

The Great Grid Upgrade

Chesterfield to Willington

Preliminary Environmental Information Report

Volume 3: Appendix 9C Water Environment Baseline Information

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nationalgrid

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9C. Water Environment Baseline Information

9C.1 Introduction

Overview

- 9C.1.1 The Chesterfield to Willington Project (the 'Project') is a proposal by National Grid Electricity Transmission plc (hereafter referred to as National Grid) who is responsible for ensuring electricity is transported safely and efficiently from where it is produced to where it is needed and for developing upgrades to the network, as agreed with the industry regulator, Office of Gas and Electricity Markets (Ofgem).
- 9C.1.2 This appendix presents detailed baseline data for the main rivers and ordinary watercourses crossed by the Project to support **Chapter 9 Hydrology and Land Drainage**.

Development Plans

- 9C.1.3 The Project is a proposal by National Grid to build the following principal components:
- A new 400 kilovolts (kV) overhead line, approximately 60 kilometres (km) in length between a proposed new Chesterfield Substation and the existing Willington Substation. It is anticipated that this would comprise steel lattice pylons in accordance with National Grid's guidance and national planning policy.
 - A new 400 kV Chesterfield Substation, to be built in the vicinity of the existing Chesterfield 275 kV Substation and the existing 132 kV National Grid Electricity Distribution Substation to the south east of Chesterfield (referred to as the 'new Chesterfield Substation'). This is proposed to be a gas insulated switchgear substation.
 - Replacement of short sections of existing overhead line and local changes to the lower voltage distribution networks to facilitate the construction of the Project.
- 9C.1.4 The Project would include other required works, for example, temporary and permanent diversions for works on existing overhead line routes, temporary access roads, highway works, temporary works compounds, work sites and other ancillary works. The Project would also include utility diversions and drainage works. There would also be land required for mitigation, compensation and enhancement of the environment including Biodiversity Net Gain.
- 9C.1.5 The Project would connect into the existing Willington Substation located to the south west of Derby and a proposed new substation at Chesterfield. It is currently anticipated that the new Chesterfield Substation will be consented and delivered as part of a separate National Grid project (Chesterfield to High Marnham), distinct from this Project. However, it is possible that it will be decided to also include the new Chesterfield Substation works as part of the Development Consent Order application for this Project to provide an alternative consenting mechanism to remove reliance on that separate planning application/consent and so mitigate against the risk of delay to the delivery of the Project.

9C.2 Data Collection

- 9C.2.1 Some of the baseline data was collected from site surveys, undertaken in June 2025. The site visits included a general walkover of watercourses within the Study Area, primarily at the location of any proposed watercourse crossings as part of the Project. Photographs and notes were taken at these locations detailing general observations on water quality, flow dynamics, riparian quality, and geomorphological characteristics.
- 9C.2.2 Some of the watercourses were not possible to survey due to land access restrictions and physical restrictions (such as dense vegetation and fences). However, to ensure a robust baseline assessment is included as part of the Environmental Statement chapter, all known watercourses will be surveyed as part of the assessment via River Condition Assessment (RCA).
- 9C.2.3 Baseline data has been obtained for watercourses within the draft Order Limits that were not surveyed in June 2025. This desk-based data has drawn on the following information sources:
- Google Mapping (Ref 9C.1);
 - Main River map for England (Ref 9C.2);
 - Flood Estimation Handbook Web Service (Ref 9C.3);
 - Hydrometric monitoring network (Ref 9C.4);
 - Side by side viewer (Ref 9C.5); and
 - Map of River Level Monitoring Stations (Ref 9C.6).
- 9C.2.4 **Table 9C.1** provides the baseline data for main rivers within the draft Order Limits.
- 9C.2.5 **Table 9C.2** provides the baseline data for artificial watercourses crossed by the Project.
- 9C.2.6 **Table 9C.3** provides the baseline data for ordinary watercourses within the draft Order Limits.

Table 9C.1: Baseline data for main rivers within the draft Order Limits

Main River	Interaction with the Project	Description
Section 2		
Alfreton Brook	Crossed by the proposed route alignment once.	Image 9C.1: Alfreton Brook facing upstream from left bank at preferred location of the overhead line 

Image 9C.2: Alfreton Brook facing upstream from right bank approximately 650 m downstream of the preferred location of the overhead line



This watercourse has a channel which has been modified over time through overdeepening and straightening in sections through the Study Area. The riparian zone is grazed on both banks with some pockets of buffer woodland along the reach. Approximate dimensions of the channel include a bank height of 3 m, bank-full width of 7 m, wetted width of 3 m and water depth of 0.5 m. At the location of the proposed route alignment crossing, the watercourse is straightened, with smooth flow, and long grasses and reeds in the channel. Bed material ranges from sand to pebble along the reach with significant deposition of silt on top of coarser materials.

The water was mostly clear with a greyish hue in places. Anecdotal information from an employee of the landowner indicated there had been occasional sewage spills from an upstream wastewater treatment works.

No gauging station is present on the Alfreton Brook, or any of its tributaries. The catchment area at the location of the draft Order Limits is approximately 40 km².

Main River	Interaction with the Project	Description
Section 3		
Bottle Brook	Crossed by the proposed route alignment in one location and once by a proposed clear span bridge for the haul route. Over 2 km of Bottle Brook falls within the draft Order Limits.	<p>This watercourse was not surveyed in June 2025.</p> <p>Aerial imagery of the watercourse displays obvious signs of modifications, especially through several reaches that are culverted and straightened through urban or developed areas, altering its natural flow and habitat. This is especially the case through more urbanised areas such as Little Eaton, Coxbench and Denby Bottles. Remote sensing imagery shows that reaches through Little Eaton have concrete lined beds and banks with flow deflectors present (Ref 9C.7). In these modified sections, sediment will likely be flushed quickly reducing deposition but potentially causing sediment accumulation downstream. In addition, Bottle Brook’s riparian zones are often fragmented throughout due to this modification.</p> <p>In the less anthropogenically impacted areas, the channel planform appears more natural with meandering reaches present, especially between Little Eaton and Coxbench.</p> <p>The only flow gauging station is situated on a tributary of the Bottle Brook (National Grid Reference (NGR): SK 386 711). Readings show that the normal depth range is 0.35 m to 0.90 m, where the highest recorded levels reached 1.51 m in October 2023. The catchment area is approximately 36.7 km².</p> <p>At the location of the proposed route alignment crossing, the watercourse is straightened, having just flowed through culverts under the B6179 and A38.</p>

Main River	Interaction with the Project	Description
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Section 5

River Derwent Crossed by the proposed route alignment in one location.

Image 9C.3: River Derwent from the right bank facing across the channel at the preferred location of the overhead line crossing



This main river has a catchment size of approximately 1,171 km². A nearby flow gauge at Draycott (1.5 km downstream of the preferred crossing location with no major tributaries added) records a mean flow of 18.707 m³/s and a Q95 of 5.881 m³/s. This reach of the River Derwent has large meanders through a wide floodplain. There are embankments along both banks of the River Derwent through this reach; however, they are not formal Environment Agency (EA) flood defence assets. Arable agriculture dominates the right floodplain, and grazing is the predominant land use on the left bank. There are mature trees on both banks of the river; however, the riparian buffer zone is less than 2 m. Approximate dimensions of the channel include a bank height of 4 m, bank-full width of 30 m, wetted width of 25 m and water depth of 1.2 m. At the location of the proposed route alignment crossing, the watercourse has rippled flow. The bed material ranges from sand to boulder with some silt deposits. In channel vegetation was mostly bank vegetation overhanging into the river with some reeds at the channel edges.

Main River	Interaction with the Project	Description
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A gauging station is present on the River Derwent at Church Wilne (Station ID: 28067), which is approximately 3.5 km downstream of the draft Order Limits (NGR: SK 441 316). The river level is typically between 0.49 – 1.60 m; however, it has a record high of 2.53 m (October 2023). The mean flow here is 18.835 m³/s, with a Q95 of 4.892 m³/s. Base flow index is 0.63. The catchment area at the location of the draft Order Limits is approximately 1,170 km².

Thulston Brook Crossed by the proposed route alignment in one location. A watercourse crossing is proposed for Thulston Brook.

