

The West Midlands Rail Freight Interchange Order 201X  
Technical Appendix 16.2 - Water Framework Directive Assessment  
Regulations 5(2)(a) and 5(2)(l)(iii)  
Ramboll - April 2018

# **The West Midlands Rail Freight Interchange Order 201x - Water Framework Directive Assessment**

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**Ramboll Environment & Health UK Ltd.**

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## EXECUTIVE SUMMARY

This Water Framework Directive (WFD) assessment has identified and described those water bodies designated under the WFD within a 2 km radius of the Proposed Development, outlined the potential effects to those water bodies, and then discussed in more detail potential effects identified through the WFD scoping process as requiring further consideration.

It has been shown that due to the nature of the Proposed Development it is the water bodies immediately adjacent to the Site boundary (River Penk and Staffordshire and Worcester Canal) that are at the highest risk but that with implementation of the Outline Demolition and Construction Environmental Management Plan (ODCEMP) and drainage strategy, the risks to these water bodies will not be significant and will not put at risk the WFD classification of either of them. Additionally the River Penk is subject to a number of management measures under the WFD and the Proposed Development will not jeopardise these.

It is concluded, with the implementation of mitigation and management measures as outlined in this report that the Proposed Development is compliant with the requirements of the WFD and the objectives outlined within that Directive, as well as the water body specific objectives set out in the Humber River Basin Management Plan.

# 1. INTRODUCTION

## 1.1 Brief

- 1.1.1 This Water Framework Directive (WFD) Assessment has been produced by Ramboll Environment & Health UK Limited (Ramboll) on behalf of Four Ashes Ltd to assess the compliance of the proposed West Midlands Interchange, 'the Proposed Development' or 'the Site', with the requirements of the WFD.
- 1.1.2 It is noted that the phased development of the Site means that construction of the Proposed Development is anticipated to take approximately 15 years. This WFD assessment therefore has been completed based upon current baseline data and the most recent WFD classifications (2016) as well as legislation in place at the time of writing.

## 1.2 The Site

- 1.2.1 The Site comprises a parcel of land with an area of approximately 297 hectares (ha), at Four Ashes, Staffordshire and is broadly centred at National Grid reference (NGR) 392288E, 309675N. A site location plan is provided as Figure 1. The Site comprises mostly arable farmland with hedgerows and trees, plus a large sand and gravel quarry in the east, and mixed plantation woodland known as Calf Heath Wood at the centre of the Site.
- 1.2.2 The Staffordshire and Worcestershire Canal runs roughly north to south through the western part of the Site before turning eastwards to form the southern boundary of the Site. The West Coast Main Line (WCML) railway runs north to south through the Site, near its western edge.
- 1.2.3 The Site is in general bound to the north by the A5/Watling Street; to the east by Calf Heath Reservoir and farmland; to the south by Four Ashes chemical works and industrial estate, the Staffordshire and Worcestershire Canal, Straight Mile road and farmland; and to the west by the A449 Stafford Road. Two existing industrial uses border the central enclave of the Site boundary.

## 1.3 Proposed Development

1.3.1 The parameters plan of the Proposed Development are included in a suite of documents which the DCO application (Documents 2.5, 2.6 and 2.7). It consists of the following elements:

- An intermodal freight terminal with direct connections to the West Coast Main Line, capable of accommodating up to 10 trains per day and trains of up to 775m length, including container storage, Heavy Goods Vehicle ('HGV') parking, rail control building and staff facilities;
- Up to 743,200 square metres (gross internal area) of rail served warehousing and ancillary service buildings;
- New road infrastructure and works to the existing road infrastructure;
- Demolition and alterations to existing structures and earthworks to create development plots and landscape zones;
- Reconfiguring and burying of electricity pylons and cables; and
- Strategic landscaping and open space, including alterations to public rights of way and the creation of new ecological enhancement areas and publicly accessible open areas.

# 2. THE WATER FRAMEWORK DIRECTIVE

## 2.1 Background

2.1.1 The WFD (2000/60/EC) was published in December 2000 and transposed into English law in December 2003 through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003, later being updated through The Water Environment (WFD) (England and Wales)

(Amendment) Regulation 2015 and most recently The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

2.1.2 The intention of the Directive is to provide a more holistic approach to protection of the water environment than had previously been in place, addressing a wide range of aspects of the water environment including; physico-chemical, chemical, hydromorphological<sup>1</sup> and ecological.

2.1.3 The environmental objectives of the WFD are to:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- Aim to achieve at least ‘good’ status for all water bodies by 2015. Where this is not possible and subject to the criteria set out in the Directive, aim to achieve ‘good’ status by 2021 or 2027. Any water body not at good or high overall status is deemed to not be in compliance with the Directive;
- Meet the requirements of Water Framework Directive Protected Areas;
- Promote sustainable use of water as a natural resource;
- Conserve habitats and species that depend directly on water;
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment;
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants; and

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<sup>1</sup> Physical characteristics of water bodies such as quantity and dynamics of flow; shape, width, depth and pattern of the channel; condition of beds, banks and riparian zone (in the case of rivers) and shores (in the case of lakes and coastal waters). These interact with and affect the biological and chemical quality of water

- Contribute to mitigating the effects of floods and droughts.

2.1.4 The Directive requires that the Environment Agency (EA) defines River Basin Districts and for each of these develop a River Basin Management Plan (RBMP). As part of this process all inland (above or below ground) and coastal waters have been allocated status categories in order to help inform where water bodies are at risk and/or protective/management measures need to be put in place.

## 2.2 Context in Relation to Nationally Significant Infrastructure Projects

2.2.1 The National Policy Statement for National Networks<sup>2</sup> identifies in paragraph 5.219 that infrastructure development can have an adverse effect on the water environment and requires in paragraphs 5.220 and 5.223 the identification of water bodies within the relevant RBMP that may be affected by a project and any potential impacts that it may have on those water bodies or associated Protected Areas.

2.2.2 Further, paragraph 5.225 states that the Secretary of State will give weight to those impacts that would have an adverse effect on the achievement of WFD objectives and paragraph 5.226 requires that a project should result in no deterioration of ecological status of water bodies, ensuring that Article 4.7<sup>3</sup> of the WFD does not need to be applied. The National Policy Statement for National Networks is therefore the primary national driver for the assessment contained within this report, implementing the requirements of the WFD for NSIPs.

## 2.3 Assessment Process

2.3.1 The completion of a WFD assessment is a staged process where data on a site and development proposals are assessed with respect to the requirements of the WFD to ascertain if the proposals will have a detrimental effect on the status of water bodies associated with that site. If the assessment concludes that the proposals may either reduce the quality

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<sup>2</sup> Department for Transport, December 2014, National Policy Statement for National Networks

<sup>3</sup> This is an article that allows development to take place, despite deterioration of water body status, as long as certain criteria, such as overriding public interest, are met

status of the water bodies or prevent them from reaching the required status, then the project is in contravention of the WFD and it should not go ahead, unless it complies with Article 4.7 of the WFD, as detailed in paragraph 2.2.1. Additionally the assessment must review the proposed development in the context of the relevant RBMP and confirm that the objectives within that RBMP will not be compromised by the proposed development.

2.3.2 In order to assess the potential impact of the Proposed Development on water bodies with respect to the requirements of the WFD and the relevant RBMP a staged process has been utilised. This process aligns with recent EA guidance on how to assess the impact of activities on the estuarine and marine environment<sup>4</sup>, but the process and logic of that guidance is equally valid to be adopted for an inland environment. The process utilised in this assessment also aligns with new Planning Inspectorate guidance<sup>5</sup> on the WFD assessment of Nationally Significant Infrastructure Projects (NSIPs).

