	to	10	m/depth
375	mm from	10	to	109	m/depth
200	mm from	109	to	210	m/depth

Casing material:							
Mild Steel	diameter:	219	mm from	+ 0.3 m	to	109	m/depth
and type: Butt Welded BS 879							

Grouting details ..... Casing grouted min thickness 50 mm SR Cement

Water struck at ..... m

Rest water level on completion ..... 25 m BGL

C. TEST PUMPING SUMMARY

Test pumping datum ..... 0.3 m AGL

Pump suction depth ..... mbd

Water level (start of test) 25 mbd date:

Water level (end of test) 65 mbd

mbd

mbd

Pumping rate .....Air lift test only Less than 1 L/sec for 30 mins

Recovery to ..... Very slow

Remarks ..... The borehole was acidised with 2.5 T Hydrochloric acid but the pressure was very slow to dissipate and there was no improvement in yield. The borehole was backfilled November 98 and the casing cut off 2m BGL

(COND 1700 pH 7)

PTO for strata log:

SU51/74

file:	PWWALCRS96
EA No.	

D. STRATA LOG

Geological Classification	Description of strata	Thickn. m	Depth m
	Light brown top soil and clay	1.00	1.00
	Orange brown clay with silty base	2.00	3.00
	Dark brown grey clay	9.00	12.00
	Grey clay (Shelly)	12.00	24.00
	Grey clay	24.00	48.00
	Grey clay and shells	7.00	55.00
	Grey clay	20.00	75.00
	Grey , green and red clays	15.00	90.00
	Red , brown and yellow clay	2.00	92.00
	Red , grey , yellow and green clays	9.00	101.00
	Flint band with pebbles	3.00	104.00
	Grey chalk and flints	3.00	107.00
	Chalk with a lot of flints	73.00	180.00
	Chalk (cleaner) with some flints	30.00	210.00
	White chalk		

Eastern WS
Anglian E.A.

316

SU51|75

G. STOW PLC

BOREHOLE RECORD

file:	PWWICKHAM98
EA No.	980061

A. SITE DETAILS

SU51SE

Borehole drilled for	PORTSMOUTH WATER PLC	
Location	MILL LANE WICKHAM SOUTHAMPTON	
NGR (8 fig.)	SU 5733 1201	B/H Type: EXPLORATION WELL
Ground level (if known) ..	40.605 m AOD	
Drilling Company	G. STOW PLC	
Date of drilling	Started: 07/08/98	Completed: 01/09/98

B. CONSTRUCTION DETAILS

Borehole datum (if not ground level) GL m AGL

Borehole drilled diameter					
500	mm from	0	to	12	m/depth
400	mm from	12	to	21	m/depth
375	mm from	21	to	142	m/depth
200	mm from	142	to	245	m/depth

Casing material: Mild Steel diameter:					
and type: Butt Welded BS 879	219	mm from	+ 0.7 m	to	142 m/depth

Grouting details ..... Casing grouted min thickness 50 mm SR Cement

Water struck at ..... m

Rest water level on completion ..... 28 m BGL

C. TEST PUMPING SUMMARY

Test pumping datum ..... 0.7 m AGL
(if different from borehole datum)

Pump suction depth ..... mbd

Water level (start of test) 28 mbd date: 01/09/98

Water level (end of test) 70 mbd
mbd
mbd

Pumping rate .....Air lift test only less than 1 L/sec for 20 mins

Recovery to ..... 69 6 mins

Remarks ..... The borehole was acidised with 2.5 T Hydrochloric acid but the pressure was very slow to dissipate and there was no improvement in yield. The borehole was backfilled in November 1998 and the casing cut off 2m BGL.
(COND 760 pH 7)

PTO for strata log:

SU51/75

file:	PWWICKHAM98
EA No.	

D. STRATA LOG

Geological Classification	Description of strata	Thickn. m	Depth m
	Brown top soil	1.00	1.00
	Brown silty clay and fine gravel	1.00	2.00
	Fine yellow brown uncemented sands	2.00	4.00
	Buff coloured fine sand (loose)	2.00	6.00
	Orange fine friable sand	1.00	7.00
	Buff – orange fine sand , some sticky clay content	2.00	9.00
	Buff/light brown sands	1.00	10.00
	Light yellow friable fine sand	2.00	12.00
	Grey fine sand	2.00	14.00
	Grey green sandy clay	1.00	15.00
	Grey clay some silt content	2.00	17.00
	Buff brown sand	1.00	18.00
	Grey silty clay	5.00	23.00
	Grey clay	83.00	106.00
	Multi coloured clays – grey , red ,yellow	29.00	135.00
	Flint beds and chalk	7.00	142.00
	White chalk with a lot of flints	47.00	189.00
	White chalk less flints	56.00	245.00

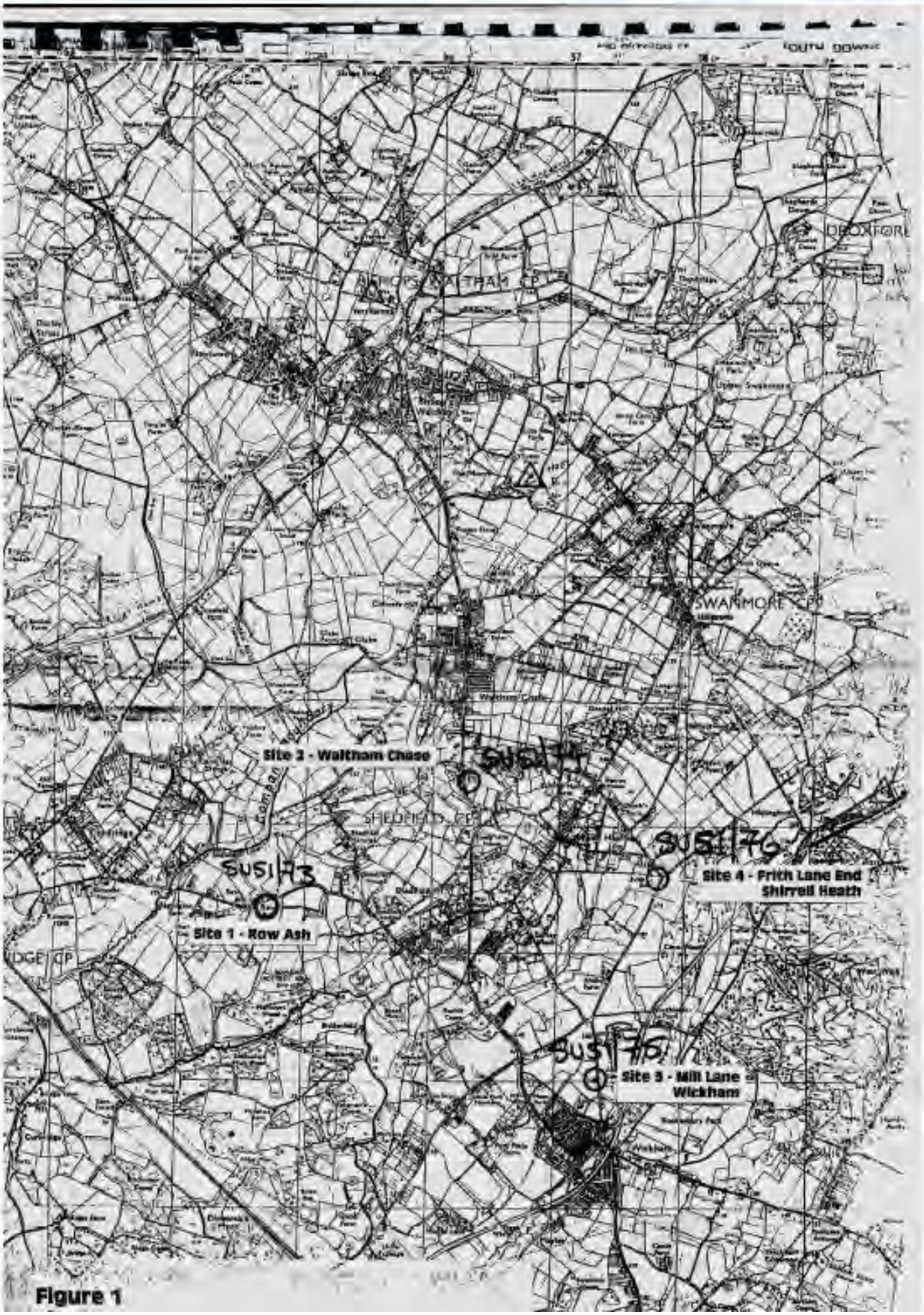
Site 2 - Waltham Chase
SU5173
Site 1 - Row Ash
SU5176
Site 4 - Frith Lane End
Shirrell Heath
SU5176
Site 3 - Mill Lane
Wickham
SWANMORE CP
DROXFORD

Figure 1

Appendix B – The Applicant Borehole Locations

Trial Pit Log

SOCOTEC

Logged	FC	Start	Equipment, Methods and Remarks	Dimension and Orientation	Ground Level 23.04 mOD
Checked	MS	02/12/2019	JCB 3CX. Machine excavated.	Width 0.60 m	Coordinates (m) E 471433.05
Approved	TC	End		Length 2.70 m	National Grid N 109242.02
		02/12/2019		191 (Deg)	

Samples and Tests

Depth	Type & No.	Records
0.20	ES1	
0.50	HV	p 58kPa, r 30kPa
0.50	ES2	
0.50	D3	
0.50 - 0.60	B4	
1.00	HV	p 69kPa, r 30kPa
1.00	ES5	
1.50	D6	
1.50 - 1.60	B7	
2.40 - 2.50	B9	
2.50	D8	
3.60	D10	
3.60 - 3.70	B11	
		02/12/19 2.40

Strata Description

Main	Detail	Depth, Level (Thickness)	Legend	Backfill
Dark brown sandy slightly organic CLAY. Rare subangular to rounded fine to coarse gravel of flint. (TOPSOIL)		(0.30) 0.30 22.74		
Soft to firm light grey, mottled orangish brown, CLAY. Locally slightly sandy. Rare organic material (up to 40x20mm).		(2.00) 2.30 20.74	1	
Stiff friable bluish grey, locally mottled dark brown, CLAY.	3.40-3.50 gravel lens. Gravel is rounded fine to coarse of siltstone	(1.60) 3.90 19.14		
END OF EXPLORATORY HOLE				

Groundwater Entries

No.	Depth Strike (m)	Remarks
1	0.50	Slight ingress.

Remarks

Depth (m)	Remarks

Stability Stable
Shoring None
Weather Sunny

Notes: For explanation of symbols and abbreviations see Key to Exploratory Hole Records. All depths and reduced levels in metres. Stratum thickness given in brackets in depth column.

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Scale 1:25 09/04/2020 20 52 11

Project HAVANT THICKET WINTER STORAGE RESERVOIR
Project No. A9031-19
Carried out for Portsmouth Water

Trial Pit
ATK-TPM-04
Sheet 1 of 1

Appendix C – SOCOTEC Otterbourne WSW Ground Investigation (2018) Boreholes

Groundwater Monitoring

Instrument Reference	Instrument Type	Instrument Base, mbgl	Date Time dd/mm/yyyy hh:mm:ss	Groundwater depth, mbgl	Comments
BH-A (1)	SPIE	17.00	14/08/2018 00:00:00	Dry	
BH-A (1)	SPIE	17.00	30/08/2018 13:00:00	Dry	
BH-A (1)	SPIE	17.00	13/09/2018 13:10:00	Dry	
BH-D (1)	SPIE	8.00	14/08/2018 00:00:00	Dry	
BH-D (1)	SPIE	8.00	30/08/2018 13:30:00	Dry	
BH-D (1)	SPIE	8.00	13/09/2018 12:53:00	Dry	
BH-E (1)	SP	7.00	14/08/2018 00:00:00	2.44	
BH-E (1)	SP	7.00	30/08/2018 11:32:00	2.55	
BH-E (1)	SP	7.00	13/09/2018 09:08:00	2.06	
BH-F (1)	SP	7.00	14/08/2018 00:00:00	2.45	
BH-F (1)	SP	7.00	30/08/2018 10:39:00	2.68	
BH-F (1)	SP	7.00	13/09/2018 09:21:00	2.11	
BH-G (1)	SPIE	4.50	14/08/2018 00:00:00	2.72	
BH-G (1)	SPIE	4.50	30/08/2018 10:30:00	2.94	
BH-G (1)	SPIE	4.50	13/09/2018 09:35:00	2.39	

Notes: Type: SP - Standpipe, SPIE - Standpipe Piezometer, HPIE - Hydraulic Piezometer, PPIE - Pneumatic Piezometer, EPIE - Vibrating Wire Piezometer, PWEL - Pumping Well

SOCOTEC

Gas Monitoring Record

Project No	G8024-18	Project	Otterbourne WSW
Date	14/08/2018	State of Ground	Dry
		Wind	Calm
Operator	KW	Wind Direction	
		Cloud Cover	None
Equipment Used	Gas meter and dipmeter	Precipitation	None

Sheet No: C3/1

Borehole ID	Inst ID	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Barometric Pressure (mbars)	Air temp (°C)	Reading Depth (mBGL)	Dip to Base of Pipe	Depth to Groundwater (m BGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
Detection Limits																		
BH-E	1	7.00	09:00:30	1014		0.00	7	2.45	0.0	0.00	0.0	0.0	15.9	1.8	0.0	0.0		
			09:01:00								0.0	0.0	15.8	1.8	0.0	0.0		
			09:02:00								0.0	0.0	15.9	1.7	0.0	0.0		
			09:03:00								0.0	0.0	16.3	1.5	0.0	0.0		
			09:04:00								0.0	0.0	16.5	1.4	0.0	0.0		
			09:05:00								0.0	0.0	16.7	1.3	0.0	0.0		
BH-F	1	7.00	09:20:00	1014		0.00	6.2	2.44	0.0	0.00	0.0	0.0	16.2	1.5	0.0	0.0		
			09:21:00								0.0	0.0	15.9	1.7	0.0	0.0		
			09:22:00								0.0	0.0	15.9	1.8	0.0	0.0		
			09:23:00								0.0	0.0	16.1	1.6	0.0	0.0		
			09:24:00								0.0	0.0	16.2	1.5	0.0	0.0		
											0.0	0.0	16.4	1.4	0.0	0.0		

SOCOTEC

Gas Monitoring Record

Project No	G8024-18	Project	Otterbourne WSW	Sheet No	
Date	30/08/2018	State of Ground	Dry		C3/2
		Wind	Calm		
Operator	MW	Wind Direction			
		Cloud Cover	Slight		
Equipment Used	Gas meter and dipmeter	Precipitation	None		

Borehole ID	Inst ID	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Barometric Pressure (mbars)	Air temp (°C)	Reading Depth (mBGL)	Dip to Base of Pipe	Depth to Groundwater (m BGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	Remarks
Detection Limits																		
BH-E	1	7.00	11:32:00	1021	16	0.00	6.3	2.55	0.0	0.00	0.0	0.0	20.7	0.0	0.0	0.0		
			11:32:30								0.0	0.0	20.7	0.0	0.0	0.0		
			11:33:00								0.0	0.0	20.7	0.0	0.0	0.0		
			11:34:00								0.0	0.0	20.7	0.0	0.0	0.0		
			11:35:00								0.0	0.0	20.7	0.0	0.0	0.0		
			11:36:00								0.0	0.0	20.7	0.0	0.0	0.0		
			11:37:00								0.0	0.0	20.7	0.0	0.0	0.0		
BH-F	1	7.00	10:39:00	1021	16	0.00	7.1	2.68	0.0	0.00	0.0	0.0	20.7	0.0	0.0	0.0		
			10:39:30								0.0	0.0	20.7	0.0	0.0	0.0		
			10:40:00								0.0	0.0	20.6	0.0	0.3	0.0		
			10:41:00								0.0	0.0	20.0	0.0	0.5	0.0		
			10:42:00								0.0	0.0	20.0	0.0	0.5	0.0		
			10:43:00								0.0	0.0	20.0	0.0	0.5	0.0		
			10:44:00								0.0	0.0	20.0	0.0	0.5	0.0		
			10:45:00								0.0	0.0	20.0	0.0	0.5	0.0		

SOCOTEC

Gas Monitoring Record

Project No	G8024-18	Project	Otterbourne WSW	Sheet No	
Date	13/09/2018	State of Ground	Damp		C3/3
Operator	[redacted]	Wind	Calm		
		Wind Direction			
		Cloud Cover	None		
Equipment Used	GFM Series Gas Analyser + Dip meter	Precipitation	None		

Borehole ID	Inst ID	Depth of Installation (m BGL)	Time of Reading hh:mm:ss	Barometric Pressure (mbars)	Air temp (°C)	Reading Depth (mBGL)	Dip to Base of Pipe	Depth to Groundwater (m BGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (% vol)	Remarks
Detection Limits																		
BH-E	1	7.00	09:08:00	1021		0.00	6.22	2.06	0.0	0.00	0.0	0.0	19.8	0.0	0.0	0.0		
			09:08:30								0.0	0.0	20.1	0.4	0.0	0.0		
			09:09:00								0.0	0.0	20.1	0.4	0.0	0.0		
			09:10:00								0.0	0.0	20.1	0.4	0.0	0.0		
			09:11:00								0.0	0.0	2.0	0.4	0.0	0.0		
			09:12:00								0.0	0.0	20.0	0.4	0.0	0.0		
			09:13:00								0.0	0.0	20.0	0.4	0.0	0.0		
BH-F	1	7.00	09:21:00	1022		0.00	7.04	2.11	0.0	0.00	0.0	0.0	20.1	0.4	0.0	0.0		
			09:21:30								0.0	0.0	11.9	4.0	0.0	0.0		
			09:22:00								0.0	0.0	9.2	4.5	0.0	0.0		
			09:23:00								0.0	0.0	9.5	4.3	0.0	0.0		
			12:00:00								0.0	0.0	10.0	4.1	0.0	0.0		
			09:25:00								0.0	0.0	10.8	3.8	0.0	0.0		
			09:26:00								0.0	0.0	11.3	3.6	0.0	0.0		

Units :			Mol/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg
Method Codes :			ANC	ICPACIDS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	ICPMSS	LOI(%MM)	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS
Method Reporting Limits :			0.04	20	0.3	0.2	1.2	1.6	0.7	0.5	2	0.5	16	0.2	0.08	0.08	0.08	0.08
Accreditation Code:			N	UM	UM	UM	UM	UM	UM	UM	UM	UM	UM	N	UM	U	U	UM
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Acid Neut. Capacity**	**SO4-- (acid sol)**	**Arsenic (MS)**	**Cadmium (MS)**	**Chromium (MS)**	**Copper (MS)**	**Lead (MS)**	**Mercury (MS)**	**Nickel (MS)**	**Selenium (MS)**	**Zinc (MS)**	**L.O.I. % @ 450C**	**Acenaphthene**	**Acenaphthylene**	**Anthracene**	**Benzo(a)anthracene**
1914894	BH-E 0.80	11-Jul-18	12.10	923	4.0	0.48	11.8	14.1	14	<0.6	20.5	2.1	47	5.7	<0.12	<0.12	<0.12	<0.12
1914895	BH-E 6.00 (NVM)	11-Jul-18		113§	3.39§	<0.19§	21.58§	8.42§	4.16§	<0.48§	18.19§	<0.48§	25.25§	0.9	<0.085§	<0.085§	<0.085§	<0.085§

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Client Name	**SOCOTEC UK Maidstone**
Contact	[redacted]

G8024-18 Otterbourne WSW

Sample Analysis

Date Printed	**31-Jul-2018**
Report Number	**EFS/187941M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Units :			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg
Method Codes :			PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PAHMSUS	PCBECD	PCBECD
Method Reporting Limits :			0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.28	5	5
Accreditation Code:			UM	UM	UM	UM	UM	N	UM	UM	UM	UM	UM	UM	UM	U	UM	UM
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Benzo(a)pyrene**	**Benzo(b)fluoranthene**	**Benzo(ghi)perylene**	**Benzo(k)fluoranthene**	**Chrysene**	**Coronene**	**Dibenzo(ah)anthracene**	**Fluoranthene**	**Fluorene**	**Indeno(123-cd)pyrene**	**Naphthalene**	**Phenanthrene**	**Pyrene**	**Total PAH (Sum of USEPA 16)**	**PCB 101**	**PCB 118**
1914894	BH-E 0.80	11-Jul-18	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<1.86	<7.26	<7.26
1914895	BH-E 6.00 (NVM)	11-Jul-18	<0.085§	<0.085§	<0.085§	<0.085§	<0.085§	<0.08	<0.085§	<0.085§	<0.085§	<0.085§	<0.085§	<0.085§	<0.085§	<1.356§		

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Contact	[redacted]

G8024-18 Otterbourne WSW

Sample Analysis

Date Printed	**31-Jul-2018**
Report Number	**EFS/187941M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Units :			µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	pH Units	mg/kg	mg/kg
Method Codes :			PCBECD	PCBECD	PCBECD	PCBECD	PCBECD	PHEHPLC	PHEHPLC	PHEHPLC	PHEHPLC	PHEHPLC	PHEHPLC	PHEHPLC	PHEHPLC	PHSOIL	SFAPI	SFAPI
Method Reporting Limits :			5	5	5	5	5		0.3	0.3	0.3	0.3			0.3		0.5	0.5
Accreditation Code:			UM	UM	UM	UM	UM	N	U	U	U	UM	N	U	U	UM	N	UM
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**PCB 138**	**PCB 153**	**PCB 180**	**PCB 28**	**PCB 52**	**Catechol**	**Cresols**	**Dimethylphenols**	**Naphthols**	**Phenol**	**Resorcinol**	**Total Phenols**	**Trimethylphenols**	**pH units (AR)**	**Cyanide(Complex)(AR)**	**Cyanide(Free) (AR)**
1914894	BH-E 0.80	11-Jul-18	<7.26	<7.26	<7.26	<7.26	<7.26	<2.2	<0.4	<0.4	<0.4*	<0.4	<0.4	<4.8	<0.4	8.2	<0.7	<0.7
1914895	BH-E 6.00 (NVM)	11-Jul-18						<1.6	<0.32§	<0.32§	<0.32*§	<0.32§	<0.3	<3.50§	<0.32§	9.2 §	<0.53§	<0.53§

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Client Name SOCOTEC UK Maidstone

Contact [redacted]

G8024-18 Otterbourne WSW

Sample Analysis

Date Printed	**31-Jul-2018**
Report Number	**EFS/187941M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Units :			mg/kg	mg/kg		%	mg/kg	mg/kg	µg/kg	ug/kg	µg/kg	µg/kg	µg/kg	µg/kg	% M/M			
Method Codes :			SFAPI	SFAS	Sub040	TMSS	TPHFIDUS	TPHFIDUS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	VOCHSAS	WSLM59			
Method Reporting Limits :			0.5	0.5		0.1	10	10	1	2	4	2	5	6	0.02			
Accreditation Code:			UM	N	Yes	U	U	UM	UM	UM	UM	UM	UM	UM	N			
LAB ID Number CL/	**Client Sample Description**	**Sample Date**	**Cyanide(Total) (AR)**	**Sulphide as S (AR)**	**^Asbestos ID and Quant (1 & 2)**	**Tot.Moisture @ 105C**	**TPH Band (>C10-C40)**	**TPH by GCFID (AR)**	**Benzene**	**Ethyl Benzene**	**m/p Xylenes**	**o Xylene**	**Toluene**	**Xylenes**	**Total Organic Carbon**			
1914894	BH-E 0.80	11-Jul-18	<0.7	<0.7	NADIS	31.1	51.7	55.3	<1	<3	<6	<3	<7	<9	2.52			
1914895	BH-E 6.00 (NVM)	11-Jul-18	<0.53§	<0.5		5.6 §	15.68§	18.22§	<1§	<2§	<4§	<2§	<5§	<6§	0.155§			

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Client Name SOCOTEC UK Maidstone

Contact [redacted]

G8024-18 Otterbourne WSW

Sample Analysis

Date Printed	**31-Jul-2018**
Report Number	**EFS/187941M**
Table Number	**1**

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

WASTE ACCEPTANCE CRITERIA TESTING
BSEN 12457/2

Client	SOCOTEC UK Maidstone				**Leaching Data**	
					Weight of sample (kg)	0.117
Contact	[redacted]				Moisture content @ 105°C (% of Wet Weight)	31.1
					Equivalent Weight based on drying at 105°C (kg)	0.090
Site	G8024-18 Otterbourne WSW				Volume of water required to carry out 10:1 stage (litres)	0.873
					Fraction of sample above 4 mm %	0.000
Sample Description		**Report No**	**Sample No**	**Issue Date**	Fraction of non-crushable material %	0.000
BH-E 0.80		S18_7941M	CL/1914894	31-Jul-18		

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
U	WSLM59	Total Organic Carbon (% M/M)	2.52	3	5	6
N	LOI450	Loss on Ignition (%)	5.7			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.02	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.049	1		
U	TPHFIDUS	Mineral Oil (mg/kg)	51.7	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.97	100		
U	PHSOIL	pH (pH units)	8.2		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	12.1		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	10:1 Single Stage Leachate	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/2 @ L/S 10 litre kg-1		
			mg/l except °°	mg/kg (dry weight)	mg/kg (dry weight)		
U	WSLM3	pH (pH units) °°	7.4	Calculated data not UKAS Accredited			
U	WSLM2	Conductivity (µs/cm) °°	155				
U	ICPMSW	Arsenic	0.004	0.04	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.01	0.5	10	70
U	ICPMSW	Copper	0.002	0.02	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	<0.001	<0.01	0.5	10	30
U	ICPMSW	Nickel	0.006	0.06	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.01	0.5	10	50
U	ICPMSW	Antimony	<0.001	<0.01	0.06	0.7	5
U	ICPMSW	Selenium	0.001	0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.02	4	50	200
U	KONENS	Chloride	2	20	800	15000	25000
U	ISEF	Fluoride	0.2	2	10	150	500
U	ICPWATVAR	Sulphate as SO4	4.88	49	1000	20000	50000
N	WSLM27	Total Dissolved Solids	121	1210	4000	60000	100000
U	SFAPI	Phenol Index	<0.05	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	5.6	56	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Where individual results are flagged see report notes for status.
Results corrected to dry weight at 105°C where appropriate, in accordance with the MCERTS standard.

Certificate of Analysis

Certificate Number	18-17577
	27-Jul-18
Client	Socotec PO Box 100 Burton upon Trent Staffordshire DE15 0XD
Our Reference	18-17577
Client Reference	S187941
Order No	37270 TES
Contract Title	S187941
Description	One Soil sample.
Date Received	23-Jul-18
Date Started	23-Jul-18
Date Completed	27-Jul-18
Test Procedures	Identified by prefix DETSn (details on request).
Notes	Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By [redacted]

[redacted]
Contracts Manager

UKAS TESTING
2139

Summary of Asbestos Analysis

Soil Samples

Our Ref 18-17577
Client Ref S187941
Contract Title S187941

Lab No	Sample ID	Material Type	Result	Comment*	Analyst
1370089	S1914894 BH-E 0.80	SOIL	NAD	none	D Wilkinson

Crocidolite = Blue Asbestos, Amosite = Brown Asbestos, Chrysotile = White Asbestos. Anthophyllite, Actinolite and Tremolite are other forms of Asbestos. Samples are analysed by DETSC 1101 using polarised light microscopy in accordance with HSG248 and documented in-house methods. NAD = No Asbestos Detected. Where a sample is NAD, the result is based on analysis of at least 2 sub-samples and should be taken to mean 'no asbestos detected in sample'. Key: * - not included in laboratory scope of accreditation.

Sample Analysis

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

S187941M

Customer SOCOTEC UK Maidstone
Site G8024-18 Otterbourne WSW
Report No S187941M

Consignment No S76496
Date Logged 19-Jul-2018
In-House Report Due 26-Jul-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	MethodID	ANC	CEN Leachate	CustServ	ICPACIDS	ICPMSS								LOI(%MM)	MCertS	PAHMSUS	PCBECD	PHEHPLC	PHSOIL	SFAPI			SFAS	Sub040	TMSS
		Sampled	Acid Neut. Capacity	CEN Leac(P)C	REPORT A	SO4-- (acid sol)	Arsenic (MS)	Cadmium (MS)	Chromium (MS)	Copper (MS)	Lead (MS)	Mercury (MS)	Nickel (MS)	Selenium (MS)	Zinc (MS)	L.O.I. % @ 450C	MCertS Analysis	PAH (17) by GCMS	PCB-7 Congeners Analysis	Phenol - HPLC (NGP)	pH units (AR)	Cyanide(Complex)(AR)	Cyanide(Free) (AR)	Cyanide(Total) (AR)	Sulphide as S (AR)	^Asbestos ID and Quant (1 & 2)	Tot.Moisture @ 105C
						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓
CL/1914894	BH-E 0.80	11/07/18																									
CL/1914895	BH-E 6.00	11/07/18																									

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key

A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key

	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.
The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Sample Analysis

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

S187941M

Customer SOCOTEC UK Maidstone
Site G8024-18 Otterbourne WSW
Report No S187941M

Consignment No S76496
Date Logged 19-Jul-2018
In-House Report Due 26-Jul-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Sampled	MethodID	TPHFIDUS		VOCHSAS		WSLM59
				TPH Band (>C10-C40)	TPH by GCFID (AR)	BTEX-HSA GCMS analysis	Ethyl Benzene (µg/kg)	Total Organic Carbon
				✓	✓	✓	✓	✓
CL/1914894	BH-E 0.80	11/07/18						
CL/1914895	BH-E 6.00	11/07/18						

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

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F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

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The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.

Units :			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Method Codes :			Calc_CR3	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPWATVAR	ICPWATVAR	ISEF	KONENS
Method Reporting Limits :			0.003	0.001	0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.001	0.001	0.001	0.002	0.01	3	0.1	1
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**Chromium (III)**	**Antimony as Sb (Dissolved)**	**Arsenic as As (Dissolved)**	**Cadmium as Cd (Dissolved)**	**Chromium as Cr (Dissolved)**	**Copper as Cu (Dissolved)**	**Lead as Pb (Dissolved)**	**Mercury as Hg (Dissolved)**	**Molybdenum as Mo (Dissolved)**	**Nickel as Ni (Dissolved)**	**Selenium as Se (Dissolved)**	**Zinc as Zn (Dissolved)**	**Barium as Ba (Dissolved) a**	**Total Sulphur as SO4 (Dissolved) a**	**Fluoride as F a**	**Chloride as Cl w**
1903081	BH-E 0.80	19-Jul-18	<0.001	<0.001	0.004	<0.0001	<0.001	0.002	<0.001	<0.0001	<0.001	0.006	0.001	<0.002	<0.01	4.88	0.2	2

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Client Name	**SOCOTEC UK Maidstone**
Contact	[redacted]

G8024-18 Otterbourne WSW

CEN Leachate 10:1

Date Printed	**30-Jul-2018**
Report Number	**EXR/266597**
Table Number	**1**

Units :			mg/l	mg/l	mg/l	uS/cm	mg/l	pH units										
Method Codes :			KONENS	SFAPI	WSLM13	WSLM2	WSLM27	WSLM3										
Method Reporting Limits :			0.003	0.05	0.2	100	60											
UKAS Accredited :			Yes	Yes	No	Yes	No	Yes										
LAB ID Number EX/	**Client Sample Description**	**Sample Date**	**Chromium VI as Cr**	**Phenol Index as C6H5OH**	**Dissolved Organic Carbon w**	**Conductivity uS/cm @ 25C w**	**Total Dissolved Solids**	**pH units w**										
1903081	BH-E 0.80	19-Jul-18	<0.003	<0.05	5.6	155	121	7.4										

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Client Name	**SOCOTEC UK Maidstone**
Contact	[redacted]

G8024-18 Otterbourne WSW

CEN Leachate 10:1

Date Printed	**30-Jul-2018**
Report Number	**EXR/266597**
Table Number	**1**

Where individual results are flagged see report notes for status.

CEN Leachate 10:1 Analysis

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

W266597

Customer SOCOTEC UK Maidstone
Site G8024-18 Otterbourne WSW
Report No W266597

Consignment No S76496
Date Logged 19-Jul-2018
In-House Report Due 26-Jul-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Matrix Type	Sampled	Chromium (III) (CALC)	Report A (CEN)C	Nickel as Ni MS (Dissolved)	Chromium as Cr MS (Dissolved)	Cadmium as Cd MS (Dissolved)	Copper as Cu MS (Dissolved)	Lead as Pb MS (Dissolved)	Zinc as Zn MS (Dissolved)	Arsenic as As MS (Dissolved)	Mercury as Hg MS (Dissolved)	Selenium as Se MS (Dissolved)	Molybdenum as Mo MS (Dissolved)	Antimony as Sb MS (Dissolved)	Total Sulphur as SO4 (Diss) VAR	Barium as Ba (Dissolved) VAR	Fluoride as F	Chloride as Cl (Kone)	Chromium VI. as Cr (Kone)
MethodID				Calc_CR3	CUSTSERV	ICPMSW											ICPWATVAR		ISEF	KONENS	
				✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
EX/1903081	BH-E 0.80	Laboratory Produced Leachate	19/07/18																		

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.
Where individual results are flagged see report notes for status.

CEN Leachate 10:1 Analysis

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

W266597

Customer SOCOTEC UK Maidstone
Site G8024-18 Otterbourne WSW
Report No W266597

Consignment No S76496
Date Logged 19-Jul-2018
In-House Report Due 26-Jul-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Matrix Type	Sampled	MethodID	LeachPrep	SFAPI	WSLM13	WSLM2	WSLM27		WSLM3
					Leachate Prep	Phenol Index SFA	Dissolved Organic Carbon	Conductivity uS/cm @ 25C	Total Dissolved Solids (Calc)	Total Dissolved Solids	pH units
						✓		✓			✓
EX/1903081	BH-E 0.80	Laboratory Produced Leachate	19/07/18								

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

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Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
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F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.
Where individual results are flagged see report notes for status.

Sample Descriptions

Client : SOCOTEC UK Maidstone
Site : G8024-18 Otterbourne WSW
Report Number : W26_6597

Lab ID Number	Client ID	Description
EX/1903081	BH-E 0.80	Laboratory Produced Leachate

		Units :	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
		Method Codes :	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPMSW	ICPWATVAR	ICPWATVAR	KONENS	SFAPI	SFAPI	SFAS	TPHFID
		Method Reporting Limits :	0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.001	0.002	0.01	3	1	0.02	0.02	0.02	0.01
		UKAS Accredited :	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
LAB ID Number EX/	Client Sample Description	Sample Date	Arsenic as As (Dissolved)	Cadmium as Cd (Dissolved)	Chromium as Cr (Dissolved)	Copper as Cu (Dissolved)	Lead as Pb (Dissolved)	Mercury as Hg (Dissolved)	Nickel as Ni (Dissolved)	Selenium as Se (Dissolved)	Zinc as Zn (Dissolved)	Boron as B (Dissolved) a	Total Sulphur as SO4 (Dissolved) a	Chloride as Cl w	Cyanide (Free) as CN	Cyanide (Total) as CN	Sulphide as S	TPH GC
1908743	BH-E 2.44	14-Aug-18	<0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.003	0.006	0.013	0.12	58	59	<0.02	<0.02	<0.02	< 0.010
1908744	BH-F 2.45	14-Aug-18	<0.001	<0.0001	<0.001	0.002	<0.001	<0.0001	0.003	0.006	0.019	0.03	38	21	<0.02	<0.02	<0.02	0.016

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Client Name	SOCOTEC UK Maidstone
Contact	[redacted]

G8024-18 Otterbourne WSW

Sample Analysis

Date Printed	23-Aug-2018
Report Number	EXR/267994
Table Number	1

Where individual results are flagged see report notes for status.

Units :			mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	pH units			
Method Codes :			TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	TPHFID-Si	WSLM3			
Method Reporting Limits :			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01				
UKAS Accredited :			Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
LAB ID Number EX/	Client Sample Description	Sample Date	TPH Ali Band >C10-C12	TPH Ali Band >C12-C16	TPH Ali Band >C16-C21	TPH Ali Band >C21-C35	TPH Ali Band >C8-C10	TPH Ali Band >C8-C40	TPH Aro Band >C10-C12	TPH Aro Band >C12-C16	TPH Aro Band >C16-C21	TPH Aro Band >C21-C35	TPH Aro Band >C8-C10	TPH Aro Band >C8-C40	pH units w			
1908743	BH-E 2.44	14-Aug-18	< 0.010	< 0.010	< 0.010	0.011	< 0.010*	0.018	< 0.010	< 0.010*	< 0.010	< 0.010	< 0.010*	0.020	7.4			
1908744	BH-F 2.45	14-Aug-18	< 0.010	< 0.010	< 0.010	0.018	< 0.010*	0.027	< 0.010	< 0.010*	< 0.010	< 0.010	< 0.010*	0.017	7.2			

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Client Name	SOCOTEC UK Maidstone
Contact	[redacted]

G8024-18 Otterbourne WSW

Sample Analysis

Date Printed	23-Aug-2018
Report Number	EXR/267994
Table Number	1

Where individual results are flagged see report notes for status.

Sample Analysis

SOCOTEC UK Ltd Environmental Chemistry
Analytical and Deviating Sample Overview

W267994

Customer SOCOTEC UK Maidstone
Site G8024-18 Otterbourne WSW
Report No W267994

Consignment No W141846
Date Logged 15-Aug-2018
In-House Report Due 23-Aug-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Matrix Type	Sampled	MethodID	CUSTSERV	ICPMSW									ICPWATVAR		KONENS	SFAPI		SFAS	TPHFID	TPHFID-SI	WSLM3
					Report A	Nickel as Ni MS (Dissolved)	Chromium as Cr MS (Dissolved)	Cadmium as Cd MS (Dissolved)	Copper as Cu MS (Dissolved)	Lead as Pb MS (Dissolved)	Zinc as Zn MS (Dissolved)	Arsenic as As MS (Dissolved)	Mercury as Hg MS (Dissolved)	Selenium as Se MS (Dissolved)	Total Sulphur as SO4 (Diss) VAR	Boron as B (Dissolved) VAR	Chloride as Cl (Kone)	Cyanide (Free) as CN SFA	Cyanide (Total) as CN SFA	Sulphide as S SFA	TPH GC	TPH by GC(Si)	pH units
						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	•
EX/1908743	BH-E 2.44	Groundwater	14/08/18																				
EX/1908744	BH-F 2.45	Groundwater	14/08/18																				

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If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.
Where individual results are flagged see report notes for status.

Analytical and Deviating Sample Overview

Customer SOCOTEC UK Maidstone
Site G8024-18 Otterbourne WSW
Report No W267994

Consignment No W141846
Date Logged 15-Aug-2018
In-House Report Due 23-Aug-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

ID Number	Description	Matrix Type	Sampled	MethodID WSLM3 pH units
				✓
EX/1908743	BH-E 2.44	Groundwater	14/08/18	
EX/1908744	BH-F 2.45	Groundwater	14/08/18	

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key	
A	The sample was received in an inappropriate container for this analysis
B	The sample was received without the correct preservation for this analysis
C	Headspace present in the sample container
D	The sampling date was not supplied so holding time may be compromised - applicable to all analysis
E	Sample processing did not commence within the appropriate holding time
F	Sample processing did not commence within the appropriate handling time

Requested Analysis Key	
	Analysis Required
	Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
	No analysis scheduled
^	Analysis Subcontracted - **Note: due date may vary**

The integrity of data for samples/analysis that have been categorised as Deviating may be compromised. Data may not be representative of the sample at the time of sampling.
Where individual results are flagged see report notes for status.

Sample Descriptions

Client : SOCOTEC UK Maidstone
Site : G8024-18 Otterbourne WSW
Report Number : W26_7994

Lab ID Number	Client ID	Description
EX/1908743	BH-E 2.44	Groundwater
EX/1908744	BH-F 2.45	Groundwater

Land Quality Results Summary (River Abstraction Building site)

Project ID: 41524404
Project Name: Otterbourne Water Supply Works (WSW) - River Abstraction Building
Site Type: WSW
Date Sampled: July and August 2018
Scope of Works: New infrastructure at the River Abstraction Building site

Author: [redacted] **Date:** 17/10/2018
Checker: **Date:** 23/10/2018
Reviewer: **Date:** 31/10/2018

Exploratory Hole ID	Sample Depth (m BGL)	Sample description	H&S issue (including detection of asbestos?)	Exceeds Commercial Contaminated Land Generic Assessment Criteria (GAC)? (see notes for details on GAC)	Barrier Pipe Assessment	Hazardous Properties? (for waste disposal purposes)	Waste Classification (from WAC) (based on individual sample only)	Groundwater Monitoring Data / Exceeds the Groundwater GAC? (see notes)
BH-E	0.8	MADE GROUND: Soft dark brown organic CLAY interbedded with light brown silty fine to medium SAND. PID reading 1.0 ppmv.	**No** Asbestos screened, not detected.	**No**	Assessment not possible (see notes)	**No** Material is Non-Hazardous	Material is suitable for disposal in an **Inert waste landfill**.	Response zone between 4m bgl to 7m bgl (River Terrace Deposits). Standpipe monitored on 14/08/2018, 30/08/2018 and 13/09/2018. Groundwater depth range between 2.06m bgl and 2.55m bgl. Groundwater sample collected on 14/08/2018. **Yes** Concentration of Aliphatic TPH C21-C34 (11 µg/l) exceeds the Groundwater GAC of 10 µg/l (see comments and notes).
	6.0	RIVER TERRACE DEPOSITS: Orangish brown and white sandy GRAVEL. Sand is fine to coarse. Gravel is angular to subangular fine to coarse of flint. Occasional subangular cobble of flint.	**No**	**No**		**No** Material is Non-Hazardous	N/A WAC test not undertaken	
BH-F	0.5	MADE GROUND: Reddish brown very gravelly clayey SAND. Sand is coarse. Gravel is angular fine to coarse. PID reading 0.3 ppmv.	**No** Asbestos screened, not detected.	**No**		**No** Material is Non-Hazardous	Material is suitable for disposal in an **Inert waste landfill**.	Response zone between 2m bgl to 7m bgl (Alluvium, River Terrace Deposits and White Chalk Subgroup). Standpipe monitored on 14/08/2018, 30/08/2018 and 13/09/2018. Groundwater depth range between 2.11m bgl and 2.68m bgl. **Yes** Concentration of aliphatic TPH C21-C34 (18 µg/L) exceeds the Groundwater GAC of 10 µg/l (see comments and notes).
	0.8	MADE GROUND: Soft light brown mottled white slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of chalk, brick, clinker and flint. PID reading 0.3 ppmv.	**No** Asbestos screened, not detected.	**No**		**No** Material is Non-Hazardous	Material is suitable for disposal in an **Inert waste landfill**.	
	2.0	ALLUVIUM?: Dark brown to black amorphous PEAT. Becoming light grey with depth. PID reading 2.7 ppmv.	**No**	**No**		**No** Material is Non-Hazardous	Material is suitable for disposal at a **Non-Hazardous landfill** but could be considered at an an **Inert waste landfill** Total Organic Carbon (TOC) value (26.3% M/M) exceeds Inert waste landfill threshold of 3% M/M, however, the Dissolved Organic Carbon (DOC) value is < 500 mg/kg at its own pH of 7.9 and therefore may be accepted as Inert.	
BH-G	0.5	MADE GROUND: Light brown to orangish brown gravelly very clayey SAND. Sand is fine to coarse. Gravel is subangular fine to coarse of chalk and rare brick. Rare subrounded cobble of flint. PID reading 0.00 ppmv.	**No** Asbestos screened, not detected.	**No**		**No** Material is Non-Hazardous	Material is suitable for disposal in an **Non-Hazardous landfill.** TOC value (3.53% M/M) exceeds Inert waste landfill GAC of 3% M/M.	Response zone between 2m bgl to 5m bgl (Head Deposits). 38mm piezometer monitored on 14/08/2018, 30/08/2018 and 13/09/2018. Groundwater depth range between 2.72m bgl and 2.94m bgl. Groundwater sample not retreived.
BH-G-A	0.4	MADE GROUND: Firm orangish brown mottled white and brown slightly gravelly CLAY. Gravel is subangular fine to medium of chalk and flint. PID reading 0.2 ppmv.	**Yes** Concentration of lead exceeds Commercial GAC (see comments). Asbestos screened, not detected.	**Yes** Concentration of lead exceeds Commercial GAC (see comments)		**No** Material is Non-Hazardous	Material is suitable for disposal in an **Inert waste landfill**.	NA Standpipe not installed.
	1.8	HEAD?: Light brown to white gravelly silty fine to coarse SAND interbedded with soft dark brown and orange clay. Gravel is angular to subangular fine to coarse of flint. PID reading 0.0 ppmv.	**No**	**No**		**No** Material is Non-Hazardous	N/A WAC test not undertaken	

NOTES	Any interpretations and recommendations given in this report may not necessarily address all aspects which may surround the subject area, for example, it is not known whether excavated material will be re-used on site, a conceptual site model has not been fully developed, no assessment made of soil geotechnical properties and details of the proposed construction and the extent of excavation have not been reviewed. As with all assessments of this type, where limited data is available, a great deal of emphasis is placed on chemical data. Chemical data is for samples collected by a third party. Sample collection and storage procedures are not known and could affect the validity of the data. It should be noted that chemical data varies spatially and with time.
	Soil GAC: To assess potential risks to human health receptors (including ground workers to be involved in the construction and future site users), the soil analytical results have been assessed against Suitable for Use Values (S4ULs) (and lead was compared against a commercial Category 4 Screening Level (C4SL) commercial end use, assuming a 1% SOM value. There are no current soil guideline values, S4ULs, or C4SLs for cyanide (free and total). Consequently, Stantec-derived generic assessment criteria (GAC) based on the former UK guidance (EA, 2009) and (Defra&EA, 2002) has been used. This is a very conservative approach which assumes daily exposure to the soil and is used as an initial screen to determine whether further assessment taking into account potential surfacings and other beneficial factors is necessary.
	Groundwater GAC: The site is located overlying a Principal Aquifer and Secondary A Aquifer, is within a groundwater SPZ 1 and nearby to a groundwater abstraction points. Consequently, the groundwater data results have been compared to 'Groundwater Intended to be Abstracted for Human Consumption' standards derived from EU Water Framework Directive Regulations 2015 for groundwater and regulations to protect Drinking Water Quality, Water Supply (Water Quality) Regulations 2010 and 2016, and UK Technical Advisory Group (UK TAG) (2013) (UK TAG 2013). Given the proximity of hte site to the River Itchen (adjacent) the groundwater results have also been compared to the Groundwater -Inland Surfae Water Receptor standards derived derived by UKTAG (2013), Environment Agency 2007 and 2010, and the WFD 2015. Both screening criteria do not have standards for total petroleum hydrocarbons (TPH) and therefore the Water Supply (Water Quality) Regulation 1989 value of 10 µg/l has been adopted for screening TPH data. The Method Detection Limit (MDL) for free and total cyanide is the corresponding Groundwater – Inland Surface Water Receptor screening criteria, however, this cannot be considered as a true exceedance.
	Barrier Pipe Requirements: Pipe material assessment is not considered as part of the soil screen. If polyethylene pipe is to be installed, a pipe material assessment should be carried out.
	Hazardous Properties: Assessment has been completed using Atkins (2018) CatWasteSoil (www.catwastesoil.co.uk)
	Soil Suitability: The results of this screen serves to indicate whether soils are suitable in the categories defined for the purposes specified in the scope of works.
	Sample Deviations: Deviations have been reported for pH, cyanide free and total, BTEX, ethylbenzene due to exceedence holding times on the provided samples from BH-F.
	Reference: This screen has been undertaken using information (including laboratory data) provided within the Otterbourne Water Supply Works (WSW) Factual Report on Ground Investigation, Report no. G8024-18, dated September 2018. Please see report for Laboratory Results Sheets.

ATKINS CatWasteSoil

Classification Assessment Tool of Soil Wastes - Hazard Summary Sheet

Site Name	Otterbourne WSW
Location	
Site ID	
Job Number	
Date	25/09//2018
User Name	[redacted]@mwhglobal.com
Company Name	Stantec

Hole ID	Sample Depth	Hazardous Waste Y/N	HP1	HP2	HP3	HP4	HP5	HP6	HP7	HP8	HP9	HP10	HP11	HP12	HP13	HP14	HP15	HP16
BH-E 0.80	0.8	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-E 6.00 (NVM)	6	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-F 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-F 0.80	0.8	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-F 2.00	2	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-G 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-G-A 0.40	0.4	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-G-A 1.80	1.8	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-O 0.30	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-O 1.00	1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-N 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-N 1.10	1.1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-N 2.20	2.2	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-P 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-1 0.40	0.4	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-1 1.00 (NVM)	1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
OP1 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
OP1 1.00 (NVM)	1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
OP2 0.30	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-J 0.30 (NVM)	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-L 0.10	0.1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-M 0.10	0.1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-F 0.10	0.1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-F 1.00	1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-H 0.40	0.4	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-K 0.30	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-D 1.00	1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-D 2.50	2.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-G 0.10	0.1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-G 1.20	1.2	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-G 3.00 (NVM)	3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-A 0.10	0.1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-A 0.30	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-B 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-C 0.10	0.1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-C 0.30	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-C 1.00 (NVM)	1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-E 0.30	0.3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-E 1.00	1	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TP-E 3.00	3	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-C 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-C 5.80 (NVM)	5.8	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-D 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-D 1.40 (NVM)	1.4	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-A 0.50	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-B 0.50 (NVM)	0.5	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
BH-B 2.70 (NVM)	2.7	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No

Appendix D – Environmental Data Tables (From Groundsure Report)

- Active or Recent Landfills
- Historic Landfill Sites
- Licensed Waste Sites
- Recent Industrial Land uses
- Pollution Incidents
- Licensed Industrial Activities Part A1
- Licensed Industrial Activities Part A2 B
- List 1 Dangerous Substances
- List 2 Dangerous Substances
- Licensed Discharges to Controlled Waters
- Groundwater Abstractions
- Surface Water Abstractions

Section	Approximate Distance (m)	Direction to Feature	Address	Type	Operator	Status	Active or Recent Landfill Area (m2)
B	0.0	Within Designation	Portsmouth Water Limited, Bedhampton Waterworks, Meyrick Road, Bedhampton, Hampshire, PO9 1NN	L05: Inert LF	Portsmouth Water Limited	Issued	28921
H	76.4	NE	Suez Recycling And Recovery Southern Ltd, Sandpit, Wickham, Hampshire, PO17 5AW	A01: Co-Disposal Landfill Site	Suez Recycling And Recovery Southern Ltd	Closure	18362

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Site Name	Site Reference	Type	Site Operator Name	Site Area (m2)
C	0	Within Designation	Land South Of Budds Farm Sewage Works	FHA10, HAV4	Household	-	121632
C	0	Within Designation	Harts Farm Way	FHA15, 1760/1/13/6	Household	-	256832
F	0	W	Albany Farm	FFA3, 10/2	Inert	-	11828
J	0	Within Designation	Land at Rossgarth	20/37/1/5/43, 5/40, FW15	Inert	-	3303
J	0	Within Designation	Ash House Farm	FW38, FW17, 5/74	Commercial, Household	-	7386
L	0	Within Designation	Crowd Hill	FEA22, EAST 5	Inert, Industrial	W T Sibley Limited	38878
M	0	Within Designation	Bugle Farm, adjacent to Brambridge Road	FW26	Waste Unknown	-	28415
F	3	W	Albany Farm	FFA2, 10/2	Inert	-	2050
H	32	NE	Shirrell Heath Sand Pit	FW1, 5/1	Inert, Commercial	-	28860
M	221	NE	Land Between Brambridge Road and Kiln Lane	FW27, W/R3336	Waste Unknown	-	3842

Note - The search area is the Draft Order Limits plus a 250m buffer in Sections B to M and the Proposed Underground Pipeline plus a 290 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Site Address	Type	Status	LIC Name	LIC Site
C	0	N	Budds Farm Water Treatment Works, Southmoor Lane, Budds Farm, Havant, Hampshire, PO9 1JW	Biological Treatment Facility	Issued	Southern Water Services Limited	W T W
C	0	E	Southmoor Lane, Havant, Hampshire, PO9 1JW	Biological Treatment Facility	Issued	Southern Water Services Ltd	Budds Farm Waste Water Treatment Works
C	0	E	Southmoor Lane, Budds Farm, Havant, Hampshire, PO9 1JW	Biological Treatment Facility	Issued	Southern Water Services Limited	Budds Farm Wastewater Treatment Works And Sludge Treatment Centre
C	0	E	Budds Farm Wastewater Treatment Works, Southmoor Lane, Havant, Hampshire, PO9 1JW	Landfill Gas Engine (<3 mW)	Issued	Southern Water Services Limited	Budds Farm Wastewater Treatment Works
B	23	SE	Bedhampton Waterworks, Meyrick Road, Havant, Hampshire, PO9 1NN	Inert LF	IPPC	Portsmouth Water Ltd	Bedhampton Waterworks Landfill
B	23	SE	Bedhampton Waterworks, Meyrick Road, Bedhampton, Hampshire, PO9 1NN	Inert LF	Issued	Portsmouth Water Limited	Bedhampton Landfill
B	23	SE	Bedhampton Waterworks, Meyrick Road, Havant, Hampshire, PO9 1NN	Landfill taking Non-Biodegradable Wastes	Expired	Portsmouth Water Limited	Bedhampton Waterworks Landfill
B	36	SE	Bedhampton Waterworks, Meyrick Road, Havant, Hampshire	Landfill taking Non-Biodegradable Wastes	Issued	Portsmouth Water Company Ltd	Bedhampton Waterworks
C	39	N	Havant Lorry Park, Southmoor Lane, Havant, Hampshire, PO9 1JW	Household, Commercial & Industrial Waste T Stn	Transferred	Sita Solent Ltd	Havant Lorry Park
C	39	N	Havant Lorry Park, Southmoor Lane, Havant, Hampshire, PO9 1JW	Household, Commercial & Industrial Waste T Stn	Surrendered	Sita Solent Ltd	Havant Lorry Park
C	39	N	Havant Lorry Park, Southmoor Lane, Havant, Hampshire, PO9 1JW	Household, Commercial & Industrial Waste T Stn	Surrendered	Sita Solent Limited	Havant Lorry Park

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Company	Description	Category	Address
E	0	S	Pylon	Electrical Features	Infrastructure and Facilities	Hampshire, PO17
E	0	N	Pylon	Electrical Features	Infrastructure and Facilities	Hampshire, PO7
F	0	W	Pylon	Electrical Features	Infrastructure and Facilities	Hampshire, PO17
F	0	E	Pylon	Electrical Features	Infrastructure and Facilities	Hampshire, PO17
M	0	N	Solar Panels	Energy Production	Industrial Features	Hampshire, SO21
M	0	N	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, SO21
G	0	E	Tank	Tanks (Generic)	Industrial Features	Hampshire, PO17
D	0	N	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
D	0	W	Inkon	Published Goods	Industrial Products	Cherry Lodge 11, Boundary Way, Portsmouth, Hampshire, PO6 3ND
D	0	N	Pit	Unspecified Quarries Or Mines	Extractive Industries	Hampshire, PO6
D	0	W	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO6
D	0	S	Mayfield Records	Recording Studios and Record Companies	IT, Advertising, Marketing and Media Services	2a, Down End Road, Portsmouth, Hampshire, PO6 1HT
D	0	W	Solar Panels	Energy Production	Industrial Features	Hampshire, PO6
D	0	N	Solar Panels	Energy Production	Industrial Features	Hampshire, PO6
B	0	W	Tank	Tanks (Generic)	Industrial Features	Hampshire, PO9
C	0	W	Chimney	Chimneys	Industrial Features	Hampshire, PO9
B	0	W	Tank (Disused)	Tanks (Generic)	Industrial Features	Hampshire, PO9
D	0	N	Mast (Telecommunication)	Telecommunications Features	Infrastructure and Facilities	Hampshire, PO9
C	0	W	Budds Farm Sewage Works	Waste Storage, Processing and Disposal	Infrastructure and Facilities	Hampshire, PO9
C	0	E	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
C	0	S	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
C	0	S	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
C	0	S	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
C	0	S	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
C	0	E	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
D	2	S	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO6
F	6	W	Conexin Ltd	Cutting, Drilling and Welding Services	Construction Services	6-7 Albany Business Centre, Wickham Road, Fareham, Hampshire, PO17 5BD
B	7	E	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
E	7	N	Repeater Station	Telecommunications Features	Infrastructure and Facilities	Hampshire, PO6
L	8	S	Pylon	Electrical Features	Infrastructure and Facilities	Hampshire, SO50
H	11	E	Mastercraft Decorative Mou	Rubber, Silicones and Plastics	Industrial Products	Long Copse View, Pricketts Hill, Shedfield, Southampton, Hampshire, SO32 2JW
F	12	E	Albany Business Centre	Business Parks and Industrial Estates	Industrial Features	Hampshire, PO17
G	12	S	Tank	Tanks (Generic)	Industrial Features	Hampshire, PO17
D	13	N	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
D	14	S	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO6
B	14	S	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
K	16	E	Electricity Poles	Electrical Features	Infrastructure and Facilities	Hampshire, SO32
D	16	N	Complete Clearance	Waste Storage, Processing and Disposal	Infrastructure and Facilities	10, Meadow Edge, Portsmouth, Hampshire, PO7 5AZ
C	16	S	Slipway	Moorings and Unloading Facilities	Water	Hampshire, PO9
B	18	E	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
E	18	N	Pinsley Chalk Pits (Disused	Stone Quarrying and Preparation	Extractive Industries	Hampshire, PO7
A	20	W	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
M	21	S	Inert Recycling UK Ltd	Recycling, Reclamation and Disposal	Recycling Services	Highbridge Estate, Highbridge Road, Highbridge, Hampshire, SO50 6HS
G	25	S	Sewage Works	Waste Storage, Processing and Disposal	Infrastructure and Facilities	Hampshire, PO17
G	25	S	Tank	Tanks (Generic)	Industrial Features	Hampshire, PO17
K	29	E	Pylon	Electrical Features	Infrastructure and Facilities	Hampshire, SO32
C	29	N	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO9
J	29	N	Pumping Station	Water Pumping Stations	Industrial Features	Hampshire, SO32
B	32	W	Dunsbury M O T Test Centr	Vehicle Repair, Testing and Servicing	Repair and Servicing	Unit 7, Leigh Park Depot Fulflood Road, Havant, Hampshire, PO9 5AX
E	32	N	Workings (Dis)	Unspecified Quarries Or Mines	Extractive Industries	Hampshire, PO7
C	33	W	Landing Stage	Moorings and Unloading Facilities	Water	Hampshire, PO9
B	33	W	Mast (Telecommunication)	Telecommunications Features	Infrastructure and Facilities	Hampshire, PO9
J	34	E	Sewage Pumping Station	Waste Storage, Processing and Disposal	Infrastructure and Facilities	Hampshire, SO32

Section	Approximate Distance (m)	Direction to Feature	Company	Description	Category	Address
J	34	E	The Welding Corner Ltd	Cutting, Drilling and Welding Services	Construction Services	Unit 23, Woodmans Farm, Curdridge Lane, Curdridge, Hampshire, SO32 2BH
B	35	W	Superyacht Doc Ltd	Marine Equipment Including Boats and Ships	Industrial Products	6, Lester Avenue, Havant, Hampshire, PO9 3HE
C	35	E	Kelleher Flooring	Construction Completion Services	Construction Services	Unit 1b Alexandria Park 1, Penner Road, Havant, Hampshire, PO9 1QY
H	35	E	Solar Panels	Energy Production	Industrial Features	Hampshire, SO32
C	35	E	Gas Governor Station	Gas Features	Infrastructure and Facilities	Hampshire, PO9
C	36	W	Slipway	Moorings and Unloading Facilities	Water	Hampshire, PO9
E	36	W	Mast (Telecommunication)	Telecommunications Features	Infrastructure and Facilities	Hampshire, PO6
H	36	W	Tank	Tanks (Generic)	Industrial Features	Hampshire, SO32
C	36	E	Rentokil	Pest and Vermin Control	Contract Services	Logistics House, Penner Road, Havant, Hampshire, PO9 1QY
K	37	E	Electricity Poles	Electrical Features	Infrastructure and Facilities	Hampshire, SO32
J	37	S	Tank	Tanks (Generic)	Industrial Features	Hampshire, SO32
F	37	E	T & J Re-upholstery	Furniture	Consumer Products	3a Albany Business Centre, Wickham Road, Fareham, Hampshire, PO17 5BW
C	39	E	Hoppers	Hoppers and Silos	Farming	Hampshire, PO9
C	40	N	Mast	Telecommunications Features	Infrastructure and Facilities	Hampshire, PO9
D	41	S	Electricity Sub Station	Electrical Features	Infrastructure and Facilities	Hampshire, PO6
B	41	S	Solar Panels	Energy Production	Industrial Features	Hampshire, PO9
E	43	N	Bere Dairy	Dairy Farming	Farming	Bere Dairy Offwell Farm, Portchester Lane, Southwick, Hampshire, PO17 6DX
B	43	E	Works	Unspecified Works Or Factories	Industrial Features	Hampshire, PO9
L	44	S	Pylon	Electrical Features	Infrastructure and Facilities	Hampshire, SO50
E	47	S	Pylon	Electrical Features	Infrastructure and Facilities	Hampshire, PO17
C	50	E	webuyanycar.com	Secondhand Vehicles	Motoring	Unit 16 Broadmarsh Business and Innovation Centre, Harts Farm Way, Havant, Hampshire, PO9 1HS
B	50	W	A A C	Electrical Equipment Repair and Servicing	Repair and Servicing	76, Priorsdean Crescent, Havant, Hampshire, PO9 3AU

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Pollution Date	Air	Land	Water	Pollution Type	Pollutant
C	0	E	2001-08-28 13:50	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Pollutant Not Identified	Not Identified
B	0	W	2003-06-12 11:24	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Oils and Fuel	Petrol
B	0	W	2003-07-24 9:13	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Sewage Materials	Grey Water
B	0	W	2002-08-24 10:55	Category 4 (No Impact)	Category 3 (Minor)	Category 3 (Minor)	Sewage Materials	Crude Sewage
B	0	W	2002-09-22 8:04	Category 4 (No Impact)	Category 4 (No Impact)	Category 1 (Major)	Sewage Materials	Crude Sewage
B	0	W	2002-09-09 8:28	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Sewage Materials	Crude Sewage
B	0	E	2003-01-01 10:30	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Sewage Materials	Crude Sewage
B	0	W	2002-10-12 16:04	Category 3 (Minor)	Category 3 (Minor)	Category 2 (Significant)	Sewage Materials	Crude Sewage
B	0	W	2002-09-07 23:25	Category 4 (No Impact)	Category 3 (Minor)	Category 4 (No Impact)	Sewage Materials	Crude Sewage
B	0	W	2003-06-09 9:46	Category 4 (No Impact)	Category 4 (No Impact)	Category 4 (No Impact)	Sewage Materials	Crude Sewage
B	0	W	2003-09-10 10:14	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Sewage Materials	Crude Sewage
J	0	N	2019-07-21 11:29	Category 3 (Minor)	Category 3 (Minor)	Category 1 (Major)	Sewage Materials	Crude Sewage
B	10	W	2003-09-17 15:54	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Sewage Materials	Other Sewage Material
B	11	W	2002-11-25 18:53	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Specific Waste Materials	Vehicles and Vehicle Parts
B	12	W	2003-02-18 10:16	Category 4 (No Impact)	Category 3 (Minor)	Category 3 (Minor)	Specific Waste Materials	Household Waste
B	12	W	2003-02-18 10:16	Category 4 (No Impact)	Category 3 (Minor)	Category 3 (Minor)	Specific Waste Materials	Household Waste
B	12	N	2001-07-18 9:00	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Sewage Materials	Storm Sewage
G	14	W	2003-06-14 9:11	Category 3 (Minor)	Category 4 (No Impact)	Category 4 (No Impact)	Atmospheric Pollutants and Effects	Dust
K	18	N	2002-11-15 21:32	Category 4 (No Impact)	Category 4 (No Impact)	Category 3 (Minor)	Sewage Materials	Crude Sewage
B	20	W	2012-12-03 9:49	Category 4 (No Impact)	Category 4 (No Impact)	Category 2 (Significant)	Inert Materials and Wastes	Soils and Clay
B	22	W	2003-08-29 17:58	Category 4 (No Impact)	Category 3 (Minor)	Category 4 (No Impact)	Oils and Fuel	Diesel
J	28	S	2001-06-15 11:57	Category 4 (No Impact)	Category 3 (Minor)	Category 4 (No Impact)	General Biodegradable Materials and Wa	Other General Biodegradable Material or Waste
H	33	W	2001-07-09 10:45	Category 3 (Minor)	Category 4 (No Impact)	Category 3 (Minor)	Sewage Materials	Other Sewage Material

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Company	Permit Number	Installation Name	Description	Status	Issue Date
C	0	S	SOUTHERN WATER SERVICES LIMITED	ZP3235XJ	Budds Farm Wastewater Treatment Works	TRANCHE B SG PERMITTING DATE 1ST JANUARY 2019	Effective	18/09/2019
C	0	S	Southern Water Services Limited	DP3131QG	Budds Farm Wastewater Treatment Works	TRANCHE B SG PERMITTING DATE 1ST JANUARY 2019	Effective	18/09/2019
C	0	S	Southern Water Services Ltd	ZP3235XJ	Budds Farm Wastewater Treatment Works Combined Heat and Power Plant	ASSOCIATED PROCESS	Superseded	15/10/2008
C	0	S	Southern Water Services Ltd	ZP3235XJ	Budds Farm Wastewater Treatment Works Combined Heat and Power Plant	COMBUSTION; WASTE DERIVED FUEL =>3MW BUT <50MW	Superseded	15/10/2008
B	41.33449596	E	PORTSMOUTH WATER LTD	BP3635UL	BEDHAMPTON LANDFILL	WASTE LANDFILLING; ANY OTHER LANDFILL TO WHICH THE 2002 LANDFILL REGULATIONS APPLY	REVOKED	06/09/2007
B	41.33449596	E	Portsmouth Water Ltd	NP3439PN	Bedhampton Landfill	WASTE LANDFILLING; ANY OTHER LANDFILL TO WHICH THE 2002 LANDFILL REGULATIONS APPLY	Superseded	21/04/2005
B	41.33449596	E	PORTSMOUTH WATER LIMITED	NP3439PN	Bedhampton Landfill	WASTE LANDFILLING; ANY OTHER LANDFILL TO WHICH THE 2002 LANDFILL REGULATIONS APPLY	Effective	31/03/2008

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Status	Company Address	Process	Permit Type	Enforcements	Enforcement Dates	Enforcement Comments	Client
C	49.0	C	Historical Permit	Seaward Accident Repair Centre Ltd, Langstone House, Beaver Industrial Estate, Southmoor Lane, Havant, Hampshire, PO9 1JW	Respraying of Road Vehicles	Part B	No Enforcement Notified	No Enforcement Notified	No Enforcement Notified	Southern Water Services

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction	Establishment Name	Receiving Water	Substances	Active
C	0	W	Wyeth **closed**	The Solent, Langstone Harbour	-	Not Active
C	0	W	Veolia Es Hampshire Ltd	The Solent, Langstone Harbour	Mercury (other), Cadmium	Active
C	0	W	Budds Farm Stw - Combined Effs.	The Solent, Langstone Harbour	Mercury (other), Cadmium, 1,2-dichloroethane	Active
G	7	N	Wickham Stw	North Sea, Any, River Meon	Mercury (other), Cadmium	Active
G	35	S	Wickham Labs	North Sea, River Meon	Mercury (other), Cadmium	Active

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance	Direction to Feature	Establishment Name	Activity	Receiving Water	Substances
C	0	S	Southern Gas Network Fka National Grid Transco	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Portsmouth Aviation Ltd	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Queensbury Shelters Ltd	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Vosper Thornycroft (uk) Ltd	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Mr N R Solly	Not Active	-	Chromium, Nickel, pH, Zinc
C	0	S	Spirit Circuits	Active	-	Chromium, Copper, Lead, pH, Zinc
C	0	S	C.p.l. Ltd	Active	-	Copper, Lead, Nickel, pH
C	0	S	Veolia Es Hampshire	Active	-	Copper, Iron, Lead, Nickel, pH, Zinc
C	0	S	Veolia Onyx	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Flagship Training Ltd	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	H & S Aviation Limited	Active	The Solent	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Macro Developments Ltd	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Lewmar Marine	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Thermofil Polymers (uk) Ltd	Not Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Solway Metal Finishers Ltd	Not Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Subadra Limited	Not Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc, Benzene, Toluene, Xylene, Xylene (m+p), Xylene (o)
C	0	S	Dunham-bush (mfg) Ltd	Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Wyeth Manufacturing (uk)	Not Active	-	pH, Zinc
C	0	S	George Gale And Co Ltd	Not Active	-	Copper, pH
C	0	S	Budds Farm Stw	Active	None	Iron
C	0	S	Hcc, Fishery Lane Recycling Centre, Hayling Island	Active	The Solent	Chromium, Copper, Lead, Nickel, Zinc
C	0	S	Cpl Electronics Ltd	Active	The Solent	Chromium, Copper, Lead, Nickel, Zinc
C	0	S	Southern Circuits Ltd, 24 Aston Road, Waterlooville	Active	The Solent	Chromium, Copper, Lead, Nickel, Zinc
C	0	S	Hants Cosmetic Labs, Waterberry Drive, Waterlooville	Active	The Solent	Copper, Lead
C	0	S	Xyratex, Langstone Road, Havant	Active	The Solent	Chromium, Copper, Lead, Nickel, Zinc
C	0	S	British Gas, Downley Road, Havant	Not Active	The Solent	Chromium, Copper, Lead, Nickel, Zinc
C	0	S	Eaton Ltd (12819), New Lane, Havant	Active	The Solent	Chromium, Copper, Lead, Nickel, Silver, Zinc
C	0	S	Hartridge And Sons Ltd, West Street, Horndean	Not Active	-	Lead
C	0	S	Complete Metal Workshops Ltd, Brockhampton Road, Havant	Not Active	The Solent	Chromium, Copper, Lead, Nickel, Zinc
C	0	S	Onyx Hampshire Ltd	Active	The Solent	Chromium, Copper, Lead, Nickel, pH
C	0	S	Sca Packaging Limited	Active	The Solent	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Ams	Active	The Solent	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Onyx Hampshire Ltd	Active	The Solent	Copper, Iron, Lead, Nickel, pH, Zinc
C	0	S	Spirit Circuits Limited	Active	The Solent	Chromium, Copper, Lead, pH, Zinc
C	0	S	Cnim S.a.	Not Active	-	Arsenic, Chromium, Copper, Iron, Lead, Nickel, pH, Zinc
C	0	S	H & S Aviation Ltd	Not Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Hampshire County Council	Active	The Solent	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Meller Home & Beauty Limited	Not Active	-	-
C	0	S	Onyx Uk Limited	Active	The Solent	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Swadling Brassware	Not Active	-	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Kenwood Ltd	Active	SolentThe Solent	Chromium, Copper, Lead, Nickel, pH, Zinc
C	0	S	Spemco Group Limited	Active	The Solent	Chromium, Copper, Lead, Zinc
C	0	S	Zehnder Ltd	Active	The Solent	Chromium, Copper, Lead, Nickel, Silver, Zinc
G	35	S	Wickham Labs Ltd	Active	Stw	Chromium, Copper, Lead, Nickel, pH, Zinc
G	35	S	Wickham Stw	Not Active	R. Meon	Chromium, Copper, Lead, Nickel, pH, Zinc

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Permit Number	Receiving Water	Status	Address	EFF Type
B	0	N	A01016	HERMITAGE STREAM	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	PRIORSDEAN CRESCENT HAVANT CSO, PRIORSDEAN CRESCENT, HAVANT, HAMPSHIRE, PO9 3AS	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
C	0	E	P03515	SALINE ESTUARY	POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)	LAND AT BEDHAMPTON QUAY, LAND AT BEDHAMPTON QUAY, HARTS FARM WAY, HAVANT, HAMPSHIRE, PO9 1JN	TRADE DISCHARGES - UNSPECIFIED
B	0	W	H01148	SALINE ESTUARY	LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995	STOCKHEATH SEWAGE PUMPING STATION, STOCKHEATH SEWAGE PUMPING STATIO, HAVANT HAMPSHIRE	SEWAGE DISCHARGES - UNSPECIFIED - NOT WATER COMPANY
B	0	N	A01016	HERMITAGE STREAM	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	PRIORSDEAN CRESCENT HAVANT CSO, PRIORSDEAN CRESCENT, HAVANT, HAMPSHIRE, PO9 3AS	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
C	0	E	P03515	SALINE ESTUARY	SURRENDERED UNDER EPR 2010	LAND AT BEDHAMPTON QUAY, LAND AT BEDHAMPTON QUAY, HARTS FARM WAY, HAVANT, HAMPSHIRE, PO9 1JN	TRADE DISCHARGES - UNSPECIFIED
B	0	N	A01016	HERMITAGE STREAM	VARIED UNDER EPR 2010	PRIORSDEAN CRESCENT HAVANT CSO, PRIORSDEAN CRESCENT, HAVANT, HAMPSHIRE, PO9 3AS	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
L	3	N	G00171	BOW LAKE STREAM VIA 200MM PIPE	SURRENDERED UNDER EPR 2010	FIELDERS FARM, WINCHESTER RD, FISHE, FIELDERS FARM, WINCHESTER ROAD, FISHERS POND, EASTLEIGH, HAMPSHIRE, SO50 7HE	AGRICULTURE - FISH FARMING - NOT WATER COMPANY
M	8	N	A00752	BROCKHAMPTON CREEK	VARIED UNDER EPR 2010	BUDDS FARM HAVANT CEO, SOUTHMOOR LANE, HAVANT, HAMPSHIRE, PO9 1JN	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
M	8	N	A00752	BROCKHAMPTON CREEK	VARIED UNDER EPR 2010	BUDDS FARM HAVANT CEO, SOUTHMOOR LANE, HAVANT, HAMPSHIRE, PO9 1JN	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
M	8	N	A00752	BROCKHAMPTON CREEK	VARIED UNDER EPR 2010	BUDDS FARM HAVANT CEO, SOUTHMOOR LANE, HAVANT, HAMPSHIRE, PO9 1JN	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
M	8	N	A00752	BROCKHAMPTON CREEK	VARIED UNDER EPR 2010	BUDDS FARM HAVANT CEO, SOUTHMOOR LANE, HAVANT, HAMPSHIRE, PO9 1JN	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
G	10	S	H01351	FRESHWATER RIVER	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	MAYLES LODGE, MAYLES LODGE, MAYLES LANE, WICKHAM, FAREHAM HAMPSHIRE	SEWAGE DISCHARGES - UNSPECIFIED - NOT WATER COMPANY
M	19	N	A00915	SALINE ESTUARY	REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995)	BUDDS FARM WTW, BUDDS FARM WTW, SOUTHMOOR LANE, HAVANT, HAMPSHIRE	TRADE DISCHARGES - UNSPECIFIED
C	21	E	G01141	HERMITAGE STREAM	SURRENDERED UNDER EPR 2010	BEDHAMPTON QUAY, HARTS FARM WAY, BEDHAMPTON QUAY, HARTS FARM WAY, HAVANT, HAMPSHIRE, PO9 1JN	TRADE DISCHARGES - SITE DRAINAGE
B	23	N	P04452	FRESHWATER RIVER	POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)	STAGE COACH (SOUTH) LTD., STAGE COACH (SOUTH) LTD., FULFLOOD ROAD, LEIGH PARK, HAVANT, HAMPSHIRE	MISCELLANEOUS DISCHARGES - SURFACE WATER
B	23	N	P04452	FRESHWATER RIVER	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	STAGE COACH (SOUTH) LTD., STAGE COACH (SOUTH) LTD., FULFLOOD ROAD, LEIGH PARK, HAVANT, HAMPSHIRE	TRADE DISCHARGES - SITE DRAINAGE
C	24	E	EPRGB3696VZ	HERMITAGE STREAM	NEW ISSUED UNDER EPR 2010	BEDHAMPTON WHARF, HAVANT CONCRETE, HARTS FARM WAY, BEDHAMPTON QUAY, HAVANT, HAMPSHIRE, PO9 1JN	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
G	24	S	H01004	FRESHWATER RIVER	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	MEON PARK SEWAGE WORKS, MEON PARK SEWAGE WORKS, MAYLES LANE, WICKHAM HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
J	27	E	W0264A	FRESHWATER RIVER	POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)	LITTLE BULL LANE PS, LITTLE BULL LANE PS, LITTLE BULL LANE, WALTHAM CHASE, SOUTHAMPTON, HAMPSHIRE, SO32 2LT	SEWAGE DISCHARGES - PUMPING STATION - WATER COMPANY
J	27	E	W00264	FRESHWATER RIVER	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	LITTLE BULL PUMPING STATION, LITTLE BULL P.S., LITTLE BULL LANE, WALTHAM CHASE HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY
J	27	E	W00264	FRESHWATER RIVER	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	LITTLE BULL PUMPING STATION, LITTLE BULL P.S., LITTLE BULL LANE, WALTHAM CHASE HAMPSHIRE	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
G	28	N	N03092	INTO LAND	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	MAYLES HOUSE, MAYLES HOUSE, MAYLES LANE, WICKHAM, HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
C	30	N	H01182	SALINE ESTUARY	LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995	BUDDS FARM SEWAGE DISPOSAL WORKS, BUDDS FARM SEWAGE DISPOSAL WORKS, HAVANT HAMPSHIRE	SEWAGE DISCHARGES - UNSPECIFIED - NOT WATER COMPANY
C	30	N	A00752	BROCKHAMPTON CREEK	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	BUDDS FARM HAVANT CEO, SOUTHMOOR LANE, HAVANT, HAMPSHIRE, PO9 1JN	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
C	30	N	A00752	BROCKHAMPTON CREEK	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	BUDDS FARM HAVANT CEO, SOUTHMOOR LANE, HAVANT, HAMPSHIRE, PO9 1JN	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
F	31	S	P04523	INTO LAND	LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995	LAND AT ALBANY BUSINESS CENTRE, LAND AT ALBANY BUSINESS CENTRE, WICKHAM ROAD, FAREHAM	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
K	34	W	G01069	GROUNDWATER VIA SOAKAWAY	NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995)	STABLES AT PRIMROSE FARM, STABLES AT PRIMROSE FARM, SCIVIERS LANE, UPHAM, SOUTHAMPTON, HAMPSHIRE, SO32 1HB	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
K	34	S	EPRWB3693RR	TRIBUTARY HORTON HEATH STREAM	NEW ISSUED UNDER EPR 2010	WINDRUSH STABLES, SCIVIERS LANE, LOWER UPHAM, SOUTHHAMPTON, HAMPSHIRE, SO32 1HB	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
G	35	S	W00598	RIVER MEON	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY
G	35	S	W00598	RIVER MEON	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY
G	35	S	W00598	RIVER MEON	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY
G	35	S	W00598	RIVER MEON	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY
G	35	S	W00598	RIVER MEON	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY
G	35	S	W00598	RIVER MEON	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY
G	35	S	W00598	RIVER MEON	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY
G	35	S	W00598	RIVER MEON	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY
G	35	S	W00598	RIVER MEON	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - STW STORM OVERFLOW/STORM TANK - WATER COMPANY
G	35	S	W00598	RIVER MEON	MODIFIED - (WRA 91 SCHED 10 - AS AMENDED BY ENV ACT 1995)	WICKHAM WWTW, WICKHAM WWTW, MAYLES LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5ND	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY
K	35	S	H01066	FRESHWATER RIVER	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	BISHOPS WALTHAM SEWAGE WORKS, BISHOPS WALTHAM SEWAGE WORKS, BISHOPS WALTHAM, HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - WATER COMPANY
L	36	N	P03199	INTO LAND	VARIED UNDER EPR 2010	LEYLANDS FARM, LEYLANDS FARM, NOBS CROOK, COLDEN COMMON, EASTLEIGH HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
L	36	N	P03199	INTO LAND	POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)	LEYLANDS FARM, LEYLANDS FARM, NOBS CROOK, COLDEN COMMON, EASTLEIGH HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
C	37	N	P04007	SALINE ESTUARY	REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995)	BEDHAMPTON PLANT, BEDHAMPTON PLANT, HARTS FARM WAY, HAVANT, HAMPSHIRE	TRADE DISCHARGES - PROCESS EFFLUENT - NOT WATER COMPANY
C	37	N	P03532	BROCKHAMPTON STREAM	POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)	BEDHAMPTON QUAY, HARTS FARM WAY, BEDHAMPTON QUAY, HARTS FARM WAY, HAVANT, HAMPSHIRE, PO9 1JN	TRADE DISCHARGES - MINERAL WORKINGS
B	38	E	A00316	FRESHWATER RIVER	POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)	PARK LANE, PARK LANE, BEDHAMPTON HAMPSHIRE	SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY
L	38	S	H00532	FRESHWATER RIVER	REVOKED (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995)	LOW HILL FARM, LOW HILL FARM, FISHERS POND, EASTLEIGH, HAMPSHIRE	SEWAGE DISCHARGES - UNSPECIFIED - NOT WATER COMPANY
C	40	N	P00366	FRESHWATER RIVER	CONSENT REVOKED - DISCHARGE CEASED (SECTION 37(1))	HARTS FARM WAY, HARTS FARM WAY, HAVANT HAMPSHIRE	MISCELLANEOUS DISCHARGES - SURFACE WATER
J	41	W	EPRLP3125GC	UNNAMED TRIB SHAWFORDS LAKE	NEW ISSUED UNDER EPR 2010	SPENCER PLACE, SPENCER LANE, WALTHAM CHASE, SOUTHAMPTON, HAMPSHIRE, SO32 2LR	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
G	43	E	G00879	UNNAMED DRAINAGE DITCH	NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995)	DELFIELD, CASTLE FARM LANE, WICKHAM, DELFIELD, CASTLE FARM LANE, WICKHAM, FAREHAM, HAMPSHIRE, PO17 5DL	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
G	44	S	P04216	INTO LAND	POST NRA LEGISLATION WHERE ISSUE DATE > 31-AUG-89 (HISTORIC ONLY)	PARKCROFT, PARKCROFT, WICKHAM, HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
G	44	S	P04216	INTO LAND	SURRENDERED UNDER EPR 2010	PARKCROFT, PARKCROFT, WICKHAM, HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
G	47	S	N03209	INTO LAND	LAPSED UNDER SCHEDULE 23 ENVIRONMENT ACT 1995	PARK CROFT, PARK CROFT, WICKHAM, HAMPSHIRE	SEWAGE DISCHARGES - FINAL/TREATED EFFLUENT - NOT WATER COMPANY
L	48	N	H01631	FRESHWATER RIVER	PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY)	LEYLANDS FARM, LEYLANDS FARM, FISHERS POND, EASTLEIGH, HAMPSHIRE	UNSPECIFIED

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Permit Number	Receiving Water	Status	Effluent Type	Address	Type Description
C	20	S	A00915	-	NEW CONSENT (WRA 91, S88 & SCHED 10 AS AMENDED BY ENV ACT 1995)	GROUNDWATER - UNSPECIFIED	SOUTHERN WATER SERVICES LTD, BUDDS FARM WTW, BUDDS FARM WTW, SOUTHMOOR LANE, HAVANT, HAMPSHIRE	Sewage Disposal Works - water company

Note - The search area is the Draft Order Limits plus a 50m buffer in Sections B to M and the Proposed Underground Pipeline plus a 90 m buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction (closest point)	Activity	Type	Easting	Northing	Groundsure Report
G	0	Within Designation	Spray Irrigation - Direct	Spray Irrigation - Direct	456410	111560	5A / 6A
G	0	Within Designation	Spray Irrigation - Direct	Spray Irrigation - Direct	456410	111560	5A / 6A
B	0	Within Designation	Potable Water Supply - Direct	Potable Water Supply - Direct	470480	106270	9A / 10A / 11A / 12A/ 13A / 14A
A	0	Within Designation	Dewatering, Process Water and Dust Suppression	Dewatering, Process Water and Dust Suppression	471343	109504	14A / 15A
A	0	Within Designation	Dewatering, Process Water and Dust Suppression	Dewatering, Process Water and Dust Suppression	470809	110112	15A
A	0	Within Designation	Dewatering, Process Water and Dust Suppression	Dewatering, Process Water and Dust Suppression	471053	110361	15A
M	2	N	Potable Water Supply - Direct	Potable Water Supply - Direct	446520	123310	1A
M	2	N	Make-Up Or Top Up Water	Make-Up Or Top Up Water	446520	123310	1A
G	6	NE	Spray Irrigation - Direct	Spray Irrigation - Direct	456700	111200	5A / 6A
B	20	E	Potable Water Supply - Direct	Potable Water Supply - Direct	470580	106370	9A / 10A / 11A / 12A/ 13A / 14A
L	42	N	Fish Farm/Cress Pond Throughflow	Fish Farm/Cress Pond Throughflow	448850	120730	2A / 2B
L	61	S	General Farming & Domestic	General Farming & Domestic	450330	120150	2A / 2B
M	70	S	Make-Up Or Top Up Water	Make-Up Or Top Up Water	446650	122950	1A
M	70	S	Potable Water Supply - Direct	Potable Water Supply - Direct	446650	122950	1A
K	99	NW	Potable Water Supply - Direct	Potable Water Supply - Direct	452360	118607	2B
K	115	NW	General Use Relating To Secondary Category (Medium Loss)	General Use Relating To Secondary Category (Medium Lo	452350	118620	2B
K	115	NW	Potable Water Supply - Direct	Potable Water Supply - Direct	452350	118620	2B
M	130	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	446840	123220	1A
M	130	E	Potable Water Supply - Direct	Potable Water Supply - Direct	446840	123220	1A
M	130	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	446840	123220	1A
M	130	E	Potable Water Supply - Direct	Potable Water Supply - Direct	446840	123220	1A
M	151	W	Make-Up Or Top Up Water	Make-Up Or Top Up Water	446090	122690	1A
M	151	W	Potable Water Supply - Direct	Potable Water Supply - Direct	446090	122690	1A
E	175	N	General Use Relating To Secondary Category (Medium Loss)	General Use Relating To Secondary Category (Medium Lo	462110	107890	8A
E	175	N	General Farming & Domestic	General Farming & Domestic	462110	107890	8A
L	417	N	Animal Watering & General Use In Non Farming Situations	Animal Watering & General Use In Non Farming Situations	451260	120480	2B
L	417	N	General Farming & Domestic	General Farming & Domestic	451260	120480	2B
M	434	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	446680	122400	1A / 2A
M	434	E	Potable Water Supply - Direct	Potable Water Supply - Direct	446680	122400	1A / 2A
B	458	E	Potable Water Supply - Direct	Potable Water Supply - Direct	471020	106370	10A / 11A/ 12A / 13A 14A
M	543	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	447260	123270	1A
M	543	E	Potable Water Supply - Direct	Potable Water Supply - Direct	447260	123270	1A
L	584	NE	General Farming & Domestic	General Farming & Domestic	449990	120980	2A / 2B
M	695	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	447410	123320	1A
M	695	E	Potable Water Supply - Direct	Potable Water Supply - Direct	447410	123320	1A
L	737	SW	General Farming & Domestic	General Farming & Domestic	447910	120280	2A / 2B
L	792	NE	Fish Farm/Cress Pond Throughflow	Fish Farm/Cress Pond Throughflow	449200	121400	2A / 2B
M	805	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	447520	123220	1A
M	805	E	Potable Water Supply - Direct	Potable Water Supply - Direct	447520	123220	1A
M	821	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	447510	123050	1A
M	821	E	Potable Water Supply - Direct	Potable Water Supply - Direct	447510	123050	1A
M	850	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	447540	123050	1A
M	850	E	Potable Water Supply - Direct	Potable Water Supply - Direct	447540	123050	1A
L	873	NE	Fish Farm/Cress Pond Throughflow	Fish Farm/Cress Pond Throughflow	449240	121480	2A / 2B
L	874	NE	Fish Farm/Cress Pond Throughflow	Fish Farm/Cress Pond Throughflow	449239	121483	2A / 2B

Section	Approximate Distance (m)	Direction (closest point)	Activity	Type	Easting	Northing	Groundsure Report
L	877	S	Fish Farm/Cress Pond Throughflow	Fish Farm/Cress Pond Throughflow	447620	120241	2A
L	878	S	Fish Farm/Cress Pond Throughflow	Fish Farm/Cress Pond Throughflow	447620	120240	2A
L	907	NE	Fish Farm/Cress Pond Throughflow	Fish Farm/Cress Pond Throughflow	449260	121510	2A
A	944	NE	Spray Irrigation - Direct	Spray Irrigation - Direct	472780	111330	15A
M	959	E	Make-Up Or Top Up Water	Make-Up Or Top Up Water	447640	123000	1A
M	959	E	Potable Water Supply - Direct	Potable Water Supply - Direct	447640	123000	1A

Note - The search area is the Draft Order Limits plus a 1 km buffer in Sections B to M and the Proposed Underground Pipeline plus a 1.04 km buffer in Section A. See Section 6.1 of the desk study report for further detail.

Section	Approximate Distance (m)	Direction to Feature	Activity	Type	X	Y	Groundsure Report
E	175	N	Historical	Fish Farm/Cress Pond Throughflow	462110	107890	8A
E	175	N	Active	Spray Irrigation - Direct	462110	107890	8A
A	202	NW	Historical	Spray Irrigation - Direct	471000	111190	15A
K	238	SW	Historical	Spray Irrigation - Direct	453700	115700	3B / 4A
K	238	SW	Active	Spray Irrigation - Storage	453700	115700	3B / 4A
K	281	E	Historical	Spray Irrigation - Direct	454310	116000	3B / 4A
L	289	N	Active	Fish Farm/Cress Pond Throughflow	448918	120968	2A / 2B
M	303	E	Historical	Potable Water Supply - Direct	447020	123260	1A
M	303	E	Active	Potable Water Supply - Direct	447020	123260	1A
M	307	E	Active	Potable Water Supply - Direct	447024	123266	1A
L	345	N	Historical	Fish Farm/Cress Pond Throughflow	448970	121010	2A / 2B
M	422	SE	Active	Transfer Between Sources (Post Water Act 2003)	446969	122772	1A
L	477	N	Active	Fish Farm/Cress Pond Throughflow	450410	120740	2B
L	477	N	Historical	Fish Farm/Cress Pond Throughflow	450410	120740	2B
M	487	E	Active	Transfer Between Sources (Post Water Act 2003)	447078	122841	1A
K	613	W	Historical	Spray Irrigation - Storage	453200	116800	3B
M	672	NE	Active	Transfer Between Sources (Post Water Act 2003)	447113	123809	1A
L	827	S	Active	Fish Farm/Cress Pond Throughflow	447510	120320	2A
E	856	N	Active	Spray Irrigation - Direct	463220	108300	8A / 8B
L	924	NE	Historical	Fish Farm/Cress Pond Throughflow	449300	121500	2A / 2B
L	960	NE	Active	Fish Farm/Cress Pond Throughflow	449370	121504	2A / 2B

Note - The search area is the Draft Order Limits plus a 1 km buffer in Sections B to M and the Proposed Underground Pipeline plus a 1.04 km buffer in Section A. See Section 6.1 of the desk study report for further detail.