Image 9C.4: Thulston Brook facing downstream on left bank at preferred location of overhead line crossing



Image 9C.5: Thulston Brook facing upstream from left bank at preferred location of overhead line crossing

This watercourse is heavily modified through straightening along field boundaries and overdeepening, likely for land drainage and flood relief. The riparian zone is grazed on the left bank and has arable farming on the right bank. There is a fence along the bank top on the left bank. There are some mature trees along the bank, but there is no riparian buffer zone. At the preferred crossing location of the proposed route alignment, the catchment is approximately 5.34 km².

Approximate dimensions of the channel include bank height of 1.5 m, a bank-full width of 7 m, wetted width of 1 m and water depth of <0.1 m. At the location of the proposed route alignment crossing, the watercourse is straightened, with no perceptible flow, and long grasses and reeds in the channel. Bed material is predominantly silt.

No gauging station is present on the Thulston Brook, or any of its tributaries. The catchment area at the location of the draft Order Limits is approximately 5.38 km².

Main River	Interaction with the Project	Description
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Section 6

Cuttle Brook

Crossed by the proposed route alignment in one location. A construction compound is located within its catchment.

Image 9C.6: Cuttle Brook facing downstream on right bank at preferred location of overhead line crossing

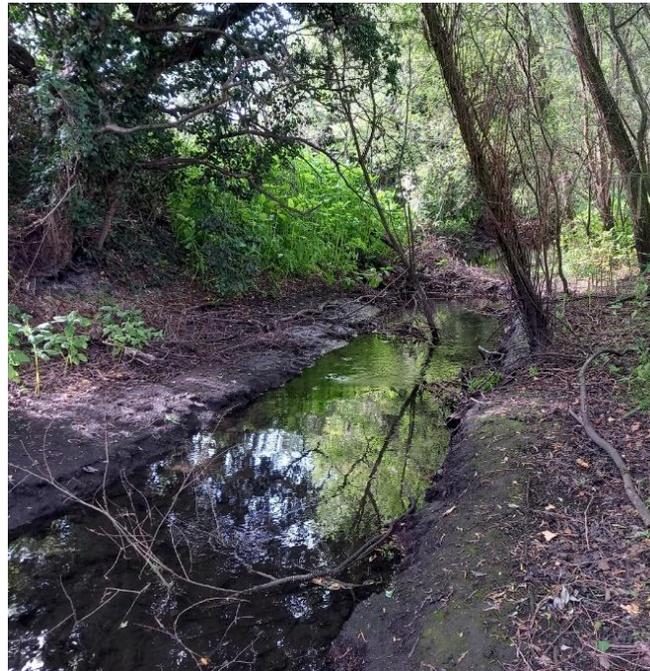


Image 9C.7: Cuttle Brook facing downstream on right bank upstream of the A50 culvert



This watercourse follows a mostly natural course before joining the River Trent. It is modified in small reaches due to urbanisation. At the preferred location of the proposed route alignment, the watercourse flows through a naturally deep valley between agricultural fields. The naturally high bank height is recorded as an EA flood defence. The banks have a moderately shallow gradient and are heavily vegetated with scrub and mature trees, therefore the channel is heavily shaded. At the preferred crossing location of the proposed route alignment the catchment is approximately 14.5 km².

Approximate dimensions of the channel include a bank height of 4 m, bank-full width of 10 m, wetted width of 2 m and water depth of 0.3 m. The channel has a two-stage cross-section. At the location of the proposed route alignment crossing, the watercourse has smooth flow with limited in-channel vegetation, although there are several naturally occurring rough woody debris dams along the reach. The bed material is predominantly silt.

No gauging station is present on the Cuttle Brook, or any of its tributaries. The catchment area at the location of the draft Order Limits is approximately 14.47 km².

Main River	Interaction with the Project	Description
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Twyford Brook
 Crossed by the proposed route alignment and the haul route once. A construction compound is located within its catchment.

Image 9C.8: Twyford Brook facing upstream from a culvert crossing, approximately 850 m upstream of the preferred location of the overhead line



The location of the proposed route alignment at Twyford Brook was not accessible for the watercourse survey. This description is based on an accessible reach approximately 850 m upstream. This location is within the Study Area but beyond the draft Order Limits. At this location, the Twyford Brook has low turbidity and bed materials ranging from sand to pebbles. There was a mid-channel bar in this study reach. Approximate dimensions of the channel include a bank height of 4 m, bank-full width of 4 m, wetted width of 1.5 m and water depth of 0.1 m. There are a few in-channel vegetation species; however, there is a lack of vegetation variety on the bank and riparian zone. This reach of the Twyford Brook flows through a livery facility so the riparian zone is grazed.

No gauging station is present on the Twyford Brook, or any of its tributaries. At the preferred location of the proposed route alignment crossing, the catchment of this watercourse is approximately 17.75 km².

Main River	Interaction with the Project	Description
River Trent	33 kV line rationalisation	<p>This watercourse was not surveyed in June 2025.</p> <p>An approximately 300 m meandering section to the west of Twyford is situated within the draft Order Limits (approximately NGR: SK 313 285).</p> <p>This watercourse displays a sinuous (approximately 1.5 sinuosity index) single thread planform with an approximate 35 m width in the proximity of the draft Order Limits, while multithread channels are evident downstream. Within this reach, the River Trent is within a largely rural setting, flowing through agricultural fields. The riparian zone is fragmented by this farm-dominated setting, with trees occasionally present on the right bank while the left bank is largely dominated by shrubs and grasses. This lack of riparian zone vegetation, as well as the laterally migrating nature of this watercourse has led to erosion and deposition of the channel, something which is evident from aerial imagery (Ref 9C.7). Point bars and cut banks are apparent; however, the latter seems more prevalent suggesting a dominance of erosional processes over depositional ones, likely driven by the reduced riparian stability.</p> <p>Modification appears minimal, with no visible structures within this reach of the River Trent.</p> <p>A flow gauging station (28007 – Trent at Shardlow) is situated approximately 15 km downstream (SK 448 299). The mean flow here is approximately 51.7 m³/s and the Q95 is 17.49 m³/s, while the base flow index is 0.65, which suggests a significant groundwater contribution. The catchment area is approximately 4,214 km² at the point of the draft Order Limits interaction.</p>
Sands Brook	Situated within the draft Order Limits.	<p>This watercourse was not surveyed in June 2025.</p> <p>An approximately 50 m section of Sands Brook is situated to the west part of Section 6 of the draft Order Limits (NGR: SK 293 286). Sands Brook appears to be culverted underneath the Trent and Mersey Canal before again being culverted under Willow Grove and another unnamed lane within the draft Order Limits. The land use here is suburban and the watercourse joins the River Trent downstream of the draft Order Limits.</p> <p>No flow gauging stations are present for Sands Brook. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>

Table 9C.2: Baseline data for artificial watercourses crossed by the Project

Artificial water body	Interaction with the Project	Description
Section 3		
Cromford Canal	Crossed by the proposed route alignment in one location.	Image 9C.9: Cromford Canal facing across channel from right bank at the preferred location of the overhead line
		

Image 9C.10: Cromford Canal facing upstream from right bank, at Main Road Bridge



The Cromford Canal at Hartshay, once constructed for transporting coal across the region is no longer navigable. The water level in the canal has been lowered with the outflow from the canal into Hartshay Brook at a few locations across the study reach. One outflow is at the location of the proposed route alignment. In the canal, the water flows from east to west to the outflow. West of the outflow, the canal is heavily vegetated with very low water levels with no perceptible flow. At the proposed route alignment crossing location, the canal has an approximate width of 5 m but is densely vegetated and the wetted width was not visible at the time of survey. There is a tow path on the northern (right) bank. No gauging station is present on the Cromford Canal, or any of its tributaries. The Flood Estimation Handbook Catchment system does not specifically record catchments of canals as they do not behave hydrologically like natural catchments.

At the preferred location of the overhead line crossing, the catchment of this watercourse is approximately 17.75 km².

Artificial water body Interaction with the Project Description

Section 5

Derby Canal Crossed by the proposed route alignment in one location. The scaffolding area will cross the canal.

Image 9C.11: Derby Canal looking downstream from left bank, upstream of the preferred location of the overhead line



Image 9C.12: Derby Canal facing downstream from left bank at location of A6005 and proposed route alignment of overhead line



The Derby Canal is no longer navigable at this location. South of the A6005, water from the canal enters a culvert, although the outfall of this culvert is not known. Ultimately this water body will discharge to the River Derwent. The section of the canal parallel to the A6005 has undergone restoration and is now home to water vole whilst the section to Hopwell Road is restored. The water levels in the canal are lower than originally designed, and the channel is heavily vegetated with a variety of species. This reach of the canal is potentially to be used as a flood attenuation area to protect the adjacent main line railway. Immediately upstream of the A6005 bridge there is a weir which results in water accumulating in the reach parallel to the A6005 and reducing water levels under the A6005. There is a tow path along the southern bank of the canal. No gauging station is present on the Derby Canal, or any of its tributaries. The Flood Estimation Handbook Catchment system does not specifically record catchments of canals as they do not behave hydrologically like natural catchments.