2.3.3 The process can be summarised as follows:

- Screening – This excludes any projects or activities that don't need to go through the scoping or impact assessment stages;
- Scoping – identifies the receptors that are potentially at risk from the proposed activities and need impact assessment; and
- Impact assessment – considers the potential impacts of proposed activities, identifies ways to avoid or minimise impacts, and shows if activities may cause deterioration or jeopardise the water body achieving good status.

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<sup>4</sup> <https://www.gov.uk/guidance/water-framework-directive-assessment-estuarine-and-coastal-waters>  
(accessed July 2017)

<sup>5</sup> The Planning Inspectorate, June 2017, Advice Note Eighteen: The Water Framework Directive (version 1)

## 3. ASSESSMENT

### 3.1 Screening

#### The Need for a WFD Assessment

- 3.1.1 The Stage 1 consultation response from Staffordshire County Council (July 2016) states “*Water Framework Directive objectives should be considered in assessment of impacts in waterways and water bodies*” and also that “*In regard of the water environment regard should be had to the Water Framework Directive and the ecological status of water courses and water bodies.*”
- 3.1.2 The Scoping Opinion<sup>6</sup> states the following in section 3.63: “*The Applicant should consider the Water Framework Directive (WFD) status of the identified groundwater bodies within the site and any relevant objectives in the River Basin Management Plan.*” Reference is also made in section 3.96 which states “*The Applicant should clearly set out the name of the relevant RBMP; the likelihood of any effects on the objectives of that plan; and whether the proposed development has potential to cause deterioration in any relevant water bodies.*”
- 3.1.3 Further, the Scoping Opinion states in 4.26 that “*the Secretary of State must be satisfied that the Applicant has had regard to relevant river basin management plans and that the proposed development is compliant with the terms of the WFD and its daughter directives. In this respect, the Applicant’s attention is drawn to Regulation 5(2)(l) of the APFP Regulations which requires an application for an NSIP to be accompanied by ‘where applicable, a plan with accompanying information identifying-... ..(iii) water bodies in a river basin management plan, together with an assessment of any effects on such sites, features, habitats or bodies likely to be caused by the proposed development.*”

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<sup>6</sup> The Planning Inspectorate, October 2016, Scoping Opinion Proposed West Midlands Interchange (ref TR050005)

3.1.4 The Environment Agency (EA) stated within their EIA scoping opinion response<sup>7</sup> that *“The River Penk and tributaries, Staffordshire & Worcestershire Canal and associated reservoirs must not see a deterioration in Water Framework Directive (WFD) status or any negative effects which may prevent them from reaching good status. The site design may also provide the opportunity to work with the Environment Agency to improve the local watercourse and improve its WFD status.”*

### The Water Bodies

3.1.5 In order to identify the potential risks to receptors associated with a project and thus inform the scoping and detailed impact assessment stages, the baseline water environment at the Site must first be considered. Water features at and in the vicinity of the Site are presented in Figure 2 and include rivers, brooks, canals, ponds and reservoirs. However, of these, only certain features are designated under the WFD. These are shown in Figure 3 and summarised below. Full details of WFD classification of these water bodies are presented in Appendix 1 and are sourced from the EA’s online WFD data platform ‘Catchment Data Explorer’<sup>8</sup>. The Site lies within the Humber River Basin.

- River Penk – The River Penk is located approximately 1.5 km to the west of the Site, flowing in an approximate northerly direction. Staffordshire Ecological Records Centre (SERC) records document the presence of white-clawed crayfish (Protected Species under the Habitats Directive<sup>9,10</sup>) within the river between 1991 and 2008, however the river is considered to have limited to no connectivity to the Site with respect to white-clawed crayfish and therefore to be of limited significance with respect to the Proposed Development<sup>10</sup> with respect to that species. SERC records also indicate the presence of otters (Protected Species under the Habitats Directive<sup>9</sup>) in the river<sup>10</sup>.

The river currently is not in compliance with the WFD, having a classification of less than ‘good’, attributable to overall poor ecological

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<sup>7</sup> Environment Agency letter, 14 October 2016, ref UT/2016/115751/01-L01

<sup>8</sup> <http://environment.data.gov.uk/catchment-planning/>

<sup>9</sup> Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora

<sup>10</sup> Ramboll, 2018, West Midlands Interchange ES Technical Appendix 10.1 – Baseline Ecology Report

quality, specifically the level of macrophytes and benthos in the river plus phosphate concentrations in the water.

A number of mitigation measures are allocated to the river (see Appendix 1) the estimated start date of which is not until 2020;

- Saredon Brook – This brook is situated approximately 350 m to the south of the Site, flowing from east to west where it joins the River Penk. SERC records indicate otters to be present in brook<sup>10</sup>.

It is classified under the WFD as being a heavily modified water body (HMWB). The reasons for this designation are not documented by the Environment Agency (EA)<sup>8</sup>, but are likely to be associated with its use for flood protection and changes from its natural state caused by passage through an urban area. It too does not comply with the requirements of the WFD, being classified as being of moderate quality. This classification is due to the status of invertebrate communities within the brook as well as the following physico-chemical parameters: ammonia, dissolved oxygen and phosphate.

The Staffordshire Wildlife Trust hold a record from 22<sup>nd</sup> May 2017 where white-clawed crayfish were confirmed as present on the Saredon Brook approximately 750 m to the south of the Site. There is not considered to be a pathway for this species to the Site due to their inability to pass flow controls and the engineered nature of the brook<sup>10</sup>. They are therefore considered to be of limited significance with respect to the Proposed Development<sup>10</sup>.

A number of mitigation measures are allocated to the brook (see Appendix 1) the estimated start date of which is not until 2020;

- Staffordshire and Worcester Canal - this runs through the Site in a roughly north-south orientation and is classified as an artificial water body. The banks are predominantly of hard engineered sheet piled construction with no marginal or emergent vegetation. The eastern bank comprises overhanging vegetation from the adjacent field margins and site boundaries including trees and grasses. The canal is likely to be lined and therefore not in continuity with regional

groundwater, although some 'leakage' of water may occur out of the canal into the underlying strata.

The canal is known to support carp, chub (*Squalius cephalus*), roach, perch, bream, barbel (*Buarbus sp.*), tench and pike (*Esox lucius*), as well as other coarse and game fish, but none of these are designated as Protected Species. Due to the nature of the canal banks water voles are assumed not to be present<sup>10</sup>. Otters, however, are believed to be a species of importance within the canal<sup>10</sup>, having been noted in the SERC records. Additionally, as part of the scoping opinion exercise, the Canal and River Trust confirmed that the Staffordshire and Worcestershire Canal provides important habitat for otters. No detailed otter surveys have been carried out to date therefore this WFD assessment has been completed based on the assumption that they are present<sup>10</sup>. Confirmatory evidence will be sought during ecological surveys later in 2017.

The canal is classified as an artificial water body and does not comply with the requirements of the WFD, being classified as being of moderate quality. This classification is due to the concentrations of phosphate and zinc within the canal;

- Hatherton Canal – This canal lies to the southeast of the Site and joins the Staffordshire and Worcester Canal approximately 350 m to the south of the south-eastern corner of the Site. This canal is likely to be of similar quality and value with respect to ecology as the Staffordshire and Worcester Canal.

The canal is classified as an artificial water body and does not comply with the requirements of the WFD, being classified as being of moderate quality. This classification is due to the concentrations of dissolved oxygen and phosphate within the canal; and

- Staffordshire Trent Valley Permo-Triassic Sandstone Staffordshire – this groundwater body underlies the whole of the Site and is a Principal aquifer indicating high permeability and water-bearing strata. Fifteen licensed groundwater abstractions from this aquifer are located within

a 1 km radius of the Site<sup>11</sup>, with a further eight abstractions within a 2 km radius. Two of the abstractions are for potable water supplies and are located 1.39 km west and 1.49 km south of the Site. The majority of the Site lies within a groundwater Source Protection Zone (SPZ) (Zone 3 - total catchment) associated with these abstractions. The total catchment is defined as the area around a source within which all groundwater recharge is presumed to be discharged at the source. The remainder of the Site (approximately 5% of the total area, encompassing the north-western corner) is situated within a Zone 2 EA designated groundwater SPZ (outer zone) which is defined by a 400 day travel time from a point below the water table to the abstraction point.