Appendix E – Potential Sources of Contamination Table

PSC No.	Name	Source	Current	Dates	Description	Category	Section
1	Works - Crockerhill Brickworks	Groundsure, National Library of Scotland, ArcGIS Earth, Google Earth	Y	1868 - Present	1868 to 1939 brickfield including infilled ponds. 1939 to 1992 (last available map) Saw mills east of Forest Lane. 1999 to Present - 'Pinks' Industrial park / Welbourne Business Park	PSC & Infilled Land	F
2	Pit - Clay	NLS	N	1937-61 - 1949-70		Infilled Land	F
4	Farm - Albany Farm	National Library of Scotland, Historic Map 1856. Fareham and Gosport Council	Y	1856-1914 - Present	Area now a business centre, houses, a care home and offices. Local authority note timber furniture manufacture.	PSC	F
5	Landfill - Albany Farm Historic Landfill	Environment Agency, National Library of Scotland, Historic Map 1856	N	1856-1913 - 1949-89	Old chalk pit 1888-1913 (NLS),1949-70 (NLS) no longer labelled, markings remain. Landfill licence granted 1977 and shown in lower area until 1989.	Infilled Land	F
6	Landfill - Albany Farm Historic Landfill	Environment Agency, National Library of Scotland, Historic Map 1856	N	1977 - 1982	1892-1914 (NLS) - Old Chalk Pit. Inert backfill.	Infilled Land	F
7	Pit - Unspecified	National Library of Scotland, Historic Map 1856	N	1856 - 1965		Infilled Land	F
8	Pit - Sand	National Library of Scotland, Historic Map 1856	N	1856-1913 - 1937-61		Infilled Land	F
9	Pit - Chalk	National Library of Scotland, Fareham BC EHO, Historic Map 1856	Y	1856-1913 - 1949-70	1892-1913 (NLS) excavation markings still present 1949-92 (NLS). Chalk pit followed by farm use.	PSC & Infilled Land	F
10	Pit - Chalk	National Library of Scotland, Historic Map 1856	N	1856-1913 - 1949-78	Former pit and pond.	Infilled Land	F
11	Landfill - Heytesbury Farm Landfill	Environment Agency, National Library of Scotland / Fareham BC EHO	N	1856-1913 - 1949-70	Former clay pit. Visible on Historical 1956 Map, 1888-1913 (NLS),1949-70 (NLS) no longer labelled. First input 1980. Unknown last input. Local authority note - Waste treatment: landfill construction/demolition/builders waste.	Infilled Land	F
12	Pit - Various	Fareham Council EHO	N	Unknown	Chalk, gravel, clay pit	Infilled Land	F
14	Pit - Various	Fareham BC EHO	N	1856 - 1873	Chalk, gravel, clay pit	Infilled Land	F
15	Infilled Land - Disturbed Ground	Fareham BC EHO	N	Unknown	Unknown landfill/ Stockpiled Soil/ Raised land/ Reclaimed land/ Fly-tipping/Burnt waste - no evidence seen on historical maps.	PSC & Infilled Land	F
16	Embankment	Historic Map 1932	Y	1932 - 1987	Road embankment, road layout has changed in area.	PSC	F
17	Embankment	Historic Map 1958	N	1958 - 1992	Road embankment, layout of road has changed in area, road no longer extends up this far, although area still seems to be raised.	PSC	F
18	Waste Facility - Recycling and waste centre	Historic Map 1856, Google Earth	Y	1856 - Present	Charity Farm shown throughout Historical Maps until 1993. Current map shows area as a waste and recycling centre.	PSC	F
19	Infilled Land - Pond	Historic Map 1856	N	1856 - 1895		Infilled Land	F
20	Infilled Land - Drain	Historic Map 1856	N	1856 - 1910		Infilled Land	F
21	Farm - Whitedell Farm	Historic Maps 1856 - 1992 Google Earth 2024	Y	1856 - Present		PSC	F
22	Pit - Sand	Historic Map 1856	N	1856 - 1898		Infilled Land	F
23	Pit - Chalk	Historic Map 1873	N	1856 - 1985		Infilled Land	F
24	Pit - Chalk	Historic Map 1895	N	1895 - 1898		Infilled Land	F
25	Pit - Chalk	Historic Map 1897	N	1856 - 1985	Infilled Land, western part potentially crosses the pipeline route.	Infilled Land	F
26	Infilled Land - Channel	Historic Map 1868	N	1856 - 1910		Infilled Land	F
27	Infilled Land - Channel	Historic Map 1868	N	1856 - 1957		Infilled Land	F
28	Infilled Land - Channel	Historic Map 1868	N	1856 - 1957		Infilled Land	F
29	Electricity Sub Station (Small)	ArcGIS Earth / Google Earth	Y	1987 - Present		PSC	G
30	Infilled Land - Pond	National Library of Scotland	N	1868 - 1894		Infilled Land	G
31	Infilled Land - Pond	National Library of Scotland	N	1868 - 1938	Infilled by 1940.	Infilled Land	G
32	Farm - Cold Harbour Farm	National Library of Scotland, Google Earth	Y	1888 -1913 - Present		PSC	G
33	Garage - Drokes Farm Motor Company	Google Earth / ArcGIS Earth	Y	2017 - Present	2017 to Present (2023). Servicing, repairs and diagnostic.	PSC	G
34	Nursery	National Library of Scotland	Y	1949-70 - Present		PSC	G
35	Infilled Land - Pond	NLS	N	1888-1913 - 1999		Infilled Land	G
36	Pit - Gravel	National Library of Scotland	N	1892-1914 - 1937-61	Excavation marks visible 1937-61, no longer labelled, pipeline route no longer being passed through PSC.	Infilled Land	G
37	Pit - Gravel	National Library of Scotland	N	1868 - 1913		Infilled Land	G
38	Farm - Little Tapnage Farm	ArcGIS Earth / Google Earth	Y	2021 - Present	2021 Google Earth to Present.	PSC	G
39	Railway	National Library of Scotland	N	1909 - 1968	Appears to be dismantled by 1980. Area now a path.	PSC	G
40	Infilled Land - Pond	National Library of Scotland	N	1868-1897 - 1949-70		Infilled Land	G
41	Infilled Land - Pond	National Library of Scotland	N	1888 - 1994		Infilled Land	G
42	Hospital - Ravenswood	National Library of Scotland, Google Earth, Historic Map 1940	Y	1940-70 - Present		PSC	G
43	Embankment	Historic Map 1939	Y	1939 - Present		PSC	G
44	Embankment	Historic Map 1987	Y	1939 - Present		PSC	E
45	Pit - Gravel	Historic Map 1968	N	Pre-1868	Labelled as 'Gravel Pit Copse'; Shape seen in 1868 map and first labelled in 1888, no actual gravel pit confirmed.	Infilled Land	H
46	Pit - Various	Historic Map 1994, BGS Historical Mineral Planning Areas	N	1973 - 1994	Park Place - Sand and gravel surface mineral working (BGS) Licence granted 1972. Eastern corner pipeline passes through.	Infilled Land	G
49	Pit - Gravel	Historic Map 1895	N	1895 - 1938		Infilled Land	G
50	Infilled Land - Pond	Historic Map 1965	N	1965 - 1994		Infilled Land	G
51	Pit - Gravel	Historic Map 1895	N	1895 - 1938		Infilled Land	G
52	Pit - Gravel	Historic Map 1908	Y	1908 - Present	Pipeline no longer passes near PSC.	Infilled Land	G
53	Infilled Land - Pond	Historic Map 1868	N	1868 - 1994		Infilled Land	F
54	Infilled Land - Drain	Historic Map 1968	N	1868 - 1979	Unclear when the drain was first created, first labelled as a drain in map 1979, however shape can be seen on 1868 map.	Infilled Land	G
55	Infilled Land - Drain	Historic Map 1968	N	1868 - 1987	Unclear when the drain was first created, first labelled as a drain in map 1979, however shape can be seen on 1868 map.	Infilled Land	G
57	Infilled Land - Drain	Historic Map 1968	N	1868 -1980	Unclear when the drain was first created, first labelled as a drain in map 1979, however shape can be seen on 1868 map.	Infilled Land	G
58	Infilled Land - Drain	Historic Map 1968	N	1868 -1980	Unclear when the drain was first created, first labelled as a drain in map 1979, however shape can be seen on 1868 map.	Infilled Land	G
59	Pit - Sand	Historic Map 1868	N	1868 - 1938	Hospital built on top.	Infilled Land	G
60	Pit - Gravel	Historic Map 1895	N	1895 - 1938	Hospital built on top.	Infilled Land	G
62	Infilled Land - Drain	Historic Map 1868	N	1868 - 1994	Shown as a large channel in 1868map, no water shown in that area on ArcGIS Map, however channel outline is still visible on 1994 Map.	Infilled Land	G
64	Infilled Land - Drain	Historic Map 1868	N	1868 - 1895		Infilled Land	G
65	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
66	Infilled Land - Drain	Historic Map 1868	N	1868 - 1938		Infilled Land	G
67	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
68	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
69	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
70	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
71	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
72	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
73	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
74	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
75	Infilled Land - Drain	Historic Map 1868	N	1868	Only visible in 1868 map.	Infilled Land	G
76	Farm	Google Earth, Groundsure Historical Tanks layer	Y	Pre-1999 - Present	Tanks identified by Groundsure 1986-87.	PSC	H
77	Agricultural - Nursery / Farm	Google Earth	Y	1987 - Present	Possible greenhouses adjacent to corridor.	PSC	H
78	Infilled Land - Disturbed Ground	Google Earth	Y	2005 - Present	Ground shown as disturbed with soil and waste heaps. Land also used a farm yard.	PSC & Infilled Land	H
79	Farm	Google Earth	Y	1999 - Present	Small scale activities, no farm name.	PSC	H
80	Tank	Historic Map 1989	N	1986 - 2007		PSC	H

PSC No.	Name	Source	Current	Dates	Description	Category	Section
81	Tank	Historic Map 1989	N	1986 - 1994		PSC	H
82	Pit - Sand	Historic Map 1939	N	1939 - 1957		Infilled Land	H
83	Pit - Sand	Historic Map 1939	N	1939 - 1968		Infilled Land	H
84	Infilled Land - Pond	Historic Map 1868	N	1868 - 1909	No labels on map, however older maps potentially show a pit or an infilled pond.	PSC	H
85	Farm - Westland Farm	Historic Map 1994	Y	1994 - Present		PSC	H
86	Farm	Google Earth	Y	2014 - Present	Farm building.	PSC	H
87	Infilled Land - Swimming pool	Historic Map 1965	N	1965 - 1987		Infilled Land	H
88	Garage	Historic Map 1965, Winchester County Council, Groundsure	Y	1965 - Present		PSC	H
89	Pit - Sand	Historic Map 1965	N	1965 - 1968		Infilled Land	H
90	Landfill - Shirrel Heath Sand Pit	Historic Map 1987, Environment Agency	N	1976 - 1987	Surrounding Old sand pit site. Licence issue11/1976. Labelled as disused workings on 1987 Map. Input - inert, commercial waste.	Infilled Land	H
91	Infilled Land - Pond	Historic Map 1965	N	1965 - 1994	Partially infilled, current site has a river running through the middle. Date of infill unknown, visible on most recent historical map of area (1993) but not on current Google Earth imagery.	Infilled Land	H
92	Garage - Winkworths Garage	Historic Map 1986	Y	1986 - Present	Vehicle repair, maintenance and MOT services.	PSC	H
94	Farm - Woodman's Farm	National Library of Scotland	N	1888 - 1913		PSC	J
95	Pit - Sand	National Library of Scotland	N	1895 - 1896		Infilled Land	J
96	Industrial Estate - Woodmans Farm	Google Earth	Y	1993 - Present	On the former footprint of Woodmans Farm. Units include several vehicle maintenance garages, metal finisher and welding activities and air condition repair. Tank shown in north of site on 1993 historical map.	PSC	J
97	Landfill - Ash House Farm Landfill	National Library of Scotland	N	1868 - 1991		Infilled Land	J
98	Pit - Sand	National Library of Scotland, Historical Map 1968	N	1965 -1968		Infilled Land	J
99	Farm - Unknown	Google Earth	Y	1999 - Present	Farm or possible horse stable.	PSC	J
100	Farm - Five Oaks Farm	National Library of Scotland	Y	Present		PSC	J
101	Farm - Sandy Hill Farm	Historical Map 1868	N	1868 - 1897	From Sandy Hill Farm to Sandy Hill House in next map, 1909.	PSC	J
102	Pit - Sand	Historic Map 1869	N	1869 - 1897		Infilled Land	J
103	Pit - Sand	Historic Map 1895	N	1895 - 1957	LiDAR shows ground level lower than surrounding area. Potentially not infilled.	Infilled Land	H
104	Pit - Sand	Groundsure Historical Maps. BGS mineral planning areas and worked ground layer	N	1965 - 1987	Phillimore Sand pit 1965. 1987 map labels whole area as disused workings.	Infilled Land	J
106	Pit - Gravel	Historic Map 1869	N	1868 - 1869	Only visible on two maps. Not shown on 1895 map.	Infilled Land	K
107	Infilled Land - Marshland	Historical Map 1964	N	1964 - 1993	Not visible on current aerial photography. May still be present.	Infilled Land	K
108	Infilled Land - Marshland	Historical Map 1964	N	1964 - 1993,	Potentially infilled by 1999.	Infilled Land	K
109	Infilled Land - Drain	Historical Map 1964	N	1964 - 1993		Infilled Land	K
114	Wastewater Treatment Works - Pumping Station	Historic Map 1994	Y	1985 - Present		PSC	J
115	Infilled Land - Drain	Historic Map 1965	N	1965	Exact location and size unclear. Label 'drain' present in 1965 map only.	Infilled Land	J
116	Embankment - Park Lug	Historic Map 1964, Hants.gov.uk	Y	1964 - Present	Historical map appear to show a tree lined artificially raised land to form an embankment. Embankment identified as Park Lug on historical maps. Hants.gov.uk describes Park Lug as a boundary for a medieval deer park.	PSC	J
117	Farm - Brooklands Farm	Historic Map 1868	Y	1868 - Present	Lodge Farm/Brooklands farm currently residential housing	PSC	K
118	Infilled Land - Marshland	National Library of Scotland	N	1840-1880		Infilled Land	K
119	Infilled Land - Channel	Historic Map 1869	N	1868 - 1957		Infilled Land	K
121	Infilled Land - Channel	Historic Map 1869	N	1868 - 1985		Infilled Land	K
122	Infilled Land - Channel	Historic Map 1869	N	1868 - 1896		Infilled Land	K
123	Infilled Land - Channel	Historic Map 1869	N	1868 - 1957	Partially infilled at different times, channel is last visible on 1957 map.	Infilled Land	K
125	Railway	National Library of Scotland	N	1868 - 1964	Marked as disused from 1964.	PSC	K
126	Pit - Sand	Historic Map 1957	N	1957	Only visible on 1957 Map. Not visible on 1910 or 1965 maps.	Infilled Land	J
127	Infilled Land - Pond	Historic Map 1868	N	1868 - 1909		Infilled Land	E
128	Infilled Land - Pond	Historic Map 1909	N	1896 - 1957		Infilled Land	J
129	Farm - Dalecote Farm	Historic Map 1965	Y	1965 - Present		PSC	J
130	Farm - Treefield Farm	Historic Map 1868	Y	1957 - Present		PSC	J
131	Agricultural - Orchard	ArcGIS Earth	Y	1868 - Present		PSC	K
132	Infilled Land - Pond	National Library of Scotland	N	1868 - 1957	Infilled by 1964. Land drain still present.	Infilled Land	K
133	Infilled land - Artificial Deposit	British Geological Survey	N	Unknown	BGS Artificial Ground	Infilled Land	K
134	Infilled Land - Pond	National Library of Scotland	N	1888 - 1914		Infilled Land	K
135	Farm - Winterhill Farm	National Library of Scotland, ArcGIS Earth	N	1888 - 1913		PSC	K
136	Garage	Google Earth	Y	Present		PSC	K
137	Works - Brick works	NLS	N	1888-1913 - 1949-70	1937-61 Works.	PSC & Infilled Land	K
138	Farm - Trullingham / Laurel Farm	NLS / Google Earth	Y	1868 - Present	Shown as Trullingham on maps from 1888-1913 to 1949-70. Laurel Farm not shown until 1949-70.	PSC	K
139	Infilled Land - Landscaped bank	National Library of Scotland	N	1896 - 1993		Infilled Land	K
140	Works - Brick works	Groundsure Winchester City Council	N	1868 - 1888	Recorded as a Brick Field with Kilns on the 1885 map. No longer recorded as a Brick Field on the 1896 map and forms the rear garden of a residential property.	Infilled Land	K
143	Farm - Merry Orchard Farm	Historic Map 1964	Y	1964 - Present	Cherry Orchard Farm/Merry, possibly part of Merrytree Farm/Merry Orchard Farm.	PSC	K
146	Infilled Land - Pond	Historic Map 1993	N	1993 - 2000	Only visible on 1993 map.	Infilled Land	K
148	Infilled Land - Pond	Historic Map 1868	N	1868 - 1964		Infilled Land	K
149	Infilled Land - Marshland	Historic Map 1964	Y	1964 - Present		Infilled Land	K
150	Farm - Tangier Farm	Historic Map 1868	Y	1868 - Present	Tangier Farm.	PSC	K
151	Infilled Land - Pond	National Library of Scotland	N	1888-1913 - 1947-1970		Infilled Land	L
152	Works - Brick works	National Library of Scotland, Winchester CC EHO	N	1892-1914	The 1940 plan records the site as disused with the south eastern area of the site divided up into fields. Post 1940 site is recorded as open ground with ponds. Site developed into housing post 1963 into housing.	PSC & Infilled Land	L
153	Landfill - Sand pit	National Library of Scotland, Winchester CC EHO	N	1892-1914 - 1945-1965		Infilled Land	L
154	Embankment	National Library of Scotland	Y	1888 - Present		PSC	L
155	Infilled Land - Made Ground (BGS)	National Library of Scotland, BGS	Y	1868 - Present		PSC	L
156	Garage	Google Maps	Y	Present	Vehicle maintenance.	PSC	L
157	Industrial Estate - Simba Business Park	Google Maps	Y	Present	Business park (fuel, workshops, general trade).	PSC	L
158	Garage	Google Earth	Y	Present	Fuel store / vehicle repair.	PSC	L
159	Waste Facility - Recycling / Scrap Yard	ArcGIS Earth	Y	Present		PSC	L
160	Farm - Rockery Farm	Google Earth	Y	Present		PSC	L
161	Worked Ground	Google Earth	N	2019 - 2020		PSC	L
162	Farm - Lowhill Farm	ArcGIS Earth	Y	1868 - Present		PSC	L
163	Farm - Ashbourne Stables	Google Earth	Y	1993 - Present		PSC	L
164	Fuel Filling Station	Historical Map 1963, Winchester City Council	N	1963 - 2010	Poor map coverage post 1963. The 1983 map shows the garage and a Coach House developed on the site, 1989 only labels the coach house.	PSC	L
165	Pit - Gravel	Historic Map 1868	N	1868 - 1957		Infilled Land	L
166	Pit - Gravel	Historic Map 1996	N	1888 - 1957	Replaced with houses.	Infilled Land	L

PSC No.	Name	Source	Current	Dates	Description	Category	Section
167	Works - Old Brick Yard	Historic Map 1868, Groundsure Historical Land Use layer	N	1868 - 1968	According to 2024 Groundsure Reports, unspecified pits and ground working are also associated with this PSC.	PSC & Infilled Land	L
168	Works - Brick works	Historic Map 1868	N	1868 - 1869	Brick Works, Clay Pits, Kilns.	PSC & Infilled Land	L
170	Infilled Land - Swimming Pool	Historic Map 1937	N	1937 - 1994		PSC & Infilled Land	L
171	Infilled Land - Pond	Historic Map 1989, ArcGIS Map	Y	1989 - Present	Large areas have been infilled and a smaller pond now exists here.	Infilled Land	L
172	Infilled Land - Pond	Historic Map 1989, ArcGIS Map	Y	1989 - Present	Large areas have been infilled and a smaller pond now exists here.	Infilled Land	L
173	Infilled Land - Pond	Historic Map 1989	N	1989 - 1993		Infilled Land	L
174	Infilled Land - Drain	Historic Map 1963	N	1963 - 1995		Infilled Land	L
175	Infilled Land - Drain	Historic Map 1963, ArcGIS Map	N	1868 - 1993	Only labelled as a drain in maps 1963 & 1968; maps as far back as 1868 show shape of the watercourse without the label, modern map shows a smaller watercourse crossing the western section. Eastern section potentially re-aligned to electricity pylon route	Infilled Land	L
177	Works - Unknown	Historic Map 1963	N	1963 - 1968	Labelled as 'works' in 1963 map, structures still visible in 1968 map, but not before 1963 or 1968.	PSC	L
178	Works - Unknown	Historic Map 1963	N	1963 - 1968	Labelled as 'works' in 1963 map, structures visible in 1968 map, but not before 1963 or after 1968 maps.	PSC	L
179	Pit - Gravel	Historic Map 1939	N	1939	Only visible in 1939 map.	Infilled Land	L
180	Pit - Gravel	Historic Map 1939	N	1937	Only visible in 1937 map.	Infilled Land	L
181	Pit - Gravel	Historic Map 1909	N	1909 - 1910		Infilled Land	L
182	Farm - Tee's Farm	Historic Map 1868	N	1868 - 1939		PSC	L
183	Infilled Land - Pond	Historic Map 1868	N	1868 - 1984		Infilled Land	L
184	Infilled Land - Pond	Historic Map 1868	N	1868 - 1896.		Infilled Land	L
185	Infilled Land - Pond	Historic Map 1868	N	1868 - 1963		Infilled Land	L
186	Farm - Upper Bambridge Farm	Historic Map 1968	Y	1868 - Present		PSC	L
187	Farm - Hill's Farm	Historic Map 1939	N	1868 - 1984		PSC	L
188	Infilled Land - Pond	Historic Map 1957	N	1957	Only visible in 1957 map.	Infilled Land	L
189	Infilled Land - Pond	Historic Map 1963	N	1963 - 1968		Infilled Land	L
190	Infilled Land - Pond	Historic Map 1963	N	1963	Only visible in 1963 map.	Infilled Land	L
191	Infilled Land - Pond	Historic Map 1868	N	1868 - 1937		Infilled Land	L
192	Tank	Historic Map 1963	N	1963	Only visible in 1963 map.	PSC	L
193	Farm - Leylands Farm	Historic Map 1968	N	1868 - 1968		PSC	L
196	Infilled Land - Pond	Historic Map 1868	N	1868 - 1939		Infilled Land	L
197	Infilled Land - Pond	Historic Map 1868	N	1868 - 1964		Infilled Land	L
198	Infilled Land - Pond	Historic Map 1868	N	1868 - 1964		Infilled Land	L
199	Infilled Land - Pond	Historic Map 1994	N	1992 - 2000	Date of infill unknown. Pond shown on 1994 map, no longer shown on modern map.	Infilled Land	L
201	Works - Depot	ArcGIS Earth	Y	Present	Metal warehouse frame and outdoor storage area with equipment.	PSC	E
202	Infilled Land - Lagoon	National Library of Scotland	N	1963 - Present		Infilled Land	M
204	Railway	Google Maps	Y	1868 - Present		PSC	M
206	Infilled Land - Pond	NLS, ArcGIS Map, Historic Map 1963	N	1963 - 1984	Pond size has changed through maps, notably from 1968 map, extended in some areas and infilled in others.	Infilled Land	M
208	Water Works	Historic Map 1888, ArcGIS Earth	Y	1888 - Present	First classed as Water works; then Sewage Works and sewage farms. Site structures include sewerage septic-tanks and filter beds.	PSC	M
209	Landfill - Bugle Farm Landfill	Groundsure Historical Maps, Environment Agency	N	1937 - 1963	Extraction of alluvial sediments (sand, stone, clay, peat, marl and gravel), previously a farm. No information on first last input or waste type from Environment Agency. SSP 2023 site visit did not find evidence of landfilling.	Infilled Land	M
210	Infilled Land - Pond	Historic Map 1963	N	1963	Infilled Pond, turns into drainage area.	Infilled Land	M
214	Landfill - Brambridge Landfill	Historic Map 1957, BGS, Hampshire County Council	N	1957	Former sand and gravel pit, Made Ground (BGS). Local authority records note 'Gas risk - no info, permeability - high'.	Infilled Land	M
215	Infilled Land - Pond	Historic Map 1963	N	1963 - 1999	Pond has changed in size over time.	Infilled Land	M
216	Infilled Land - Drain	Historic Map 1963	N	1963	Only labelled on 1963 map, present day northern section seems to now have a pond.	Infilled Land	M
217	Infilled Land - Pond	Historic Map 1963	N	1963	Watercourses still present. Pond shown until last historic map in 1993.	Infilled Land	M
218	Water Works - Pumping, Treatment, Tanks	Historic Map 1939	Y	1939 - 1963	Disused Pumping Station, Waterworks, Tanks. Site still present on 1993 map. Outline still present on 2022 Google earth, but only labelled on historical map up to 1963.	PSC	E
219	Infilled Land - Drain	Historic Map 1963	N	1963 - 1968		Infilled Land	M
220	Water Works - Filter beds	Historic Map 1937	N	1937 - 1957		PSC	M
221	Infilled Land - Drain	Historic Map 1963	N	1895 - 1980	Feature only labelled as a drain in 1963 map, however structure can be seen as far back as the 1895 map.	Infilled Land	E
222	Infilled Land - Drain	Historic Map 1963	N	1869 - 1980	Feature only labelled as a drain in 1963 Map, however structure can be seen as far back as the 1869 map.	Infilled Land	E
223	Infilled Land - Drain	Historic Map 1963	N	1963	Only visible in 1963 map.	Infilled Land	E
224	Infilled Land - Drain	Historic Map 1963	N	1908 - 1980	Drain extends further SE, however that appears to still be filled with water. Feature only labelled as a drain in 1963 Map, however structure can be seen as far back as the 1908 map	Infilled Land	E
225	Infilled Land - Sluice	Historic Map 1896	N	1869 - 1896		Infilled Land	M
226	Infilled Land - Channel	Historic Map 1896	N	1869 - 1999	Unsure exactly when infilled. Visible on last historical map of the area, not shown on Google Earth 1999 image.	Infilled Land	E
227	Infilled Land - Channel	Historic Map 1869	N	1869 - 1957		Infilled Land	E
228	Infilled Land - Channel	Historic Map 1869	N	1869 - 1909		Infilled Land	M
229	Infilled Land - Channel	Historic Map 1869	N	1869 - 1999	Unsure exactly when infilled. Visible on last historical map of the area, not shown on Google Earth 1999 image.	Infilled Land	E
230	Infilled Land - Channel	Historic Map 1869	N	1869 - 1957		Infilled Land	E
231	Infilled Land - Channel	Historic Map 1896	N	1869 - 1909		Infilled Land	M
232	Infilled Land - Channel	Historic Map 1896	N	1869 - 1968		Infilled Land	E
233	Infilled Land - Pond	Historic Map 1869	N	1869 - 1999	Unsure exactly when infilled. Visible on last historical map of the area, not shown on Google Earth 1999 image.	Infilled Land	E
234	Infilled Land - Channel	Historic Map 1870	N	1870 - 1999	Unsure exactly when infilled. Visible on last historical map of the area, not shown on Google Earth 1999 image.	Infilled Land	M
235	Infilled Land - Channel	Historic Map 1870	N	1870 - 1957		Infilled Land	M
236	Infilled Land - Channel	Historic Map 1870	N	1869 - 1999	Unsure exactly when infilled. Visible on last historical map of the area, not shown on Google Earth 1999 image.	Infilled Land	E
237	Infilled Land - Drain	Historic Map 1963	N	1963 - 1999	Unsure exactly when infilled. Visible on last historical map of the area, not shown on Google Earth 1999 image.	Infilled Land	E
238	Infilled Land - Drain	Historic Map 1963	N	1957 - 1999	Unsure exactly when infilled. Visible on last historical map of the area, not shown on Google Earth 1999 image.	Infilled Land	M
239	Infilled Land - Drain	Historic Map 1993	N	1932 - 1999	Unsure exactly when infilled. Visible on last historical map of the area, not shown on Google Earth 1999 image.	Infilled Land	E
240	Infilled Land - Drain	Historic Map 1958	N	1869 - 1987		Infilled Land	E
241	Infilled Land - Drain	Historic Map 1958	N	1869 - 1987		Infilled Land	E
242	Infilled Land - Drain	Historic Map 1958	N	1958 - 1987		Infilled Land	E
243	Farm - Bugle Farm	Historic Map 1968	Y	1968 - Present		PSC	E
256	Infilled Land - Pond	Historic Map 1993	N	1896-1993		Infilled Land	K
257	Infilled Land - Tank	Historic Map 1994	N	1994	Former tank, now part of a nursery (agricultural).	PSC & Infilled Land	G
258	Farm - Prior's Holds Farms	NLS	Y	1888-1913 - Present		PSC	E
259	Farm	NLS	Y	Pre-1999 - Present		PSC	E
260	Pit - Gravel	National Library of Scotland	N	1888 - 1913		Infilled Land	E
261	Farm - Heath Farm	Google Earth	Y	Present		PSC	E
262	Pit - Unspecified	National Library of Scotland	N	1888 - 1970	Local authority suggest pit present in 1878.	Infilled Land	E

PSC No.	Name	Source	Current	Dates	Description	Category	Section
263	Farm - Pigeionhouse Farm	National Library of Scotland	N	1856-1913 - 1949-70	Currently residential property.	PSC	E
264	Pit - Chalk	National Library of Scotland	N	1856-1913 - 1949-70		Infilled Land	E
265	Infilled Land - Pond	National Library of Scotland	N	1856-1931 - 1949-70		Infilled Land	E
266	Worked Ground	National Library of Scotland	N	1937-61 - 1949-70	1937-61 unspecified buildings.1949-70 (NLS) unspecified heaps. Area identified by local authority as a former anti-aircraft battery during 2nd world war.	PSC	E
267	Pit - Chalk	National Library of Scotland	N	1888-1913 - 1949-70		Infilled Land	E
268	Pit - Chalk	National Library of Scotland	N	1856-1913 - 1937-61		Infilled Land	E
269	Pit - Chalk	National Library of Scotland	N	1908 - 1913	Local authority suggest pit present in 1873.	Infilled Land	E
270	Pit - Chalk	National Library of Scotland	N	1888-1913 - 1949-70		Infilled Land	E
271	Pit - Chalk	National Library of Scotland	N	1888-1913 - 1937-61		Infilled Land	E
273	Water Works - Reservoir	National Library of Scotland	N	1938 - 1951	Reservoir(Portsmouth Water Works).	PSC	E
274	Infilled Land - Pond	National Library of Scotland	N	1937-61 - 1949-70		Infilled Land	E
275	Pit - Chalk	Historic Map 1860	N	1856 - 1980		Infilled Land	E
276	Pit - Chalk	Historic Map 1869	N	1856 - 1980		Infilled Land	E
277	Pit - Chalk	Historic Map 1869	N	1856 - 1978		Infilled Land	E
278	Pit - Chalk	Historic Map 1869, Groundsure Historical Industrial Land Uses layer	N	1856 - 1957		Infilled Land	E
279	Works - Kiln	Historic Map 1869	N	1869 - 1957		PSC	E
280	Infilled Land - Pond	Historic Map 1856	N	1856 - 1897		Infilled Land	E
281	Pit - Chalk	Historic Map 1873	N	1873 - 1980		Infilled Land	E
282	Works - Kiln	Historic Map 1856	N	1856 - 1957		PSC	E
283	Pit - Chalk	Historic Map 1856	N	1856 - 1993		Infilled Land	E
284	Pit - Chalk	Historic Map 1856	N	1856 - 1895		Infilled Land	E
285	Pit - Chalk	Historic Map 1856	N	1856 - 1873		Infilled Land	E
286	Infilled Land - Well	Historic Map 1868	N	1868 - 1965		Infilled Land	E
287	Pit - Chalk	Historic Map 1873	N	1873 - 1978		Infilled Land	E
288	Pit - Chalk	Historic Map 1895	N	1895 - 1980		Infilled Land	E
289	Pit - Chalk	Historic Map 1895	N	1895 - 1978		Infilled Land	E
290	Pit - Chalk	Historic Map 1895	N	1895 - 1957		Infilled Land	E
291	Pit - Chalk	Historic Map 1895	N	1895 - 1993		Infilled Land	E
292	Pit - Chalk	Historic Map 1895	N	1895 - 1941		Infilled Land	E
293	Pit - Chalk	Historic Map 1895	N	1895 - 1908		Infilled Land	E
294	Pit - Chalk	Historic Map 1897	N	1897 - 1972		Infilled Land	E
295	Pit - Chalk	Historic Map 1909	N	1909 - 1957		Infilled Land	E
296	Infilled Land - Pond	Historic Map 1909	N	1868 - 1957		Infilled Land	E
297	Military - Fort Widley	Historic Map 1963	Y	1850 - 1972	Various uses. Last military use 1972. See Zeticia Report P14032-24-R10 Site E. Sold to Portsmouth Council 1972.	Military	E
298	Farm - New Barns Farm	Historic Map 1968	Y	1968 - Present		PSC	E
299	Infilled Land - Pond	National Library of Scotland	N	1860 - 1913		Infilled Land	D
300	Pit - Chalk	National Library of Scotland	N	1888 - 1913		Infilled Land	D
301	Infilled Land - Pond	National Library of Scotland	N	1892 - 1914		Infilled Land	D
302	Pit - Chalk	National Library of Scotland, Havant Borough Council	N	1866 - 1980	Known or suspected filled ground.	Infilled Land	D
303	Pit - Chalk	National Library of Scotland	N	1888 - 1913		Infilled Land	D
304	Military - Farlington Redoubt	https://www.heritagegateway.org.uk/Gateway/. Zetica Detailed UXO report.	N	1860s - 1991	1860s - Farlington Redoubt, former barracks. Chalk pit 1931 - 1991. Chalk pit used as firing range during 1944.	Infilled Land	D
305	Waste Facility - Physical Treatment Facility	Google Earth	Y	Present	L&S Waste Management. EA Permit Number - DP3295HN, A16 : Physical Treatment Facility.	PSC	D
306	Pit - Chalk	National Library of Scotland	N	1860 - 1913	Former quarry	Infilled Land	D
307	Water Works - Treatment Works	Groundsure, Google Earth	Y	1931 - Present	Filter beds shown in the northern portion of the map. Filter tanks also shown on maps.	PSC	D
308	Water Works - Reservoir	National Library of Scotland	N	1897 - Present		PSC	D
310	Garage	Google Earth	Y	Present	Tyre repair / replacement garage.	PSC	E
311	Pit - Chalk	Historic Map 1859	N	1859 - 1932	Labelled 'old chalk pit' on 1859 map. Shown as 'Old chalk pit' and 'Collyer's Pit' on 1897 map buildings in the central area. Cottages shown by 1951.	Infilled Land	D
313	Pit - Chalk	National Library of Scotland	N	1859 - 1913	Eastern part extends across pipeline route.	Infilled Land	D
314	Pit - Unspecified	National Library of Scotland	N	1860-1913 - 1949-1970	Labelled 'The Dell'	Infilled Land	D
315	Infilled Land - Pond	National Library of Scotland	N	1869 - 1914		Infilled Land	D
316	Farm - Highbank Farm	National Library of Scotland	N	1970 - 1973		PSC	D
317	Infilled Land - Pond	National Library of Scotland	N	1888 - 1973		Infilled Land	D
318	Infilled Land - Pond	National Library of Scotland	N	1860 - 1913		Infilled Land	D
319	Water Works - Reservoir	National Library of Scotland	N	1897 - 1991	Reservoir(Portsmouth Water Works).	Infilled Land	D
320	Railway - Portsdown & Horndean (Tram)	Historic Map 1910, Wikipedia	N	1903 - 1935	Portsdown & Horndean Light railway (tram).	PSC	D
321	Electricity Sub Station (Small)	ArcGIS Earth	Y	1960 - Present		PSC	D
322	Pit - Chalk	Historic Map 1859	N	1859 - 1995		Infilled Land	D
323	Pit - Chalk	Historic Map 1859	N	1859 - 1971		Infilled Land	D
324	Pit - Chalk	Historic Map 1859	N	1859 - 1963		Infilled Land	E
325	Pit - Clay	Historic Map 1860, Havant Borough Council	N	1860 - 1907	Known or suspected Made Ground (local authority records).	Infilled Land	D
326	Pit - Sand	Historic Map 1860, Environment Agency, Havant Borough Council	N	1860 - 1960	Privett Road Sand Pit. Input data and type unknown.	Infilled Land	D
327	Infilled Land - Pond	Historic Map 1860	N	1860 - 1991		Infilled Land	D
328	Infilled Land - Pond	Historic Map 1860	N	1860 - 1869		Infilled Land	D
329	Pit - Chalk	Historic Map 1866	N	1866 - 1969		Infilled Land	D
330	Pit - Chalk	Historic Map 1866, Havant Borough Council	N	1866 - 1897	Known or suspected filled ground (local authority records).	Infilled Land	D
331	Pit - Unspecified	Historic Map 1868	N	1868 - 1897	Davis's Grave / Beris's Grave	Infilled Land	D
332	Infilled Land - Pond	Historic Map 1895	N	1895 - 1937		Infilled Land	D
333	Infilled Land - Pond	Historic Map 1895	N	1895 - Present		Infilled Land	D
334	Infilled Land - Pond	Historic Map 1895	N	1895 - 1930		Infilled Land	D
335	Infilled Land - Pond	Historic Map 1895	N	1895 - 1937		Infilled Land	D
336	Pit - Gravel	Historic Map 1897, Havant Borough Council, Groundsure Historical Industrial Use layer	N	1897 - 1930	Known or suspected filled ground (local authority records).	Infilled Land	D
337	Infilled Land - Pond	Historic Map 1898	N	1898 - 1907		Infilled Land	D
338	Pit - Sand	Historic Map 1930	N	1930 - 1937		Infilled Land	D
339	Pit - Sand	Historic Map 1930	N	1930 - 1952		Infilled Land	D

PSC No.	Name	Source	Current	Dates	Description	Category	Section
340	Military - Fort Purbrook	Historic Map 1932	Y	1861 - 1968	Various uses. Last military use 1968. See Zeticia Detailed UXO Report P14032-24-R11, D Site.	Military	D
341	Agricultural - Nursery	Historic Map 1937	N	1937 - 1963		PSC	D
344	Water Works	Historic Map 1950	Y	1950 - Present	Drain (covered).	PSC	D
345	Infilled Land - Drain	Historic Map 1950	N	1950 - 1993	Drain (covered).	Infilled Land	D
346	Infilled Land - Drain	Historic Map 1950	N	1950 - 1993		Infilled Land	D
347	Infilled Land - Drain	Historic Map 1950	N	1950 - 1973		Infilled Land	D
348	Infilled Land - Drain	Historic Map 1950	N	1950 - 1973		Infilled Land	D
349	Electricity Sub Station (Small)	Historic Map 1951	Y	1951 - Present		PSC	D
350	Infilled Land - Pond	Historic Map 1952	N	1952 - 1959		Infilled Land	D
351	Infilled Land - Drain	Historic Map 1960	N	1960 - 1979		Infilled Land	D
352	Farm - Highbank Farm	Historic Map 1960	N	1960 - 1973		PSC	D
353	Infilled Land - Pond	Historic Map 1960	N	1960 - 1973		Infilled Land	E
354	Infilled Land - Drain	Historic Map 1960	N	1960 - 1975		Infilled Land	E
355	Infilled Land - Drain	Historic Map 1960	Y	1960 - Present	Looks to be covered but still mapped. Possibly realigned but Groundsure show a watercourse in this location by woodland	Infilled Land	E
356	Infilled Land - Swimming Pool	Historic Map 1969	N	1969 - 1982	Swimming Pool.	Infilled Land	D
357	Electricity Sub Station (Small)	Historic Map 1968	Y	1968 - Present		PSC	D
358	Water Works	Historic Map 1969	Y	1969 - Present	Reservoir (Covered).	Infilled Land	D E
359	Infilled Land - Swimming Pool	Historic Map 1969	N	1969 - 1973	Swimming Pool.	Infilled Land	D
360	Infilled Land - Swimming Pool	Historic Map 1969	N	1969 - 1973	Swimming Pool.	Infilled Land	D
361	Pit - Chalk	Historic Map 1969	N	1859 - 1980	Northern portion crosses pipeline route.	Infilled Land	D
363	Electricity Sub Station (Small)	Historic Map 1971	Y	1971 - Present		PSC	D
364	Water Works	Historic Map 1973	N	1973	Tank.	PSC	D
365	Water Works	Historic Map 1973	N	1973 - 1991		PSC	D
366	Water Works - Reservoir	Historic Map 1991	Y	1991 - Present	Covered Reservoir.	Infilled Land	D
367	Pit - Chalk	Historic Map 1993	N	1991 - Present	Potentially Infilled.	Infilled Land	D E
368	Infilled Land - Marshland	Historic Map 1993	Y	1993 - Present		Infilled Land	E
369	Infilled Land - Marshland	Historic Map 1993	Y	1993 - Present		Infilled Land	E
370	Infilled Land - Made Ground (BGS)	Historic Map 1866, Havant Borough Council	N	1866 - 1974	Potential infill with Earth Spoils, Domestic Refuse, Incinerator Ash (local authority records).	Infilled Land	WRP (C), Budds Farm to WRP (C)
372	Infilled Land - Marshland	Historic Map 1866	N	1866 - 1993	Broad Marsh.	Infilled Land	WRP (C), Budds Farm to WRP (C), D
375	Infilled Land - Watercourse	Historic Map 1867	N	1863 - 1969	Former Hermitage Stream to Storehouse Lake.	Infilled Land	WRP (C), Budds Farm to WRP (C)
378	Wastewater Treatment Works - Budds Farm	Historic Map 1969	Y	1969 - Present	Budd's Farm Sewage Works.	PSC	Budds Farm (C), Budds Farm to WRP (C)
379	Wastewater Treatment Works - Lagoons	Historic Map 1969	N	1969 - 1991	Sewage Sludge.	Infilled Land	Budds Farm (C), Budds Farm to WRP (C)
381	Works - Aggregate	Historic Map 1991	Y	1991 - Present	Aggregate works currently owned by Tarmac. Hanson ready mixed concrete plant located on site.	PSC	Budds Farm to WRP (C)
382	Works	Google Earth, Historic Map 1971, Havant Borough Council	Y	1958 - Present	Garage / Depot / Works / Factory. Area of known or suspected filled ground (local authority records).	PSC	WRP to Havant Thicket Reservoir (B)
383	Railway - Building and siding	National Library of Scotland	N	1892 - 1914	Historical Maps do not detail use. Possibly for storage.	PSC	WRP to Havant Thicket Reservoir (B)
385	Infilled Land - Pond	National Library of Scotland	N	1892 - 1914	In proposed tunnel area.	Infilled Land	WRP to Havant Thicket Reservoir (B)
386	Infilled Land - Watercourse	National Library of Scotland	N	1888 - 1913		Infilled Land	WRP to Havant Thicket Reservoir (B)
387	Works - Corn Mill	National Library of Scotland, Historic Map 1866	N	1866 - 1951	Including Mills Dams and pond areas that have been infilled.	PSC	WRP to Havant Thicket Reservoir (B)
388	Wastewater Treatment Works	National Library of Scotland	N	1931 - 1966	Tanks and filter beds shown on 1939 historical map onwards.	PSC	WRP to Havant Thicket Reservoir (B)
389	Infilled Land - Watercourse	National Library of Scotland, Havant Borough Council	N	1892 - 1978	Area of known or suspected infilled soils (local authority records)	Infilled Land	WRP to Havant Thicket Reservoir (B)
391	Railway - South Western Railway	Historic Map 1866	Y	1866 - Present	South Western Railway branch line.	PSC	WRP to Havant Thicket Reservoir (B), D
392	Infilled Land - Pond	Historic Map 1866	N	1866 - 1951		Infilled Land	WRP to Havant Thicket Reservoir (B)
393	Infilled Land - Pond	Historic Map 1886	N	1868 - 1971		Infilled Land	WRP to Havant Thicket Reservoir (B)
394	Infilled Land - Pond	Historic Map 1886	N	1868 - 1907		Infilled Land	WRP to Havant Thicket Reservoir (B)
395	Water Works - Tank	Historic Map 1939	N	1939 - 1961		PSC	WRP to Havant Thicket Reservoir (B)
396	Water Works - Tank	Historic Map 1939	Y	1939 - Present		PSC	WRP to Havant Thicket Reservoir (B)
397	Water Works - Tank	Historic Map 1939	Y	1939 - Present		PSC	WRP to Havant Thicket Reservoir (B)
398	Water Works - Tank	Historic Map 1939	Y	1939 - Present		PSC	WRP to Havant Thicket Reservoir (B)
399	Water Works - Tank	Historic Map 1939	Y	1939 - Present		PSC	WRP to Havant Thicket Reservoir (B)
400	Water Works - Tank	Historic Map 1939	Y	1939 - Present		PSC	WRP to Havant Thicket Reservoir (B)
401	Water Works - Tank	Historic Map 1939	Y	1939 - Present		PSC	WRP to Havant Thicket Reservoir (B)
403	Wastewater Treatment Works	Historic Map 1952	N	1952 - 1957	1952 map shows sludge beds, filter beds, settling tanks, congestion tanks (east of Dunsbury Way) and humus tanks (west side of Dunsbury Way). Now an industrial estate.	PSC	WRP to Havant Thicket Reservoir (B)
405	Infilled Land - Pond	Historic Map 1953	N	1953 - 1971	Pond likely infilled, now forms part of residential gardens.	Infilled Land	WRP to Havant Thicket Reservoir (B)
406	Infilled Land - Pond	Historic Map 1953	N	1953 - 1973		Infilled Land	WRP to Havant Thicket Reservoir (B)
407	Water Works - Pumping station	Historic Map 1955	N	1955 - 1998		Infilled Land	WRP to Havant Thicket Reservoir (B)
408	Farm - Health Farm	Historic Map 1955	N	1955 - 1973	Farm	PSC	WRP to Havant Thicket Reservoir (B)
409	Infilled Land - Pond	Historic Map 1955	N	1955 - 1978	Pond, potentially infilled land	Infilled Land	WRP to Havant Thicket Reservoir (B)
411	Infilled Land - Drain	Historic Map 1955	N	1955 - 1978		Infilled Land	WRP to Havant Thicket Reservoir (B)
413	Infilled Land - Drain	Historic Map 1963	N	1963 - 1973		Infilled Land	WRP to Havant Thicket Reservoir (B)
414	Infilled Land - Drain	Historic Map 1963	N	1955 - 1973		Infilled Land	WRP to Havant Thicket Reservoir (B)
415	Farm - Hook's Farm	Historic Map 1966	N	1966 - 1971	Farm.	PSC	WRP to Havant Thicket Reservoir (B)
416	Infilled Land - Drain	Historic Map 1966	N	1966 - 1971	Drain - Infilled Land.	Infilled Land	WRP to Havant Thicket Reservoir (B)
417	Infilled Land - Drain	Historic Map 1966	N	1961 - 1973		Infilled Land	WRP to Havant Thicket Reservoir (B)
418	Infilled Land - Drain	Historic Map 1967	N	1967 - 1987		Infilled Land	E
420	Infilled Land - Swimming Pool	Historic Map 1974	Y	1974 - 1993	Swimming Pool - No Longer present, last record 1993.	PSC	WRP to Havant Thicket Reservoir (B)
421	Infilled Land - Pond	National Library of Scotland	N	1892 - 1914		Infilled Land	E
422	Farm - Dunsbury Hill Farm	National Library of Scotland, Google Earth	N	1840-1880- 1999	Last available map shown 1963 NLS map. Not shown on 1999 google photography.	PSC	E
424	Infilled Land - Pond	Historic Map 1952	Y	1866 - 1966	Pond - Potentially still present but obscured by trees.	Infilled Land	Havant Thicket Reservoir (A)
425	Infilled Land - Swimming Pool	Historic Map 1952	N	1952 - 1956	Swimming Pool - Part of Stockheath Naval Camp.	Infilled Land	Havant Thicket Reservoir (A)
426	Embankment	Historic Map 1956	N	1956 - 1964	Embankment - Crosses Pipeline Route.	PSC	WRP to Havant Thicket Reservoir (B)
427	Infilled Land - Drain	Historic Map 1975	Y	1975 - Present	Drain - Likely still present, potentially obscured by trees.	Infilled Land	Havant Thicket Reservoir (A)
428	Infilled Land - Drain	Historic Map 1988	N	1988 - 1991		Infilled Land	Havant Thicket Reservoir (A)
429	Infilled Land - Marshland	Historic Map 1866	N	1866 - 1938		Infilled Land	WRP (C), WRP to Bedhampton Springs (B)
430	Infilled Land - Pond	Historic Map 1951	N	1939 - 1969	Potentially still present.	Infilled Land	D

PSC No.	Name	Source	Current	Dates	Description	Category	Section
431	Works - Portsdown Windmill	Historic Map 1869	N	1856 - 1869		PSC	E
432	Pit - Unspecified	Historic Map 1980, Groundsure Historical Industrial Land use and waste disposal layers	N	1856 - 1991	Disused pit on 1980 map. Widley Dell on previous maps. Groundsure Waste Disposal layer notes 1952 used as landfill or other waste disposal site. Site may extend southwest outside of boundary.	Infilled Land	E
433	Pit - Chalk	Historic Map 1941	N	1908 - 1957		Infilled Land	E
434	Pit - Chalk	Historic Map 1908	N	1908 - 1993		Infilled Land	E
435	Pit - Gravel	Historic Map 1868	N	1868 - 1950		Infilled Land	G
437	Infilled Land - Worked Ground (BGS)	BGS	N	1963 - 1993	Appears to have been infilled by 1993.	Infilled Land	M
438	Infilled Land - Made Ground (BGS)	BGS	N	Unknown		Infilled Land	M
439	Pit - Unspecified	Groundsure Historical Land Use Layer	N	1869 - 1957		Infilled Land	L
440	Infilled Land - Made Ground (BGS)	BGS	N	Unknown		Infilled Land	L
441	Landfill - Crowd Hill Landfill	Environment Agency	N	1962 - 1972	SW Phase 2 ground investigation 2023 found very little to denote landfill. Approx 0 - 0.5m MG overlying natural deposits.	Infilled Land	L
442	Works - Brick works	Groundsure Historical Industrial Land Use layer	N	1895		PSC	L
443	Landfill - Land at Rossgarth Landfill	Hampshire County Council, Environment Agency. Phase 3c GI	N	1988 - 1995	EA input 1988 to 1995 (licence surrendered).Inert waste. Local authority note - 'Gas risk - Gassing, Permeability - high'. Boundary extended west following Phase 3c GI hole 3J5007DS. MG to 3.6m bgl inc brick, concrete, glass, ceramics, cement.	Infilled Land	J
444	Works - Smithy	Groundsure Historical Industrial Land Use layer	N	1910		PSC	H
445	Worked Ground - unspecified	Groundsure Historical Land Use Layer	N	1965 - 1987	LiDAR shows ground level lower than surrounding area. Potentially not infilled.	Infilled Land	H
446	Worked Ground - Unspecified heap	Groundsure Historical Industrial Land Use layer	N	1868 - 1965		PSC	H
447	Pit - Unspecified	Groundsure Historical Industrial Land Use layer	N	1868 - 1869		Infilled Land	H
448	Landfill - Firth Lane Sand Pit	Winchester City Council, Hampshire County Council, Environment Agency, Google Earth	N	1998 - 2007	A01: co-disposal landfill site (EA), Licence application desk study undertaken 1997. Google Earth appears to show site closure by 2007.	Infilled Land	H
449	Landfill - Quob Copse Landfill	Environment Agency	N	1971 - 1972	Droxford Rural District Council, household / commercial landfill.	Infilled Land	G
450	Worked Ground - unspecified	Groundsure Historical Industrial Land Use layer	N	1908 - 1938		Infilled Land	G
451	Fuel Filling Station	Groundsure Historical Garages Layer	N	1961 - 1993	Information from Groundsure layer. Site is currently residential properties and a public house.	PSC	E
452	Infilled Land - Christ Church, London Road	Havant Borough Council	N	1897 - 1998	Waste type - Putrescible.	PSC	D
453	Pit - Unspecified	Groundsure Historical Industrial Land Use layer	N	1895		Infilled Land	D
454	Landfill - Disused Sand Pit B Brick and Tile works	Groundsure Historical Industrial Land use / Havant Borough Council	N	1930 - 1938	Local authority - suspected filled ground along the south of site.	Infilled Land	D
455	Pit - Unspecified	Groundsure Historical Industrial Land Use layer	N	1898 - 1938		Infilled Land	D
456	Landfill	Portsmouth City Council	N	1952	Waste disposal / unknown infill. Considered a landfill by the local authority.	Infilled Land	D
457	Pit - Chalk	Havant Borough Council, Groundsure Historical Industrial Land Use layer	N	1895 - 1963	Unknown material used to fill a small quarry hole.	Infilled Land	D
459	Infilled Land - Made Ground (BGS)	BGS / Havant Borough Council	Y	1969 - Present	Known or suspected infilled soils (local authority records). Historical mapping shows potential highways construction activities.	Infilled Land	WRP to Havant Thicket Reservoir (B), WRP (C), Budds Farm to WRP (C), D
460	Landfill - Land South of Budds Farm	Environment Agency, Havant Borough Council	N	2014	Bund erosion and water egress noted to EA. Former domestic waste landfill.	Infilled Land	Budds Farm (C), Budds Farm to WRP (C)
461	Infilled Land - Made Ground (BGS)	BGS	N	Unknown		Infilled Land	E
462	Landfill - Bedhampton Waterworks	Environment Agency, Havant Borough Council, Groundsure Historical Industrial Land use	N	Unknown	L05 inert landfill registered to Portsmouth Water. Area of known or suspected infilled soils (local authority records).	Infilled Land	WRP to Havant Thicket Reservoir (B)
463	Worked Ground - Heap	Groundsure Historical Industrial Land Use layer	N	1910 - 1963	Unspecified heap apart from 1931 which is recorded as unspecified ground workings. Tank recorded on site between 1897 - 1910.	Infilled Land	Havant Thicket Reservoir (A)
464	Pit - Unspecified	Groundsure Historical Industrial Land Use layer	N	1963 - 1991	Potential embankment on Historical Mapping.	Infilled Land	WRP to Havant Thicket Reservoir (B)
465	Pit - Unspecified	Groundsure Historical Industrial Land Use layer	N	1907 - 1963		Infilled Land	WRP to Havant Thicket Reservoir (B)
466	Landfill - Harts Farm Landfill	Environment Agency	N	1978 - unknown	Household waste landfill, site ref FHA15, 1760/1/13/6.	Infilled Land	WRP (C), Budds Farm to WRP (C), D
467	Worked Ground - unspecified	Groundsure Waste Disposal and Historical Industrial Uses layers	N	1952	Unknown hole. Potentially landfilled.	Infilled Land	E
468	Military - Research Facility	Google Maps, http://www.portsdown-tunnels.org.uk/	Y	1950 - Present	QinetiQ Technology Business park. Potential tanks on site.	Military	E
469	Military - Fort Southwick	Winchester County Council, / http://www.portsdown-tunnels.org.uk/	N	1861 - 2002	Various uses. Last military use 1968. See Zeticia Detailed UXO Report P14032-24-R11, D Site.	Military	E
470	Worked Ground - unspecified	Groundsure Historical Industrial Land Use layer	N	1986 - 1987		Infilled Land	H
471	Worked Ground - unspecified	Groundsure Historical Industrial Land Use layer	N	1987		Infilled Land	J
472	Landfill - Crowd Hill Landfill	BGS Historical Landfill point	N	Unknown	Risk code G2, boundaries unknown, location shown at point.	Infilled Land	L
473	Worked Ground - unspecified	Groundsure Historical Industrial Land Use layer	N	1957 - 1968		Infilled Land	L
474	Military - Wintershill Hall (Former military / civilian base)	https://wintershill.net/about/	N	1941 - 1946	Headquarters of the Hampshire Fire Service. The lower lawn was covered in Nissen huts for offices and additional accommodation. 20m south of BPT-4.	PSC	K
475	Garage	Google Earth, Site visit 04052023	Y	Unknown - Present	Streetview shows Motorhome Service Centre. Above ground tank (metal) and bunded tank (plastic) at approx. 456320, 111685.	PSC	G
476	Works - Parchow Groundworks	Ground investigation site visit 26 March 2023	Y	Unknown - Present	Former telephone exchange.	PSC	E
478	Infilled Land - Artificial Ground	ROL-2-562-575-0135-1979 MAP	N	1937 - 1993	Artificial Land / Worked Ground may be associated with removal of woodlands	Infilled Land	M
479	Water Works - Pump house	A60-21-SU-0089	Y	1988 - Present	Pump House.	PSC	D
480	Pit - Various	HAM-076-10-XX-1909-G-01	N	1909 - 1932	Potentially Infilled Pit (Sand and Gravel) associated with RTD deposits.	PSC	D
481	Waste Facility - Incinerator	Groundsure 2023 Report	N	1987 - 1993		PSC	WRP (C)
482	Infilled Land - Pond	SU51SE-03-G-1957	Y	1939 - 1957	Former Un-named building which at present is an infilled pond (associated with the River Meon).	PSC	G
483	Farm - Crockerhill Farm	SU-51SE-03-G-1957	Y	1957		PSC	F
484	Farm - Building (potential)	SU-51E-03-G-1957	Y	1957		PSC	G
485	Wastewater Treatment Works	SU-51SE-01-G_1987	Y	1987	Sewage Works with 5 tanks, two settlement tanks.	PSC	G
487	Building - Un-named	HAM-075-03-XX-1941-G-01_1941	Y	1941		PSC	E
488	Infilled Land - Pond	ROL-4-1741-1750-0290_1986	Y	1986		Infilled Land	F
490	Infilled Land - Pond	SU810_S1_SEP_1994_1994	Y	1994		Infilled Land	F
492	Infilled Land - Pond	SU6109_1965_1965	Y	1965		Infilled Land	E
493	Railway - Meon	SU-51SE-03-G_1957	Y	1909 - 1957	Meon Railway.	PSC	G
494	Infilled Land - Pond	SU5909_S1_NOV_1992_1992	Y	1992		Infilled Land	F
495	Water Works - Reservoir (covered)	SU-51SE-01-G-1987	Y	1987		PSC	F G
496	Pit - Gravel	HAM-075-02-xx-1932	N	1932		Infilled Land	F
498	Wastewater Treatment Works	Groundsure Google Earth	Y	1965 - Present		PSC	E
499	Landfill	Portsmouth Borough Council Waste Disposal GIS	N	1952 - 1980	Potential landfill recorded by local authority, unknown infill (dated 1952 by local authority).	Infilled Land	E
500	Military - Belmont Camp II	Safelane WfL UXO Report 9714 RA Section 9.1.3	N	1940 - 1950	Camp's facilities included classrooms, training grounds, barracks, and administrative buildings.	PSC	D
501	Military - Stockheath Naval Camp	Safelane WfL UXO Report 9714 RA Section 9.1.3	N	1941 - 1970	Nissen huts in west of Camp, assault course south of PSC 425 swimming pool, practice trench in the north. South of PSC 428 drain. Site demolished in 1950 to 1970 and replaced with housing	Military	WRP to Havant Thicket Reservoir (B)
502	Military - HMS Daedalus III	Safelane WfL UXO Report 9714 RA Section 9.1.3 / Zetica P14032-24-R1-A Zetica UXO Desk Study Havant Thicket Pipeline	N	1940 - 1950	Camp's facilities included classrooms, training grounds, barracks, and administrative buildings. Eastern extent passes pipeline route.	Military	WRP to Havant Thicket Reservoir (B)
503	Military - Fraser Naval Camp	Safelane WfL UXO Report 9714 RA Section 9.1.3	N	1940 - 1950	Camp's facilities included classrooms, training grounds, barracks, and administrative buildings. Northern part of the former barracks potentially passes through the pipeline route.	Military	WRP to Havant Thicket Reservoir (B)
504	Military - Belmont Naval Camp	Safelane WfL UXO Report 9714 RA Section 9.1.3	N	1940 - 1950	Camp's facilities included classrooms, training grounds, barracks, and administrative buildings.	Military	WRP to Havant Thicket Reservoir (B)
505	Farm - Widley Farm	Groundsure 2023 Report Winchester County Council	N	1860 - 1980	Farm buildings. Unknown filled ground (possible pond) noted in east of site by local authority	PSC	E
507	Farm - Offwell Farm	Groundsure 2023 Report	Y	1867 - Present		PSC	E
508	Landfill - Whitedell Farm	Environment, Agency Groundsure	N	1980 - 1982	Licence 10/14, FFA7, 1760/7 - Inert landfill.	PSC	F
509	Farm - Cloverfield Farm	OS Zoomstack maps	Y	2005 - Present		PSC	H
510	Worked Ground	Google Maps	Y	2023		PSC & Infilled Land	F
511	Worked Ground	Google Maps	Y	2023	Potential stockpile of unknown soil.	Infilled Land	F
512	Farm - Pig farm (potential)	Google Earth (2005)	N	2005 - 2007	Potential pig Farm.	PSC	H

PSC No.	Name	Source	Current	Dates	Description	Category	Section
513	Farm - Barn	Google Maps, Groundsure Maps	Y	1986 - Present		PSC	G
514	Infilled Land - Made Ground (asbestos)	WfL Phase 2 Ground Investigation	Y	2023	Made Ground up to 0.7m bgl including brick, tile and macadam. Asbestos cement (0.147%) detected at 0.5m bgl. Source not delineated.	Infilled Land	J
515	Infilled Land - Artificial Ground	Groundsure Historic Maps	N	1937 - 1993		Infilled Land	M
516	Pit - Gravel	Groundsure Historic Maps, Winchester City Council Contaminated Land Data	N	1938 - 2010		Infilled Land	M
517	Farm - Storage area	Google Earth	Y	2015 - Present	Storage area.	PSC	M
519	Infilled Land - Artificial Ground	Winchester City Council Contaminated Land Data (Site Reports)	N	2016		Infilled Land	M
520	Infilled Land - Marshland	Groundsure Historic Maps	N	1868 - 1968		Infilled Land	L
522	Infilled Land - Marshland	Groundsure Historic Maps	N	1939 - 1968		Infilled Land	L
523	Farm - Storage area	Google Earth	Y	2000 - Present	Storage area.	PSC	L
524	Infilled Land - Watercourse	Groundsure Historic Map 1869, LIDAR data	N	1869 - 1888		Infilled Land	L
525	Infilled Land - Pond	Groundsure Historic Maps, LIDAR data, Google Earth	N	1868-1992		Infilled Land	L
526	Farm - Storage area	Google Earth, LIDAR data	Y	2014 - Present	Storage area for farm / stables to the southeast.	PSC	L
527	Embankment	Groundsure Historic Maps, LIDAR data	Y	1964 - Present		Infilled Land	L
528	Agricultural - Orchard	Groundsure Historic Maps	N	1868 - 1957		PSC	K
529	Worked Ground - Stockpile	Google Earth, LIDAR data	N	2012 - Present	Ground workings. Soil heap first visible in 2012, still present but overgrown in 2024 aerial photography.	PSC	K
530	Worked Ground - unspecified	Google Earth, Google Maps, LIDAR data	Y	2019 - Present		PSC	K
531	Infilled Land - Watercourse	Groundsure Historic Maps	N	1868 - 1964		Infilled Land	K
532	Infilled Land - Made Ground (BGS)	BGS, LIDAR data, Google Earth	N	Unknown	BGS Made Ground	Infilled Land	K
533	Embankment - (potential)	Groundsure Historic Maps, LIDAR data	Y	1964 - Present		PSC	J
534	Embankment	Groundsure Historic Maps, LIDAR data	Y	1964 - Present		PSC	J
535	Tank	Groundsure Historic Maps, Google Earth	N	1993 - 2012		PSC	J
536	Infilled Land - Pond	Groundsure Historic Maps, LIDAR data	N	1869 - 1964		Infilled Land	J
538	Farm - Storage area	Google Earth, Google Maps	Y	2019 - Present	Storage area.	PSC	J
539	Worked Ground - Stockpile	Google Earth, LIDAR data	Y	2014 - Present	Unspecified heap.	PSC	J
540	Farm - Storage area	Google Earth, Google Maps	Y	2012 - Present	Storage area.	PSC	J
541	Agricultural - Orchard	Groundsure Historic Maps	N	1868 - 1968		PSC	J
542	Infilled Land - Pond	Groundsure Historic Maps, LIDAR data	N	1868 - 1957		Infilled Land	J
543	Infilled Land - Pond	Groundsure Historic Maps	N	1868 - 1869		Infilled Land	H
544	Infilled Land - Marshland	Groundsure Historic Maps	N	1895 - 1896		Infilled Land	H
545	Farm - Building	Google Earth	Y	2005 - Present	Farm building.	PSC	H
546	Farm - Yard / Storage area	Google Earth	Y	2012 - Present	Yard / Storage area.	PSC	H
547	Farm	Google Earth	Y	pre-1999 - Present		PSC	H
548	Farm	Groundsure Historic Maps, Google Earth	Y	1868 - Present		PSC	K
582	Filter Beds or Potential Tanks	Historical Maps A28-17-SU7006SW 1959, Google Earth	N	1959-2007		PSC & Infilled Land	B
584	Tanks	Historical Maps 1969	Y	1969 - Present		PSC	D
587	Tanks	Historical Maps - 1939 HAM-076-10-XX-1939	N	1939 - 1969		PSC & Infilled Land	WRP to Havant Thicket Reservoir (B)
588	Farm - Mayles Farm	Historical Map - A48-06-SU-0380-1980	Y	1980 - Present		PSC	G
592	Pit - Gravel	Groundsure Historical Maps	N	1859 - 1985		Infilled Land	F
593	Infilled Land - Reservoir	Historical Maps - HAM-075-01-XX-1910	N	1897 - 1910		Infilled Land	F
594	Infilled Land - Pond	Historical Maps - HAM-075-01-XX-1859	N	1856 - 1957		Infilled Land	F
595	Farm - Castle Farm	Historical Maps HAM-067-13-XX-1897-G-01	Y	1897 - Present		PSC	G
596	Wastewater Treatment Works - Filter beds / tanks	Historical Maps - A54-02-SU-0360_1969	N	1939 - 1993		PSC & Infilled Land	WRP to Havant Thicket Reservoir (B)
597	Wastewater Treatment Works - Settlement Tanks	Historical Maps 2500 A33-18-SU-0239_1952	N	1952 - 1958		PSC & Infilled Land	WRP to Havant Thicket Reservoir (B)
598	Wastewater Treatment Works - Filter beds (former)	Historical Maps 2500 - A33-18-SU-0239_1952	N	1952 - 1964		PSC	WRP to Havant Thicket Reservoir (B)
599	Tank - Congestion	Historical Maps 2500 - A33-18-SU-0239_1952	N	1952 - 1958		PSC & Infilled Land	WRP to Havant Thicket Reservoir (B)
600	Infilled Land - Former Sludge Beds	Historical Maps - 2500 A33-18-SU-0239_1952	N	1952 - 1958		PSC & Infilled Land	WRP to Havant Thicket Reservoir (B)
601	Water Works - Pumping station	Historical Map - A49-02SU-0211_1971	N	1955 - 1975		PSC	WRP to Havant Thicket Reservoir (B)
602	Embankment	A28-22-SU7107-1_1955	N	1955 - 1971		PSC	WRP to Havant Thicket Reservoir (B)
603	Tank	Historical Maps - SU7108SE_1971 TO 1993, Google Earth	Y	1971 - Present		PSC	WRP to Havant Thicket Reservoir (B)
604	Electricity Sub Station (Small)	Historical Mapping - SU107SW_1969, Google Street View	Y	1969 - Present		PSC	WRP to Havant Thicket Reservoir (B)
605	Electricity Sub Station (Small)	Historical Maps - A60-01-SU-0576_1973, Groundsure Historical Energy Features	Y	1973 - Present	Potentially 2 substations have existed at this location. 1st substation approximately 1973 later replaced approximately 1993.	PSC	D
606	Infilled Land - Pond	Historical Map - A28-08-SU108NW-1_1957	N	1952 - 1964		Infilled Land	Havant Thicket Reservoir (A)
607	Fuel Petrol Filling Station	Google Earth Imagery	Y	1999 - Present		PSC	G
609	Electricity Sub Station (Small)	A32-04-SU7008-4_1964 - Groundsure	N	1964 - 1971		PSC	WRP to Havant Thicket Reservoir (B)
610	Garage	A32-04-SU7008-4_1964 - Groundsure	N	1964 - 1995		PSC	WRP to Havant Thicket Reservoir (B)
611	Farm - Leigh Park Farm	Groundsure Historical Map 1975	N	1991 - Present		PSC	WRP to Havant Thicket Reservoir (B)
612	Pit - Unspecified	Groundsure 2024 Report	N	1968 - 1980	Unspecified Hole. No additional information on Groundsure maps. Potentially an infilled pit.	Infilled Land	M
613	Water Works - Pumping station	Groundsure 2024 Report	N	1980	Groundsure maps indicate a pumping station.	Ground Investigation	L
614	Wastewater Treatment Works	Aerial imagery and Groundsure 2024 reporting	Y	1993 - Present	Sewage Treatment Works.	PSC	K
621	Works - Industrial Estate	Groundsure	N	1939 - 1992	Saw Mills between 1939 - 1990s, then industrial estate.	PSC	F
622	Military - Anti-aircraft Battery	Winchester City Council	N	1939 - 1946	Dates are approximate. Information from Winchester City Council Potential Contaminative use GIS 1_2500 2km buffer 2022.	PSC	Havant Thicket Reservoir (A)
623	Military - Leigh Park House	Zetica Detailed Desk Study	N	1940 - 1957	Used by Admiralty Mine Design Department for administration and design of mines, depth changes and minesweeping. Explosive stored in the 'ice house'. See Zetica Detrail Risk Assessment for detail.	PSC	Havant Thicket Reservoir (A)
624	Pit - Unspecified	Groundsure Winchester City Council	N	1868	Shown only on 1868 map. Reduced ground level also visible on LiDAR.	Infilled Land	E
626	Infilled Land - Drain	Groundsure	N	1868 - 1980	Partially infilled by 1980 south of Mayles Lodge.	Infilled Land	G
627	Infilled Land - Drain	Groundsure	N	1868 - 1994	Drain south of sewage works no longer shown on maps.	Infilled Land	G
628	Works - Depot	Groundsure Google Maps Winchester City Council	Y	1964 - Present	'Depot' shown on maps until 1989. Buildings remain on 2019 Google Earth photography	PSC	K

Appendix F – Risk Assessment and Methodology

Risk Assessment Methodology

Risk Classification Methodology

The method of risk evaluation adopted in this document is consistent with CIRIA C552 (2001). Hence, risk is considered to be a function of both the probability (likelihood) of contamination occurring at the study site and also the potential severity (consequence) of the environmental impacts associated with this contamination.

The classification system used to define contaminant probability, consequence and risk is described in the following tables.

Table A: Classification of probability

Classification	Definition
High Likelihood	There is a contaminant linkage and an event that appears either very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution.
Likely	There is a contaminant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term, and likely over the long term.
Low Likelihood	There is a contaminant linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period such event would take place and is less likely in the shorter term.
Unlikely	There is contaminant linkage but circumstances are such that it is improbable that an event would occur even in the long term.

Table B: Classification of consequence

Classification	Receptor	Definition	Examples
Severe	Humans	Short-term (acute) risk to human health likely to result in "significant harm" as defined in the Environmental Protection Act 1990, Part 2a.	High concentrations of cyanide on the surface of an informal recreation area
	Controlled waters	Short-term risk of pollution (note: Water Resources Act contains no scope for considering significance of pollution) of sensitive water resource	Major spillage of contaminants from site into controlled water
	Property	Catastrophic damage to buildings/property	Explosion, causing building collapse (can also equate to an acute human health risk if buildings are occupied)
	Ecology	A short-term risk to a particular ecosystem, or organism forming part of such eco-system	Potentially long term derogation of a designated site or protected species
Medium	Humans	Chronic damage to human health ("significant harm" as defined in the Environmental Protection Act 1990, Part 2a.)	Concentrations of a contaminant from a residential site exceed the site-specific assessment criteria
	Controlled waters	Pollution of sensitive water resources (note: Water Resources Act contains no scope for considering significance of pollution)	Leaching of contaminants from a site to a principal or secondary aquifer
	Property	Significant damage to crops, buildings, structures and services	Damage to building rendering it unsafe to occupy (e.g. foundation damage resulting in instability).
	Ecology	A significant change in a particular ecosystem	Death of a species within a designated nature reserve
Mild	Humans	Contamination present although unlikely to constitute a significant chronic health risk	Concentrations of a contaminant from a public access site moderately exceed the generic assessment criteria
	Controlled waters	Pollution of non-water resources	Pollution of non-classified groundwater
	Property	Damage to sensitive. buildings/structures/services	Aggressive ground conditions leading to potential for long term degradation of buried concrete
	Ecology	Damage to the environment	Localised damage to aquatic habitat causing temporary relocation of certain species
Minor	Humans	Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc.)	The presence of contaminants at such concentrations that protective equipment is required during site works.
	Controlled waters	Potential minor release of contamination to local water features	Short term or low volume release of potentially polluting material to a secondary surface water course of low existing quality
	Property	Easily reparable effects of damage to buildings, structures and services. Harm which may result in a financial loss, or expenditure to resolve.	The loss of plants in a landscaping scheme. Discolouration of concrete
	Ecology	Short term, localised damage may occur; consequences are spatially and temporally limited	Short term or localised disruption to in situ flora or fauna; no lasting effects

Table C: Risk classification (comparison of consequence and probability)

Probability (likelihood)		Consequence (severity)			
		Severe	***Medium***	***Mild***	***Minor***
	High likelihood	Very high risk	High risk	Moderate risk	Moderate/low risk
	Likely	High risk	Moderate risk	Moderate/low risk	Low risk
	Low likelihood	Moderate risk	Moderate/low risk	Low risk	Very low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very low risk

Section A

Appendix F - Risk Assessment Table for Construction and Maintenance Activities for PSCs within 50m of the Draft Order Limits (DoL) within Section A

The Draft Order Limits (DoL) of the proposed development in Section A includes a tunneled section to the proposed Havant Thicket Shaft. See specific desk study and risk assessments for the proposed Havant Thicket Shaft (Appendix H). There is additional open cut excavation northwards from the shaft to the proposed Havant Thicket Reservoir. The DoL for the Havant Thicket Reservoir is outside the scope of the proposed development which considers the proposed pipeline route, therefore a 90m buffer has been placed around the pipeline route in Section A instead of using the entire DoL + a 50m buffer which has been completed in all other Sections.

Refer to the following risk assessment tables for PSCs within the DoL or within 50 m of the DoL that cross the boundaries of proposed development in Sections A and B; PSC 501 (Military – Stockheath Naval Camp) with Infilled Land - Swimming Pool (425) in Section B.

PSC 428	**Infilled Land - Drain**					**Section A**
Potential Source of Contamination	**Potential Contaminants of Concern**	**Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Possible infilled watercourse/ surface drain. Potential to have been infilled with unknown made ground. Within the area formerly used as Stockheath Naval Camp and grounds (see PSC 501). Located approximately 30 m from Section A DoL. This does not include the DoL for the Havant Thicket reservoir.r	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX) and phenols. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Residential properties adjacent to PSC; Staunton Country Park.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Tributary to Hermitage Stream is adjacent to the PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate / Low
		Groundwater: Head deposits Secondary (undifferentiated) Aquifer. Located on the bedrock geological boundary of Bognor Sand member (Secondary A Aquifer) and London Clay (unproductive stratum). Located in a groundwater Source Protection Zone 1c.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

Section B

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50 m of Draft Order Limits (DoL) within Section B

The Draft Order Limits (DoL) of the proposed development for Section B extends to the proposed WRP-72 East Shaft currently located within the proposed Water Recycling Plant (WRP) area. The WRP is the site of the former Harts Farm Way Landfill (PSC 466). The risk assessment for Harts Farm Way Landfill (PSC 466) is presented in Section C Risk Assessments and this should be reviewed when addressing all PSCs within Section B.

Refer to the following risk assessment tables for PSCs that cross the boundaries of proposed development in Sections B, C and D; PSC 372 (Infilled Land – Marshland) and PSC 459 (Infilled Land – Made Ground (BGS)) in Section D; PSC 466 (Landfill – Harts Farm Way) and PSC 370 (Infilled Land – Made Ground (BGS)) in Section C.

PSC 462	**Landfill - Bedhampton Waterworks**					**Section B**
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Inert Landfill registered to Portsmouth Water. Permitted waste licensed site (April 2005). Potential for unauthorised infill material and areas of Made Ground. Recorded by Local Council as suspected or known infilled ground. Western area of PSC within the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyl compounds (PCBs), pesticides, herbicides and per-and polyfluorinated alkyl substances (PFAS).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Likely	Moderate[1] [2]
		Adjacent land users: Works area, land adjacent to Hermitage Stream	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavations and stockpiling.	Medium	Low Likelihood	Moderate/Low [2]
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact	Medium	Unlikely	Low [2]
		Surface Water bodies / Watercourses: Hermitage stream flows adjacent to the DoL and PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Likely	Moderate [2]
		Groundwater: River Terrace Deposits (Secondary A Aquifer) and Alluvium (Secondary A Aquifer). Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, and Portsdown Chalk Formation (Principal Aquifer). Location within a groundwater Source Protection Zone I. Groundwater abstractions (potable water supply) within DoL and PSC.	Leaching through unsaturated and saturated soil.	Severe	Likely	High [2]
		Ecology (flora and fauna): No statutory designated sites within 250 m. Hermitage Stream flows is adjacent to PSC.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Likely	Moderate [2]
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users:** Construction workers during excavations/construction of shafts and infrastructure, future site users and maintenance workers during operation.	Inhalation of gases and vapours.	Medium	Likely	Moderate [1] [2]
		Scheme on Site existing and future property (buildings and buried services): None	Gas migration / accumulation.	Medium	Low Likelihood	Moderate / Low [2]

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice
[2] Reduced risk if the DoL for the tunnelled option is pursued.

PSC 382	Works incorporating Tank (PSC 603)					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Works, current warehouses, industrial units, vehicle servicing garages and depots. A tank is shown within the southeastern corner (PSC 603). Previously a former wastewater treatment works (WTW) shown on 1952 to 1958 maps (see PSC 403). Information from the local council notes cut and fill activities on site with fill including inert waste, ash, clinker, coal and other organics. Central and north area of former works redeveloped into residential housing from 1952.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs and PCBs. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Residential properties are south of the tunnelled route (High Lawn Way).	Direct dermal contact, ingestion and inhalation of gases and vapours during	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Mild	Unlikely	Very Low
		Surface water bodies/watercourses: A tributary to Hermitage Stream immediately south of PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities limited	Medium	Unlikely	Low
		Groundwater: Head (Secondary Undifferentiated Aquifer) overlying London Clay (unproductive stratum) in the west. Bognor Sand Member (Secondary A Aquifer) across east of site. Located in a Source Protection Zone I.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m. Ancient and semi-natural woodland (Sir George Staunton conservation area) adjacent to the east PSCs and DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 383	Railway - Building and Siding					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Building (potential works) with railway siding located adjacent to the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs and PCBs.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Unlikely	Low [1]
		Adjacent land users: Residential properties approximately 50 m northwest of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Hermitage Stream approximately 60 m southeast.	Surface water runoff from stockpiles and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: River Terrace Deposits (Secondary A Aquifer) and Alluvium (Secondary A Aquifer). Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, and Portsdown Chalk Formation (Principal Aquifer). Location within a groundwater Source Protection Zone I.	Leaching through unsaturated and saturated soil.	Medium	Low likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m. Old Bedhampton conservation area is approximately 10 m west and south.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSCs 425, 501, 502, 503, 504	Military - Stockheath Naval Camp (501) with Infilled Land - Swimming Pool (425); Military - HMS Daedalus III Camp (502); Military - Fraser Naval Camp (503); Military - Belmont Naval Camp (504)					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former naval camps. The footprints of PSCs 501, 502 and 503 cross the Section B DoL and 50m buffer zone. PSC 504 is only present within the 250m buffer zone. Likely activities included barracks, training grounds, laundry, classrooms, administrative buildings, and canteens. Storage of supplies including clothing, ammunition, and bulk storage of fuels/oils. Nissen huts documented to have been present at these camps. Stockheath Camp (PSC 501) was also shown to have a swimming pool (PSC 425). Potential for Infill areas/Made Ground.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, explosives (ammunition, UXO), PFAS. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Residential.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: PSC 501: tributary to Hermitage Stream is within DoL and PSC; PSC 503 Hermitage Stream is 25 m east (at closest point) and >200 m east of the DoL.	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: Head deposits Secondary (undifferentiated) Aquifer. PSC 501: Bognor Sand member (Secondary A Aquifer); London Clay (unproductive stratum); PSCs 502, 503 and 504 London Clay (unproductive stratum); PSC 504 Lambeth Group (Secondary A Aquifer). Located in a groundwater Source Protection Zone 1c.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate /Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m. PSC 501: Great Copes Ancient Woodland within footprint of PSC and within DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSCs 385, 389, 386, 393, 409, 411, 416,	Infilled Land - Pond (PSC 385, 393, 409), Infilled Land - Watercourse (PSC 389, 386), Infilled Land – Drain (PSC 411, 416)					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Ponds / watercourses / drains have potentially been infilled with unknown made ground. PSCs either cross the Section B DoL or are present within the 50m buffer.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, benzene, toluene, ethylbenzene (BTEX) and phenols. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Unlikely	Low [1]
		Adjacent land users: Recreational grounds (PSC 385, 386, 393, 416); residential (PSC 389, PSC 411), allotments (PSC 409).	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: . Hermitage stream is located adjacent to PSC 389, west of PSC 411 and approximately 50 m west of PSC 409. Hermitage stream is located between 150 and 250 m southeast of PSCs 385, 386, 393 and 416.	Surface water runoff and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: Superficial deposits are Head (PSC 389, 411, 416, 385 (north)), Secondary (Undifferentiated) Aquifer. River Terrace Deposits PSC 385 (south), 386, 416 (Secondary A Aquifer). **Bedrock Geology,** PSC 389, 411 (north**)** London Clay Formation (unproductive stratum). PSC 385 (north) Lambeth Group (Secondary A Aquifer). PSC 385 (south), 416 and 386 Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) – Chalk (Principal Aquifer). PSCs 385, 386, 389, 411 and 416 are in a Source Protection Zone (SPZ) I.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSCs 395, 396, 397, 398, 399, 400, 401 and 582	Water Works Tanks (395 to 401) and Filter Beds or Potential Tanks (582)					Section B
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Water Works Tanks associated with Bedhampton Water Works. Potential for Infill areas/Made Ground. DoL crosses PSC, possible open cut excavation	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, phenols and PCBs. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate [2]
		Adjacent land users: Residential properties and businesses approximately 80 m north of closest tank (395).	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/Low [2]
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low [2]
		Surface water bodies/watercourses: Hermitage Stream approximately between 20 m to 30 m south.	Surface water runoff and migration through groundwater and underground utilities.	Medium	Likely	Moderate [2]
		Groundwater: River Terrace Deposits (Secondary A Aquifer) and Alluvium (Secondary A Aquifer). Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, and Portsdown Chalk Formation (Principal Aquifer). Location within a groundwater Source Protection Zone I. Groundwater abstractions (potable water supply) within DoL and PSCs.	Leaching through unsaturated and saturated soil.	Medium Based on above ground pipework and limited excavations	Likely	Moderate [2]
		Ecological receptors (flora and fauna): No statutory designated site within 250 m. DoL within the Old Bedhampton conservation area.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Low Likelihood	Moderate / Low [2]

[2] Reduced risk if the DoL for the tunnelled option is pursued.

PSC 388	Wastewater Treatment Works incorporating Tanks (PSC 587) and Filter Beds/Tanks (PSC 596)					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former wastewater treatment works, infrastructure no longer shown apart from circular tank bases. Tanks and filter beds shown on historical mapping from 1939 onwards (PSC 587 and 596). DoL of a tunnelled section crosses the PSCs.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, phenols, PCBs, PFAS and pathogens. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Open land between A27 road and railway line. Closest residential property approximately 50 m northeast.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Hermitage Stream approximately 70 m east.	Surface water runoff and migration through groundwater and underground utilities.	Medium	Unlikely	Low
		Groundwater: River Terrace Deposits (Secondary A Aquifer) underlain by Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated – Chalk) **(**Principal Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m. Old Bedhampton Conservation Area is adjacent to the eastern boundary of PSC.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 403 and PSC 610	Wastewater Treatment Works (403) incorporating Garage (610) within footprint					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former wastewater treatment works including former sludge beds (PSC 600), congestion tanks (PSC 599), settlement tanks (PSC 597) and former filter beds (PSC 598). Works warehouses / industrial units currently occupy the majority of WTW footprint to the east of Dunsbury Way (see PSC 382). Potential for unauthorised infill material and areas of Made Ground. Located adjacent to DoL at closest point.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, phenols PCBs, PFAS and pathogens. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Industrial estate and residential	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: A tributary to Hermitage Stream south of PSC and adjacent to the DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Unlikely	Low
		Groundwater: Head (Secondary Undifferentiated Aquifer) overlying London Clay (unproductive stratum) in west between Billy Copse and Dunsbury Way. Bognor Sand Member (Secondary A Aquifer) in east PSC.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No Statutory designated sites within 250 m. Great Copes Ancient Woodland is approximately 200 m east of PSC 403 (Sir George Staunton conservation area).	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 464	Pit - Unspecified					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential unspecified ground workings potential for infilled land.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Residential properties are 25 m west of the tunnelled route.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Mild	Unlikely	Very Low
		Surface water bodies/watercourses: A tributary to Hermitage Stream immediately south of PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: No superficial deposits. Bedrock geology is London Clay (unproductive stratum). Bognor Sand Member (Secondary A Aquifer) across east of site. Located in a Source Protection Zone I.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): Ancient and semi-natural woodland adjacent to east PSCs. Sir George Staunton conservation area is adjacent to the east of the PSC. Great Copes Ancient Woodland to the south.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 387	Works - Corn Mills					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Corn Mills including mills, dams and ponds that have now been infilled.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs and PCBs. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low [1]
		Adjacent land users: Field/rural, residential property adjacent to PSC and DoL.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		Existing and Future property: No building structures as part of scheme.	Direct contact and gas migration/accumulation during excavation works and stockpiling.	Medium	Unlikely	Low
		Surface Water bodies/Watercourses: Hermitage Stream and Brookside Road Stream	Surface water runoff from stockpiles and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: River Terrace Deposits and Alluvium (Secondary A Aquifer). Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, and Portsdown Chalk Formation (Principal Aquifer). Location within a groundwater Source Protection Zone I. Groundwater abstractions (potable water supply) within DoL and PSCs.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecology (flora and fauna): No statutory designated sites within 250 m. PSC and DoL within Old Bedhampton conservation area.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 429	Infilled Land - Marshland					Section B Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potentially filled with unknown Made Ground	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Fields, road infrastructure, industrial units on Harts Farm Way.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Hermitage Stream adjacent to PSC and within the DoL.	Surface water runoff and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: Superficial deposits are Alluvium (Secondary A Aquifer). Bedrock geology is Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) – Chalk (Principal Aquifers).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): Hermitage Stream adjacent to PSC which flows southwards towards Langstone Harbour RAMSAR, SSSI, SAC and SPA approximately 500 m south.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

Section C

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50 m of the Draft Order Limits (DoL) within Section C

Refer to the following risk assessment tables for PSCs that cross the boundaries of proposed development in Sections B, C and D; PSC 372 (Infilled Land – Marshland) and PSC 459 (Infilled Land – Made Ground (BGS)) included in Section D; PSC 429 (Infilled Land – Marshland) included in Section B.

PSC 466	**Landfill - Harts Farm Way Landfill**					**Section C (WRP Site)**
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Household and commercial waste types (Landfill Holder Reference EAHLD20831; Site Reference FHA15, 1760/1/13/6). The depth to the base of the waste material (where encountered) ranges between 5.5m bgl to 13.9m bgl (east area) and 8.2-11.5m bgl (west area) [3]. Proposed development includes Water Recycling Plant, tunnels and shafts to be constructed at the site.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), per-and polyfluorinated alkyl substances (PFAS), pesticides, herbicides and polychlorinated biphenyls (PCBs).	**Construction, maintenance workers and future site users:** Construction workers during excavations/construction of shafts and infrastructure, future site users and maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Severe	High Likelihood	Very High [1]
		Adjacent land users: Landfills to the south, business park within 25-50 m east beyond Hermitage Stream.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavations and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future infrastructure property (buildings and buried services): Proposed WRP to include proposed WRP-72 East Shaft and WRP-72 West Shaft. (see Shaft Desk Study and risk assessments (Appendix H).	Direct contact	Medium	Likely	Moderate
		Surface water bodies/watercourses: Hermitage Stream adjacent to landfill area and within DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	High Likelihood	High
		Groundwater: Raised Marine Deposits (Secondary Undifferentiated Aquifer) over Chalk (Principal Aquifer). Alluvium (land immediately east of the landfill) (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	High Likelihood	High
		Ecological receptors (flora and fauna): Langstone Harbour (SPA, SAC, Ramsar and SSSI) adjacent to DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Likely	Moderate
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users:** Construction workers during excavations/construction of shafts and infrastructure, future site users and maintenance workers during operation.	Inhalation of gases and vapours.	Severe	High Likelihood	Very High [1]
		Scheme on Site existing and future property (buildings and buried services): Proposed WRP and shafts.	Gas migration / accumulation.	Severe	High Likelihood	Very High

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

[3] SSP. (2023a). Havant Water Recycling Plant- Land Parcel 72 Geo-Environmental Interpretative Report and Outline Remediation Strategy. SSP. (2021). Havant Water Recycling Plant (WRP) Geo-Environmental Desk Study .