Artificial water body Interaction with the Project Description

Section 6

Trent and Mersey Canal

Crossed by the proposed route alignment in one location and scaffolding.

Image 9C.13: Trent and Mersey Canal facing upstream towards the preferred location of the overhead line



This canal is navigable and was constructed to provide an inland waterway to link the ports of Hull and Liverpool. At the proposed route alignment the canal is approximately 12 m wide and an unknown depth. There is a towpath on the southern bank of the canal which is not paved. Arable farming dominates both banks of the canal, with a hedgerow between the field and towpath on the southern bank. There are some long grasses and reeds at the channel margins and some in-channel submerged vegetation. No gauging station is present on the Trent and Mersey Canal, or any of its tributaries. The Flood Estimation Handbook Catchment system does not specifically record catchments of canals as they do not behave hydrologically like natural catchments.

Table 9C.3: Baseline data for each ordinary watercourse crossed by the Project

Ordinary Watercourses	Interaction with the Project	Description
Section 1		
Calow Brook including its tributaries and ditches	Crossed by the proposed route alignment in three locations. Watercourse crossing for the haul route on Calow Brook and Calow Brook Tributary 1. A construction compound and scaffolding area is also situated within its catchment.	<p>These watercourses were not surveyed in June 2025.</p> <p>Calow Brook is situated downstream of Muster Brook (described below) and becomes Calow Brook upon the joining of a tributary just north of the A617 (NGR: SK 425 677). Calow Brook becomes Spital Brook at Calow Lane (NGR: SK 402 699).</p> <p>Calow Brook has undergone straightening adjacent to agricultural fields, before the first archived mapping in 1897. This has altered its natural flow dynamics, potentially increasing flow velocity, reducing habitat diversity, and reducing the natural sediment regime. The assumed increased flow velocity will have led to reduced deposition and increased erosion, leading to incision of the bed and destabilisation of the channel banks.</p> <p>Calow Brook’s riparian zones along the watercourse are a mosaic of semi-natural woodland and agriculturally influenced margins. In addition, online imagery shows that the riparian zone appears largely unmanaged, allowing natural processes to prevail. Mature trees are able to grow close to the channel, and fallen limbs or large woody debris are left in situ, enhancing in-stream habitat complexity, promoting flow diversity, and supporting a more dynamic and ecologically rich watercourse (Ref 9C.7).</p> <p>The only flow gauging station is situated on Calow Brook at Chesterfield Calow Lane (NGR: SK 402 699), which is approximately 1.5 km downstream of the proposed route alignment. The average flow depth range is 0.03 m to 0.19 m, with the highest recorded flow depth 1.45 m (Ref 9C.7). The catchment area is approximately 12.77 km².</p>

Ordinary Watercourses	Interaction with the Project	Description
Muster Brook and its tributaries	Crossed by the proposed route alignment once. Muster Brook Tributary 2 is crossed by the haul road. A construction compound is situated within the catchment.	<p>These watercourses were not surveyed in June 2025.</p> <p>Muster Brook is situated upstream of Calow Brook (described above) and is Muster Brook from Williamthorpe Ponds to approximately Postman’s Lane and the joining of a tributary north of A617 where it becomes Calow Brook (NGR: SK 425 677).</p> <p>Muster Brook exhibits a varied character, with some reaches retaining a natural, unmodified form, while others are heavily influenced by urban development. In its upstream reach, it flows into the northern-most Williamthorpe Nature Reserve pond, where the watercourse transitions from a defined channel to a more lentic environment. After outflowing from the lake, Muster Brook possesses sinuous bends through a small woodland area south of the A617. This section reflects a more natural geomorphological character, with features such as point bars, undercut banks, and occasional large woody debris. The woodland canopy provides shading which could help regulate water temperature.</p> <p>Muster Brook is subsequently culverted beneath the A617. Upon re-emergence, the brook flows along the perimeters of agricultural fields where it appears artificially straightened.</p> <p>Muster Brook’s riparian zones along the watercourse are also a mosaic of semi-natural woodland and agriculturally influenced margins. Therefore, impacts on the watercourse are similar to that described above.</p> <p>No gauging stations are present on the Muster Brook or its tributaries. The catchment area is approximately 3.99 km².</p>

Ordinary Watercourses	Interaction with the Project	Description
River Doe Lea Tributary 4	A construction compound is situated within the catchment of River Doe Lea Tributary 4.	<p>This watercourse was not surveyed in June 2025.</p> <p>River Doe Lea Tributary 4 (RDLT4) has its source near Holmewood at approximately NGR: SK 439 659 and joins the River Doe Lea itself at NGR: SK 456 656 (1.5 km downstream of the draft Order Limits).</p> <p>RDLT4 appears to have undergone channel straightening in several reaches, likely as a result of historical land drainage or agricultural realignment efforts. These modified sections are characterised by uniform, linear alignments with reduced channel complexity and limited in-stream habitat diversity. In contrast, other stretches of these watercourses retain a more natural morphology, with sinuous meander bends, variable channel widths, and a more diverse substrate composition.</p> <p>RDLT4 passes beneath the M1 motorway via two separate culverts, which represents a significant point of artificial modification along its course. This culverted section likely alters the natural flow regime, potentially restricting sediment transport and aquatic connectivity.</p> <p>The riparian zone for RDLT4 is predominantly lined with deciduous trees, especially along the right bank. In contrast, the left bank alternates between areas of agricultural buffer zones and tree cover.</p> <p>No gauging stations are present on RDLT4.</p> <p>RDLT4 has an upstream catchment area of approximately 1.09 km² at the preferred location of the proposed route alignment crossing, but a total catchment of 2.13 km².</p>
Hardstoft Road Brook	Within the draft Order Limits	<p>This watercourse was not surveyed in June 2025.</p> <p>Hardstoft Road Brook is located to the east of Pilsley and is situated within a narrow woodland (upstream within the draft Order Limits) and an agricultural setting (downstream within the draft Order Limits).</p> <p>No gauging stations are present on Hardstoft Road Brook. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>

Ordinary Watercourses	Interaction with the Project	Description
Westwood Brook and its tributaries (Westwood Brook Tributaries 1–6)	Crossed by the proposed route alignment in three locations, one crossing on Westwood Brook and two on Westwood Brook Tributary 1.	<p>These watercourses were not surveyed in June 2025.</p> <p>Westwood Brook has several tributaries within close proximity to the proposed route alignment, two of which are crossed by the proposed route alignment, while the third crossing is over Westwood Brook itself.</p> <p>Westwood Brook’s tributaries exhibit predominantly natural planforms in their upper reaches, indicating minimal anthropogenic alteration. The riparian zone is asymmetrical in character: the right bank is densely vegetated with mature trees, whilst the left bank is dominated by agricultural land use.</p> <p>No culverts are present within or upstream of the draft Order Limits. However, downstream of the confluence of its tributaries (where Westwood Brook Tributary 1 becomes Westwood Brook), the channel appears to have been artificially straightened, most likely as a result of historical agricultural modification. The straightened reach contrasts with the more sinuous, unmodified upper sections, potentially reducing hydraulic diversity, disrupting sediment transport processes, and diminishing in-stream habitat complexity.</p> <p>No gauging stations are present on Westwood Brook or its tributaries. The catchment area is approximately 2.3 km² at the most downstream location within the draft Order Limits. This specific reading is from Westwood Brook itself and therefore, includes the catchments of its tributaries.</p>
Doe Hill Ditches	Crossed by the proposed route alignment in one location and situated within the draft Order Limits. Is nearby to the haul route but is not crossed by it. In addition, a scaffolding area is situated within proximity to Doe Hill Country Park Ditch 1.	<p>These watercourses were not surveyed in June 2025.</p> <p>Doe Hill Ditches is a group that comprises two ditches: Doe Hill Lane Ditch 2 and Doe Hill Country Park Ditch 1. The latter is crossed by the proposed route alignment where it spans the draft Order Limits (NGR: SK 430 604), while the former is situated approximately parallel to the periphery of the draft Order Limits (NGR: SK 431 603). It is likely that these ditches are hydrologically connected given their close proximity to one another.</p> <p>These watercourses traverse an agricultural field, where the riparian zone is limited to shrubs and grass. These ditches are clearly artificial, given their straightened planform, with a likely agricultural-related origin for drainage. In addition, these ditches are likely ephemeral in that they are dry for parts of the year.</p>