Currently there are on-going groundwater remediation works in the south western part of the Site which will continue until the risks are mitigated to the satisfaction of the Environment Agency<sup>11</sup>.

The groundwater body is currently classified as having poor quantitative status (due to poor water balance and potential effects on associated surface water bodies) and poor chemical quality status (due to potential effects on associated surface water bodies and drinking water supplies). The EA records show an increase in contaminants over time within this groundwater body<sup>8</sup>.

- 3.1.6 It is therefore concluded that there are designated water bodies at and adjacent to the Site that have the potential to be affected by the Proposed Development and that a WFD Assessment is required.

## 3.2 Scoping

- 3.2.1 In order to ascertain which of the proposed clearance, demolition, construction or operational activities on site present a risk to the above designated water bodies and thus which need to be taken forward for detailed impact assessment, a scoping exercise has been carried out. This is presented in Appendix 2 and is based on EA guidance<sup>4</sup> as recommended

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<sup>11</sup> Ramboll, West Midlands Interchange Environmental Statement Volume 1: Environmental Statement Main Report, Chapter 11: Ground Conditions

by the Planning Inspectorate<sup>5</sup>, and adapted for the inland location of the Site and freshwater nature of associated water bodies.

3.2.2 The assessment of potential impacts on the water environment in the Environmental Statement (ES)<sup>12</sup> for the Proposed Development has been completed on the basis of a 2 km buffer around the Site boundary. This is considered to be an appropriate zone of influence for the purposes of this scoping exercise within this WFD assessment and thus has been utilised.

3.2.3 The details of the Proposed Development are listed in section 1.3.1. The potential interactions with the water environment associated with these proposals include those listed in Table 3-1.

**Table 3-1 Potential Interactions with the Water Environment**

<b>Activity</b>	<b>Potential Interaction</b>	<b>C/O<sup>1</sup></b>
General construction activities (including demolition, site clearance and construction)	<ul style="list-style-type: none"> <li>• Increased sediment runoff into surface water bodies</li> <li>• Spillages of chemicals, oils and fuels with run-off into surface water bodies or infiltration into groundwater</li> </ul>	C
Demolition of service bridges over the canal	<ul style="list-style-type: none"> <li>• Mobilisation of sediment</li> <li>• Removal of bank vegetation</li> </ul>	C
Earthworks cut and fill operations	<ul style="list-style-type: none"> <li>• Mobilisation of pre-existing localised contamination (if present) leading to run-off to adjacent water bodies or infiltration into groundwater.</li> <li>• Opening of pathways from contaminated soils to the groundwater.</li> <li>• Importation of contaminated soils onto Site, with associated run-off into adjacent water bodies.</li> <li>• Direct and indirect pollution impacts from silt-laden runoff from stockpiles or cleared ground, into surface water bodies.</li> </ul>	C

<sup>12</sup> Ramboll, West Midlands Interchange Environmental Statement Volume 1: Environmental Statement Main Report, chapter 16: Water Environment

<b>Activity</b>	<b>Potential Interaction</b>	<b>C/O<sup>1</sup></b>
	<ul style="list-style-type: none"> <li>Changes to groundwater flow where groundwater dewatering is undertaken (if necessary)</li> </ul>	
Construction of foundations	<ul style="list-style-type: none"> <li>Impact on groundwater flow direction and groundwater levels which could, if not controlled, impact the efficiency of the ongoing remediation or hydrological receptors.</li> </ul>	C/O
Construction of new sidings	<ul style="list-style-type: none"> <li>Changes to groundwater flow</li> </ul>	O
Increase in hardstanding and roof areas	<ul style="list-style-type: none"> <li>Increased surface water run off</li> <li>Reduction in run-off of surface water containing elevated concentrations of fertilisers (nitrates/phosphates)</li> </ul>	O
HGV parking, freight container management	<ul style="list-style-type: none"> <li>Spillage and contamination of surface water runoff</li> </ul>	O

<sup>1</sup> C – construction phase O – Operational phase

3.2.4 The Proposed Development is currently at masterplan stage and thus the final design is not set, however, it is not intended that the final design include piled foundations for warehouse buildings though they will be required for the bridge abutments for the bridges over the current railway line and the Staffordshire and Worcester Canal. No works to the banks/walls of the Staffordshire and Worcester Canal are currently envisaged.

3.2.5 A surface water drainage strategy has been developed for the Site (ES Technical Appendix 16.3). It is proposed to drain all areas of hardstanding within the Site via a pipe network to a series of swales and surface detention ponds prior to discharge via four surface water outfalls: two to the River Penk via drainage watercourses and two to the Staffordshire and Worcestershire Canal, one via a drainage watercourse and one directly to the canal. It is proposed to restrict runoff rates within the Site to greenfield rates, in line with the existing drainage regime at the Site, including an allowance for climate change. The proposed outfall to the Staffordshire and Worcestershire Canal from drainage catchment D will be a new outfall, therefore restriction to greenfield rates is not directly applicable. For this outfall it has been agreed with the Canal & River Trust that a peak discharge rate of 60 litres/second will not be exceeded. This rate is well below the

equivalent greenfield rate for the catchment. Attenuation storage is to be provided for up to the 1-in-100 year storm, including allowances for the predicted effects of climate change. Attenuation storage is proposed in the form of ditches, attenuation basins, ponds and swales.

3.2.6 The demolition of existing structures on the Site and the construction of the Proposed Development will be completed under a Demolition and Construction Environmental Management Plan (DCEMP). This is currently in outline form (ODCEMP) (ES Technical Appendix 2.3). The Ground Conditions chapter of the Environment Statement for the Proposed Development<sup>11</sup> concludes that with the ODCEMP in place, construction will not introduce significant pollutants / additional discharges to underlying groundwater.

3.2.7 Controls within the ODCEMP that are relevant to the water environment include the following. The impact assessment below has been completed on the basis that these measures will be in place:

- Siting of work compounds and access tracks as far from watercourses as reasonably practicable;
- Storage of potentially dangerous materials as far from the watercourses as practicable in approved containers and protected by bunds, as appropriate;
- Adoption of a Pollution Control Plan to enable the effects of any spills or releases to be minimised or contained;
- Management of spoil material to segregate contaminated soils from uncontaminated soils and minimise run-off;
- Redundant groundwater monitoring boreholes being decommissioned in line with EA guidance in order to remove preferential pathways to underlying groundwater;
- Safeguarding of the ongoing groundwater remediation works so that their operation is not compromised;

- Use and management of hazardous chemicals in compliance with the Control of Substances Hazardous to Health (COSHH) Regulations, as amended;
- All oils and chemicals being stored in bunded areas in line with good working practices;
- Completion of all site works in accordance with the EA's Pollution Prevention Guidance Note 6 (PPG6) 'Working at Construction and Demolition Sites'<sup>13</sup>;
- Implementation of an Emergency Incident Plan which would include spillages and/or pollution incidents; and
- Operation of an unexpected contamination procedure.

3.2.8 The results of the WFD scoping exercise are presented in Table 3-2. Potential risks associated with habitats, water quality and Protected Areas will be taken forward to the impact assessment stage of the process.