PSCs 375, 378, 379, 460, 461	Wastewater Treatment Works – Budds Farm (378) with Lagoons (379); Landfill - Land south of Budds Farm Sewage Works (460); Infilled Land – BGS Made Ground (461), Infilled Land – Watercourse (375)					Section C
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
PSC 460 Landfill - Land south of Budds Farm Sewage Works (Holder Reference EAHLD20826; Site Reference FHA10, HAV4) was licensed to accept household waste. The depth of the waste material is unconfirmed. PSCs 378, 379 and PSC 460 are within the DoL. PSC 461 is adjacent to the DoL and within 50 m buffer zone. Construction for the proposed development to include tunnels/pipejack below Langstone Harbour channel and Budds Farm WTW with open cut excavation and shaft launch / reception construction in the southern area of current Budds Farm WTW.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, pesticides, herbicides, PFAS and pathogens.	**Construction, maintenance workers and future site users:** Construction workers during excavations/construction of shafts/reception areas for tunnel drilling and maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Severe	Likely Within open cut excavations and shaft construction.	High [1] [2]
		Adjacent land users: Budds Farm Wastewater treatment works, industrial estate to the north and west.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation and stockpiling.	Medium	Likely Within open cut excavations and shaft construction.	Moderate [2]
		On Site existing and future infrastructure property (buildings and buried services: Shaft and tunnel launch / reception areas within Budds Farm WTW. Location to be confirmed. .	Direct contact	Severe	Likely	High
		Surface water bodies/watercourses Langstone Harbour within the DoL. Brookhampton Stream adjacent to Budds Farm WTW northern boundary and within 50m of DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	High Likelihood	High
		Groundwater Alluvium (Secondary A Aquifer). River Terrace deposits on site and adjacent (Secondary A Aquifer) overlying bedrock of Principal aquifer (Chalk)	Leaching through unsaturated and saturated soil.	Medium	High Likelihood	High
		Ecological receptors (flora and fauna): Langstone Harbour (SPA, SAC, Ramsar and SSSI) within DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Likely	Moderate
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users:** Construction workers during excavations/construction of shafts/reception areas for tunnel drilling and maintenance workers during operation.	Inhalation of gases and vapours.	Severe	High Likelihood	Very High
		Scheme on Site existing and future property (buildings and buried services): Shaft and tunnel reception areas within landfill area.	Gas migration / accumulation.	Severe	High Likelihood Accumulation of landfill gas in future structures.	Very High

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

[2] Reduced risk expected during tunnelling/pipejack construction due to minimal disturbance of materials.

PSC 381	Works - Aggregate					Section C Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Aggregate and Cement Works potential for leakages and spillage from bulk storage fuels/materials. Within the DoL of Section C.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs and PCBs.	**Construction, maintenance workers and future site users:** Construction workers during excavations/construction of shafts/reception areas for tunnel drilling and maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Unlikely	Low [1]
		Adjacent land users: Budds Farm Wastewater treatment works, industrial units on Harts Farm Way.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation and stockpiling.	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services: Shaft and tunnel launch / reception areas within Budds Farm WTW. Location to be confirmed.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses Langstone Harbour within the DoL. Brookhampton Stream adjacent to the south of PSC and within 50m of DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate / Low
		Groundwater Alluvium (Secondary A Aquifer) and Raised Marine Deposits (Secondary undifferentiated Aquifer) overlying bedrock of Principal aquifer (Chalk).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): Langstone Harbour (SPA, SAC Ramsar and SSSI) within DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Low Likelihood	Moderate / Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

PSC 370	Infilled Land - Made Ground (BGS)					Section C Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground identified by the BGS. potentially filled with unknown Made Ground	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, pesticides, herbicides and PFAS Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Industrial units on Harts Farm Way	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme. WRP-72 east Shaft is located east of Hermitage Stream Channel within proposed WRP (see Shaft Desk Study and risk assessments (Appendix H).	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Hermitage Stream adjacent to PSC and within the DoL. Langstone Harbour within the DoL. Brookhampton Stream adjacent to the south of PSC.	Surface water runoff and migration through groundwater and underground utilities	Medium	Low Likelihood	Moderate / Low
		Groundwater: Superficial deposits are Alluvium (Secondary A Aquifer).Bedrock geology is Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) – Chalk (Principal Aquifers).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): Langstone Harbour RAMSAR, SSSI, SAC and SPA within the DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Low Likelihood	Moderate / Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

Section D

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50m of the Draft Order Limits (DoL) for Section D

Groundwater in the Principal Chalk aquifer along the southern tunnelled route B2177 Portsdown Hill Road may be impacted by infilled land/landfills including Harts Farm Way where leachate is reported to migrate into the chalk aquifer. Principal Aquifers in this area have been given a maximum rating of Medium for Potential Consequence of Pollutant Linkage as they are not in a Source Protection Zone.

The Draft Order Limits (DoL) of the proposed development in the eastern part of Section D extends to the WRP-72 West Shaft located within the proposed WRP development which is the site of the former Harts Farm Way Landfill (PSC 466). The risk assessment for Harts Farm Way Landfill (PSC 466) is presented in Section C Risk Assessments and this should be reviewed when addressing all PSCs within Section D.

PSC 372, 459	**Infilled Land - Marshland (372); Infilled Land - Made Ground (BGS) (459)**					**Section D** **Tunnel Section**
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former marshland and Made Ground identified by the BGS. Marshland has been potentially filled with unknown Made Ground to reclaim the land or raise ground levels.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyl compounds (PCBs), pesticides, herbicides, per-and polyfluorinated alkyl substances (PFAS). Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Residential, fields, road infrastructure	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme. WRP-72 West Shaft is located within proposed WRP (see Shaft Desk Study and risk assessments (Appendix H).	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Langstone Harbour approximately 180 m southwest (at closest point).	Surface water runoff and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: Superficial deposits are River Terrace Deposits, Raised Marine Deposits, (Secondary A Aquifers) andHead Deposits. Bedrock geology is Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (Undifferentiated) – Chalk **(**Principal Aquifers).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): Langstone Harbour RAMSAR, SSSI, SAC and SPA are approximately 180 m south	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Low Likelihood	Moderate / Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSCs 302, 306, 311, 313, 322, 323, 329, 330, 361	Pit – Chalk					Section D Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with infill of unknown material. Pits listed are either present within the DoL or the 50m buffer zone. PSC 311, 'Collyer's Pit', historical maps show buildings within the central area and may be associated with a works facility following pit closure. The following PSCs are identified by the Local Council as known or suspected areas of infilled ground; PSC 302, PSC 306, PSC 312, PSC 313, PSC 322, PSC 323, PSC 329 and PSC 361.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, benzene, toluene, ethylbenzene (BTEX) and phenols. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Fields, water works, residential, woodland.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme. Portsdown Hill Shaft located approximately 35 m west of PSCs 306 and 361. See Shaft Desk Study and risk assessments (Appendix H).	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface watercourses within 250m of DoL.	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Portsdown Chalk Member**,** Spetisbury Chalk Member, Newhaven Chalk Formation, Tarrant Chalk Member (Principal Aquifers).	Leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250m of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSCs 314	Pit – Unspecified (‘The Dell’)					Section D Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with infill of unknown material. Recorded by the Local Council as ‘waste disposal/unknown fill’ categorised as ‘landfill’. Located adjacent to the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Residential properties and agricultural land within DoL**.**	Direct dermal contact, ingestion, and inhalation of dusts gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme. Purbrook Shaft is located approximately 65 m west.	Direct contact and gas migration / accumulation.	Medium	Low	Moderate / Low
		Surface water bodies/watercourses: No surface watercourses within 250 m.	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Bedrock geology is Portsdown Chalk Formation (Principal Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 500	Military - Belmont Naval Camp II [4]					Section D Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former naval camp. The eastern end of the camp footprint crosses the Section D DoL and 50m buffer zone. Likely activities include barracks, training grounds, laundry, classrooms, administrative buildings, and canteens. Storage of supplies including clothing, ammunition, and bulk storage of fuels/oils. Potential for Infill areas/Made Ground.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, explosives (ammunition, UXO), PFAS. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Residential.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None within 250m of PSC.	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: Superficial deposits are Head deposits (Secondary (undifferentiated) Aquifer). Bedrock is on the boundary of the Newhaven Chalk Formation and the Lewes Nodular, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, Portsdown Chalk Formation (undifferentiated chalk) (Principal Aquifers).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice
[4] Unexploded Ordnance (UXO) risks are not assessed in this risk assessment. Further details are presented in the Detailed Unexploded Ordnance Risk Assessment report (SafeLane Global, 2023)

PSC 340	Military – Fort Purbrook [4]					Section D Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Military Fort, southern tip of PSC crosses into the Section D 50m buffer zone. Activities included barracks and a centre for civil defence which likely included administrative buildings, munitions storage and training grounds (plus rifle range). Post WWII the fort was used as a Naval Radar School. Potential for Infill areas/Made Ground.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, explosives (ammunition, UXO), PFAS. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Portsmouth Golf Course 30 m north of PSC.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None within 250 m of PSC.	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: No Superficial Deposits. Underlying bedrock geology is Portsdown Chalk or Spetisbury Chalk (Principal Aquifer)	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate /Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice
[4] Unexploded Ordnance (UXO) risks are not assessed in this risk assessment. Further details are presented in the Detailed Unexploded Ordnance Risk Assessment report (Zetica, 2024)

PSCs 307, 308, 319, 366, 584	Water Works - Treatment Works (307); Water Works – Reservoir (308, 319, 366); Tank (584) within the Water Works PSC 307					Section D Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Water treatment and supply works including reservoirs, filter beds, filter tanks and unknown tanks, though likely for filtration purposes. Information from Local Councils regarding potential for Made Ground/Fill material. Located within the DoL and within the 50m buffer zone.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, phenols and PCBs. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide, chlorine gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Site users of Water Works, a residential property is within the DoL and historically possibly part of the Water Works.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme. Portsdown Hill Shaft located approximately 60 m north (at closest point). See Shaft Desk Study and risk assessments (Appendix H).	Direct contact and gas migration / accumulation.	Mild	Unlikely	Very Low
		Surface water bodies/watercourses: No surface watercourses within 250 m.	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Head deposits recorded immediately south of PSC 307 and 308. Underlying bedrock geology is Portsdown Chalk Formation (PSC 319), Newhaven Chalk or Tarrant Chalk Member. (Principal Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

PSC 304	Military – Farlington Redoubt [4]					Section D Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Farlington Redbout formed part of the defensive fortifications overlooking Portsmouth (from C.1880s). Factilities and activities included heavy gun batteries, storage magazines and accommodation. The fort was decommissioned at the start of WWII and chalk pit excavations took place. Records show that the land was temporarily used for live-fire range (1944). It is unsure if chalk excavation continued after the WWII. A waste management facility currently occupies the site. (see Risk Assessment for PSC 305). Recorded by the Local Council as 'waste disposal/unknown fill' categorised as 'landfill'. Potential for Made Ground with infill of unknown material.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, explosives (ammunition, UXO), PFAS Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low
		Adjacent land users: Fields east and west of PSC and Water Works to the south	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Mild	Unlikely	Very Low
		Surface water bodies/watercourses: No surface watercourses within 250 m of DoL.	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Underlying bedrock geology is Portsdown Chalk, Spetisbury Chalk, or Newhaven Chalk (Principal Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

[4] Unexploded Ordnance (UXO) risks are not assessed in this risk assessment. Further details are presented in the Detailed Unexploded Ordnance Risk Assessment report (Zetica, 2024)

PSC 305	Waste Facility - Physical Treatment Facility (L&S Waste Management)					Section D Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Waste management facility (Environment Agency Permit No. DP3295HN. Physical waste treatment facility). The waste management facility is on the site of a former chalk quarry/pit and Farlington Redoubt (PSC 304). Recorded by the Local Council as 'waste disposal/unknown fill' categorised as 'landfill'.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs and PCBs. Potential for methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during tunnelling, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours	Medium	Unlikely	Low [1]
		Adjacent land users: Fields east and west of PSC and Water Works to the south.	Direct dermal contact, ingestion and inhalation of gases and vapours	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface watercourses within 250 m.	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits**.** Underlying bedrock geology is Portsdown Chalk, Spetisbury Chalk, or Newhaven Chalk (Principal Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

Section E

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50m of Draft Order Limits (DoL) within Section E

PSC 264, 268, 269, 270, 271, 275, 276, 278, 288, 289, 290, 292, 294, 432	**Pit - Chalk (264, 268, 269, 270, 271, 275, 276, 278, 288, 289, 290, 292, 294); Pit – Unspecified (432)**					**Section E**
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former chalk pits. Potential for Made Ground with infill of unknown material. Former pits within the DoL: PSCs 268, 278 and 289. Pits located within, or part located within the 50m DoL: PSCs 264, 269, 270, 271, 275, 276, 288, 290, 292, 294 and 432.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX) and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		Scheme on Site existing and future property (buildings and buried services): AGP site BPT/IPS-E (Desk Study and risk assessments (Appendix H)). No building structures across the remainder of Section E scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Tributary to Potwell Tributary approximately 130m north (PSC 268).	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: Head Deposits (PSC 278) (Secondary Undifferentiated Aquifer)**,** Portsdown Chalk or Spetisbury Chalk Member (Principal Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): Stroud Coppice Ancient Woodland approximately 75m north of PSC 270 and within 250m of PSC 268 and 269. No other sensitive ecological receptors within 250m of the DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

PSC 262, 280, 499	Pit – Unspecified (262); Infilled Land - Pond (280); Infilled Land (499)					Section E
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potentially infilled former pond, PSC 280. PSC 499 potential infilled land recorded by Local Council; unknown infill dated 1952. Possible Made Ground with infill of unknown material. Located on Site to within 50m buffer from DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Farmland (PSC 499, 262), farmland and farm buildings (PSC 280).	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		Scheme on Site existing and future property (buildings and buried services): No building structures.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None within 250m of the PSCs.	Surface water runoff from stockpiles and migration through groundwater.	Mild	Low Likelihood	Low
		Groundwater: No Superficial deposits. Portsdown Chalk Formation (Principal Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No sensitive ecological receptors found within 250m. of the pipe route.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

PSC 279, 282	Works - Kilns (279, 282)					Section E
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Kilns on chalk pit (PSC 278) within DoL	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Mild	Low Likelihood	Low
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Mild	Low Likelihood	Low
		Scheme on Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Mild	Low Likelihood	Low
		Surface water bodies/watercourses: No surface water bodies within 250m.	Surface water runoff from former kilns and migration through groundwater.	Mild	Low Likelihood	Low
		Groundwater: Head deposits (Secondary Undifferentiated Aquifer) Portsdown Chalk Formation (Principal Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No sensitive ecological receptors found within 250m of the pipe route.	Plant uptake, direct contact, ingestion and inhalation of dusts by animals.	Medium	Unlikely	Low

PSC 451	Fuel Filling Station					Section E
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Fuel Filling Station, northeastern section located within 50m buffer of the DoL.	Metals, inorganics, petroleum hydrocarbons VOCs and phenols.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Car Park	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		Scheme on Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface water bodies located within 250m.	Surface water runoff from stockpiles and migration through groundwater.	Mild	Low Likelihood	Low
		Groundwater: Portsdown Chalk Formation is classified as a Principal Aquifer.	Leaching through unsaturated and saturated soil.	Severe	Low Likelihood	Moderate
		Ecological receptors (flora and fauna): Portsdown Hill is classified as a SSSI located approximately 20m southwest of PSC and 40m southwest of the DoL	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

Section F

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50m of Draft Order Limits (DoL) within Section F

PSC 5	Landfill - Albany Farm Historic Landfill Site Reference FFA2, 10/2					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Inert waste type. The depth of the waste material is unconfirmed. The landfill is located within the Section F DoL. Landfill adjacent to the proposed area for Above Ground Plant IPS-F.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyl compounds (PCBs), pesticides, herbicides and per-and polyfluorinated alkyl substances (PFAS).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Likely	Moderate
		Adjacent land users: Farmland, closest residential properties recorded approximately 270m northwest.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future infrastructure property (buildings and buried services: Landfill adjacent to the proposed area for infrastructure IPS-F. Location and design of building structures to be confirmed.	Direct contact	Medium	Likely If landfill areas are within development of future IPS-F	Moderate
		Surface water bodies/watercourses: Drain or watercourse (a tributary to the Wallington River) approximately 100m northeast.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low likelihood	Low
		Groundwater No superficial deposits. Spetisbury Chalk (Principal Aquifer). Within a groundwater Source Protection Zone II.	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low likelihood	Low
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users:** Construction workers during open cut excavations / construction, maintenance workers during operation.	Inhalation of gases and vapours.	Medium	Likely	Moderate
		Scheme on Site existing and future property (buildings and buried services): Landfill adjacent to the proposed area for infrastructure IPS-F. Location and design of building structures to be confirmed.	Gas migration / accumulation.	Severe	Likely Accumulation of landfill gas could migrate to future building structures and services on IPS-F	High

PSC 6	Landfill - Albany Farm Historic Landfill Site Reference FFA3, 10/2					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Inert waste type. The depth of the waste material is unconfirmed. Landfill located within the Section F DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, pesticides, herbicides and PFAS.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Severe	Likely	High
		Adjacent land users: Farmland and Albany Business Park 40m west of the landfill.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future infrastructure property (buildings and buried services: Landfill within the proposed area for IPS-F. Location and design of building structures to be confirmed.	Direct contact	Medium	Likely	Moderate
		Surface water bodies/watercourses: Drain or **w**atercourse (a tributary to the Wallington River) approximately 50m northeast.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: Spetisbury Chalk (Principal Aquifer), with absent superficial deposits. Within a groundwater Source Protection Zone II.	Leaching through unsaturated and saturated soil.	Severe	Likely	High
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low
	Landfill gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users:** Construction workers during open cut excavations / construction, maintenance workers during operation.	Inhalation of gases and vapours.	Medium	Likely	Moderate
		Scheme on Site existing and future property (buildings and buried services): Landfill within the proposed area for infrastructure IPS-F. Location and design of building structures to be confirmed.	Gas migration / accumulation.	Severe	Likely Accumulation of landfill gas within future building structures and services on IPS-F.	High

PSC 15	Infilled Land - Disturbed Ground					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with potential for infill of unknown material. Identified by Local Council. Located within the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, benzene, toluene, ethylbenzene (BTEX) and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Farmland, Albany Business Centre (small business park) approximately 45-50m south of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Drain (flowing in a southeasterly direction towards the Wallington River) approximately 150m northeast.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Spetisbury Chalk (Principal Aquifer). Within a groundwater Source Protection Zone III (total catchment).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 594	Infilled Land - Pond					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with potential for infill of unknown material. Identified by Local Council. Located within 50 m of the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None within 250m of PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: River Terrace Deposits (Secondary A Aquifer). Lambeth Group (Unproductive Stratum). Within a groundwater Source Protection Zone III (total catchment).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): Ancient Woodland located 150m north of PSC.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 1	Works - Crockerhill Brickworks incorporating Works – Industrial Estate (PSC 621)					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Historic brickfield east and west of Forest Lane. Historic sawmills and current industrial estate (PSC 621) located to the west of Forest Lane (Welbourne Business Park). Brickfield active between 1892 – 1914 and sawmills present between 1949 – 1970. Current use includes a brick and stone works, concrete manufacturer, self-storage facility and vehicle repair garage located approximately 10m west of DoL (at closest point). Eastern section of former brickfield is within the DoL. Potential for Made Ground with infill of unknown material.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs and PCBs. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Farmland, industrial estate	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Low Likelihood	Moderate / Low
		Surface water bodies/watercourses: None located within 250 m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: Superficial deposits is River Terrace Deposits (Secondary A Aquifer) encroaching the DoL. Artificial ground recorded approximately 45m west of DoL on western section of Forest Lane. Bedrock geology is Lambeth Group (unproductive strata). Southern section is within a groundwater Source Protection Zone III (total catchment).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood Where unproductive stratum over lies Chalk aquifer	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. Ancient woodland adjacent to DoL and PSC (at closest point).	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 7	Pit - Unspecified					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential Old Pit. Potential for Made Ground with potential for infill of unknown material. Located with the DoL	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Likely	Moderate
		Surface water bodies/watercourses: None within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Spetisbury Chalk (Principal Aquifer). Within a groundwater Source Protection Zone III (total catchment).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSCs 22 and 24	Pit - Sand (22); Pit - Chalk (24);					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with potential for infill of unknown material. Both are located within the 50m buffer of the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme at these locations.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface watercourses within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Portsdown Chalk Formation (Principal Aquifer). Old Chalk Pit (PSC 24) within a groundwater Source Protection Zone II.	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 2	Pit - Clay					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with potential for infill of unknown material. Located within the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future property (buildings and buried services): No building structures as part of scheme at this location.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface watercourses within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Mild	Low Likelihood	Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. Ancient woodland approximately 15m south of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSCs 9, 14 and 25	Pit – Chalk (Crockerhill) (9); Pit – Various (Chalk, Gravel, Clay) (14); Pit – Chalk (25)					Section F
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with potential for infill of unknown material within the DoL. PSCs 14 and 25 cross into the DoL. The southeast area of PSC 9 crosses into the 50 m buffer zone.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Farmland, PSC 14 located adjacent to Albany Farm Historic Landfill (PSC 6) and Albany Business Centre.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future property (buildings and buried services): No building structures as part of scheme at these locations.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface watercourses within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Bedrock Spetisbury Chalk Member (Principal Aquifer). Within a groundwater source protection zone II (outer protection).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Mild	Low Likelihood	Low

Section G

Appendix F -Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50m of Draft Order Limits (DoL) within Section G

PSC 33	Garage - Drokes Farm Motor Company					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Sales and garage (vehicle maintenance) on Titchfield Lane approximately 5-15m north of DoL (construction access to proposed AGP site). PSC >100m from proposed AGP site.	Metals, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and phenols.	**Construction, maintenance workers and future site users:** Construction workers during groundworks for site access road construction.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate /Low
		Adjacent land users: Residential properties adjacent to DoL and approximately 10m south of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme. Proposed infrastructure IPS-G located approximately 100m northeast of PSC.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface watercourses within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: Earnley Sand Formation – sand, silt and clay (Secondary A Aquifer). Superficial deposits of River Terrace Deposits (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. Ancient Woodland located approximately 120m northwest.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 31	Infilled Land - Ponds					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Ponds. Potential for Made Ground with potential for infill of unknown material. Located approximately 5m north of DoL (access to proposed AGP site)	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during ground works for site access road construction.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Residential properties adjacent to DoL and approximately 5 m south of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface watercourses within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: Superficial deposits of River Terrace Deposits (Secondary A Aquifer). Earnley Sand Formation – sand, silt and clay (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. Ancient Woodland located approximately 100m northwest of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 257	Infilled Land - Tank					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Tank (unknown contents) within Nursery located approximately 10m southwest of DoL (access to proposed AGP site). Potential for leaks and spillages. Potential for infill.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during ground works for site access road construction.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Residential properties approximately 10m north of DoL and 30m north of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No surface watercourses within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: Superficial deposits of River Terrace Deposits (Secondary A Aquifer). Earnley Sand Formation – sand, silt and clay (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. Ancient Woodland located approximately 135m northwest.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 475	Garage					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Garage (vehicle maintenance) access off Titchfield Lane. Garage activities appear to be still current. DoL goes through PSC area.	Metals, asbestos, petroleum hydrocarbons, PAHs, VOCs and phenols.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Car park for golf club users and nursery (garden centre) adjacent. Gardens of residential properties approximately 20m northwest.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Land drain flows through Wickham golf course approximately 180 m south.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Earnley Sand Formation – sand, silt and clay (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. Ancient Woodland located approximately 220m northwest.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 46	Pit – Various (Park Place and Sand and Gravel Pit)					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Old Gravel and sand pit with former ponds within the footprint of pit. Potential for Made Ground and unknown fill material. Within the DoL. The DoL covers Wickham Golf Course.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely (dependent on extent of gravel pit and potential infilling)	Moderate
		Adjacent land users: Wickham golf club users**. Farm buildings** are approximately 50m east of the DoL.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood (dependent on extent of gravel pit and potential infilling)	Moderate / Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme at this location.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Small drain/water course within the golf course and with the DoL	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Likely	Moderate/Low
		Groundwater: Superficial deposits are River Terrace Deposits (Secondary A Aquifer). Earnley Sand Formation – sand, silt, clay (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 485	Wastewater Treatment Works (WTW)					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Operational Wastewater Treatment Works with possible areas of infilled land adjacent to the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, phenols, PCBs, PFAS and pathogens. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely (at temporary shaft locations, reduced within trenchless section)	Moderate
		Adjacent land users: Wastewater treatment works operators and users; Wickham Golf Course adjacent to the north.	Direct dermal contact, ingestion and inhalation of gases and vapours.	Medium	Low Likelihood (at temporary shaft locations, reduced within trenchless section)	Moderate / Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme at this location.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: River Meon located approximately 40m south (closest point) of the PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities. Trenchless crossing, possible pathway created during excavation of temporary reception pits.	Medium	Low Likelihood y	Moderate/Low
		Groundwater: River Terrace Deposits (Secondary A Aquifer) underlain by London Clay Formation (Unproductive Strata). Whitecliff Sand Member (Secondary A Aquifer) shown on mapping approximately 30m northwest and may encroach the WTW.	Leaching through unsaturated and saturated soil. Trenchless crossing beneath the River Meon may create a preferential pathway for contamination to impact groundwater.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): None recorded within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

PSC 35	Infilled Land - Pond					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with potential for infill of unknown material. Located approximately 45m southwest from Section G DoL (at closest point).	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Farmland, residential properties approximately 25m southeast of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme at this location.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: No watercourses are located within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: Superficial deposits of River Terrace Deposits (Secondary A Aquifer). Wittering Formation, sand, silt, clay (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate /Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Mild	Unlikely	Very Low

PSC 626 and 627	Infilled Land - Drain					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for Made Ground with potential for infill of unknown material. DoL crosses PSCs. Trenchless crossing beneath the River Meon.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Unlikely	Low
		Adjacent land users:. PSC 626 farmland/rural; PSC 627 wastewater treatment works and Wickham Golf Course adjacent to the north.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme at this location.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: River Meon is located approximately 50-60m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Unlikely	Low
		Groundwater: Alluvium and River Terrace Deposits (Secondary A Aquifer). Head deposits. Bedrock is London Clay Formation (Unproductive Stratum).	Leaching through unsaturated and saturated soil. Trenchless crossing beneath the River Meon may create a preferential pathway for contamination to impact groundwater.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Mild	Unlikely	Low

PSC No. 36, 37 and 52	Pit - Gravel					Section G
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Old Gravel Pits. Potential for Made Ground with potential for infill of unknown material. PSCs 36 and 52 are located along the southwestern boundary of Wickham Golf Course and are within the 50m buffer zone of the Section G DoL (approximately 10m from the DoL at closest point). The northeastern area of PSC 37 encroaches the 50m buffer zone of the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood (dependent on extent of gravel pit and potential infilling)	Moderate / Low
		Adjacent land users: Closest residential properties are approximately 45m west, users and visitors of Wickham Golf Course.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood (dependent on extent of gravel pit and potential infilling)	Moderate / Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme at this location.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Small land drain/water course located within the DoL and flows easterly through the former gravel pit areas to a pond in the golf course, which drains to the River Meon.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Likely	Moderate
		Groundwater: Superficial deposits are River Terrace Deposits (Secondary A Aquifer). Wittering Formation – sand, silt and clay (Secondary A Aquifer) and Earnley Sand Formation – sand (Secondary A Aquifer)	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

Section H

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50m of the Draft Order Limits (DoL) within Section H

PSC 103	Pit - Sand					Section H Trenchless Crossing
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Sand Pit. Potential for Made Ground and infill areas. Trenchless crossing through former sand pit area.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX) andl phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Unlikely	Low [1]
		Adjacent land users: Wooded area, residential property approximately 50m northeast**.**	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: Whitecliff Sand Member – Sand (Secondary A Aquifer). Head deposits (Secondary undifferentiated aquifer) to the south of pipeline route (approximately 30m).	Leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

***** The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 445	Worked Ground					Section H
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Unspecified Ground Workings likely to be associated with Old Sand Pit (PSC103). Potential for Made Ground and infill areas. Southern part of PSC within the 50m buffer zone which encroaches the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Wooded area and farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: possible drain approximately 170m northwest.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Whitecliff Sand Member – Sand (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 45	Pit - Gravel					Section H
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Old Gravel Pit (Gravel Pit Copse). Potential for Made Ground and infill areas. Located adjacent to the DoL and within 50m buffer of Section H DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Farmland, closest residential property is adjacent to the DoL and within the PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: Superficial deposits of River Terrace Deposits (Secondary A Aquifer). Wittering Formation - sand silt and clay (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. Gravel Pit Copse is located 60 m southwest of the DoL and within the PSC.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 78	Infilled Land – Disturbed Ground					Section H
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Ground shown as disturbed and used as a farmyard within satellite imagery including unknown spoil heaps. Potential for Made Ground and infill areas. Western part of PSC crosses Section H DoL and much of the eastern area is located within the 50m buffer.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Farmland, closest residential property is located 15 m southwest of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: A watercourse is approximately 190 m southeast of DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: Superficial deposits of Head Deposits (Secondary Undifferentiated Aquifer). Whitecliff Sand Member (Secondary A Aquifer) at western area of PSC and London Clay Formation (Unproductive Stratum) within central and eastern area of DoL.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No designated statutory sites within 250 m. Shirrell Copse (Ancient replanted Woodland) is located approximately 40 m southwest (closest point) of DoL. Long Copse (Ancient and Semi natural woodland) is located approximately 100 m southeast of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 80 and 81	Tank					Section H
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Potential for leakages and spillage. Potential for Made Ground and infill areas if tanks extended below ground. PSC 80 within the boundary of a current farm (PSC 76). PSC 81 identified by council as storage tanks (above and below ground). Located approximately 45 m (PSC 80) and 35 m west (PSC 81) of Section H DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, volatile organic compounds (VOCs) and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: PSC 80 Farmland; PSC 81 Farm and Shirrell Copse.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Very Low
		Surface water bodies/watercourses: PSC 80 None within 250m. PSC 81 watercourse approximately 240 m southeast.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Whitecliff Sand Member (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. PSC 80 located approximately 80 m southwest from Shirrell Copse. PSC 81 located within Shirrell Copse (Ancient replanted Woodland) and approximately 35m west of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 90	Landfill - Shirrell Heath Sand Pit					Section H
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Inert and commercial waste type. (Landfill Reference EAHLD2048 Site Ref. FW1, 5/1). The depth of the waste material is unconfirmed. Southern area of the landfill approximately 30 m north of the Section H DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, semi-volatile organic compounds (SVOCs), polychlorinated biphenyl compounds (PCBs), pesticides, herbicides, per-and polyfluorinated alkyl substances (PFAS).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Likely Dependent on boundary of landfill	Moderate
		Adjacent land users: Farmland, closest residential properties are approximately 45-50m east.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low likelihood Dependent on boundary of landfill	Moderate / Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures on pipeline route.	Direct contact	Medium	Low Likelihood	Moderate / Low
		Surface water bodies/watercourses: None within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: No superficial deposits Whitecliff Sand Member (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood Dependent on boundary of landfill	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low
	Landfill ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users:** Construction workers during open cut excavations / construction, maintenance workers during operation.	Inhalation of gases and vapours.	Medium	Likely Depending on extent of the landfill	Moderate
		Scheme on Site existing and future property (buildings and buried services): No building structures on pipeline route.	Gas migration / accumulation.	Medium	Low Likelihood	Moderate / Low

PSC 512	Farm – Pig Farm (potential)					Section H
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Possible former pig farm circa 2005. The land use activity shown on 2005 aerial photography is not confirmed, however, a possible pig farm has been included as a PSC for completeness. There is no further information to confirm this. DoL crosses the PSC.	Metals, parasites, pathogens and pesticides/herbicides.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Arable farming	Direct dermal contact, ingestion and inhalation of dusts during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site future property (buildings and buried services): No building structures on pipeline route.	Direct contact with materials	Medium	Unlikely	Low
		Surface water bodies/watercourses: Land drain is approximately 50 southeast of DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: Superficial deposits are River Terrace Deposits (Secondary A Aquifer). Bedrock is Wittering Formation, sand, silt, clay (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): no statutory designated sites within 250m	Plant uptake, direct contact, ingestion and inhalation of dusts by animals.	Mild	Unlikely	Very low

Section J

Appendix F -Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50m of Draft Order Limits (DoL) within Section J

PSC 96 and 535	Industrial Estate - (Woodmans Farm); former Tank (PSC 535) within the industrial estate					Section J
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Current Industrial estate is adjacent to the DoL (at closest point) and between 20-40m of DoL at other points along its boundary. Historically the industrial estate was Woodmans Farm which was present between 1888 and 1913. Historical tank present (PSC 535) in the northwest part of the industrial estate, located approximately 40m southwest of the DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), polychlorinated biphenyl compounds (PCBs), pesticides and herbicides.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Low Likelihood Increased likelihood where the PSC encroaches the DoL	Moderate/Low
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood Increased likelihood where the PSC encroaches the DoL	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures present or proposed as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits Wittering Formation (sand silt and clay) mapped beneath southern part of PSC and Whitecliff sand member beneath central part of PSC (Secondary A Aquifers). London Clay (Unproductive Stratum) mapped beneath northern section, PSC 535.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Mild	Low Likelihood	Very Low

PSC 102	Pit - Sand					Section J
Potential Source of Contamination	**Potential Contaminants of Concern**	**Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Sand Pit. Potential for Made Ground and infill areas. Trenchless crossing through northern part of the former sand pit area.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, benzene, toluene, ethylbenzene (BTEX) and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Low Likelihood Trenchless crossing through area	Moderate / Low [1]
		Adjacent land users: Wooded area, closest residential property approximately 30m northeast**.**	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely Trenchless crossing through area.	Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely Trenchless crossing through area.	Very Low
		Groundwater: Whitecliff Sand Member – Sand (Secondary A Aquifer). Head deposits (Secondary Undifferentiated Aquifer) to the south of DoL (approximately 30m).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Mild	Low Likelihood	Very Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 114	Water Works - Sewage Pumping Station					Section J
Potential Source of Contamination	**Potential Contaminants of Concern**	**Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Small Sewage Pumping Station unit located approximately 10 m east of the Section J DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, phenols and pathogens	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Mild	Low Likelihood	Low
		Adjacent land users: Farmland**.**	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Mild	Low Likelihood	Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Mild	Unlikely	Very Low
		Surface water bodies/watercourses: Small watercourse 45m east of PSC; small watercourse 80m west of the PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: No superficial deposits recorded. London Clay Formation (Unproductive Aquifer).	Leaching through unsaturated and saturated soil.	Mild	Low Likelihood	Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Mild	Low Likelihood	Low

PSC 97	Landfill - Ash House Landfill					Section J
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Landfill accepted commercial and household waste type (Site Reference FW38, FW17, 5/74). The depth of the waste material is unconfirmed. The landfill is within the Section J DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, pesticides, herbicides and per- and polyfluorinated alkyl substances (PFAS).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Severe	Likely	High
		Adjacent land users: Farmland, residential premises approximately 35m south of the DoL, a residential property approximately 15m north of DoL and adjacent to the landfill.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme but DoL through landfill.	Direct contact	Medium	Likely	Moderate
		Surface water bodies/watercourses: Issues are recorded approximately 200m south.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: No superficial deposits are recorded. Whitecliff Sand Member (Secondary A Aquifer).	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low
	Landfill ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users:** Construction workers during open cut excavations / construction, maintenance workers during operation.	Inhalation of gases and vapours.	Medium	Likely	Moderate
		Scheme on Site existing and future property (buildings and buried services): No building structures as part of scheme.	Gas migration / accumulation.	Medium	Low Likelihood	Moderate/Low

PSC 443	Landfill - Land at Rossgarth Landfill					Section J
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Landfill accepted inert waste type (Holder Reference EAHLD20420). The depth of the waste material is unconfirmed. Northwestern part of the Landfill is within the DoL	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, pesticides, herbicides and PFAS.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Likely	Moderate
		Adjacent land users: Farmland, farm facilities approximately 100m east of the DoL.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme but DoL through the landfill.	Direct contact	Medium	Low Likelihood	Moderate / Low
		Surface water bodies/watercourses: Surface drains recorded approx. 100 and 120m west within the golf course.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: Superficial deposits of Head (Secondary undifferentiated Aquifer). London Clay (unproductive stratum) across the majority of the site with Whitecliff Sand Member (Secondary A Aquifer) in the southeast corner of the landfill.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m..	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low
	Landfill ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users :** Construction workers during open cut excavations / construction, maintenance workers during operation.	Inhalation of gases and vapours.	Medium	Low Likelihood Dependent on extend of landfill	Moderate / Low
		Scheme on Site existing and future property (buildings and buried services): No building structures on pipeline route,	Gas migration / accumulation.	Medium	Low Likelihood Dependent on extent of landfill area.	Moderate / Low

Section K

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50m of Draft Order Limits (DoL) within Section K

PSC 132	Infilled Land - Pond					Section K
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former pond. Made Ground with potential for infill of unknown material. Located within the DoL	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX) and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Likely	Moderate
		Adjacent land users: Farmland, closest residential properties approximately 60m northeast of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Drain flows in a southwest direction across the former pond area. A tributary to Ford Lake.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Severe	Likely	High
		Groundwater: No superficial deposits recorded. London Clay Formation (unproductive stratum). Within a groundwater Source Protection Zone II.	Leaching through unsaturated and saturated soil.	Mild	Low Likelihood	Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250m. The South Downs National Park is approximately 150m east of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 474	Military – Wintershall Hill (former military/civilian base)					Section K
Potential Source of Contamination	**Potential Contaminants of Concern**	**Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Historic activities during World War I and II at Wintershill Hall and estate grounds. WWI: used as the base for the Hampshire Ambulance Service. Potential for storage and use of fuels. WWII: used as a school and headquarters of the Hampshire Fire Service. Potential for storage and use of fuels. Nissen huts are documented to have been present in the grounds (the exact location unconfirmed). Asbestos cement sheeting has been used in construction materials. Potential for asbestos fibres to be released to soils during demolition. Section K DoL approximately 170m east of main buildings.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, explosives (ammunition, UXO), PFAS (if fire training and chemical storage undertaken).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/ Low
		Adjacent land users: Estate land and Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and soils stock piling.	Medium	Low Likelihood	Moderate/ Low
		On Site existing and future property (buildings and buried services): Proposed area for AGP site BPT - K within the estate. See separate desk study for assessment at BPT – K (Appendix H).	Direct contact and gas migration / accumulation.	Medium	Low Likelihood	Moderate/ Low
		Surface water bodies/watercourses: Drains approximately 30m east from the southeast boundary.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: No superficial deposits. London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Mild	Low Likelihood	Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m. Ancient replanted woodland located approximately 40m east of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 119	Infilled Land - Channel					Section K
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Infilled Channel. Made Ground with potential for infill of unknown material. Located within the Section K DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: River Hamble approximately 60m from infilled channels.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate/Low
		Groundwater: Superficial deposits River Terrace Deposits (Secondary A Aquifer) over London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m, however the area is adjacent to the River Hamble.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Low Likelihood	Moderate/Low

PSCs 120, 121, 122, 123, 124	Infilled Land - Channels					Section K Trenchless Crossing
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Infilled Channels. Made Ground with potential for infill of unknown material. Trenchless Crossing	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Unlikely	Low [1]
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Trenchless crossing beneath River Hamble.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Unlikely .	Low
		Groundwater: Superficial deposits River Terrace Deposits (Secondary A Aquifer) and Alluvium (Secondary A Aquifer). Bedrock is London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely .	Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice.

PSC 529	Worked Ground - Stockpile					Section K
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material. Located within Section K DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Farmland, closest residential properties approximately 25 m west of PSC.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: None located within 250m of PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits. Bedrock is London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Mild	Unlikely	Very Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

PSC 530	Worked Ground - Unspecified					Section K
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material. Located within the Section K DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Farmland	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Low Likelihood	Moderate/Low
		Surface water bodies/watercourses: Field drain within draft order limits and adjacent to PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate/Low
		Groundwater: Superficial deposits Alluvium (Secondary A Aquifer). Bedrock is London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

PSC 107, 108, 109, 118 and 531	Infilled Land – Marshland (107, 108 and 118); Infilled Land – Drain (109); Infilled Land - Watercourse (531)					Section K
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Infilled Watercourse, Marshland and Drains. Made Ground with potential for infill of unknown material. Located within the Section K DoL (except PSC 118).	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Farm buildings located adjacent to the PSCs.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: River Hamble adjacent to PSCs.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate/Low
		Groundwater: Superficial deposits Head Deposits (Secondary Aquifer Undifferentiated), River Terrace Deposits and Alluvium (Secondary A Aquifers) overlies bedrock (London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate/Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

Section L

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50m of Draft Order Limits (DoL) within Section L

PSC 168	Works - Brick Works					Section L
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Former Brick Works (clay pits and kilns) located adjacent to DoL. Infilled Land – Made Ground (BGS) (PSC 440) extends onto PSC 168. See Risk Assessment for PSC 440 for more details. Made Ground with potential for infill areas.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Likely	Moderate
		Adjacent land users: Residential properties (mobile homes) on the site of former brick works.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		Scheme on Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Bow Lake is adjacent to DoL; PSC approximately 35 m south of DoL and 100 m south of Bow Lake.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate/Low
		Groundwater: No superficial deposits. Bedrock is London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Mild	Low Likelihood	Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250m. Ancient Woodland located approximately 70 m west of PSC, and approximately 15 m to DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Mild	Low likelihood	Low

PSC 520	Infilled Land - Marshland					Section L Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material. PSC crosses Section L DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, benzene, toluene, ethylbenzene (BTEX) and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during trenchless excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Unlikely	Low [1]
		Adjacent land users: The closest residential properties are approximately 30 m south.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		Scheme On Site existing and future property (buildings and buried services): None, Highbridge Shaft location approximately 130 m southeast (see separate risk assessment – Appendix H).	Direct contact and gas migration/accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: The River Itchen is located approximately 190 m south.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Unlikely	Low
		Groundwater: Superficial deposits River Terrace Deposits (Secondary A Aquifers). Bedrock is London Clay Formation (unproductive stratum)	Leaching through unsaturated and saturated soil.	Medium	Unlikely.	Low
		Ecological receptors (flora and fauna): The River Itchen (SSSI and SAC) are approximately 190 m southwest.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Medium	Unlikely	Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

PSC 524	Infilled Watercourse					Section L
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material. PSC crosses Section L DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: Farmland, closest residential property is approximately 60 m west.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Low Likelihood	Moderate/Low
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Pond approximately 13 m north of DoL and adjacent to PSC. Pond feeds a tributary to Bow Lake.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate/Low
		Groundwater: No superficial deposits. London Clay Formation (unproductive stratum)	Leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): No statutory designated sites within 250 m. Ancient Woodland >250 m south of the DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Medium	Unlikely	Low

PSC 174	Infilled Land - Drain					Section L
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material. PSC adjacent to the Section L DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Mild	Low Likelihood	Low
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Mild	Low Likelihood	Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Mild	Unlikely	Very Low
		Surface water bodies/watercourses: No surface water courses within 250 m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: No superficial deposits present. (London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Mild	Unlikely	Very Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250 m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

PSC 175	Infilled Land - Drain					Section L
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material. PSC approximately 10m (closest point) from the Section L DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Mild	Low Likelihood	Low
		Adjacent land users: Farmland.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Mild	Low Likelihood	Low
		On Site existing and future property (buildings and buried services): No building structures as part of scheme.	Direct contact and gas migration / accumulation.	Mild	Unlikely	Very Low
		Surface water bodies/watercourses: Bow Lake (surface watercourse) approximately 70 m north of PSC.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater: Alluvium (Secondary A Aquifer), London Clay Formation (unproductive stratum).	Leaching through unsaturated and saturated soil.	Mild	Low Likelihood	Low
		Ecological receptors (flora and fauna): No statutory designated areas within 250 m. Ancient Woodland adjacent to the south of PSC and approximately 15 m south of DoL.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSCs 440, 441 and 472	**Infilled Land Made Ground (BGS) (440); Landfill - Crowd Hill Landfill (441 and 472)** The BGS historical landfill point positions Crowd Hill Landfill in a different location to that provided by the EA. The EA Crowd Hill landfill boundary includes an area of ancient woodland in the east of the landfill and may be inaccurate To date there is no additional information to confirm the second location and a risk assessment table has not been included. The second location (PSC 472) is presented on **Figure 12.**					Section L
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Inert and industrial waste type (Holder Reference EAHLD20508; Site Reference FEA22, EAST 5). The depth of the waste material is unconfirmed. BGS Made Ground (PSC 440) coincides with the landfill and on land to the north and northeast. DoL crosses both the Crowd Hill landfill sites.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, polychlorinated biphenyl compounds (PCBs), pesticides, herbicides and per-and polyfluorinated alkyl substances (PFAS).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts	Severe	Likely	High
		Adjacent land users: Farmland, residential properties (mobile homes) approximately 10m west of DoL and landfill boundary.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Likely	Moderate
		On Site existing and future infrastructure property (buildings and buried services): No building structures as part of scheme.	Direct contact	Severe	Unlikely	Moderate/Low
		Surface water bodies/watercourses: Bow Lake is approximately 145 m north (PSCs 440 and 441). A tributary to Bow Lake watercourse is present approximately 140 m east of PSC 472.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Unlikely	Low
		Groundwater No superficial deposits are recorded. London Clay (unproductive stratum).	Leaching through unsaturated and saturated soil.	Mild	Low Likelihood	Low
		Ecological receptors (flora and fauna): There are no statutory designated sites within 250 m. Ancient woodland shown in the east of Crowd Hill Landfill (PSC 441) approximately 30 m east of DoL. Ancient Woodland (Hill Copse) located approximately 160 m west of PSC 440 and the DoL. Ancient Woodland (Park Hills Wood) shown approximately 130 m southwest of PSC 472.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Likely	Moderate
	Landfill ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers, adjacent land users and future site users:** Construction workers during open cut excavations / construction, maintenance workers during operation.	Inhalation of gases and vapours.	Medium	Likely	Moderate
		Scheme on Site existing and future property (buildings and buried services): No building structures as part of scheme.	Gas migration / accumulation.	Medium	Unlikely	Moderate / Low

Section M

Appendix F - Risk Assessment Tables for Construction and Maintenance Activities for PSCs within 50 m of the Draft Order Limits (DoL) within Section M

PSC 208	Water Works - Otterbourne Water Supply Works					Section M
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill areas at Otterbourne WSW. PSC area crosses into the DoL and 50m buffer.	Metals, inorganics (including ammonia, nitrates), asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Otterbourne WSW (current operation); Solar Panel Farm users.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works	Medium	Low Likelihood Disturbance of ground in southern area of WSW	Low
		On Site existing and future infrastructure property (buildings and buried services): None within the DoL. Further details of connection into WSW to be confirmed.	Direct contact and gas migration/ accumulation.	Medium	Low Likelihood	Moderate/ Low
		Surface water bodies/watercourses: Surface watercourse (possible land drain) is located approximately 170m east of the DoL. Ponds are approximately 240m southwest and the River Itchen is located approximately 360m east of the DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate/ Low
		Groundwater Superficial deposits of Head Deposits (Secondary Undifferentiated Aquifer) and Clay-with-Flints (unproductive stratum) overlying Culver Chalk Formation (Principal Aquifer). Located within a Source Protection Zone I.	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): The River Itchen is classified as a SSSI and SAC located within 250m from the PSC. PSCs located within South Downs National Park.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSC 209	Landfill - Bugle Farm Landfill					Section M Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Unknown waste type, therefore potential for inert, commercial/industrial and domestic waste types to have been deposited. The depth of the waste material is unconfirmed (Holder Reference EAHLD20430; Site Reference FW26). PSC crosses DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, semi-volatile organic compounds (SVOCs), polychlorinated biphenyl compounds (PCBs), pesticides, herbicides, per- and polyfluorinated alkyl substances (PFAS).	**Construction, maintenance workers and future site users:** Construction workers during trenchless construction, and maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Unlikely	Low [1]
		Adjacent land users: Business premises is approximately 10m southwest of DoL, a residential property is approximately 125m north of DoL and within 5m of the landfill.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services: No building structures as part of scheme. Highbridge Shaft located approximately 200m southeast of landfill (see separate RA – Appendix H).	Direct contact	Medium	Unlikely	Low
		Surface water bodies/watercourses: River Itchen approximately 200m southwest of the DoL. Watercourse crosses DoL at approximately 50m from landfill area. Two ponds approximately 80 m southwest (closest point) unknown if in connection with River Itchen.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Severe	Unlikely	Moderate/ Low
		Groundwater: Superficial depots are River Terrace deposits (Secondary A Aquifer). Principal Aquifer (Chalk) with overlying London Clay (unproductive stratum). Within a groundwater Source Protection Zone I.	Leaching through unsaturated and saturated soil.	Severe	Unlikely	Moderate/ Low
		Ecological receptors (flora and fauna): River Itchen (SSSI and SAC) approximately 200m southwest at its closest point to the landfill. PSCs located within South Downs National Park.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low
	Landfill ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide).	**Construction, maintenance workers, adjacent land users and future site users:** Construction works would be operators (above ground) during trenchless construction; maintenance during operation within created trenchless area.	Inhalation of gases and vapours.	Severe	Low Likelihood	Moderate [1]
		On Site existing and future property (buildings and buried services): No building structures as part of scheme. Highbridge Shaft located approximately 200m southeast of landfill (see separate RA).	Gas migration/accumulation.	Severe	Unlikely	Moderate/ Low

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

PSC 220	Water Works - Filter Beds					Section M
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material. Filter bed immediately adjacent to the DoL and within the 50m buffer.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Otterbourne WSW (current operation); Solar Panel Farm users.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future infrastructure property (buildings and buried services): None	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: A surface watercourse (possible land drain) approximately 130m east and ponds are approximately 215m southwest. River Itchen is approximately 370 m east of the DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate / Low
		Groundwater: Superficial deposits of Head (Secondary Undifferentiated) and Clay-with-Flints (unproductive stratum) overlying Culver Chalk formation (Principal aquifer). Located within a Source Protection Zone I.	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna): River Itchen (SSSI and SAC) are approximately 370 m east. PSCs located within South Downs National Park. Otterbourne Park Wood is located adjacent to this PSC.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low

PSCs 437, 438	Infilled Land – BGS Made Ground*					Section M Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material. PSC crosses into Section M DoL.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, VOCs, SVOCs, PCBs, pesticides, herbicides and PFAS. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during trenchless construction, and maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Unlikely	Low [1]
		Adjacent land users: Construction and Recycling works (Gracelands and Inert Recycling).	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Unlikely	Low
		On Site existing and future infrastructure property (buildings and buried services): None	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: River Itchen (SSSI and SAC) within 35m southwest of the DoL at its closest point to PSC	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Low Likelihood	Moderate/Low
		Groundwater: Superficial deposits are River Terrace Deposits (Secondary A aquifers). Bedrock geology is London Clay Formation (unproductive aquifer) over Lambeth Beds and Chalk (Principal Aquifer). Located within a Source Protection Zone I.	Leaching through unsaturated and saturated soil.	Severe	Unlikely	Moderate/ Low
		Ecological receptors (flora and fauna): The River Itchen (SSSI and SAC) is approximately 35m southwest. PSCs located within South Downs National Park.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Medium	Low Likelihood	Moderate/Low

* PSCs 206, 210, 215 and 216 are within the footprint of PSC 516 (Pit-Gravel Pit) and PSCs 437 and 438 (Infilled Land – BGS Made Ground) and are therefore covered within these risk assessments.

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

PSC 516	Pit – Gravel *					Section M Tunnel Section
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Made Ground with potential for infill of unknown material.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and phenols. Potential methane, carbon dioxide, carbon monoxide, hydrogen sulphide gas.	**Construction, maintenance workers and future site users:** Construction workers during trenchless construction, and maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Unlikely	Low [1]
		Adjacent land users: Business premises within DoL, Residential properties and roads located adjacent to the former gravel pits.	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours.	Medium	Unlikely.	Low
		On Site existing and future infrastructure property (buildings and buried services): Highbridge Shaft location approximately 200 m southeast.	Direct contact and gas migration/ accumulation.	Medium	Unlikely	Low
		Surface water bodies/watercourses: Tributaries to the River Itchen are located within DoL and adjacent to the former gravel pit. River Itchen is located approximately 250m southwest of DoL.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Medium	Unlikely	Low
		Groundwater: Superficial deposits are River Terrace Deposits (Secondary A aquifers). Bedrock geology is London Clay Formation (unproductive aquifer) over Lambeth Beds and Chalk (Principal Aquifer). Located within a Source Protection Zone I.	Leaching through unsaturated and saturated soil.	Severe	Unlikely	Moderate/ Low
		Ecological receptors (flora and fauna): River Itchen (SSSI)) is approximately 190 m southwest; special area of conservation (SAC) approximately 230 m southwest. PSCs located within South Downs National Park.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals.	Mild	Unlikely	Very Low

* PSCs 206, 210, 215 and 216 are within the footprint of PSC 516 (Pit-Gravel Pit) and PSCs 437 and 438 (Infilled Land – BGS Made Ground) and are therefore covered within these risk assessments

[1] The potential for the presence of gas and the associated risks during trenchless crossing techniques will need to be evaluated and assessed in accordance with BS 6164:2019 H&S in Tunnelling in the Construction Industry - Code of Practice

Appendix G – Above Ground Plant Desk Studies

Site Reference	BPT-E / IPS-E
National Grid Reference (NGR)	466413E, 106521N *(Based on AGP information 11 January 2024)*
Proposed Infrastructure Site	The proposed area for the BPT-E / IPS-E AGP is approximately 0.58 ha. The extended BPT-E / IPS-E compound area including access roads is approximately 2.5 ha. The exact location of the proposed AGP will be dependent on the route of the Proposed Underground Pipeline. This will be confirmed following hydraulic assessment of the route topography to ensure the required flow can be achieved.
Site Location and Description	BPT-E / IPS-E ('the Site') is located north of Portsdown Hill Road, immediately to the east of New Down Lane. The eastern, northern, and western Site boundaries are arable fields. To the south is Portsdown Hill Road and a viewpoint over the Portsmouth and Havant region. There is a groundworks company approximately 50m northwest of the Site. A covered reservoir is located approximately 60m east, two masts and two buildings are also present to the south of the reservoir. The village of Widley is recorded approximately 150m northeast. The Site slopes downward towards the north with elevations ranging between 95m OD in the south to 88m OD in the north.  **Figure G1.1: Site location of BPT-E AGP Site. The Site is in yellow above** (Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetM, 2023)**.**
Current Site Use	Arable cropped field (**Figure G1.2**).
Site History	OS mapping (NLS, 2023), (Groundsure, 2023 and 2024) shows the location of the Site has remained as open fields since prior to 1900. Circa.1900 the main road now known as B2177 Portsdown Hill Road (located approximately 20m south from the Site) is present.

	Mapping dated c.1888 shows three chalk pits (disused) approximately 80m, 125m and 205m south and southeast of the Site. A reservoir, part of the Borough of Portsmouth Water Works Company, is present approximately 140m east of the Site. Beyond the northeast of the Site resides the small village of Widley (located approximately 150m from the Site) which has been populated with Portsdown Cottage, Portsdown Lodge, Christ Church. 'The Dell' (possible former pit) appears to be sited in the grounds of Portsdown Lodge (since c.1888). The northern part of the Site is surrounded by agricultural fields (including Widley Farm) and two pits (potentially infilled) located approximately 185m north and 170m northeast from the Site. Between 1895 to 1937, the Portsdown and Horndean Light Railway (tram), orientated northeast to southwest, was located approximately 250m east of the Site. A building located approximately 50m north of the site is shown on map 1955-1961 (NLS, 2023), this is known to have been a telecoms repeater station (telephone exchange) which is now occupied by Parchow Groundworks. This was confirmed by a site visit (26th April 2023). Aerial photography dated 1999 to the present-day (Google Earth, 2023) shows a covered reservoir (part of Portsmouth Water Works) approximately 60m east of the Site with several telecom masts.
Geology	Superficial Deposits: Head Deposits comprising silt, sand, clay and gravel are noted along the northern edge of the site. Bedrock: White Chalk Subgroup (Portsdown Chalk Formation).
Hydrogeology	Head Deposits are classified as a Secondary Aquifer (Undifferentiated). The Chalk bedrock is classified as a Principal Aquifer. The Site is not located within a Groundwater Source Protection Zone (SPZ) or Groundwater Drinking Water Safeguard Zone (DWSgZ). The Site is within a Groundwater Nitrate Vulnerable Zone (NVZ) (G58 – Fareham). No groundwater abstractions are located within 1km of the Site.
Hydrology	No watercourses or waterbodies on Site or within 250m. A covered reservoir is mapped approximately 60m east. The Site is located within a Surface Water NVZ - Eutrophic Water ET2 (Chichester, Langstone and Portsmouth Harbours Eutrophic NVZ) and Fareham G58 (Environment Agency, 2023). The Site is not located within a Surface Water DWSgZ. No surface water abstractions are located within 1km of the Site.
Flood Zone	Flood Zone 1 (less than 1 in 1,000 annual probability of river flooding).
Environmental Setting	Portsdown Hill, a Site of Special Scientific Interest (SSSI), is located approximately 160m south of the Site. No Ramsar Sites, Special Areas of Conservation or Special Protection Areas are present within 250m of the Site (MAGIC, 2023).

Previous Ground Investigation/Records of Remediation	None
Geotechnical Considerations/ Issues	Hazards Dissolution is a common weathering mechanism in chalk. Typical features associated with dissolution in chalk include an irregular interface with the cover material, downward tapering pipes infilled with compressible material and voids. If undetected, dissolution features pose a risk to construction through differential settlement or collapse. Excavations Chalk close to the surface would be weathered (i.e., broken down by frost) and comprise structureless chalk, which would be of relatively low permeability when compared with structured chalk at greater depth. Perched groundwater is possible on top of the structureless chalk, and subartesian groundwater conditions are possible. Chalk is susceptible to becoming a slurry during wet weather so construction of the BPT during spring/summer would be recommended. Any Head Deposits expected on site are likely to be of minimal thickness with bedrock predominantly underlying the topsoil. Foundations BPT1 will be founded on chalk. The Portsdown Chalk Formation has been described in recently constructed boreholes as weak, locally very weak, medium and high-density chalk with CIRIA Grade B2 and B3. An ultimate bearing capacity, q_u , is estimated between 4.3 – 16.0 MN/m^2 based upon the description of this material (formerly Upper Chalk (BGS, 1998), (Lord et al., 2002). Floatation Groundwater levels on site is expected to be significantly below the level of construction though there may be areas across the site that contain perched water. This would not always be identified during ground investigation if water flush was used during rotary drilling so caution should still be maintained during construction. Frost Susceptibility Chalk may freeze within the upper 0.6m of ground across the site during periods where air temperatures are below freezing, resulting in frost heave leading to the ground rising up. At the base and adjacent to the surrounding walls of the BPT where constructed below ground level, a coarse sandy gravel/ other free draining material should be placed a minimum of 0.3m thick to prevent the effects of frost heave on the structure (Lord et al., 2002). Concrete Aggressivity Chalk is not aggressive towards concrete. Head Deposits if identified contain clay and silt consisting of sulphates, which are aggressive towards concrete. These deposits would have a minimum design sulphate class of DS-1.
Potential Sources of Contamination (PSCs)	**On Site:** None **Off Site within 50m:** Parchow Groundworks Depot located approx. 50m north (**PSC 476**). **Off Site infilled land between 50m to 250m:** Potentially infilled pit located approx.185m north (**PSC 262**); Potentially infilled/imported material associated with a former reservoir **(PSC 273)** and a covered reservoir **(PSC 358)** located

	approx. 60m east; Potentially infilled/imported material for the historic reservoir site located approx. 140m east (**PSC 319)**; The Dell Pit (**PSC 314**) potentially infilled land located approx. 235m northeast; and Potentially infill pit (**PSC 499**) located approx. 170m northeast. Havant Borough Council recorded **PSCs 262, 314** and **499** may have been infilled with unknown material and referred to them as potential waste disposal/landfill sites. Former chalk pits (**PSC 313, 324, and 323**) are located approx. 125m, 80m and 205m respectively to the southwest and southeast. These pits are located down gradient at a lower elevation to the Site. The difference in elevation between the Site and the three chalk pits range between 13m and 27m. Havant Borough Council record that these sites may have been infilled with unknown material and referred to them as potential waste disposal/landfill sites.
Conceptual Site Model and Land Contamination Risk Assessment	A preliminary conceptual site model (CSM) has been developed for the proposed Site based on the information collated and has identified potential contaminant linkages on Site and in the surrounding areas. Potential contaminants, pathways and receptors are listed and assessed in the land contamination risk assessment (**Table G1.1**). **Figure 12.1** shows the PSC locations. No PSCs have been identified on the Site. Land contamination risk assessment for off-Site contaminant sources is based on the potential for contaminant migration onto Site.
Photograph	 **Figure G1.2: Looking east towards BPT-E (Photo taken on 31/05/2023).**
Further Assessment	Further geotechnical and geo-environmental assessment is required to determine the ground conditions at the proposed BPT-E Site. These works will aid design, inform on health and safety of the construction workers and excavated materials (waste) management (i.e., disposal and/or re-use). Further details are presented in **Section 8.2.3** of the report.
The current scheme is still appraising several alternative Section routes and infrastructure sites. Revisions to the desk study including identification and confirmation of additional PSCs may be required.	

Appendix G1 BPT-E / IPS-E Above Ground Plant (AGP) Desk Study

Table G1.1: Risk Assessment for Construction and Maintenance Activities for PSCs within 50m and infilled land between 50 and 250m of Proposed BPT-E / IPS-E

Site Name/Reference	BPT-E (Section E)					
Potential Source of Contamination	**Potential Contaminants of Concern**	**Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (Without mitigation measures)**
Parchow Groundworks Ltd Depot located approximately 50m northwest (**PSC 476)**	Petroleum hydrocarbons, volatile organic compounds (VOCs), metals, polycyclic aromatic hydrocarbons (PAHs), and asbestos.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion and inhalation of dusts, gases, and vapours	Medium	Low Likelihood (due to distance)	Moderate/Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: arable farming	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling	Medium	Unlikely	Low
		On Site future property (buildings and buried services): Location and design of building structures to be confirmed	Direct contact with materials	Medium	Unlikely	Low
			Gas migration and accumulation	Medium	Low Likelihood	Moderate/Low
		Surface water bodies/watercourses: No main rivers within 250m	Surface water runoff from stockpiles and migration through groundwater and underground utilities	Mild	Unlikely	Very low
		Groundwater: Principal Aquifer and Secondary Undifferentiated Aquifer	Leaching through unsaturated and saturated soil	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): Portsdown SSSI located approximately 160m south from Site	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals	Mild	Low Likelihood	Low

(Continued on the next page)

Appendix G1 BPT-E / IPS-E Above Ground Plant (AGP) Desk Study

	BPT-E (Section E)					
Potential Source of Contamination	**Potential Contaminants of Concern**	**Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (Without mitigation measures)**
Potentially Infilled Pits/Landfill and Potentially Imported Material for the reservoir 50m to 250m (PSC 262, 273, 358, 319,, 314 and 499) **Former Chalk Pits, potential for infill material 50m to 250m** (PSC 313, 324 and 323)	Petroleum hydrocarbons, metals, inorganics (sulphate, sulphide, cyanide, etc), asbestos, and ground gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion and inhalation of dusts	Medium	Unlikely	Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate/Low
		Adjacent land users: arable farming	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling	Medium	Unlikely	Low
		On Site future property (buildings and buried services): Location and design of building structures to be confirmed	Direct contact with materials	Medium	Unlikely	Low
			Gas migration and accumulation	Medium	Low Likelihood	Moderate/Low
		Surface water bodies/watercourses: No main rivers within 250m	Surface water runoff from stockpiles and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: Principal Aquifer and Secondary Undifferentiated Aquifer	Leaching through unsaturated and saturated soil	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): Portsdown SSSI approximately 160m from Site	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals	Mild	Low Likelihood	Low

Appendix G2 IPS-F Above Ground Plant (AGP) Desk Study

Site Name/Reference	IPS-F
National Grid Reference (NGR)	458245E 109003N *(Based on AGP information 11 January 2024)*
Proposed Infrastructure Site	The AGP IPS-F is approximately 0.75 ha. The exact location of the proposed AGP will be dependent on the route of the Proposed Underground Pipeline. This will be confirmed following hydraulic assessment of the route topography to ensure the required flow can be achieved.
Site Location and Description	IPS-F ('the Site') is located within an arable field, approximately 400m east of Wickham Road and 280m east of Albany Farm in North Fareham, Hampshire. The Site is surrounded by arable fields. Towards the southwest and southeastern boundaries of the Site an unnamed access road is present. The Site gently slopes downward towards the southeast with elevations ranging between 23m OD in the northwest to 20m OD in the southeast.  **Figure G2.1: Site location of IPS-F infrastructure site. The Site is in yellow above** (Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetM, 2023)**.**
Current Site use	Arable cropped field (**Figure G2.2**).
Site History	OS mapping (Groundsure, 2024 and 2022) shows the proposed location of IPS-F has remained as open fields since pre-1900. The present-day tracks bounding the southwest of the Site are also present at this time. Three old chalk pits are located within the surrounding area at approximately <10m south, 50m north, and 95m northwest of the Site. A review of historical OS mapping procured from Groundsure (2022) also records an old chalk pit approximately 105m northwest (1892 to 1914). Later mapping (c.1937-61) shows these pits as no longer labelled and vegetated, although excavation markings remain. Aerial photography dated c.1999 and present-day OS mapping shows the former pit locations approximately 50m north, 95m and 105m northwest as arable fields. The former pit <10m south is vegetated.

	The former chalk pits <10m south and approximately 95m northwest are recorded as historical landfills, understood to have been operating c.1977 to 1982 (see the Potential Sources of Contamination (PSC) section for details). Albany Farm is present approximately 280m west of the Site.
Geology	Recent borehole constructed on site notes thin layer of Head overlying the Chalk Mapping notes site underlain by White Chalk Subgroup (Spetisbury Chalk Member).
Hydrogeology	Head Deposits are classified as a Secondary Aquifer (Undifferentiated). The Chalk bedrock is classified as a Principal Aquifer. The Site is located within a groundwater Source Protection Zone (SPZ) 2 (Outer Protection). The Site is located within a groundwater Drinking Water Safeguard Zone (DWSgZ) GWSGZ0145 (Environment Agency, 2023). The Site is located within a groundwater Nitrate Vulnerable Zone (NVZ) (G58-Fareham). There are no groundwater abstractions recorded within 1km of the Site.
Hydrology	No watercourses are present on Site. Wallington River is located approximately 600m east of the Site. A drainage ditch is approximately 15m to the east of the AGP Site boundary. The Site is within a surface water NVZ: Eutrophic Water ET2 (Chichester, Langstone and Portsmouth Harbours Eutrophic NVZ) and Fareham G58 (Environment Agency, 2023). The Site is not located within a Surface Water DWSgZ. There are no surface water abstractions recorded within 1km of the Site.
Flood Zone	The Site is located within a Flood Zone 1 (less than 1 in 1,000 annual probability of river flooding).
Environmental Setting	No Ramsar Sites, Special Areas of Conservation, Sites of Special Scientific Interest (SSSI) or Special Protection Areas are present on Site or within 250m of the Site (MAGIC, 2023).
Previous Ground Investigations/ Records of Remediation	None
Geotechnical Considerations/Issues	<u>Hazards</u> Dissolution is a common weathering mechanism in chalk. Typical features associated with dissolution in chalk include an irregular interface with the cover material, downward tapering pipes infilled with compressible material and voids. If undetected, dissolution features pose a risk to construction through differential settlement or collapse. <u>Excavations</u> Chalk close to the surface would be weathered (i.e., broken down by frost) and comprise structureless chalk, which would be of relatively low permeability when compared with structured chalk at greater depth.

	Perched groundwater is also possible on top of the structureless chalk, and subartesian groundwater conditions are possible. Chalk is susceptible to becoming a slurry during wet weather so construction of the IPS during spring/summer would be recommended. Head Deposits expected on site are likely to be of minimal thickness with bedrock expected to be encountered within the upper 2m bgl. <u>Foundations</u> IPS-F will be founded on Head Deposits underlain by chalk. Recently constructed boreholes within 5m of the IPS-F area (on western edge) encountered Head Deposits from 0 – 1.20m bgl underlain by structureless chalk from 1.20m - 1.35m (assigned CIRIA grade Dc) From 1.35 – 3m bgl, chalk was described as very weak medium density with assigned CIRIA grade B4. An ultimate bearing capacity, q_u , is estimated between 4.3 – 16.0 MN/m^2 based upon the description of this material (formerly Upper Chalk (Lord et al., 2002). If founded only in Head Deposits across the IPS-F area, ultimate bearing resistance, q_u, would be approximately 800 kPa based on undrained conditions and assuming foundations of the IPS have a width and length of 13.5m length and constructed to 1m bgl. <u>Flotation</u> Groundwater level on site is expected to be significantly below the level of construction. This would not always be identified during ground investigation if water flush was used during rotary drilling so caution should still be maintained during construction. <u>Frost Susceptibility</u> Chalk may freeze within the upper 0.6m of ground across the site during periods where air temperatures below freezing, resulting in frost heave leading to the ground rising up. At the base and adjacent to the surrounding walls of the IPS, where constructed below ground level, a coarse sandy gravel/other free draining material should be placed a minimum of 0.3m thick to prevent the effects of frost heave on the structure. Cohesive soils are also prone to frost where the plasticity ranges between 15-20% (note testing of nearby Head Deposits notes plasticity index just in excess of this at 21% and 24%). <u>Concrete Aggressivity</u> Chalk is not aggressive towards concrete. Head Deposits, if identified, may contain clay and silt consisting of sulphates, which are aggressive towards concrete.
Potential Source of Contamination (PSCs)	**On-Site**: None **Off-Site within 50m**: Albany Farm Historic Landfill and Old Chalk Pit (infilled) (**PSC 5**) located approx. <10m south (Holder Ref. EAHLD20600 - Treloar Waste Containers Ltd). Landfill is reported to have accepted inert waste. Licence issued in 1977. Potential for uncontrolled infilling. A Chalk Pit, potentially infilled land, is located approximately 50m north (**PSC 25**). **Off-Site between 50m and 250m**: Albany Farm Historic Landfill and Former Chalk Pit (infilled) (**PSC 6**), located approximately 95m northwest (Holder Ref. EAHLD20601 – Treloar Waste Containers Ltd). Licensed to have accepted inert waste between 1977 and 1982. Potential for uncontrolled infilling.

	A former Pit, potentially infilled) land is located approximately 105m northwest (**PSC 14**) adjacent to the Albany Farm landfill (**PSC 6**).
Conceptual Site Model and Land Contamination Risk Assessment	A preliminary Conceptual Site Model (CSM) has been developed based on the information collated and has identified potential contaminant linkages on Site and in the surrounding areas. Potential contaminants, pathways and receptors are listed and assessed in the land contamination risk assessment (**Table G2.1**). **Figure 12.1** shows the PSC locations. No PSCs have been identified on Site. Albany Farm historic landfill (inert) is located within 10m of the Site boundary and may have encroached onto the Site boundary. No further ground condition information is available. Land contamination risk assessment for identified off-Site contaminant sources is based on the potential for contaminant migration onto Site.
Photograph	 **Figure G2.2: View looking east towards IPS-F in the distance near to overhead pylons, photo taken 13/03/2023.**
Further Assessment	Further geotechnical and geo-environmental assessment is required to determine the ground conditions at the proposed IPS-F Site. These works will aid design, inform on health and safety of the construction workers and excavated materials (waste) management (i.e., disposal and/or re-use). Further details are presented in **Section 8.2.3** of the report.
The current scheme is still appraising several alternative Section routes and AGP sites. Revisions to the desk study including identification and confirmation of additional PSCs is likely to be required.	

*Includes for an extended range of PCOC as the landfill contents have not been verified and considering the potential for unauthorised dumping.

Appendix G2 IPS-F Above Ground Plant (AGP) Desk Study

Table G2.1: Risk Assessment for Construction and Maintenance Activities for PSCs within 50m and infilled land between 50m and 250m of Proposed IPS-F

Site Name/Reference	IPS-F (Section F)					
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (Without mitigation measures)**
Albany Farm Historic Landfill & Old Chalk Pit (infilled) located approximately <10m south (**PSC 5**). Inert waste type. Licensed from 1977, no information on the last input date. The depth, extent and nature of the infill material is unconfirmed. Potential for uncontrolled infilling.	Metals, inorganics (sulphates, sulphides, cyanides, etc), asbestos, petroleum hydrocarbons, PAHs, VOCs, semi-VOCs, PFAS *. Landfill gas (methane, carbon dioxide, carbon monoxide, and hydrogen sulphide)	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion, and inhalation of dusts.	Medium	Likely	Moderate
			Inhalation of gases and vapours	Medium	Likely	Moderate
		Adjacent land users: arable farming	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate/Low
		On-Site future property (buildings and buried services) Landfill adjacent to the proposed IPS-F. Design of building structures to be confirmed.	Direct contact with materials	Medium	Likely If landfill areas are within development of future IPS-F.	Moderate
			Gas migration and accumulation	Severe	Likely Accumulation of landfill gas could migrate to future building structures and services	High
		Surface water bodies/watercourses: No main rivers within 250m. Drainage ditch approximately 15m east.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Low Likelihood	Low
		Groundwater (Secondary Undifferentiated and Principal Aquifers, no abstractions)	Leaching through unsaturated and saturated soil.	Medium	Likely	Moderate
		Ecological receptors (flora and fauna)	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals. Inhalation of gases and vapours by animals.	Mild	Low Likelihood	Low

Appendix G2 IPS-F Above Ground Plant (AGP) Desk Study

Table G2.1: Risk Assessment for Construction and Maintenance Activities for PSCs within 50m and infilled land between 50m and 250m of Proposed IPS-F

Site Name/Reference	IPS-F (Section F)					
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (Without mitigation measures)**
Albany Farm Historic Landfill and Former Chalk Pit located approximately 95m northwest (**PSC 6**), inert waste. Potential for uncontrolled infilling. **Old Chalk Pits** potentially infilled **(PSC 14 and 25)** located approximately 50m north and 105m northwest respectively	Metals, inorganics (sulphate, sulphide, cyanide, etc), asbestos, petroleum hydrocarbons, PAHs, VOCs, semi-VOCs, PFAS *. Landfill gas (methane, carbon dioxide, carbon monoxide, and hydrogen sulphide)	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion, and inhalation of dusts, gases and vapours.	Medium	Unlikely	Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: arable farming	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		On-Site future property (buildings and buried services)	Direct contact with materials	Medium	Unlikely	Low
			Gas migration and accumulation	Medium	Low Likelihood	Moderate / Low
		Surface water bodies/watercourses: No main river within 250m**.** Drainage ditch approximately 15m east.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater (Secondary Undifferentiated and Principal Aquifers, no abstractions)	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Ecological receptors (flora and fauna)	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals. Gases and vapours by animals.	Mild	Unlikely	Very Low

Appendix G4 IPS-G Above Ground Plant (AGP) Desk Study

Site Reference	IPS-G
National Grid Reference (NGR)	456364E, 111714N *(based on AGP information 11 January 2024)*
Proposed Infrastructure Site	The AGP IPS-G is approximately 0.59 ha. The wider compound surrounding the AGP to the south is approximately 1.5 ha. This desk study addresses the AGP only, the larger proposed AGP compound area is not included. The AGP compound is an area selected for storage of materials and plant during construction phase and assessment of this area may be required during later stages of the scheme. The exact location of the proposed AGP will be dependent on the route of the Proposed Underground Pipeline. This will be confirmed following hydraulic assessment of the route topography to ensure the required flow can be achieved.
Site Location and Description	IPS-G ('the Site') is located within an arable field approximately 100 m east of Titchfield Lane and approximately 100 m northeast of Wickham Park Golf Club, near Wickham in Hampshire. Land extending off-Site to the northeast / east is agricultural. A recent Site visit (17/04/23) noted spoil heaps present on Site, composition unknown, likely related to the Sites agricultural use. A residential property is recorded <10 m west of the Site. A small road is present along the southwest boundary of the Site. Park Place Farm Nursery and a caravan repair garage are present. The village of Wickham is located approximately 900 m west. Within IPS-G the elevation is shown to be 51 m OD across the Site (Google Earth, 2024).  **Figure G4.1: Site location of IPS-G Infrastructure Site. The Site is in yellow. (**Sources: Esri, DigitalGlobe, GeoEye, i-cubed, USDA FSA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community)
Current Site use	Agricultural land (arable).
Site History	Earliest available mapping (c.1860s) (Groundsure 2024, Google Earth 2024 and NLS 2024) shows agricultural land on Site and in the surrounding area, with Cold Harbour Farm to the west as well as Titchfield Lane. Adjacent to Cold

	Harbour Farm to the east are two ponds (PSC No's. 30 & 31) which are potentially infilled. Approximately 260 m north, a small collection of residential buildings are present (1897). The Site largely remains unchanged, the surroundings, c.1940, shows the appearance of a possible glass house approximately 100 m southwest of the Site. The same building is shown present day as a nursery/garden centre (PSC No. 34). Historical mapping from 1973 shows the small lane to the south of the Site to now be present, which extends eastwards and eventually joins Titchfield Lane approximately 130 m from the Site. A Poultry House is now present approximately 100 m northwest adjacent to which Gardeners Cottages are shown. 1965 mapping shows a gravel pit (PSC No. 46) approximately 160 m south of the Site. The 1973 map shows a barn (PSC No. 513) approximately 15 m southeast. By 1986 the Poultry House is no longer shown. 1995 historical mapping shows a tank approximately 80 m west of the Site within the garden centre/nursery. Aerial photography dated between 1999 – 2019 shows the Site has remained unchanged and the field the Site is situated within shows evidence of cultivation and tram lines present, suggesting it is used to grow crops. Google Street view shows A Motorhome repair garage (PSC No. 475) across the small lane just to the south of the Site.
Geology	River Terrace deposits are potentially present beneath the Site encroaching from the west and south/southeast. Bedrock comprises Earnley Sand Formation consisting of a fine-grained silty sand horizon underlying topsoil overlying laminated clays with sand partings further underlain by Wittering Formation at depth. Towards the south of Site, Wittering Formation consisting of grey laminated clay with sand partings is expected.
Hydrogeology	River Terrace Deposits, Earnley Sand Formation and Wittering Formation are classified as Secondary A Aquifers. The Site is not located within a Groundwater Source Protection Zone (SPZ), Groundwater Drinking Water Safeguard Zone (DWSgZ) or a Groundwater Nitrate Vulnerable Zone (NVZ) (Environment Agency, 2023). There are no groundwater abstractions within 1 km.
Hydrology	There are no watercourses or waterbodies recorded on the Site. A Land drain is situated within Wickham Golf Course 240 m south of the Site. The Site is not located within a Surface Water DWSgZ nor a Surface Water NVZ.
Flood Zone	The Site is located within a Flood Zone 1 (less than 1 in 1,000 annual probability of river flooding).
Environmental Setting	There are no Sites of Special Scientific Interest (SSSI), Ramsar Sites, Special Areas of Conservation (SAC), Special Protection Areas (SPA), National Nature Reserves (NNR) or Local nature Reserves (LNR) are present on or within 250 m of the Site.
Previous Ground Investigations/ Records of Remediation	None

Geotechnical Considerations/Issues	Hazards Within Earnley Sand Formation, fine sands are likely to be highly mobile in the presence of groundwater with the possibility of running sand. The sand beds are exposed at the surface at the lowest local point. If sub-artesian conditions were present, a spring or similar may be encountered. Excavations Excavations within Earnley Sand Formation and will be within the capabilities of conventional plant. A high groundwater level and high permeability may be assumed in. Large amounts of sump pumping may draw out fines risking instability of the excavation and/or settlement in the surrounding ground may occur. Full excavation support is recommended. Earnley Sand Formation also comprising firm silt and clay would not require full excavation support. Foundations IPS-G will be founded on the silty sand horizon of the Earnley Sand Formation overlying laminated clays with sand partings. The strength/density of the underlying soils together with the potential bearing of the structures is currently unknown. However, the Earnley Sand Formation is an overconsolidated deposit that where typically encountered should be suitable for bearing of the anticipated structures (though the upper metre or so may be softened/loosened by local weathering. Concrete Aggressivity Wittering Formation that underlies Earnley Sand Formation is noted to be pyritic throughout and are therefore likely to be moderately aggressive towards concrete.
Potential Sources of Contamination (PSCs)	**On site**: None, the land use activity shown has been agricultural since the 1860's[1]. **Off-Site (within 50 m):** A motor home repair garage (PSC No. 475) is located approximately 10 m south/southwest of the Site. A barn (PSC No 513) approximately 15 m southeast. A nursery/garden centre (PSC No. 34) is located approximately 20 m southwest, a tank associated with the nursery (PSC 257) is approximately 70m southwest. **Off-Site infilled land between 50 m and 250 m:** Approximately 160 m south/southeast of the Site is the former Park Place Farm sand and gravel pit (PSC No. 46) located within Wickham Park Golf Course. Infilled ponds are approximately 105 m northwest (PSC No.31) and 190 m northeast (PSC No. 35)
Conceptual Site Model and Land Contamination Risk Assessment	A preliminary conceptual site model (CSM) has been developed for the proposed site based on the information collated and has identified potential contaminant linkages on site and in the surrounding areas. Potential sources, pathways and receptors are listed and assessed in the land contamination risk assessment (**Table G4.1**). **Figure 13.1** shows the PSC locations. Potential contaminant linkages with a moderate/low risk rating which could potentially impact construction workers, future site users, future property (buildings and services) and adjacent site users (during construction) have

[1] The historical and ongoing agricultural land use on and adjacent to the proposed compound areas may be associated with contaminants including pesticides and herbicides. The use of pesticides and herbicides containing arsenic, mercury and toxic substances (e.g., dichloro-diphenyl-trichloroethane (DDT)) ceased some decades ago, and significant residual concentrations of such contaminants are considered unlikely due to degradation, dilution, etc. There are other contaminants in modern pesticides, however, if applied correctly, they should not be present at concentrations that would be harmful. There can be risks associated with spillages or leaks, but this is more likely to occur within a farmyard or storage area and less likely in a field. Therefore, the former and current agricultural land within and surrounding the Site is not considered to be a significant and credible source.

	been identified. A ground investigation is recommended at the proposed location IPS-G to quantify these risks.
Photograph	 **Figure G4.2: Looking north from IPS-G (Photo taken 26/03/2024).**
Further Assessment	Further geotechnical and geo-environmental assessment is required to determine the ground conditions at the proposed IPS-G Site. These works will aid design, inform on health and safety of the construction workers and excavated materials (waste) management (i.e. re-use, recovery, recycling or disposal). Further details are presented in **Section 8.2.3** of the report.
The current scheme is still appraising several alternative Section routes and infrastructure sites. Revisions to the desk study including identification and confirmation of additional PSCs may be required.	

Appendix G4 IPS-G Above Ground Plant (AGP) Desk Study

Table G4.1 Risk Assessment for Construction and Maintenance Activities for PSCs within 50m and infilled land between 50m and 250m of IPS-G

Site Reference	IPS-G (Section G)					
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Motorhome Repair Garage (PSC No. 475) (approximately 10 m southwest).	Metals, inorganics, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), asbestos and benzene, toluene, ethylbenzene, xylenes, volatile organic compounds, semi volatile organic compounds and phenols	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts and vapours.	Medium	Low Likelihood	Moderate / Low
		On Site future property (buildings and buried services): Location and design of building structures to be confirmed.	Direct contact with materials	Medium	Unlikely	Low
		Groundwater: Secondary A Aquifers. River Terrace Deposits. Wittering and Earnley Sand Formations.	Leaching through unsaturated and saturated soil.	Medium	Low Likelihood	Moderate / Low
		Water environment – Surface water No on Site surface water features	Surface water runoff. Lateral migration through underground utilities.	N/A for an off-Site PSC		
		Ecological receptors (flora and fauna): No statutory designated sites on Site.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	N/A for an off-Site PSC		

Appendix G4 IPS-G Above Ground Plant (AGP) Desk Study

Site Reference	IPS-G (Section G)					
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
en Centre/Nursery (PSC No. 34) approximately 50 m southwest. **Former Infilled Tank (PSC No. 257)** contained within the northern footprint of PSC No. 257 (beyond 50m from IPS-G). **Farm Barn (PSC No. 513)** Approximately 15 m southeast	Metals, inorganics (i.e. cyanides, sulphates), petroleum hydrocarbons, PAHs, pesticides and herbicides.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Low Likelihood	Moderate / Low
		On Site existing and future property (buildings and buried services): Location and design of building structures to be confirmed.	Direct contact with materials	Medium	Unlikely	Low
		Groundwater: Secondary A Aquifers (River Terrace Deposits) Wittering and Earnley Sand Formations.	Leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecological receptors (flora and fauna): no statutory designated sites within 250m	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	N/A for an off Site PSC		

Appendix G4 IPS-G Above Ground Plant (AGP) Desk Study

Site Reference	IPS-G (Section G)					
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Park Place Farm sand and gravel pit (PSC No. 46) approximately 180 m south/southwest.	Metals, inorganics, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), asbestos and benzene, toluene, ethylbenzene (BTEX) and phenols Potential for ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion and inhalation of dusts.	Medium	Unlikely (due to distance of PSC)	Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Arable farming	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Unlikely	Low
		On Site future property (buildings and buried services): Location and design of building structures to be confirmed.	Direct contact with materials	Medium	Unlikely	Low
			Gas migration / accumulation.	Medium	Low Likelihood	Moderate / Low
		Groundwater: Secondary A Aquifers, River Terrace Deposits, Wittering and Earnley Sand Formations.	Leaching through unsaturated and saturated soil.	Mild	Unlikely (due to distance of PSC)	Very Low
		Ecological receptors (flora and fauna): no statutory designated sites within 250m	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very low

Appendix G5 BPT-K Above Ground Plant (AGP) Desk Study

Site Name/Reference	BPT-K
National Grid Reference (NGR)	452787E 118499N *(Based on AGP information 11 January 2024)*
Proposed Infrastructure Site	The proposed area for BPT- K AGP compound area is approximately 0.44 ha. The extended BPT-K compound area including access roads is approximately 1.8 ha. The exact location of the proposed AGP will be dependent on the route of the Proposed Underground Pipeline. This will be confirmed following hydraulic assessment of the route topography to ensure the required flow can be achieved.
Site Location and Description	BPT-K ('the Site') is located at Winters Hill within the private estate of Wintershill Hall. The Site may be accessed via a private road from Scivier's Lane, Durley. BPT-K is situated to the north of the main building footprint of (including Coach House Cottage) Wintershill Hall. Within BPT-K, elevations increase southwards, from approximately 65m OD in the north to 74m OD in the southeast. A Site walkover was completed in October 2023. Care should be taken when walking across the sloped area and during construction, protective track mats or boards are recommended to prevent slipping.  **Figure G5.1: Site location of AGP BPT-K.** (Southern Water, 2023) The Site is shown in **Figure G5.1** with the orange pipeline route to the east and north of Site.
Current Site use	Arable field (agricultural) Wintershill Hall Estate

Appendix G5 BPT-K Above Ground Plant (AGP) Desk Study

Site History	Earliest mapping (Groundsure 2023 and 2024, NLS 2023) shows the Site as open fields (1869-1913). Mapping at this time shows the north, east and west of the Site to be surrounded by arable fields and Woolstreet copse's, with an unnamed road approximately 30m east, leading from Scivier's Lane. Wintershill House (later called Wintershill Hall) is shown approximately 45m south of the Site comprising the main house and outbuildings. Two small ponds are shown approximately 210m and 250m south of the Site respectively. Wintershill House was built in 1852 with the current gardens and parkland. In 1902, the house was renamed Wintershill Hall (Wintershill Hall, 2023). No significant changes are noted on historical mapping from the early 1900's, with exception of Woolstreet Copse to the north of the Site which is no longer shown on the 1964 map onwards. A pond approximately 245m north of the Site on the 1964 map is no longer visible on current mapping (potentially infilled) (Groundsure, 2023). Wintershill Hall was used during World War I as a base for the Hampshire Ambulance Service. During World War II, after briefly used as a school, it became the Headquarters of the Hampshire Fire Service. Information from the estate website (Wintershill.net, 2023) states that Nissen huts were present on the lower lawn and used for offices and additional accommodation during this time. The information also states that a new sewage system was installed to cope with the additional numbers living at the estate. After the war the House was used to house orphan children rescued from concentration camps. At present, Wintershill is now being used as a residential building and venue centre (Wintershill Hall, 2023).
Geology	No superficial deposits recorded. London Clay Formation is the bedrock.
Hydrogeology	London Clay Formation (bedrock) is classified as an unproductive stratum. The Site does not lie within a groundwater Source Protection Zone (SPZ), a groundwater Drinking Water Safeguard Zone (DWSgZ) or within a groundwater Nitrate Vulnerable Zone (NVZ). One active groundwater abstraction used for potable water supply is located approximately 400m northwest. An historical groundwater abstraction (general use) was located approximately 410m northwest.
Hydrology	No watercourses are recorded on Site or within 250m of the Site. The nearest surface waterbodies (ponds) are recorded approximately 200m south within the grounds of Wintershill Hall. The Site is located within Hamble Estuary Eutrophic Nitrate Vulnerable Zone (NVZ), Eutrophic Water (ET3). Immediately south of the Site, is a Surface Water NVZ (S810) for Upper Hamble. The Site is not located within a surface water DWSgZ. There are no surface water abstractions located within 1km of the Site.
Flood Zone	The Site is located within a Flood Zone 1 (less than 1 in 1,000 annual probability of river flooding).