Ordinary Watercourses	Interaction with the Project	Description
		<p>No gauging stations are present on Doe Hill Ditches. The catchment area is approximately 0.58 km² at the preferred location for the proposed route alignment crossing.</p>
Section 2		
<p>Morton Brook including its tributaries and ditch</p>	<p>Morton Brook Tributary 4, Morton Brook Tributary 7, Morton Brook Tributary 8 and Morton Brook itself are all crossed by the proposed route alignment and the haul route.</p>	<p>These watercourses were not surveyed in June 2025.</p> <p>Morton Brook Tributary 4 appears to be an artificial agricultural drainage ditch, as indicated by its straightened channel morphology and uniform planform. The watercourse runs either side of a small lake, suggesting it may have been engineered to manage surface runoff or field drainage. The surrounding land is dominated by intensively managed agricultural fields, with only a minimal riparian buffer present. The watercourse is likely to be ephemeral.</p> <p>Morton Brook Tributary 7 has its source to the north east of Tibshelf. From aerial imagery it appears largely natural (especially in its upper reaches), with only small reaches downstream near the proposed route alignment crossing appearing straightened. The riparian corridor is agriculturally influenced where the tributary acts as an agricultural drainage ditch. Sediment composition is predominantly fine-grained, with silt and sand most common, though coarser material up to cobble size is mobilised during high-flow events as visible on Google Street View. Evidence of undercut banks and active lateral erosion is visible in imagery, indicating ongoing channel adjustment (Ref 9C.7).</p> <p>Morton Brook Tributary 8 closely resembles Tributary 4, with a straightened, uniform channel indicative of agricultural drainage. It flows through intensively farmed land with minimal riparian vegetation.</p> <p>Morton Brook originates to the north of Morton and flows southward, receiving several tributaries along its course before joining the Alfreton Brook to the south west of Westhouses. Within the draft Order Limits the watercourse has both natural and artificial aspects. A wide floodplain and dense vegetation along some of the reach is beneficial to the watercourse, while on the other half, signs of straightening is the anthropogenic impacted extent.</p>

Ordinary Watercourses	Interaction with the Project	Description
		<p>No gauging stations are present on Morton Brook or its tributaries. The catchment area is approximately 33.56 km².</p>
Alfreton Brook Tributaries 3 and 4	Both tributaries are crossed by the proposed route alignment and the haul route.	<p>These watercourses were not surveyed in June 2025.</p> <p>Alfreton Brook Tributaries 3 and 4 consist of straightened channels, clearly modified for agricultural drainage, with a uniform, angular planform that reflects minimal natural geomorphic activity. The tributaries likely experience low, intermittent flows driven by runoff. The surrounding landscape is intensively farmed, and the riparian zone is minimal to absent, offering little vegetative buffering. Given their artificial nature and drainage function, the tributaries are also likely to behave ephemerally.</p> <p>No gauging stations are present on Alfreton Brook Tributary 3 or 4. In addition, the catchment size of these watercourses is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>
Church Street Ditch 1	Crossed by the proposed route alignment.	<p>This watercourse was not surveyed in June 2025.</p> <p>Church Street Ditch 1 is an approximately 850 m stretch of ditch which flows from Ufton Fields Farm to Alfreton Brook. Of this 850 m, approximately 250 m are present within the draft Order Limits, with an initial reach near perpendicular to the draft Order Limits (NGR: SK 397 562), with the second reach near to Alfreton Brook parallel to the eastern extent of the draft Order Limits (NGR: SK 399 567).</p> <p>The riparian zone at the ditch's source is that of shrubs or a hedgerow, while the second reach is situated within a narrow deciduous woodland (referred to as 'Long Plantation' on some mapping). The elevation profile of the ditch and surrounding area suggests that the ditch is shallow in nature and is likely ephemeral.</p> <p>No gauging stations are present on Church Street Ditch 1. In addition, Church Street Ditch has an approximate catchment area of 0.52 km².</p>

**Ordinary
Watercourses**

Interaction with the Project

Description

Oakerthorpe Brook

Crossed by the proposed route alignment.

Image 9C.14: Oakerthorpe Brook facing downstream from right bank at the preferred location for the overhead line



This watercourse has a natural channel which is heavily shaded by woodland on both banks. Approximate dimensions of the channel include bank height of 1 m, bank-full width of 3 m, wetted width of 2.5 m and water depth of 0.5 m. Although it has a low immediate bank height, the channel is within a small valley with steep sides. Bed material ranges from sand to cobble along the reach with significant deposition of silt and organic debris on top of coarser materials. There are many natural debris structures formed along the channel through the Study Area, mostly created initially from fallen trees across the channel.

The water was mostly clear at the time of survey. At the downstream section of the Study Area is a small weir where water is pumped from the channel to irrigate the adjacent golf course.

Ordinary Watercourses	Interaction with the Project	Description
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No gauging stations are present on Oakerthorpe Brook, while it has an approximate catchment area of 5 km² at the draft Order Limits.

Millstone Lane Brook
 Crossed by the proposed route alignment and haul route. In addition, a scaffolding area is within proximity to this watercourse.

Image 9C.15: Millstone Lane Brook facing upstream from left bank, downstream of the proposed overhead line crossing, at confluence with Millstone Lane Brook Tributary 2

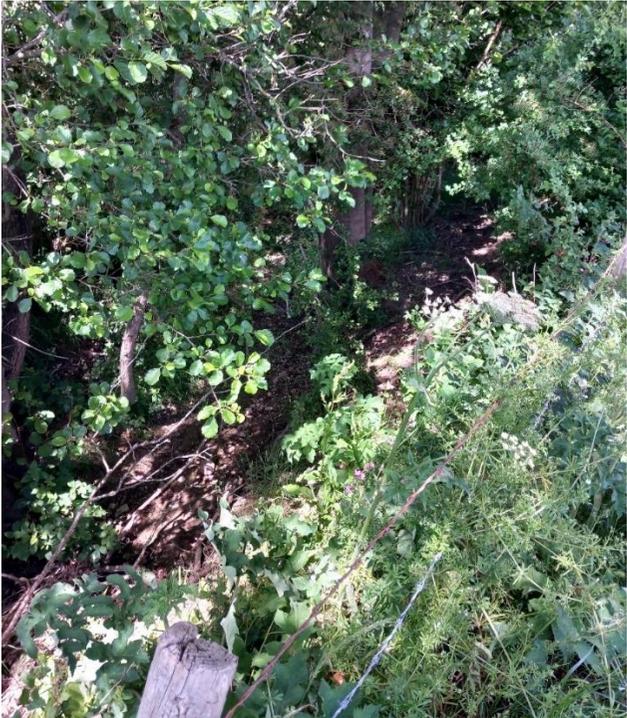


Image 9C.16: Millstone Lane Brook Tributary 2, facing upstream from right bank



Through the Study Area, this watercourse is located within a steep wooded valley, with steep high banks. The bank top is bounded by a fence on the left bank which limited access to the watercourse during the survey. Immediately upstream of the confluence with Tributary 2, the watercourse is approximately 1 m wide; however, there was little water in the channel at time of survey. The bed material comprises earth and organic debris. The riparian zone is used for grazing cattle. No gauging stations are present on Millstone Lane Brook, while it has an approximate catchment area of 1.1 km² at the draft Order Limits.

Ordinary Watercourses	Interaction with the Project	Description
Wood Lane Brook	Crossed by the proposed route alignment and haul route. In addition, a scaffolding area is situated within proximity to the watercourse.	<p>This watercourse was not surveyed in June 2025.</p> <p>Wood Lane Brook is a tributary of the River Amber near Pentrich Lane End. The watercourse appears to be straightened, likely functioning as an agricultural drainage ditch that conveys overland flow from surrounding fields. Its absence from several mapping sources suggests it is an ephemeral channel.</p> <p>No gauging stations are present on Wood Lane Brook. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>

Section 3

Hartshay Brook	Crossed by the proposed route alignment	<p>Image 9C.17: Hartshay Brook, facing across the channel from adjacent canal towpath (left bank of watercourse), at preferred crossing location of overhead line</p>
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Image 9C.18: Hartshay Brook facing downstream from left bank, downstream of wetland



This watercourse meanders through the Study Area and is dominated by a wetland and online pond within the draft Order Limits. At the preferred crossing of the proposed route alignment the brook is close to, and receives discharge from, the Hartshay Canal. At this location there is smooth or no perceptible flow as the watercourse widens and is slowed by the wetland area. The main channel is approximately 3 m wide. The water was turbid at this location at the time of survey.