**Table 3-2 Results of Scoping Exercise**

<b>Receptor</b>	<b>Potential risk to receptor?</b>	<b>Note the risk issue(s) for impact assessment</b>
Hydromorphology	No	
Biology: habitats	Yes	Work will be undertaken adjacent to and over water bodies that are host to protected species
Biology: fish	No	
Water quality	Yes	Surface water run-off from the site will be discharged into the River Penk and Staffordshire and Worcester canal
Protected Areas	Yes	The Site is located within a Nitrate Vulnerable Zone

<sup>13</sup> Environment Agency, 2011. Pollution Prevention Guidelines for Working at Construction and Demolition Sites (PPG6). Note that this guidance is no longer supported by the EA but remains useful.

<b>Receptor</b>	<b>Potential risk to receptor?</b>	<b>Note the risk issue(s) for impact assessment</b>
Invasive non-native species	No	
Groundwater	Yes	Localised groundwater dewatering may be required and the connecting rail to the new railway sidings crosses an area of high groundwater

### 3.3 Impact Assessment

#### Biology: Habitats

- 3.3.1 This potential impact has been scoped in due to the footprint of the Proposed Development and its location adjacent to a sensitive habitat. The Staffordshire and Worcester Canal passes through the Site and has been known to be a habitat for otters, a Protected Species under the Habitats Directive. The Site as a whole is 297 ha in area but the portion of the Site immediately adjacent to the canal is only relatively small, approximately 8 ha. Potential impacts on the quality of the water within the canal are listed in Table 3-1. Work near or over the canal, together with uncontrolled run-off from the Site could potentially result in a reduction in water quality within the canal and thus impact on the fauna within the canal that the otters rely on as part of their diet.
- 3.3.2 However, given the absence of work to be carried out within the canal itself and the implementation of the ODCEMP these risks will be appropriately managed and thus reduced. Should any changes in water quality occur, for example during removal of bank vegetation (if this is required), it would likely be of a short timescale and geographical extent and thus not to a degree significant enough to affect this Protected Species. Such events would not compromise the water quality of the canal in terms of the elements for which the canal currently fails under the WFD (phosphate and zinc).

### Water Quality

- 3.3.3 This potential impact has been scoped in due to the possibility for contaminated surface water to drain from the Site into the River Penk and Staffordshire and Worcester Canal (see Table 3-1), potentially affecting the quality of these water bodies and also the surface water abstraction from the canal towards the southern end of the Site (see Figure 2).
- 3.3.4 The proposed Foul Drainage Strategy as determined by Waldeck utilises two new connections to the public sewer. The west and east foul drainage systems are separated by the Staffordshire and Worcestershire Canal. It is anticipated that some reinforcement of the existing network will be required, in particular the existing rising main which runs between Calf Heath and the Four Ashes Sewerage Treatment Works, which will take foul drainage from the majority of the Proposed Development. Discussions are currently ongoing with Severn Trent to confirm available capacity and agree any necessary infrastructure changes. It is the anticipation that the new foul networks will be installed as part of the enabling works for the initial plots, along with any reinforcements to the sewer network which are required to accommodate flows generated by that phase of the development.
- 3.3.5 During the construction phase, and until such time as the long term foul sewer connections are established, standard good practice for management of foul water will be implemented. E.g. foul water generated could be locally stored and disposed of via tankers. Should this not be practical local foul water treatment plants which would process foul water and discharge the relatively small quantities of cleaned water to the surface water system could be utilised. The flow rates would be designed to be included in the calculated surface water rates. Other risks to water quality arising during the demolition and construction phases will be managed through the implementation of the ODCEMP.
- 3.3.6 With respect to the operational phase of the Proposed Development, the drainage strategy includes for 4 no. outfalls to discharge surface water run-off from the Site into adjacent water bodies (2 no. to the River Penk and 2 no. to the Staffordshire and Worcester Canal). All water discharged from the Site via these outfalls will first drain through a number of treatment stages including sustainable drainage systems (SuDS) Swales and detention ponds will be used to provide flood attenuation as well as

contribution towards attenuation and retention of hardstanding derived pollutants (including metals, petroleum hydrocarbons and polyaromatic hydrocarbons) from heavy goods vehicles and cars. They will also act to some extent as contaminant containment in the event of a fuel or chemical spillage taking place on site.

- 3.3.7 Thus, the risks to surface water quality from the input of contaminated water both during construction and operational phases are considered to be mitigated appropriately, and the resultant risk is not considered to present a risk to the WFD classification of either the River Penk or the Staffordshire and Worcester Canal nor the surface water abstraction from the canal.

#### Protected Areas

- 3.3.8 This potential impact has been scoped in due to the location of the Site within a surface water and groundwater Nitrate Vulnerable Zone as designated under the Nitrates Directive. The removal of much of the Site from agricultural use, and replacement with development incorporating a large proportion of hardstanding and buildings will have the effect of reducing the application of fertilisers (including nitrates and phosphates) to that land. This will in turn contribute towards a reduction in surface run-off of nitrates and phosphates into the adjacent water bodies (the River Penk is classified as being of poor quality partly due to the presence of elevated concentrations of phosphates, Saredon Brook as moderate (ammonia and phosphate) and the Staffordshire and Worcester Canal as moderate (for phosphate).
- 3.3.9 Additionally, the increase in hardstanding and buildings, combined with the surface water drainage design, will intercept incident rainfall and reduce leaching and infiltration of nitrates and phosphates into the underlying groundwater body.

#### Groundwater

- 3.3.10 This potential impact has been scoped in due to:

- The need to construct in an area of shallow groundwater, specifically where a groundwater remediation scheme is currently in operation;

- The increase in hardstanding across the site which will alter the surface water run-off and infiltration regime;
- The likely need to implement localised dewatering during construction; and
- The use of piled foundations for bridge abutments.

3.3.11 The railway which runs through the Site at the western side falls below the groundwater level south of the point where Gravelly Way Bridge crosses the railway; this is also within the vicinity of contaminated land which surrounds the chemical works. It is understood that surface and groundwater level is controlled through the use of a pumping system which maintains the groundwater below the line in this area. This WFD assessment assumes that backup measures are in place to maintain groundwater levels should the pump system power supply fail. The water is pumped to the neighbouring chemical works for treatment before being discharged under existing measures managed by SI Group.

3.3.12 Impacts on the groundwater remediation scheme during the construction and operation of Phase 1 and Phase 2 of the Proposed Development have been identified. Details of the measures to be implemented order to address these impacts and maintain the integrity of the groundwater remediation scheme are detailed in the Remediation Safeguarding report (ES Technical Appendix 11.5) and are summarised below.

- Sections of new abstraction pipework will be installed to replace existing sections likely to be impacted by the construction of Phase 1. The new lengths of pipework will be installed within gravel trenches to minimise the risk of damage but also allow easy maintenance access should that be required. Additionally a short section of pipework under the Phase 1 trackway will be laid in a protective concrete duct (or suitable protective alternative) to protect it from vehicular movements. Once all new pipework is installed the remediation system will be temporarily switched off to allow rapid switch over to the new pipes and this will minimise the associated down time. As part of these works the manifold house will potentially be moved to the west of the Phase 1 trackway in order to maintain easy access to it. The proposed alterations have been designed so that no further alterations to

remediation pipework will be necessary for future phases of development.

3.3.13 The Phase 2 construction activities are not considered to have a significant impact on the remediation works (refer to ES Technical Appendix 11.5 for details).

3.3.14 Phase 3 construction will not commence until the remediation works (including any post remediation monitoring period) is complete and the associated Environmental Permit varied so that Phase 3 construction area is no longer covered by the Environmental Permit. As part of this process the Environmental Permit holder would be responsible for appropriate decommissioning of abstraction and monitoring wells in order to not create preferential pathways to the underlying aquifer.