Appendix G5 BPT-K Above Ground Plant (AGP) Desk Study

Environmental Setting	No Ramsar Sites, Special Areas of Conservation, Sites of Special Scientific Interest (SSSI) or Special Protection Areas are present on Site or within 250m of the Site (MAGIC, 2023).
Previous Ground Investigation/ Records of Remediation	None
Geotechnical Considerations/Issues	<u>Excavations</u> It is expected that excavation of the London Clay will be within the capabilities of conventional plant. Excavation support will be dependent upon the depth of excavation, strength of the soil and the groundwater table but where London Clay Formation comprised of firm to very stiff clay above the water table is encountered within the excavations at shallow depth (<3m) then ¼ or ½ space sheeting may be utilised or side batter in the region of 40° (CIRIA C97). <u>Foundations</u> BPT-K will be founded on the London Clay Formation. London Clay Formation may be softened slightly at the top but typically should have sufficient capacity to cope with a BPT. Ultimate bearing resistance, q_n, would be approximately 1100 kPa based on undrained conditions and assuming foundations of the BPT have a width of 10m length of 20m and constructed to 2.5m bgl. <u>Flotation/Uplift</u> Groundwater levels are currently unknown on the Site due to no previous GI data being available. GI locations are proposed in subsequent GI stages for this location, which would inform if any floatation (and uplift) design requirements are required. <u>Concrete Aggressivity</u> London Clay is noted to be pyritic throughout and are therefore likely to be moderately aggressive towards concrete.
Potential Sources of Contamination (PSCs)	**On site**: Unknown (see below **PSC 474**). **Off-Site within 50m**: Historical use of Wintershill Hall and estate grounds during World War I and II (**PSC 474**), the building footprint located approximately 35m south. Historical maps do not show the location of the Nissen huts, sensitive sites during World Wars I and II and were generally omitted from maps for security reasons. Asbestos cement sheeting has been used in construction materials of some Nissen hut styles and there may be a potential for asbestos fibres to be released to soils during demolition. It is unknown whether fuel storage or vehicle maintenance were undertaken within the estate. It is possible that if these activities were undertaken these would have been close to the main buildings. Historical maps do not provide any details to the location of these potential structures. It is unknown what activities were undertaken at the site by the Hampshire Fire Service. **Off-Site between 50m and 250m**: The small infilled Pond (**PSC 146**) located approximately 245m north is noted but is not further considered a

	PSC for the current BPT-K Site area due to the distance and size of the potential infilled area.
Conceptual Site Model and Land Contamination Risk Assessment	A preliminary conceptual site model (CSM) has been developed for the proposed site based on the information collated and has identified potential contaminant linkages on site and in the surrounding areas. Potential sources, pathways and receptors are listed and assessed in the land contamination risk assessment (**Table G5.1**). **Figure 12.1** shows the PSC locations. Potential contaminant linkages with a moderate/low risk rating which could potentially impact construction workers, future site users and future property (buildings and services) have been identified. A ground investigation is recommended at the proposed location BPT-K to quantify these risks.
Photograph	 **Figure G5.2: Site photograph of BPT-K infrastructure site looking northwest (Photo taken on 26/10/2023)**
Further Assessment	Further geotechnical and geo-environmental assessment is required to determine the ground conditions at the proposed BPT-K Site. These works will aid design, inform on health and safety of the construction workers and excavated materials (waste) management (i.e., disposal and/or re-use). Further details are presented in **Section 8.2.3** of the report.
The current scheme is still appraising several alternative Section routes and infrastructure sites. Revisions to the desk study including identification and confirmation of additional PSCs may i be required.	

Appendix G5 BPT-K Above Ground Plant (AGP) Desk Study

Table G5.1 Risk Assessment for Construction and Maintenance Activities for PSCs within 50m and infilled land between 50m and 250m of BPT-K

Site Name/Reference	BPT-K (Section K)					
Potential Source of Contamination	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (Without mitigation measures)**
Historic activities during World War I and II at Wintershill Hall and estate grounds (**PSC 474**), building footprints located approximately 35m south of proposed BPT-K location. BPT-K within grounds of Wintershill Hall. WWI: used as the base for the Hampshire Ambulance Service. Potential for storage and use of fuels. WWII: used as a school and headquarters of the Hampshire Fire Service. Potential for storage and use of fuels. Nissen huts are documented to have been present in the grounds (the exact location unconfirmed). Asbestos cement sheeting has been used in construction materials. Potential for asbestos fibres to be released to soils during demolition.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and total phenols	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion, and inhalation of dusts.	Medium	Low Likelihood	Moderate / Low
			Inhalation of gases and vapours	Medium	Unlikely	Low
		Adjacent land users: arable farming (estate land and Farmland) residents of Wintershill Hall.	Direct dermal contact, ingestion and inhalation of dusts, gases and vapours during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
		On Site future property (buildings and buried services): Location and design of building structures to be confirmed.	Direct contact with materials	Medium	Low Likelihood	Moderate / Low
			Gas migration and accumulation	Medium	Unlikely	Low
		Surface water bodies/watercourses: No main rivers within 250m.	Surface water runoff from stockpiles and migration through groundwater and underground utilities.	Mild	Unlikely	Very Low
		Groundwater: Unproductive Stratum	Leaching through unsaturated and saturated soil.	Mild	Unlikely	Very Low
		Ecological receptors (flora and fauna)	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals. Gases and vapours by animals.	Mild	Low Likelihood	Low

Appendix H – Tunnel Shaft Desk Studies

Geology Abbreviations for Appendix H Figures

Geology Abbreviations	Geological Descriptions
ALV-XCZSV	ALLUVIUM - CLAY, SILT, SAND AND GRAVEL
BOSA-S	BOGNOR SAND MEMBER - SAND
BTFU-XCZSV	BEACH AND TIDAL FLAT DEPOSITS (UNDIFFERENTIATED) - CLAY, SILT, SAND AND GRAVEL
LC-S	LONDON CLAY FORMATION - SAND
LC-XCZS	LONDON CLAY FORMATION - CLAY, SILT AND SAND
LMBE-S	LAMBETH GROUP - SAND
LPCK-CHLK	LEWES NODULAR CHALK FORMATION, SEAFORD CHALK FORMATION, NEWHAVEN CHALK FORMATION, CULVER CHALK FORMATION AND PORTSDOWN CHALK FORMATION (UNDIFFERENTIATED) - CHALK
LMBE-XCZS	LAMBETH GROUP - CLAY, SILT AND SAND
HEAD-XCZSV	HEAD - CLAY, SILT, SAND AND GRAVEL
NCK-CHLK	NEWHAVEN CHALK FORMATION - CHALK
PCK-CHLK	PORTSDOWN CHALK FORMATION - CHALK
SPCH-CHLK	SPETISBURY CHALK MEMBER - CHALK
TACH-CHLK	TARRANT CHALK MEMBER - CHALK
RMD-XSV	RAISED MARINE DEPOSITS - SAND AND GRAVEL
RTD1-XSV	RIVER TERRACE DEPOSITS, 1 - SAND AND GRAVEL
RTD3-XSV	RIVER TERRACE DEPOSITS, 3 - SAND AND GRAVEL
RTDU-XSV	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) - SAND AND GRAVEL
RTDU-XSZC	RIVER TERRACE DEPOSITS (UNDIFFERENTIATED) - SAND, SILT AND CLAY
LMBE-S	LAMBETH GROUP - SAND
LMBE-XCZS	LAMBETH GROUP - CLAY, SILT AND SAND

Appendix H2 Bedhampton Shaft Desk Study

Bedhampton Shaft on Route Havant Thicket Reservoir-WRP					
Approximate Location	Located approximately 100m northeast of Beaufort Road, Havant, Hampshire				
National Grid Reference	470707, 107018				
Current Site Use (50m buffer zone, 250m buffer for potentially infilled land)[2]	**Site History (summary)**	**Geology** [1]	**Hydrogeology**[1]	**Hydrology**[1]	**Environmental Setting**[1]
Recreation Ground	**1868-1880: Onsite:** Open land which appears undeveloped. **Offsite**: Scratchface Lane is approximately 110m north. A land drain is approximately 40m west. **1881-1930: Offsite:** The 1897 map shows a pump approximately 240m northwest, by 1909 this is shown as Hook's Farm (buildings). The farm boundary is approximately 35m west of the Site. The land drain is no longer show. Scratchface Lane is now Hook's Lane. **1931-1960: Offsite:** Residential housing is shown on the 1951 map north of Hook's Lane. **1961-1990: Onsite:** The 1971 maps shows the Site as 'Hook's Lane Recreation Ground'. **Offsite:** The 1971 map shows the boundary of St Thomas Moore primary school is approximately 30m west, on the former farmland.	**Superficial:** Head Deposits **Bedrock:** London Clay Formation	**Superficial:** Secondary (undifferentiated) Aquifer **Bedrock:** Unproductive Aquifer (London Clay LC-XCZS). Secondary A Aquifer immediately north. London Clay Formation (LC-S) **Groundwater Abstractions:** 3No. approximately 650m, 710m, and 770m. **Groundwater Source Protection Zone:** 1c **Drinking Water Safeguard Zones (Groundwater) (DWSZ):** No	**Surface Waters:** None **Surface Water Abstractions:** None	**NVZ:** Nitrate Vulnerable Zone- Chichester, Langstone and Portsmouth Harbours Eutrophic NVZ (Eutrophic Water) No Ramsar Sites, Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), and Special Protection Areas (SPAs). **Landfills**: None. **Pollution Incidents:** None

Figure H2.1 – Aerial Photo of Bedhampton Shaft



Figure Appendix H2.2 – Artificial / Superficial and Bedrock Geology (not to scale)

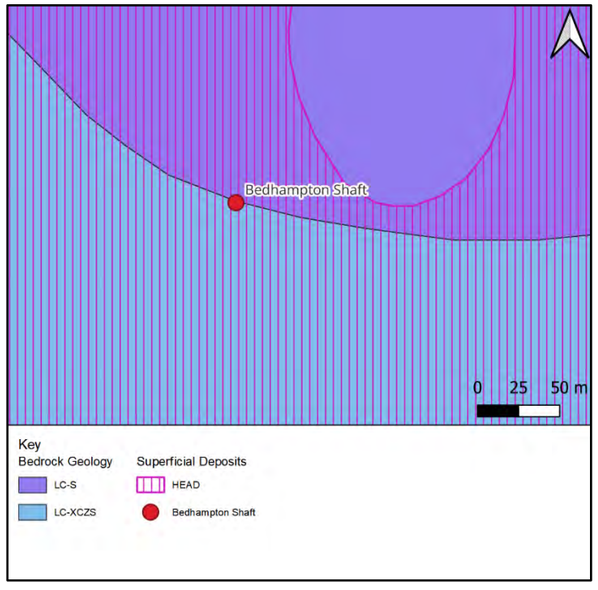


Figure Appendix H2.3 – Potential Sources of Contamination Plan (not to scale)



Appendix H2 Bedhampton Shaft Desk Study

Risk Assessment

Potential Source of Contamination (approximate distance) (50m buffer zone, 250m buffer for potentially infilled land) [1]	**Potential Contaminants of Concern**	**Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
PSC No. 415: Hook's Farm (located approximately 35m west)	Petroleum hydrocarbons, Polycyclic aromatic hydrocarbons (PAHs), metals, pesticides, and asbestos	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: School (30m west)**, c**losest residential property approximately 55m southwest.	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate / Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes, shaft)	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Low Likelihood	Moderate / Low
		Surface Water bodies/Watercourses: None within 250m	Surface water runoff and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: Secondary A Aquifer	Leaching through unsaturated and saturated soils	Medium	Low Likelihood	Moderate / Low
		Ecology (flora and fauna)	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Low Likelihood	Low

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m
2. Other PSCs shown on Figure H2.3 within 250m radius of the proposed shaft location include PSC No. 502 – HMS Daedalus III and PSC 503 Fraser Navel Camp. Further investigation is ongoing into the activities at these sites. A generic risk assessment is included in the desk study which will be updated as further information is available.

Appendix H1 Havant Thicket Desk Study

Havant Thicket Shaft on **Route Havant Thicket Reservoir-WRP**					
Approximate Location	Located approximately 150m north of Middle Park Way, Leigh Park, Havant.				
National Grid Reference	471858 108816				
Current Site Use	**Site History (summary)**	**Geology** [1]	**Hydrogeology** [1]	**Hydrology** [1]	**Environmental Setting** [1]
Open grassed land associated with Staunton Country Park (gardens, parkland).	**1840s to present day. On Site:** Site is part of Leigh Park Estate and located on an area referred to as 'High Lawn', now part of Staunton Country Park. **Surrounding Area:** Leigh Park Estate, with residential development to the west post 1930s. Stockheath Naval Camp was present in the surrounding area to the west and its activities may have encroached on Leigh Park. The outdoor swimming pool approximately 110m southwest shown on historical maps (1952 map) is referenced in information about the camp (Hind 2017).	**Superficial:** None. Head deposits approximately 50m north. **Bedrock:** Bognor Sand Member and London Clay Formation	**Superficial:** None. Head deposits are a Secondary (undifferentiated) Aquifer. **Bedrock:** London Clay Formation: Unproductive Bognor Sand Member: Secondary A Aquifer **Groundwater Abstractions**: None **Groundwater source protection zone:** Zone 1c.	**Surface Waters:** Riders Lane Stream is located approximately 95m southwest. **Surface Water Abstractions:** None	**NVZ:** Nitrate Vulnerable Zone- Chichester, Langstone and Portsmouth Harbours Eutrophic NVZ. No Ramsar Sites, Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), and Special Protection Areas (SPAs). **Landfills:** None **Pollution Incidents:** None

Figure H1.1 – Aerial Photo of Havant Thicket Shaft



Figure H1.2 – Artificial/ Superficial and Bedrock Geology (not to scale)



Figure H1.3 – Potential Sources of Contamination Plan (not to scale)



Appendix H1 Havant Thicket Desk Study

Risk Assessment

Potential Source of Contamination (50m buffer zone, 250m buffer for potentially infilled land) [2]	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
On Site: None **Off Site:** **PSC No. 425:** Infilled Swimming Pool (approximately 110m southwest), **PSC No. 464:** Unspecified Pit (approximately 180m south), **PSC No. 424:** Infilled Pond (approximately 140m northeast), and **PSC No. 463:** Former Ground Workings/Heap (approximately 235m northeast).	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and total phenols. Potential for ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Park users	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes)	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Unlikely	Low
			Gas migration / accumulation.	Medium	Low Likelihood	Moderate / Low
		Surface Water bodies/watercourses: Riders Lane Stream approximately 95m southwest.	Surface water runoff and migration through groundwater and underground utilities	Mild	Low Likelihood	Low
		Groundwater: Unproductive Aquifer and Secondary A Aquifer	Leaching through unsaturated and saturated soil	Medium	Low Likelihood	Moderate /Low
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Low Likelihood	Low

Notes:

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m
2. Other PSCs shown on Figure 1.3 within 250m radius of the proposed shaft location include (1) PSC No.426 embankment which is not considered a high-risk PSC and is not further assessed at this stage in the project and (2) PSC No.427 infilled watercourse which is still present, not considered further and will be removed from the PSC list.

Highbridge Shaft on Route Havant Thicket Reservoir-WRP 72					
Approximate Location	East of Highbridge Road (B3335), north of Wardle Road, Highbridge, Otterbourne				
National Grid Reference	447057, 121511				
Current Site Use	**Site History (summary)**	**Geology [1]**	**Hydrogeology [1]**	**Hydrology [1]**	**Environmental Setting [1]**
Farmland	**On-site** **1840s-present day:** Open undeveloped land (farmland). **Surrounding land** **1840s-present day**: rural, an area of marsh land approximately 150m northwest (1930s-1960s), residential properties approximately 125m southwest along Wardle Road from 1930s. Highbridge Gravel Pit is approximately 200m northwest on the 1937 map, shown as disused by 1963 and no longer on maps by 1984.	**Superficial:** River Terrace Deposits **Bedrock:** London Clay Formation (approximately 100m thick)[3]. Upper Chalk at depth **Artificial Ground:** Two areas (infilled ground), approximately 210m and 220m northwest respectively.	**Superficial:** Secondary A Aquifer **Bedrock:** Unproductive (London Clay Formation). Principal Aquifer (Upper Chalk). **Groundwater Abstractions:** 1No**.** active abstraction (potable) approximately 950m northwest. **Groundwater source protection Zone**: No	River Itchen located approximately 220m southwest. unnamed tributary (drain) approximately 80m east. **Surface Water Abstractions:** None	**NVZ:** Nitrate Vulnerable Zone- Hamble Estuary Eutrophic NVZ (Eutrophic Water). **SSSI and SAC:** River Itchen approximately 200m southwest. **Ancient Woodland:** Lords Wood approximately 150m south. **Landfills**: Bugle Farm Landfill (former Highbridge Gravel Pit) approximately 200m northwest. No information on waste type accepted. **Pollution Incidents:** None

Figure H6.1 – Aerial Photo of Shaft Highbridge



Figure H6.2 – Artificial / Superficial and Bedrock Geology

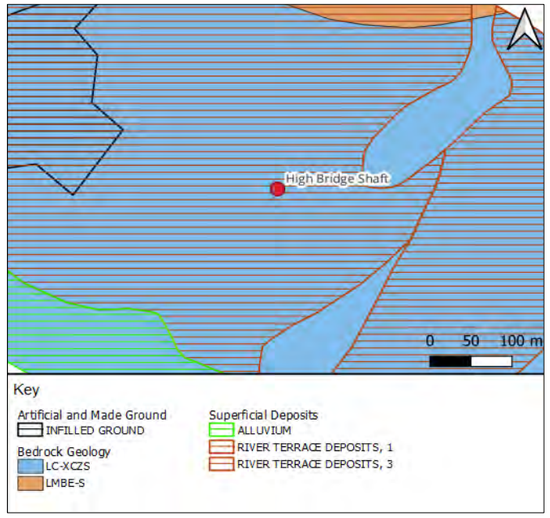
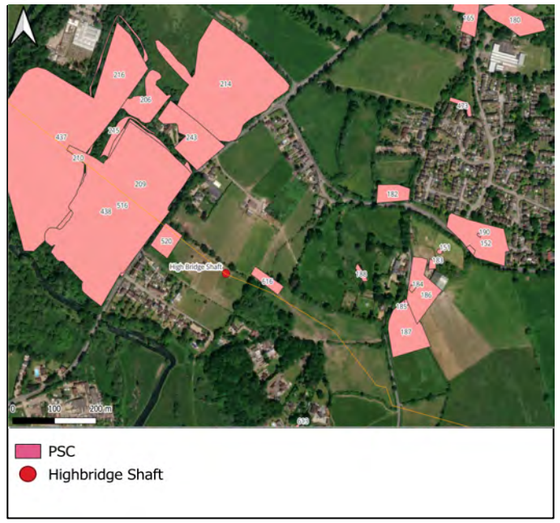


Figure H6.3 – Potential Source of Contamination Plan (not to scale)



Risk Assessment

Potential Source of Contamination (50m buffer zone, 250m buffer for potentially infilled land)[2]	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
Bugle Farm Landfill (**PSC No. 209)** distance 200m northwest. Unknown waste type potential inert, commercial/industrial and domestic waste types to have been deposited. Artificial Ground (infilled ground) approximately 210m northwest (**PSC No. 438**). Extent of artificial ground extends over Bugle Farm Landfill and therefore grouped together.	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) (including phenols), per and polyfluorinated alkyl substances (PFAS), pesticides/herbicides.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Farmland, closest residential properties approximately 100m southeast.	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low
		Existing and Future property (buildings and buried services), Shaft located approximately 200m southeast of landfill.	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Unlikely	Low
			Gas migration / accumulation.	Medium	Low Likelihood	Moderate / Low
		Surface water bodies/watercourses: River Itchen approximately 220m southwest, unnamed tributary (drain) approximately 80m east	Surface water runoff and migration through groundwater and underground utilities	Medium	Unlikely	Low

	Landfill ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Groundwater:** Secondary A Aquifer (River Terrace Deposits), Unproductive Aquifer (London Clay). Upper Chalk (Principal Aquifer) underlies London Clay.	Leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecology (flora and fauna): River Itchen (SSSI and SAC) approximately 220m southwest.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Medium	Unlikely	Low

Notes

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m
2. Other PSCs within 250m of the proposed shaft location shown on Figure H6.3 include infilled drainage channels and ponds, several of these PSCs are within the footprint of s Bugle Farm Landfill and the area of Artificial Ground (infilled ground) and are therefore covered within the risk assessment above.
3. British Geological Survey Map Sheet 315 Southampton, Solid and Drift Geology (1:50,000 scale) 1987.

Appendix H6 Highbridge Shaft Desk Study

Appendix H4 Mill Lane East Shaft

Mill Lane East Shaft on Route Havant Thicket Reservoir-WRP 72					
Approximate Location	Located 20m west of Mill Lane, Havant, Hampshire				
National Grid Reference	470336, 106203				
Current Site Use	**Site History (summary)**	**Geology**	**Hydrogeology**	**Hydrology**	**Environmental Setting**
Open land (grass and trees present)	**1840-1920s: Onsite:** The Site appears undeveloped. The land appears to be part of Upper Mill / Bedhampton Mill. Upper Mill is approximately 100m northeast and Bedhampton Mill is approximately 125m south, both processed corn. **Off-site**: Mill Dam is approximately 30m southeast. A railway is approximately 30m northwest. **Onsite**: The 1869 map shows a railway siding approximately 10m west of the shaft from the main railway heading southwest to an unidentified building 60m southwest. A building with railway siding from the mainline past the shaft is approximately 40m north. **Onsite:** By 1909 Upper Mill and Bedhampton Mill are shown as 'disused' The railway siding has been removed from Bedhampton Mill but remains adjacent to the shaft. **1920s -1960s: Onsite:** By 1932 Upper Mill has been replaced by a Portsmouth Water pumping station. Bedhampton Mill is no longer shown, and Mill House is present. The 1939 map shows tanks approximately 90m northeast at the pumping station. **1961 to present day:** The 1999 aerial map no longer shows the railway siding adjacent to the Site. .No other significant changes.	**Superficial:** Alluvium. River Terrace Deposits surround Alluvium. (See Figure H4.2) **Bedrock:** Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, and Portsdown Chalk Formation (Undifferentiated)	**Superficial –** Secondary A Aquifer **Bedrock –** Principal Aquifer **Groundwater Abstractions: 3 No.** Approximately 155m northeast and 295m northeast and 700m east. **Drinking Water Safeguard Zones (Groundwater) (DWSZ):** Bedhampton and Havant Springs (GWSGZ0138) is approximately 40m northeast of the shaft. **Groundwater Source Protection Zone: No.** (50m buffer zone, 250m buffer for potentially infilled land) A SPZ 1 is approximately 35m north.	**Surface Waters:** Hermitage Stream located approximately 35m southeast. Brookside Road Stream located approximately 35m southwest. **Surface Water Abstractions:** None	**NVZ:** Chichester, Langstone, and Portsmouth Harbours Eutrophic NVZ (Eutrophic Water). No Ramsar Sites, Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), and Special Protection Areas (SPAs). **Landfills**: Bedhampton Waterworks Licenced Landfill approximately 180m northeast. **Pollution Incidents:** None

Figure H4.1 – Aerial Photo of Mill Lane East Shaft



Figure H4.2 – Artificial / Superficial and Bedrock Geology (not to scale)

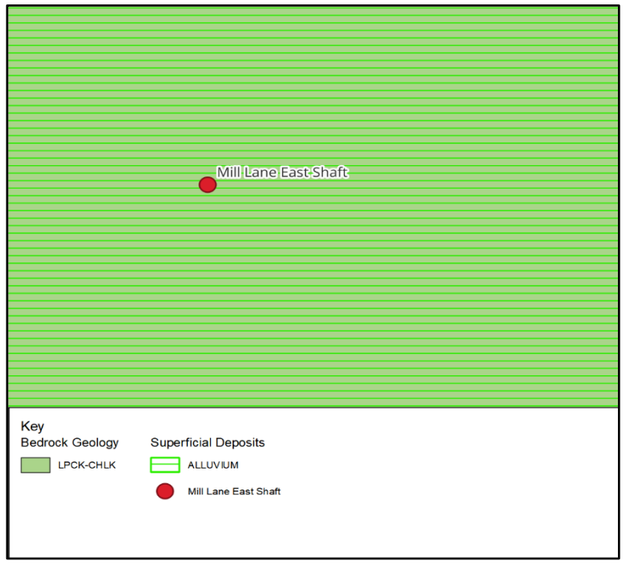
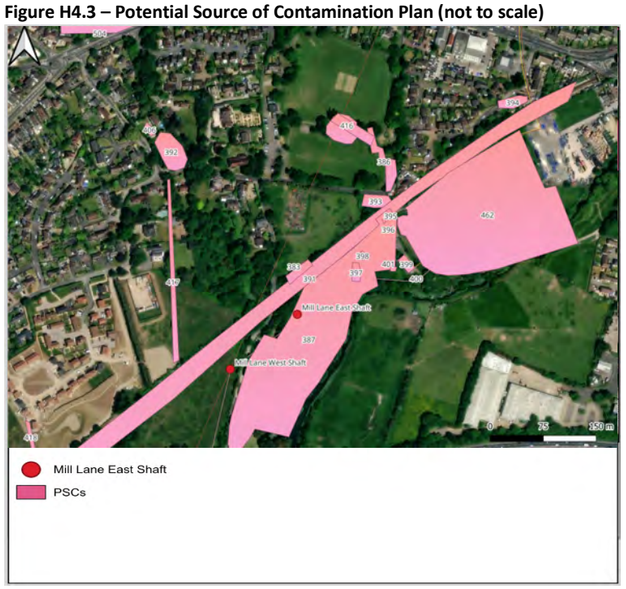


Figure H4.3 – Potential Source of Contamination Plan (not to scale)



Appendix H4 Mill Lane East Shaft

Risk Assessment

(50m buffer zone, 250m buffer for potentially infilled land)[2]	**Potential Contaminants of Concern**	**Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Off-Site: **PSC 391:** Railway Land with embankment (approximately 24m northwest) and siding (approximately 10m west. **PSC 383:** Building with railway siding (approximately 45m northwest). Potential for Made Ground/Fill during construction.	Petroleum hydrocarbons, metals, polycyclic aromatic hydrocarbons (PAHs), asbestos, pesticides/herbicides	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Likely	Moderate
		Adjacent land users: field/rural, railway land.	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate/Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes, shafts)	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Unlikely	Low
		Surface Water bodies / Watercourses: Hermitage Stream and Brookside Road Stream	Surface water runoff and migration through groundwater and underground utilities	Medium	Likely	Moderate
		Groundwater: Secondary A Aquifer and Principal Aquifer	Leaching through unsaturated and saturated soil	Medium	Low Likelihood	Low
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion of soil and dust, and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low
On-Site: **PSC 387:** Corn Mills	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, benzene, toluene, ethylbenzene (BTEX).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: field/rural, railway land	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate/Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes, shaft)	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Low Likelihood	Moderate/Low
		Surface Water bodies/Watercourses: Hermitage Stream and Brookside Road Stream	Surface water runoff and migration through groundwater and underground utilities	Medium	Low Likelihood	Moderate / Low
		Groundwater: Secondary A Aquifer and Principal Aquifer	Surface water runoff and leaching through unsaturated and saturated soil	Mild	Low Likelihood	Low
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Low Likelihood	Low
Off-Site: **PSC 417:** Infilled Watercourse (approximately 170m west), **PSC 384:** Infilled Pond/Watercourse (approximately 125m northwest), **PSC 429:** Marshland (approximately 200m south), **PSC 393:** Infilled Pond (approximately 180m northeast), and **PSC 386:** Infilled Watercourse (approximately 215m northeast)	Petroleum hydrocarbons, metals, asbestos, and ground gas	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Likely	Moderate
		Adjacent land users: field/rural, railway land	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate/Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes)	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Likely	Moderate
		Surface Water bodies/Watercourses: Hermitage Stream and Brookside Road Stream	Surface water runoff and migration through groundwater and underground utilities	Medium	Likely	Moderate
		Groundwater: Secondary A Aquifer and Principal Aquifer	Surface water runoff and leaching through unsaturated and saturated soil	Medium	Likely	Moderate
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Low Likelihood	Low
Off-Site: **PSC 416:** Bedhampton Waterworks Landfill (approximately 185m northeast)	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs and ground gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Likely	Moderate
		Adjacent land users: field/rural, railway land	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Likely	Moderate
		Existing and Future property (buildings and buried services, including drinking water supply pipes)	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Likely	Moderate
		Surface Water bodies / Watercourses: Hermitage Stream and Brookside Road Stream	Surface water runoff and migration through groundwater and underground utilities.	Medium	Likely	Moderate
		Groundwater: Secondary A Aquifer and Principal Aquifer	Surface water runoff and leaching through unsaturated and saturated soil.	Medium	Unlikely	Low
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals.	Mild	Unlikely	Very Low

Notes

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m

2. Other PSCs shown on Figure H4.3 within 250m radius of the proposed shaft location include (1) **PSC No. 388** Sewage (wastewater treatment works, **PSC No. 390** Industrial Estate, **PSC No. 395 to 401** (inclusive) Water works tank and **PSC No. 419** Farm are not considered as they are greater than 50m from the shaft.

Appendix H9 Mill Lane West Shaft

Mill Lane West Shaft on Route Havant Thicket Reservoir-WRP 72					
Approximate Location	Located 15m west of Mill Lane, Havant, Hampshire				
National Grid Reference	470241 106124				
Current Site Use	**Site History (summary)**	**Geology** [1]	**Hydrogeology** [1]	**Hydrology** [1]	**Environmental Setting** [1]
Open land (grass covered field)	**1840-1920s. On Site:** Field, open land. **Off Site:** Bedhampton Corn Mill is shown approximately 20m east with railway sidings. Watercourse (now known as Hermitage Stream) flows through the mill. A rail line is approximately 25m northwest (in present day location). Bedhampton Mills shown as disused on 1909 maps. **1930s-1970s. On Site:** Allotment gardens (1930s-C.1960), no other change. **Offsite**: a wastewater treatment works is present approximately 120m south. **1970s to present day. On Site**: No change. **Off Site:** Recent residential development in progress to the north of the rail line (2022-23).	**Superficial:** River Terrace Deposits Alluvium shown approximately 30m east. **Bedrock:** Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, and Portsdown Chalk Formation (Undifferentiated)	**Superficial:** Secondary A Aquifers **Bedrock:** Principal Aquifer **Groundwater Abstractions:** 3No. approximately 280m, 420m and 820m northeast (active potable water supply **Groundwater Source Protection Zone:** No	**Surface Waters:** Hermitage Stream located approximately 100m east. **Surface Water Abstractions:** None	**NVZ:** Chichester, Langstone and Portsmouth Harbours Eutrophic NVZ (Eutrophic Water) No Ramsar Sites, Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), and Special Protection Areas (SPAs). **Landfills**: None **Pollution Incidents:** None

Figure H9.1 – Aerial Photo of Mill Lane West Shaft (not to scale)



Figure H9.2 – Artificial / Superficial and Bedrock Geology (not to scale)

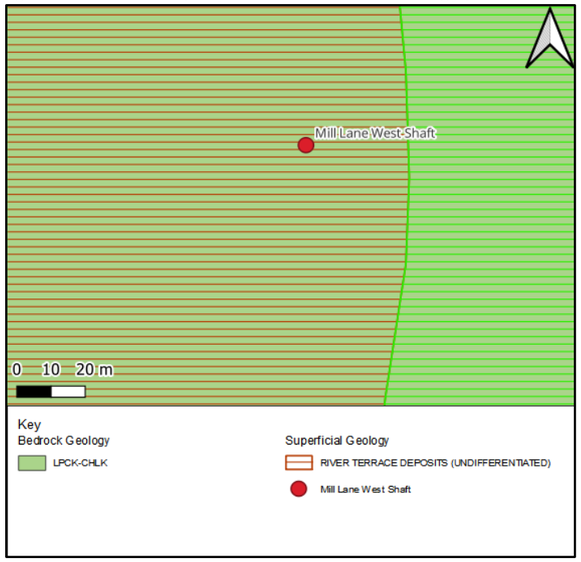
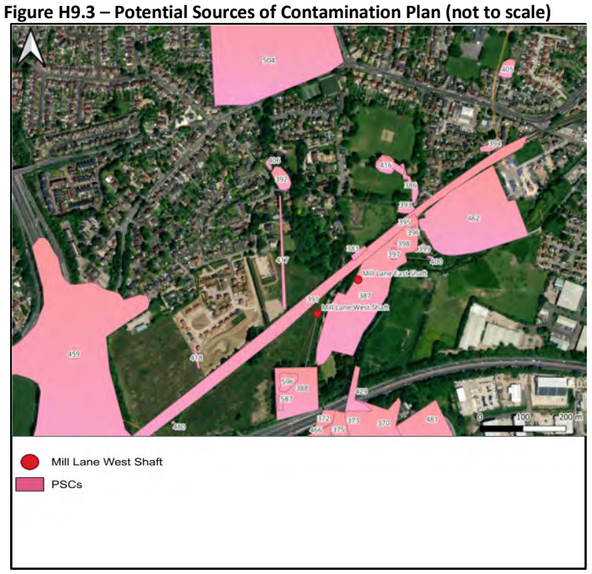


Figure H9.3 – Potential Sources of Contamination Plan (not to scale)



Risk Assessment

Potential Source of Contamination (50m buffer zone, 250m buffer for potentially infilled land) [2]	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
Off-Site **PSC No. 391:** Railway Line in cutting (dating back to 1840s/1880s map) (approximately 25m northwest). Potential for Made Ground/Fill during construction.	Petroleum hydrocarbons, metals, polycyclic aromatic hydrocarbons (PAHs), asbestos, pesticides/herbicides	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation.	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate / Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: field/rural land use, closest residential property approximately 25m east.	Direct dermal contact, ingestion, and inhalation of dusts, vapours and gases.	Medium	Low Likelihood	Moderate / Low
		Existing and Future property: buildings and buried services, including drinking water supply pipes; shaft	Direct contact and gas migration/accumulation during excavation works and stockpiling.	Medium	Low Likelihood	Moderate / Low
			Gas migration / accumulation.	Medium	Low Likelihood	Moderate / Low
		Surface Water bodies/Watercourses: Hermitage Stream	Surface water runoff and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: Secondary A Aquifer and Principal Aquifer	Leaching through unsaturated and saturated soil	Medium	Low Likelihood	Low

		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion of soil and dust, and inhalation of dusts, gases and vapours by animals.	Mild	Low Likelihood	Low
Off-Site **PSC No. 387:** Former Bedhampton Corn Mill (approximately 20m southeast).	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, benzene, toluene, ethylbenzene, xylenes (BTEX).	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts, vapours, and gases	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Field/rural, closest residential property approximately 25m east.	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate / Low
		Existing and Future property: Buildings and buried services, including drinking water supply pipes; shaft	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Low Likelihood	Moderate/Low
		Surface Water bodies/Watercourses: Hermitage Stream	Surface water runoff and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: Secondary A Aquifer and Principal Aquifer	Leaching through unsaturated and saturated soil	Medium	Low Likelihood	Low
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Low Likelihood	Low
Off-Site **PSC No. 417:** Possible infilled Watercourse (approximately 75m northwest) to the north of the rail line. **PSC No. 429:** Marshland (approximately 140m southeast closest point). **PSC No. 372:** Marshland (approximately 230m south closest point). Potential for Made Ground/Fill.	Metals, inorganics, asbestos, petroleum hydrocarbons, PAHs, BTEX and total phenols. Potential for ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low
			Inhalation of gases and vapours	Medium	Unlikely	Low
		Adjacent land users: Field/rural, closest residential property approximately 25m east.	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low
		Existing and Future property: Buildings and buried services, including drinking water supply pipes; shaft	Direct contact and gas migration/accumulation during excavation works and stockpiling	Medium	Unlikely	Low
		Surface Water bodies/Watercourses: Hermitage Stream	Surface water runoff and migration through groundwater and underground utilities	Medium	Unlikely	Low
		Groundwater: Secondary A Aquifer and Principal Aquifer	Leaching through unsaturated and saturated soil	Medium	Unlikely	Low
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Unlikely	Very Low

Notes

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m
2. Other PSCs shown on Figure H9.3 within 250m radius of the proposed shaft location include (1) **PSC No. 419** - a farm which is not considered a high risk PSC and not further assessed at this stage in the project: (2) **PSC No.388** - a wastewater treatment works greater than >50m; (3) **PSC No.384** – recorded as an infilled pond; however, this is still present and will be removed from the PSC listing**.**

Appendix H7 Otterbourne Shaft Desk Study

Otterbourne Shaft on Route Otterbourne					
Approximate Location	Approximately 0.8km southeast of Otterbourne Village. Approximately 60m east of Otterbourne Park Wood.				
National Grid Reference	446191, 122125				
Current Site Use	**Site History (summary)**	**Geology [1]**	**Hydrogeology [1]**	**Hydrology [1]**	**Environmental Setting [1]**
Open grassed land	**1840-to present day:** Open undeveloped land to the east of Otterbourne Park Wood	**Superficial:** River Terrace Deposits **Bedrock:** London Clay Formation	**Superficial:** Secondary A Aquifer **Bedrock:** Unproductive **Groundwater Abstractions:** 2No. active abstractions (potable) approximately 550m northeast and northwest. **Groundwater source protection zone**: Zone 1c	**Surface Waters:** Un-named tributaries (drains) located approximately 60m west, 100m north and 250m east (adjacent to the rail track). The River Itchen (designated a SAC and a SSSI) is located approximately 330m southeast (at its closest location). **Surface Water Abstractions:** None	**NVZ:** Nitrate Vulnerable Zone- Hamble Estuary Eutrophic NVZ (Eutrophic Water) **SSSI/SAC/SPA/RAMSAR:** None **Ancient Woodland:** approximately 45m west (Otterbourne Park Woodland). **Landfills**: None **Pollution Incidents:** None

Figure Appendix H7.1: Aerial Photo of Otterbourne Shaft

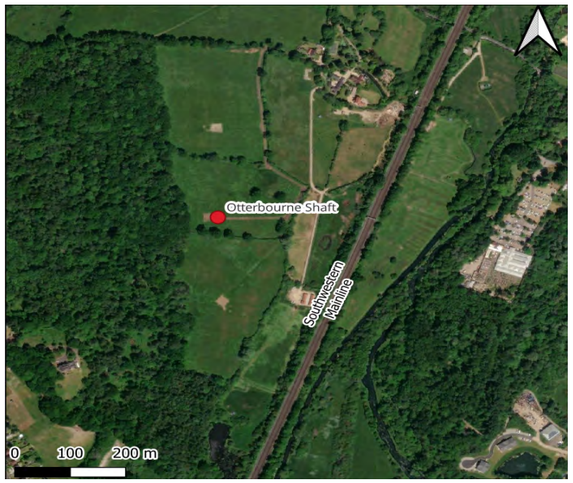


Figure Appendix H7.2: Artificial / Superficial and Bedrock Geology

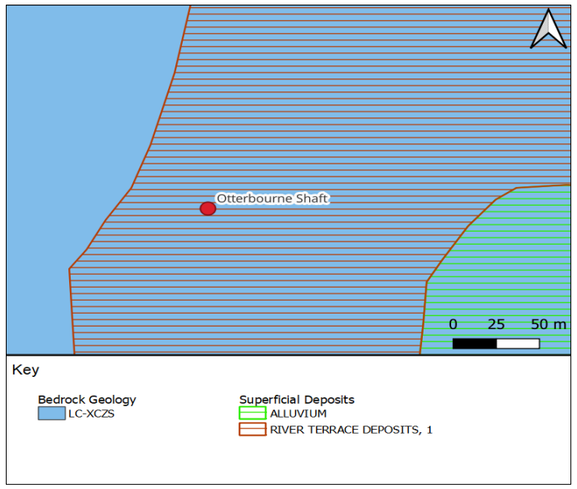
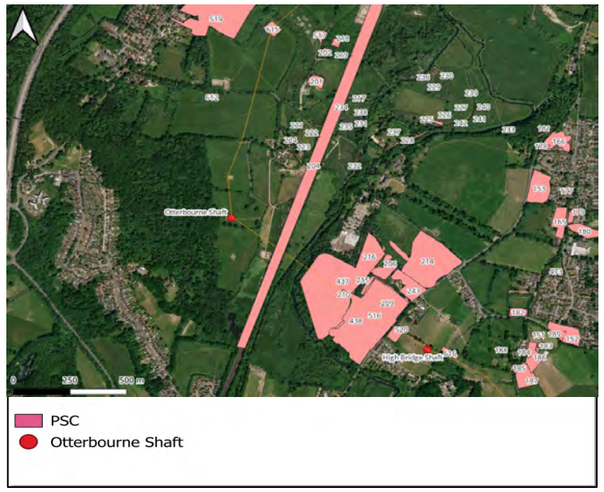


Figure Appendix H7.3 – Potential Sources of Contamination Plan (not to scale)



Risk Assessment

Potential Source of Contamination (50m buffer zone, 250m buffer for potentially infilled land))	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
No PSCS identified	None	None	None	N/A	N/A	N/A

Notes

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m

Appendix H4 Portsdown Hill Shaft Desk Study

Portsdown Hill Shaft on Route WRP 72-Purbrook (optional)					
Approximate Location	Located southeast of Portsdown Hill Road (B2177) off Gillman Road, Farlington, Portsmouth				
National Grid Reference	468095, 106270				
Current Site Use	**Site History (summary)**	**Geology** [1]	**Hydrogeology**	**Hydrology** [1]	**Environmental Setting** [1]
Land within Farlington Water Treatment Works (WTW) (Portsmouth Water)	**On-site** **1840s-1920s:** the site comprises land to the north of Portsdown Hill reservoirs, an old quarry located approximately 100m east**.** **1930s-1950s:** increased expansion of the water works to the south and southeast of the site, (Portsmouth Water Co.) **Surrounding land** Farlington Redoubt and Fort Purbrook located approximately 430m east and 200m west respectively.	**Superficial:** None **Bedrock:** Tarrant Chalk Member. New Haven Chalk or Spetisbury Chalk Member may also be encountered.	**Superficial:** N/A **Bedrock:** Principal Aquifer **Groundwater Abstractions:** None **Groundwater Source Protection Zone:** None	None **Surface Water Abstractions:** None	**NVZ:** Nitrate Vulnerable Zone: Chichester, Langstone, and Portsmouth Harbours Eutrophic NVZ (Eutrophic Water) **SSSI and SAC:** None **Ancient Woodland:** None **Landfills**: None **Pollution Incidents:** None

Figure H4.1 – Aerial Photo of Shaft J



Figure H4.2 – Artificial/Superficial and Bedrock Geology (note to scale)

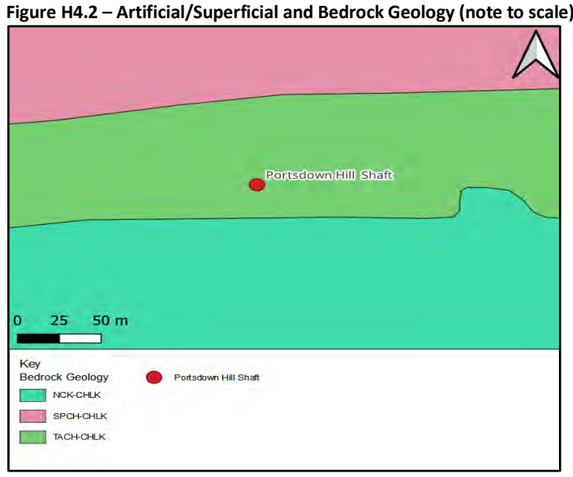


Figure H4.3 – Potential Sources of Contamination Plan (note to scale)



Appendix H4 Portsdown Hill Shaft Desk Study

Risk Assessment

Potential Source of Contamination ((50m buffer zone, 250m buffer for potentially infilled land) [3]	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
ON-SITE **PSC No. 308:** Land north of reservoirs (Portsmouth Water). Potential for Made Ground/Fill material during construction.	Metals, inorganics, petroleum hydrocarbons, asbestos, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX) and total phenols. Potential for ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide) and chlorine gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate / Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Reservoir site, closest residential properties approximately 200m south and west.	Direct dermal contact, ingestion, and inhalation of dusts, gases and vapours during excavation works and stockpiling	Medium	Low Likelihood	Moderate / Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes): no current or future buildings	Direct contact during excavation works and stockpiling	Medium	Low Likelihood	Moderate/Low
			Gas migration / accumulation.	Medium	Low Likelihood	Moderate/Low
		Surface water bodies/watercourses[2]: None within 250m	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Low
		Groundwater: Principal Aquifer	Leaching through unsaturated and saturated soil	Medium	Likely	Moderate
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Unlikely	Very Low
OFF SITE **PSC No.306**: Old chalk quarry and **PSC No.361**: Old chalk pit potential for Made Ground/Fill material located approximately 35m northeast (at closest point). Information from Havant BC and Portsmouth City Council regarding potential for Made Ground/Fill material.	Metals, inorganics, petroleum hydrocarbons, asbestos, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX) and total phenols. Potential for ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide)	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low Likelihood	Moderate / Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Reservoir site, closest residential properties approximately 200m south and west.	Direct dermal contact, ingestion, and inhalation of dusts, gases and vapours during excavation works and stockpiling	Medium	Unlikely	Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes): no current or future buildings	Direct contact during excavation works and stockpiling	Medium	Unlikely	Low
			Gas migration / accumulation.	Medium	Low Likelihood	Moderate/Low
		Surface water bodies/watercourses [2]: None within 250m	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: Principal aquifer	Leaching through unsaturated and saturated soil	Medium	Likely	Moderate
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Low Likelihood	Low
OFF SITE **PSC Nos. 307 and 309:** Reservoirs and filtration works (Portsmouth Water), located approximately 180m southeast and 50m south respectively. Potential for Made Ground/Fill material during construction. Likely storage of chemical and bulk fuels. Information from Portsmouth City Council regarding potential for Made Ground/Fill material.	Metals, inorganics, petroleum hydrocarbons, asbestos, polycyclic aromatic hydrocarbons (PAHs), benzene, toluene, ethylbenzene (BTEX) and total phenols. Potential for ground gas (methane, carbon dioxide, carbon monoxide, hydrogen sulphide) and chlorine gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Reservoir site, closest residential properties approximately 200m south and west.	Direct dermal contact, ingestion, and inhalation of dusts, gases and vapours during excavation works and stockpiling	Medium	Unlikely	Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes): no current or future buildings	Direct contact during excavation works and stockpiling	Medium	Unlikely	Low
			Gas migration / accumulation.	Medium	Low Likelihood	Moderate/Low
		Surface water bodies/watercourses [2]: None within 250m	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Low
		Groundwater: Principal Aquifer	Leaching through unsaturated and saturated soil	Medium	Unlikely	Low
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Mild	Unlikely	Very Low

Notes –

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m
2. Current reservoirs (Portsmouth Water) are not included as a potential receptor. The construction of the reservoir is unknown, however is assumed to be a contained and impermeable structure.
3. PSC No. 343 are roadside drains along the route of a former road (Crookhorn Lane), it is not considered further in this risk assessment. Two historical military sites were located in the surrounding land, located >50m, the closest being Fort Purbrook at approximately 200m northwest (PSC No.340). Military activities outside these forts may have occurred to also include including tunnels.

Appendix H5 Purbrook Shaft Desk Study

Purbrook Shaft on Route WRP 72 - Purbrook					
Approximate Location	Located approximately 200m north of Portsdown Hill Road (B2177), east of Widley, Portsmouth				
National Grid Reference	466620, 106635				
Current Site Use	**Site History (summary)**	**Geology** [1]	**Hydrogeology** [1]	**Hydrology** [1]	**Environmental Setting** [1]
Agricultural Land	**c.1840s-present day. On Site:** agricultural land **1840s-1920s. Surrounding Land:** rural, Dell Garden (approximately 65m east) associated with Portsdown Lodge property, possible pits 100m and 170m northwest, reservoir 180m southeast and large chalk pits (>200m) to the south. **1920s-1970s:** residential expansion to the northeast and southeast. **1970s to present day:** continued residential development, new reservoir site approximately 100m south.	**Superficial:** None **Bedrock:** Portsdown Chalk Formation	**Superficial:** N/A **Bedrock:** Principal Aquifer **Groundwater Abstractions:** None **Groundwater source protection Zone**: None	**Surface Waters:** None **Surface Water Abstractions:** None	**NVZ:** Nitrate Vulnerable Zone- Chichester, Langstone and Portsmouth Harbours Eutrophic NVZ (Eutrophic Water); Nitrate Vulnerable Zone-Fareham (Groundwater) **SSSI:** Portsdown SSSI is located approximately 450m south. **Landfills**: None. **Pollution Incidents:** None

Figure H5.1- Aerial Photo of Purbrook Shaft



Figure H5.2- Artificial/ Superficial and Bedrock Geology (not to scale)

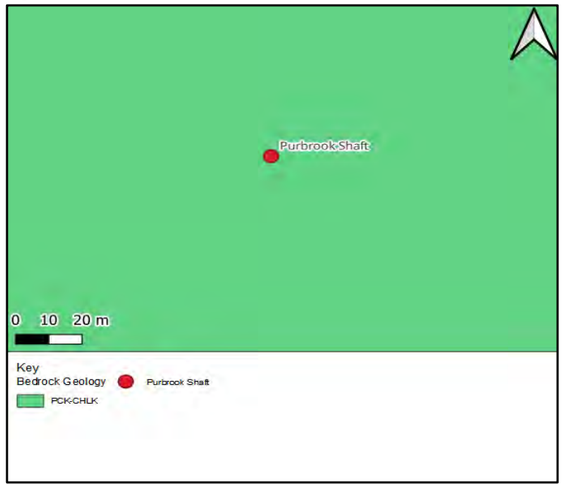


Figure H5.3- Potential Sources of Contamination Plan (not to scale)



Risk Assessment

Potential Source of Contamination (50m buffer zone, 250m buffer for potentially infilled land)	Potential Contaminants of Concern	Potential Receptors	Potential Pathways	Potential Consequence of Pollutant Linkage	Probability of Pollutant Linkage	Risk (without mitigation measures)
On Site: None **Off Site:** **PSC No. 358**: Active Reservoir (covered) (approximately 100m south) potentially imported material during reservoir construction; **PSC No. 319:** Former Reservoir (approximately 140m south); **PSC No. 314:** The Dell Pit (approximately 65m east; **PSC No. 499:** Infilled Land (approximately 100m northwest); **PSC No. 262:** Pit potentially infilled (approximately 165m northwest); **PSC No. 315**: Infilled Pond (approximately 195m north); **PSC No. 313**: Chalk Pit (approximately 240m south) (not shown in **Figure H6.3**); **PSC No. 367:** Chalk Pit (approximately 160m north)	Petroleum hydrocarbons, metals, inorganics, asbestos, and ground gas (i.e., methane, carbon dioxide, carbon monoxide and hydrogen sulphide)	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Unlikely	Low
			Inhalation of gases and vapours	Medium	Low Likelihood	Moderate / Low
		Adjacent land users: Agricultural land, closest residential properties approximately 45m east.	Direct dermal contact, ingestion, and inhalation of dusts gases and vapours during excavation works and stockpiling	Medium	Unlikely	Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes)	Direct contact during excavation works and stockpiling	Medium	Unlikely	Low
			Gas migration / accumulation.	Medium	Low Likelihood	Moderate / Low
		Surface water bodies/watercourses: None within 250m	Surface water runoff and migration through groundwater and underground utilities	Mild	Unlikely	Very Low
		Groundwater: Principal Aquifer	Leaching through unsaturated and saturated soil	Medium	Unlikely	Low
		Ecology (flora and fauna): No statutory designated sites within 250m.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases, and vapours by animals	Mild	Unlikely	Very Low

Notes

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m

WRP East and WRP West Shaft on Route Havant Thicket Reservoir-WRP and WRP-Purbrook *(a separate geo-environmental interpretative report with desk study information provides more detailed information (September 2023), see references)*					
Approximate Location	Located 70m southeast of Havant Bypass (A27), Harts Farm Way, Havant, Hampshire				
National Grid Reference	470158, 105760 WRP East Shaft 470102, 105732 WRP West Shaft				
Current Site Use	**Site History (summary)**	**Geology [1]**	**Hydrogeology [1]**	**Hydrology [1]**	**Environmental Setting [1]**
Former Landfill Site (grassed), no current activities	**1840-1880:** Located on Broad Marsh, Storehouse Lake watercourse is approximately 75m from WRP East Shaft and flows into Langstone Harbour. **1880s-1950s**: No significant change **1960s-1980s**: On site landfill accepting household, commercial and industrial waste types. As part of these works Storehouse Lake channel (now Hermitage Stream) was realigned and a bund wall on the coastline (280-380m southeast and southwest of the shaft locations). Landfilling on surrounding land to the west and south was also undertaken during this time. **1990s-2000s:** Planning application information and historical aerial imagery show an area to the west of the shafts to have undergone earth works to raise the ground and subsequently used as a 'playing field'. The western area appears to have been used as a stockpiling and construction compound in mid 2000s during Harts Farm Way/A27 road works. **2010s-present day:** the Site appears to have been almost entirely restored to its existing condition. Further details on the development of the landfill are presented in the Havant Water Recycling Plant – Geo-Environmental Interpretative Report & Outline Remediation Strategy (SSP 2023, Ref.331101000-RP-GEO-100.00948-710060-002).	**Artificial Ground:** On Site Made Ground (artificial deposits) **Superficial:** Raised Marine Deposits **Bedrock:** Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation, and Portsdown Chalk Formation (Undifferentiated)	**Superficial:** Secondary (Undifferentiated) **Bedrock:** Principal Aquifer **Groundwater Abstractions:** 3No. approximately 600m, 730m and 1km northeast (active potable water supply)	**Surface Waters:** Hermitage Stream approximately 130m east (closest point), flows southwards to Langstone Harbour (approximately 280m-380m southeast and south of the shafts. **Surface Water Abstractions:** None	**RAMSAR Site, Special Protection Area (SPA), Special Area of Conservation (SAC): Site of Specifical Scientific Interest (SSSI):** Langstone Harbour (approximately 430m south) **NVZ:** Chichester, Langstone and Portsmouth Harbours Eutrophic NVZ (Eutrophic Water) **Landfills**: Harts Farm Way Historic Landfill (on Site, adjacent land to the south and west) **Pollution Incidents:** None

Figure H3.1 – Aerial Photo of WRP_72 East and WRP_72 West (not to scale)



Figure H3.2 – Artificial/Superficial and Bedrock Geology (not to scale)

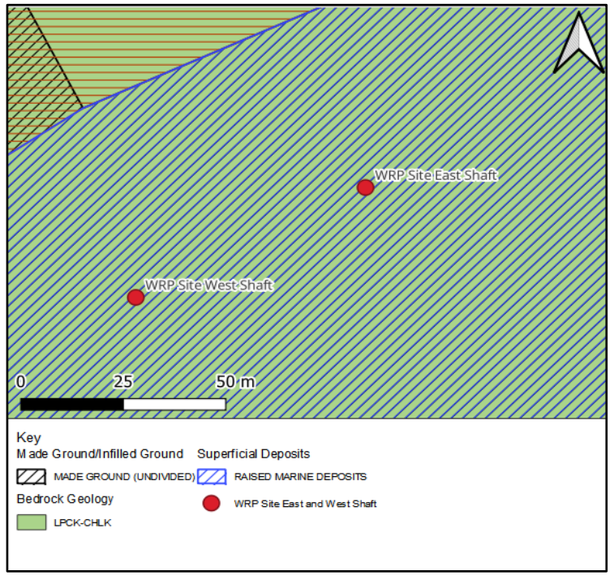


Figure H3.3 – Potential Sources of Contamination Plan (not to scale)



Risk Assessment

Potential Source of Contamination (50m buffer zone, 250m buffer for potentially infilled land) [2]	**Potential Contaminants of Concern**	**Potential Receptors**	**Potential Pathways**	**Potential Consequence of Pollutant Linkage**	**Probability of Pollutant Linkage**	**Risk (without mitigation measures)**
On Site. PSC No. 372: Marshland. **PSC No. 466:** Harts Farm Way Landfill includes **PSC No. 459** (BGS recorded Artificial Ground (Made Ground). **Off Site. PSC No. 375** infill land (former route of Hermitage Stream) approximately 65m east. Existing ground investigation data is provided in Geo-environmental) Interpretative report. (SSP 2023, Ref.331101000-RP-GEO-100.00948-710060-002).	Metals, inorganics, asbestos, petroleum hydrocarbons, polycyclic aromatic hydrocarbons, volatile organic compounds, semi-volatile organic compounds, per-and polyfluorinated alkyl substances (PFAS), and ground gas.	**Construction, maintenance workers and future site users:** Construction workers during open cut excavations/construction, maintenance workers during operation	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Likely	Moderate
			Inhalation of gases and vapours	Severe	High	Very High
		Adjacent land users: Workers at business park approximately 200m east.	Direct dermal contact, ingestion, and inhalation of dusts	Medium	Low	Moderate / Low
		Existing and Future property (buildings and buried services, including drinking water supply pipes): Shafts	Direct contact during excavation works and stockpiling	Medium	Likely	Moderate
			Gas migration / accumulation.	Severe	High	Very High
		Surface Water bodies/Watercourses): Hermitage Stream (approximately 130m), Langstone Harbour	Surface water runoff and migration through groundwater and underground utilities	Medium	High	High
		Groundwater: Secondary (Undifferentiated and Principal Aquifer), as biodiversity (not water resource)	Leaching through unsaturated and saturated soil	Medium	High	High
		Ecology (flora and fauna): no statutory designated sites within 250m, Langstone Harbour approximately 430m south, Hermitage Stream flows to Langstone Harbour.	Plant uptake, direct contact, ingestion and inhalation of dusts, gases and vapours by animals	Medium	Likely	Moderate

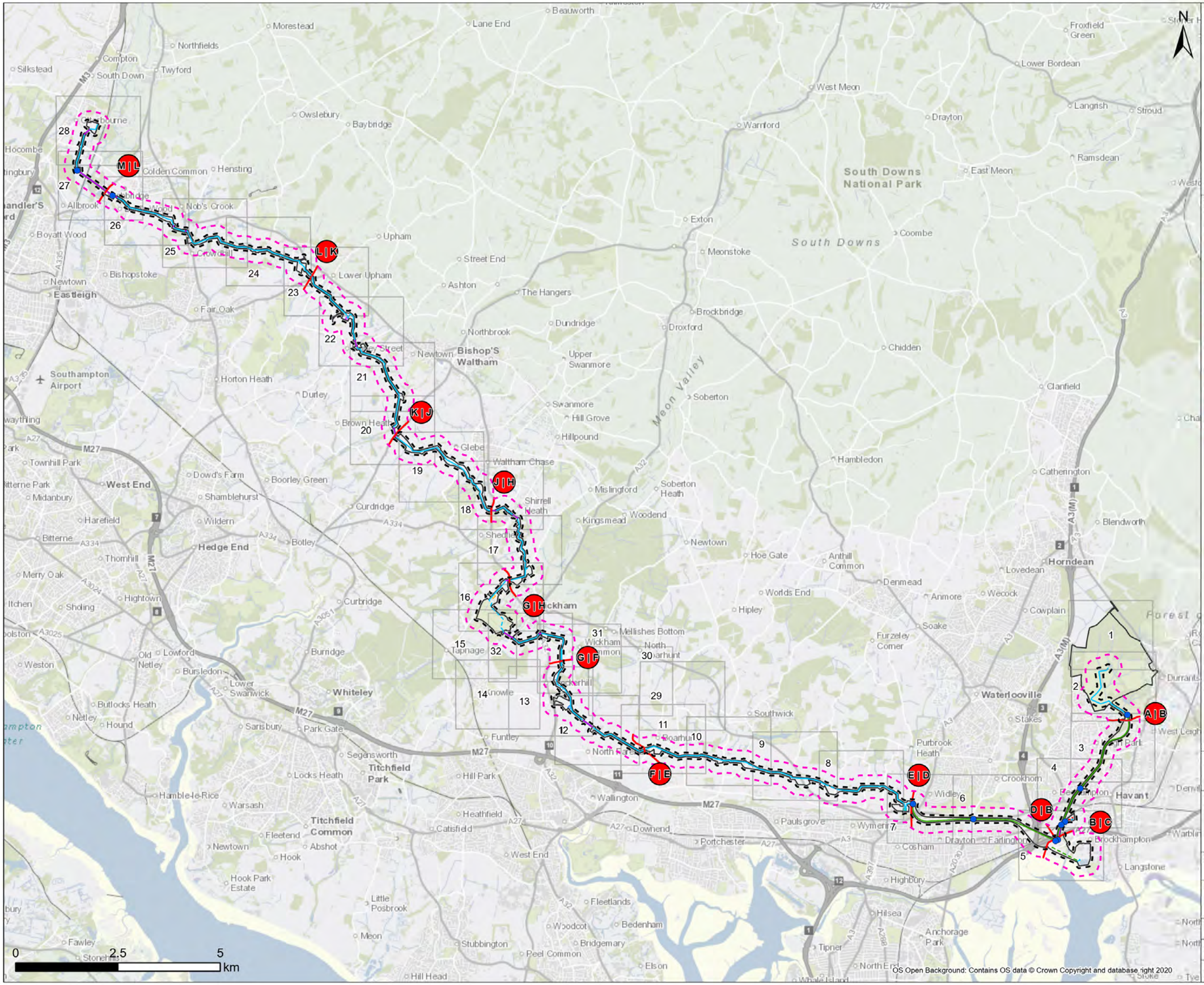
Notes

1. Groundwater and surface water abstractions up to 1km; surface waters up to 250m; artificial ground up to 250m, statutory designated sites up to 250m, landfill sites within 250m; pollution incidents within 50m
2. Other PSCs within 250m of the proposed shaft locations shown on Figure H3.3 include PSC No. 301 Infilled Pond (approximately 220m west) and marshland (PSC No. 472), which is within the area of Artificial Ground (infilled ground) and Landfill area and are therefore covered within the risk assessment above.

Appendix I – Groundsure Report

Not included due to licencing terms

Figures



Note: 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

Contains Southern Water preliminary data - All site locations and routes shown are preliminary only and subject to further site selection assessment and stakeholder consultation.

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WATER for LIFE from Southern Water

Project Title	Water For Life Hampshire
Drawing Title	Location of Pipeline Route Scheme Overview

Scale	Date Drawn	Page	Sheet Size
1:85,000	27/08/2024	1.0	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-SK-GE-00001			A

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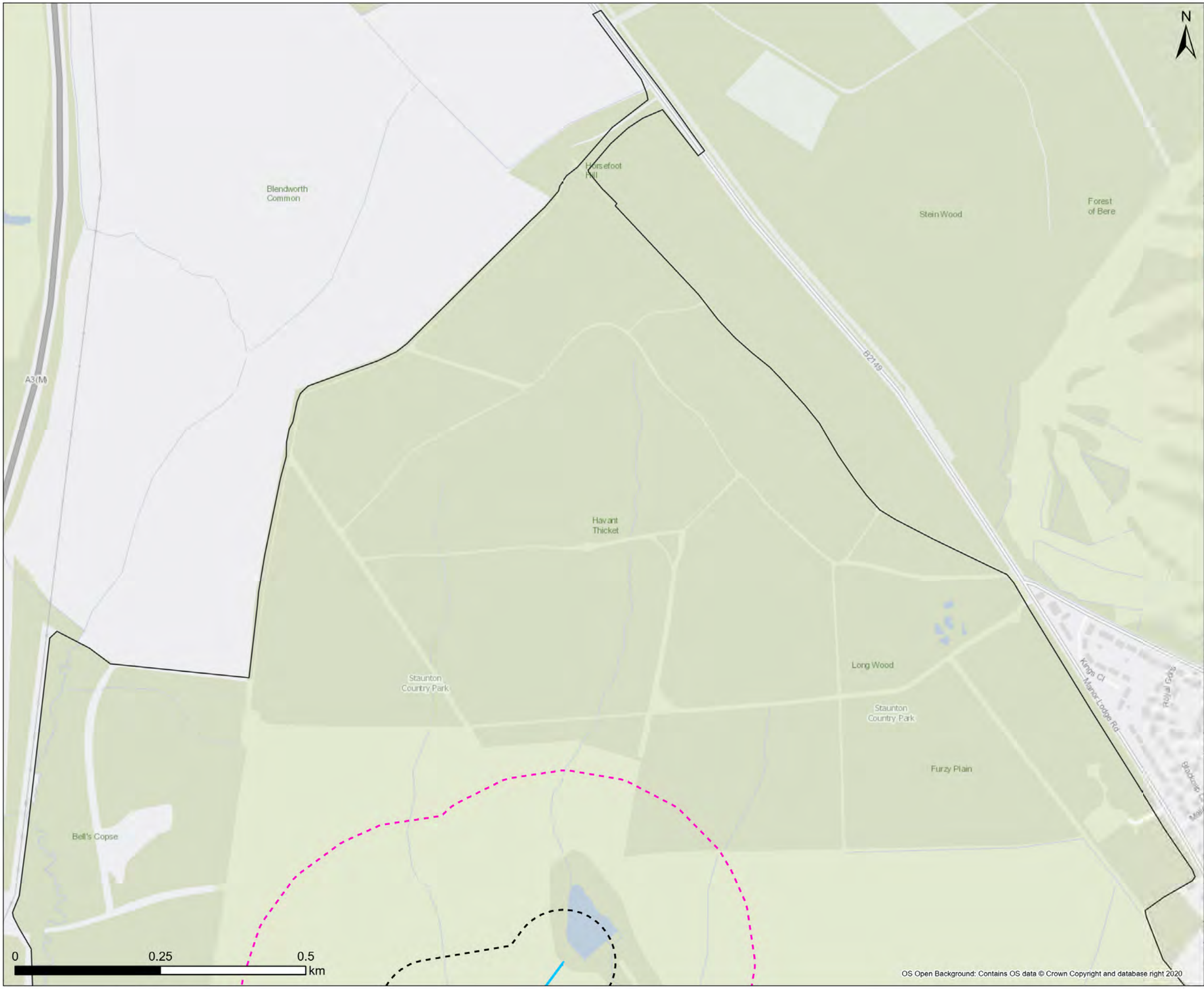



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Open Cut
- 50m Buffer
- 250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - A

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 1 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00701			A

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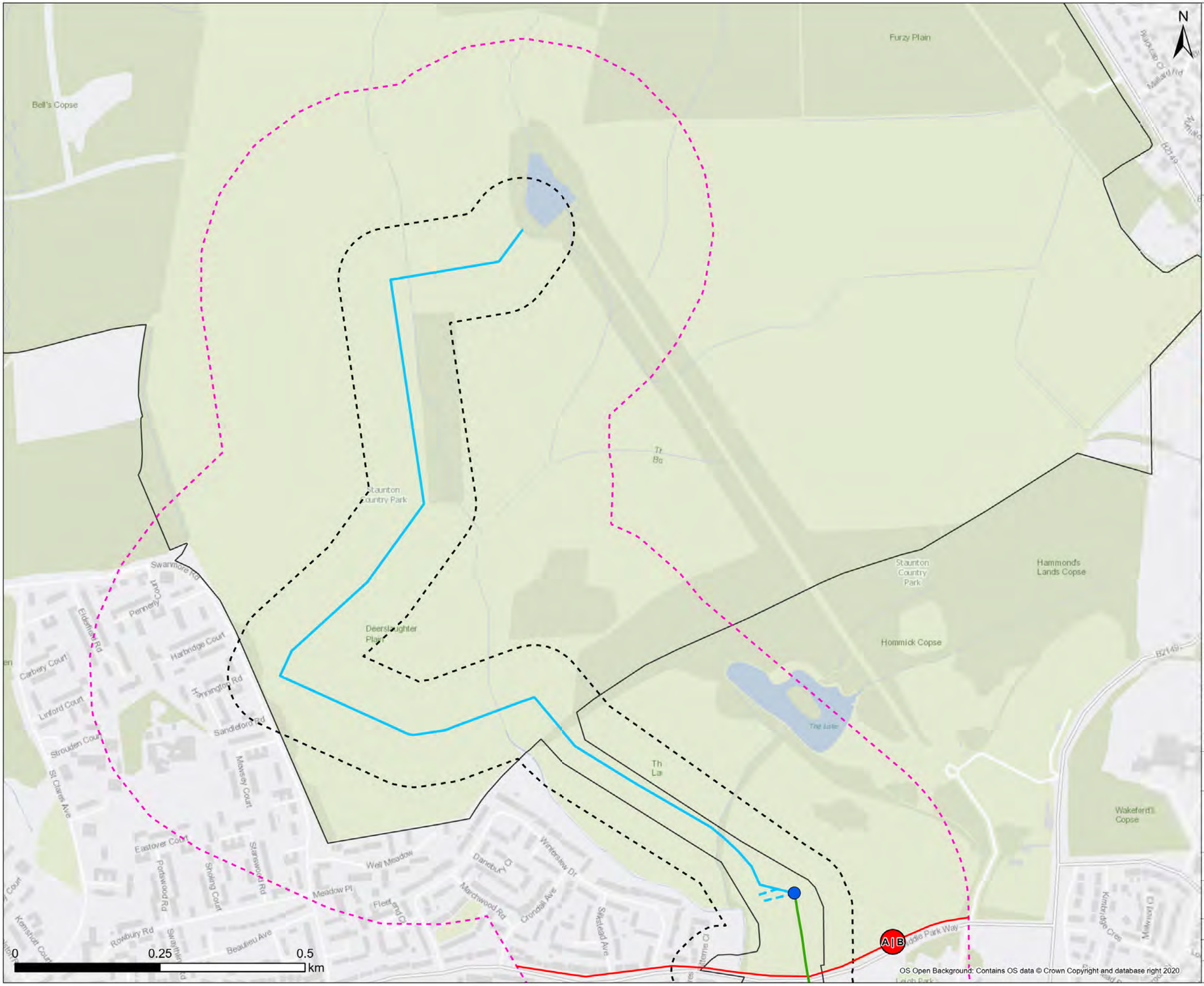



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Open Cut
- Open Cut - SUBJECT TO CHANGE
- Tunnel
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break
- Proposed Shaft Location

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - A

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 2 of 32	A3
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Project No.: 710166-SWS-XX-XX-DR-Z-00702			Revision: A

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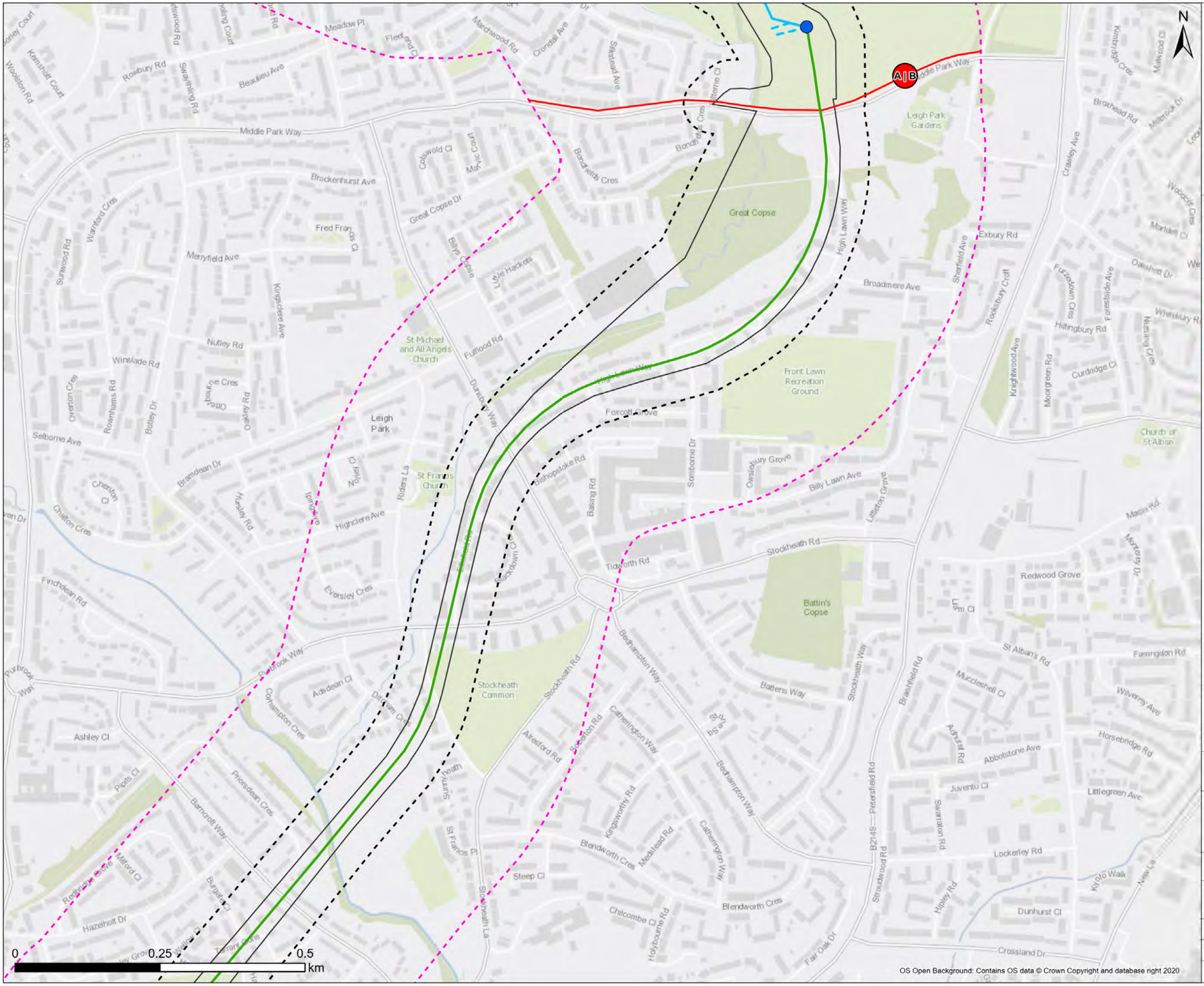



Legend

- Draft Order Limit

Proposed Pipeline Route

- Open Cut
- Open Cut - SUBJECT TO CHANGE
- Tunnel
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break
- Proposed Shaft Location

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - B

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 3 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00703			Revision: A

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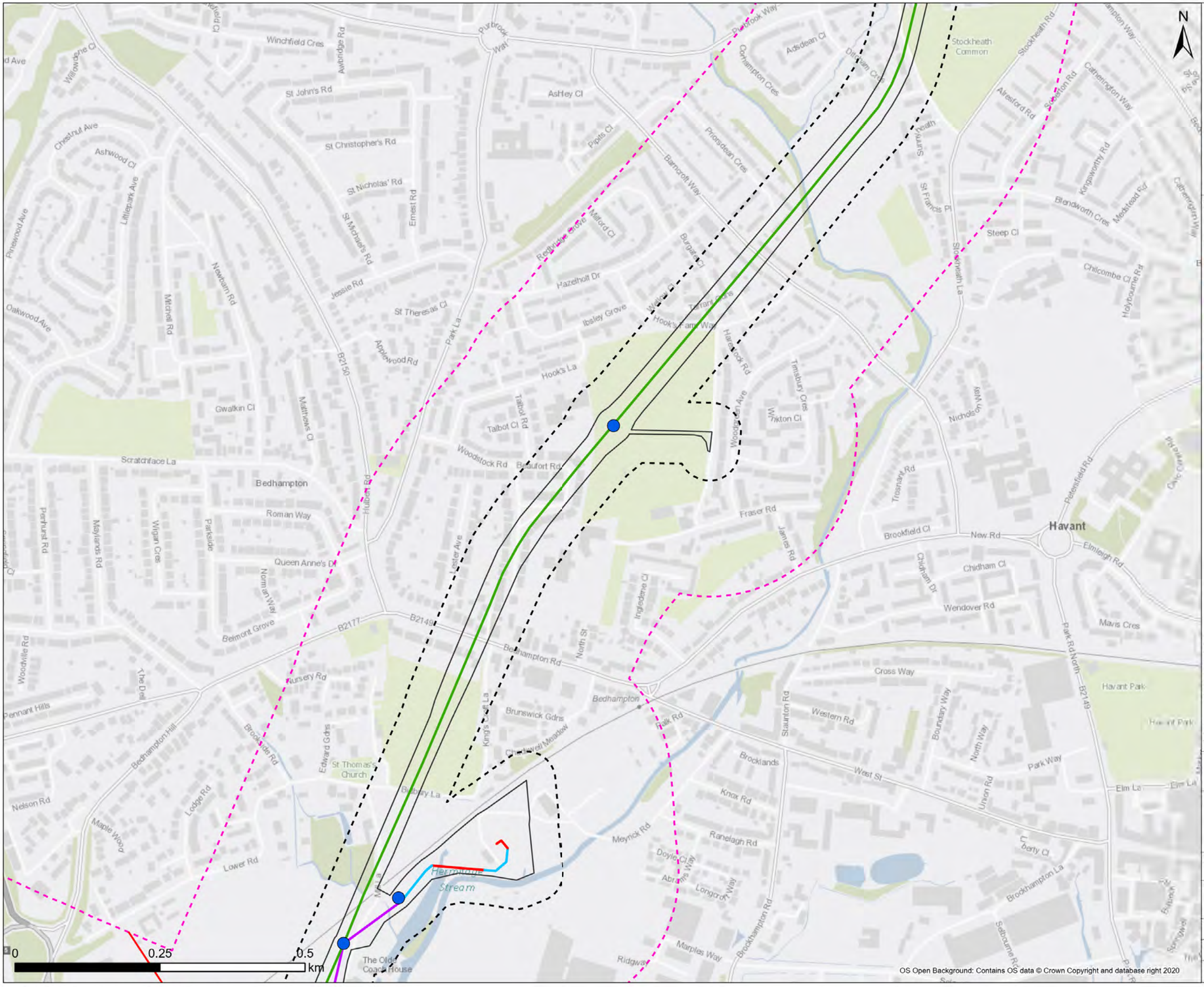

Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Above Ground - SUBJECT TO CHANGE
  - Open Cut
  - Trenchless
  - Tunnel
- 50m Buffer
- 250m Buffer
- Pipeline Section Break
- Proposed Shaft Location

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - B

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 4 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00704			A

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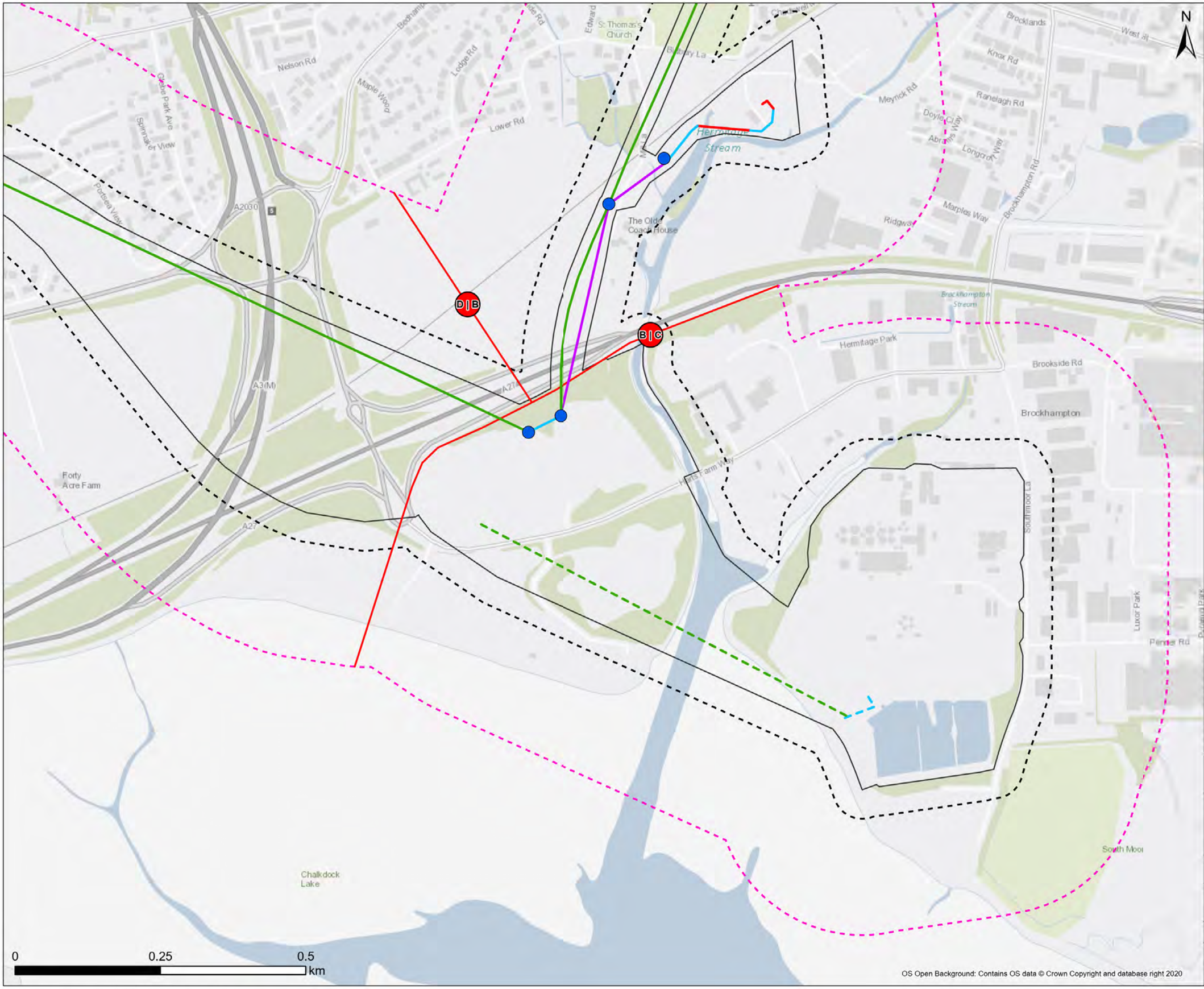



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Above Ground - SUBJECT TO CHANGE
- Open Cut
- Open Cut - SUBJECT TO CHANGE
- Trenchless
- Tunnel
- Tunnel - SUBJECT TO CHANGE
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break
- Proposed Shaft Location

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - C

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 5 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00705			A

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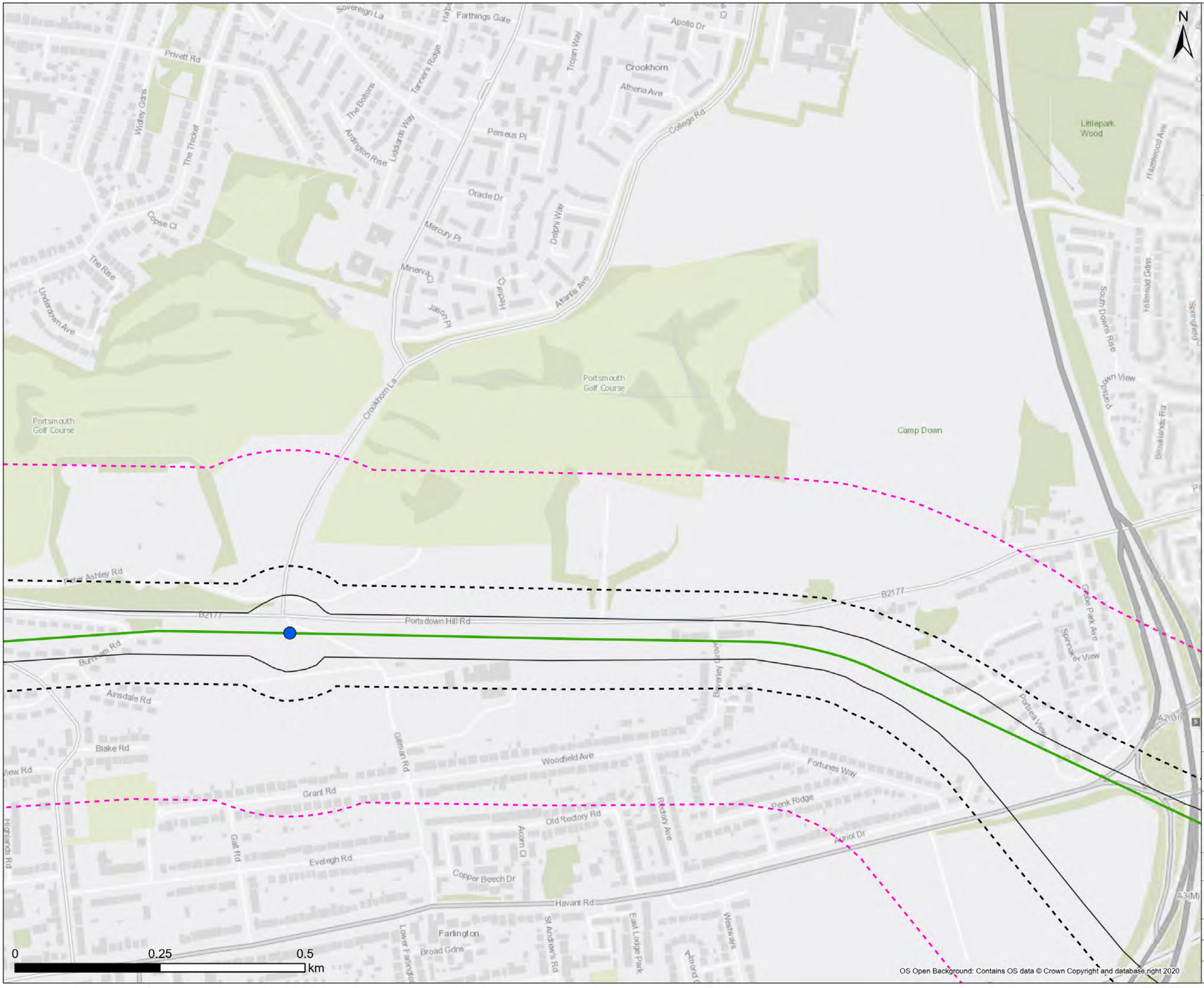

Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Tunnel
- 50m Buffer
- 250m Buffer
- Proposed Shaft Location

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - D

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 6 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00706			A

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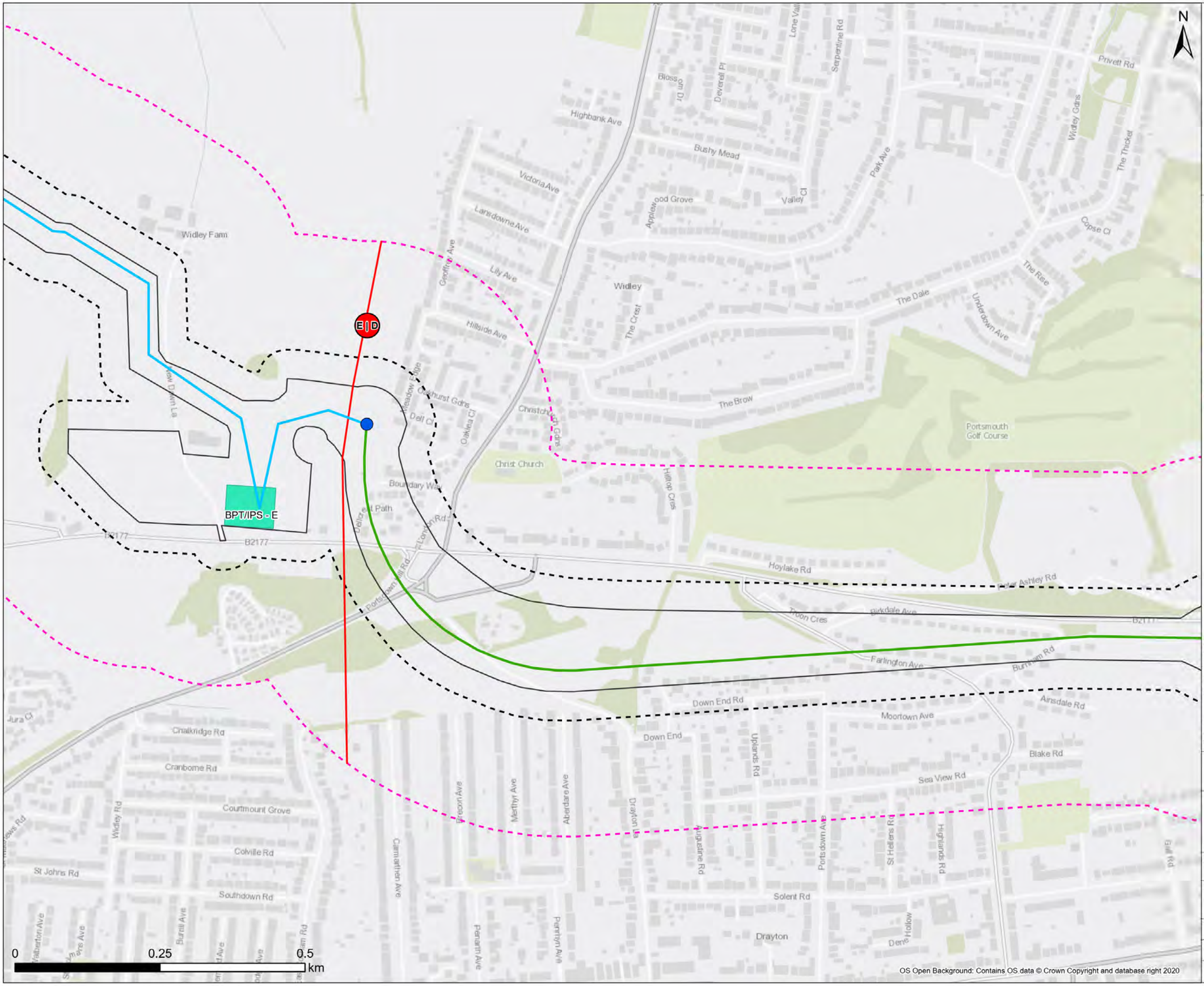

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - D

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 7 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00707			Revision: A

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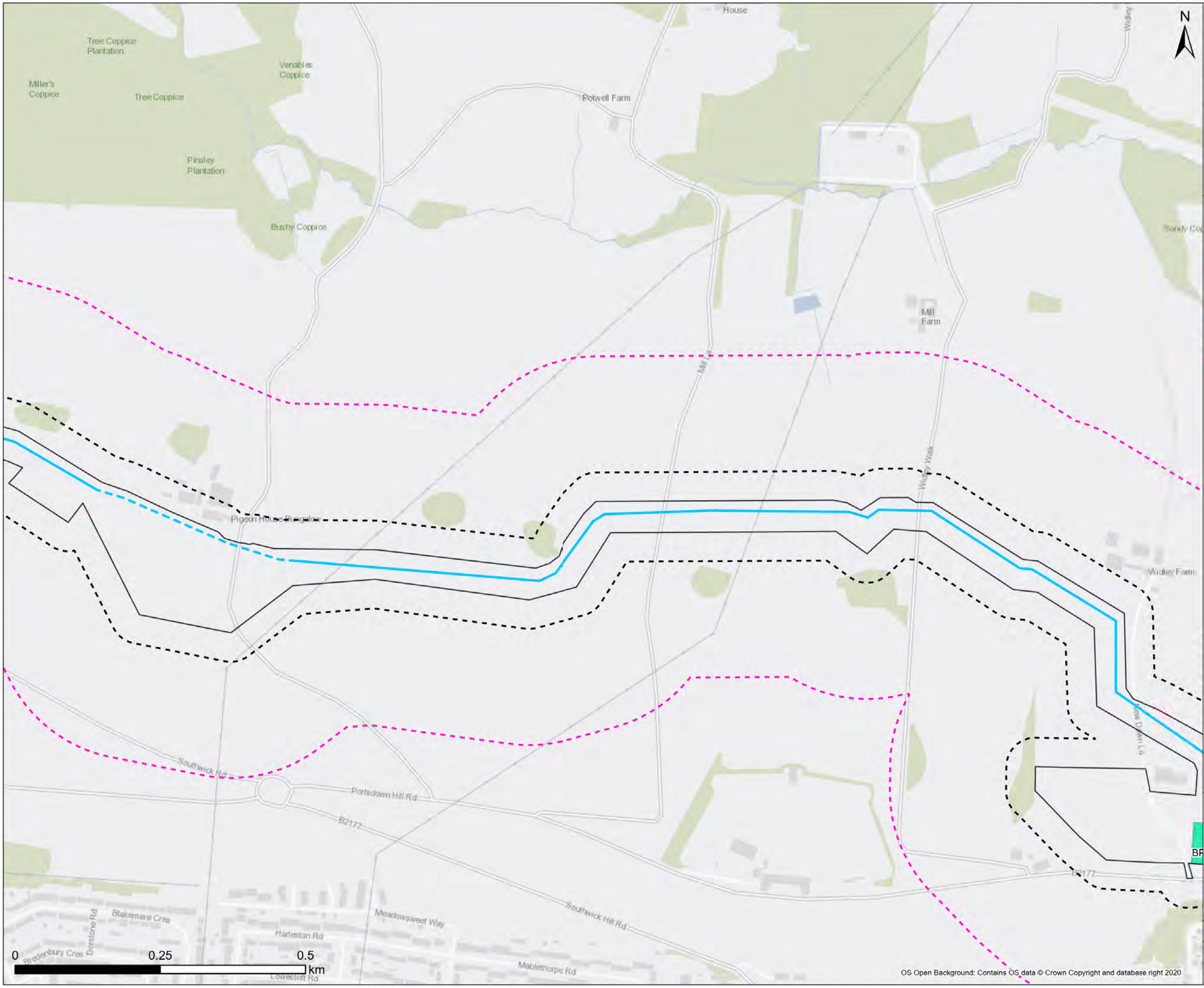