Further downstream, the watercourse is clear and flows through an approximately 1.5 m wide channel with shallow banks. Both banks are grazed.

No gauging stations are present on Hartshay Lane Brook, while it has an approximate catchment area of 6.8 km² at the draft Order Limits.

Ordinary Watercourses	Interaction with the Project	Description
Coppice Brook 2 Ditch	Within the draft Order Limits	<p>This watercourse was not surveyed in June 2025.</p> <p>Coppice Brook 2 Ditch is a tributary of Coppice Brook situated along the eastern periphery of the draft Order Limits (NGR: SK 377 489). It appears straightened in planform and runs adjacent to agricultural fields. Topographically there is no depression in the elevation profile, suggesting an ephemeral ditch is present here.</p> <p>No flow gauging stations are present on Coppice Brook 2 Ditch. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
Coppice Brook	<p>Crossed by the proposed route alignment in one location. A construction compound is situated adjacent, while a scaffolding area is located within proximity. A watercourse crossing of the haul route is also proposed.</p>	<p>Image 9C.19: Coppice Brook facing downstream from right bank, upstream of the preferred overhead line crossing location</p>



Image 9C.20: Coppice Brook facing upstream from right bank. The preferred crossing location of the overhead line is beyond the fence line



This watercourse mainly flows through a low-lying marsh area at the preferred location for the proposed route alignment. This area was not accessible for the survey. Upstream of this location, the approximate dimensions of the channel include a bank height of 2 m, bank-full width of 5 m, wetted width of 1.5 m and water depth of 0.3 m. The channel lies within a wide floodplain which is grazed on both banks by cattle. The bed material is mostly silt and organic debris. The water was mostly clear.

No gauging stations are present on Coppice Brook, while it has an approximate catchment area of 3 km² at the draft Order Limits.

Ordinary Watercourses	Interaction with the Project	Description
Bottle Brook	Located within the draft Order Limits but not crossed by the proposed route alignment.	<p>This watercourse was not surveyed in June 2025.</p> <p>Bottle Brook has a main river section that is crossed by the proposed route alignment and an ordinary watercourse section (See Section 3 of Table 9C.1 for Bottle Brook main river).</p> <p>At its source near Morrell Wood Farm, the watercourse originates in a low-gradient, rural catchment dominated by agricultural land use. The brook appears to have undergone artificial channel modification, suggesting historical straightening likely for land drainage or agricultural efficiency. This section of the watercourse likely exhibits reduced habitat diversity and altered flow dynamics due to channelisation, with limited interaction between the stream and its floodplain. As it approaches the A38, the watercourse is culverted, which likely further disrupts natural sediment transport.</p> <p>Downstream of the A38 culvert, Bottle Brook appears to have a more natural morphology, with a relatively sinuous channel running through Morrell Wood before alternating between an agricultural and woodland riparian zone before becoming a main river designation.</p> <p>No flow gauging stations are present on this section of the Bottle Brook. The catchment area within the draft Order Limits is approximately 0.77 km².</p>
Killis Lane Brook and Kilburn Lake Brook	Crossed by the proposed route alignment. In addition, the haul route crosses Killis Lane Brook in two locations, while a scaffolding area is located within proximity.	<p>These watercourses were not surveyed in June 2025.</p> <p>Kilburn Lake Brook and Killis Lane Brook have been grouped as they share very similar geomorphological features to one another and have both been impacted by urbanisation in similar ways. Kilburn Lake Brook joins with Killis Lane Brook at the approximate location of the proposed route alignment crossing at NGR: SK 371 465, south of the A609. Both these watercourses are tributaries of the Bottle Brook main river.</p> <p>At its source Kilburn Lake Brook flows through Kilburn fishery lake, while Killis Lane Brook has its source approximately 200 m to the north, before flowing under the A38 and then joining the Bottle Brook.</p> <p>The watercourses have undergone clear modification, notably straightening and culverts which will likely impact natural flow and sediment regime. In addition, the</p>

Ordinary Watercourses	Interaction with the Project	Description
		<p>riparian zone is minimal, largely limited to shrubs and grasses, with occasional small trees as part of an agricultural field hedgerow.</p> <p>No flow gauging stations are present on Kilburn Lake Brook or Killis Lane Brook. The catchment area is approximately 0.8 km² at the draft Order Limits.</p>
Bottle Brook Parallel	Crossed by the proposed route alignment in one location.	<p>This watercourse was not surveyed in June 2025.</p> <p>Bottle Brook Parallel runs adjacent to the A38 and appears hydrologically connected to Killis Lane Brook at NGR: SK 374 460. The entirety of Bottle Brook Parallel is situated within the draft Order Limits, before it joins Bottle Brook itself at NGR: SK 373 455.</p> <p>Bottle Brook Parallel appears straightened in nature with a minimal riparian zone. Sediment is likely fine grained, while the channel is likely ephemeral.</p> <p>No flow gauging stations are present on Bottle Brook Parallel. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>
Horsley Road Brook 1 and 2	Situated within the draft Order Limits.	<p>These watercourses were not surveyed in June 2025.</p> <p>Horsley Road Brook 1 is a tributary of Bottle Brook situated near Kilburn Sewage Treatment Works. They are straightened sections of watercourse adjacent to agricultural fields.</p> <p>The riparian zones are limited to hedgerows, while the sediment is likely that of silt and fine-grained sand. In addition, the watercourses are likely to be ephemeral.</p> <p>No flow gauging stations are present on Horsley Road Brook 1. In addition, the catchment size of these watercourses is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>

Ordinary Watercourses	Interaction with the Project	Description
St Clement's Church Ditch	Within the draft Order Limits.	<p>This watercourse was not surveyed in June 2025.</p> <p>St Clement's Church Ditch has two reaches situated within the draft Order Limits. The first is to the south of St Clement's Church (NGR: SK 373 443) while the latter is situated in south Lower Kilburn (NGR: SK 372 447).</p> <p>The Lower Kilburn section appears to be an artificially constructed ditch due to its straight manner situated between the B6179 road and agricultural fields. The riparian zone is minimal, limited to shrubs and grasses.</p> <p>The southern section of St Clement's Church Ditch appears less artificial, with minimal sinuosity and a riparian zone composed of deciduous trees.</p> <p>No flow gauging stations are present on St Clement's Church Ditch. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>

**Ordinary
Watercourses****Interaction with the Project****Description**

Booth's Wood Brook

Crossed by the proposed route alignment in one location.

Image 9C.21: Booth's Wood Brook facing downstream from right bank at preferred location of overhead line



Image 9C.22: Booth's Wood Brook facing upstream from Public Right of Way crossing. Downstream of the preferred overhead line crossing location



In the Study Area, this watercourse flows through woodland, mostly in a narrow channel with shallow banks. At the preferred location of the proposed route alignment the approximate dimensions of the channel include bank height of 0.4 m, bank-full width of 0.5 m, wetted width of 0.5 m and water depth of <0.1 m. Beyond the bank top, the riparian zone is inclined and is grazed beyond the woodland. The bed material is mostly sand with some organic debris. The water is clear.

There is a Public Right of Way crossing within the draft Order Limits. At this location the watercourse widens to an approximate 2 m wetted width. Here ripples have been formed by the sand bed material.

No gauging stations are present on Booth's Wood Brook, while it has an approximate catchment area of 0.96 km² at the draft Order Limits.