3.3.15 Two groundwater abstraction wells are located close to the area of groundwater remediation (see Figure 2). These wells abstract water from approximately 90 m below ground level. The pump and treat remediation scheme operates under an existing Environmental Permit from the Environment Agency and thus it may be stated that the system is deemed not to pose a significant risk to the aquifer beneath the Site. The proposed changes to the pump and treatment system as outlined in the bullets above are not deemed to result in a significant change to the system (physical changes are minimal and any down time will be very short) and thus are not considered to represent a significant risk to the aquifer beneath the Site.

3.3.16 Management of risk to groundwater as a result of the new structures and changed drainage regime will be addressed through design via a number of avenues:

- In order to minimise the risk to groundwater beneath the Site the new track connecting the main line to the sidings plus any associated structures in this area will be built at levels above the maintained groundwater table and will be designed to prevent infiltration of rainwater into the ground where it may cause leaching of contaminants;

- Management of risks to groundwater from foul water will be managed as detailed in paragraph 3.3.4; and
- The Surface Water Drainage Strategy (ES Technical Appendix 16.3) discusses in detail the factors associated with the use of infiltration as part of the drainage system on the Site and section 6.1.2 of that document can be referred to for more detail. At this stage the design approach that has been adopted is to avoid infiltration. As the Site is developed, the development details and ground conditions in each Phase can be reviewed and drainage design finalised as needed (potentially incorporating infiltration if deemed appropriate).
- Open water structures have all been designed as lined structures to ensure that the runoff from the development receives adequate treatment (runoff will not infiltrate to the ground prior to passing through all of the treatment stages). This approach accommodates the worst case scenario in terms of storage and ensures that groundwater quality will not be affected by the Proposed Development. Storm water drainage will not include infiltration and proposed drainage ponds in the area near where groundwater remediation is taking place would not intercept underlying groundwater and would be clay puddle lined.
- The Site is classified as having limited potential for groundwater flooding (ES Technical Appendix 16.1) but it is recognised that groundwater was encountered during ground investigations at depths varying from 2.5 m to 4 m below ground level. As such the Surface Water Drainage Strategy for the Site recognises the need to manage the quantity of water entering the ground and the risk of artificially charging the groundwater table resulting in an increase in groundwater flood risk during periods of heavy rainfall. The strategy therefore, at this stage, assumes that all SuDS structures are lined with impermeable medium and the treatment methods in each catchment chosen with risks to groundwater (quality and quantity) taken into account. This approach has been incorporated into the overall strategy of managing and restricting surface water run-off to greenfield rates. The risk of the Proposed Development resulting in an increased risk of groundwater flooding is therefore not considered to be significant.

- 3.3.17 The detailed design is still to be developed so the details of piled foundations for the bridge abutments are not available. However, their design will be informed by ground conditions at the locations of the bridges and, if contamination is encountered in soils or groundwater, then their design will also reflect this and be subject to a foundation works risk assessment in line with EA guidance<sup>14</sup>.
- 3.3.18 The earthworks scheme for the Site identifies the likely need for localised, short term dewatering of excavations. Such operations will be managed through the ODCEMP (ES Technical Appendix 2.3).
- 3.3.19 The above design and management measures mean that risks to groundwater are not considered to be significant and the groundwater body (and the abstraction wells) beneath the Site is not considered to be at risk of deterioration.

#### Flooding

- 3.3.20 Flooding is not a formal WFD 'Quality Element' and thus has not been assessed in the same way as the other topics within this section. However, one of the objectives of the WFD as outlined in paragraph 2.1.3 *is* to contribute to mitigating the effects of floods and droughts. On the basis of the proposed drainage design as discussed in this document and elsewhere, it is considered that flood risk to downstream receptors will not increase following development, and thus the Proposed Development will contribute towards this objective.

### **3.4 Mitigation and Deterioration Assessments**

#### Mitigation

- 3.4.1 The scale of otter populations within the Staffordshire and Worcester Canal is currently unproven. Prior to commencement of demolition and clearance activities at the Site, surveys will be undertaken to confirm their presence (or not), management measures established and an Ecological Mitigation and Management Plan (EMMP) developed accordingly (based on the

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<sup>14</sup> Environment Agency, May 2001, Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention NC/99/73

principles in the framework document included as ES Technical Appendix 10.4). Should any interventions of otters be required then they will be undertaken under the remit of the EMMP for the Site and only by appropriately licensed personnel.

- 3.4.2 The drainage throughout the Proposed Development will be maintained so that it performs as designed, in particular in relation to interception of run-off from car park and yard areas. All operators will implement and practice pollution prevention and control measures in order to provide ongoing management of the risks to surface water quality in the adjacent River Penk and Staffordshire and Worcester Canal.
- 3.4.3 Consultation with the EA and Network Rail will confirm any potential impact and establish agreement of the drainage design in order to avoid compromise of the groundwater pumping system. The proposed changes to the pump and treat system described within this report will not be undertaken until agreement has been reached with the EA and a variation to the Environmental Permit issued.
- 3.4.4 Completion of a foundation works risk assessment will assist in management of risks of piled foundations mobilising contaminants into the groundwater beneath the Site.

#### Deterioration

- 3.4.5 The implementation of the above management and mitigation measures will ensure that there will be no significant impact on the quality of the adjacent water bodies and thus will not result in any deterioration of the status of any of the water bodies discussed in this report and will not jeopardise their potential to meet their objectives as set out in Appendix 1.
- 3.4.6 One of the mitigation measures that the River Penk is subject to (see Appendix 1) is the control of point source inputs. Design and management of the drainage strategy as detailed above will contribute towards this mitigation measure.

## 4. CONCLUSIONS

- 4.1 This WFD assessment has identified and described those water bodies designated under the WFD within a 2 km radius of the Proposed Development, outlined the potential impacts to those water bodies, and then discussed in more detail potential impacts identified through the WFD scoping process as requiring further consideration.
- 4.2 It has been shown that due to the nature of the Proposed Development it is the water bodies immediately adjacent to the Site boundary (River Penk and Staffordshire and Worcester Canal) that are at the highest risk but that with implementation of the ODCEMP and drainage strategy, the risks to these water bodies will not be significant and will not put at risk the WFD classification of either of them. Additionally, the River Penk is subject to a number of mitigation measures and the Proposed Development will not jeopardise these.
- 4.3 It is therefore recommended to the Environment Agency and the Planning Inspectorate that, with the implementation of mitigation measures and management as outlined above, that the Proposed Development is compliant with the requirements of the WFD and the objectives outlined within that Directive as summarised in paragraph 2.1.3, as well as the water body specific objectives set out in the Humber RBMP and presented in Appendix 1.

***Appendix 1***

<b>WFD Classification</b>
Poor
Moderate
Good
High

<b>River Penk – Saredon Brook to Whiston Brook</b>			
<b>General</b>			
Water body ID	GB104028047122		
River Basin District name	Humber		
Water body type	River		
Length/catchment area	11.966 km / 4371.85 ha		
Overall Water Body Status (2016)	Poor		
Artificial or Heavily modified water body (A_HMWB) and for what use	Not designated as A_HMWB		
<b>Overall Ecological Status: Poor (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Biological quality elements: Poor	<i>Fish Invertebrates Macrophytes and phytobenthos combined</i>	<i>Good Moderate Poor</i>	<i>Moderate by 2015</i>
Hydromorphological Supporting Elements: Supports good	<i>Hydrological Regime</i>	<i>Supports good</i>	<i>Supports good by 2015</i>
Physico-chemical quality elements: Moderate	<i>Ammonia (Phys-Chem) Dissolved oxygen pH Phosphate Temperature</i>	<i>High Good High Poor High</i>	<i>Good by 2027</i>
Specific Pollutants	Not assessed		
Supporting elements	Not assessed		
<b>Overall Chemical Status: Good (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Other Pollutants	Does not require assessment		
Priority Hazardous Substances	Does not require assessment		
Priority Substances	Does not require assessment		
<b>Protected Areas (≤ 2 km of water body)</b>			
Nitrate sensitive areas: Nitrate Vulnerable Zone (Nitrates Directive)	✓	Areas designated for the protection of habitats or species, where water is an	X