Legend

- Draft Order Limit

Proposed Pipeline Route

- Open Cut
- Open Cut - SUBJECT TO CHANGE
- 50m Buffer
- 250m Buffer

Proposed AGP Microsite Footprint

- BPT/IPS - E

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - E

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 8 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No. 710166-SWS-XX-XX-DR-Z-00708 | Revision A

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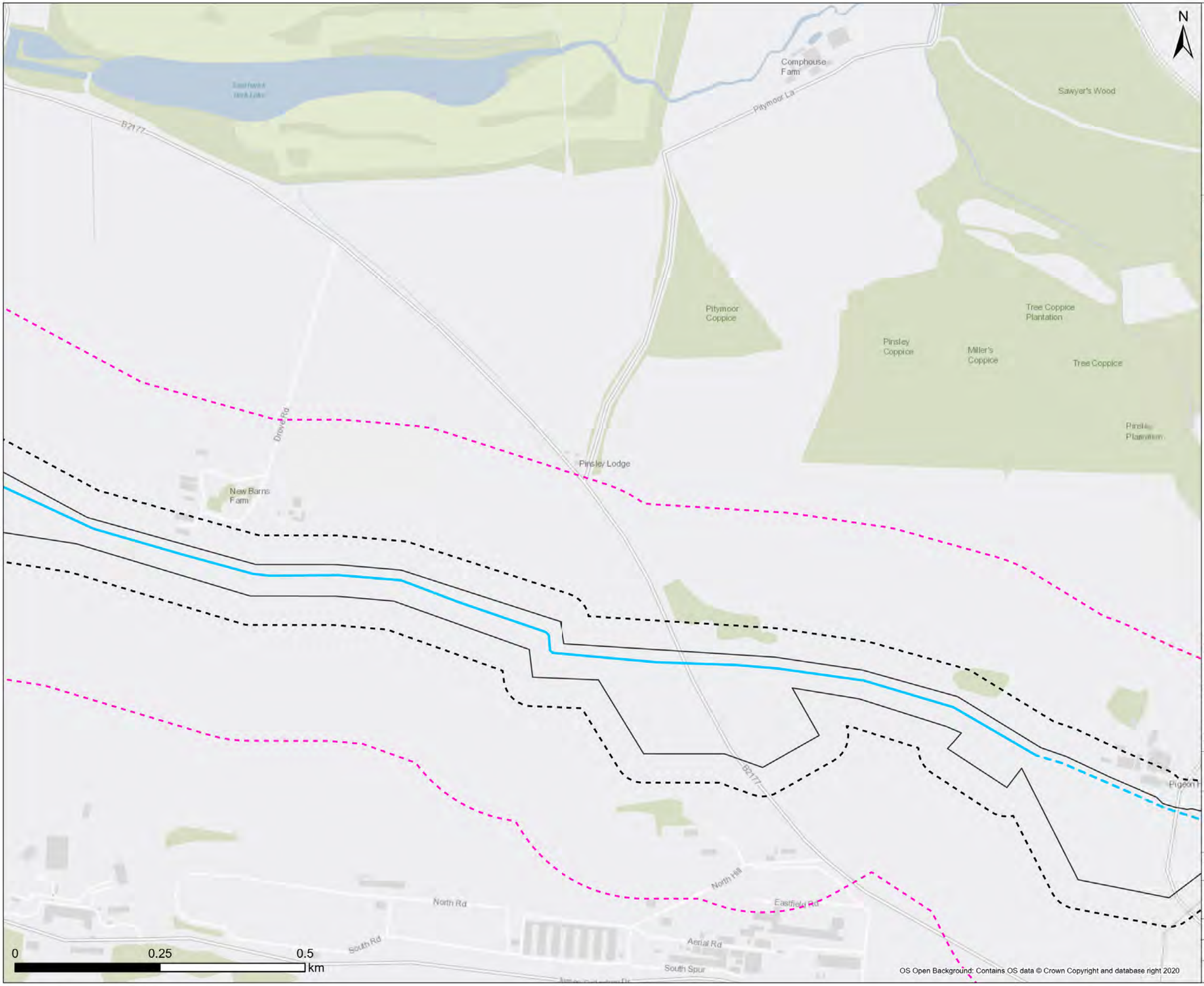

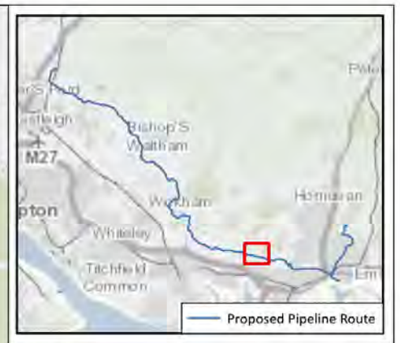

Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Open Cut
- Open Cut - SUBJECT TO CHANGE
- 50m Buffer
- 250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - E

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 9 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00709			Revision: A

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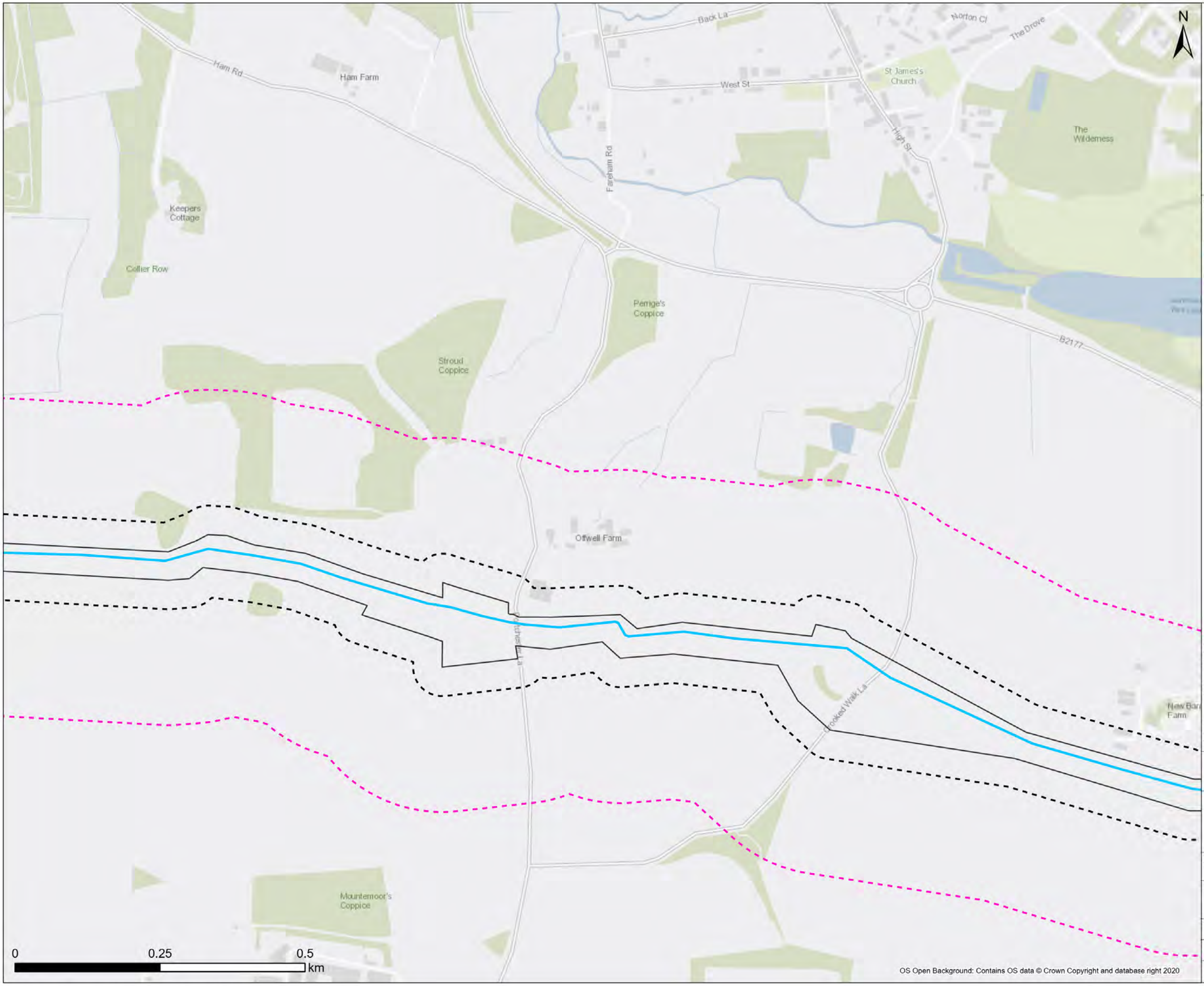



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - 50m Buffer
  - 250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - E

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 10 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00710			Revision: A

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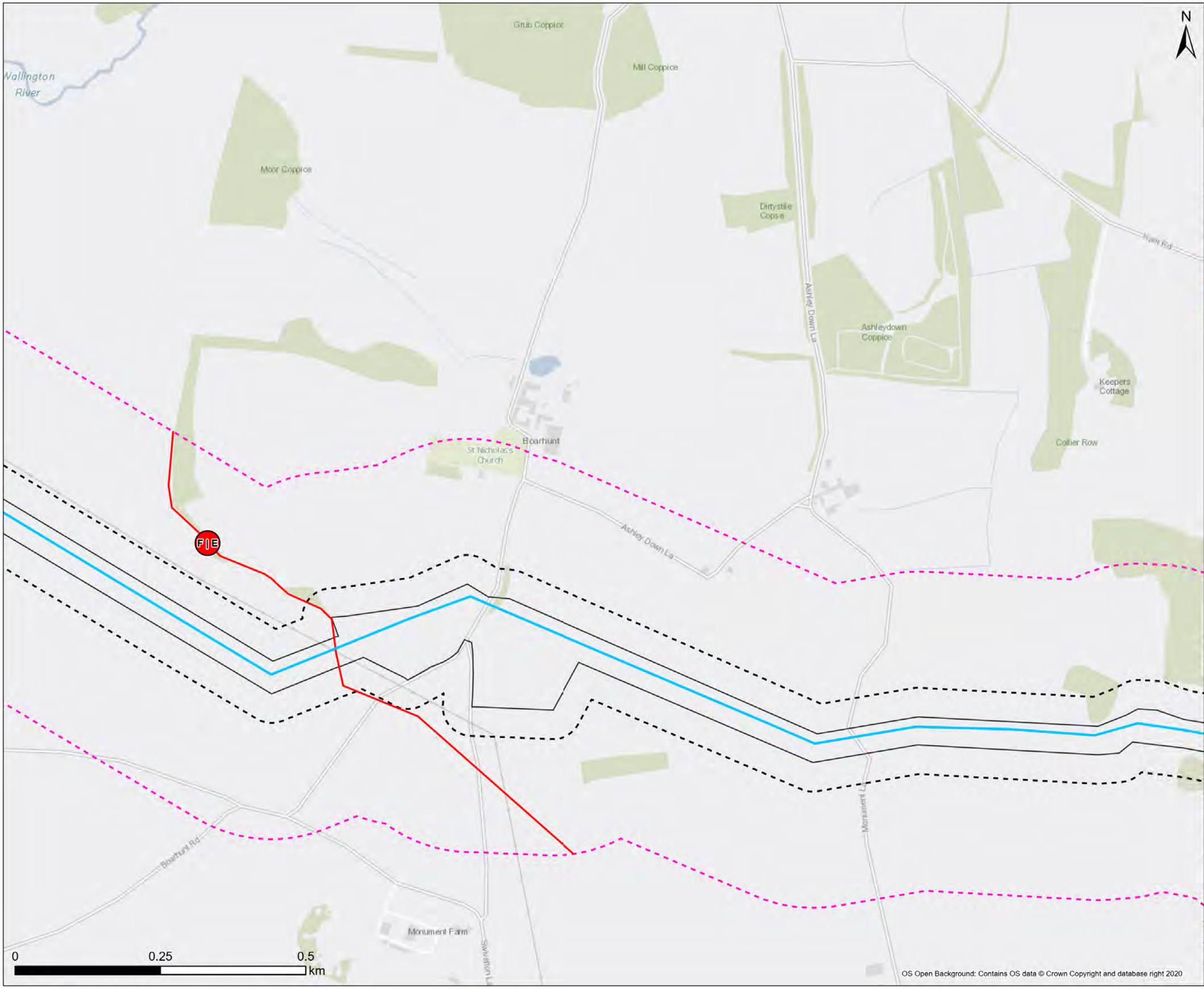



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Open Cut
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - E

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 11 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00711			Revision: A

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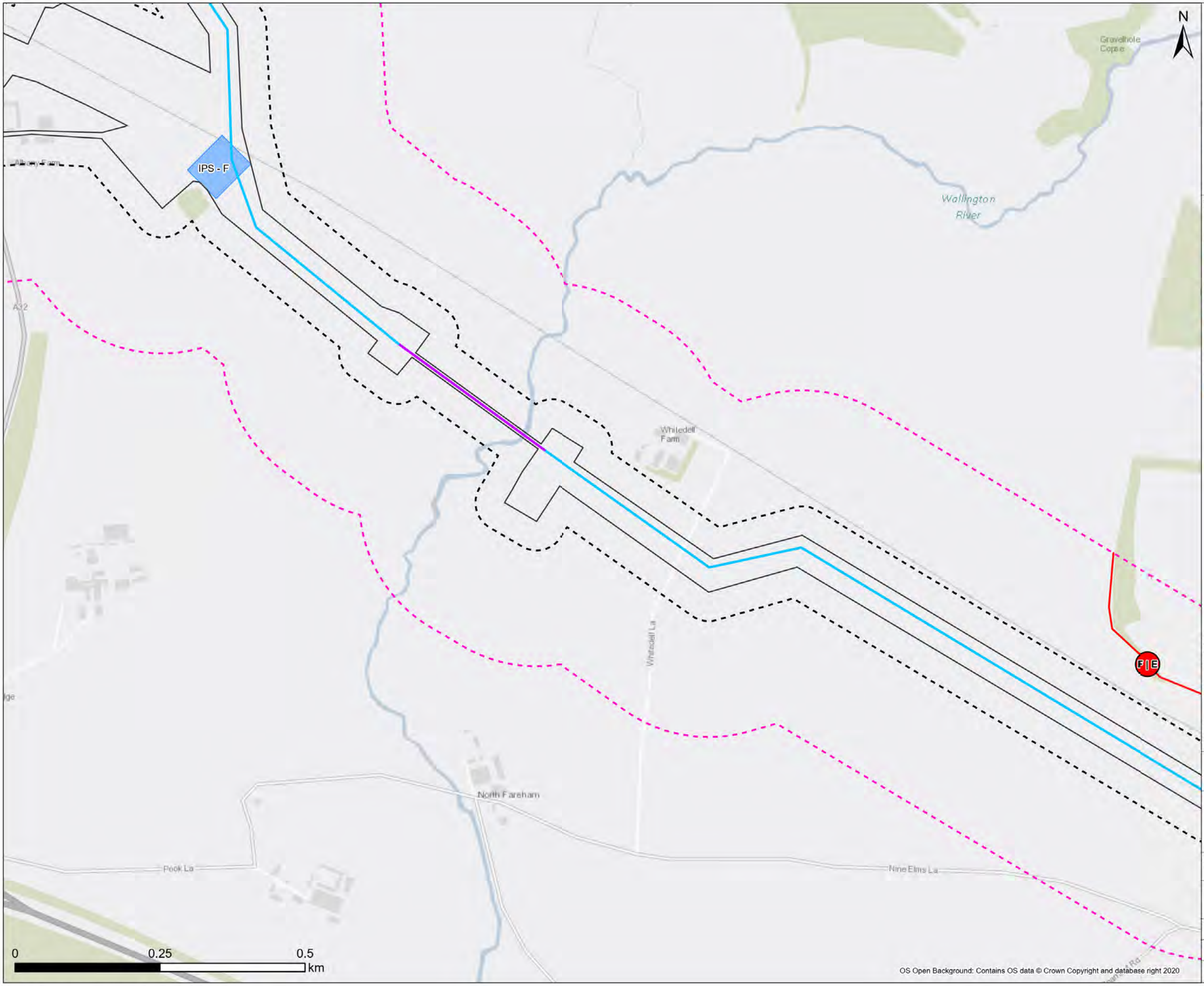



Legend

- Draft Order Limit

Proposed Pipeline Route

- Open Cut
- Trenchless
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Proposed AGP Microsite Footprint

- IPS - F

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 12 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00712	A

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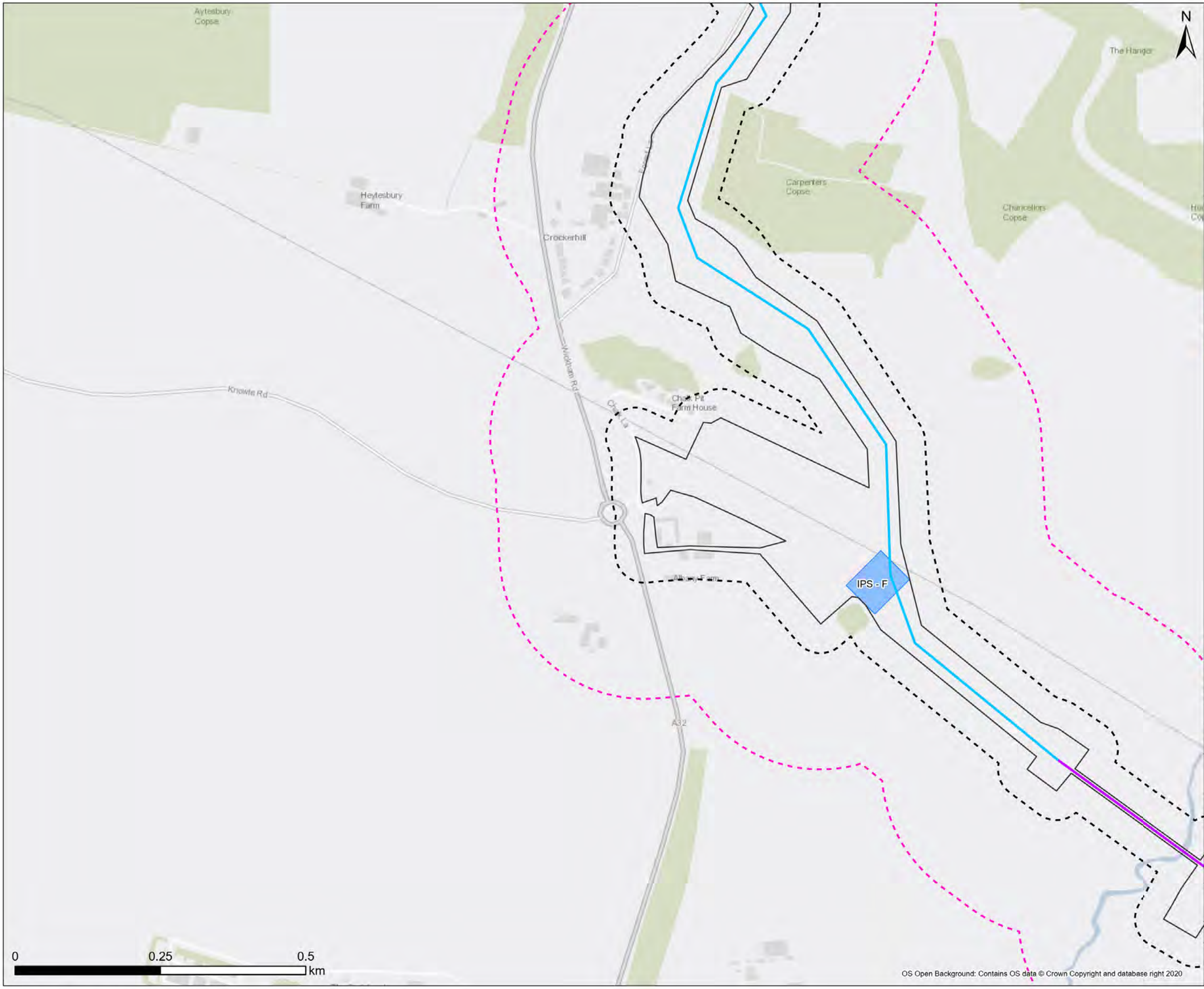



Legend

- Draft Order Limit

Proposed Pipeline Route

- Open Cut
- Trenchless
- 50m Buffer
- 250m Buffer

Proposed AGP Microsite Footprint

- IPS - F

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 13 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00713	A

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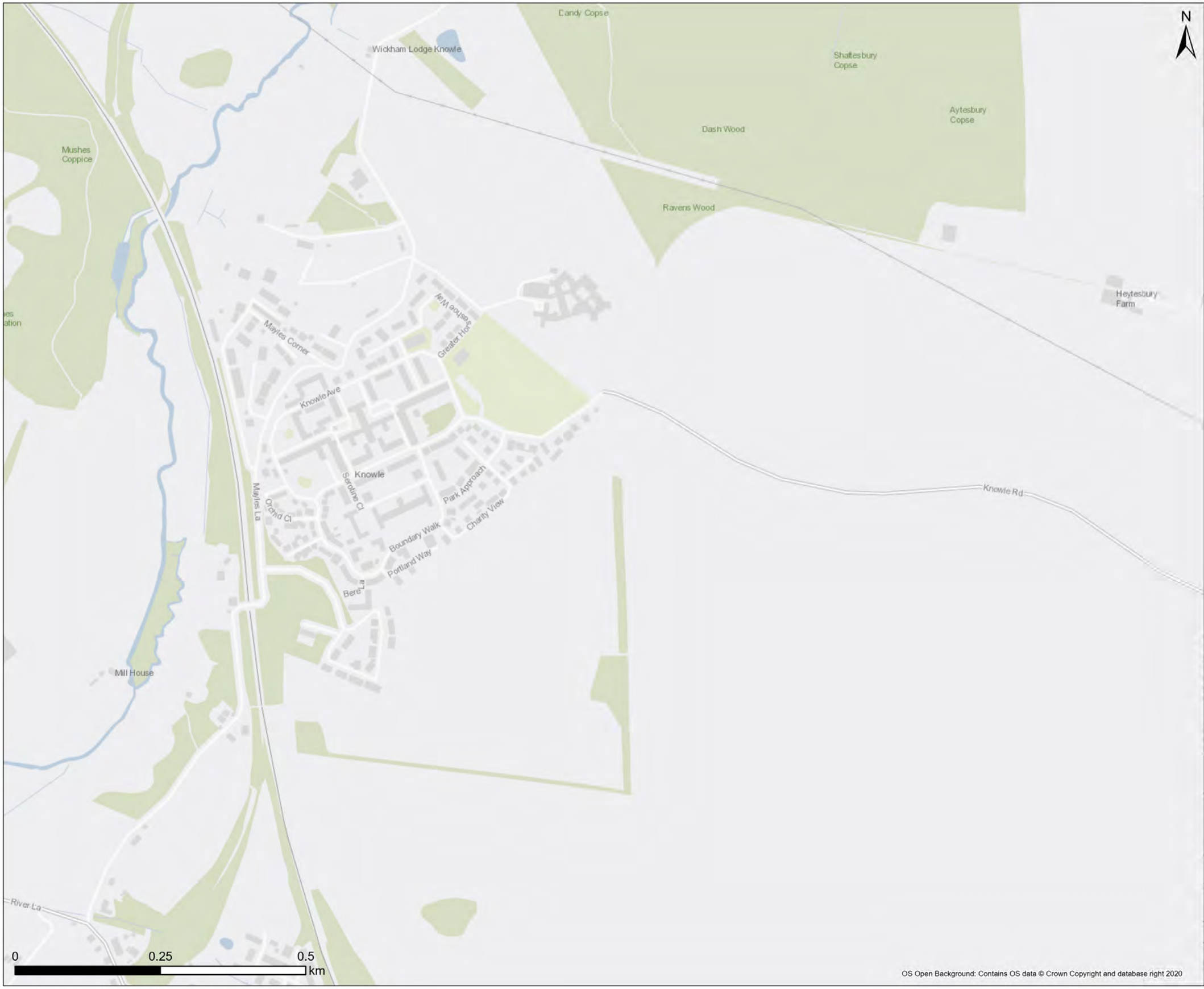



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Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - G

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 14 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00714	A

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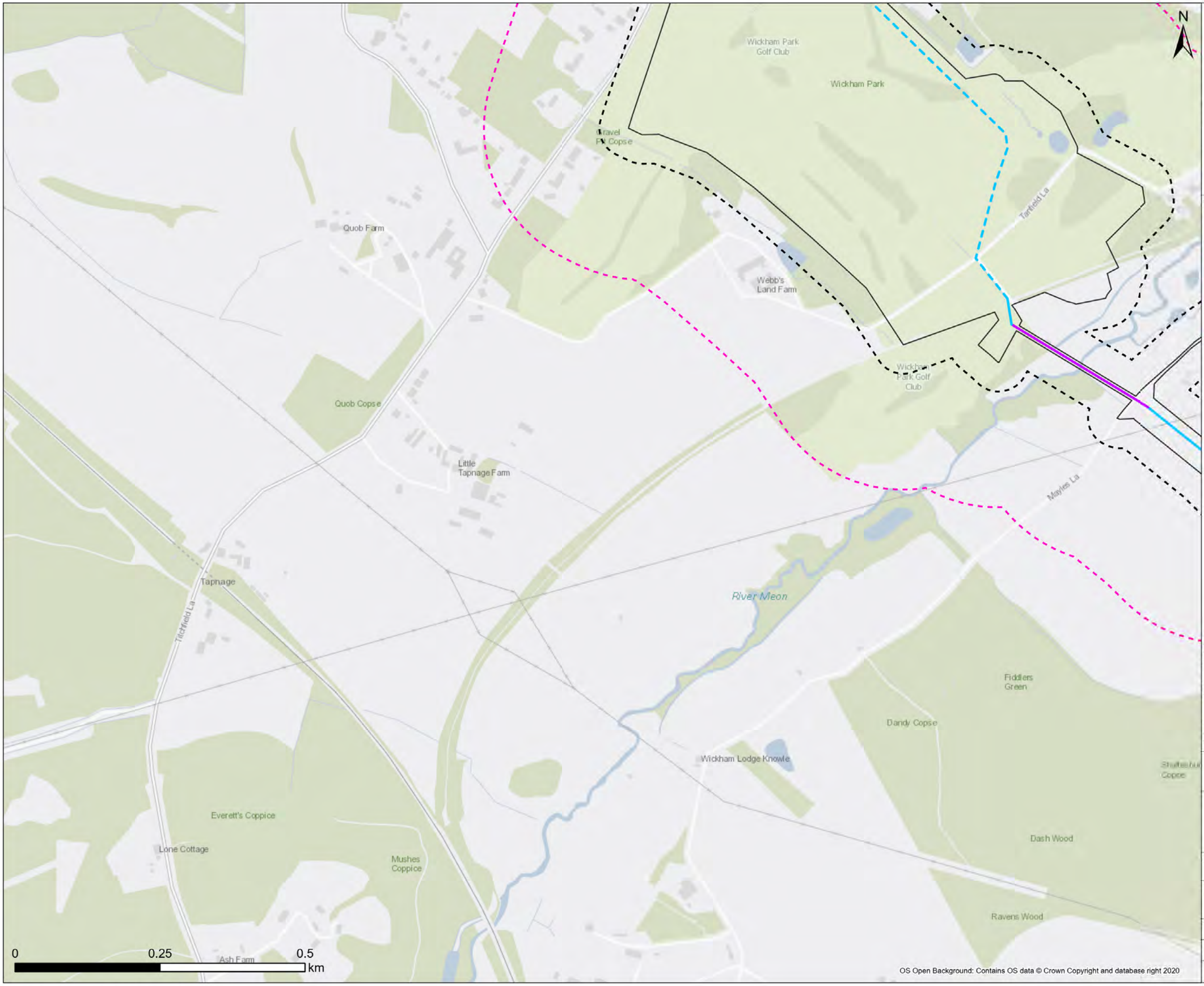

Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - Open Cut - SUBJECT TO CHANGE
  - Trenchless
  - 50m Buffer
  - 250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

Contains Southern Water preliminary data - All site locations and routes shown are preliminary only and subject to further site selection assessment and stakeholder consultation.

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WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - G

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 15 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00715			A

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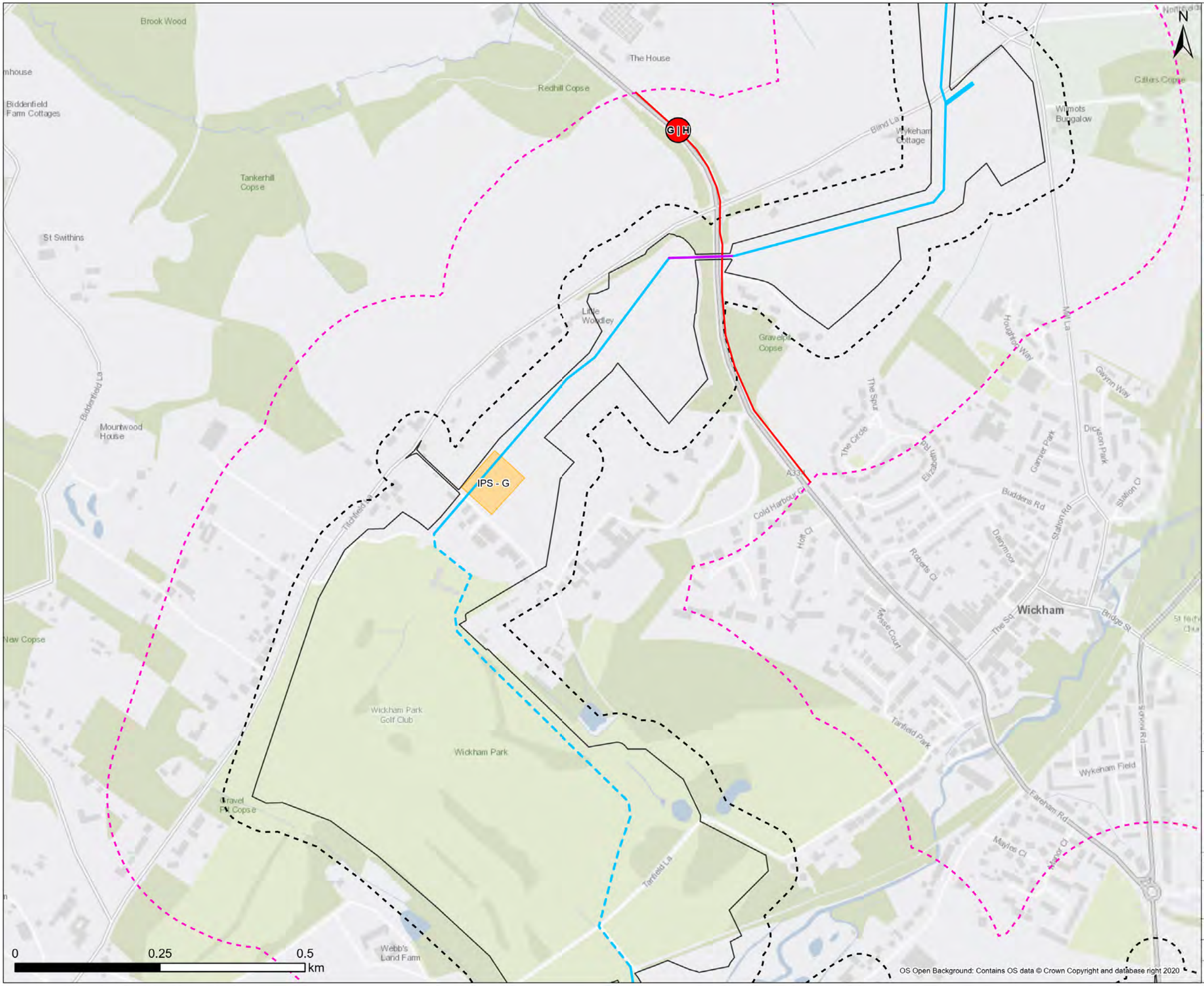

Legend

- Draft Order Limit

Proposed Pipeline Route

- Open Cut
- Open Cut - SUBJECT TO CHANGE
- Trenchless
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Proposed AGP Microsite Footprint

- IPS - G

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - G

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 16 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00716			Revision: A

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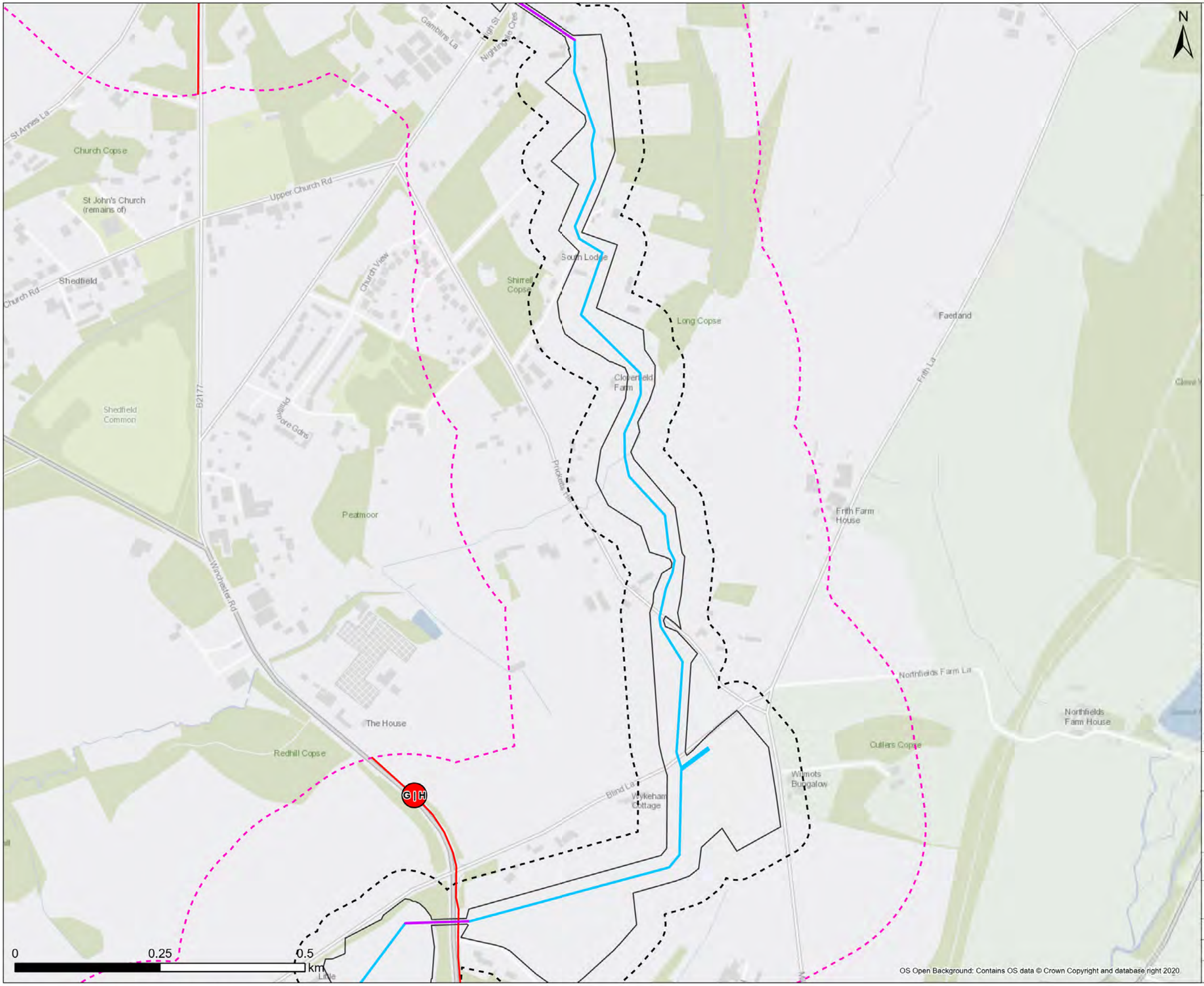



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - Trenchless
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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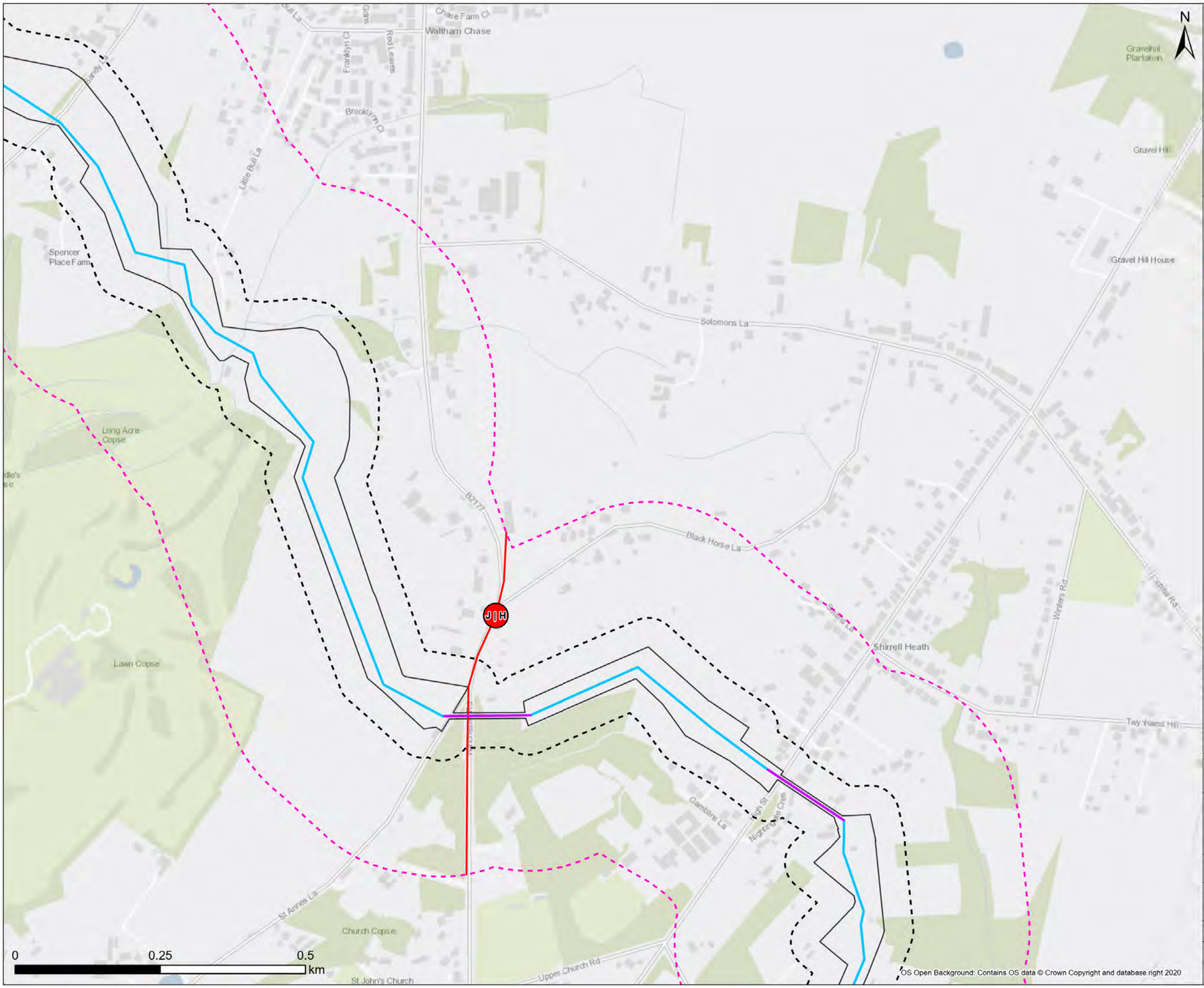
WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - H

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 17 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00717			A

Document Path: C:\Users\lwignall\Documents\ArcGIS\Projects\Geo_Projects\Geo_MapSeries\Geo_MapSeries.aprx





Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - Trenchless
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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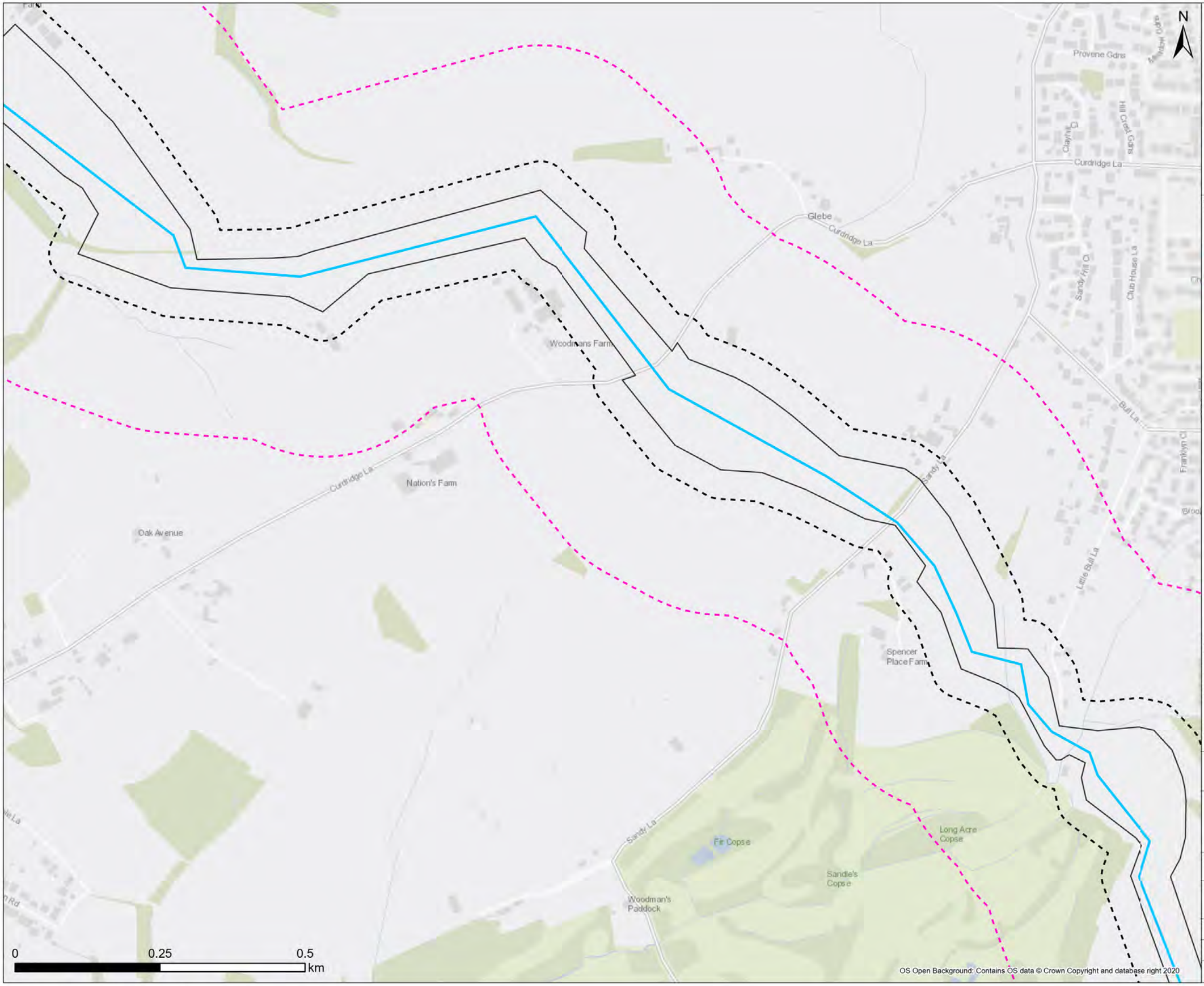
Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - H

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 18 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00718			Revision: A

Document Path: C:\Users\lwignall\Documents\ArcGIS\Projects\Geo_Projects\Geo_MapSeries\Geo_MapSeries.aprx





Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Open Cut
- 50m Buffer
- 250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - J

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 19 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00719	A

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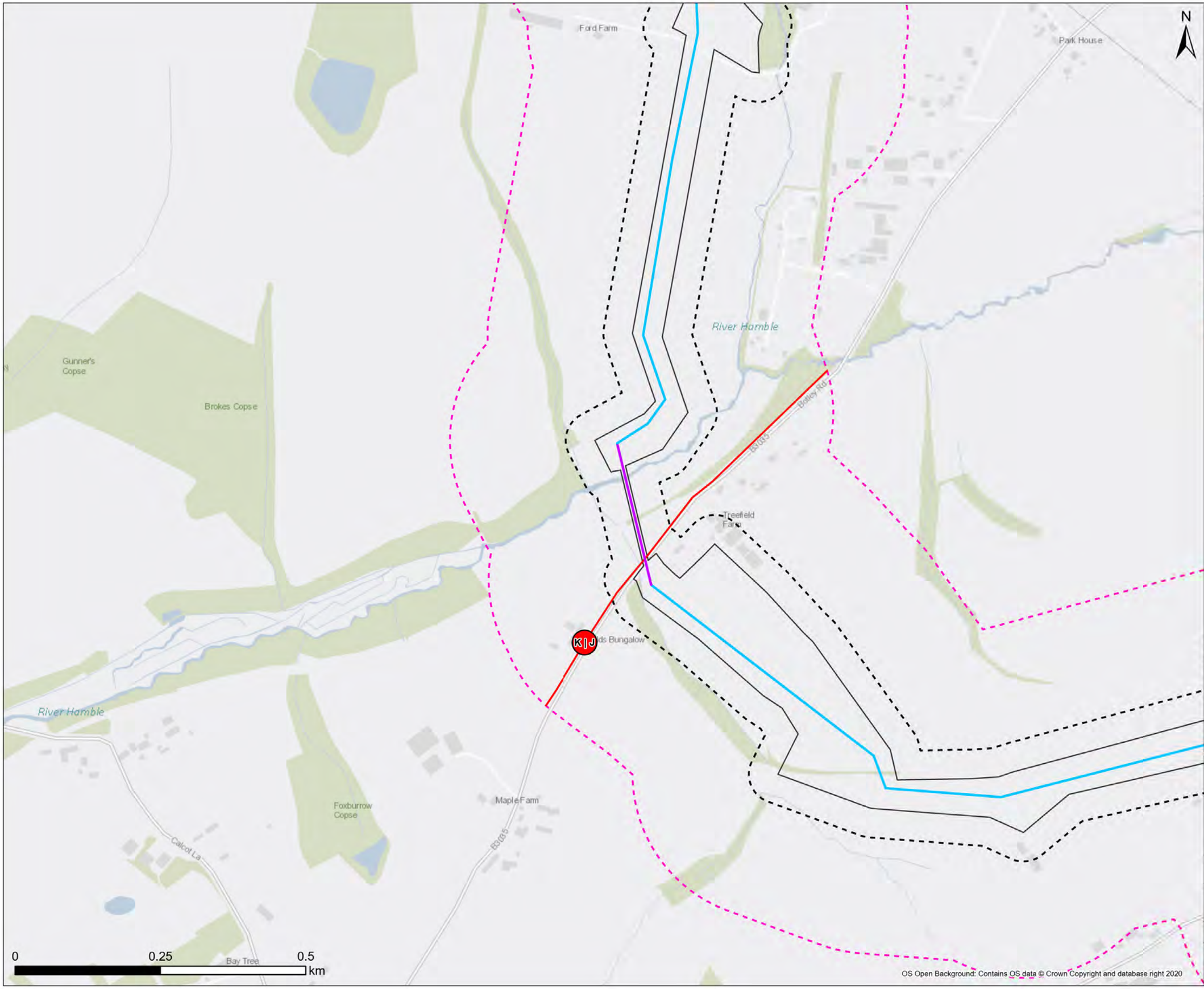



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Open Cut
- Trenchless
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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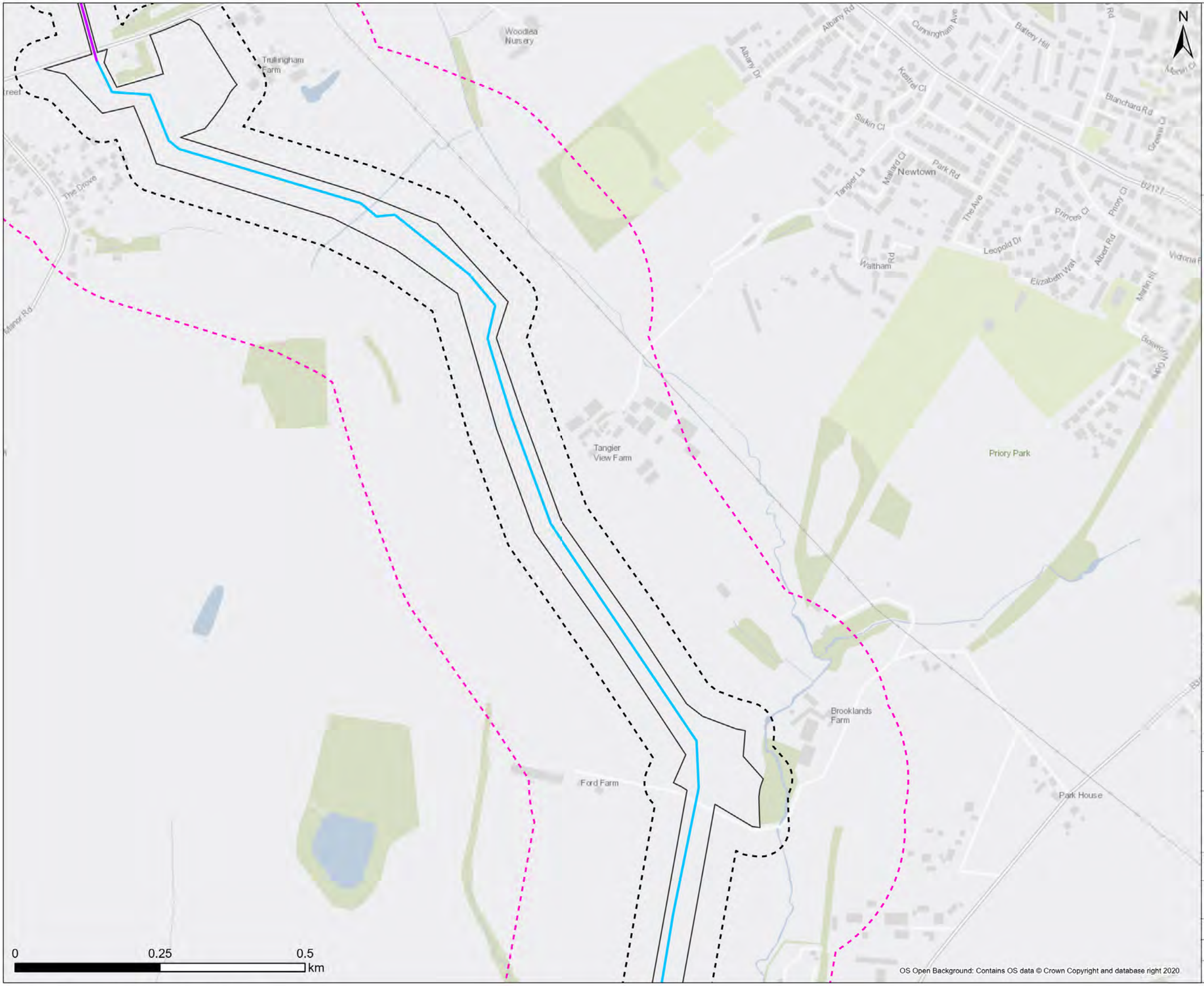
Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - J

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 20 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00720			Revision: A

Document Path: C:\Users\lwignall\Documents\ArcGIS\Projects\Geo_Projects\Geo_MapSeries\Geo_MapSeries.aprx





Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - Trenchless
- 50m Buffer
- 250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - K

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 21 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No. 710166-SWS-XX-XX-DR-Z-00721			Revision A

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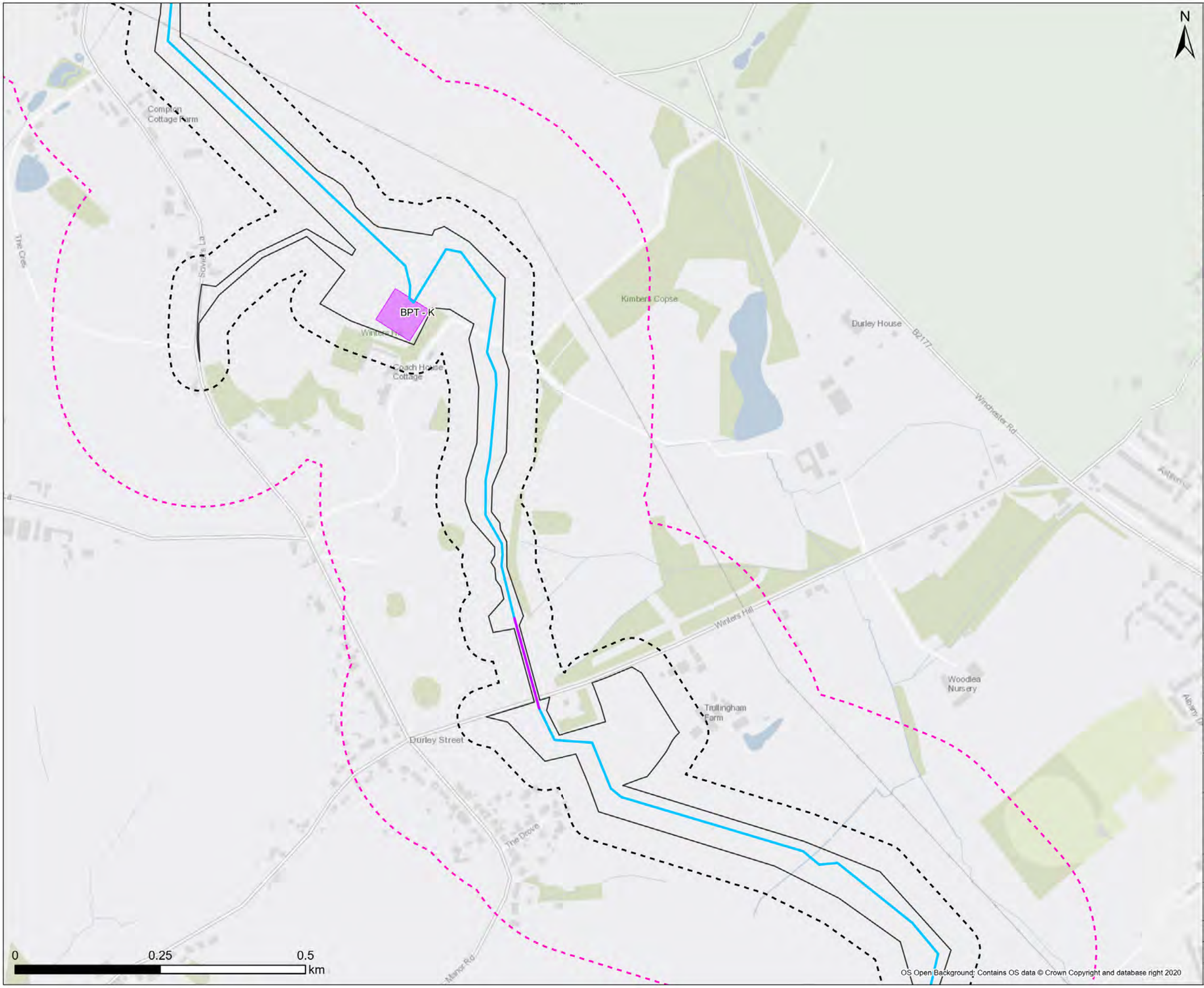



Legend

- Draft Order Limit

Proposed Pipeline Route

- Open Cut
- Trenchless
- 50m Buffer
- 250m Buffer

Proposed AGP Microsite Footprint

- BPT - K

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - K

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 22 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No. 710166-SWS-XX-XX-DR-Z-00722			Revision A

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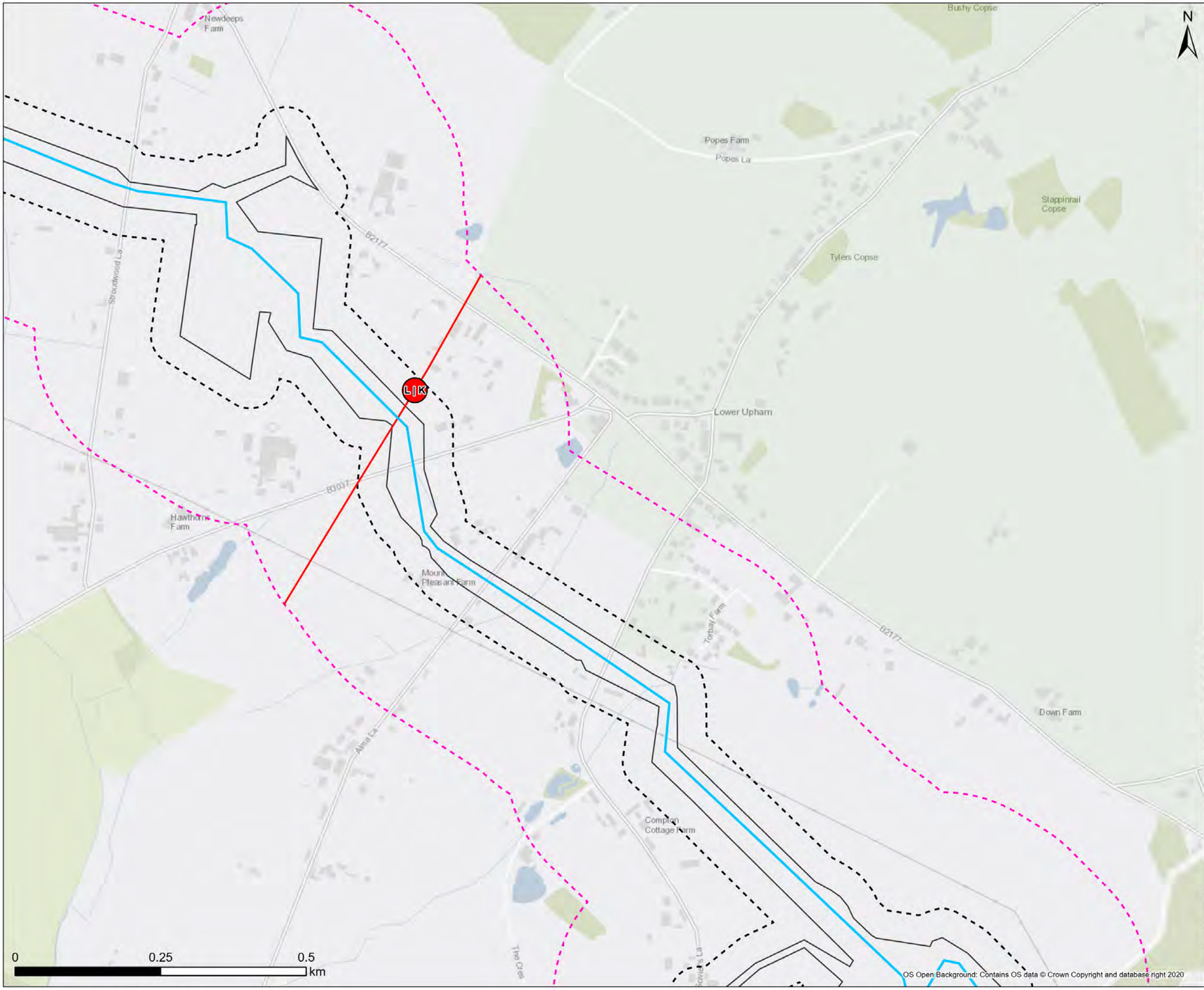

Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - 50m Buffer
  - 250m Buffer
  - Section Break
  - Pipeline Section Break

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Drawing Title
Figure 1.1 Location of Pipeline Sections - K

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 23 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00723	A

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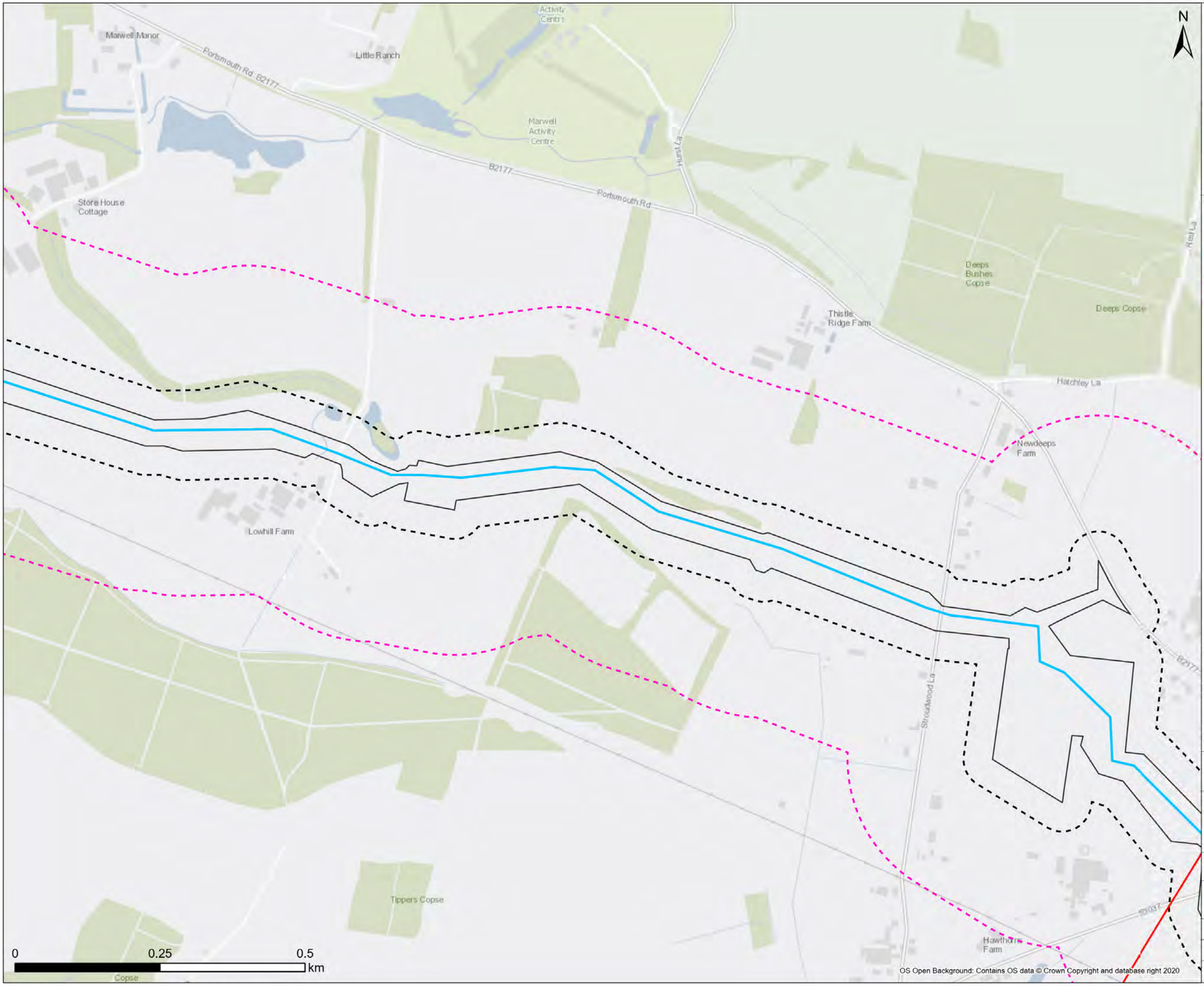

Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - 50m Buffer
  - 250m Buffer
  - Pipeline Section Break

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - L

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 24 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00724			Revision: A

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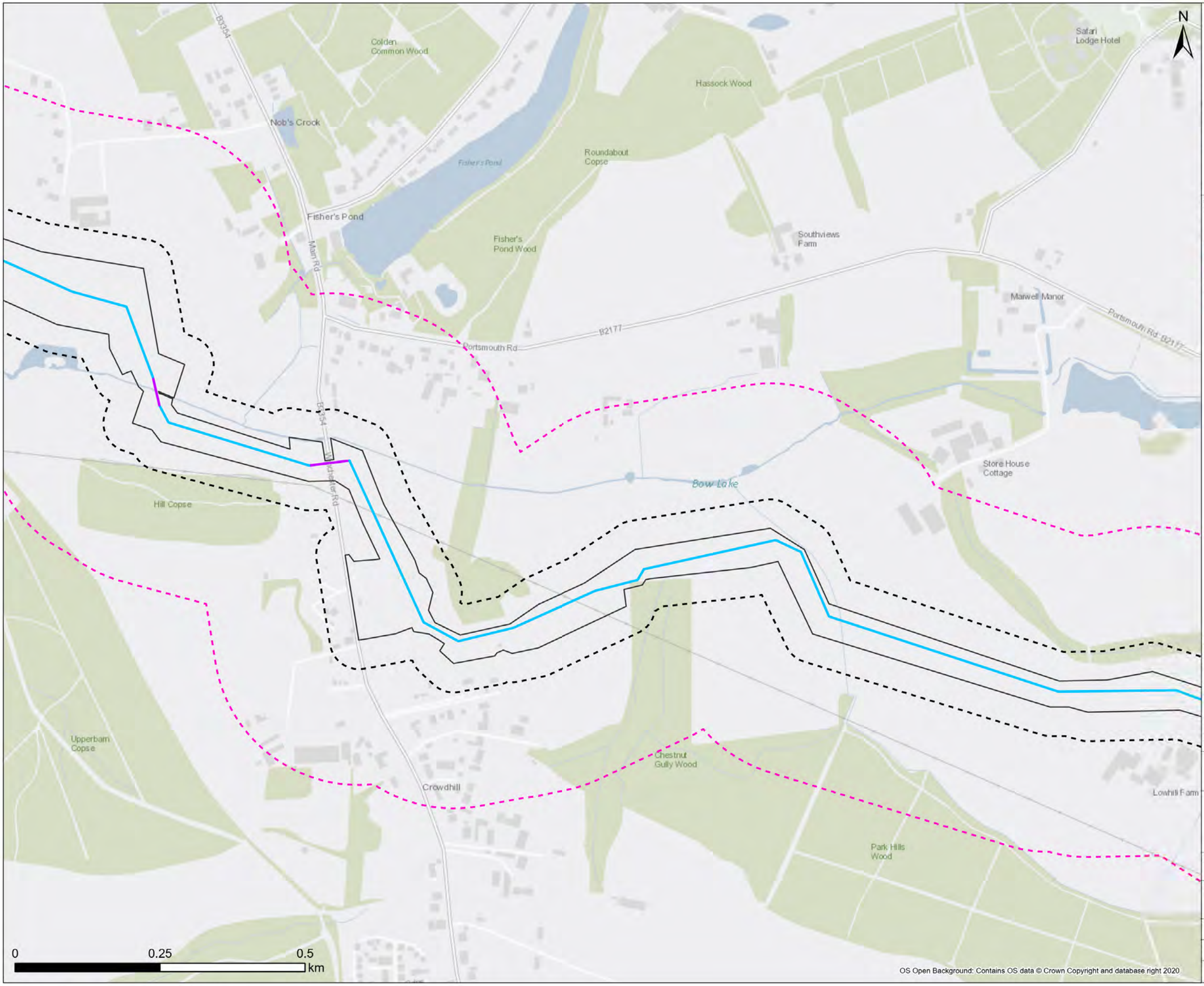



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - Trenchless
- 50m Buffer
- 250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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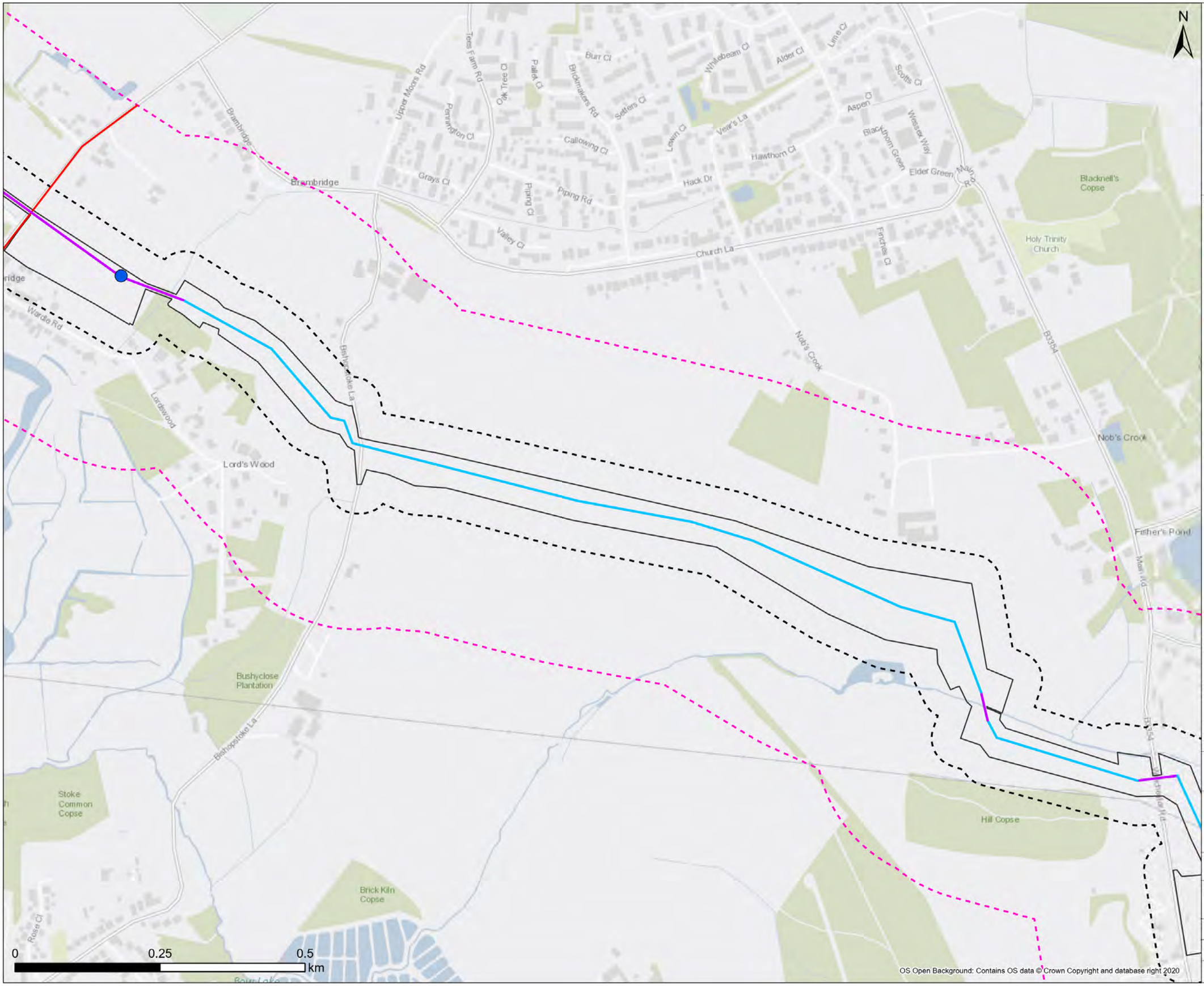
Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - L

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 25 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00725			A

Document Path: C:\Users\lwignall\Documents\ArcGIS\Projects\Geo_Projects\Geo_MapSeries\Geo_MapSeries.aprx



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - Trenchless
- 50m Buffer
- 250m Buffer
- Pipeline Section Break
- Proposed Shaft Location

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - L

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 26 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No. 710166-SWS-XX-XX-DR-Z-00726			Revision A

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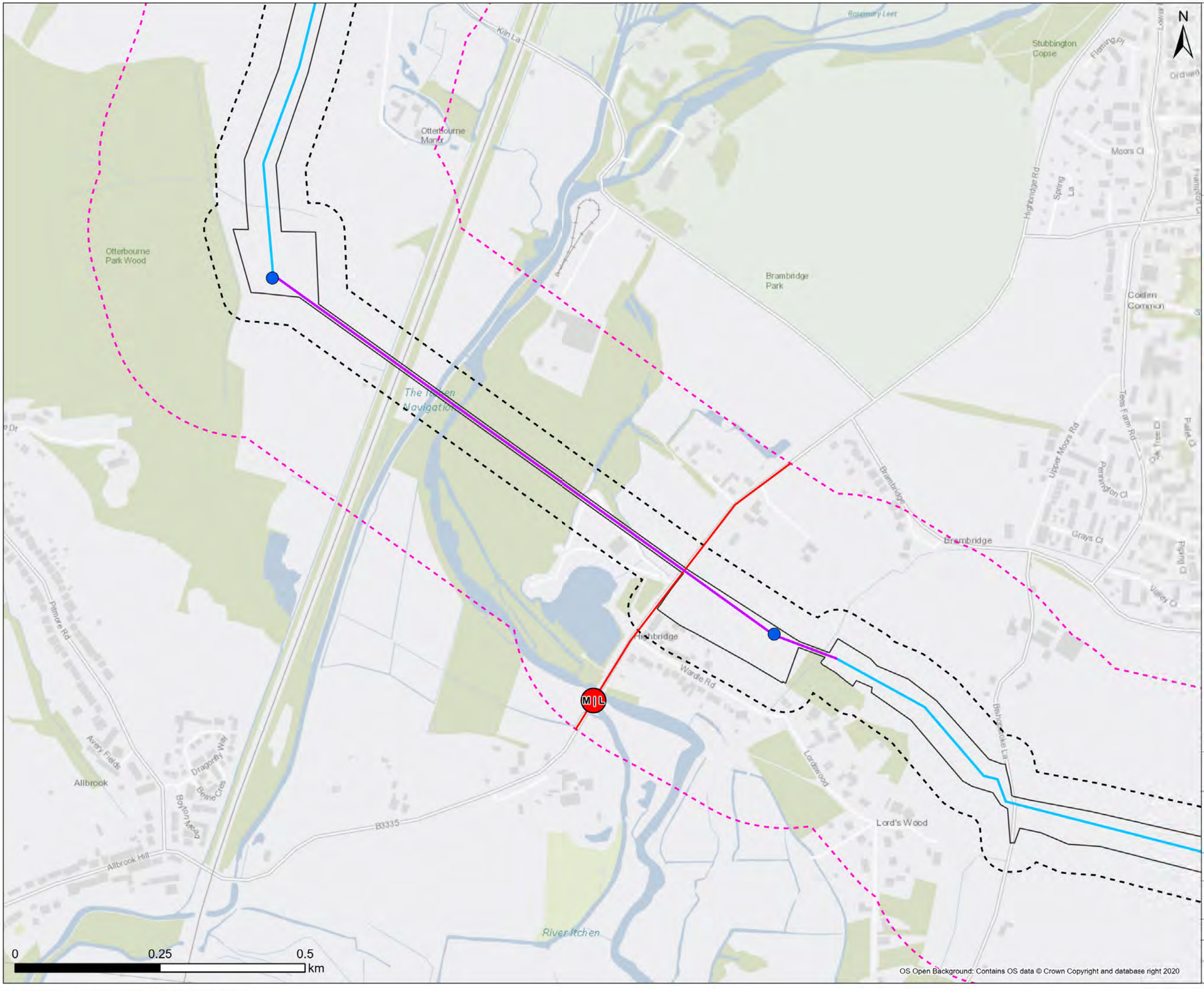

Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - Trenchless
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break
- Proposed Shaft Location

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - M

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 27 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00727			Revision: A

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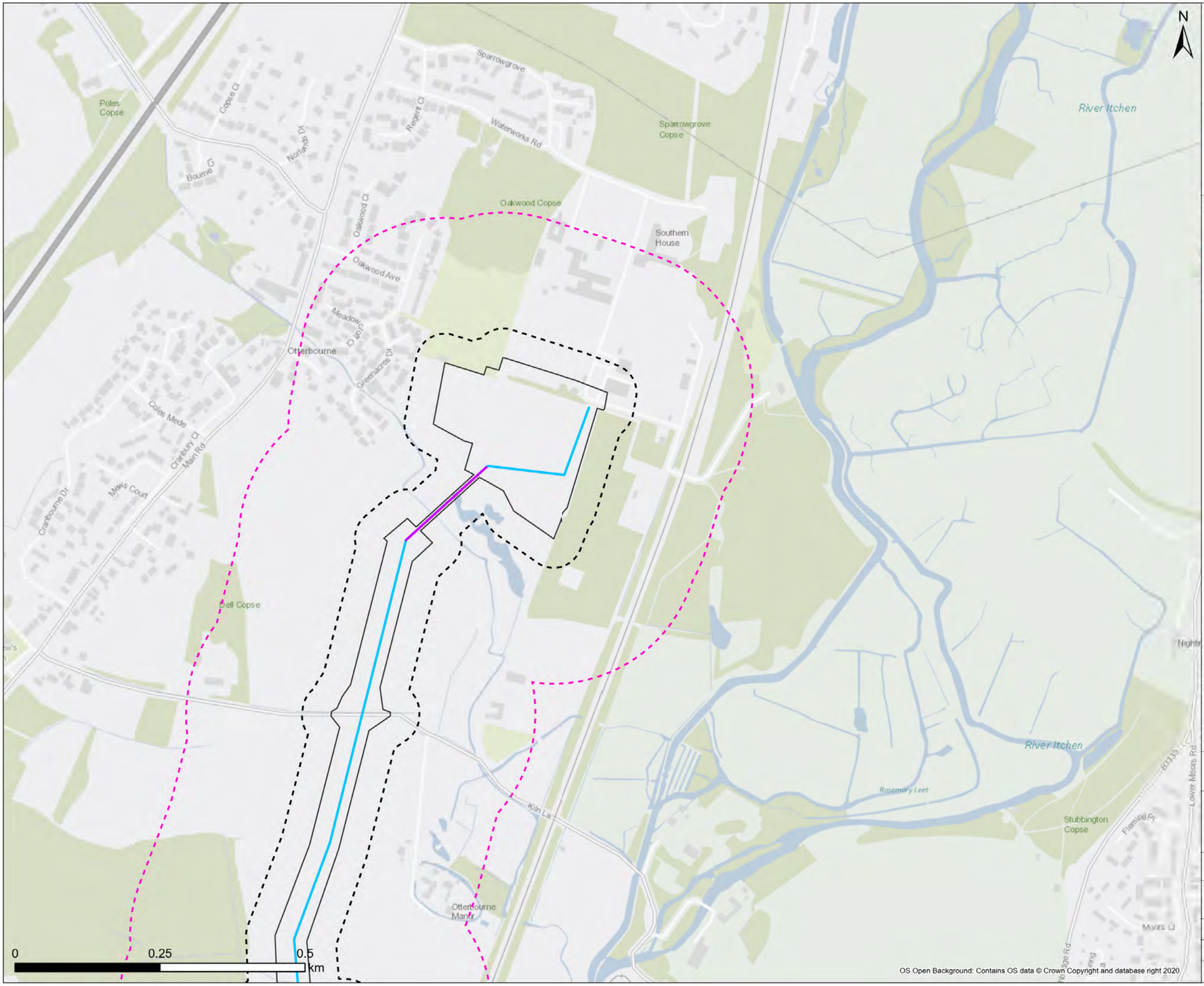



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
  - Open Cut
  - Trenchless
- 50m Buffer
- 250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - M

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 28 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00728			A

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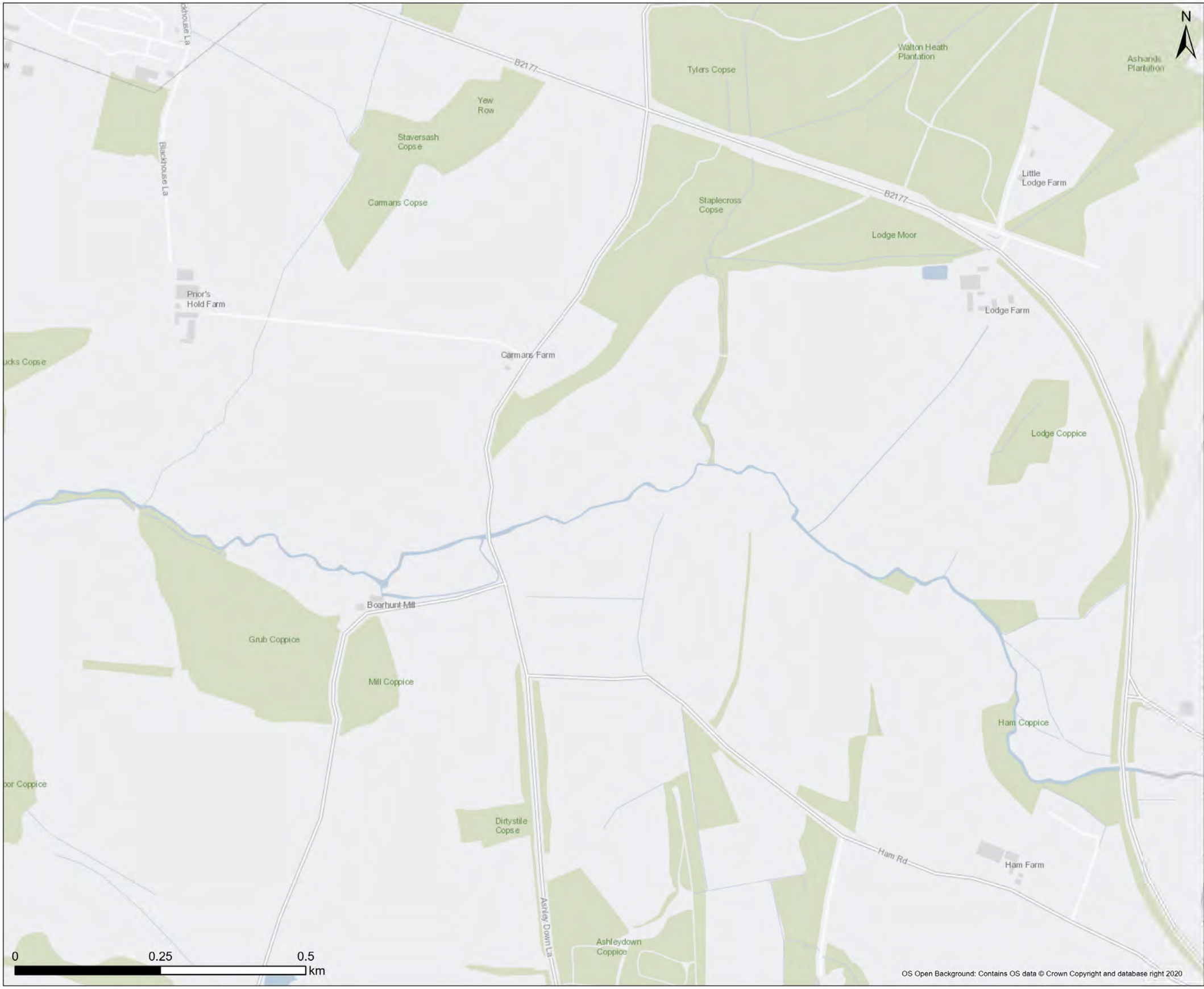

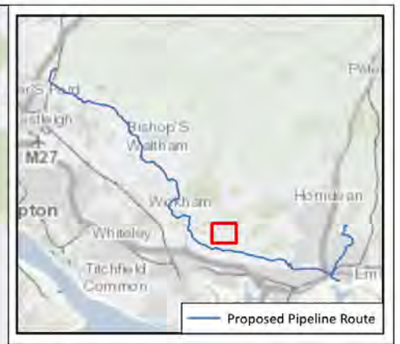

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Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER forLIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 1.1 Location of Pipeline Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 29 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00729			A

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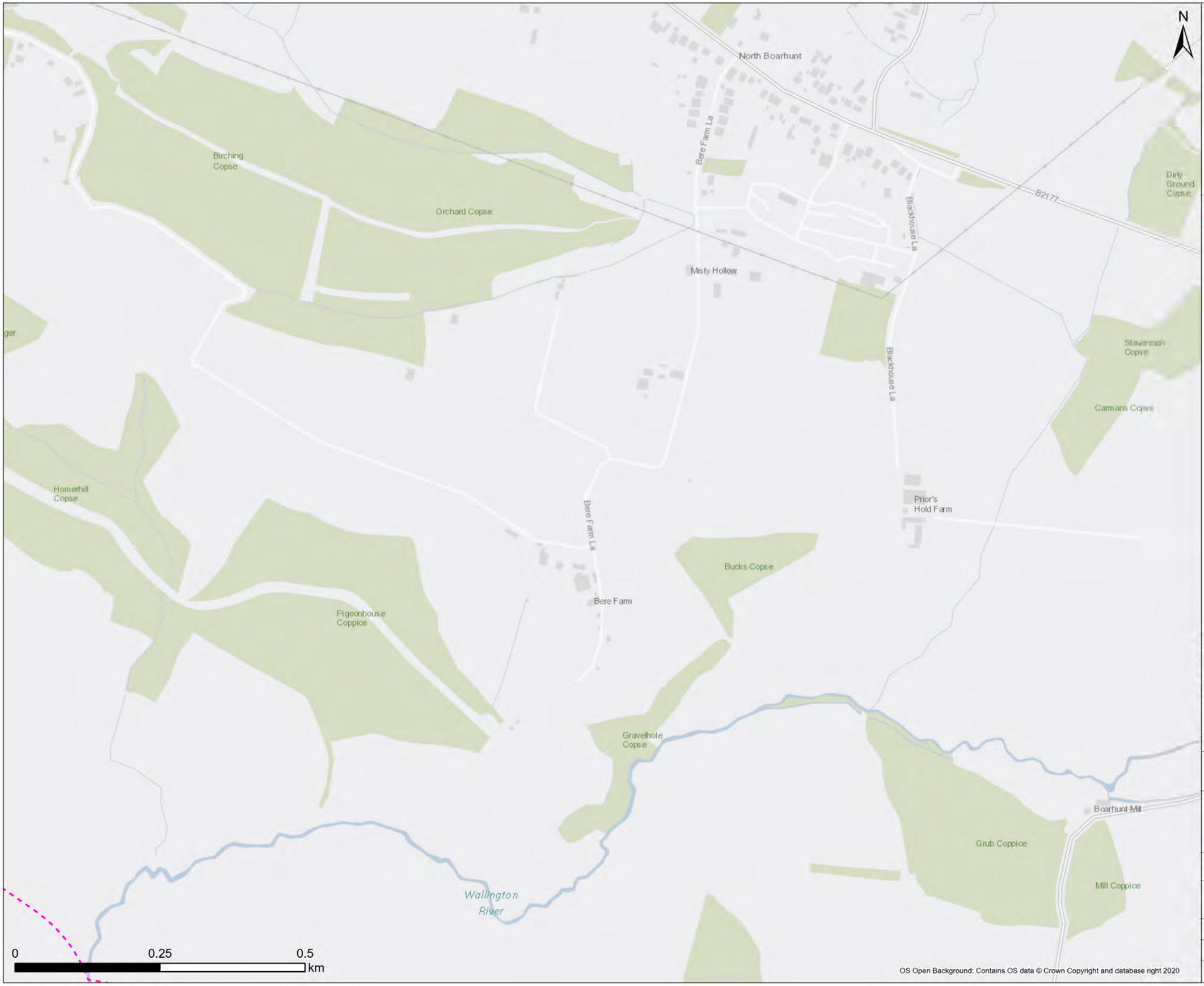



Legend

250m Buffer

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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Drawing Title
Figure 1.1 Location of Pipeline Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 30 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00730			A

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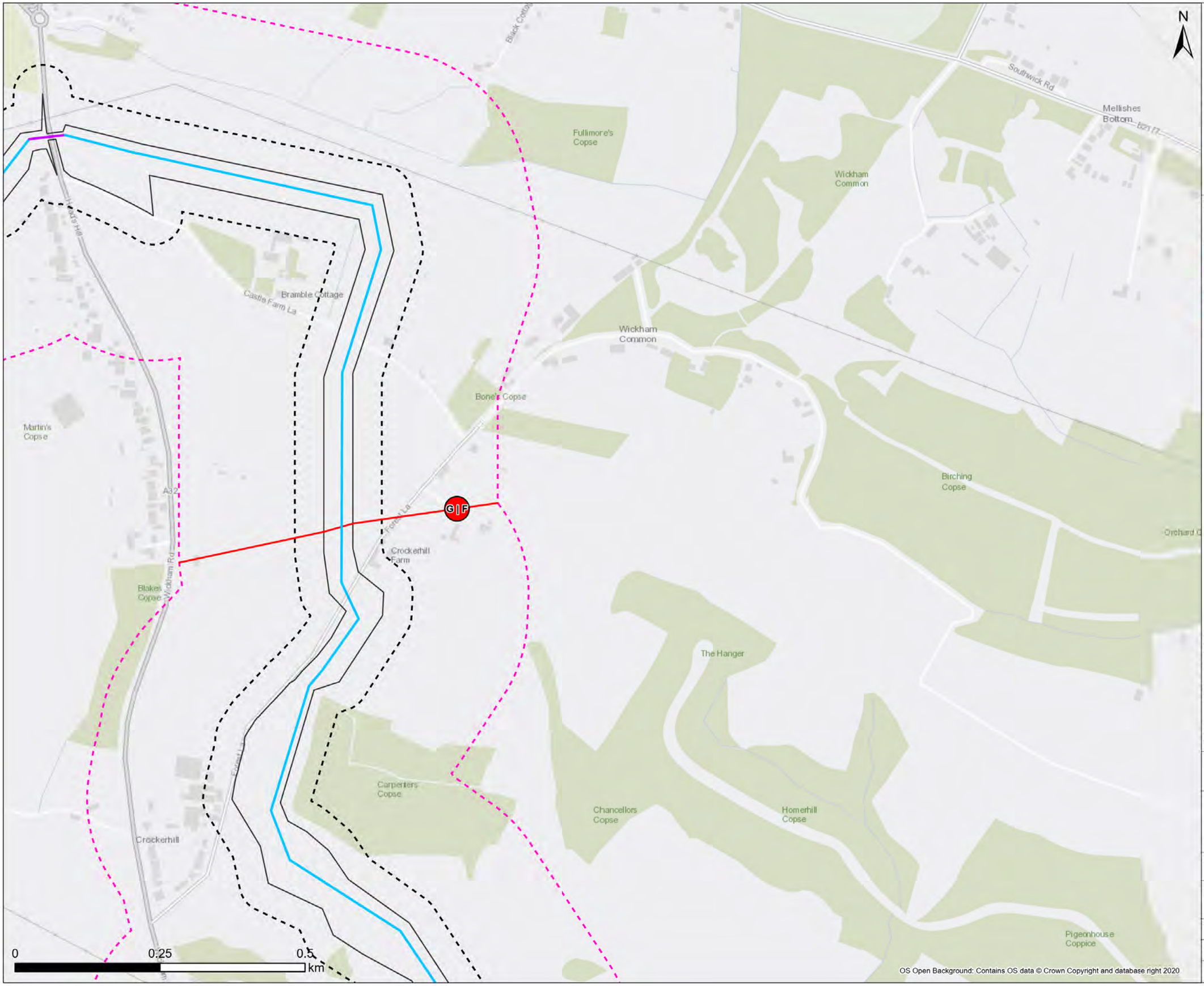



Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Open Cut
- Trenchless
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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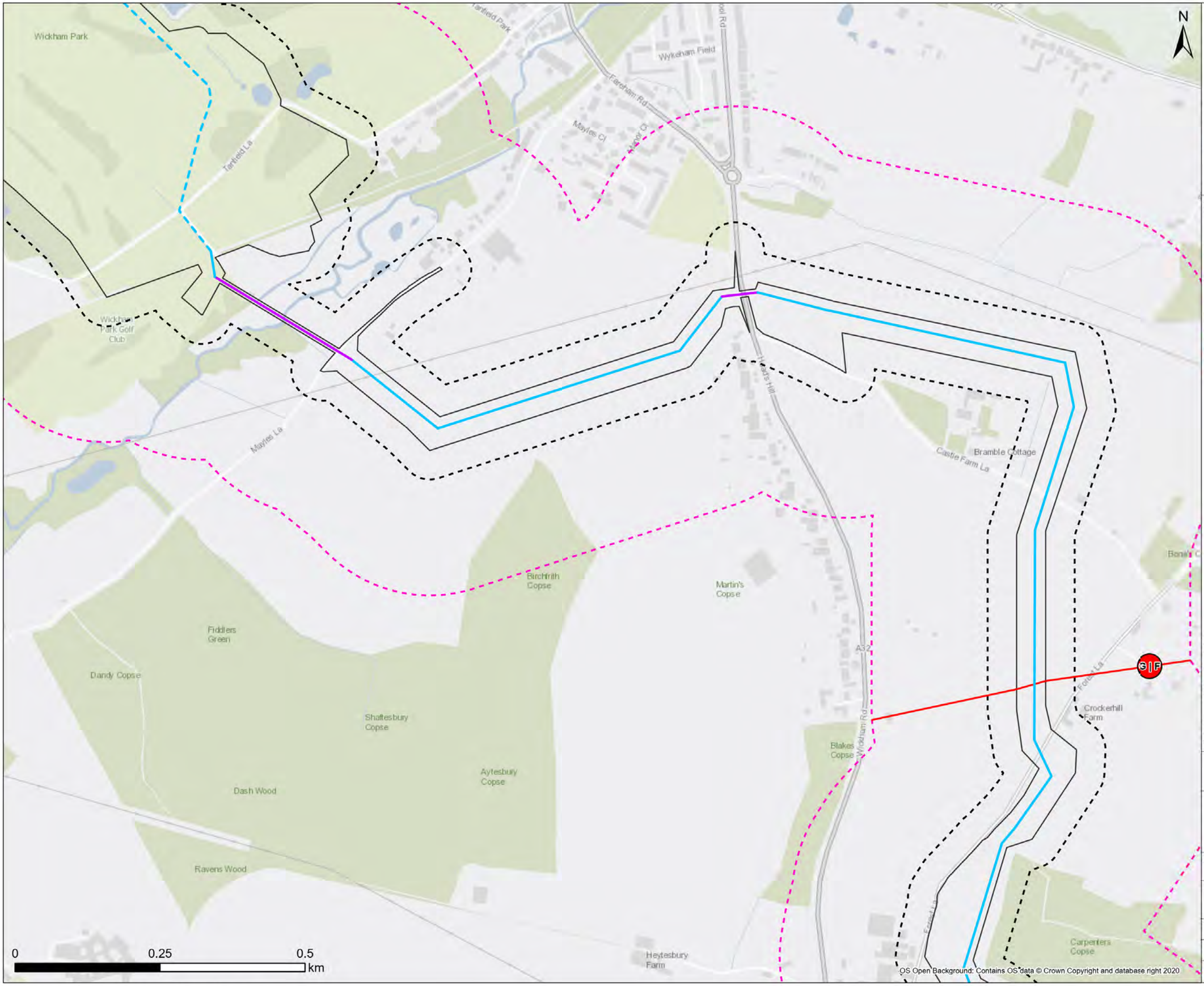
WATER for LIFE from Southern Water

Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 31 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00731			Revision: A

Document Path: C:\Users\lwignall\Documents\ArcGIS\Projects\Geo_Projects\Geo_MapSeries\Geo_MapSeries.aprx





Legend

- Draft Order Limit
- **Proposed Pipeline Route**
- Open Cut
- Open Cut - SUBJECT TO CHANGE
- Trenchless
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water.