Ordinary Watercourses	Interaction with the Project	Description
Mushroom Wood Brook	The proposed route alignment and haul route crosses Mushroom Wood Brook.	<p>This watercourse was not surveyed in June 2025.</p> <p>Mushroom Wood Brook is a tributary of Bottle Brook and is crossed by the proposed haul road route at approximately NGR: SK 367 441.</p> <p>Upstream of the draft Order Limits, Mushroom Wood Brook appears relatively natural, with a meandering section present within a steep gradient setting. Sediment size ranges up to cobble size from aerial imagery, however, average sediment size is likely finer grained (e.g. silt or fine sand) (Ref 9C.7). In addition, aerial imagery also reveals a step-pool geomorphological system for some of its upstream reach. This suggests that Mushroom Wood Brook is a confined system and possesses high energy, especially in high flow events.</p> <p>Closer to the draft Order Limits, the watercourse is culverted under Port Way Road before displaying obvious signs of artificial channel straightening along an agricultural field perimeter (Ref 9C.7).</p> <p>No flow gauging stations are present on Mushroom Wood Brook. The catchment area within the draft Order Limits is approximately 0.7 km², which is also similar to what the overall catchment area would be for this watercourse.</p>
Park Brook and its tributaries	<p>Crossed by the proposed route alignment in four distinct locations, one on each of the following: Park Brook, Park Brook Tributary 4, Park Brook Tributary 7 and Park Brook Tributary 8.</p> <p>A scaffolding area is located within proximity to Park Brook itself.</p> <p>In addition, the haul road crosses the Park Brook and its tributaries in five locations.</p>	<p>These watercourses were not surveyed in June 2025.</p> <p>Park Brook appears varied in terms of both the impact of urbanisation and the consequent geomorphology. Some reaches are largely natural, with meandering bends (Ref 9C.7), while other reaches appear to have artificially straightened channels. Riparian zone vegetation is fragmented, with some sections having dense trees and shrubs, while others are limited to grass and occasional shrubs.</p> <p>On the other hand, Park Brook Tributaries 4, 7 and 8 are more artificial, with a straightened morphology composing a vast majority of the watercourse.</p> <p>No flow gauging stations are present on Park Brook and its tributaries. The catchment area of Park Brook at the draft Order Limits is approximately 7.73 km².</p>

Ordinary Watercourses	Interaction with the Project	Description
Carr Brook	Crossed by the proposed route alignment and haul route. A scaffolding area is located within the catchment.	<p>It is assumed that Carr Brook is culverted for much of its reach within the draft Order Limits. It is assumed that its source is near Morley Smithy and it flows west towards Quarry Road. There is no mapping of this potentially culverted section of watercourse to confirm if there is a hydrological connection to Carr Brook, west of Quarry Road. To the east of Quarry Road a pond of water can be seen on aerial imagery and Google Streetview.</p> <p>No flow gauging stations are present on Carr Brook. The catchment area within the draft Order Limits is approximately 0.62 km².</p>

Section 4

Moses Lane Brook
 Crossed by the proposed route alignment and the haul route.

Image 9C.23: Moses Lane Brook facing upstream from a footbridge



Ordinary Watercourses	Interaction with the Project	Description
		<p>Access to this watercourse within the draft Order Limits was not possible. The survey location was 175 m upstream of the draft Order Limits where the watercourse flows through a wooded valley. At this location, the watercourse had a multi-thread channel and bed material ranging from sand to cobble, but is dominated by gravels. This reach is steep, and tree roots influence the channel locations and dimensions. The approximate dimensions of the channel include bank height of 0.2 m (5 m to top of wooded valley sides), bank-full width of 4 m, wetted width of 3 m and water depth of <0.1 m. The water was clear.</p> <p>At the location of the proposed route alignment crossing, the watercourse flows through arable land. No gauging stations are present on Moses Lane Brook, while it has an approximate catchment area of 1 km² at the draft Order Limits.</p>
Church Lane Ditch	Within the draft Order Limits.	<p>This watercourse was not surveyed in June 2025.</p> <p>Church Lane is a ditch located to the east of Morley (NGR: SK 400 406) and to the west of the draft Order Limits.</p> <p>The ditch follows a hedgerow through agricultural fields with two ponds situated at its western extent. It is not clear whether the ditches flow from or to these ponds, but online mapping and topography suggests that the ditch likely flows from these ponds, joins Manor Farm Brook and Manor Farm Ditches before joining with Stanley Brook.</p> <p>No flow gauging stations are present Church Lane Ditch. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>

Ordinary Watercourses	Interaction with the Project	Description
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Manor Farm Brook and its tributaries

Crossed by the proposed route alignment on Manor Farm Brook, Manor Farm Ditch 3 and Manor Farm Ditch 4. In addition, Manor Farm Ditch 4 is crossed by the haul route.

Image 9C.24: Manor Farm Brook looking upstream from right bank at preferred location for the overhead line



Image 9C.25: Online pond on Manor Farm Brook, taken from left bank



Manor Farm Brook is relatively straight and overdeep, following field boundaries. Historical mapping does not show a different channel alignment so any modification will have happened before 1830. At the location of the proposed route alignment crossing, the channel is trapezoidal and vegetated mostly by long grasses with some hedgerow on the right bank. The approximate dimensions of the channel include bank height of 1.5 m, bank-full width of 3 m. The water was not visible at the time of survey due to overgrown vegetation. Immediately downstream the channel joins an online pond which receives water from Manor Farm Ditch 3.

Its tributaries, Manor Farm Ditch 2, 3 and 5 follow field boundaries and are steep in gradient flowing north towards Manor Farm Brook. There is a hedgerow along most of the length of these tributaries.

The riparian zone for these watercourses is predominantly arable agriculture, with some grazing.

Ordinary Watercourses	Interaction with the Project	Description
		<p>No gauging stations are present on Manor Farm Brook and its tributaries, while it has an approximate catchment area of 1.3 km² at the draft Order Limits.</p>
Locko Park North Tributary 1	Situated within the draft Order Limits.	<p>This watercourse was not surveyed in June 2025.</p> <p>Locko Park North Tributary 1 appears to consist of straightened artificial ditches, online ponds and online small lakes. It then flows to Locko Park Lake before flowing into Lees Brook.</p> <p>The likely ephemeral nature of the tributary, suggested by its discontinuous representation across multiple mapping sources, implies that it may only flow during periods of high rainfall or seasonal runoff. In addition, Locko Park North Tributary 1 flows through a landscaped garden and is therefore, broken up with amenity ponds, bridges and culverts. This intermittent flow regime reduces the stream's capacity for sediment transport (limiting it to fine grained material) and biological connectivity, and may result in periodic drying of channel sections, especially in the upper reaches.</p> <p>The riparian zone appears quite dense: approximately 10–20 m of trees and shrubs either side of the watercourse.</p> <p>No flow gauging stations are present on Locko Park North Tributary 1. The catchment area within and upstream of the draft Order Limits is approximately 0.8 km². The overall catchment area is similar to this.</p>
Locko Park East Tributary 1 and 2	Locko Park East Tributary 1 is crossed by the proposed route alignment, haul route and scaffolding area. Locko Part East Tributary 2 is situated within the draft Order Limits but is not proposed to be crossed by any infrastructure.	<p>These watercourses were not surveyed in June 2025.</p> <p>Both Locko Park East tributaries are straightened artificial ditches. They flow into Locko Park Lake before flowing into Lees Brook.</p> <p>The likely ephemeral nature of these tributaries, suggested by their discontinuous representation across multiple mapping sources, implies that they may only flow during periods of high rainfall or seasonal runoff. In addition, Locko Park East Tributary 1 flows through a landscaped garden and is therefore broken up with amenity ponds, bridges and culverts. This intermittent flow regime reduces the stream's capacity for sediment transport (limiting it to fine grained material) and biological connectivity, and may result in periodic drying of channel sections,</p>

Ordinary Watercourses	Interaction with the Project	Description
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especially in the upper reaches. The riparian zone appears largely non-existent, limited to grass and small shrubs.

No flow gauging stations are present on Locko Park East Tributary 1 and 2. The catchment area of Locko Park East Tributary 1 is approximately 1.19 km². The catchment size of these watercourses is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².

Ock Brook and its tributaries

The proposed route alignment and haul route cross four watercourses in total. These include Ock Brook itself, as well as Ock Brook Tributary 2, Brook 2 (a tributary to Ock Brook Tributary 2), and Brook 1 (also a tributary to Ock Brook Tributary 2). Additionally, a scaffold area is located adjacent to Ock Brook.