Sensitive Area (Urban Waste Water Treatment Directive)	X	important factor (Habitats Directive/ Birds Directive)	
Drinking Water Protected Area (WFD)	X	Areas designated for the protection of economically significant aquatic species (fish or shellfish) (WFD)	X
		Designated Bathing Waters (Bathing Water Directive)	X
<b>Mitigation Measures</b>			
Control or manage point source inputs Mitigate/Remediate point source impacts on receptor Alter/change permits for sewage treatment works Additional treatment to reduce concentrations of phosphate from Cannock sewage treatment works			

<b>Saredon Brook from Source to River Penk</b>			
<b>General</b>			
Water body ID	GB104028046740		
River Basin District name	Humber		
Water body type	River		
Length/catchment area	25.163 km / 7041.941 ha		
Overall Water Body Status (2016)	Moderate		
Artificial or Heavily modified water body (A_HMWB) and for what use	Designated as HMWB		
<b>Overall Ecological Potential: Moderate (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Biological quality elements: Moderate	<i>Fish Invertebrates Macrophytes and phytobenthos combined</i>	<i>Good Moderate -</i>	<i>Good by 2027</i>
Hydromorphological Supporting Elements: Supports good	<i>Hydrological Regime</i>	<i>Supports good</i>	<i>Supports good by 2015</i>
Physico-chemical quality elements: Moderate	<i>Acid neutralising capacity Ammonia (Phys-Chem) Dissolved oxygen pH Phosphate Temperature</i>	<i>High Moderate Moderate High Moderate High</i>	<i>Good by 2027</i>
Specific Pollutants: High	<i>2,4-dichlorophenol Ammonia Copper Iron Manganese Phenol Triclosan Zinc</i>	<i>- - High High High - High High</i>	<i>- - High by 2015 High by 2015 High by 2015 - High by 2015 High by 2015</i>
Supporting elements: Moderate	<i>Mitigation Measures Assessment</i>	<i>Moderate or less</i>	<i>Moderate by 2015</i>
<b>Overall Chemical Status: Good (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Other Pollutants	<i>Does not require assessment</i>		
Priority Hazardous Substances: Good	<i>Benzo (b) and (k) fluoranthene Benzo (ghi) perelyene and indeno (123-cd) pyrene Benzo(a)pyrene</i>	<i>Good Good Good</i>	<i>Good by 2015 Good by 2015 Good by 2015</i>

	<i>Brominated diphenylether (BDPE) Calc</i>	-	<i>Good by 2015</i>
	<i>Cadmium and Its Compounds</i>	<i>Good</i>	<i>Good by 2015</i>
	<i>Di(2-ethylhexyl)phthalate (Priority hazardous)</i>	<i>Good</i>	<i>Good by 2015</i>
	<i>Mercury and Its Compounds</i>	<i>Good</i>	<i>Good by 2015</i>
	<i>Nonylphenol</i>	<i>Good</i>	<i>Good by 2015</i>
	<i>Tributyltin Compounds</i>	-	-
Priority Substances: Good	<i>Di(2-ethylhexyl)phthalate (Priority)</i>	-	-
	<i>Lead and Its Compounds</i>	<i>Good</i>	<i>Good by 2015</i>
	<i>Nickel and Its Compounds</i>	<i>Good</i>	<i>Good by 2015</i>
	<i>Pentachlorophenol</i>	-	-
<b>Protected Areas (≤ 2 km of water body)</b>			
Nitrate sensitive areas: Nitrate Vulnerable Zone (Nitrates Directive)	✓	Areas designated for the protection of habitats or species, where water is an important factor (Habitats Directive/ Birds Directive)	X
Sensitive Area (Urban Waste Water Treatment Directive)	X		
Drinking Water Protected Area (WFD)	X	Areas designated for the protection of economically significant aquatic species (fish or shellfish) (WFD)	X
		Designated Bathing Waters (Bathing Water Directive)	X
<b>Mitigation Measures</b>			
Control or manage point source inputs Mitigate/Remediate point source impacts on receptor Alter/change permits for sewage treatment works Additional treatment to reduce concentrations of phosphate from Cannock sewage treatment works			

<b>Staffordshire and Worcester Canal, summit to Lower Penn</b>			
<b>General</b>			
Water body ID	GB70410266		
River Basin District name	Humber		
Water body type	Canal		
Length	16.608 km		
Overall Water Body Status (2016)	Moderate		
Artificial or Heavily modified water body (A_HMWB) and for what use	Designated as artificial		
<b>Overall Ecological Status: Moderate (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Biological quality elements:	<i>Not assessed</i>		
Hydromorphological Supporting Elements:	<i>Not assessed</i>		
Physico-chemical quality elements: Moderate	<i>Ammonia (Phys-Chem)</i>	<i>High</i>	<i>Moderate by 2015</i>
	<i>Biochemical Oxygen Demand (BOD)</i>	<i>High</i>	
	<i>Dissolved oxygen</i>	<i>Good</i>	
	<i>pH</i>	<i>High</i>	
	<i>Phosphate</i>	<i>Moderate</i>	
Specific Pollutants: Moderate	<i>Temperature</i>	<i>High</i>	<i>-</i>
	<i>Ammonia</i>	<i>-</i>	
	<i>Copper</i>	<i>High</i>	
	<i>Iron</i>	<i>High</i>	
	<i>Phenol</i>	<i>High</i>	
Supporting elements: Good	<i>Zinc</i>	<i>Moderate</i>	<i>-</i>
	<i>Mitigation Measures Assessment</i>	<i>Good</i>	<i>Good by 2015</i>
<b>Overall Chemical Status: Good (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Other Pollutants	<i>Does not require assessment</i>		
Priority Hazardous Substances: Good	<i>Cadmium and its Compounds</i>	<i>Good</i>	<i>Good by 2015</i>
Priority Substances: Good	<i>Lead and its Compounds</i>	<i>Good</i>	<i>Good by 2015</i>
	<i>Nickel and its Compounds</i>	<i>Good</i>	<i>Good by 2015</i>
<b>Protected Areas (≤ 2 km of water body)</b>			
Nitrate sensitive areas:			
Nitrate Vulnerable Zone (Nitrates Directive)	✓	Areas designated for the protection of habitats or species, where water is an important factor (Habitats Directive/	X
Sensitive Area (Urban Waste Water Treatment Directive)	X	Birds Directive)	

Drinking Water Protected Area (WFD)	X	Areas designated for the protection of economically significant aquatic species (fish or shellfish) (WFD)	X
		Designated Bathing Waters (Bathing Water Directive)	X
<b>Mitigation Measures</b>			
There are no mitigation measures currently in place.			

<b>Hatherton Canal</b>			
<b>General</b>			
Water body ID	GB70410265		
River Basin District name	Humber		
Water body type	Canal		
Length	3.314 km		
Overall Water Body Status (2016)	Moderate		
Artificial or Heavily modified water body (A_HMWB) and for what use	Designated as artificial		
<b>Overall Ecological Status: Moderate (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Biological quality elements:	<i>Not assessed</i>		
Hydromorphological Supporting Elements:	<i>Not assessed</i>		
Physico-chemical quality elements: Moderate	Ammonia (Phys-Chem)	<i>Good</i>	<i>Moderate by 2015</i>
	Biochemical Oxygen Demand (BOD)	<i>High</i>	
	Dissolved oxygen	<i>Moderate</i>	
	pH	-	
	Phosphate	<i>Moderate</i>	
Specific Pollutants:	Temperature	<i>High</i>	
	Ammonia	-	-
	Copper	-	-
	Zinc	-	-
Supporting elements: Good	Mitigation Measures Assessment	<i>Good</i>	<i>Good by 2015</i>
<b>Overall Chemical Status: Good (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Other Pollutants	<i>Does not require assessment</i>		
Priority Hazardous Substances: Good	<i>Does not require assessment</i>		
Priority Substances: Good	<i>Does not require assessment</i>		
<b>Protected Areas (≤ 2 km of water body)</b>			
Nitrate sensitive areas:			
Nitrate Vulnerable Zone (Nitrates Directive)	✓	Areas designated for the protection of habitats or species, where water is an important factor (Habitats Directive/ Birds Directive)	
Sensitive Area (Urban Waste Water Treatment Directive)	X		

Drinking Water Protected Area (WFD)	X	Areas designated for the protection of economically significant aquatic species (fish or shellfish) (WFD)	X
		Designated Bathing Waters (Bathing Water Directive)	X
<b>Mitigation Measures</b>			
There are no mitigation measures currently in place.			