Project Title: Water For Life Hampshire

Drawing Title: Figure 1.1 Location of Pipeline Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	27/08/2024	Sheet 32 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00732			Revision: A

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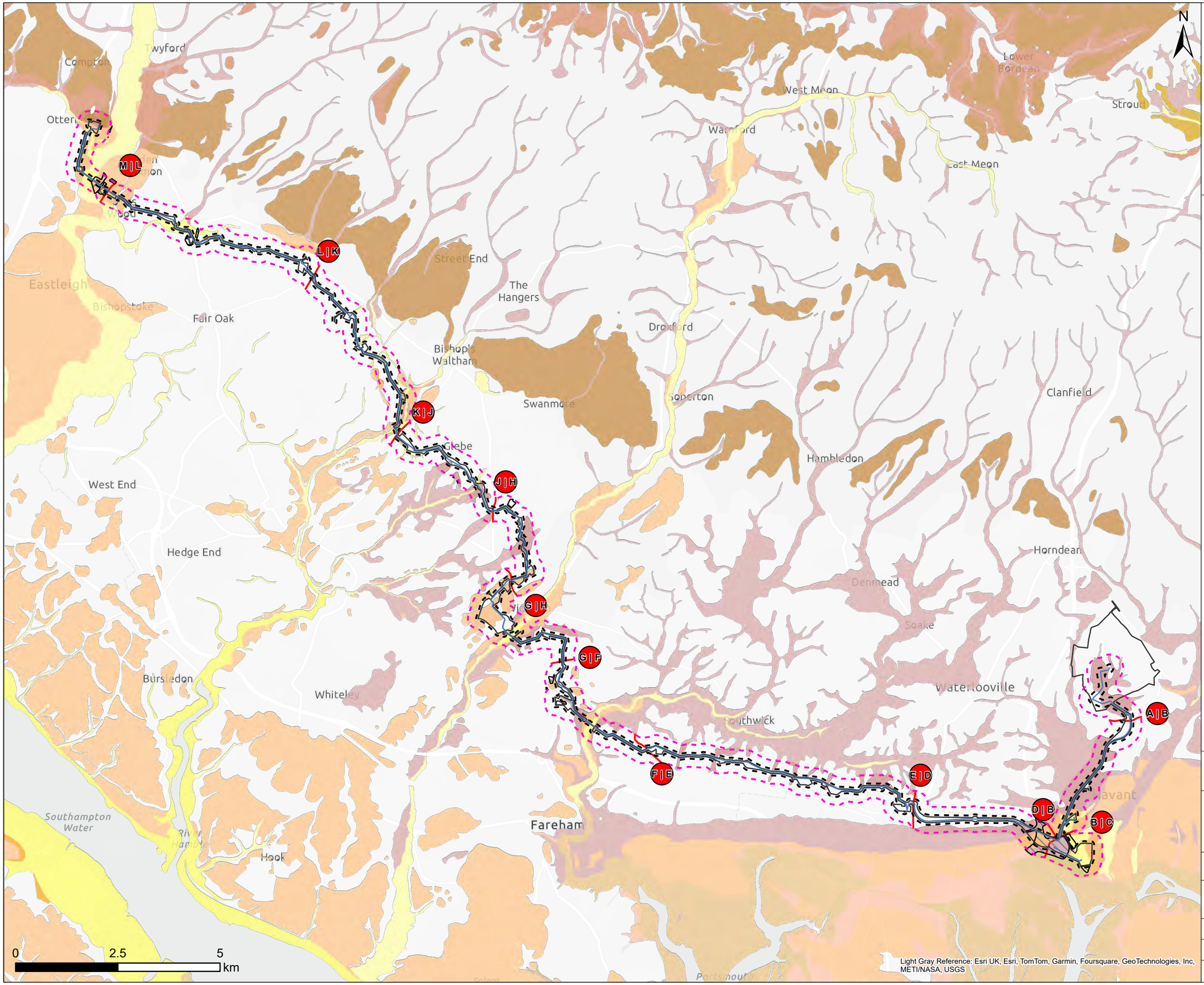

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Artificial and Made Ground

- Infilled Land - Artificial Deposit
- Made Ground (Undivided) - Artificial Deposit
- Worked Ground (Undivided) - Void

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- HEAD - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- River Terrace Deposits (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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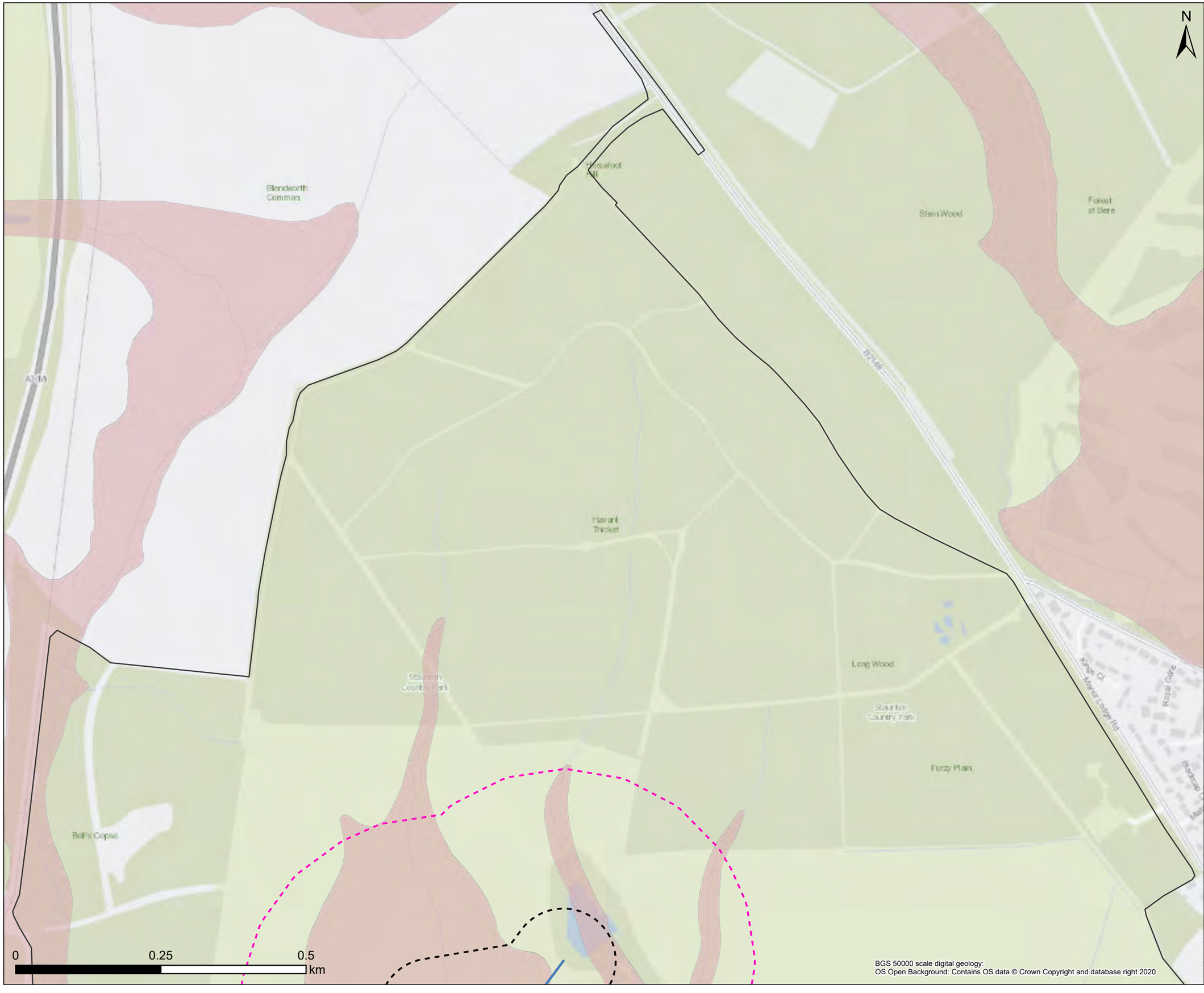
Drawing Title
Figure 2.0 Artificial and Superficial Geology Scheme Overview

Scale	Date Drawn	Page	Sheet Size
1:85,000	01/10/2024	2.0	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-SK-GE-00002			A

Document Path: C:\Southern Water\Hampshire Water for Life\Geo_MapSeries\Geo_MapSeries.aprx





Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title: Water For Life Hampshire

Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - A

Scale	Date Drawn	Page	Sheet Size
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Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00701			Revision: A

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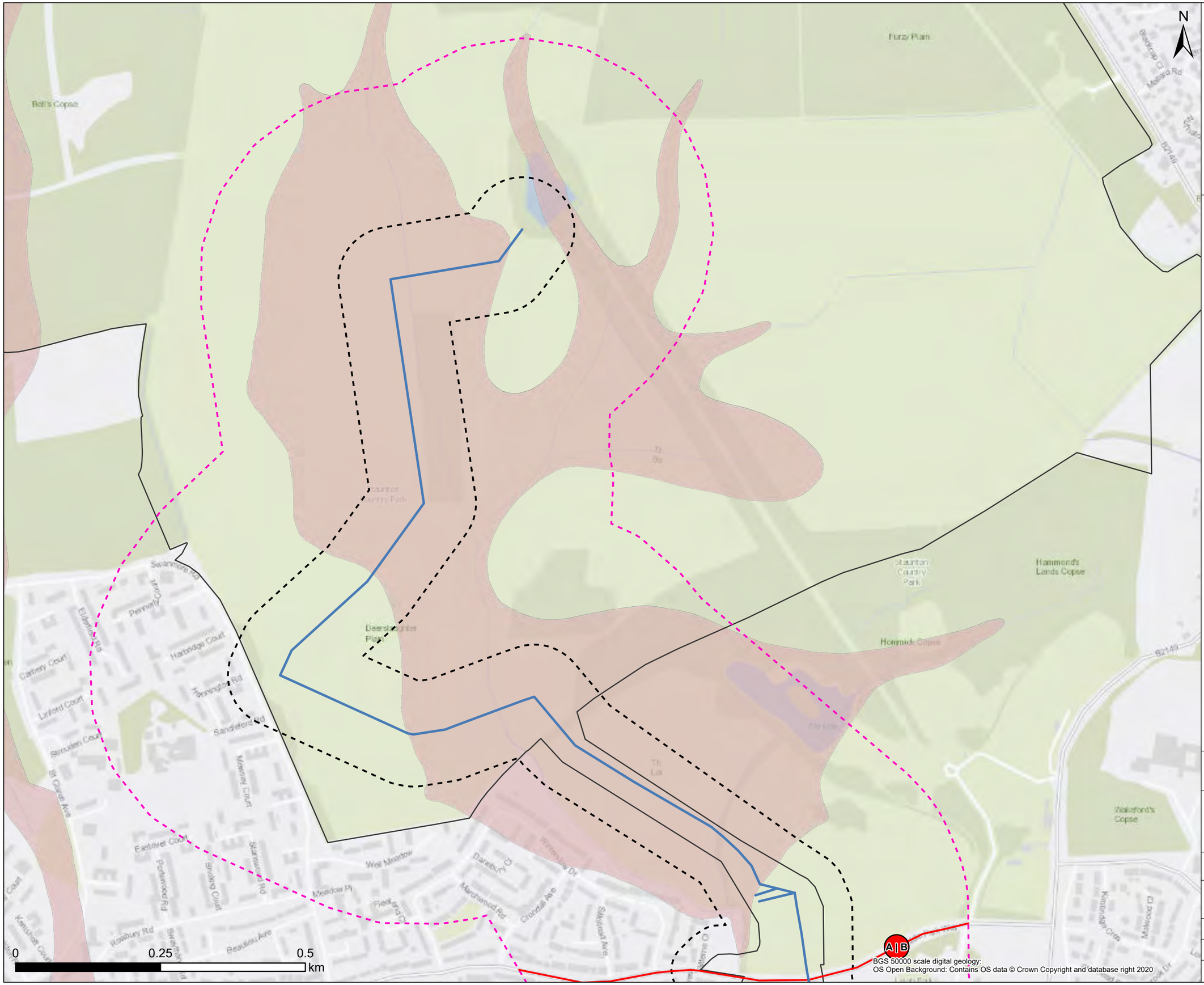

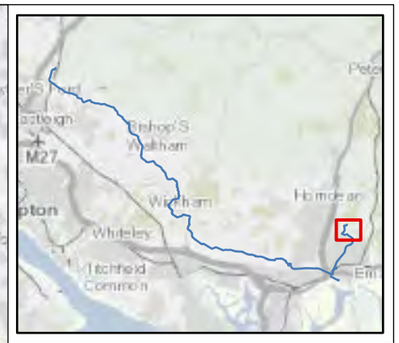

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology Scheme Sections - A

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 2 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
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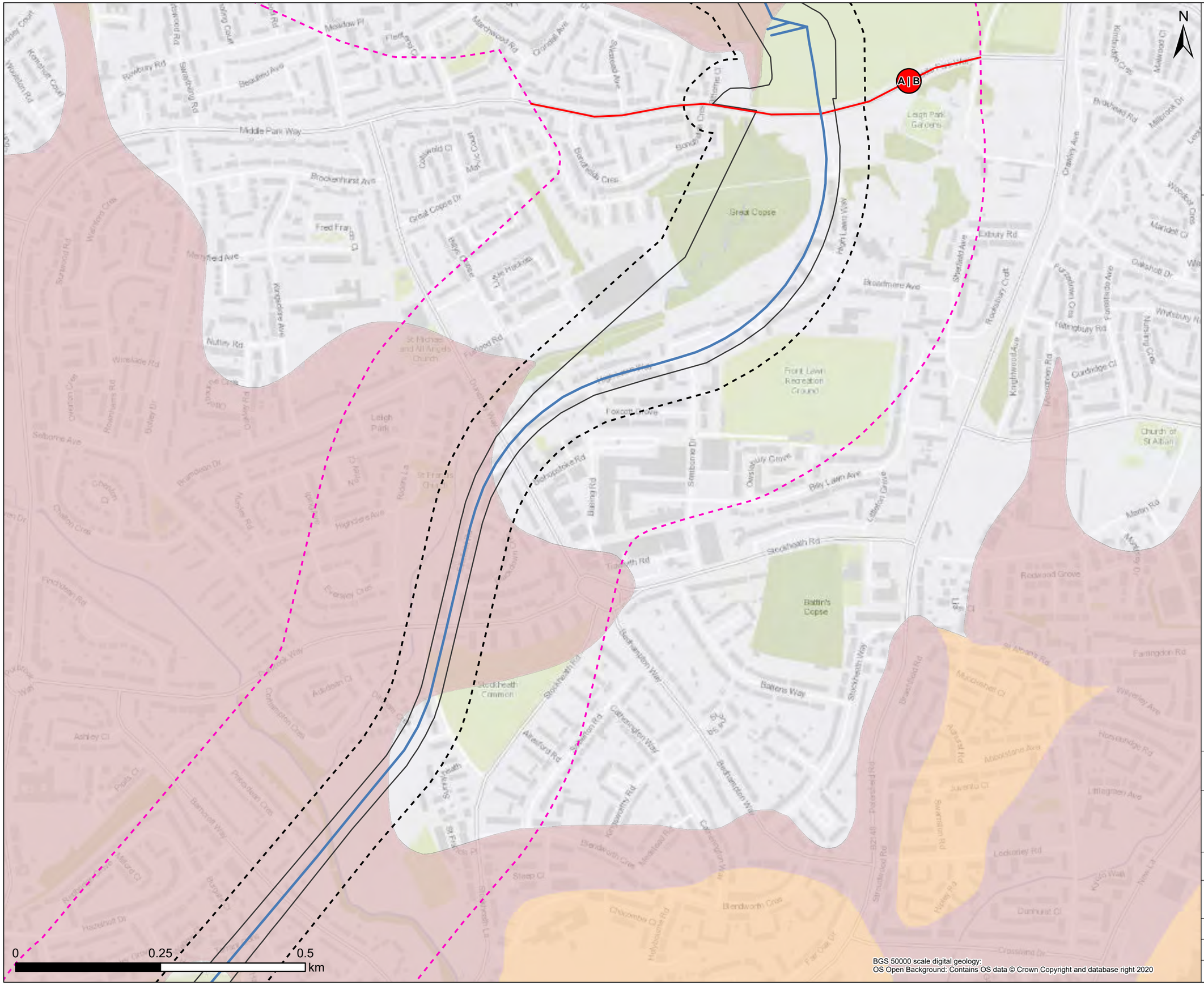



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - B

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 3 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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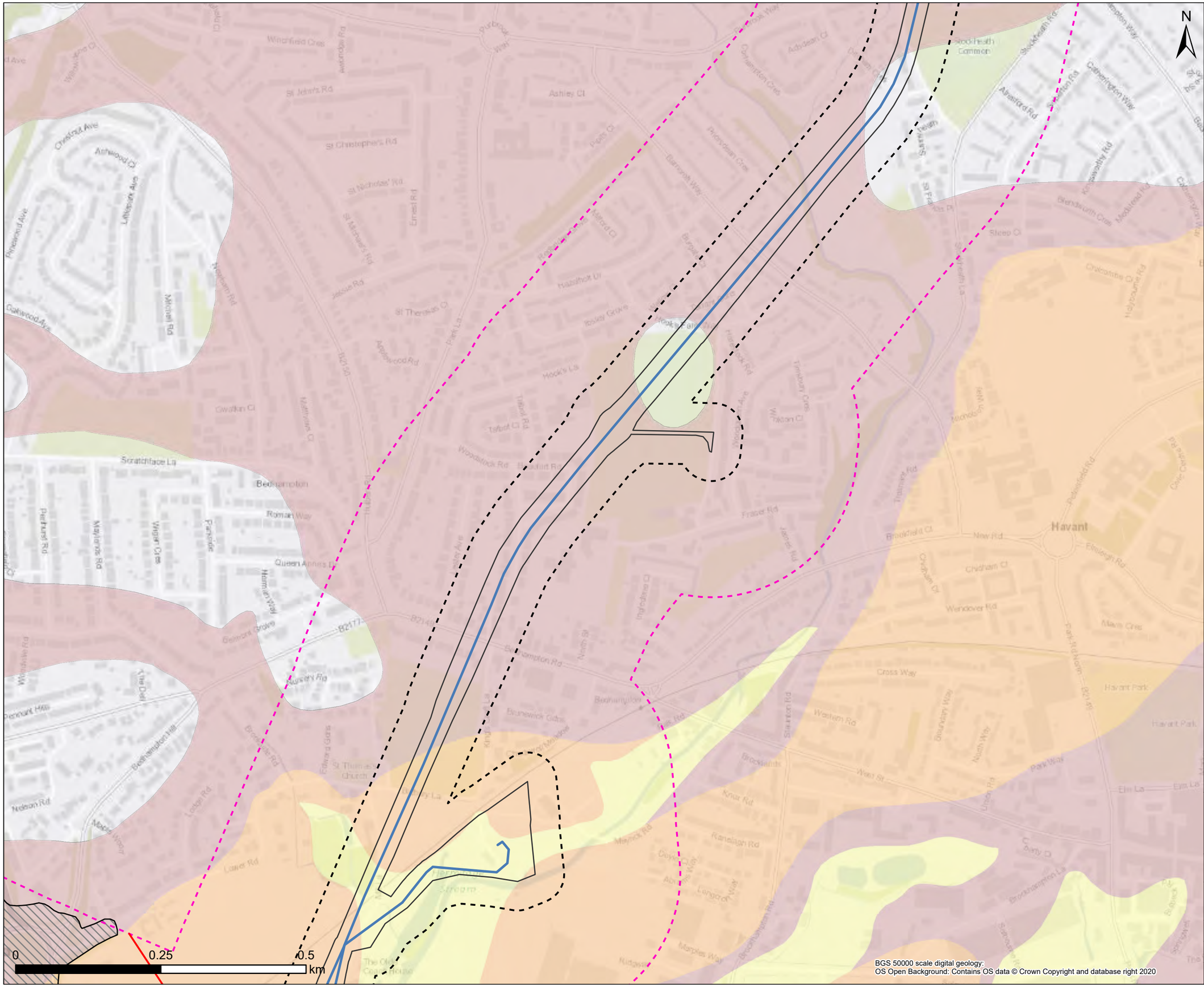



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Pipeline Section Break

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire			
Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - B			
Scale: 1:6,000	Date Drawn: 01/10/2024	Page: Sheet 4 of 32	Sheet Size: A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00704			Revision: A

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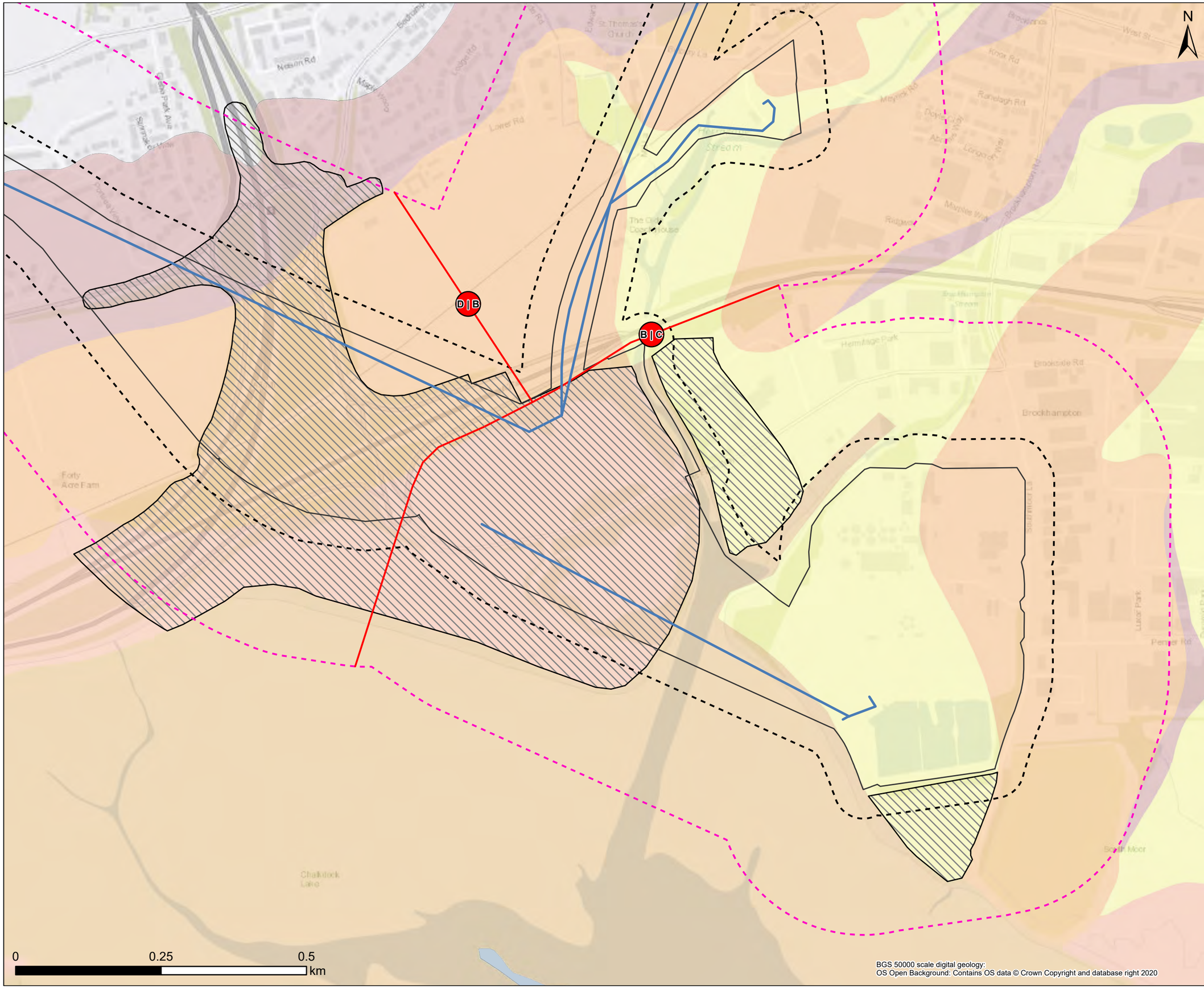



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - C

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 5 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00705			A

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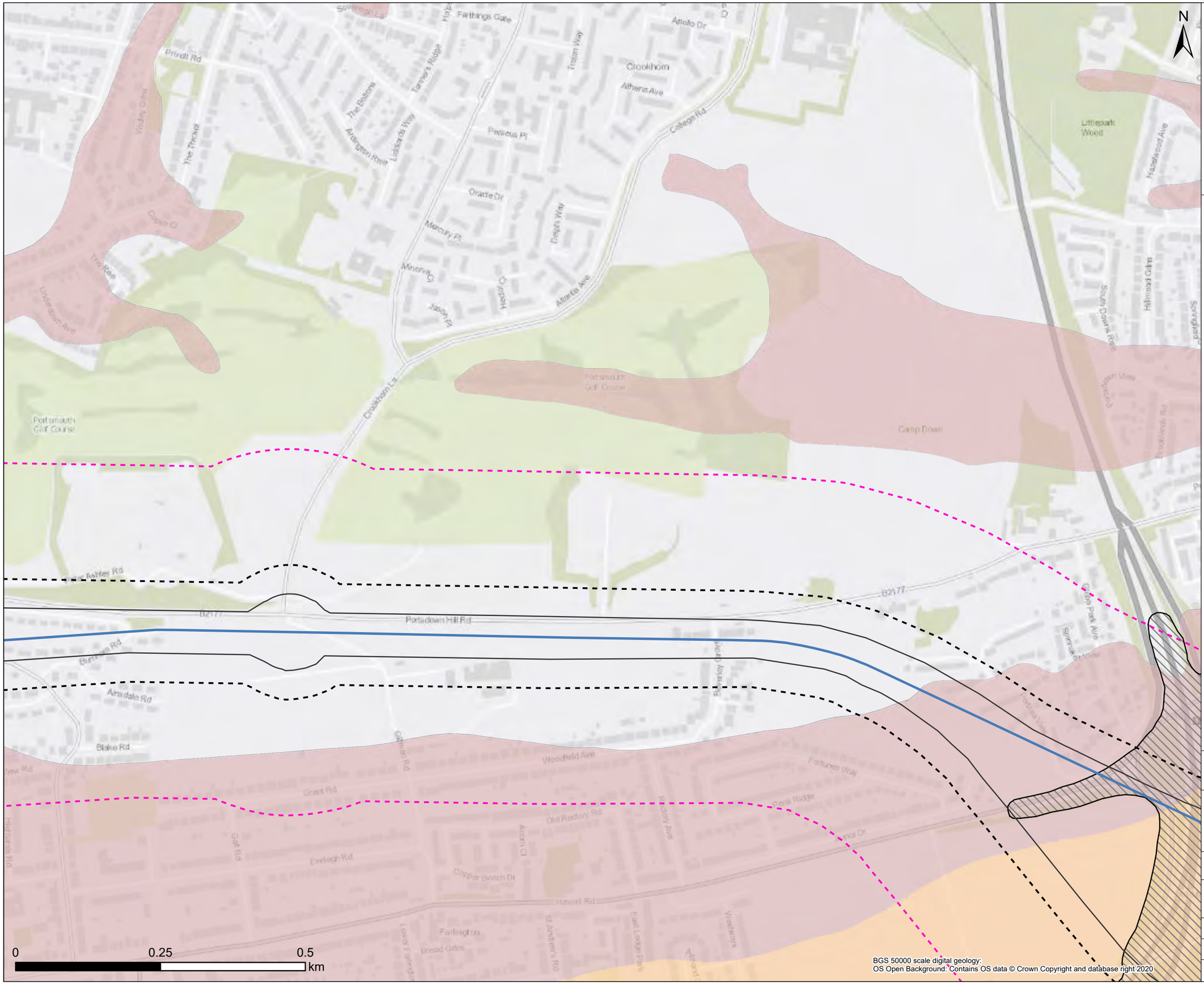

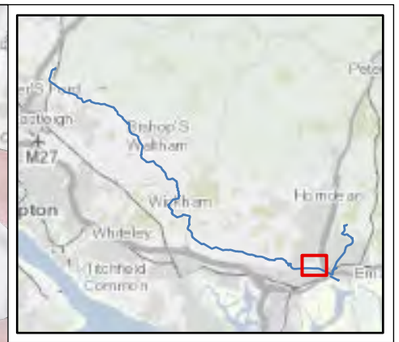

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology Scheme Sections - D

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 6 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00706	A

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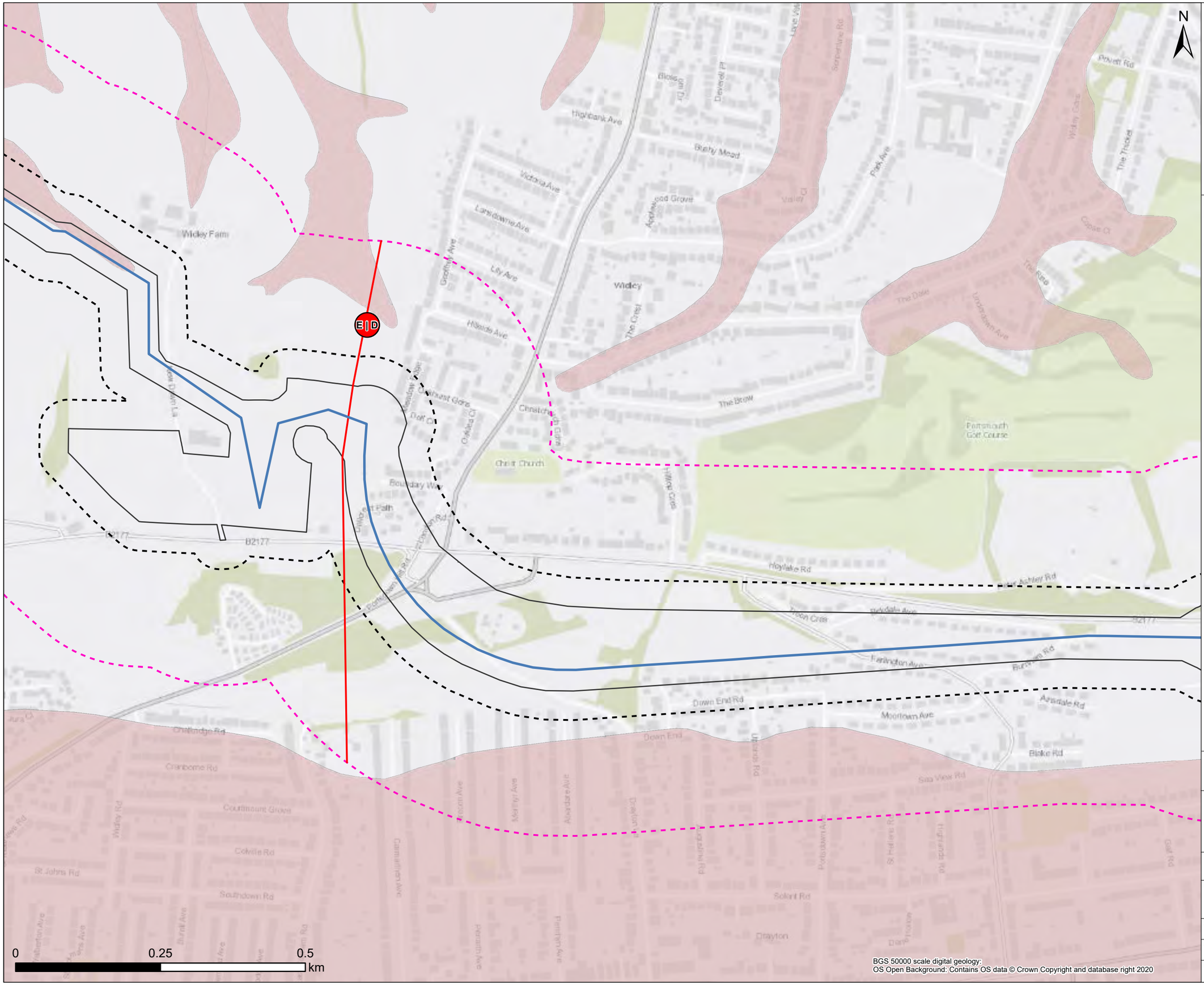

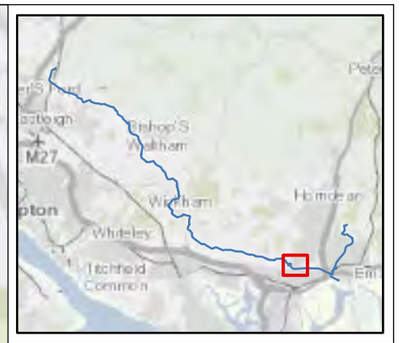

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - D

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 7 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00707			A

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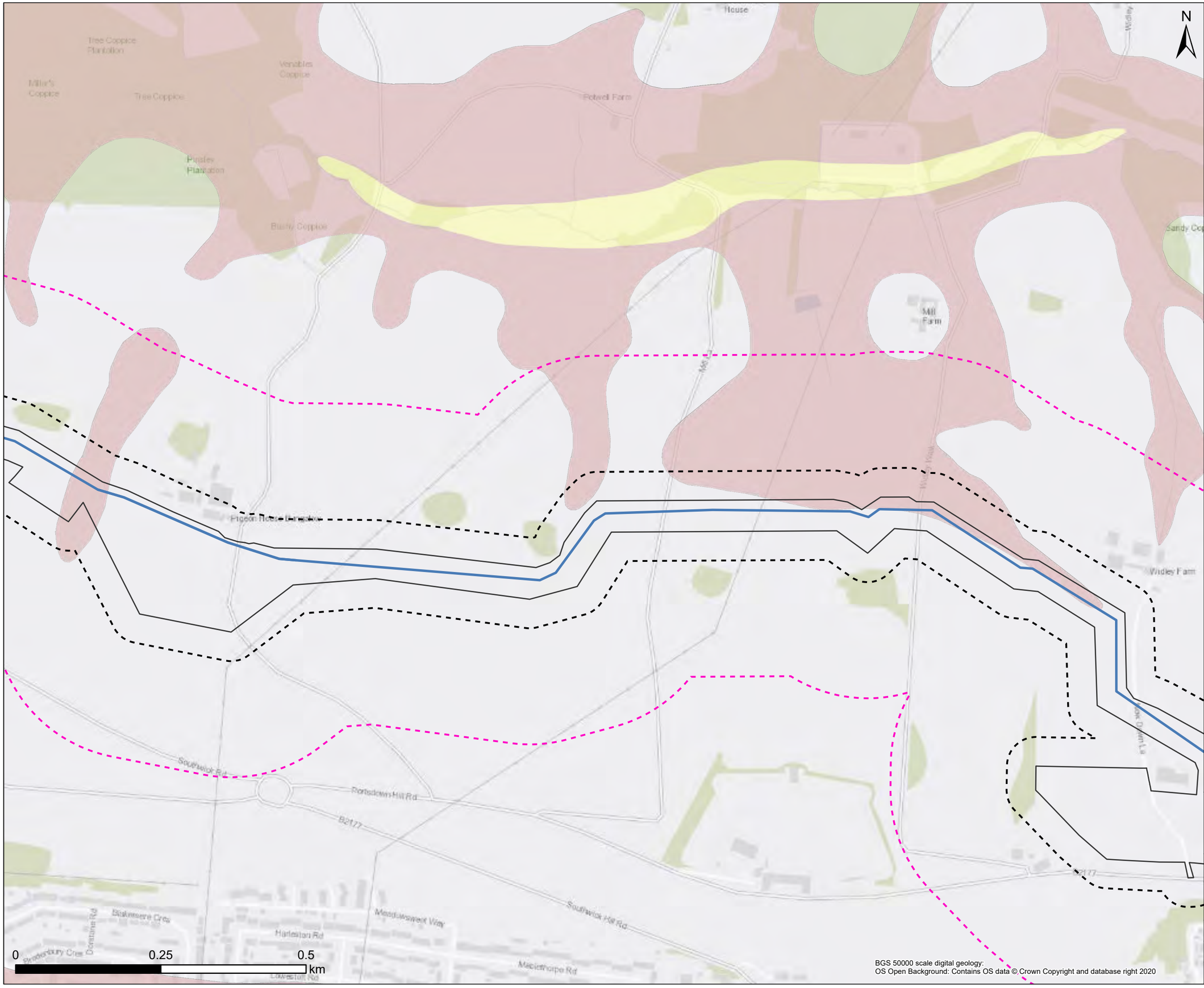



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology Scheme Sections - E

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 8 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00708			A

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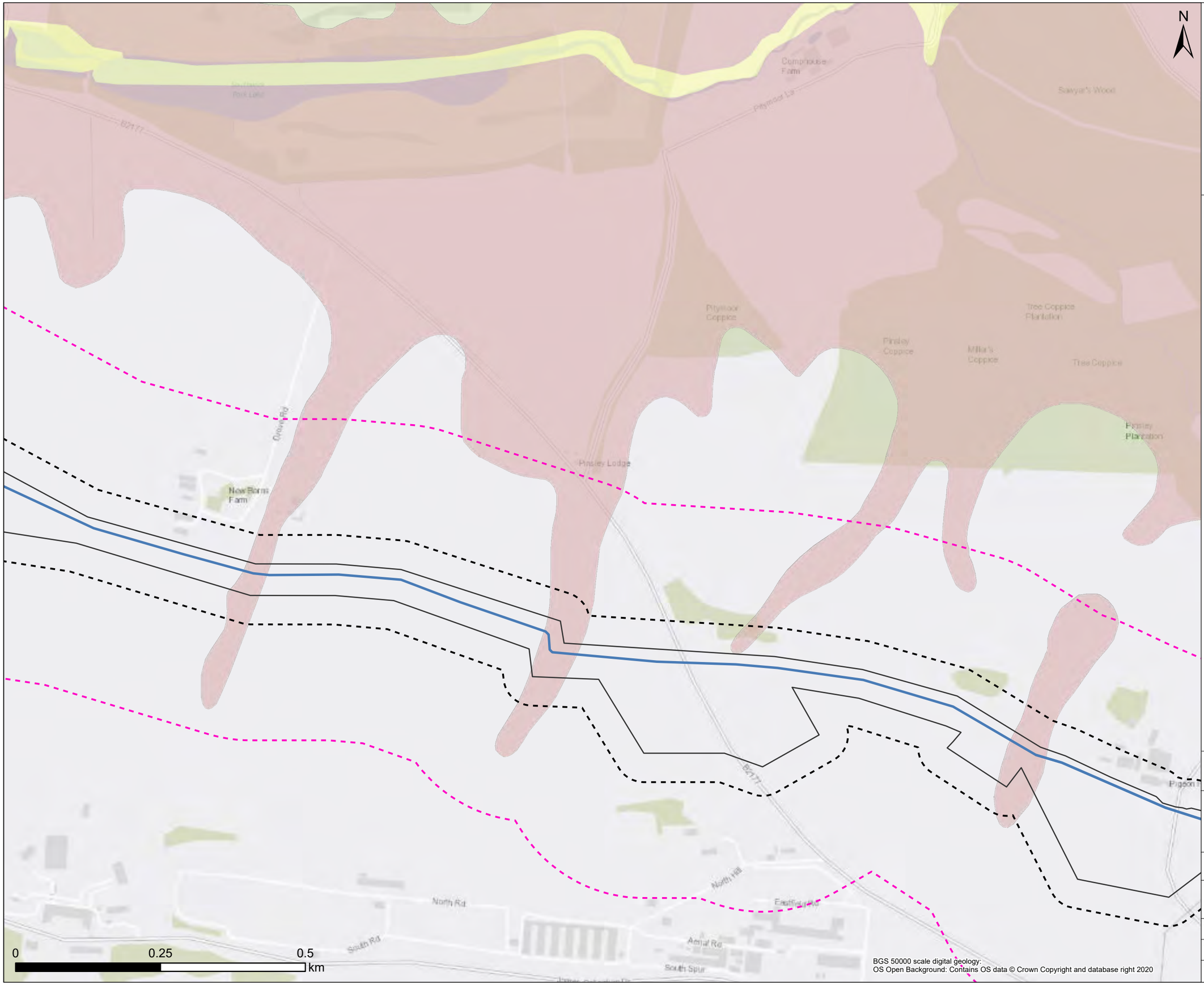



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - E

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 9 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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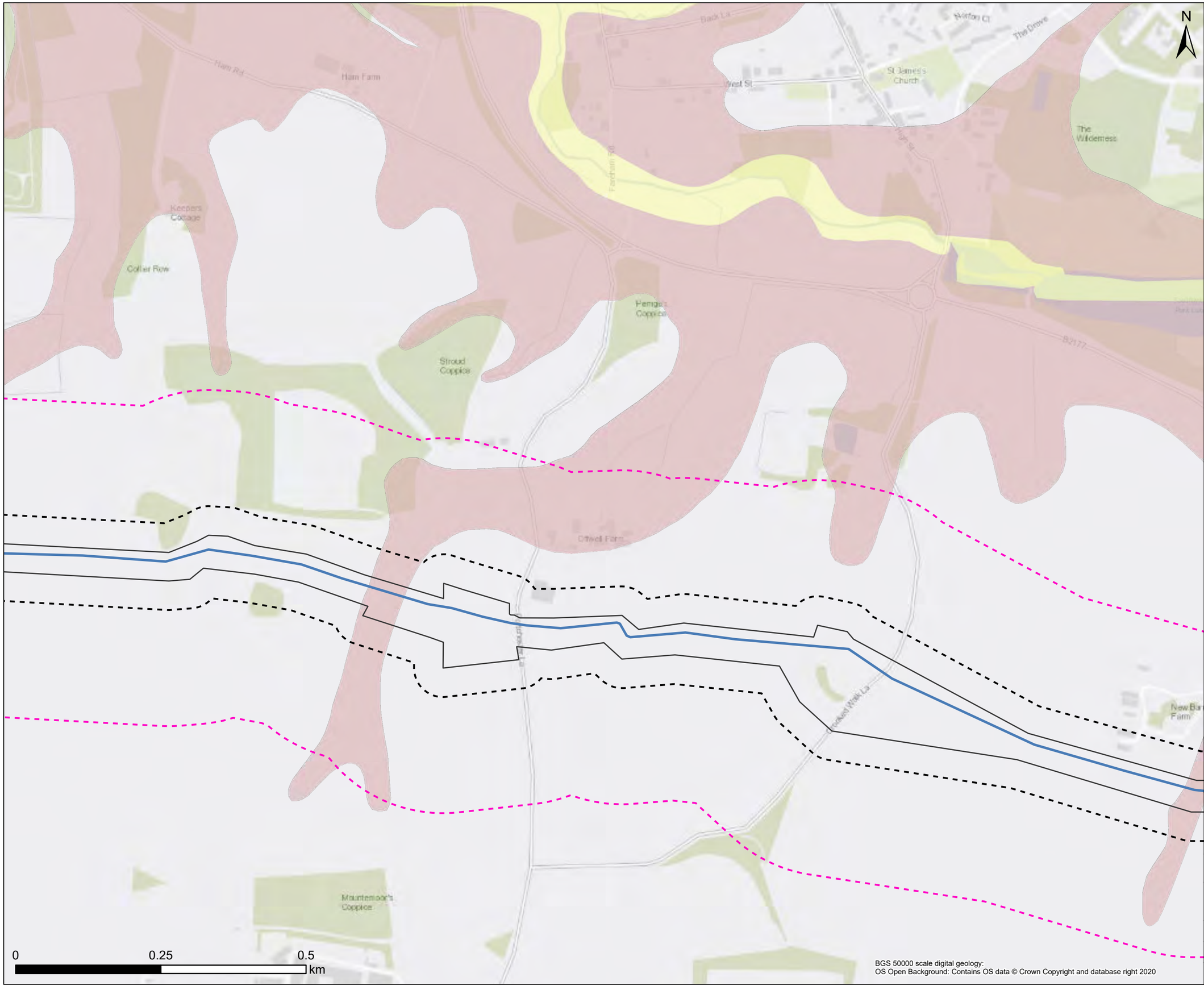



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water.

Project Title: Water For Life Hampshire

Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - E

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 10 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00710	A

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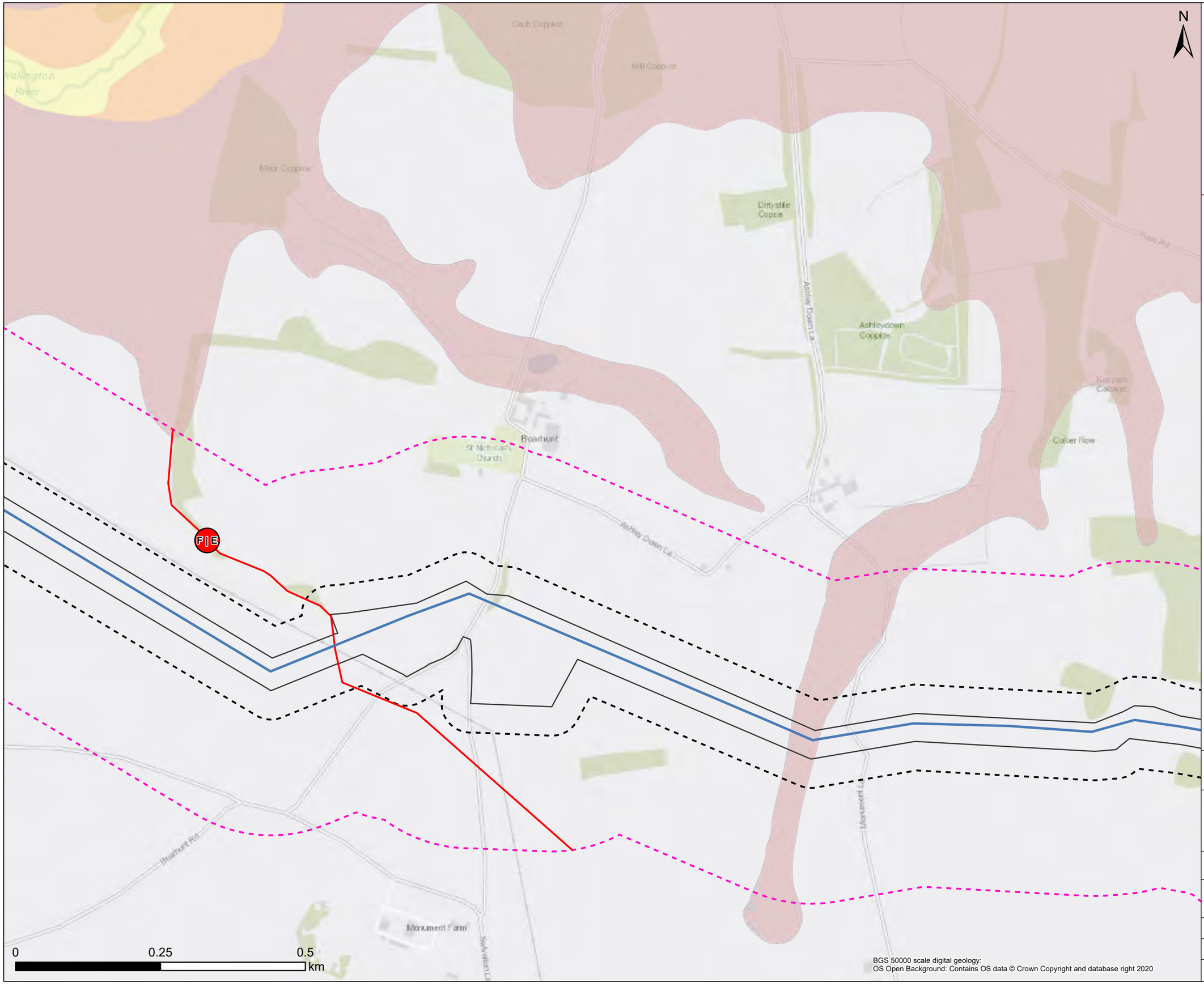



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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WATER for LIFE from Southern Water.

Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - E

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 11 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00711			A

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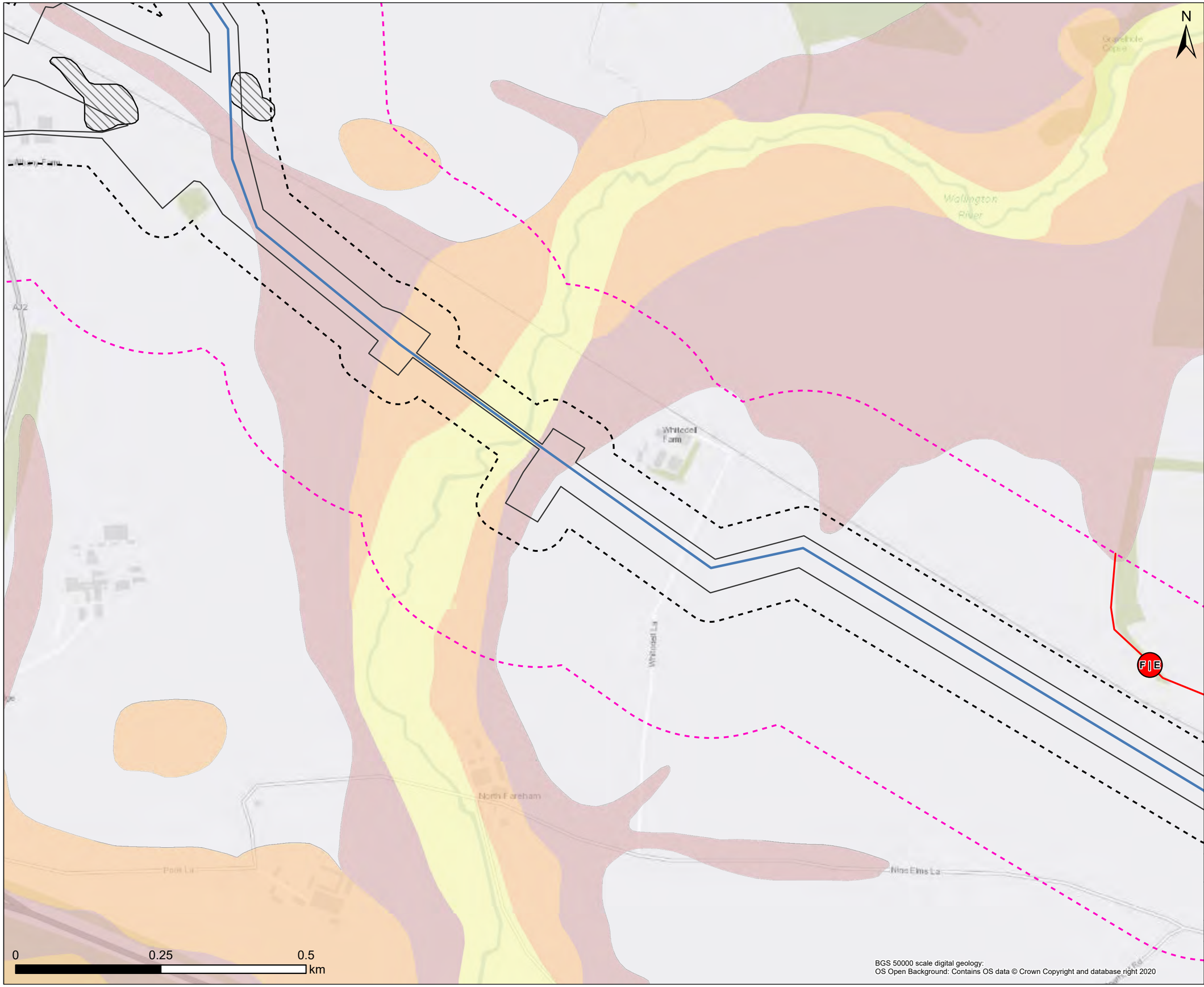



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 12 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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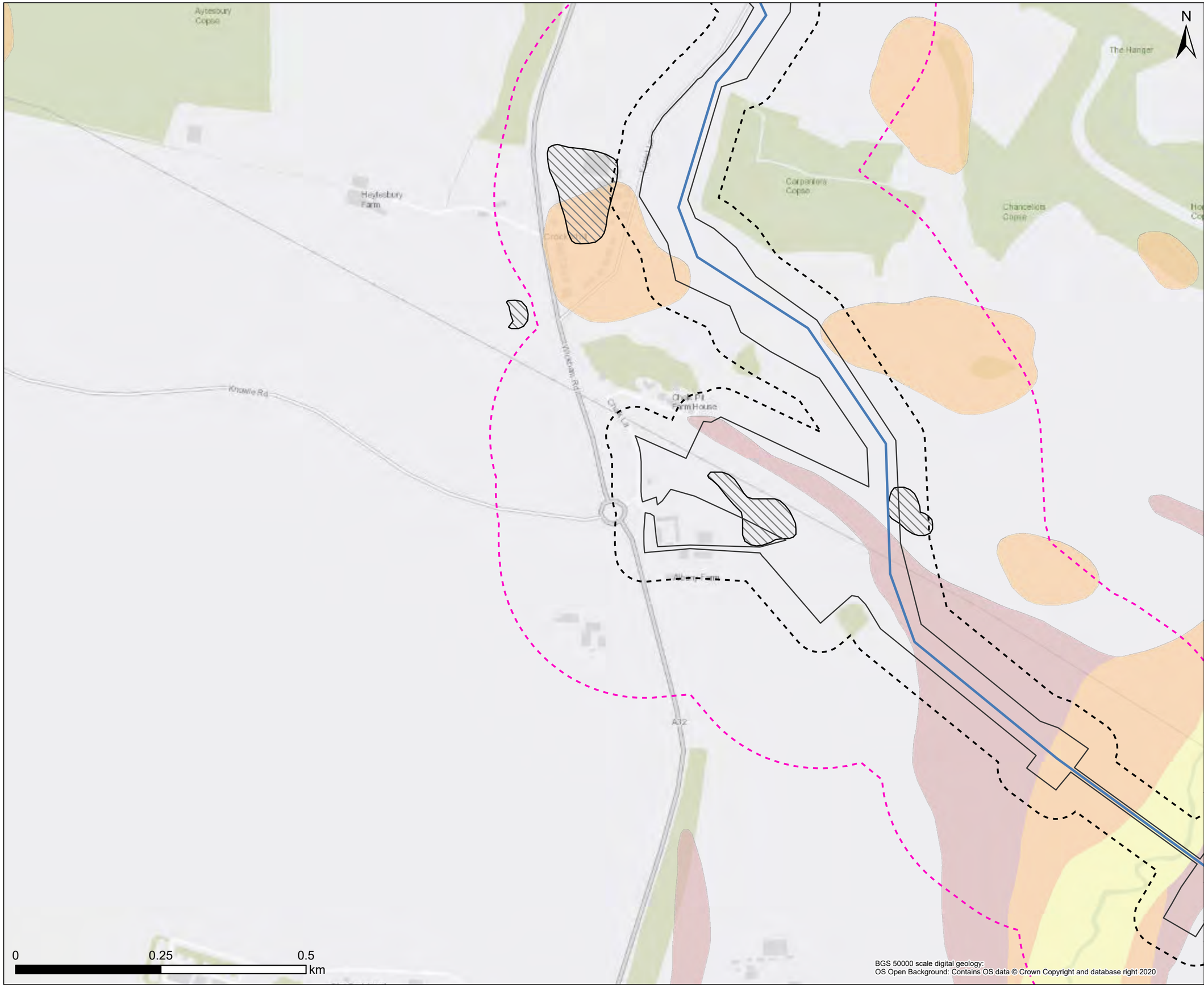



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 13 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00713	A

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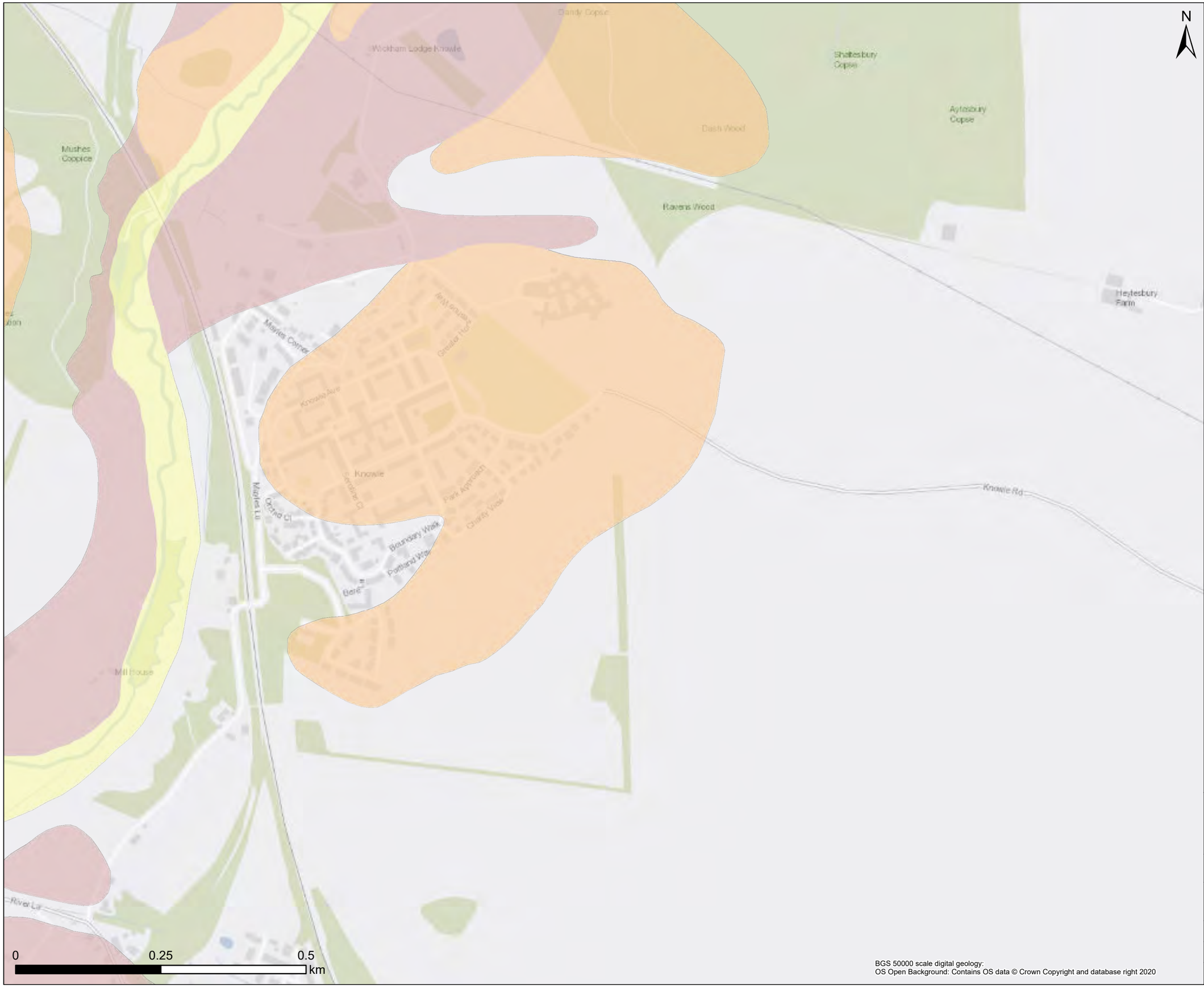



Legend

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - G

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 14 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00714			A

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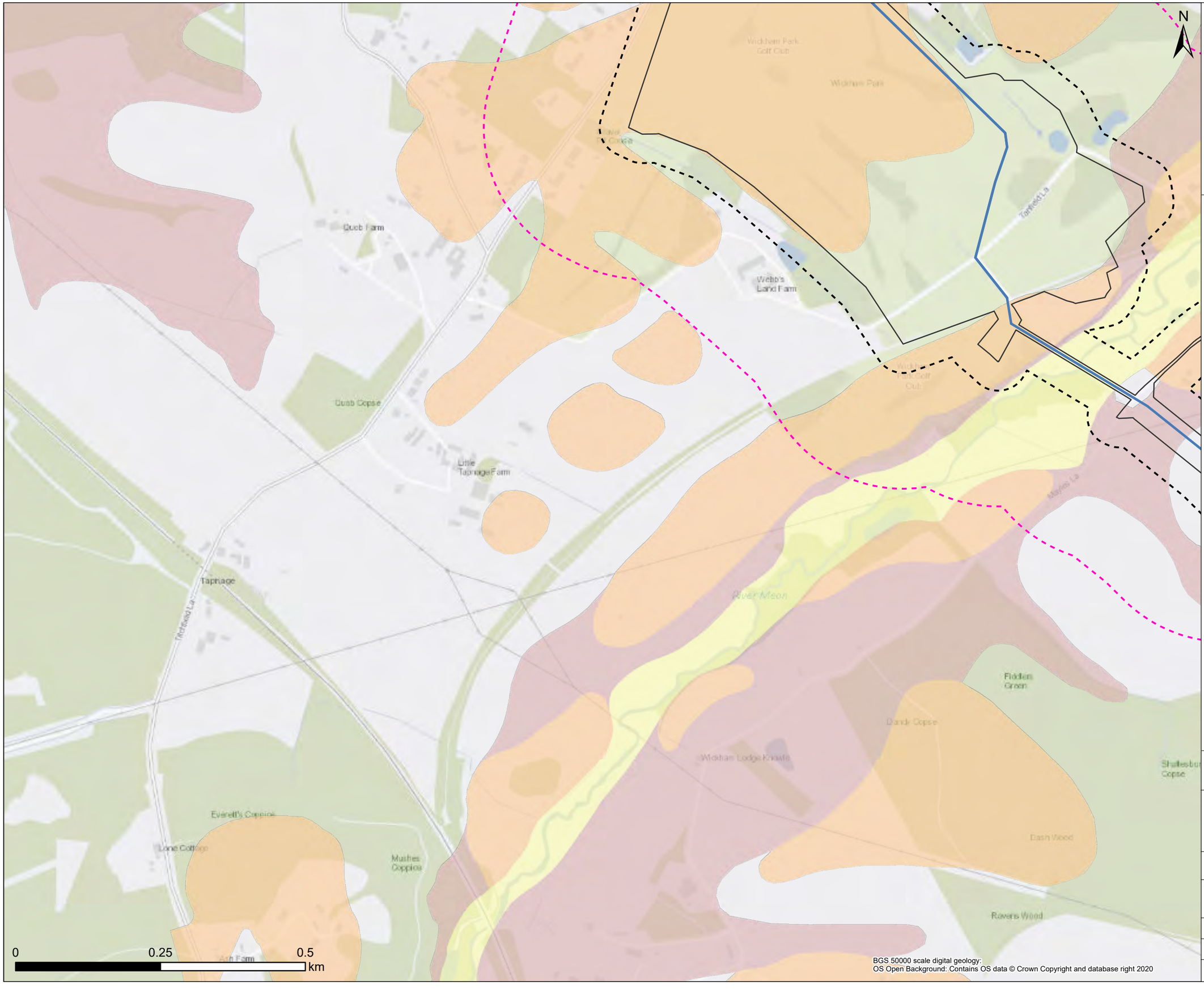



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title	Water For Life Hampshire
Drawing Title	Figure 2.1 Artificial and Superficial Geology Scheme Sections - G

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 15 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00715			A

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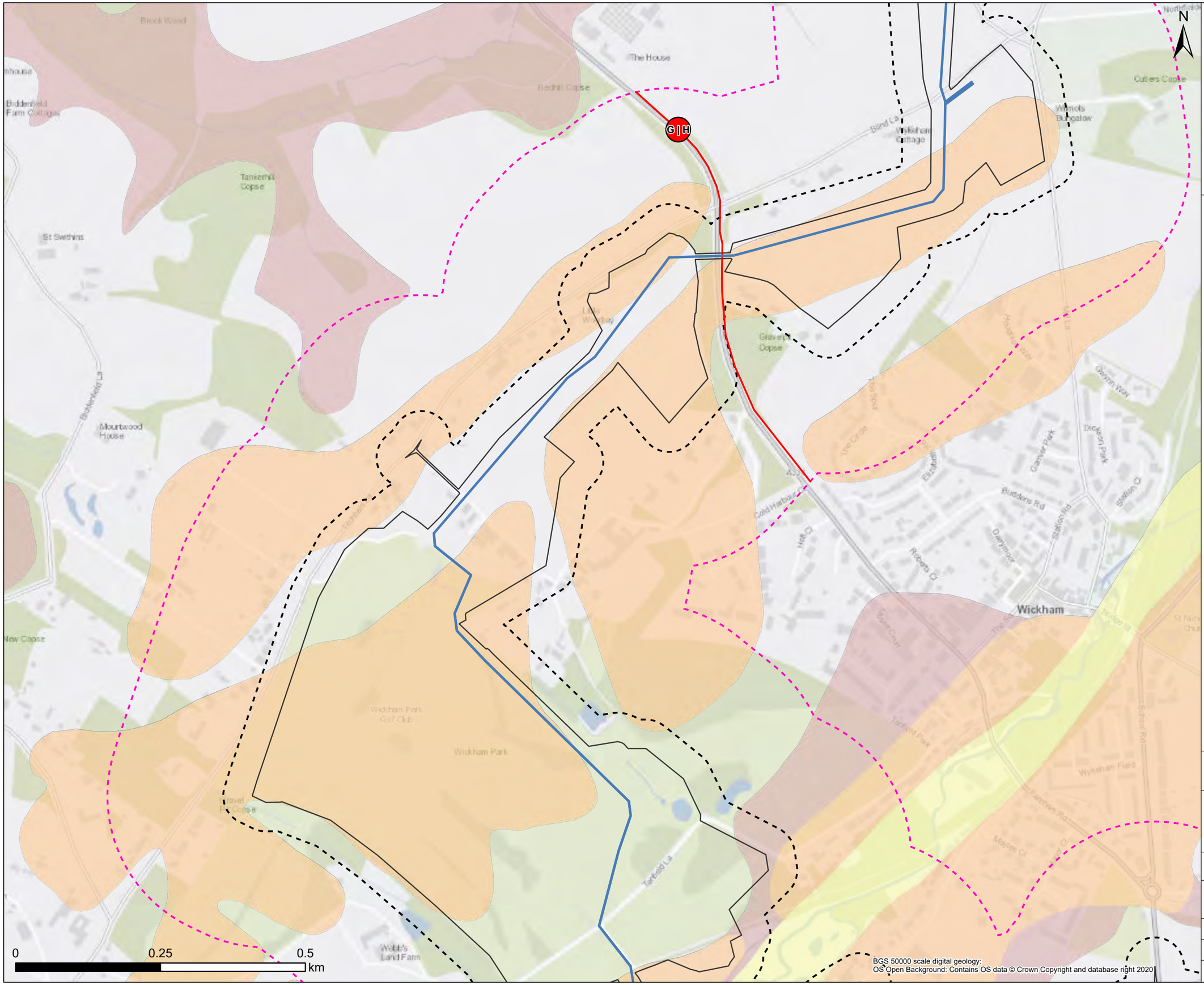



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - G

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 16 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00716			Revision: A

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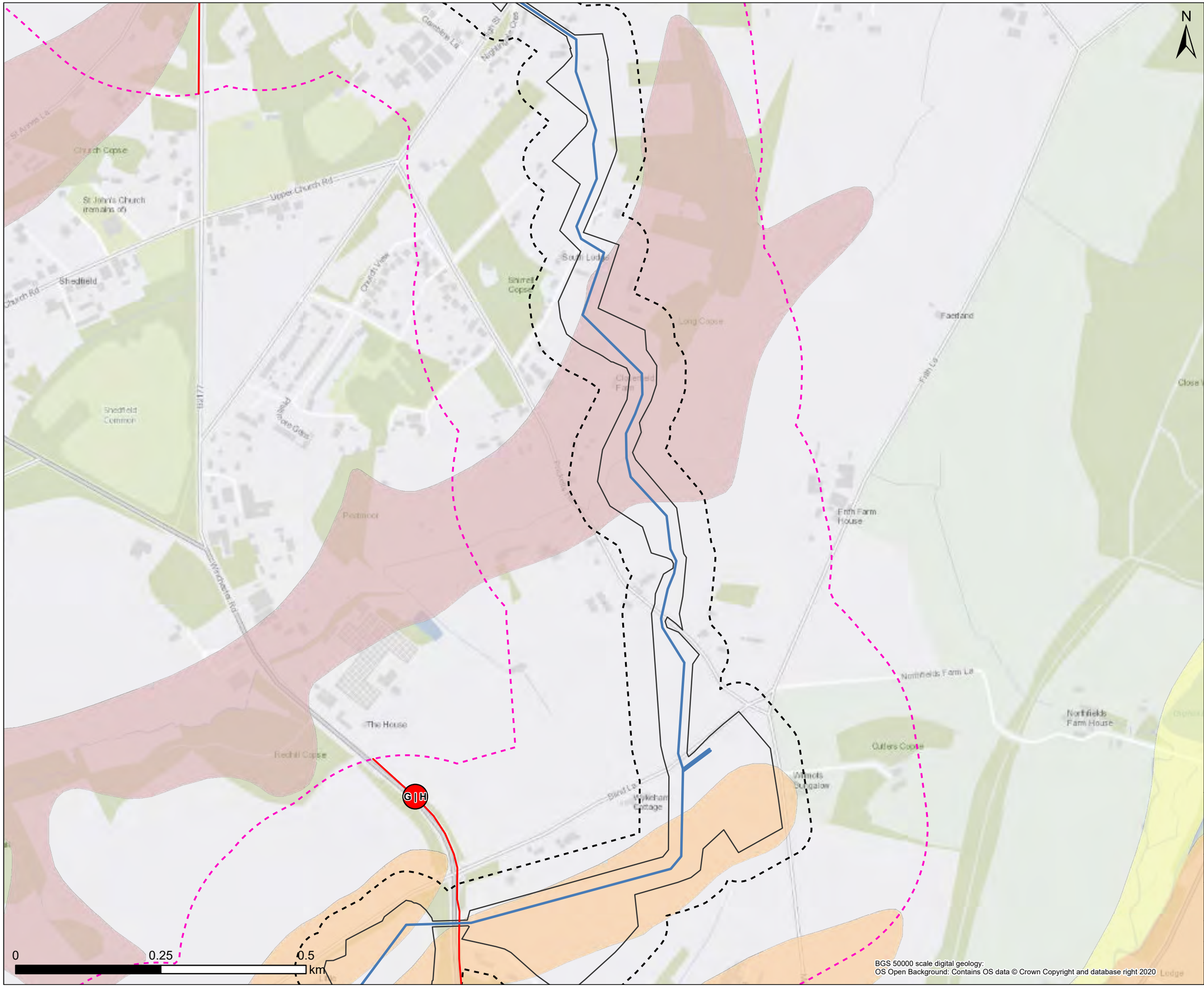



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - H

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 17 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00717			Revision: A

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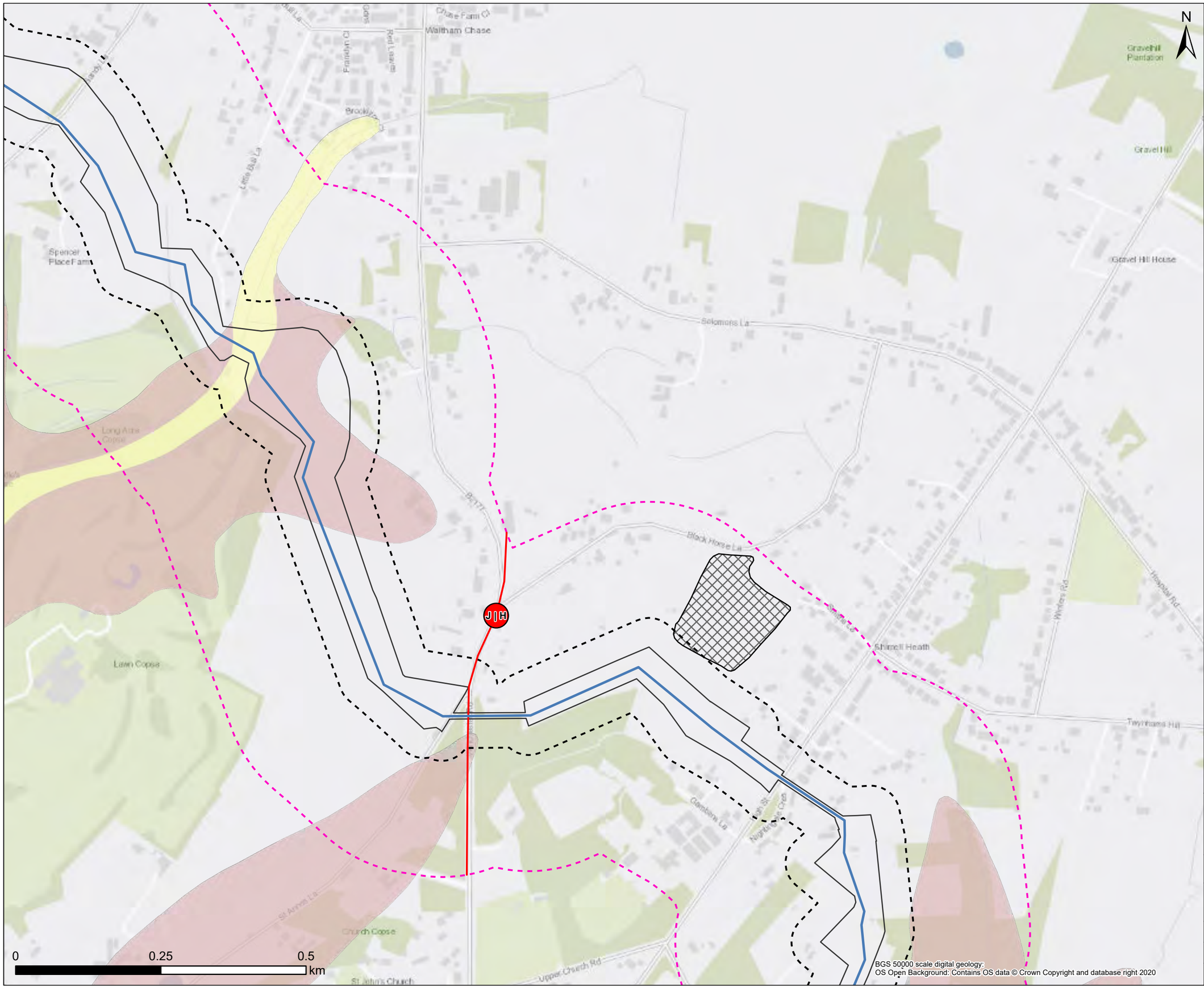



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Artificial and Made Ground

- Infilled Land - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - H

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 18 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00718			A

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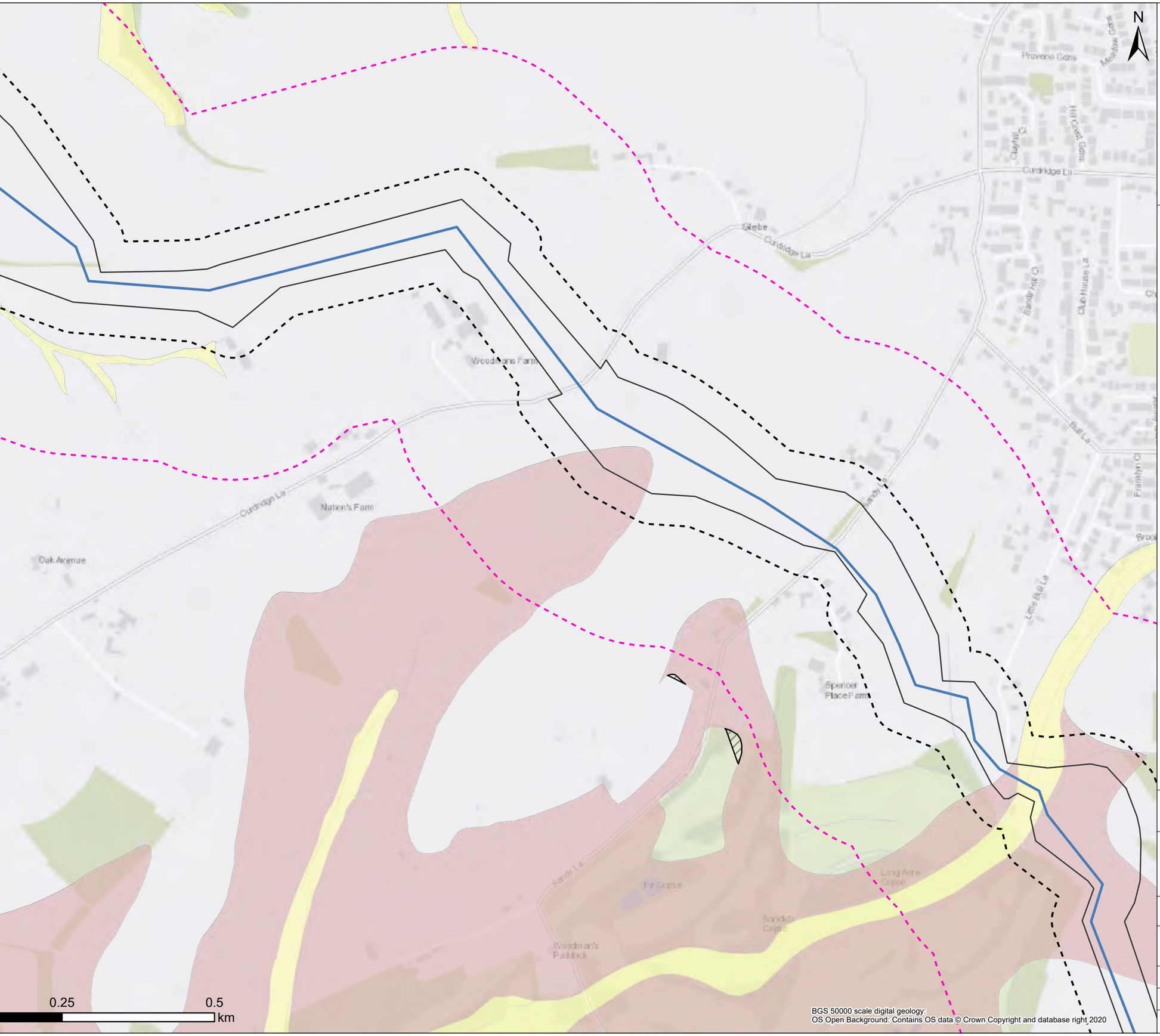



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Artificial and Made Ground

- Worked Ground (Undivided) - Void

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title: Water For Life Hampshire

Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - J

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 19 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00719	A

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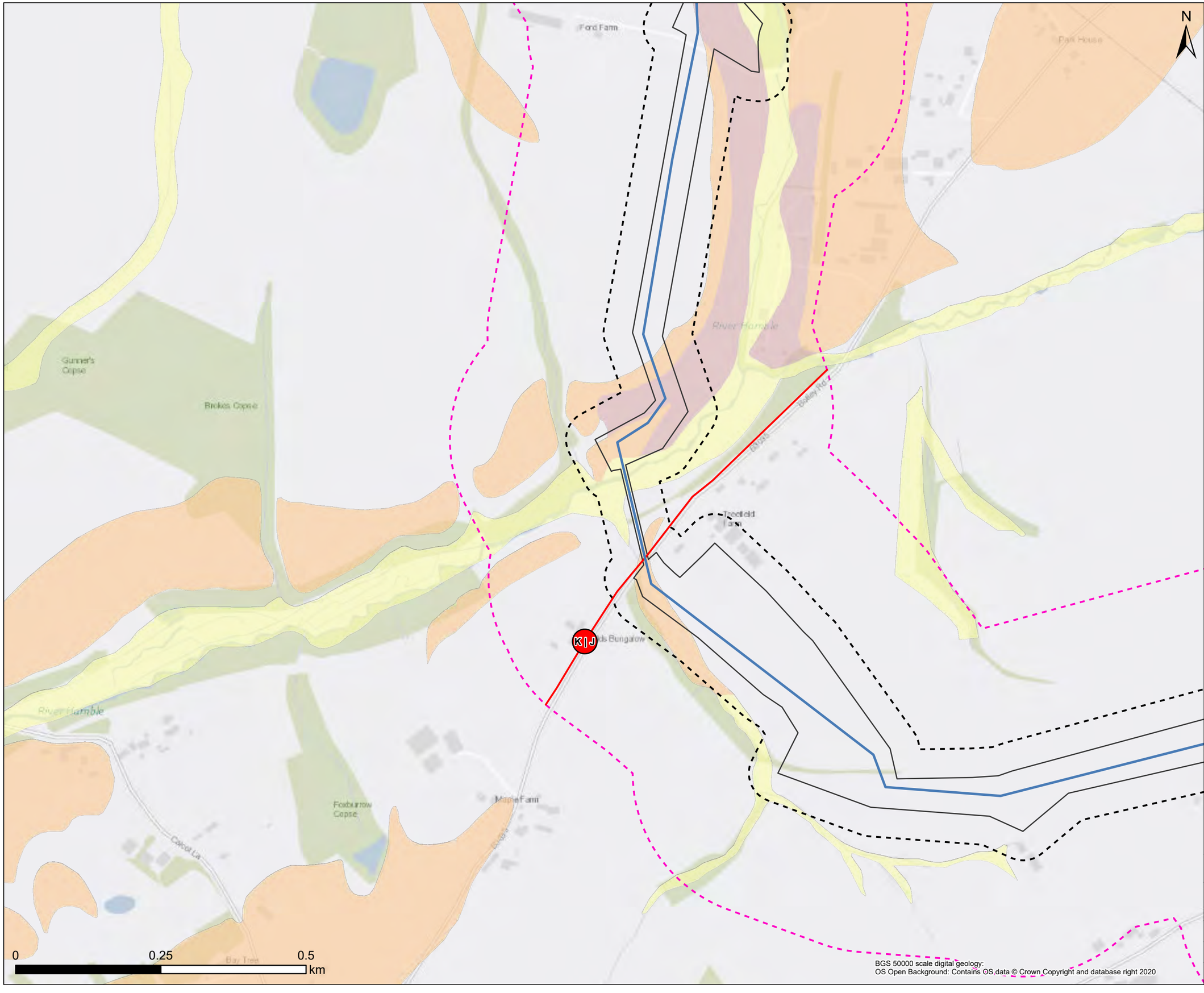



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - J

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 20 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00720			Revision: A

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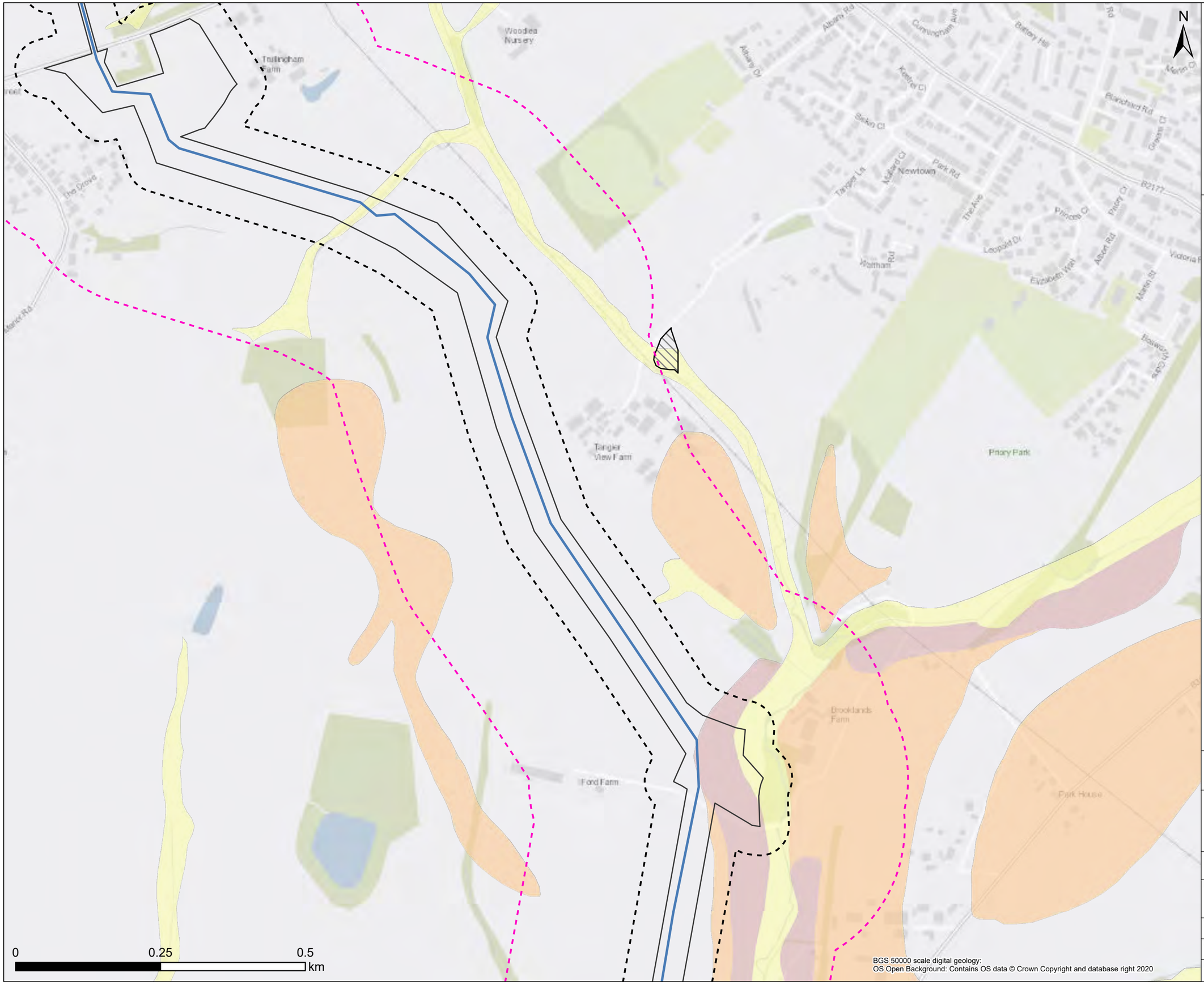