Image 9C.26: Ock Brook facing across the channel from the left bank. Located upstream of the preferred crossing location of the overhead line



Ock Brook has a wooded riparian zone between arable fields in the Study Area. At the survey location the channel flowed through a culvert under an access track. The culvert was obscured by vegetation but a drop from the outfall of the culvert to the water was audible, therefore, the culvert is very likely a barrier to species migration. Immediately downstream of the culvert is a wide deep pool where the water is turbid. There is no perceptible flow downstream of this culvert. The

Ordinary Watercourses	Interaction with the Project	Description
		<p>riparian zone on the left bank is woodland whilst the right bank has some trees before an arable field. The bank height is approximately 3 m.</p> <p>Upstream of the culvert, the channel has more in-channel diversity with a pool riffle sequence and a visible range of bed material (sand to boulders). The riparian zone on both banks is woodland, and the banks are less steep.</p> <p>The approximate wetted width of the channel is 1.5 to 2 m.</p> <p>Ock Brook tributaries are relatively natural, with elements of meandering planforms particularly evident for Ock Brook Tributary 2. Riparian vegetation is dense, with deciduous trees as well as shrubs present for all of their reaches within the draft Order Limits. Agricultural fields are present adjacent to these tributaries which could lead to sediment and nutrient loading.</p> <p>No gauging stations are present on Ock Brook and its tributaries, while it has an approximate catchment area of 6.5 km² at the draft Order Limits.</p>
Moor Lane Brook	Situated within the draft Order Limits.	<p>This watercourse was not surveyed in June 2025.</p> <p>The riparian zone on both banks comprises agricultural fields. The watercourse is approximately aligned with a hedgerow separating these fields, with the planform appearing straightened. It is located to the north east of the village of Spondon (NGR: SK417369).</p> <p>No flow gauging stations are present for Moor Lane Brook. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>
Ock Brook Ditch 3	Crossed by the proposed route alignment and haul route.	<p>This watercourse was not surveyed in June 2025.</p> <p>Ock Brook Ditch 3 is a hedgerow agricultural ditch situated to the east of the village of Ockbrook (NGR: SK 430 360) and is a tributary of Ock Brook itself. The riparian zone is minimal, with the hedgerow largely composed of shrubs.</p> <p>No flow gauging stations are present for Ock Brook Ditch 3. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>

Ordinary Watercourses	Interaction with the Project	Description
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Section 5

Borrowwash Brook and tributary

Crossed by the proposed route alignment and haul route on both Borrowwash Brook itself and Borrowwash Brook Tributary.

Image 9C.27: Borrowwash Brook facing across the channel from left bank



This watercourse is in an overdeep channel between arable fields. There is a riparian buffer on the left bank dominated by scrub and trees. The channel was not visible at time of survey due to dense vegetation.

Image 9C.28: Borrowwash Brook Tributary facing downstream from culvert crossing



Borrowwash Tributary which runs parallel to the B5010 was dry at the time of survey. The approximate dimensions of the channel include bank height of 0.5 m and channel width of 0.5 m. The bed material is silt and organic debris.

No gauging stations are present on Borrowwash Brook, and it has an approximate catchment area of 0.6 km² at the draft Order Limits.

Ordinary Watercourses	Interaction with the Project	Description
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Chellaston Lane Brooks Crossed by the proposed route alignment in two places, one by Chellaston Lane Brook 1 and one by Chellaston Lane Brook 2.

Scaffolding area crosses Chellaston Lane Brook 2, while a construction compound is located in proximity to Chellaston Lane Brook 1.

Chellaston Lane Brook 1 is crossed by the haul route in two locations, while Chellaston Lane Brook 2 is crossed once.

Image 9C.29: Chellaston Lane Brook 1, facing upstream from culvert crossing



This watercourse is a straightened, overdeep channel which forms the boundary of two fields. The bank vegetation is long grasses with occasional trees, and the riparian zone is cropped. The approximate dimensions of the channel include bank height of 1.5 m, bank-full width of 3 m, wetted width of 1 m and water depth of 0.2 m. The water was clear. The bed material was silt. There were tadpoles visible in this watercourse.

Image 9C.30: Chellaston Lane Brook 2 facing downstream from left bank. Immediately downstream of the A6 culvert



At the location of the proposed route alignment, Chellaston Lane Brook 2 is in a culvert under the A6. This is a 1.2 m diameter concrete culvert. Downstream of the culvert, this watercourse is a straightened, overdeep channel which forms the boundary of two fields. The bank vegetation consists of long grasses on the left bank and hedgerow on the right bank. The approximate dimensions of the channel include a bank height of 1.5 m, bank-full width of 2 m, wetted width of 1 m and water depth of 0.2 m. The bed material is silt and there are long grasses in

Ordinary Watercourses	Interaction with the Project	Description
Derby Canal Tributary	Situated within the draft Order Limits. The scaffolding area is located within proximity to this ditch.	<p>the channel. At the time of the survey, the water was clear with a greyish hue and there was no perceptible flow.</p> <p>No gauging stations are present on Chellaston Lane Brooks 1 and 2, while they have an approximate catchment area of 1.65 km² and 0.69 km² for Chellaston Lane Brook 1 and Chellaston Lane Brook 2 respectively at the draft Order Limits.</p> <p>This watercourse was not surveyed in June 2025.</p> <p>Derby Canal Tributary is located to the north west of Draycott adjacent to Derby Road (NGR: SK 431 337 to SK 434 347) and joins the Derby Canal.</p> <p>The riparian zone is composed of shrubs which run along the edge of an agricultural field. It is likely that this ditch is ephemeral. No flow gauging stations are present for Derby Canal Tributary. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of ≥ 0.5 km².</p>

Ordinary Watercourses	Interaction with the Project	Description
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Ambaston Ditches

Crossed by the proposed route alignment in four locations. In addition, the haul route crosses Ambaston Ditches eight times.

Image 9C.31: Ambaston Ditch 11 facing west. This is a typical example of the Ambaston Ditches



The Ambaston Ditches are a network of 12 ditches in proximity to the village of Ambaston. This group of ditches is separated approximately in half by the presence of Ambaston Lane which runs north to south from Ambaston.

The eastern group of ditches is arranged in a hydrologically connected network, approximately 500 m from the River Derwent. These ditches trace the perimeters of agricultural fields and, as evident from aerial imagery, are clearly artificial in

Ordinary Watercourses	Interaction with the Project	Description
		<p>origin. Their straight, angular layout suggests deliberate engineering, and they appear to have been excavated into trapezoidal cross-sections to facilitate drainage. The riparian zones surrounding these ditches are minimal, consisting mostly of narrow grass margins or bare soil.</p> <p>The western group of ditches are similar in geomorphology and hydromorphology to the eastern group of ditches above. It is unclear exactly where they flow to but it seems likely that they flow into the nearby gravel pits before joining Thulston Brook and eventually the River Derwent.</p> <p>No flow gauging stations are present for Ambaston Ditches. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
Chellaston Lane Ditch 1	Situated within the draft Order Limits.	<p>This watercourse was not surveyed in June 2025.</p> <p>Chellaston Lane Ditch 1 is an agricultural ditch situated to the west of the A6 Aston Interchange (NGR: SK 399 302 to SK 400 306). Based on mapping contours, it is likely that Chellaston Lane Ditch 1 flows northwards, where it joins Chellaston Lane Brook 2 before it joins the Trent and Mersey Canal. The ditch has a limited riparian zone, composed of grasses and shrubs, while the ditch is clearly straightened and used to drain the adjacent fields.</p> <p>Although remote sensing imagery only indicates that the ditch is present at the east of the draft Order Limits, aerial imagery suggests that the ditch may traverse the draft Order Limits from east to west. If this is the case, then the interaction with the draft Order Limits will be that it is crossed by the proposed overhead line.</p> <p>No flow gauging stations are present for Chellaston Lane Ditch 1. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
Chellaston Lane Ditch 2	Crossed by the proposed haul route in one location.	<p>This watercourse was not surveyed in June 2025.</p> <p>Chellaston Lane Ditch 2 is not clearly visible from aerial imagery due to a combination of poor resolution in this area, as well as a dense riparian zone. It is likely that this ditch is ephemeral, only containing water when runoff rates are</p>

Ordinary Watercourses	Interaction with the Project	Description
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high. In addition, it is not clear which direction the ditch will flow when water is present.

No flow gauging stations are present for Chellaston Lane Ditch 2. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.

Section 6

Fox Covert Tributaries Located within the draft Order Limits but does not interact with the proposed route alignment.