<b>Staffordshire Trent Valley Permo-Triassic Sandstone Staffordshire</b>			
<b>General</b>			
Water body ID	GB40401G300500		
River Basin District name	Humber		
Water body type	Groundwater		
Groundwater Area	31126 ha		
Overall Water Body Status (2016)	Poor		
<b>Overall Quantitative Status: Poor (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Quantitative Dependent Surface Water Body Status		<i>Poor</i>	<i>Good by 2027</i>
Quantitative GWDTE <sup>a</sup> s test		<i>Good</i>	<i>Good by 2015</i>
Quantitative Saline Intrusion		<i>Good</i>	<i>Good by 2015</i>
Quantitative Water Balance		<i>Poor</i>	<i>Poor by 2015</i>
<b>Overall Chemical Status: Poor (2016)</b>			
<b>Supporting Elements:</b>		<b>Status</b>	<b>Objective</b>
Chemical status element: Poor	Chemical Dependent Surface Water Body Status	<i>Poor</i>	<i>Good by 2027</i>
	Chemical Drinking Water Protected Area	<i>Poor</i>	<i>Good by 2027</i>
	Chemical GWDTEs test	<i>Good</i>	<i>Good by 2015</i>
	Chemical Saline Intrusion	<i>Good</i>	<i>Good by 2015</i>
	General Chemical Test	<i>Good</i>	<i>Good by 2015</i>
Supporting elements:	Prevent and Limit Objective Trend Assessment	- <i>Upward trend</i>	- -
<b>Protected Areas (≤ 2 km of water body)</b>			
Nitrate sensitive areas: Nitrate Vulnerable Zone (Nitrates Directive) Sensitive Area (Urban Waste Water Treatment Directive)	✓ X	Areas designated for the protection of habitats or species, where water is an important factor (Habitats Directive/ Birds Directive)	X
Drinking Water Protected Area (WFD)	X	Areas designated for the protection of economically significant aquatic species (fish or shellfish) (WFD)	X
		Designated Bathing Waters (Bathing Water Directive)	X
<b>Mitigation Measures</b>			
There are no mitigation measures currently in place.			

*a – groundwater dependant terrestrial ecosystem*

*Appendix 2*

### Scoping Assessment

(Based on EA guidance<sup>4</sup>, adapted for inland location with freshwater surface water bodies plus groundwater bodies)

### Hydromorphology

<b>Consider if your activity:</b>	<b>Yes</b>	<b>No</b>	<b>Hydromorphology risk issue(s)</b>
Could impact on the hydromorphology (for example morphology or flow patterns) of a water body at high status	Requires impact assessment	<b>Impact assessment not required</b>	No. The adjacent water bodies are of moderate or poor status.
Could significantly impact the hydromorphology of any water body	Requires impact assessment	<b>Impact assessment not required</b>	No. The Staffordshire and Worcester Canal runs through the site and forms part of the southern boundary. No works to the banks or walls of the canal are proposed as part of the Proposed Development.
Is in a water body that is artificial or heavily modified for the same use as your activity	Requires impact assessment	<b>Impact assessment not required</b>	The Staffordshire and Worcester Canal and Hatherton canals are both classified as artificial water bodies due to their use as canals. The proposed works do not include for the construction of canals.

**Biology: habitats**

<b>Consider if the footprint<sup>a</sup> of your activity:</b>	<b>Yes</b>	<b>No</b>	<b>Biology habitats risk issue(s)</b>
0.5 km <sup>2</sup> or larger	<b>Requires impact assessment</b>	Impact assessment not required	The Site is 2.7 km <sup>2</sup> in area, but only approximately 0.08 km <sup>2</sup> of that is immediately adjacent (<25 m of the canal bank) to the Staffordshire and Worcester canal. Adopting a conservative approach, this potential impact has been scoped in.
Within 2 km of a WFD Protected Area	Requires impact assessment	<b>Impact assessment not required</b>	No. The closest Protected Area is located 7 km to the east of the Site.
Within 500 m of any sensitive habitat (e.g. habitat host to protected species)	<b>Requires impact assessment</b>	Impact assessment not required	Yes. Otters have been recorded within the Staffordshire and Worcester Canal in the past. White-clawed crayfish have been recorded in the River Penk, but this is scoped out as the river is considered to have limited to no connectivity to the Site with respect to this species (see 3.1.5).

*a - footprint may also be a temperature or sediment plume. For dredging activity, a footprint is 1.5 times the dredge area.*

**Biology: Fish**

<b>Consider if your activity:</b>	<b>Yes</b>	<b>No</b>	<b>Biology fish risk issue(s)</b>
Could impact on normal fish behaviour like movement, migration or spawning (for example creating a physical barrier, noise, chemical change or change in depth or flow)	Requires impact assessment	<b>Impact assessment not required</b>	No. No works to the banks or walls of the canal are proposed as part of the Proposed Development.
Could cause entrainment or impingement of fish	Requires impact assessment	<b>Impact assessment not required</b>	No. No works to the banks or walls of the canal are proposed as part of the Proposed Development.

**Surface Water Quality**

<b>Consider if your activity:</b>	<b>Yes</b>	<b>No</b>	<b>Water quality risk issue(s)</b>
Could affect water clarity, temperature, oxygen levels, nutrients or microbial patterns continuously for a period longer than 1 week	Requires impact assessment	<b>Impact assessment not required</b>	No. No works to the banks or walls of the canal are proposed as part of the Proposed Development. Works to remove the service bridges over the canal will be have no direct impact on the water environment, and effects would be limited to temporary over-shadowing, noise or vibration.

<b>Consider if your activity:</b>	<b>Yes</b>	<b>No</b>	<b>Water quality risk issue(s)</b>
Is in a water body with a history of harmful algae or phytoplankton	Requires impact assessment	<b>Impact assessment not required</b>	None known. No algae or phytoplankton have been recorded in the Staffordshire and Worcester Canal during ecological surveys <sup>10</sup> .
Uses or could release into the surface water environment chemicals that are on the Environmental Quality Standards Directive (EQSD) list <sup>15</sup>	<b>Requires impact assessment<sup>b</sup></b>	Impact assessment not required	Yes – surface water run-off from the Proposed Development will be drained into the River Penk and Staffordshire and Worcester Canal. Although there will be no process discharge. Site run off could contain oils, fuels and chemicals but will be subject to control measures including detention ponds and swales.
Disturbs sediment with contaminants above Cefas Action Level 1 <sup>16</sup>	Requires impact assessment	<b>Impact assessment not required</b>	No. No works are proposed within the Staffordshire and Worcester canal.