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title
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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - K

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 21 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00721	A

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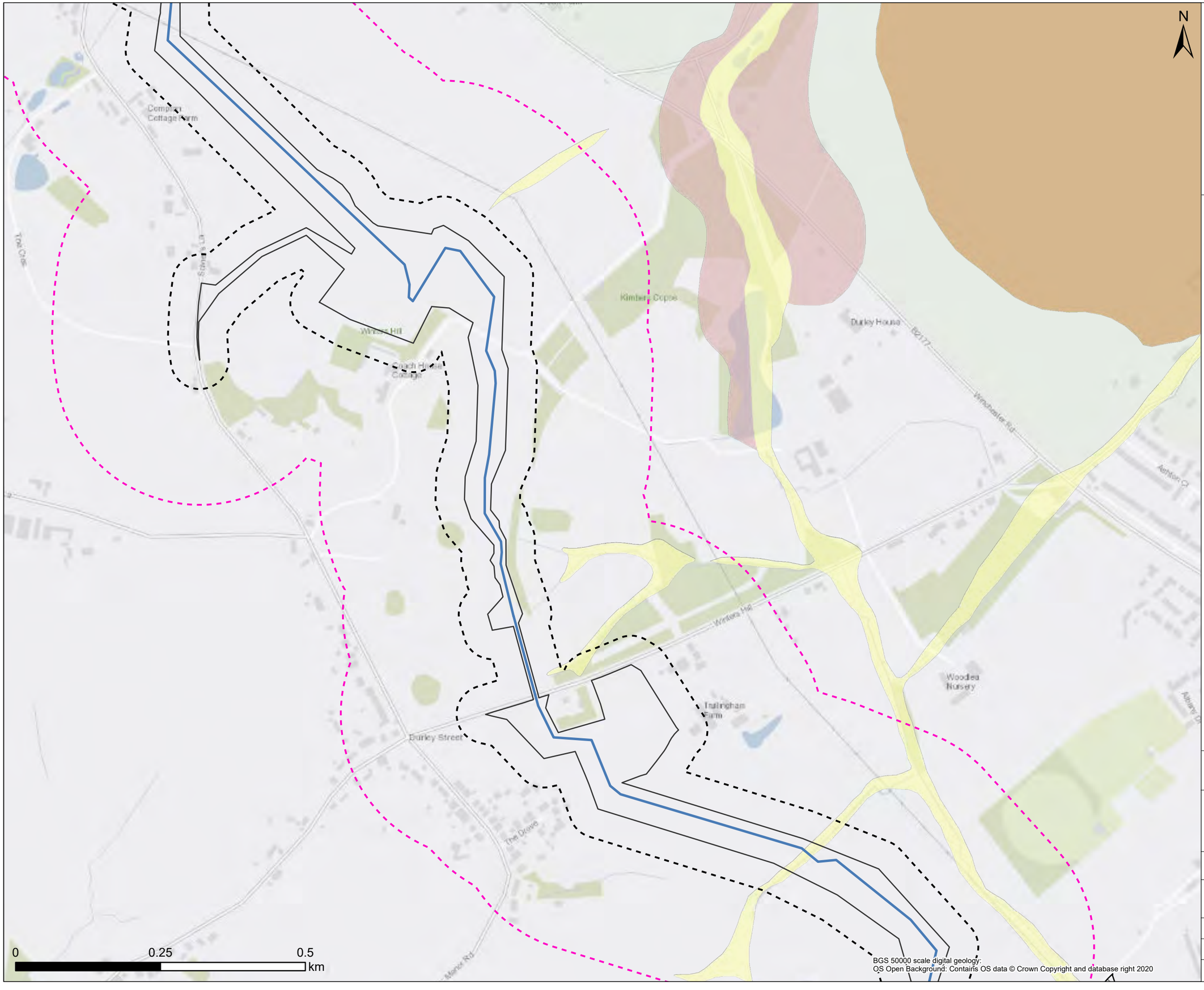



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Project Title
Water For Life Hampshire

Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - K

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 22 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00722			A

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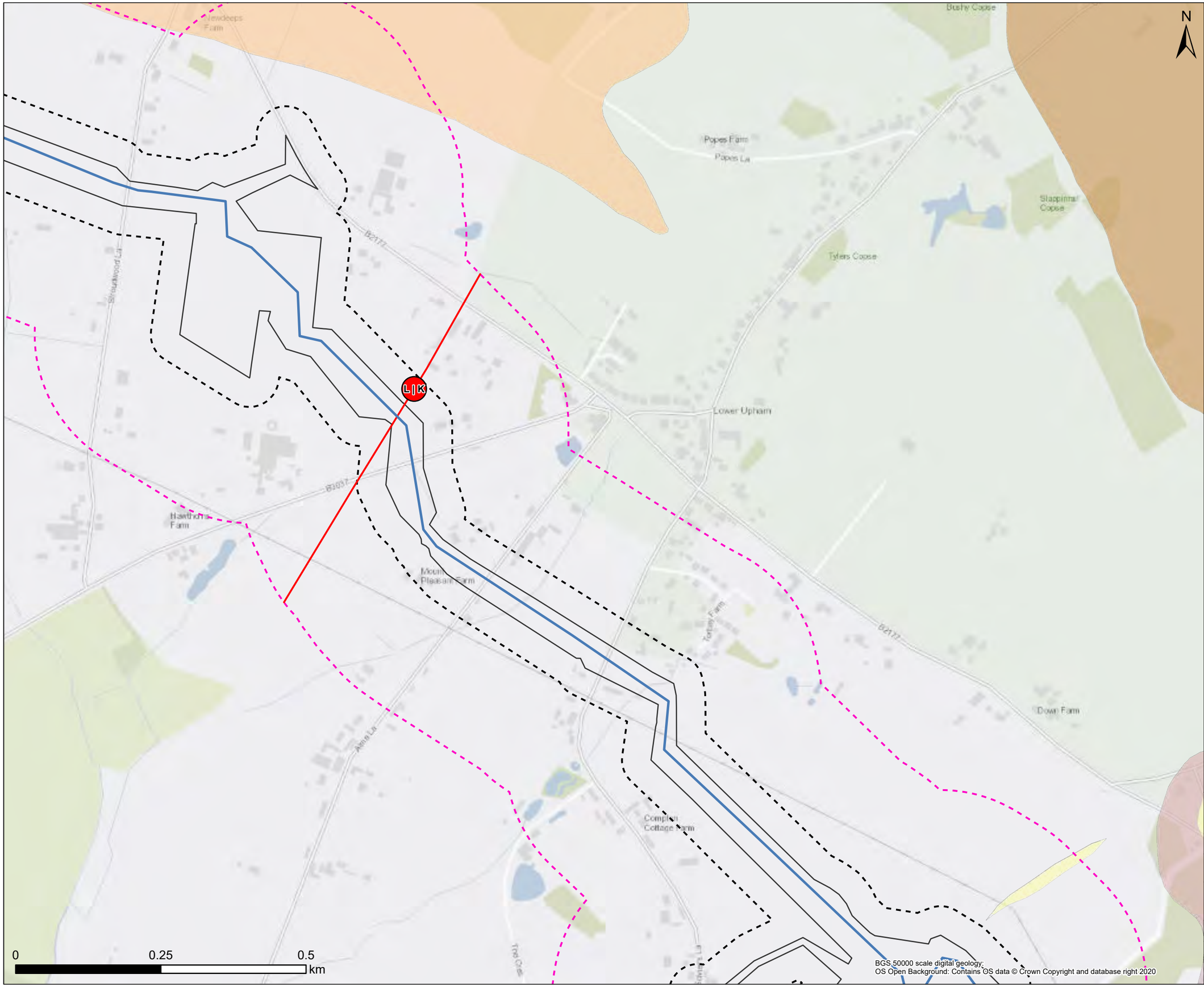



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Scheme Sections - K

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 23 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00723			A

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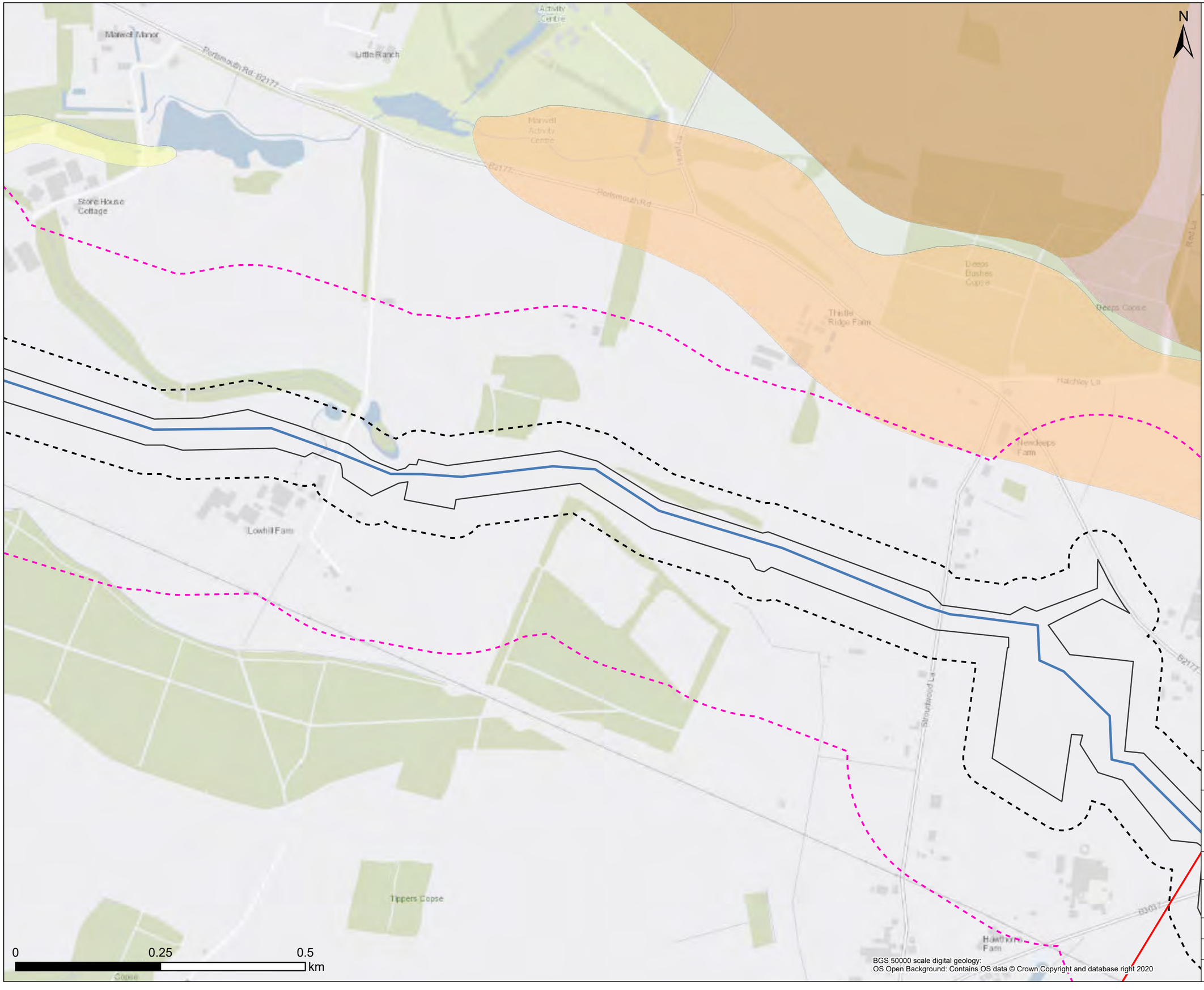



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Pipeline Section Break

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title: Water For Life Hampshire

Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - L

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 24 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00724	A

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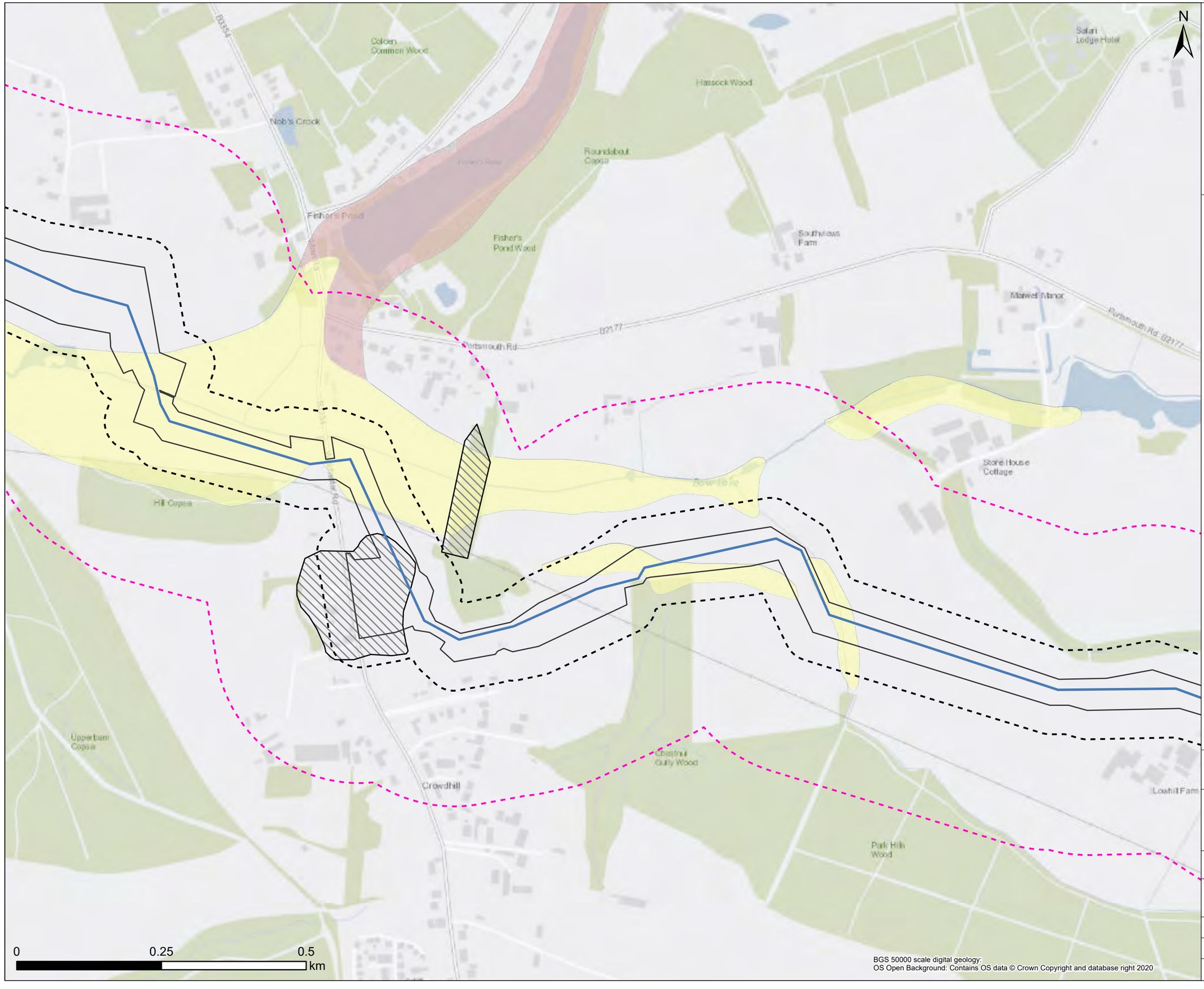



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Drawing Title
Figure 2.1 Artificial and Superficial Geology Scheme Sections - L

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 25 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00725			A

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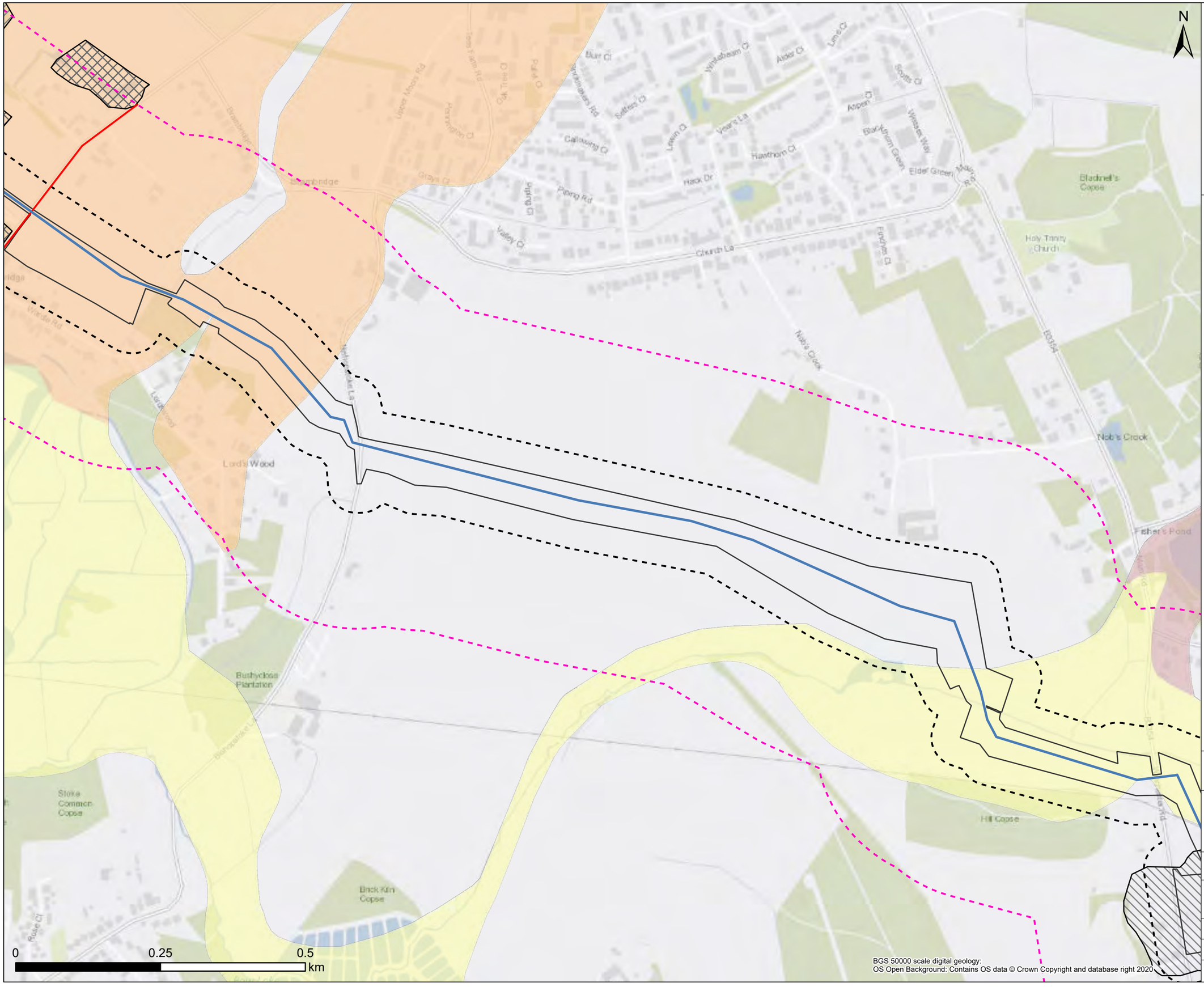

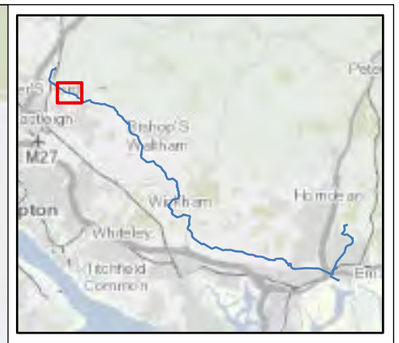

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Pipeline Section Break

Artificial and Made Ground

- Infilled Land - Artificial Deposit
- Made Ground (Undivided) - Artificial Deposit
- Worked Ground (Undivided) - Void

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title	Water For Life Hampshire
Drawing Title	Figure 2.1 Artificial and Superficial Geology Scheme Sections - L

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 26 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00726	A

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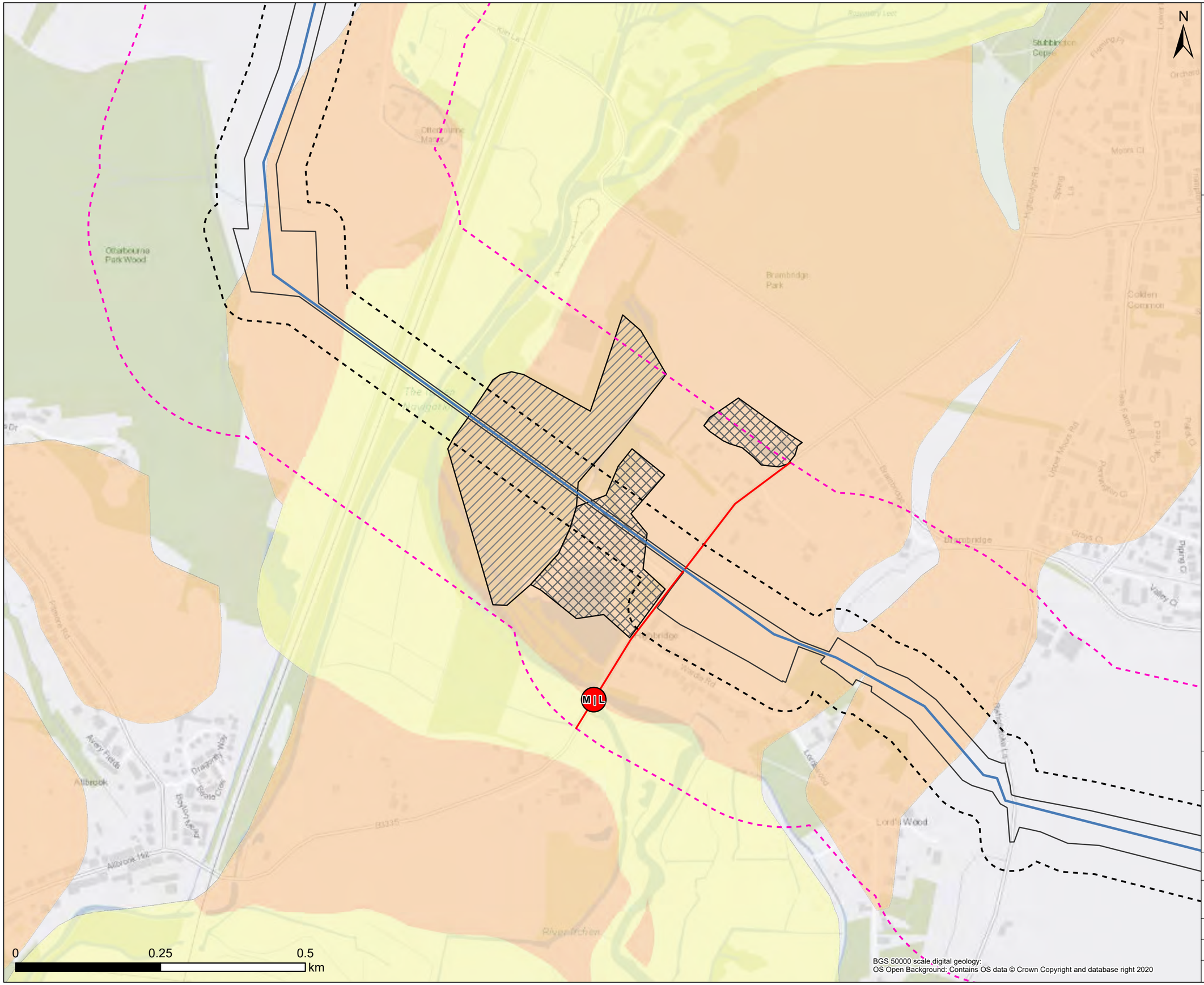

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Artificial and Made Ground

- Infilled Land - Artificial Deposit
- Worked Ground (Undivided) - Void

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Project Title: Water For Life Hampshire

Drawing Title: Figure 2.1 Artificial and Superficial Geology Scheme Sections - M

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 27 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00727			Revision: A

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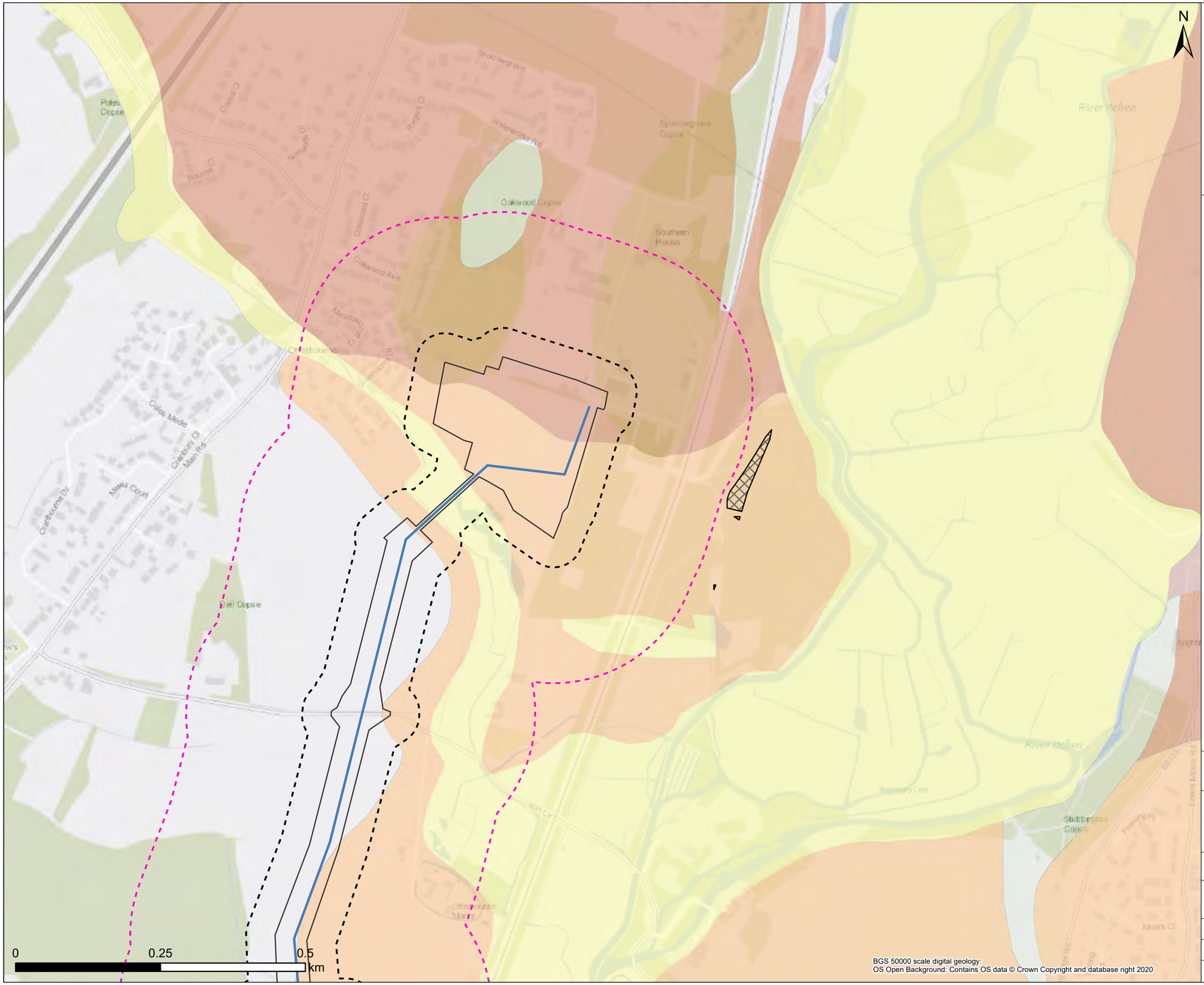



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer

Artificial and Made Ground

- Infilled Land - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

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Figure 2.1 Artificial and Superficial Geology
Scheme Sections - M

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 28 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00728			A

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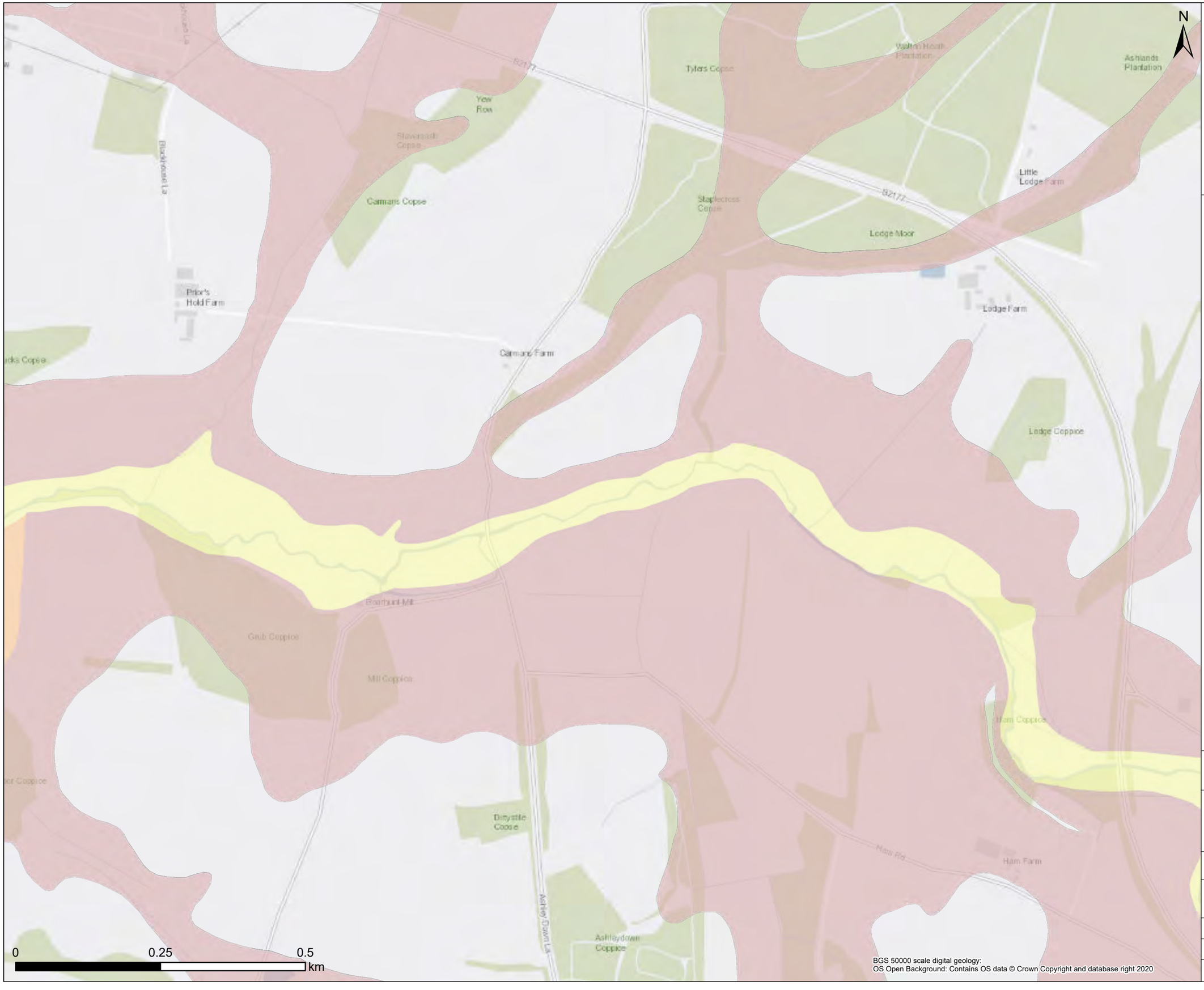



Legend

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Drawing Title
Figure 2.1 Artificial and Superficial Geology
Scheme Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 29 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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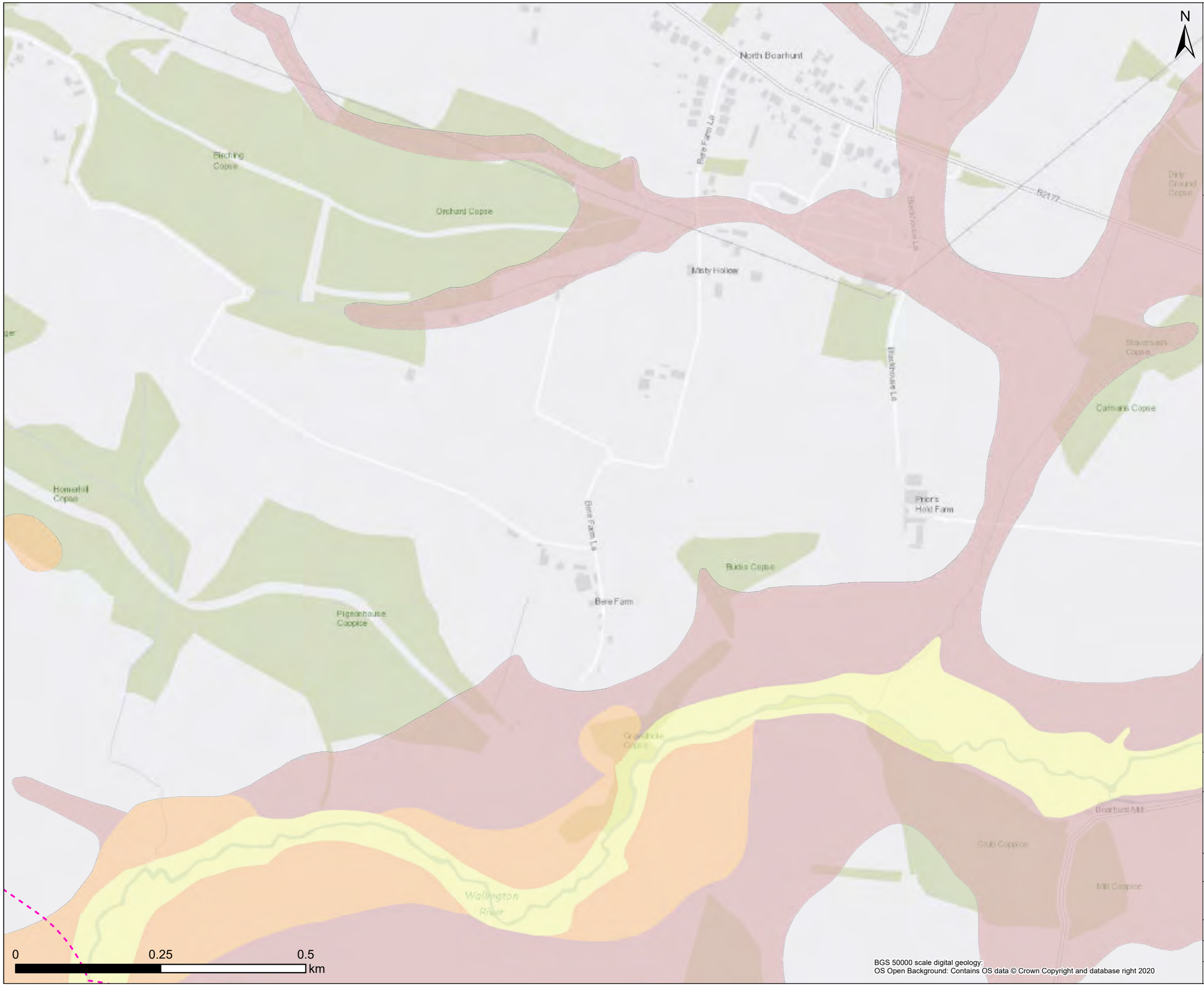



Legend

250m Buffer

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 30 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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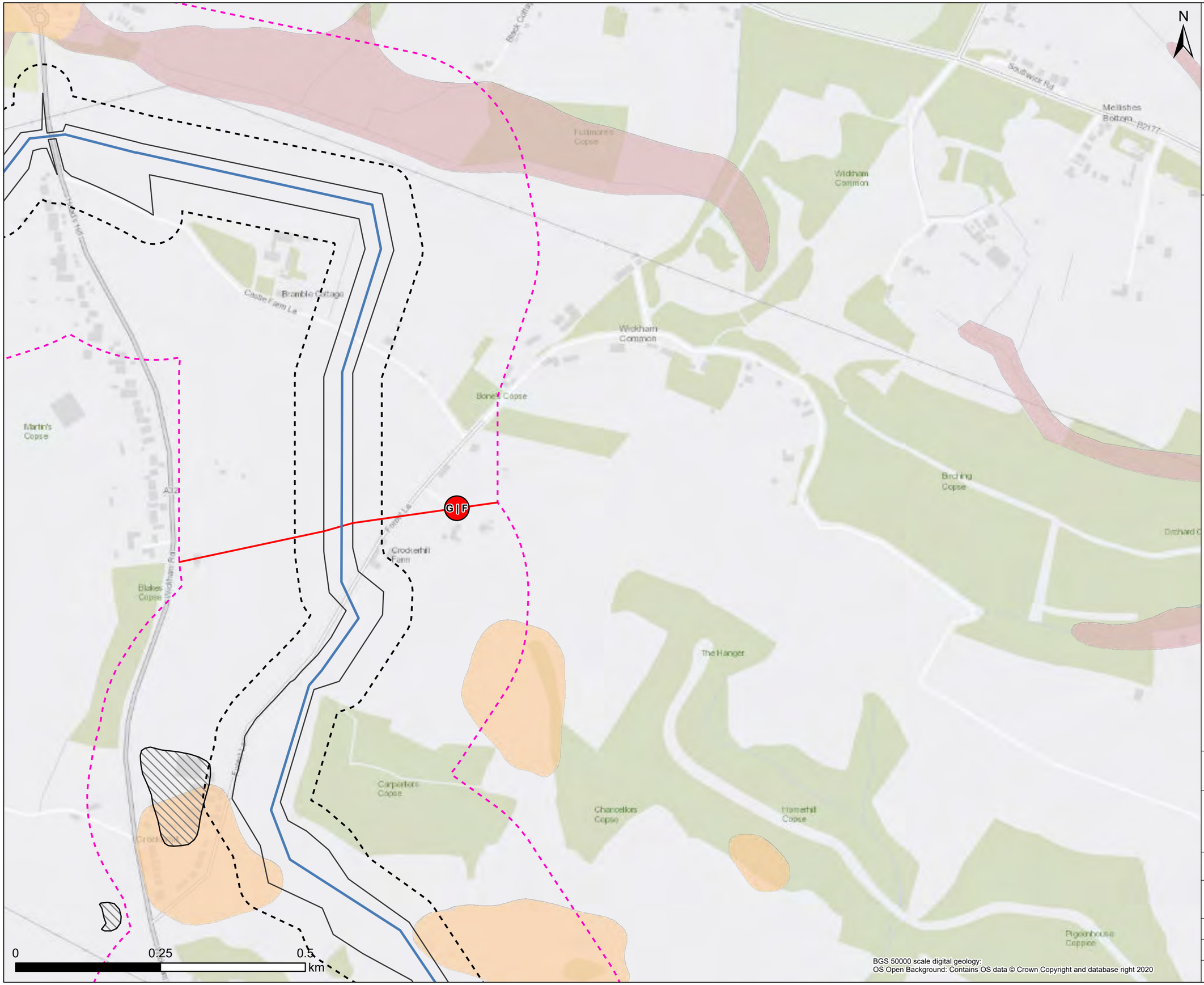



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Scheme Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 31 of 32	A3
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LW	JH	SP	SP
Project No.			Revision
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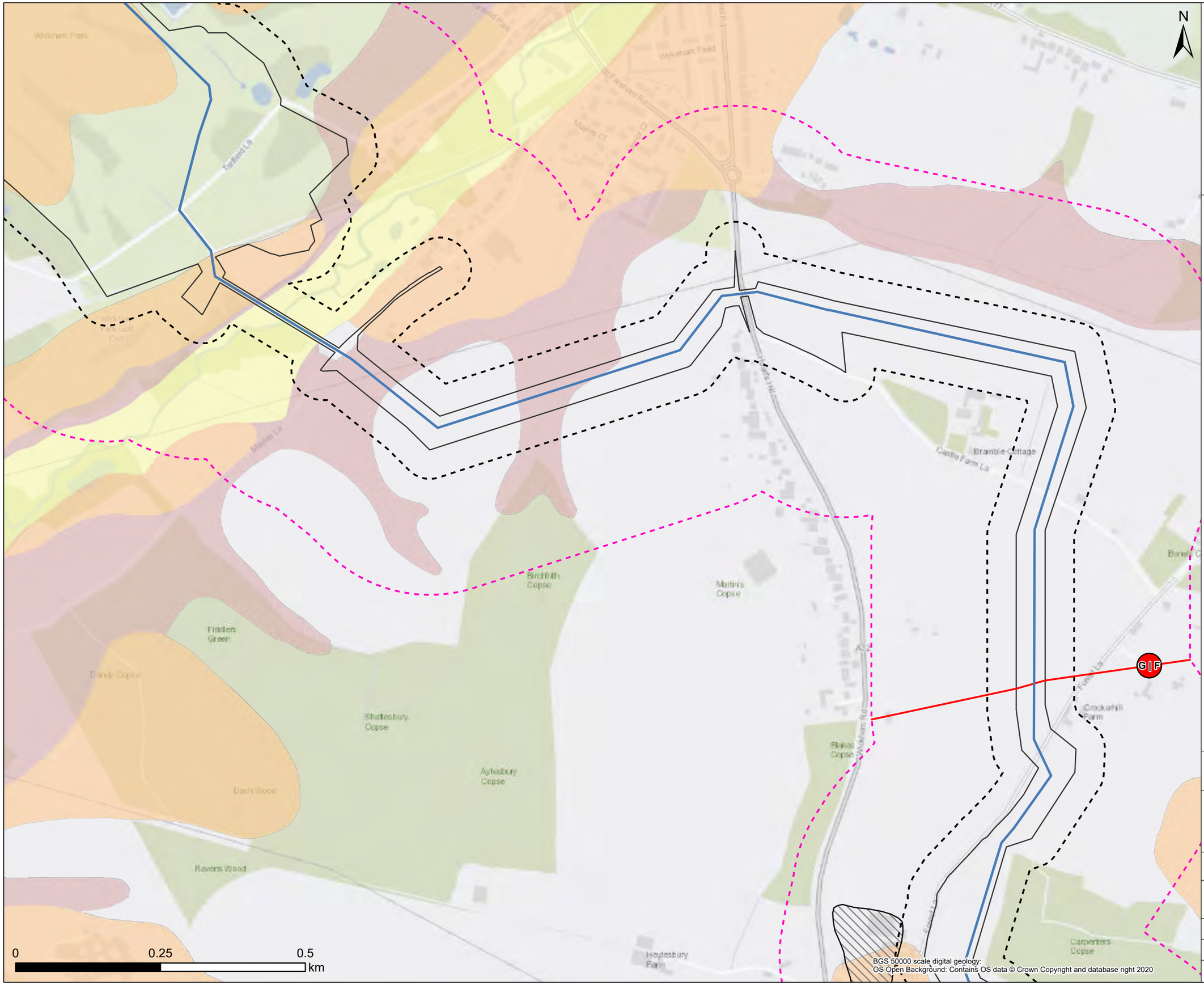



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 50m Buffer
- 250m Buffer
- Section Break
- Pipeline Section Break

Artificial and Made Ground

- Made Ground (Undivided) - Artificial Deposit

Superficial Geology

- Alluvium - Clay, Silt, Sand and Gravel (ALV)
- Head - Clay, Silt, Sand and Gravel (HEAD)
- River Terrace Deposits (RTD)
- River Terrace Deposits (Undifferentiated (U)) (RTD)
- Raised Marine Deposits (RMD)
- Beach and Tidal Flat Deposits (Undifferentiated) (BTFU)
- Clay-with-Flints Formation (CWF)

Note: Scale has been modified from 1:5000 to include the 250m buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 50m / 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 90m / 290m (40m pipe corridor + 50m or 250m buffer respectively).

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Figure 2.1 Artificial and Superficial Geology
Scheme Sections - F

Scale	Date Drawn	Page	Sheet Size
1:6,000	01/10/2024	Sheet 32 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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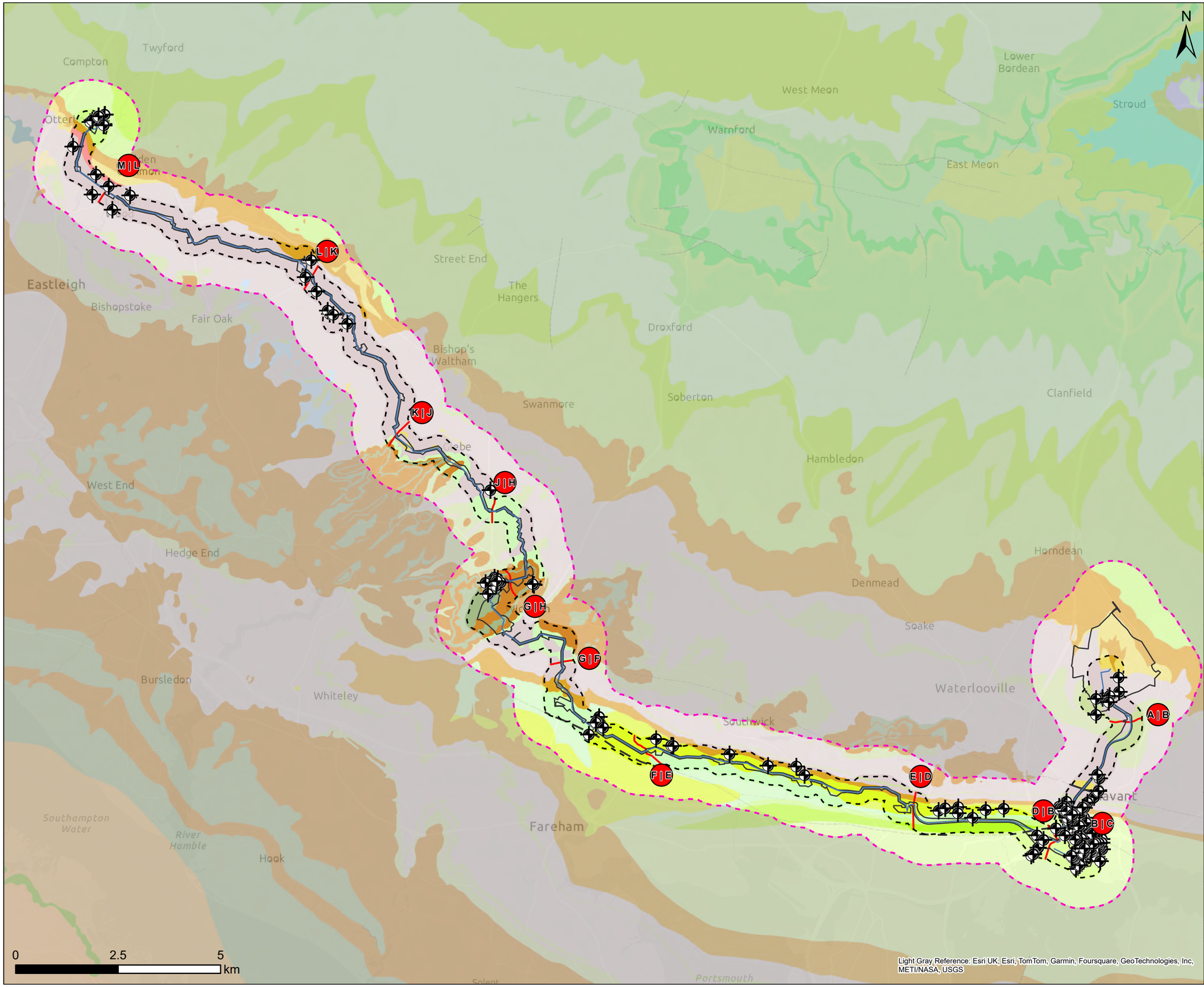



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- 1km buffer from Draft Order Limits
- Section Break
- Pipeline Section Break
- BGS Borehole

Bedrock Fault

- Portsdown Anticline
- Bere Forest Syncline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

Note: 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 290m (40m pipe corridor 250m buffer).

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Project Title: Water For Life Hampshire

Drawing Title: Figure 3.0 Bedrock Geology Scheme Overview

Scale	Date Drawn	Page	Sheet Size
1:85,000	01/10/2024	3.0	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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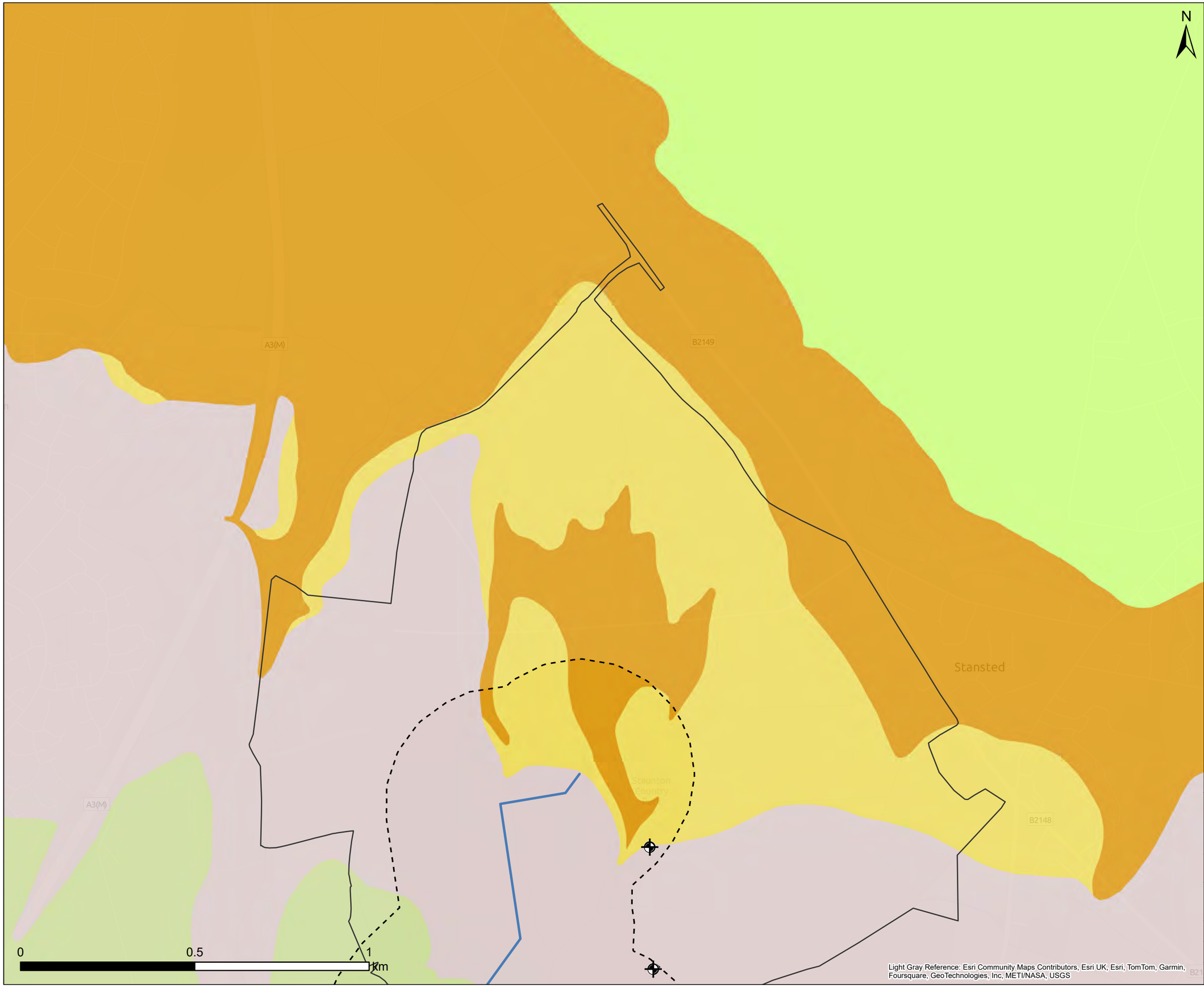



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

Note: Scale has been modified from 1:5000 to 1:10000 to include the 1km buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 290m (40m pipe corridor + 250m buffer).

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WATER forLIFE from Southern Water.

Project Title: Water For Life Hampshire

Drawing Title: Figure 3.1 Bedrock Geology Sections - A

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 1 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00701	A

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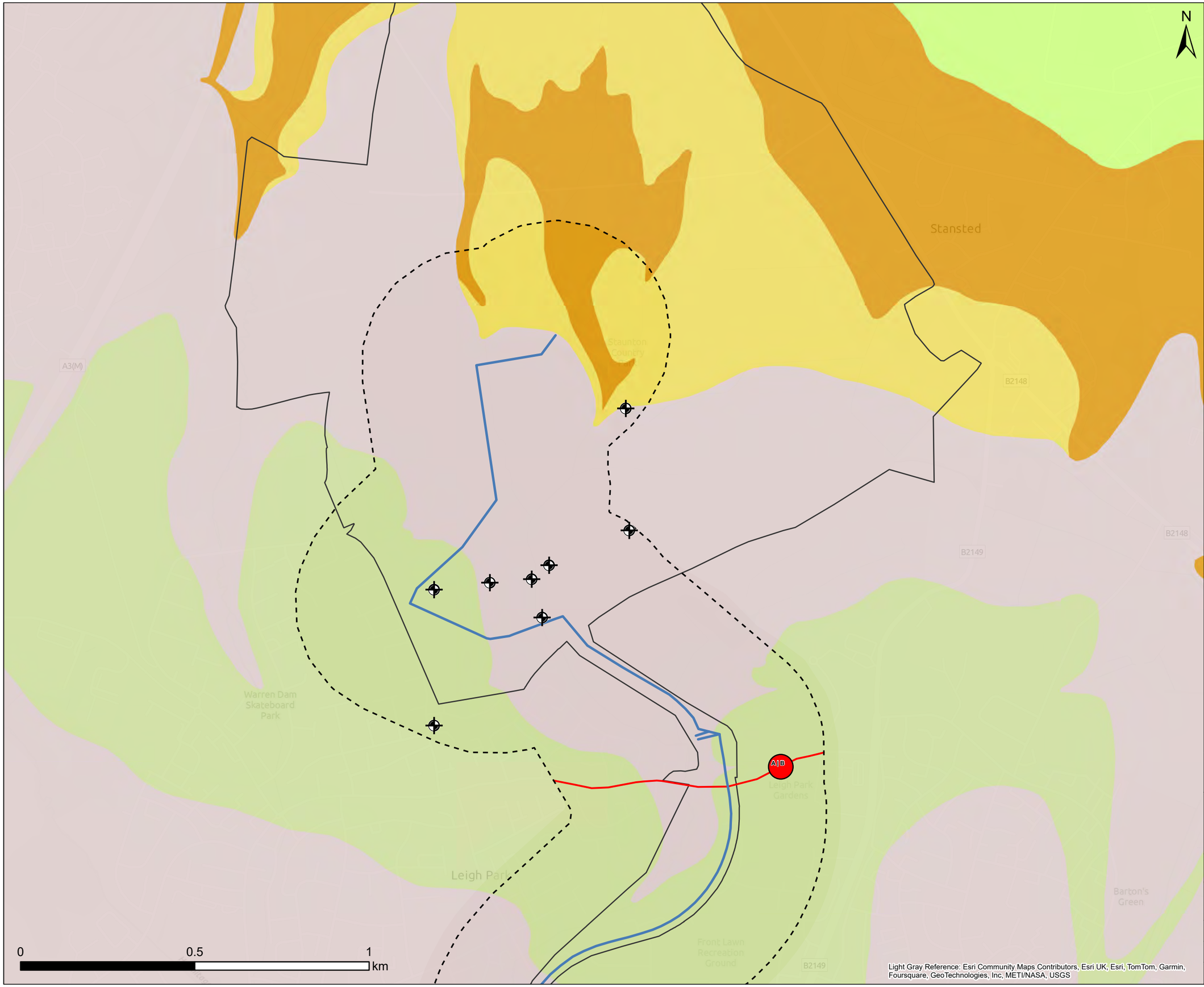



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
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WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - A

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 2 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00702			A

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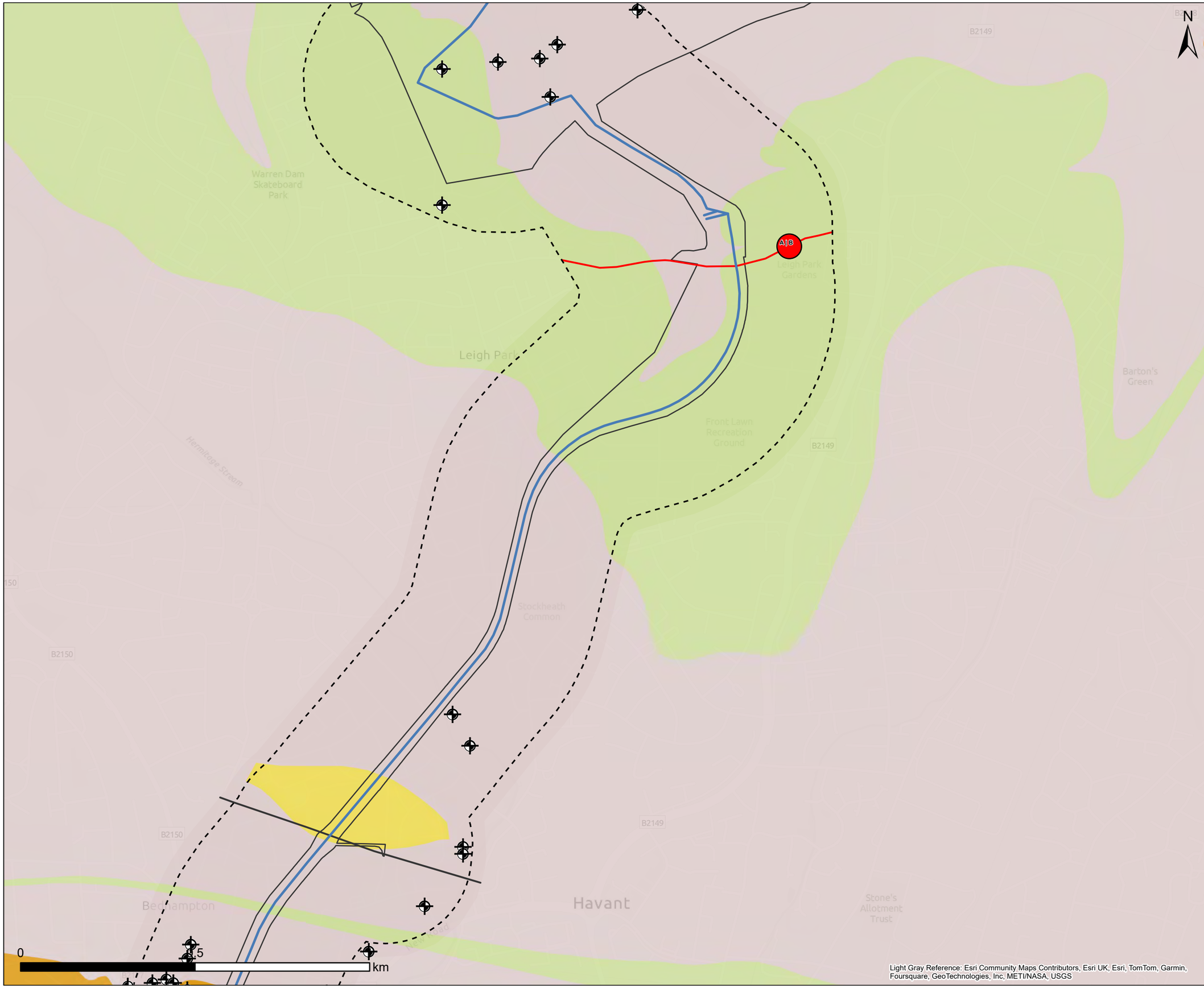

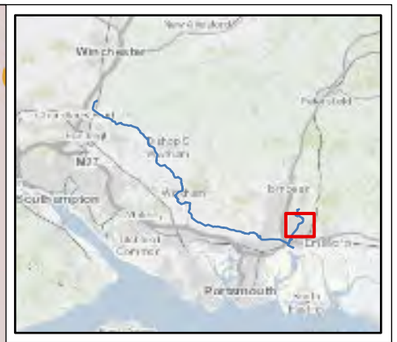

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Bere Forest Syncline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
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- Wittering Formation - Sand, Silt and Clay (WTT)
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- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
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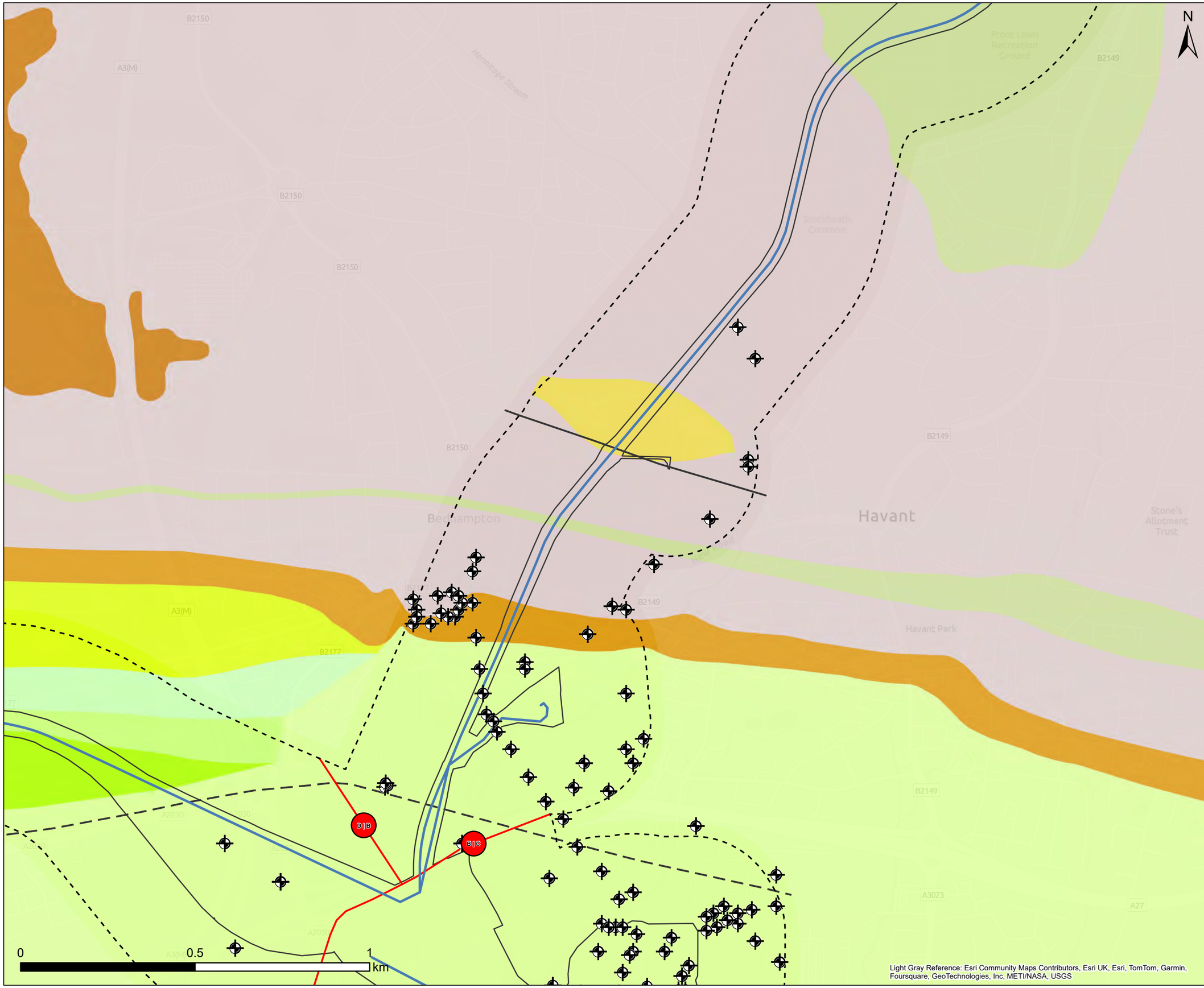
WATER for LIFE from Southern Water

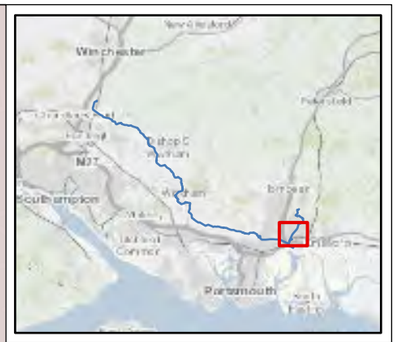
Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - B

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 3 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00703			A

Light Gray Reference: Esri Community Maps Contributors, Esri UK, Esri, TomTom, Garmin, Foursquare, GeoTechnologies, Inc, METI/NASA, USGS





Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline
- Bere Forest Syncline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
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WATER forLIFE from Southern Water.

Project Title: Water For Life Hampshire

Drawing Title: Figure 3.1 Bedrock Geology Sections - B

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 4 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00704			A

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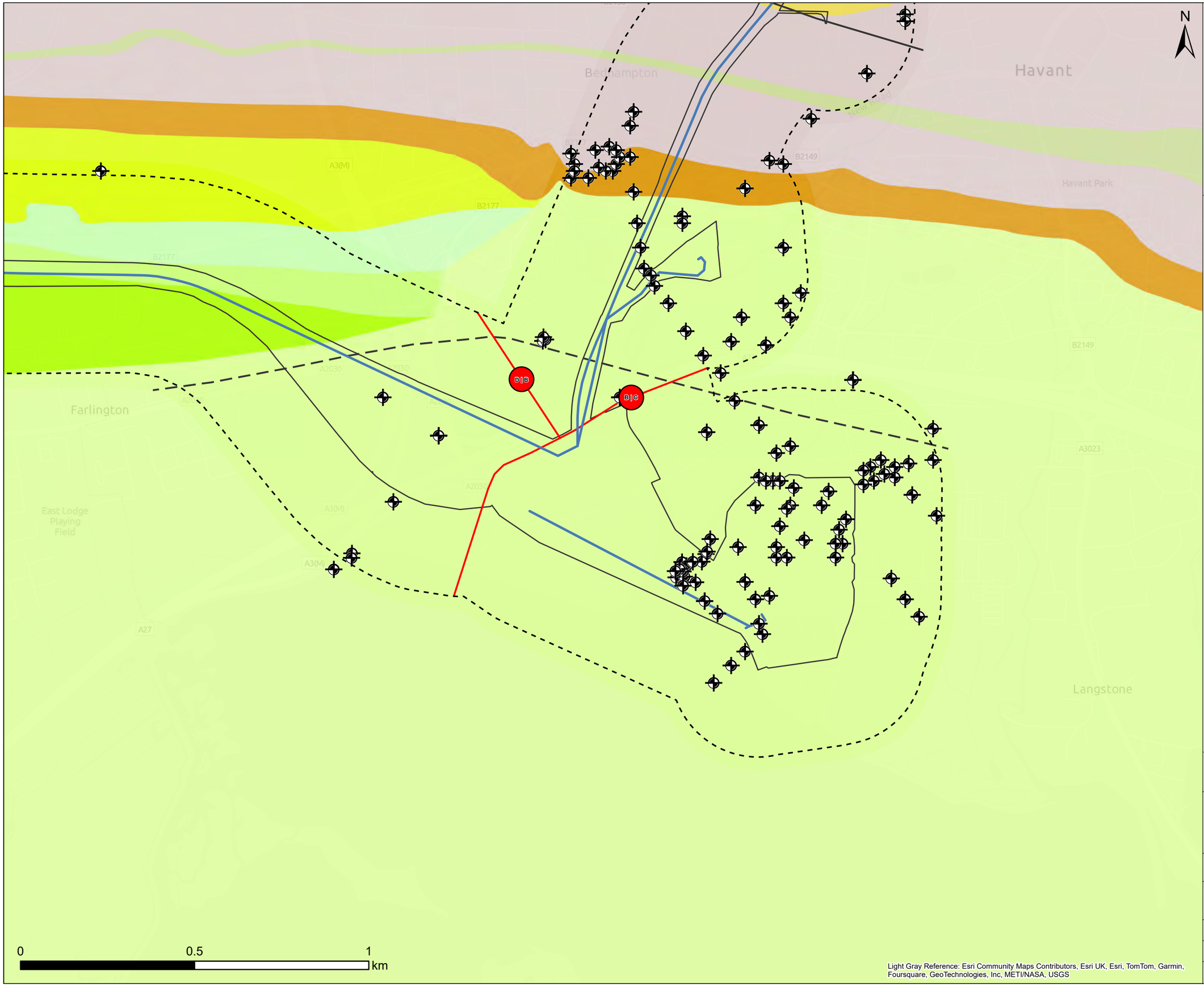

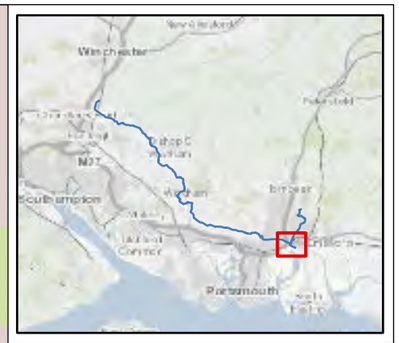

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline
- Bere Forest Syncline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
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WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - C

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 5 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00705			A

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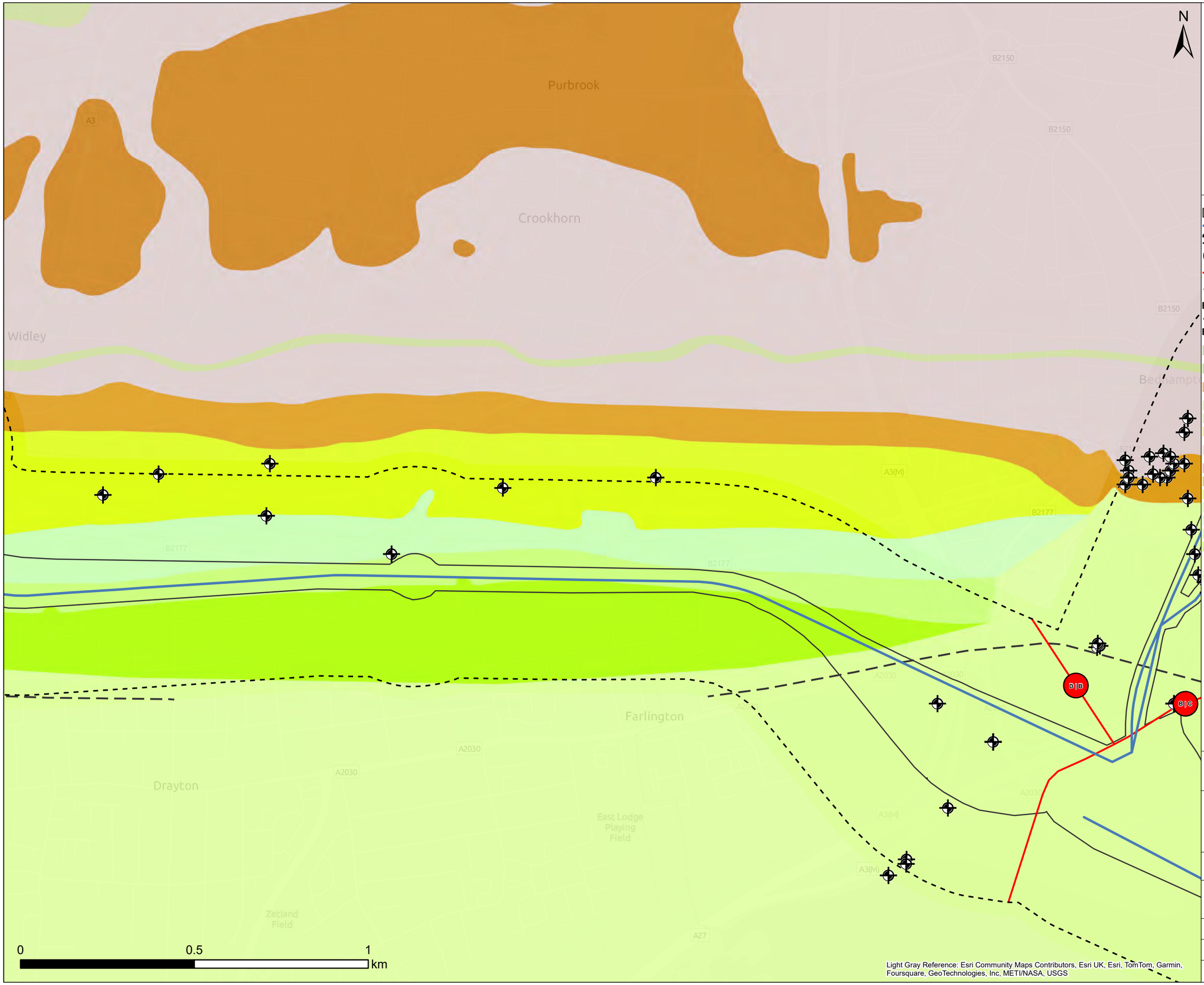

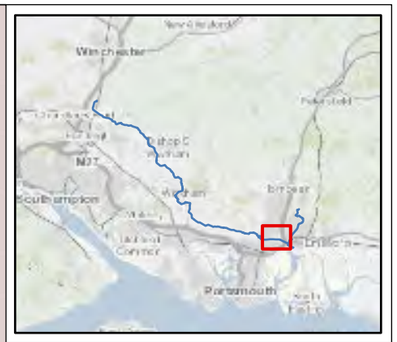

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
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WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - D

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 6 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00706			A

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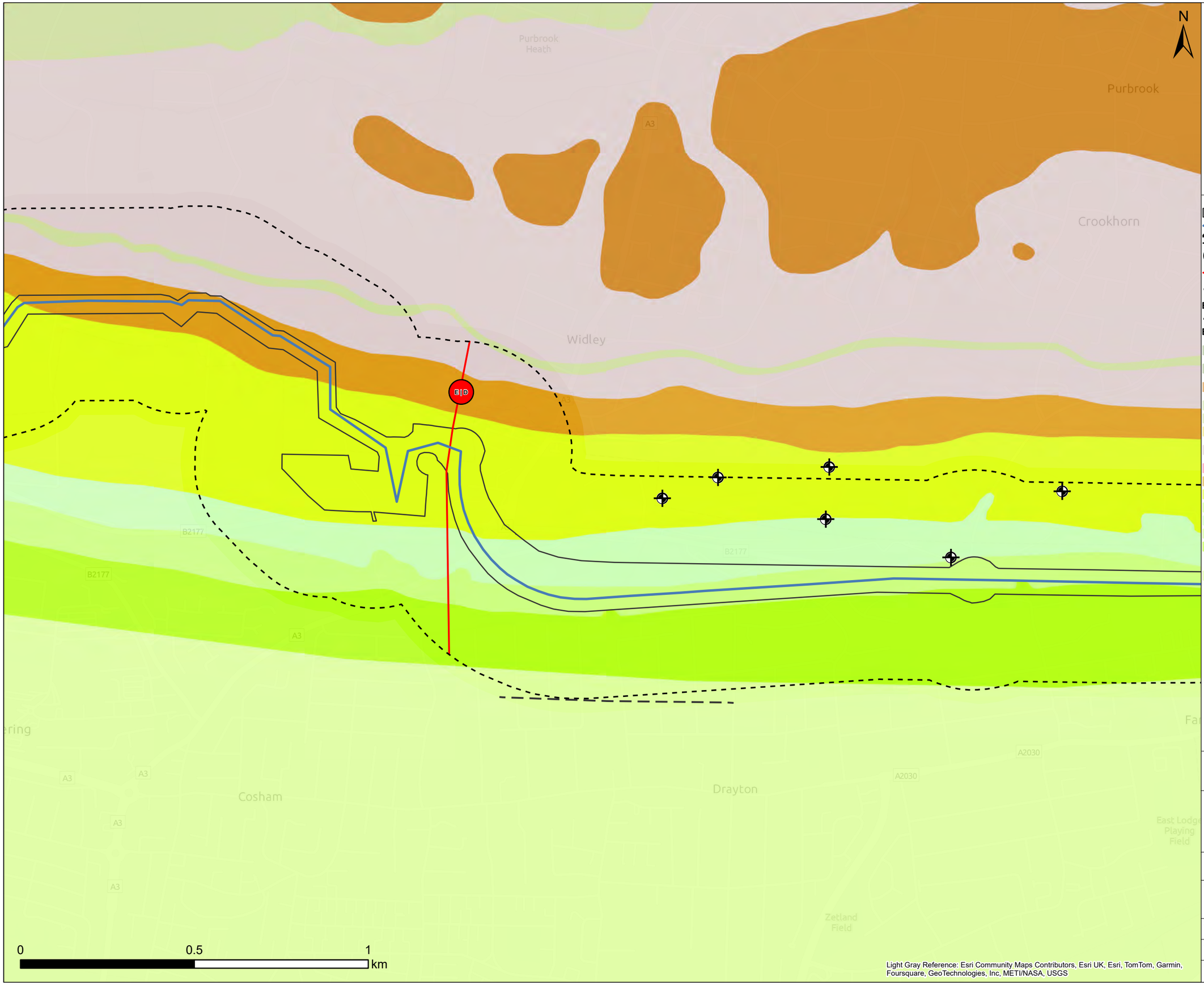

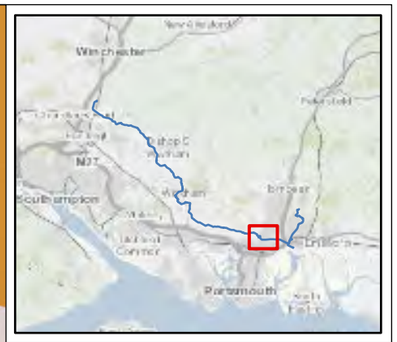

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

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WATER forLIFE from Southern Water.

Project Title: Water For Life Hampshire

Drawing Title: Figure 3.1 Bedrock Geology Sections - D

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 7 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00707			A

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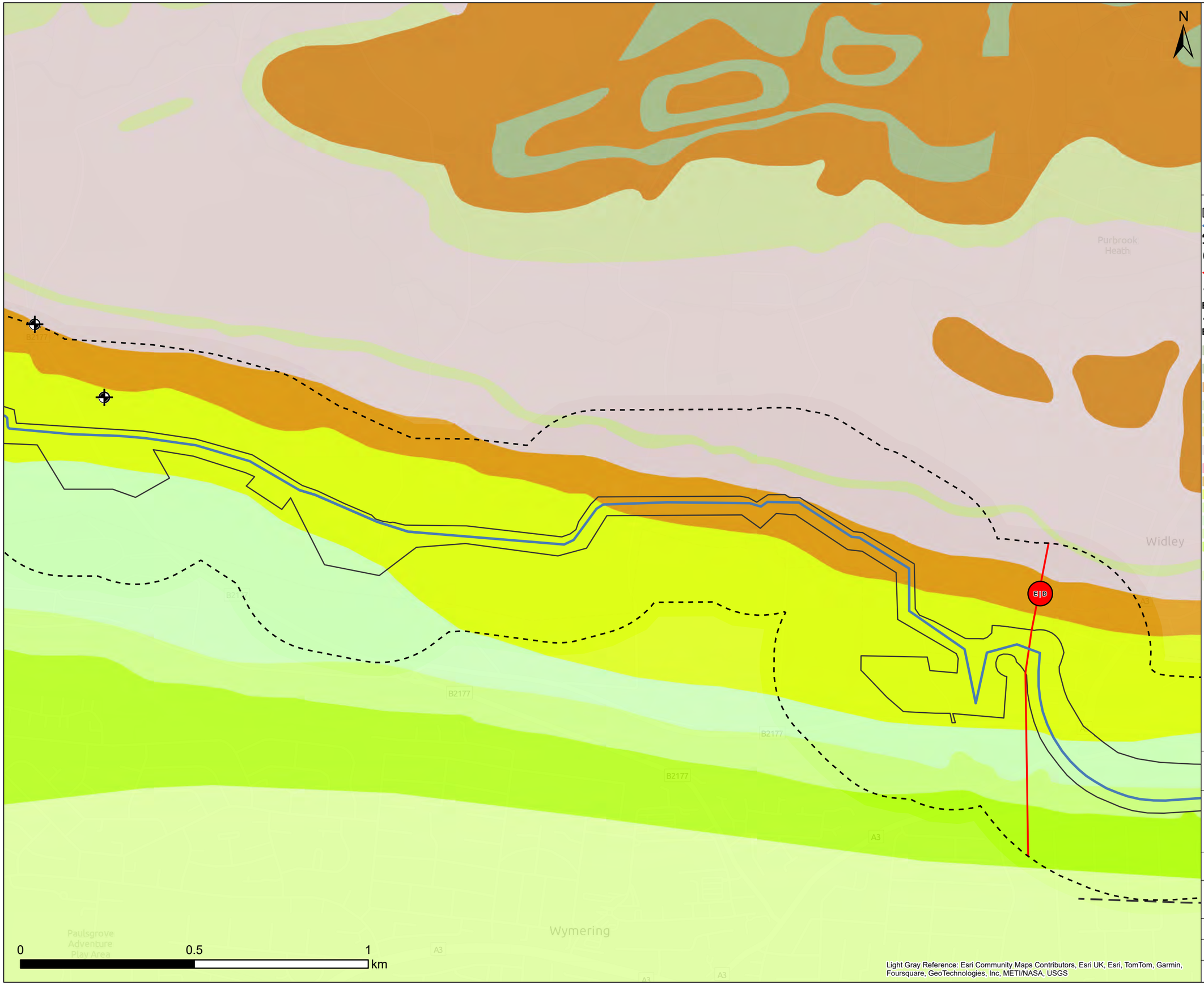

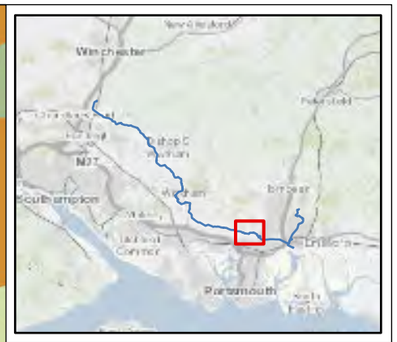

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

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WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - E

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 8 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00708			A

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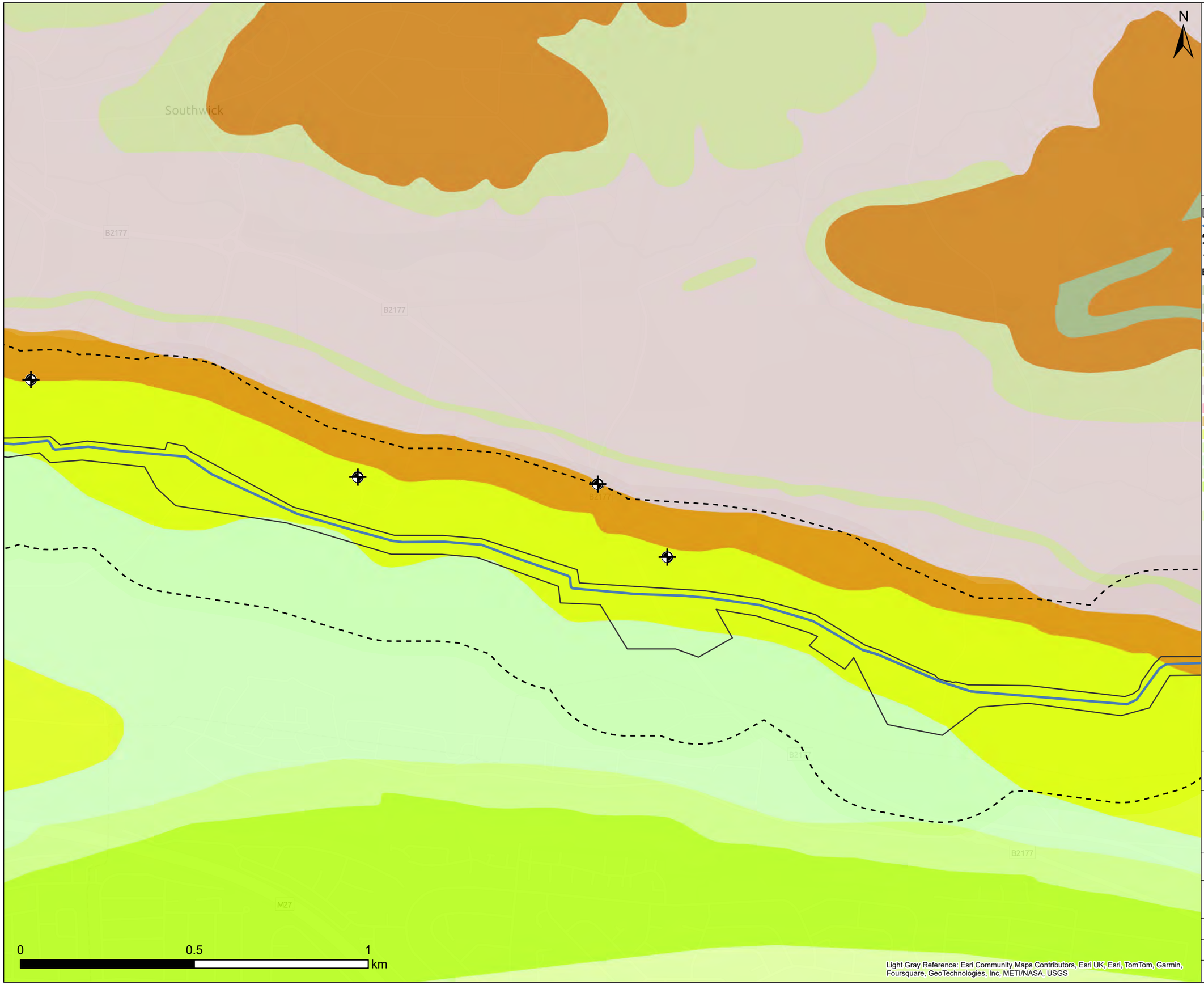



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- BGS Boreholes

Bedrock Geology

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Project Title
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Drawing Title
Figure 3.1 Bedrock Geology Sections - E

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 9 of 32	A3
Originator	Checker	Reviewer	Approver
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Project No.			Revision
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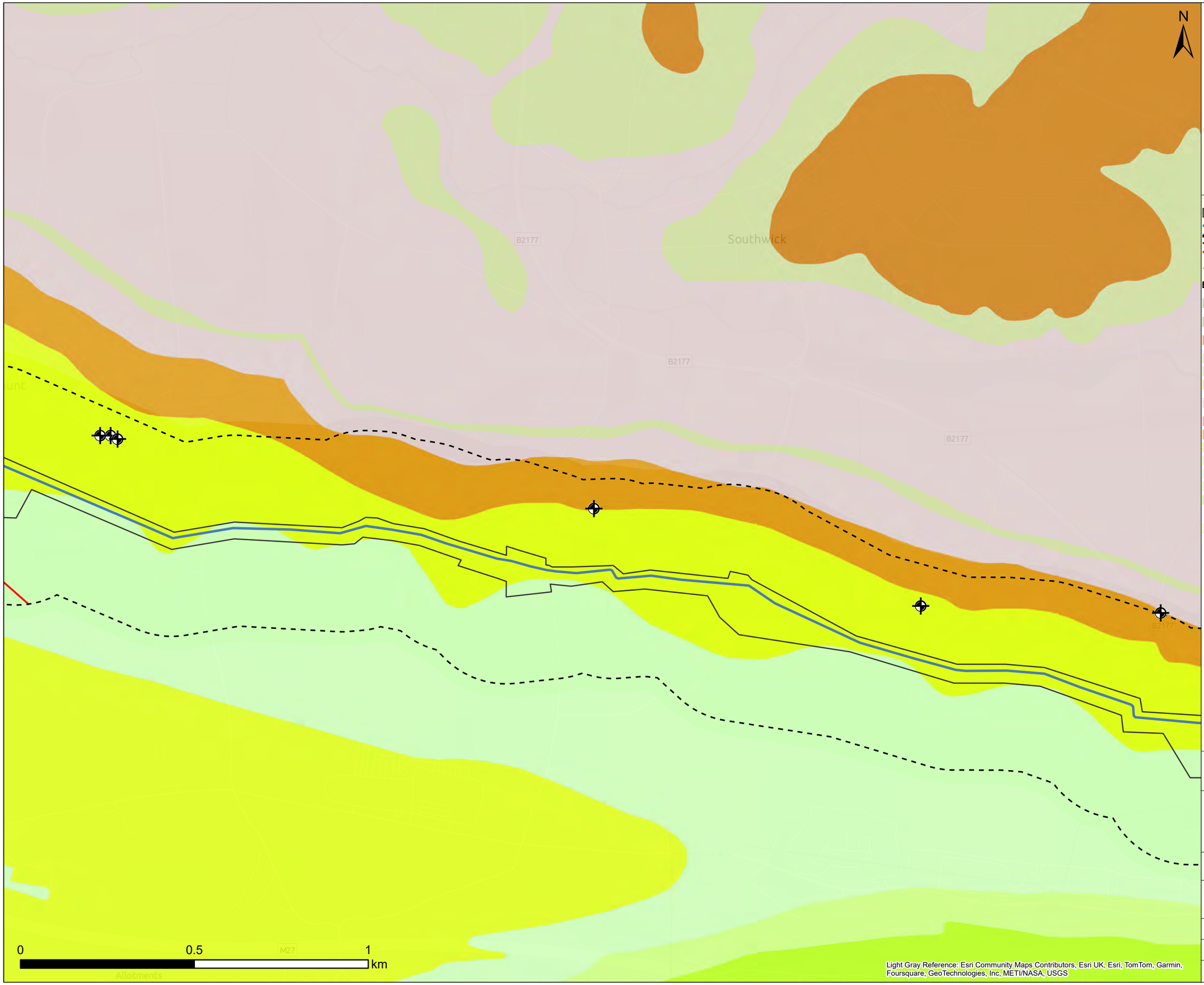

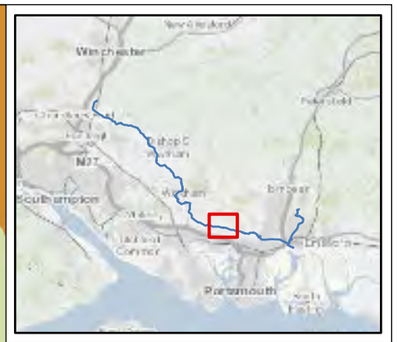

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

Note: Scale has been modified from 1:5000 to 1:10000 to include the 1km buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 290m (40m pipe corridor + 250m buffer).