Image 9C.32: Fox Covert Tributary 4, facing upstream on right bank, downstream of the draft Order Limits



The surveyed section is not within the draft Order Limits, but is within 500 m downstream of Fox Covert Tributary 4. At the surveyed location, the watercourse is a field boundary, with crops on the right bank and hedgerow on the left bank

Ordinary Watercourses	Interaction with the Project	Description
		<p>with arable land beyond that. The watercourse is overdeepened and straightened. The bed was not visible at time of survey due to dense bankside vegetation. Fox Covert Tributary 3 was dry at the time of survey and similar to Tributary 4. The reach within the draft Order Limits was not accessible due to dense vegetation.</p> <p>No flow gauging stations are present for Fox Covert Tributaries. In addition, the catchment size of these watercourses is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
Lowes Lane Ditch 1	Crossed by proposed haul route.	<p>This watercourse was not surveyed in June 2025.</p> <p>Lowes Lane Ditch 1 is similar to Chellaston Lane Ditch 2 above, in that it is not clearly visible from aerial imagery due to a combination of poor resolution imagery in this area as well as a dense riparian zone. In fact the riparian zone is composed of a small area of deciduous woodland within the draft Order Limits.</p> <p>No flow gauging stations are present for Lowes Lane Ditch 1. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
River Trent Tributary	Crossed by the proposed route alignment and the haul road.	<p>This watercourse was not surveyed in June 2025.</p> <p>River Trent Tributary flows through Barrow upon Trent just downstream of its interaction with the draft Order Limits. The River Trent Tributary has a largely natural morphology within the vicinity of the draft Order Limits; however, the watercourse is culverted under the A5132. The riparian zone is limited to shrubs and/or grasses.</p> <p>No flow gauging stations are present on the River Trent Tributary. The catchment area within and upstream of the draft Order Limits is approximately 6.14 km^2, while the overall catchment area is approximately 6.82 km^2.</p>

Ordinary Watercourses

Interaction with the Project

Description

Extension of River Trent Tributary

Crossed by the proposed route alignment. Two watercourse crossings are also proposed.

Image 9C.33: Extension of River Trent Tributary facing downstream from right bank at preferred location of overhead crossing



This is a straightened, overdeep watercourse forming a boundary between arable fields. There is crop within the riparian zone. The bank vegetation is mainly long grass with occasional trees along the reach on both banks. The approximate dimensions of the channel include a bank height of 1.5 m, bank-full width of 3 m, wetted width of 1 m and water depth of 0.2 m. There was water in the channel at the time of the survey. The bed material is silt.

No flow gauging stations are present for the Extension of River Trent Tributary. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.

**Ordinary
Watercourses**

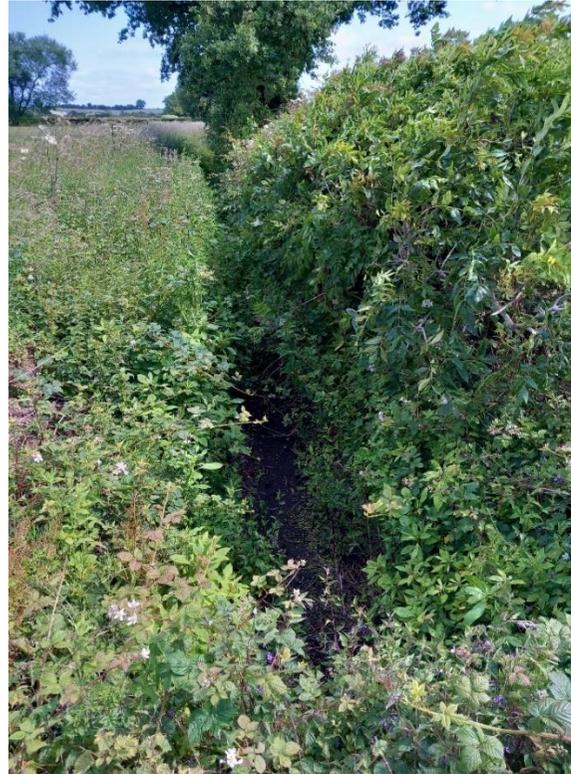
Interaction with the Project

Description

Merrybower Ditches

Crossed by the proposed route alignment and haul route, while scaffolding area is located within proximity.

Image 9C.34: Merrybower Ditch 1 facing upstream from a culvert crossing



This watercourse was dry at the time of survey in the reach within the draft Order Limits. There is a hedgerow on the left bank of the channel and long grasses on both banks. The bed material is silt. The approximate dimensions of the channel include bank height of 1.5 m, bank-full width of 2 m and channel width of 0.5 m. There is a culvert for a field access downstream of the proposed route alignment crossing location. The watercourse is wet downstream of this culvert.

Ordinary Watercourses	Interaction with the Project	Description
		<p>The other two Merrybower Ditch sections display similar features. They are artificial with a clearly straightened and overdeep cross-section. This is likely for an agricultural drainage purpose and appear to flow west to the Twyford Brook.</p> <p>No flow gauging stations are present for Merrybower Ditches. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
Twyford Brook Ditches	<p>Crossed by the proposed route alignment in two locations. Twyford Brook Ditch 3, 4 and 5 are all in proximity to a construction compound.</p>	<p>These watercourses were not surveyed in June 2025.</p> <p>Twyford Brook Ditches comprise three different ditches situated within the draft Order Limits.</p> <p>The ditch network is artificial, with a clearly straightened and overdeep cross-section. This is likely for agricultural drainage purposes and flows to the Twyford Brook. The riparian zone on Twyford Brook Ditches is fragmented, with some sections composed of bare soil while others are grass and shrub with trees occasionally present.</p> <p>No flow gauging stations are present for Twyford Brook Ditches. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
Findern Ditch	<p>Situated within the draft Order Limits.</p>	<p>This watercourse was not surveyed in June 2025.</p> <p>Findern Ditch is similar to Lowes Lane Ditch 1 above, in that it is not clearly visible from aerial imagery due to a combination of poor resolution imagery in this area as well as a dense riparian zone. In fact, the riparian zone is composed of a small area of deciduous woodland within the draft Order Limits.</p> <p>No flow gauging stations are present for Findern Ditch. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
Frizams Lane Ditch	<p>Crossed by the proposed route alignment, haul route and scaffolding area.</p>	<p>This watercourse was not surveyed in June 2025.</p> <p>This watercourse runs adjacent to a road on its left bank and an agricultural field on its right bank, before flowing into the River Trent. Within the draft Order Limits, the riparian zone begins as trees but is less dense and more shrub-dominated in</p>

Ordinary Watercourses	Interaction with the Project	Description
		<p>the downstream stretch. The watercourse appears straightened in terms of planform.</p> <p>No flow gauging stations are present for Frizams Lane Ditch. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>
Power Station Ditches	Crossed by the proposed route alignment and haul route in one location.	<p>These watercourses were not surveyed in June 2025.</p> <p>Power Station Ditches is comprised of five ditches within the proximity of the Willington Power Station. They are not clearly visible on aerial imagery due to a combination of poor resolution imagery in this area as well as a densely vegetated riparian zone. The western ditches are situated within a small deciduous woodland, while the more eastern ditches are situated within a riparian zone of shrubs. It is likely that these ditches discharge to the Trent and Mersey Canal.</p> <p>No flow gauging stations are present for Power Station Ditches. In addition, the catchment size of this watercourse is under the minimum catchment limit of the Flood Estimation Handbook of $\geq 0.5 \text{ km}^2$.</p>

References

- Ref 9C.1 Google (2025). Google Mapping. [Online]. Available at: <https://www.google.com/maps/> [Accessed July 2025].
- Ref 9C.2 Environment Agency (2025). Main River map for England. [Online]. Available at: <https://www.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386> [Accessed July 2025].
- Ref 9C.3 UK Centre for Ecology and Hydrology (2025). Flood Estimation Handbook Web Service. [Online]. Available at: <https://fehweb.ceh.ac.uk/Map> [Accessed July 2025].
- Ref 9C.4 National River Flow Archive (2025). Hydrometric monitoring network. [Online]. Available at: <https://nrfa.ceh.ac.uk/data/search> [Accessed July 2025].
- Ref 9C.5 National Library of Scotland (2025). Side by side viewer. [Online]. Available at: <https://maps.nls.uk/geo/explore/side-by-side/#zoom=15.4&lat=53.21834&lon=-1.38404&layers=1&right=osm> [Accessed July 2025].
- Ref 9C.6 River Levels (2025). Map of River Level Monitoring Stations. [Online]. Available at: <https://riverlevels.uk/map> [Accessed July 2025].
- Ref 9C.7 Google Street View (2022). Available at: <https://www.google.co.uk/maps> [Accessed July 2025].

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