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WATER for LIFE from Southern Water

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - E

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 10 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00710			Revision: A

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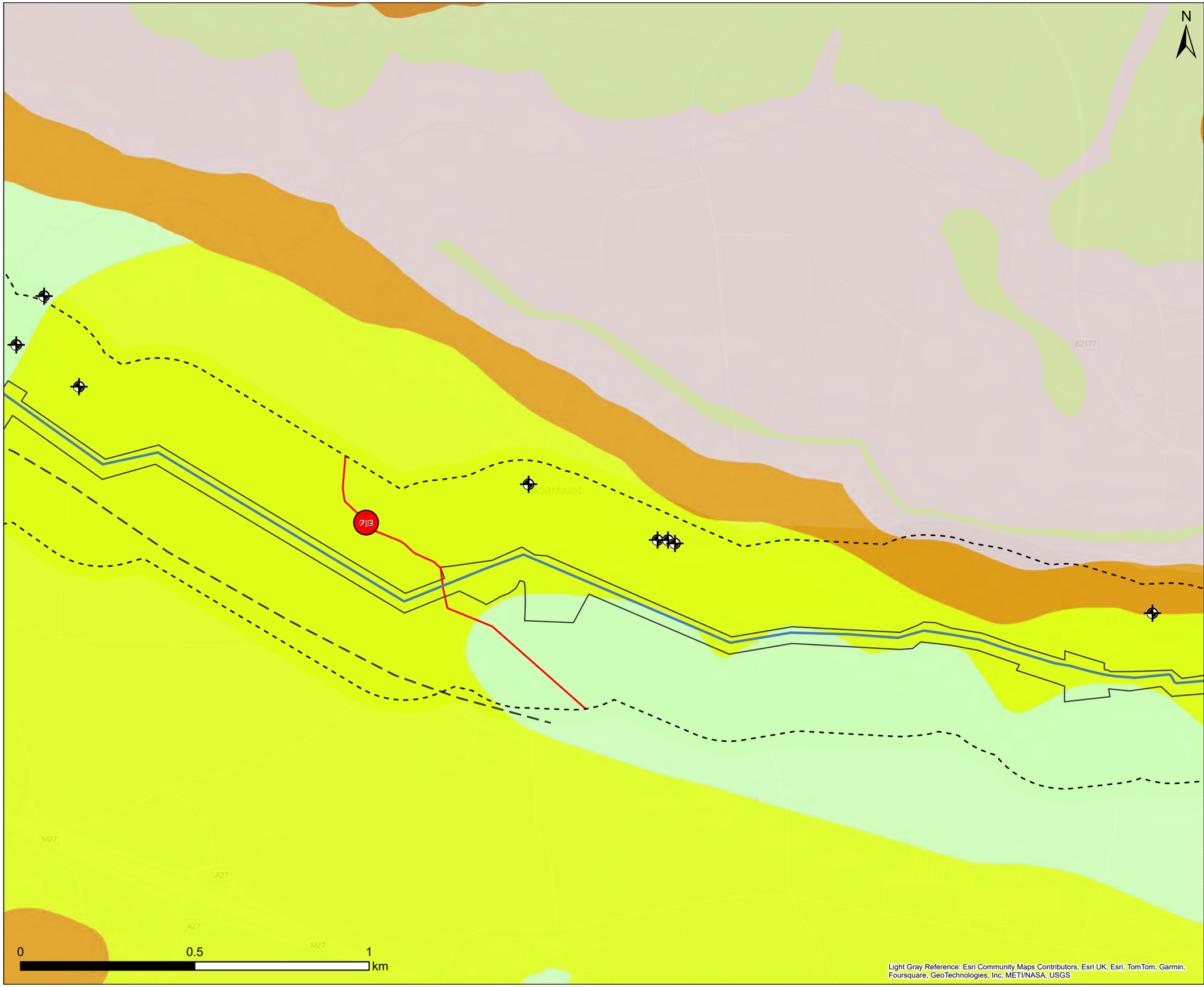



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
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Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - E

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 11 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00711			Revision: A

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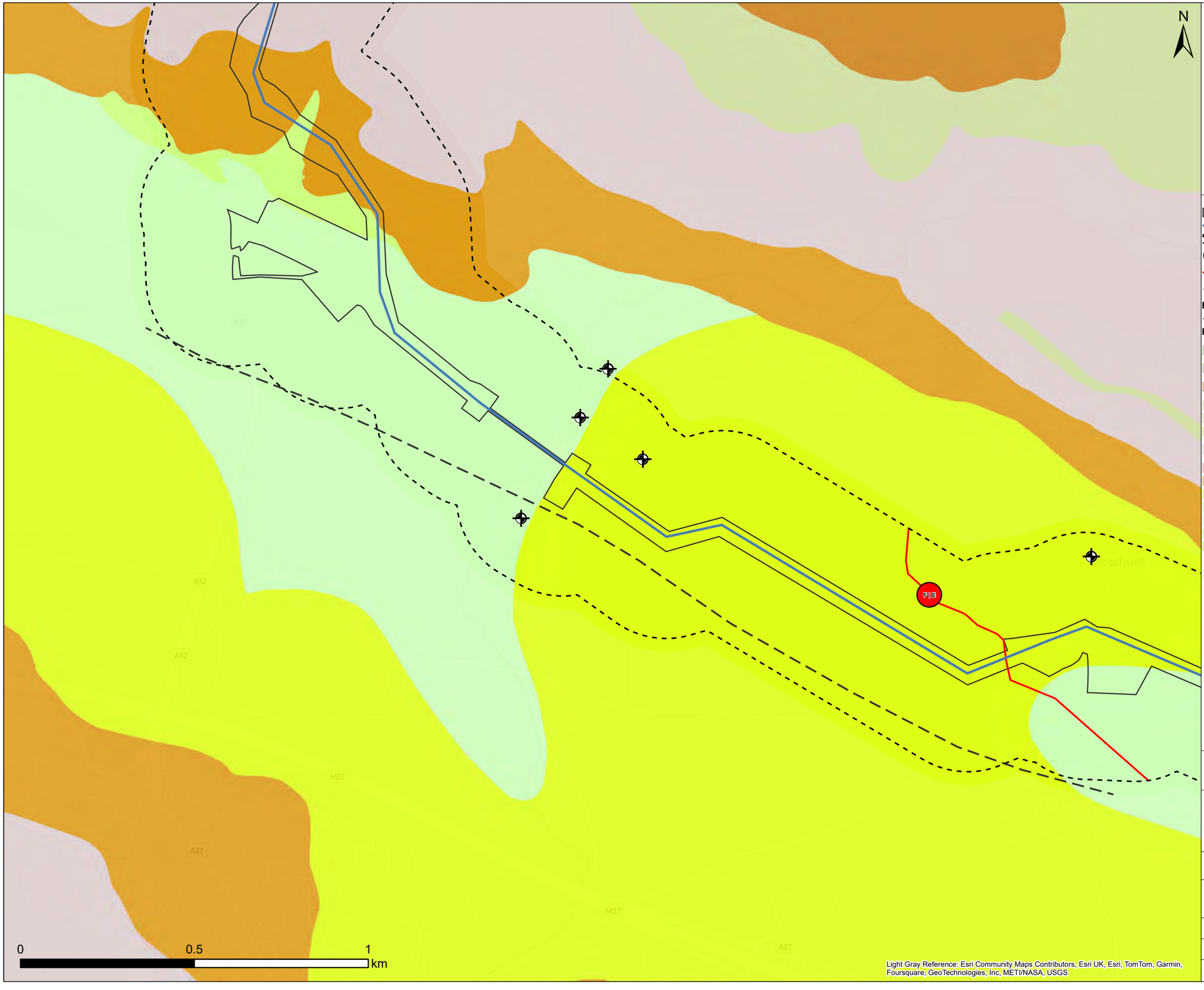



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
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- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
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WATER for LIFE from Southern Water.

Project Title
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Drawing Title
Figure 3.1 Bedrock Geology Sections - F

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 12 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00712			A

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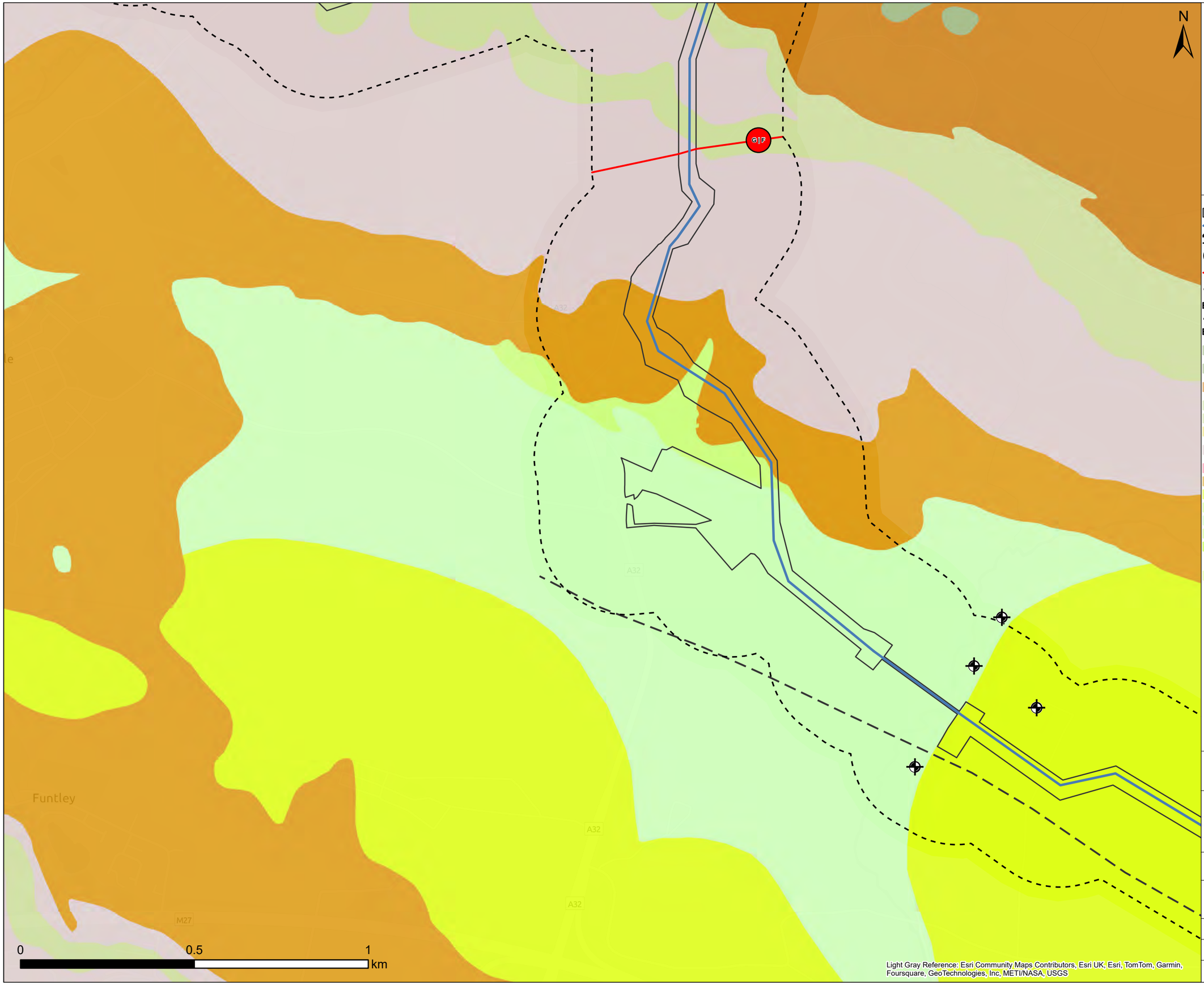



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
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Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - F

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 13 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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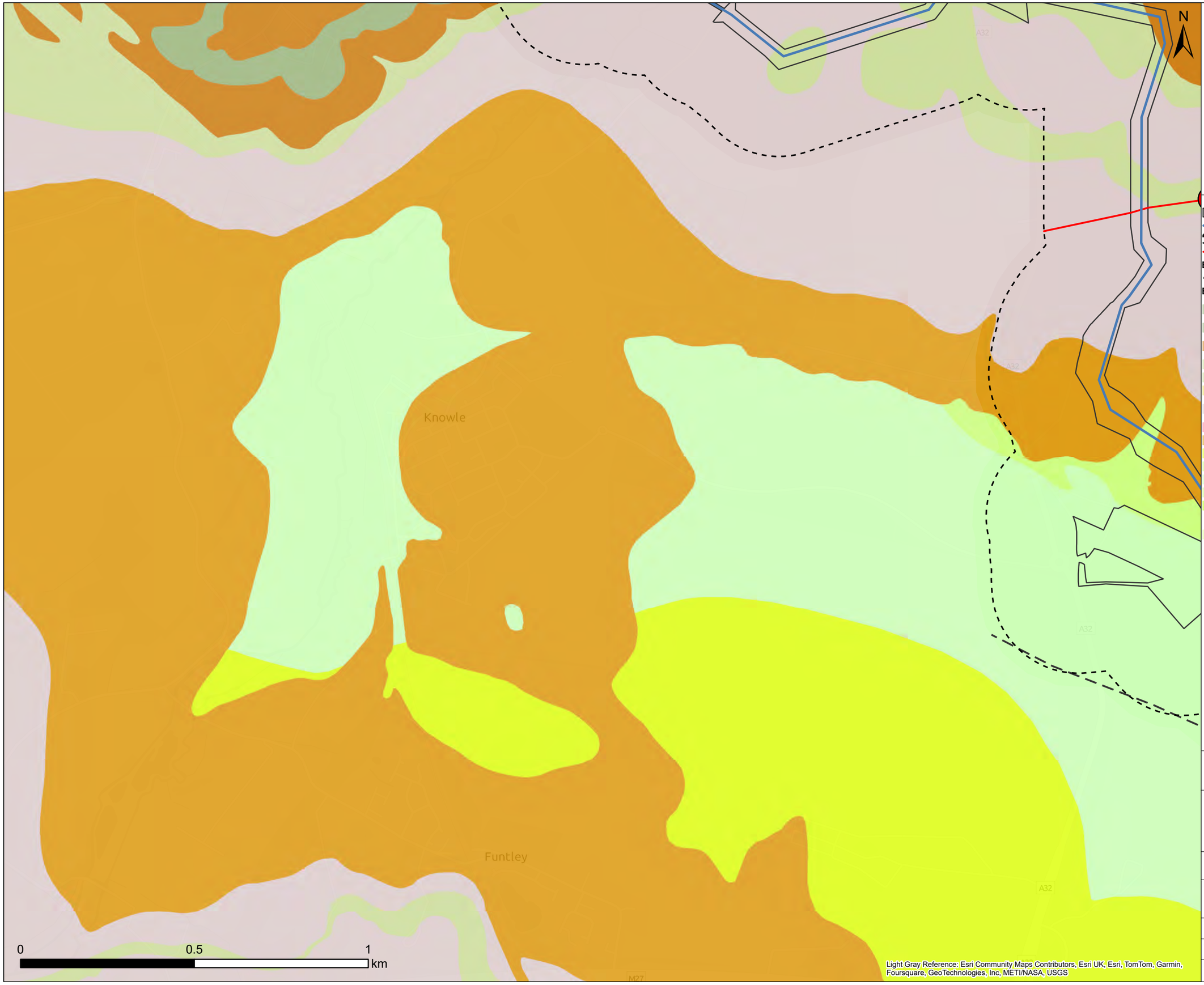



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Pipeline Section Break

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
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WATER forLIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - G

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 14 of 32	A3
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Project No.			Revision
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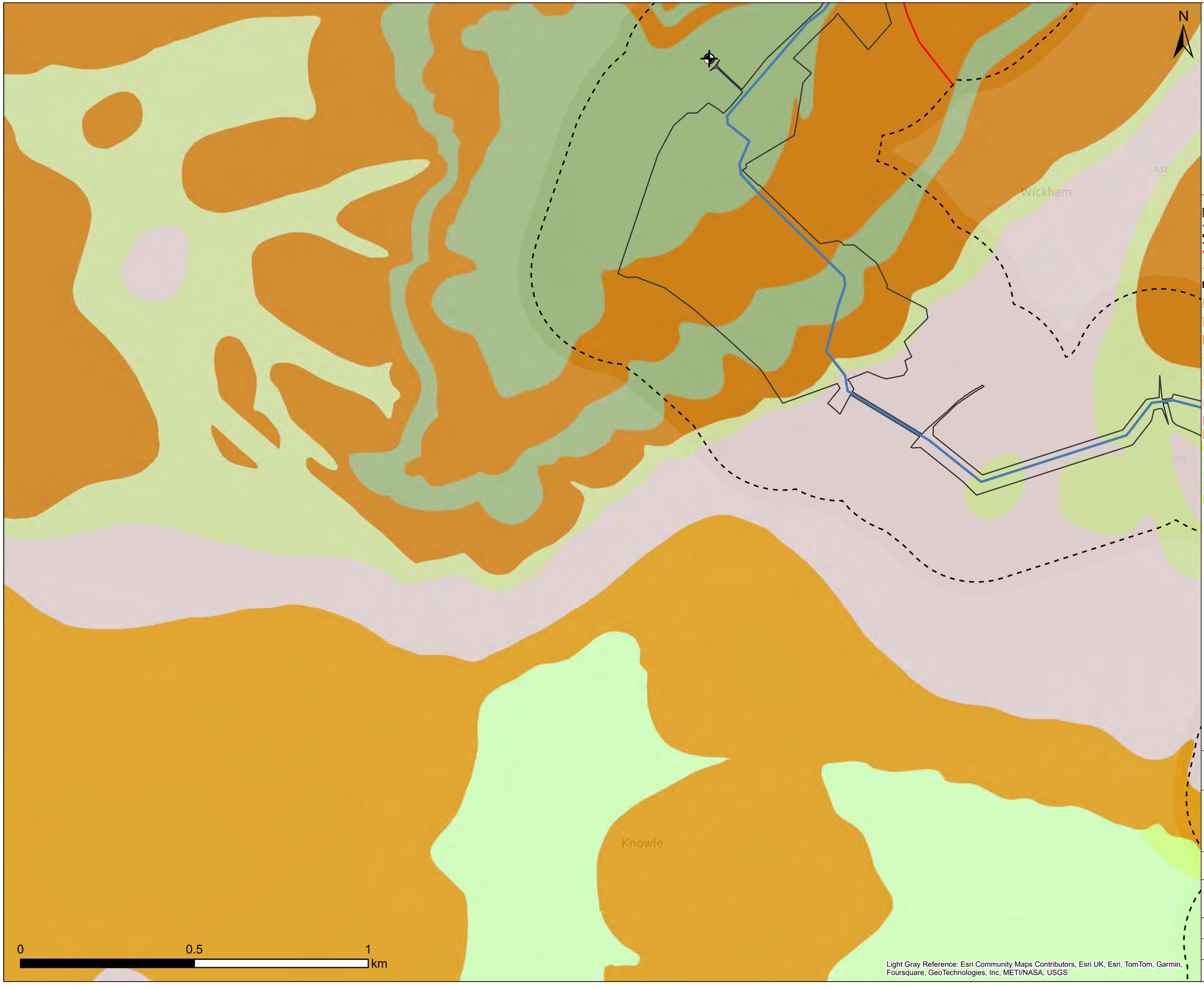



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
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Figure 3.1 Bedrock Geology Sections - G

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 15 of 32	A3
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LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00715			A

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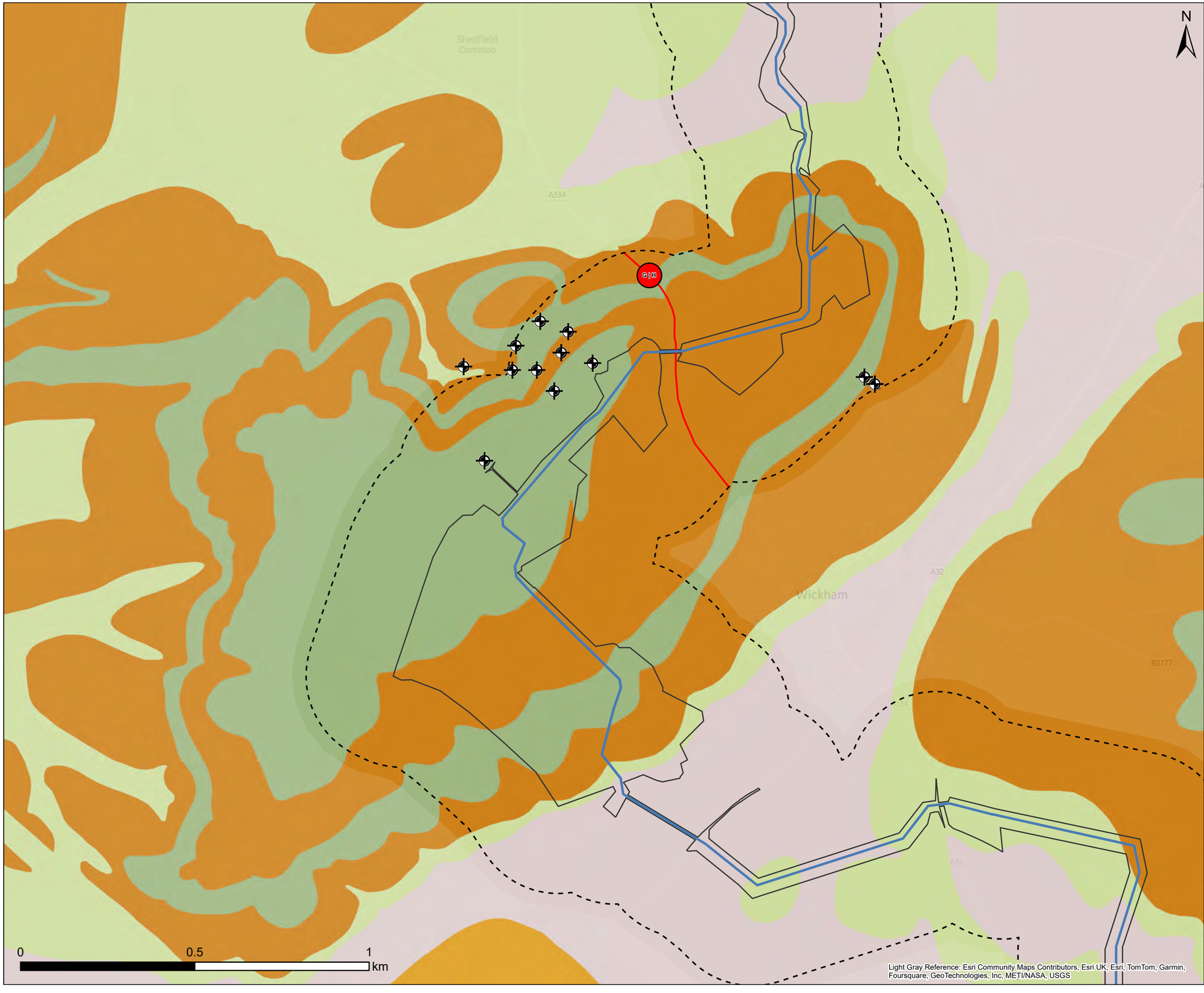



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
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Project Title: Water For Life Hampshire

Drawing Title: Figure 3.1 Bedrock Geology Sections - G

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 16 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00716			Revision: A

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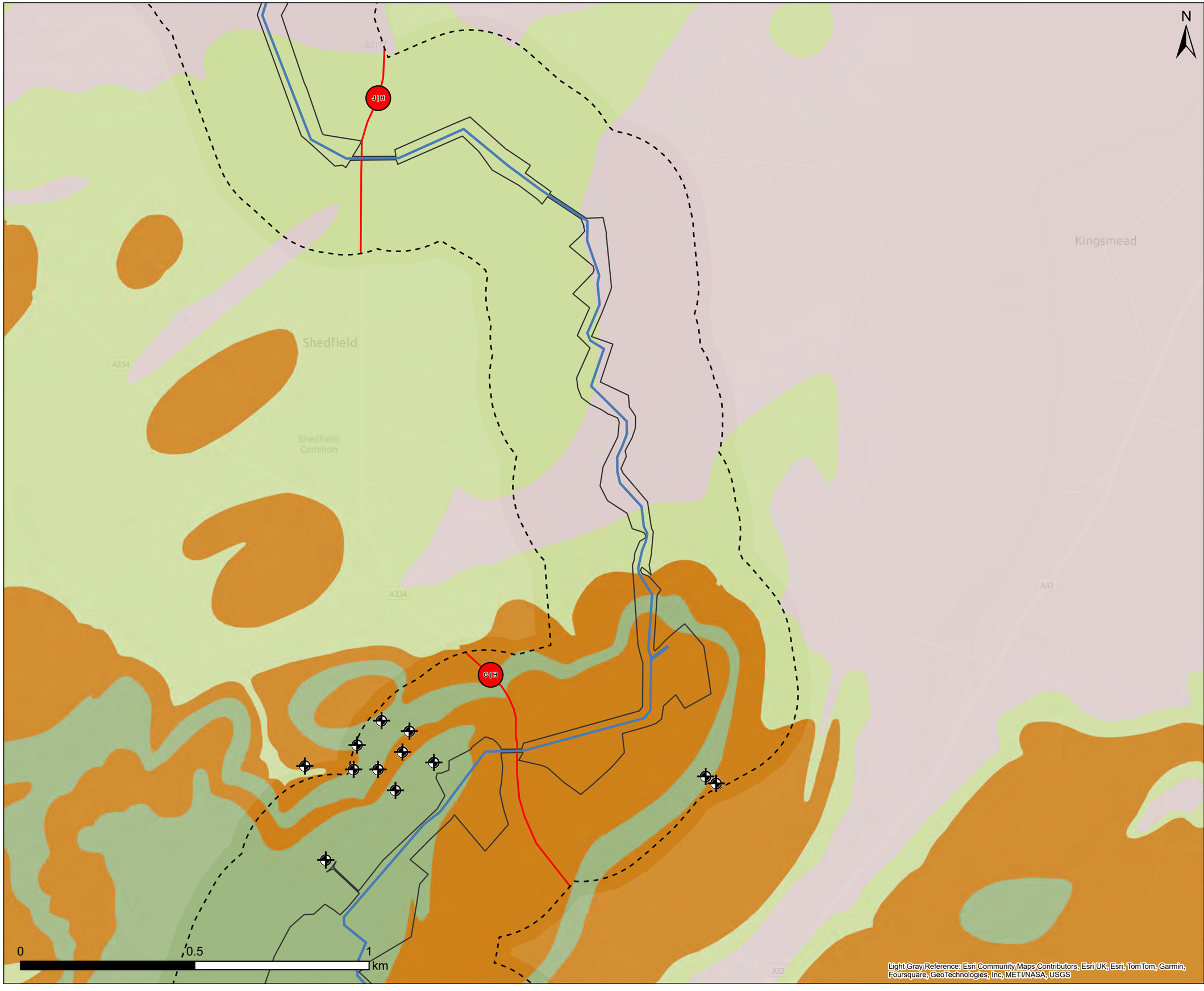



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
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- London Clay Formation - Sand (LC)
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- Portsdown Chalk Formation - Chalk (PCK)
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Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - H

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 17 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
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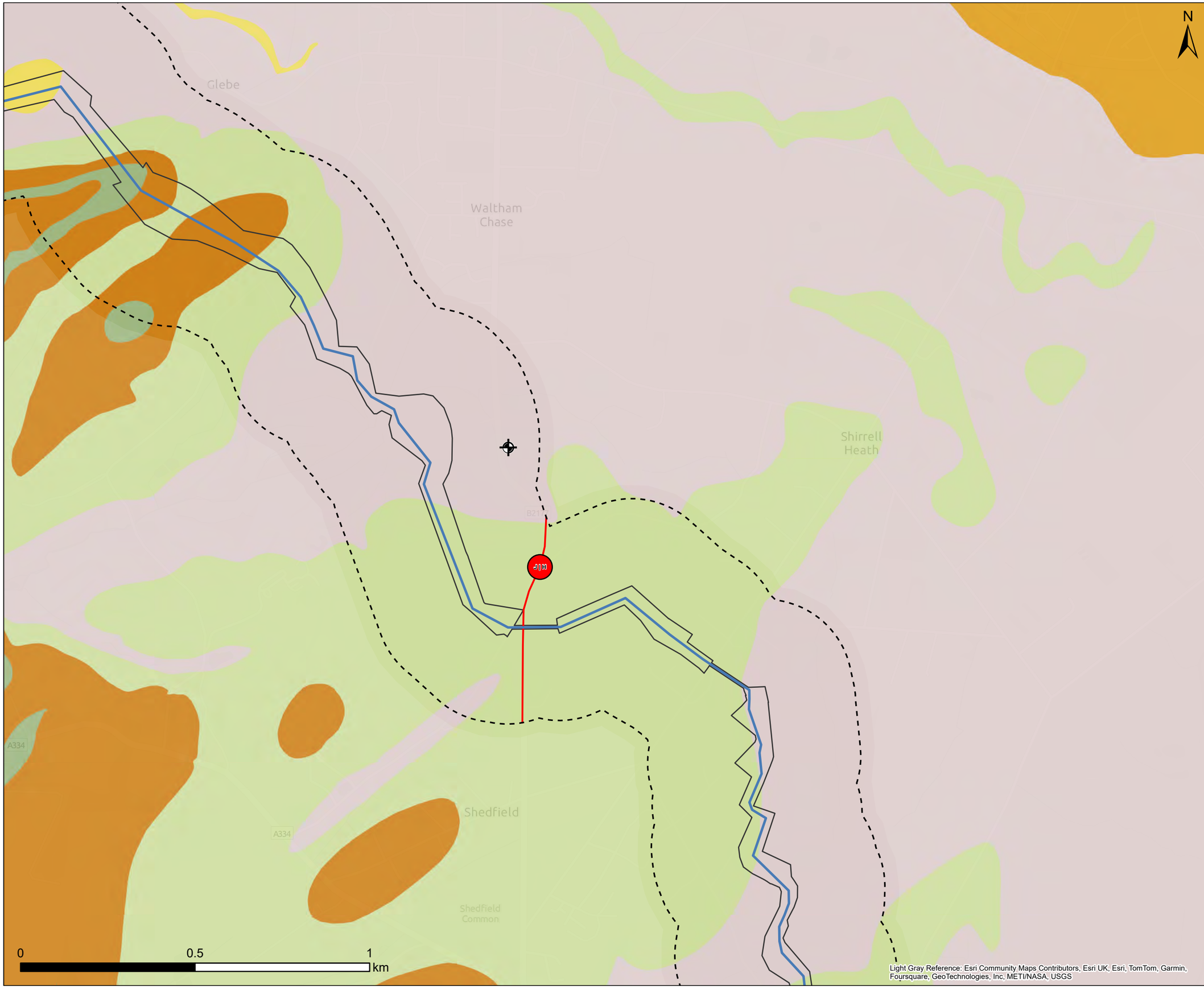

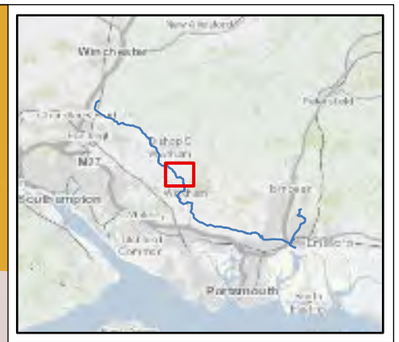

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
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- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
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Project Title: Water For Life Hampshire

Drawing Title: Figure 3.1 Bedrock Geology Sections - H

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 18 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00718	A

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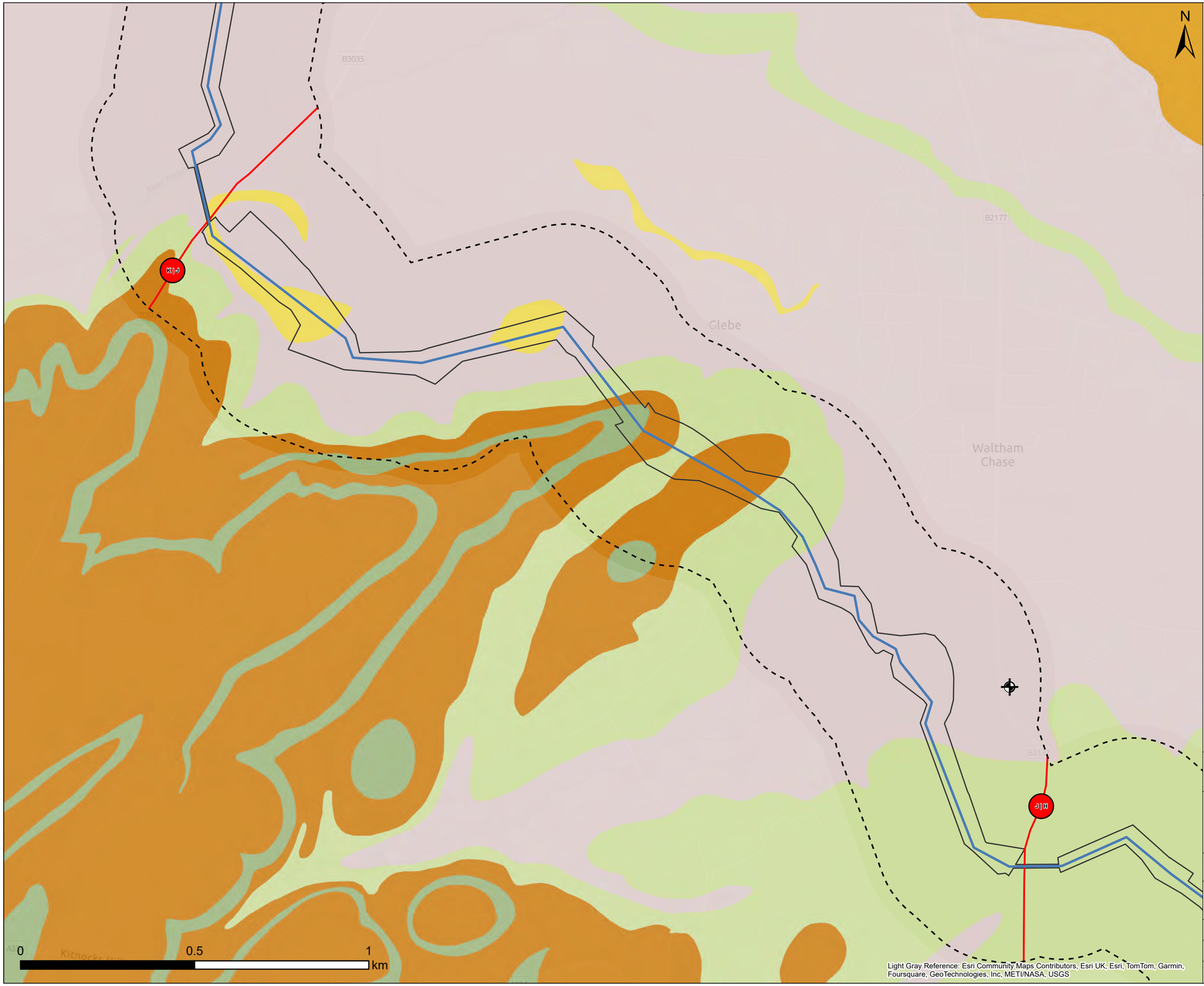



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

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- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
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- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
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WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - J

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 19 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00719			Revision: A

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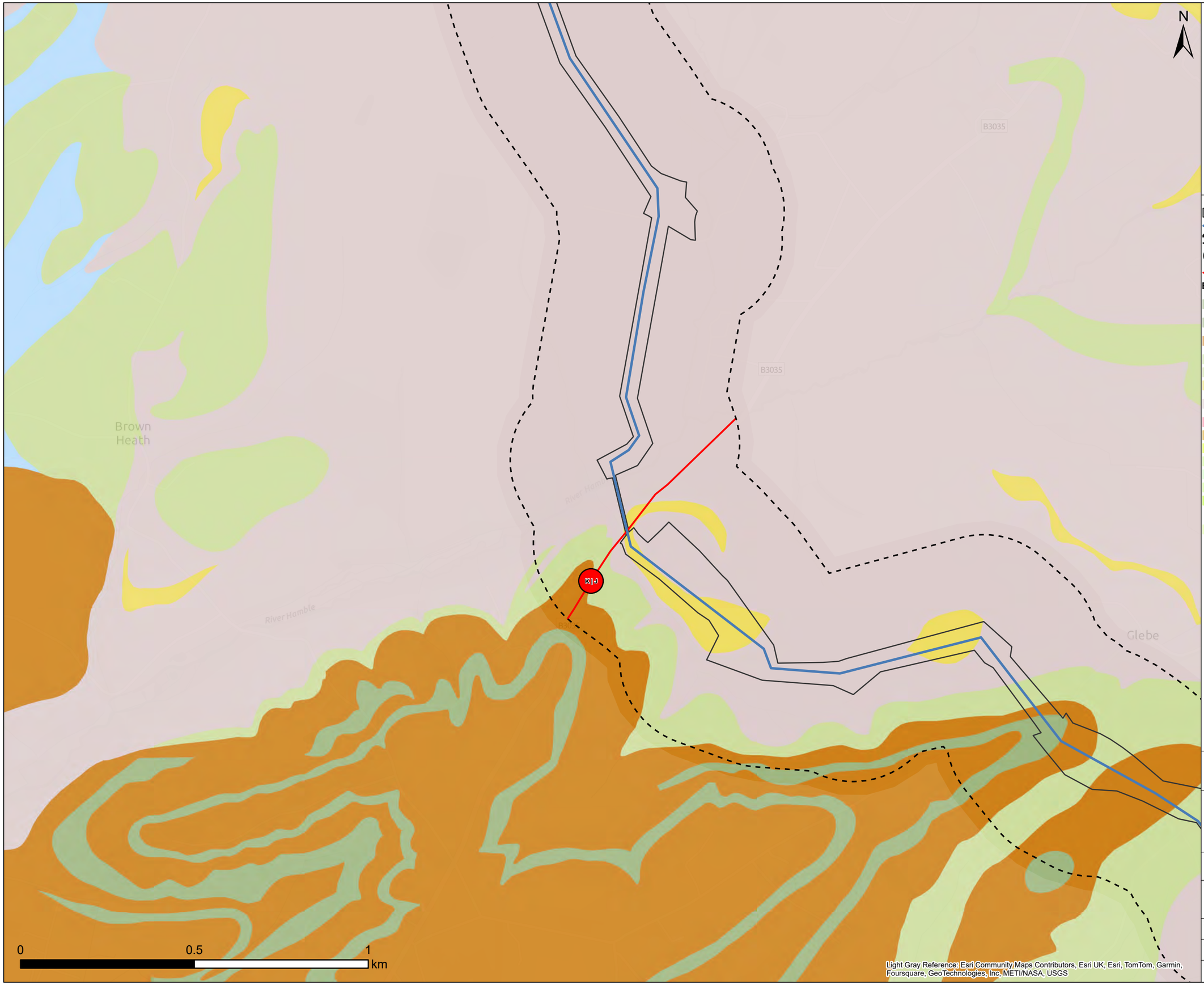

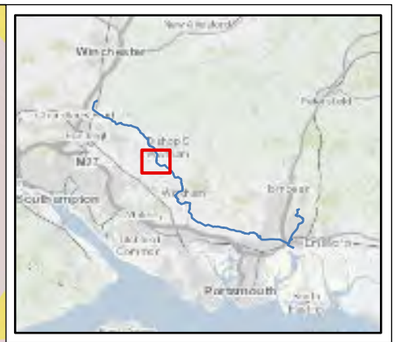

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

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WATER forLIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - J

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 20 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00720	A

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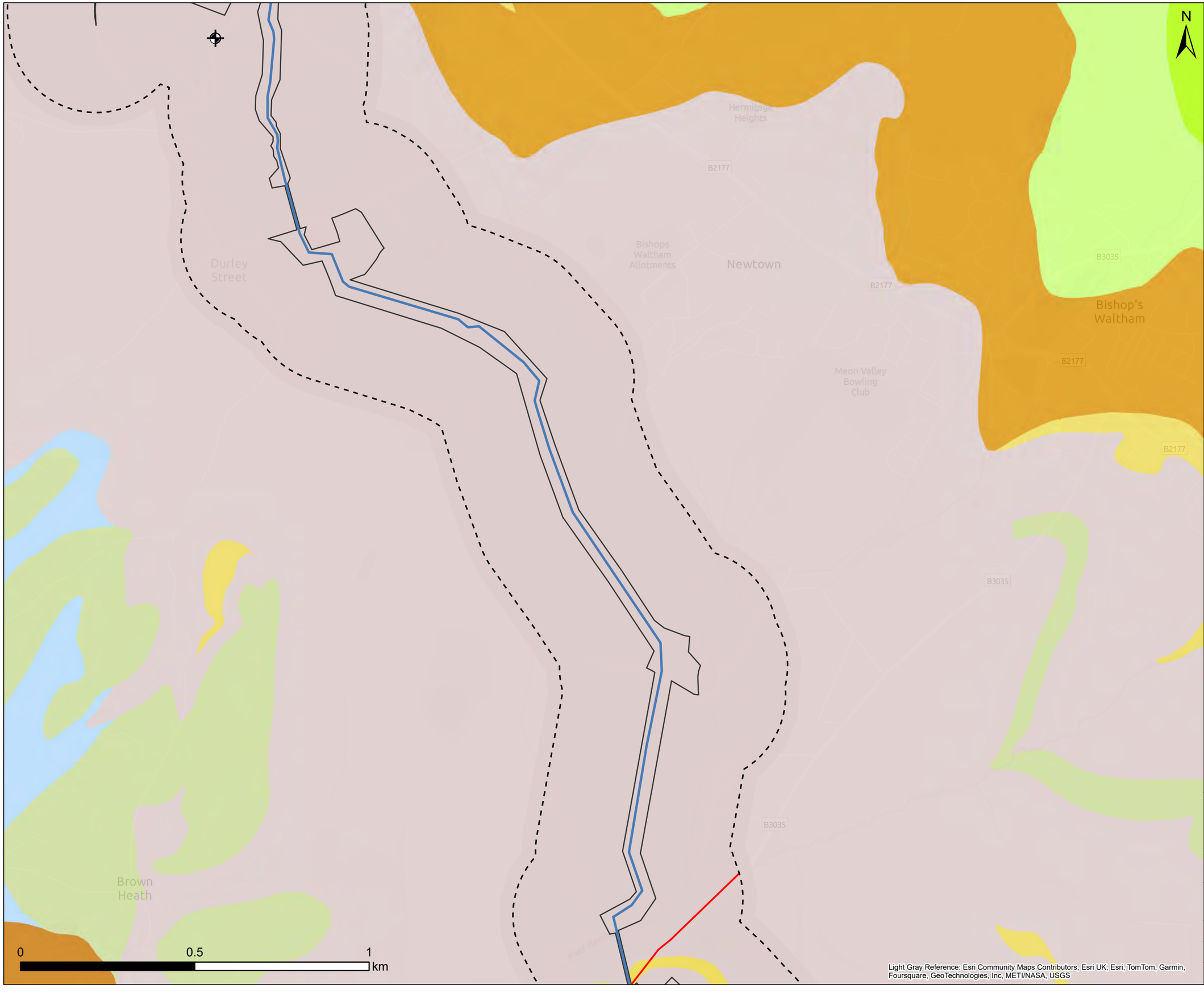



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

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Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - K

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1:10,000	01/10/2024	Sheet 21 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00721	A

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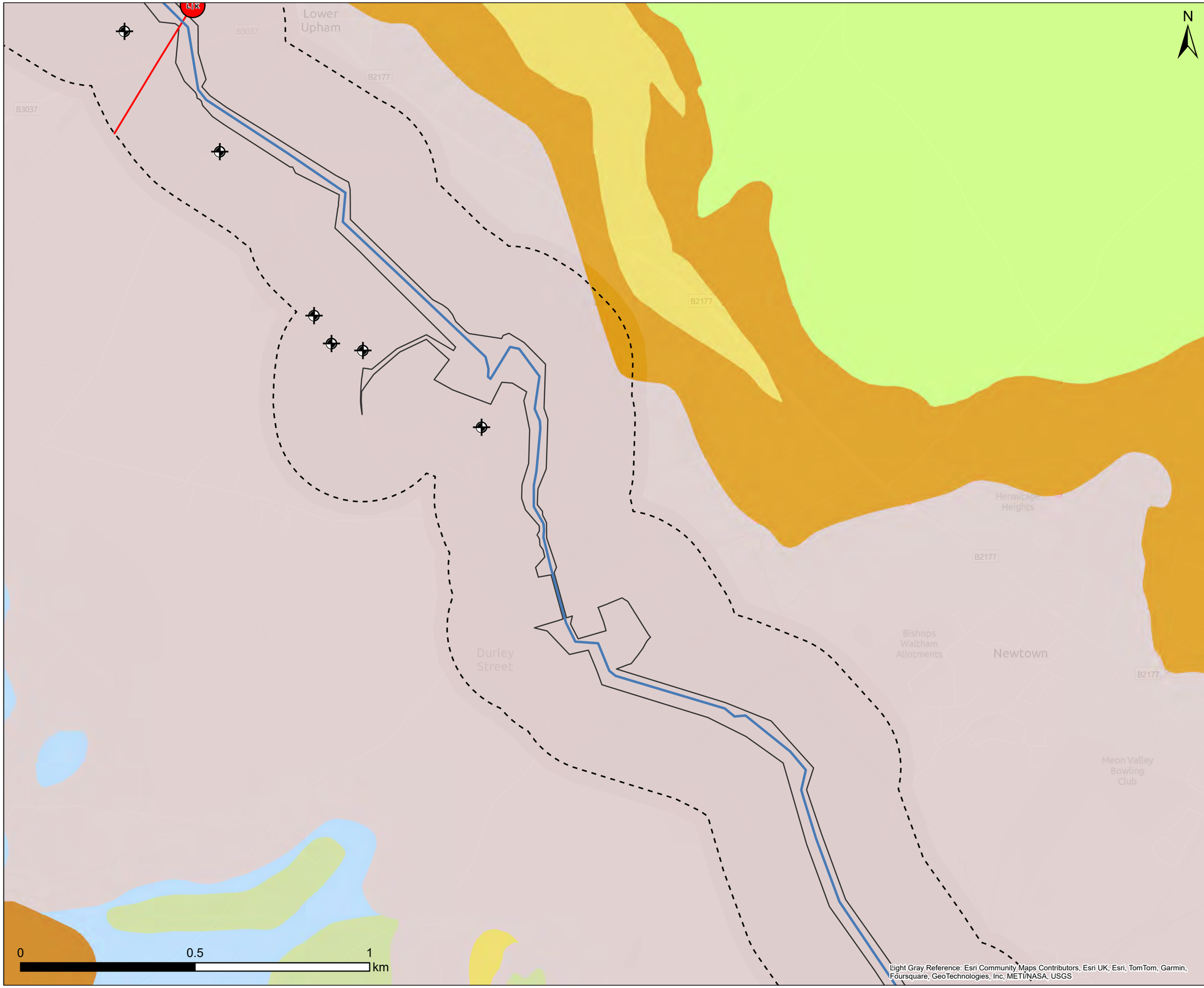

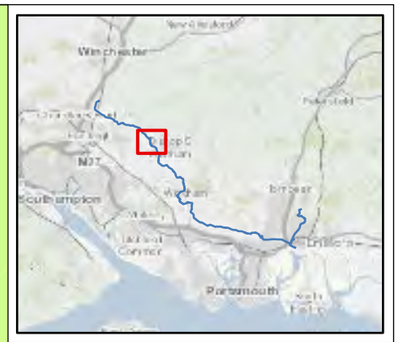

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

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Drawing Title: Figure 3.1 Bedrock Geology Sections - K

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1:10,000	01/10/2024	Sheet 22 of 32	A3
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Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00722			A

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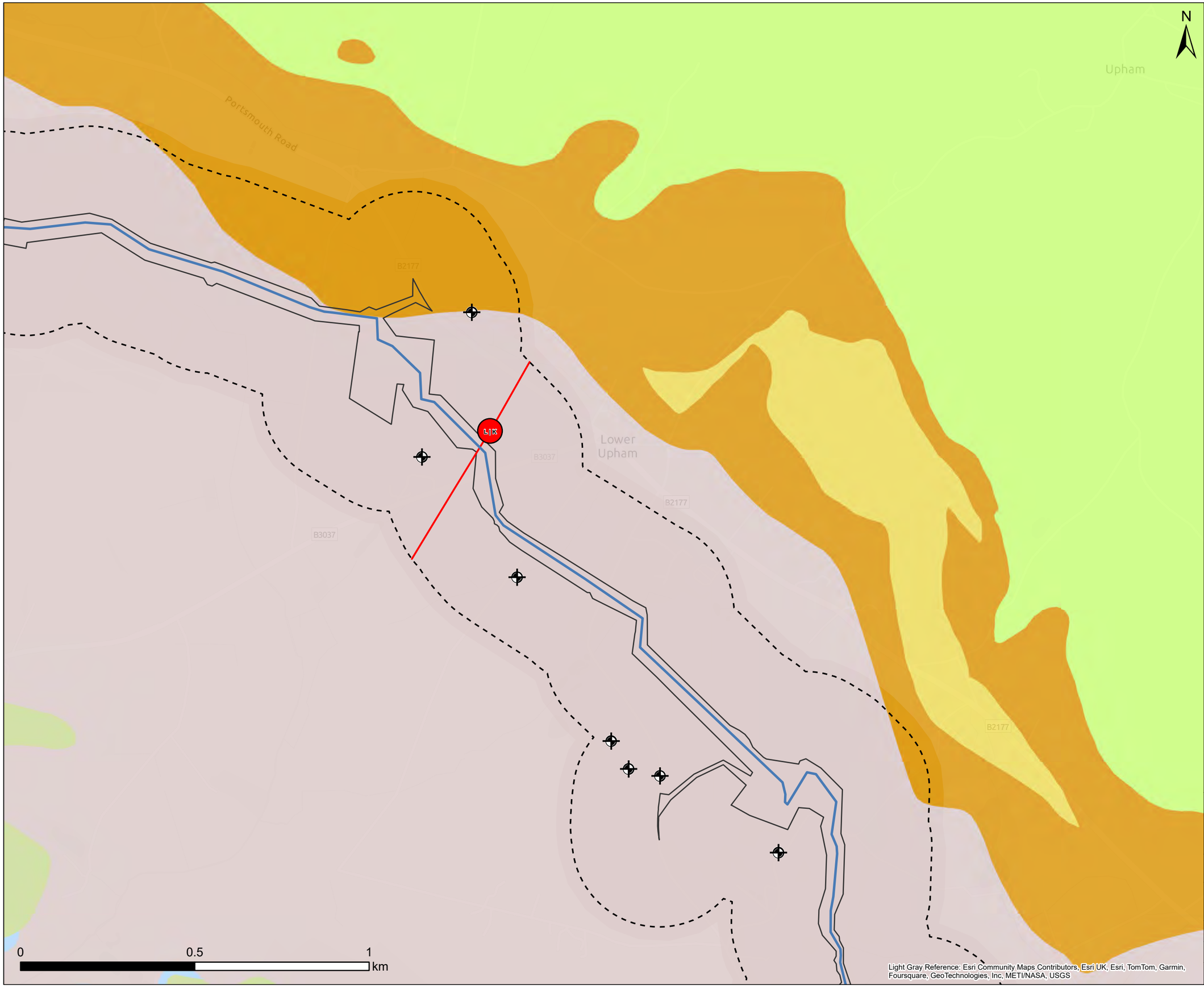



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

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Project Title: Water For Life Hampshire

Drawing Title: Figure 3.1 Bedrock Geology Sections - K

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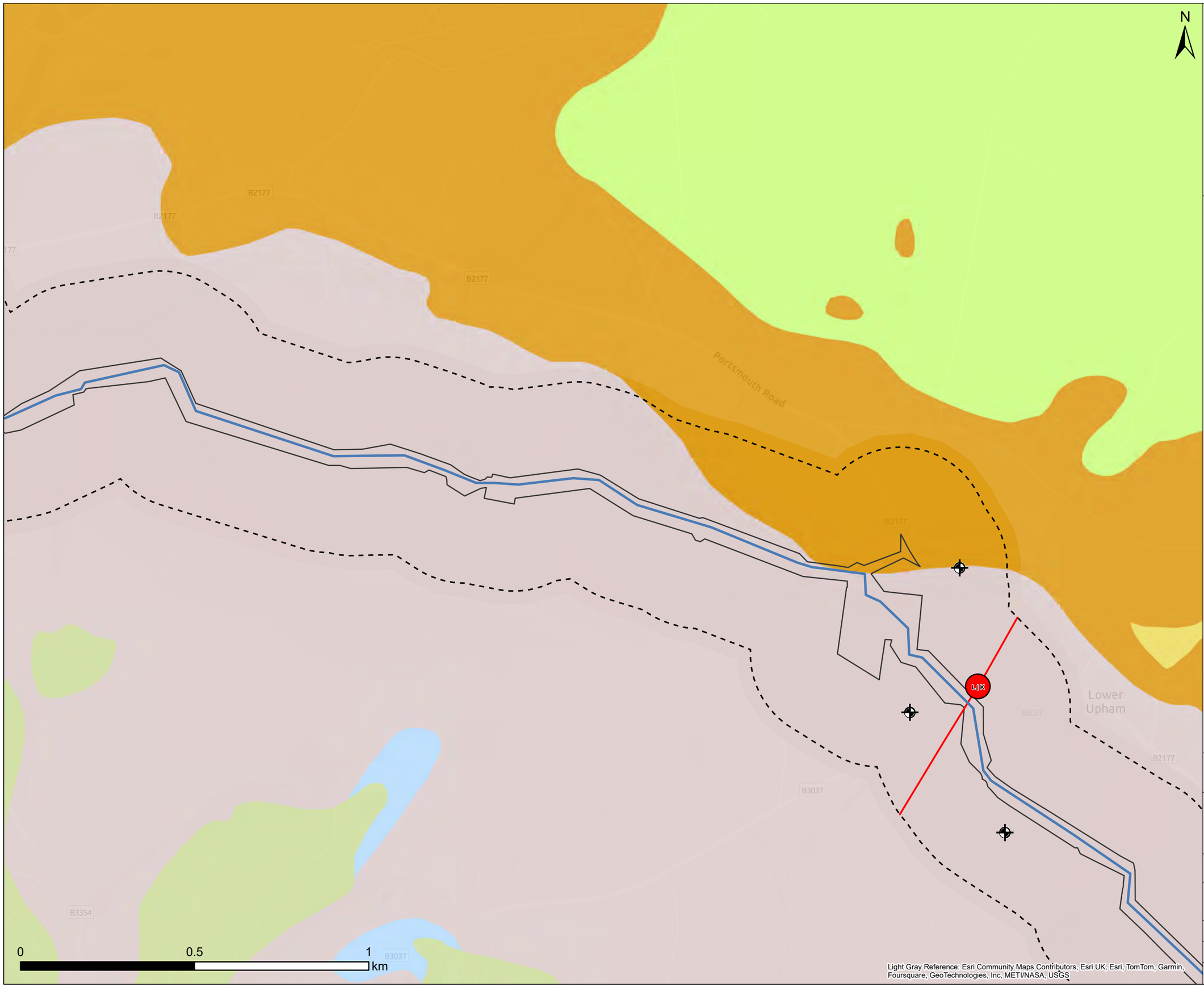
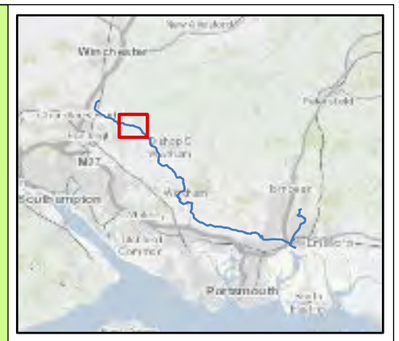
1:10,000	01/10/2024	Sheet 23 of 32	A3
Originator: LW	Checker: JH	Reviewer: SP	Approver: SP
Project No.: 710166-SWS-XX-XX-DR-Z-00723			Revision: A





Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

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Drawing Title
Figure 3.1 Bedrock Geology Sections - L

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1:10,000	01/10/2024	Sheet 24 of 32	A3
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Project No. 710166-SWS-XX-XX-DR-Z-00724			Revision A

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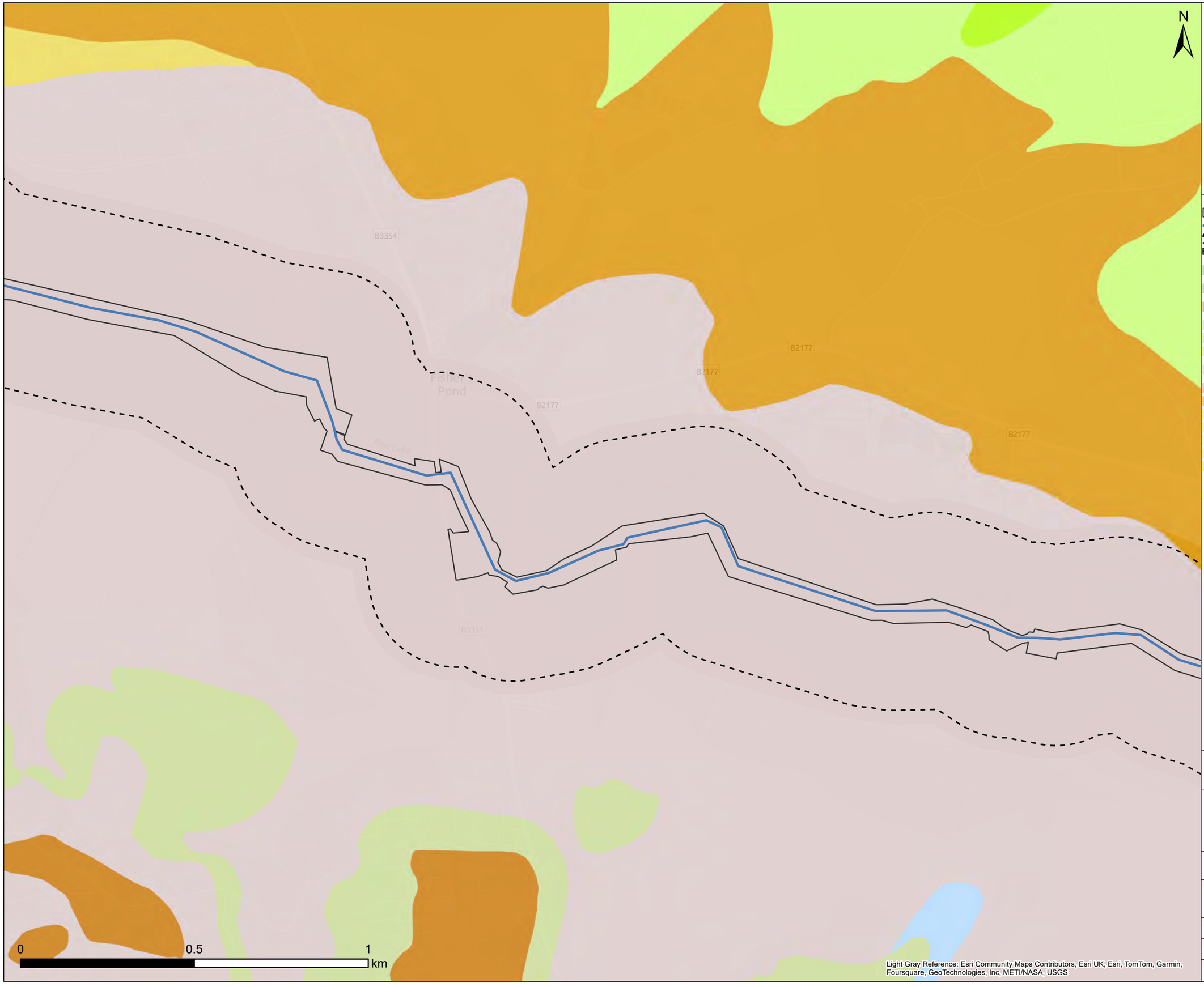

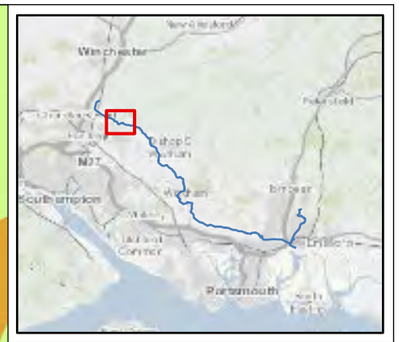

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

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Drawing Title
Figure 3.1 Bedrock Geology Sections - L

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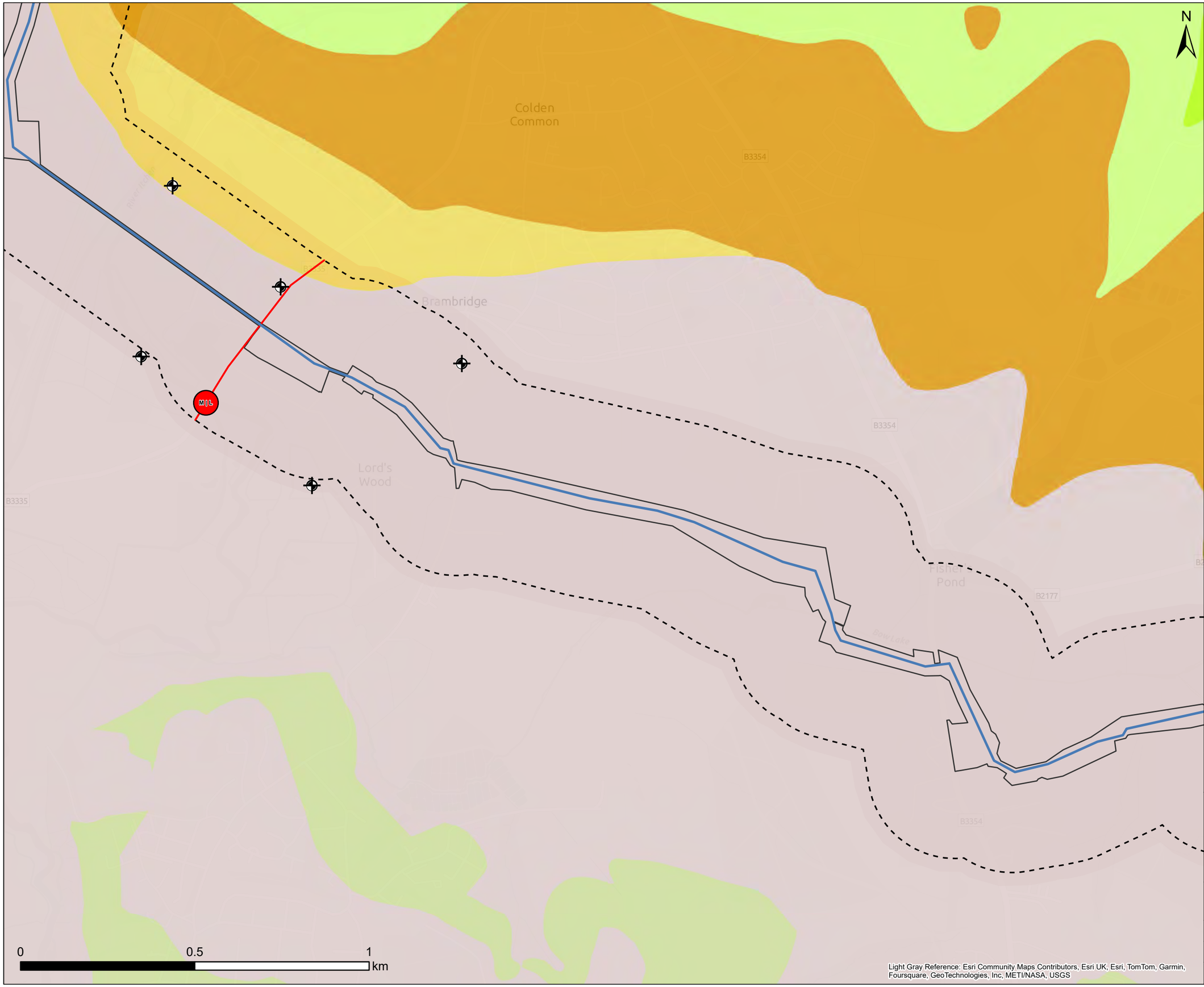



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
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Project Title: Water For Life Hampshire

Drawing Title: Figure 3.1 Bedrock Geology Sections - L

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 26 of 32	A3
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LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00726			A

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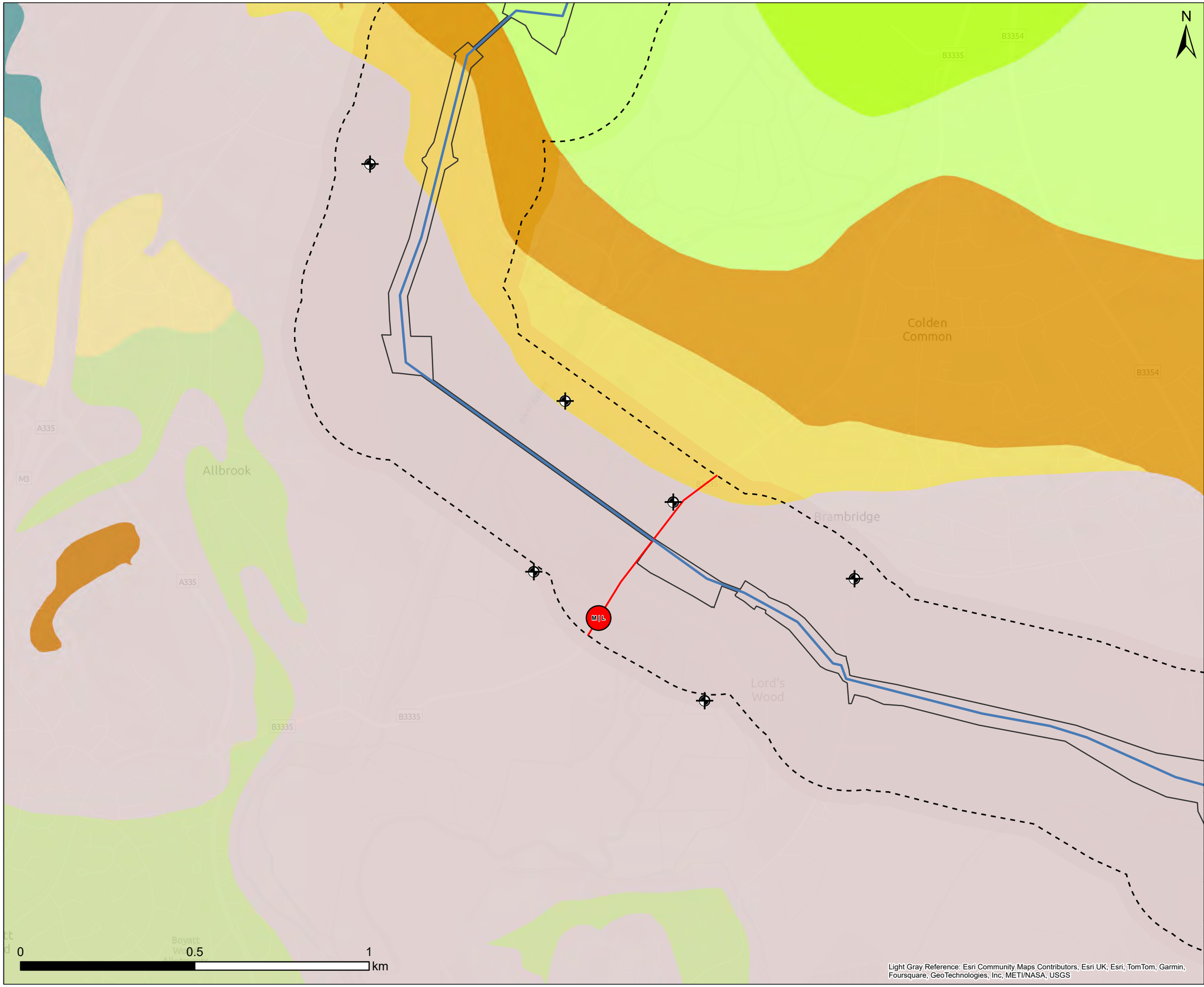

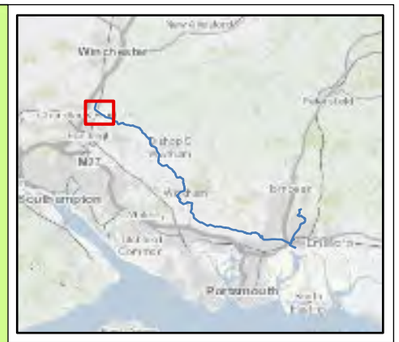

Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
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Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - M

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1:10,000	01/10/2024	Sheet 27 of 32	A3
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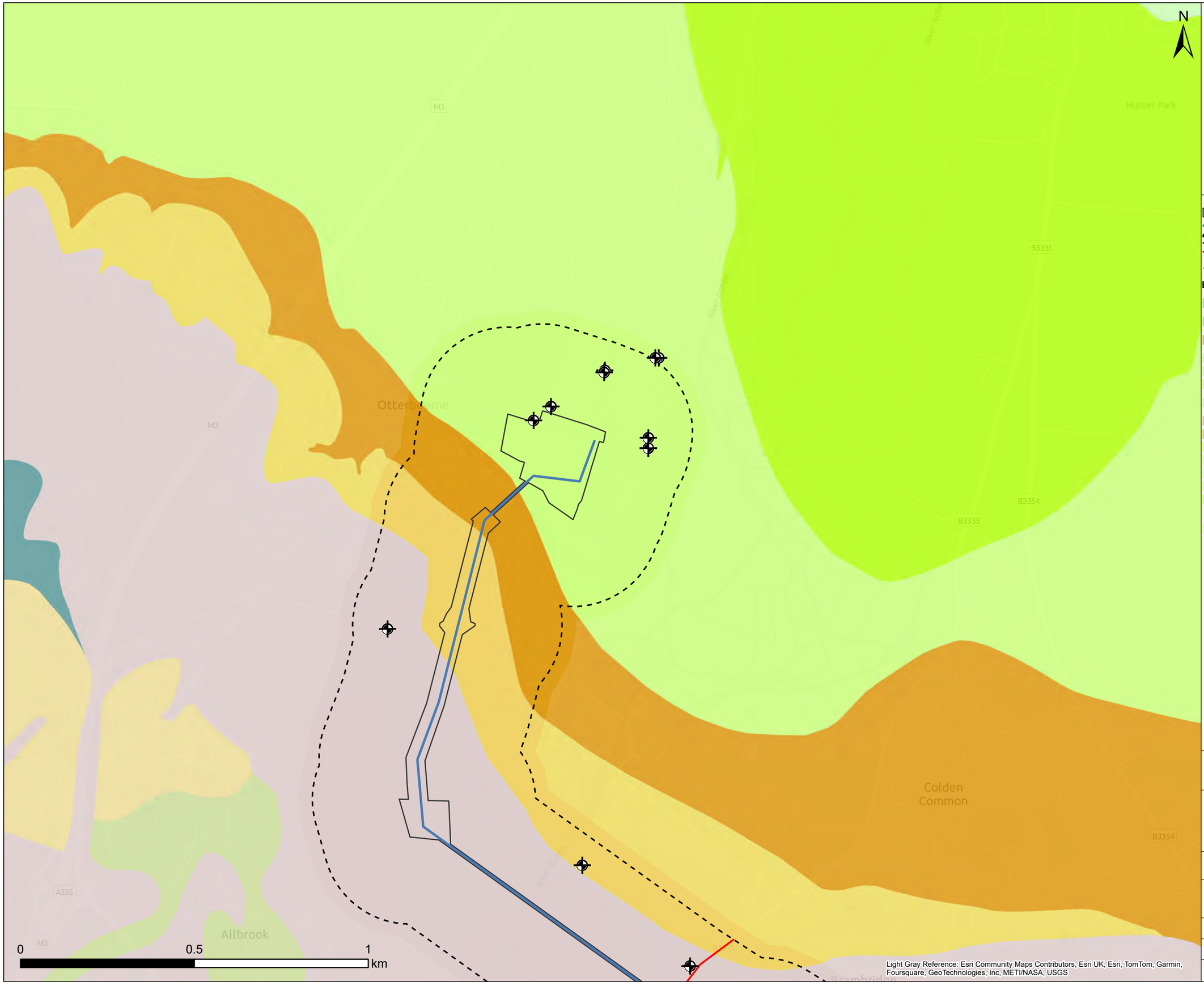



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
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WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - M

Scale	Date Drawn	Page	Sheet Size
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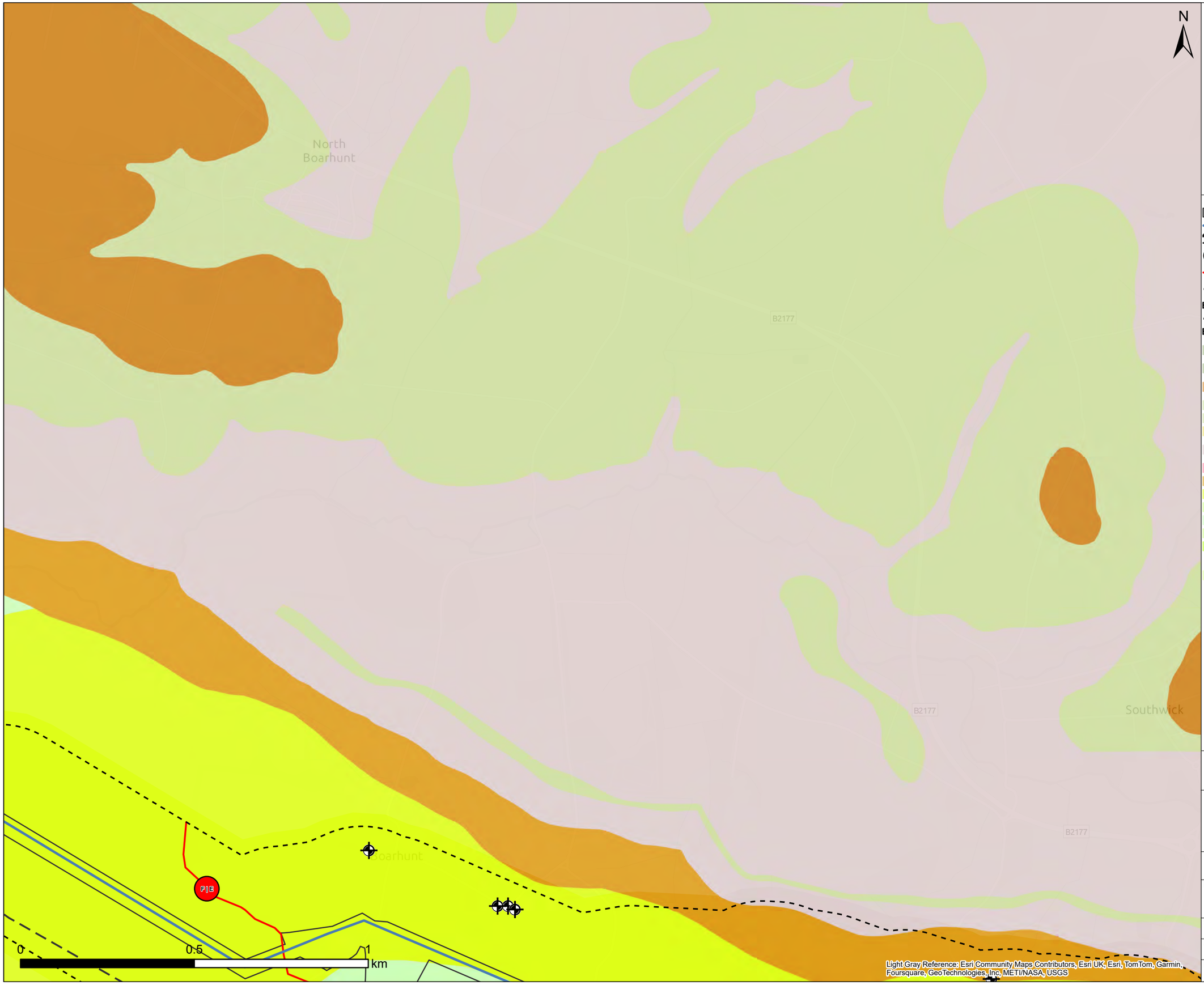



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
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- Wittering Formation - Sand, Silt and Clay (WTT)
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- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
- Lambeth Group - Sand (LMBE)
- Lambeth Group - Sand, Silt and Clay (LMBE)
- Portsdown Chalk Formation - Chalk (PCK)
- Culver Chalk Formation - Chalk (CUCK)
- Septisbury Chalk Member - Chalk (SPCH)
- Tarrant Chalk Member - Chalk (TACH)
- Newhaven Chalk Formation - Chalk (NCK)
- Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated) - Chalk (LPCK)

Note: Scale has been modified from 1:5000 to 1:10000 to include the 1km buffer extent using the sheet extents provided by Southern Water. Some maps may not show data as there is no applicable data for the scheme in this location. 250m buffer is from Draft Order Limits apart from Havant Thicket Reservoir where the buffer is 290m (40m pipe corridor + 250m buffer).

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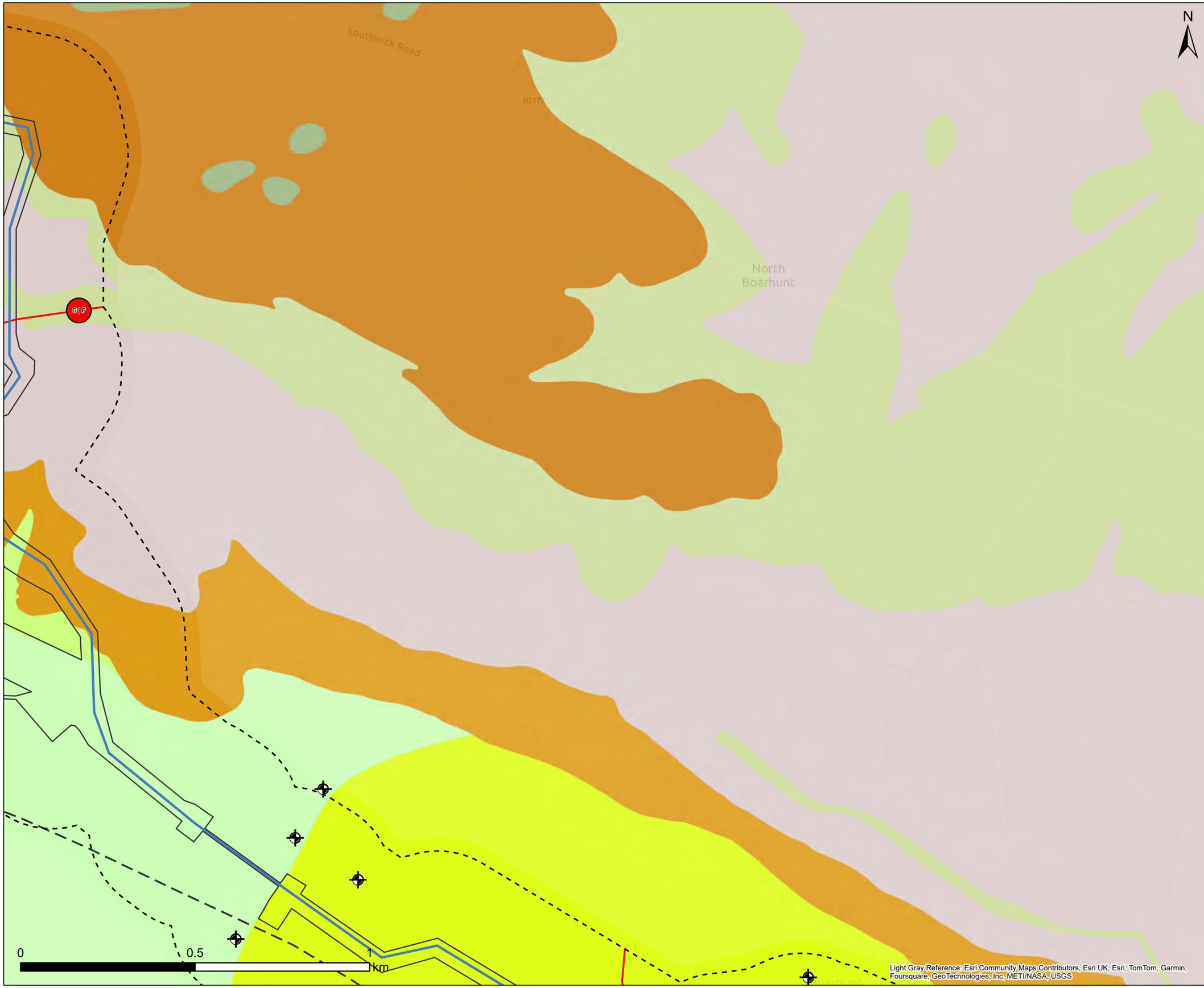
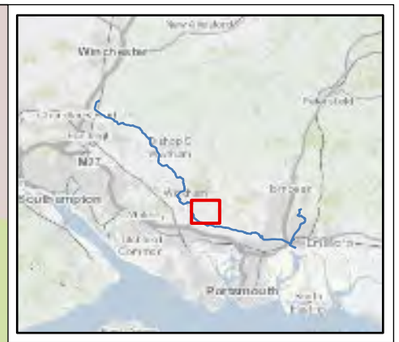
WATER for LIFE from Southern Water.

Project Title
Water For Life Hampshire

Drawing Title
Figure 3.1 Bedrock Geology Sections - F

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 29 of 32	A3
Originator	Checker	Reviewer	Approver
LW	JH	SP	SP
Project No.			Revision
710166-SWS-XX-XX-DR-Z-00729			A





Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
- Wittering Formation - Sand (WTT)
- Wittering Formation - Sand, Silt and Clay (WTT)
- Bognor Sand Member - Sand (BOSA)
- Whitecliff Sand Member - Sand (WHI)
- London Clay Formation - Sand (LC)
- London Clay Formation - Clay, Silt and Sand (LC)
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Project Title: Water For Life Hampshire

Drawing Title: Figure 3.1 Bedrock Geology Sections - F

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 30 of 32	A3

Originator	Checker	Reviewer	Approver
LW	JH	SP	SP

Project No.	Revision
710166-SWS-XX-XX-DR-Z-00730	A

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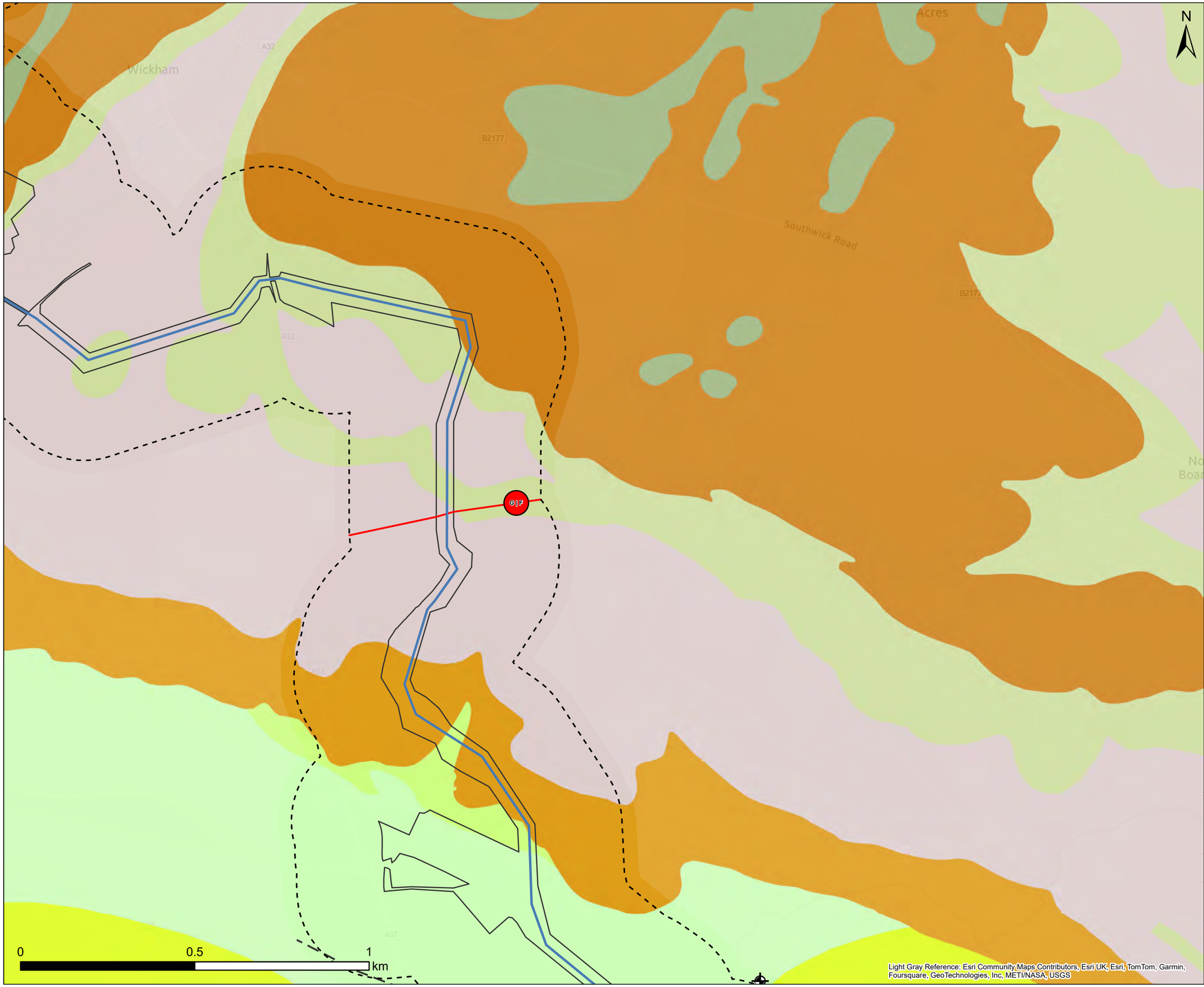



Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Fault

- Portsdown Anticline

Bedrock Geology

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Project Title
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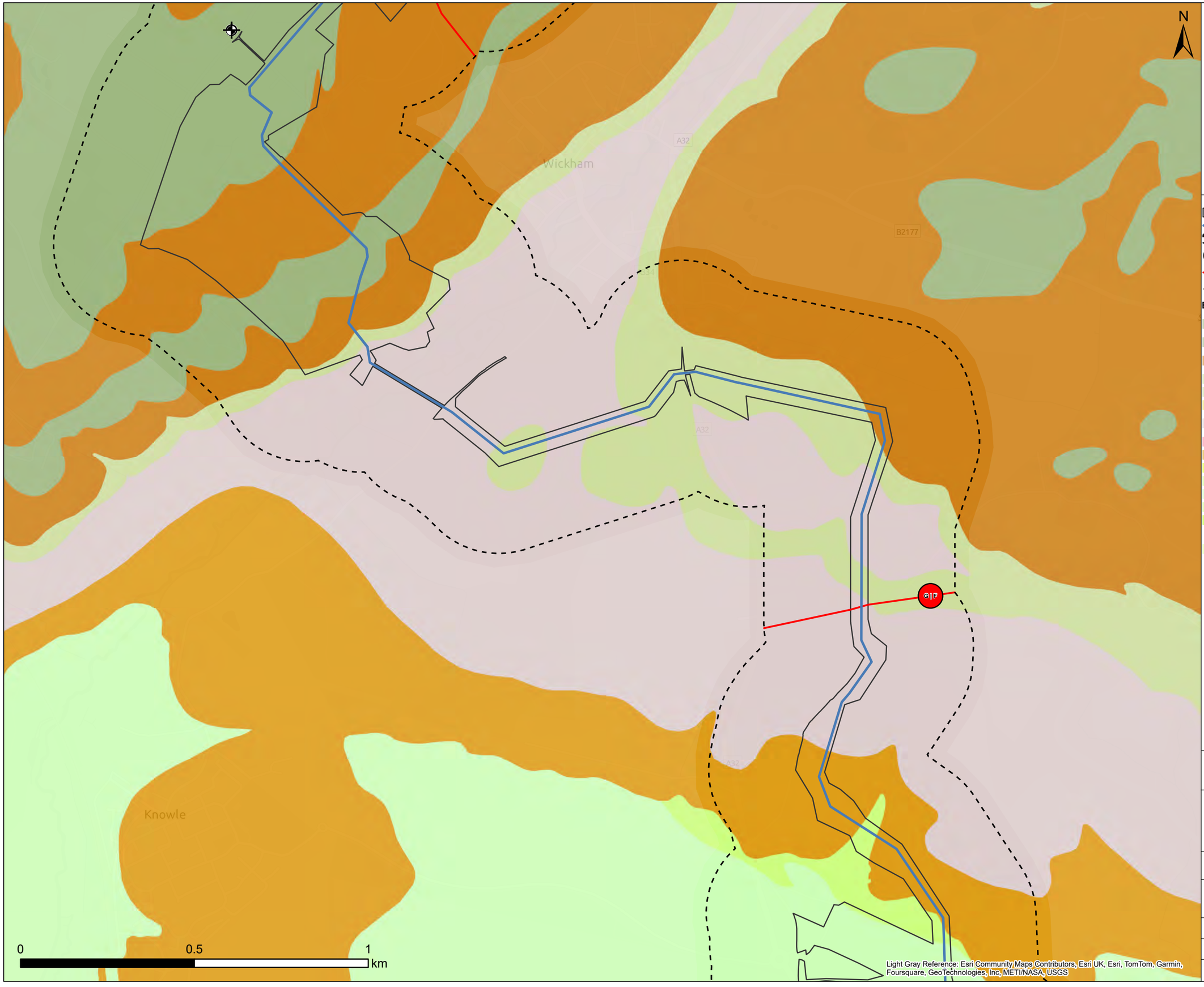
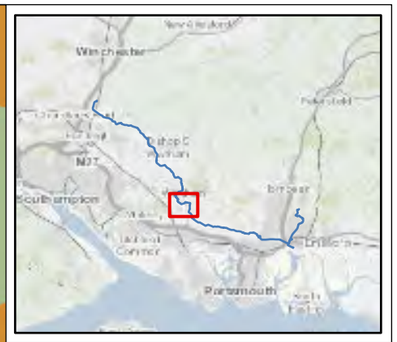
Drawing Title
Figure 3.1 Bedrock Geology Sections - F

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 31 of 32	A3
Originator	**Checker**	**Reviewer**	**Approver**
LW	JH	SP	SP
Project No.			**Revision**
710166-SWS-XX-XX-DR-Z-00731			A





Legend

- Draft Order Limit
- Proposed Pipeline Route
- 250m Buffer
- Section Break
- Pipeline Section Break
- BGS Boreholes

Bedrock Geology

- Earnley Sand Formation - Sand, Silt and Clay (EA)
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Drawing Title
Figure 3.1 Bedrock Geology Sections - F

Scale	Date Drawn	Page	Sheet Size
1:10,000	01/10/2024	Sheet 32 of 32	A3

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