*b - carry out the impact assessment using the Environment Agency's surface water pollution risk assessment guidance, part of Environmental Permitting Regulations guidance.*

<sup>15</sup> <https://www.gov.uk/government/publications/list-of-chemicals-for-water-framework-directive-assessments>

<sup>16</sup> <https://www.pla.co.uk/Environment/Cefas-Guideline-Action-Levels-for-the-Disposal-of-Dredged-Material>

### WFD Protected Areas

<b>Consider if your activity is:</b>	<b>Yes</b>	<b>No</b>	<b>WFD Protected Areas risk issue(s)</b>
Within 2km of any WFD protected area <sup>c</sup>	<b>Requires impact assessment</b>	Impact assessment not required	Yes. The Site is located within a surface water and groundwater Nitrate Vulnerable Zone as designated under the Nitrates Directive <sup>17</sup> .

*c - Note that a regulator can extend the 2km boundary if your activity has an especially high environmental risk.*

### Invasive non-native species (INNS)

<b>Consider if your activity could:</b>	<b>Yes</b>	<b>No</b>	<b>INNS risk issue(s)</b>
Introduce or spread INNS	Requires impact assessment	<b>Impact assessment not required</b>	No. False acacia ( <i>Robinia pseudoacacia</i> ) was identified in one hedgerow in the south western corner of the site <sup>10</sup> . This was an isolated occurrence and not near a water body. No Japanese knotweed or other non-native invasive plant species have been recorded on Site.

<sup>17</sup> Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources

**Groundwater**

<b>Consider if your activity could:</b>	<b>Yes</b>	<b>No</b>	<b>Groundwater risk issue(s)</b>
Introduce into a groundwater body chemicals that are on the Environmental Quality Standards Directive (EQSD) list <sup>15</sup>	<b>Requires impact assessment</b>	Impact assessment not required	The Proposed Development will not use piled foundations for buildings but they will be required for bridge abutments. There will be no discharges to groundwater but localised groundwater dewatering may be required which could mobilise contaminants. Proposed track connecting main line to Site will be constructed through an area of shallow groundwater.
Impact on the water balance of a groundwater body	<b>Requires impact assessment</b>	Impact assessment not required	Yes. The Proposed Development includes excavation of a new cutting which will need to be drained. Site will change from a greenfield site to a developed site so surface water run-off will change. Changes to local groundwater regime may result.
Impact a GWDTE through changes in groundwater quality or flow	Requires impact assessment	<b>Impact assessment not required</b>	No. There are a small number of habitats on the Site associated with wet or damp ground conditions <sup>10</sup> but none that can be regarded as a wetland.

## Summary

<b>Receptor</b>	<b>Potential risk to receptor?</b>	<b>Note the risk issue(s) for impact assessment</b>
Hydromorphology	No	
Biology: habitats	<b>Yes</b>	Work will be undertaken adjacent to and over water bodies that are host to protected species
Biology: fish	No	
Water quality	<b>Yes</b>	Surface water run-off from the site will be discharged into the River Penk and Staffordshire and Worcester canal
Protected areas	<b>Yes</b>	The Site is located within a Nitrate Vulnerable Zone
Invasive non-native species	No	
Groundwater	<b>Yes</b>	Piled foundations will be required for bridge abutments. The proposed track connecting the main line to the Site will be constructed through an area of shallow groundwater and localised groundwater dewatering is likely to be required.

**Legend**



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**Client**  
**Four Ashes Limited**

**Project Title**  
**West Midlands Interchange**  
**Project Number**  
**1620002055**

**Figure Title**  
**Figure 1**  
**Site Location**



**Date** 14/06/2018

**Scale** 1:12,000 @A3



**Legend**

- ▭ Site Boundary
- ▬ EA Main River
- ▬ Ordinary Watercourse
- ▬ Canal
- ▭ Reservoir
- Pond
- Abstractions**
- ▲ Surface Water
- ▲ Groundwater

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Client  
**Four Ashes Limited**

Project Title  
**West Midlands Interchange**

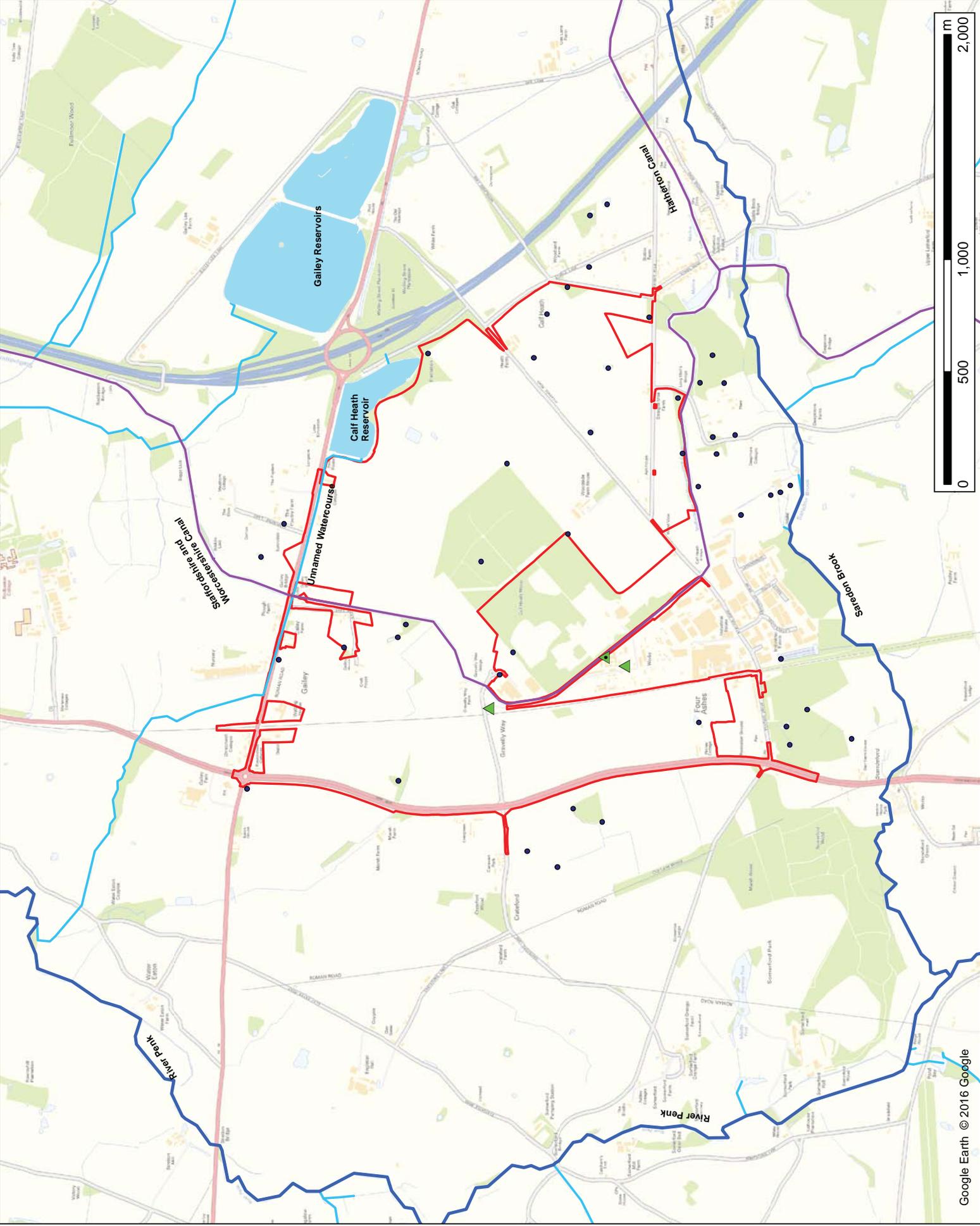
Project Number  
**UK15-22821**

Figure 2  
**Water Features**



Date 14/06/2018

Scale 1:15,000 @A3



- Legend**
- Site Boundary
  - EA Main River
  - Ordinary Watercourse
  - Canal
  - Reservoir
  - WFD Designated Water Bodies



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Client  
**Four Ashes Limited**

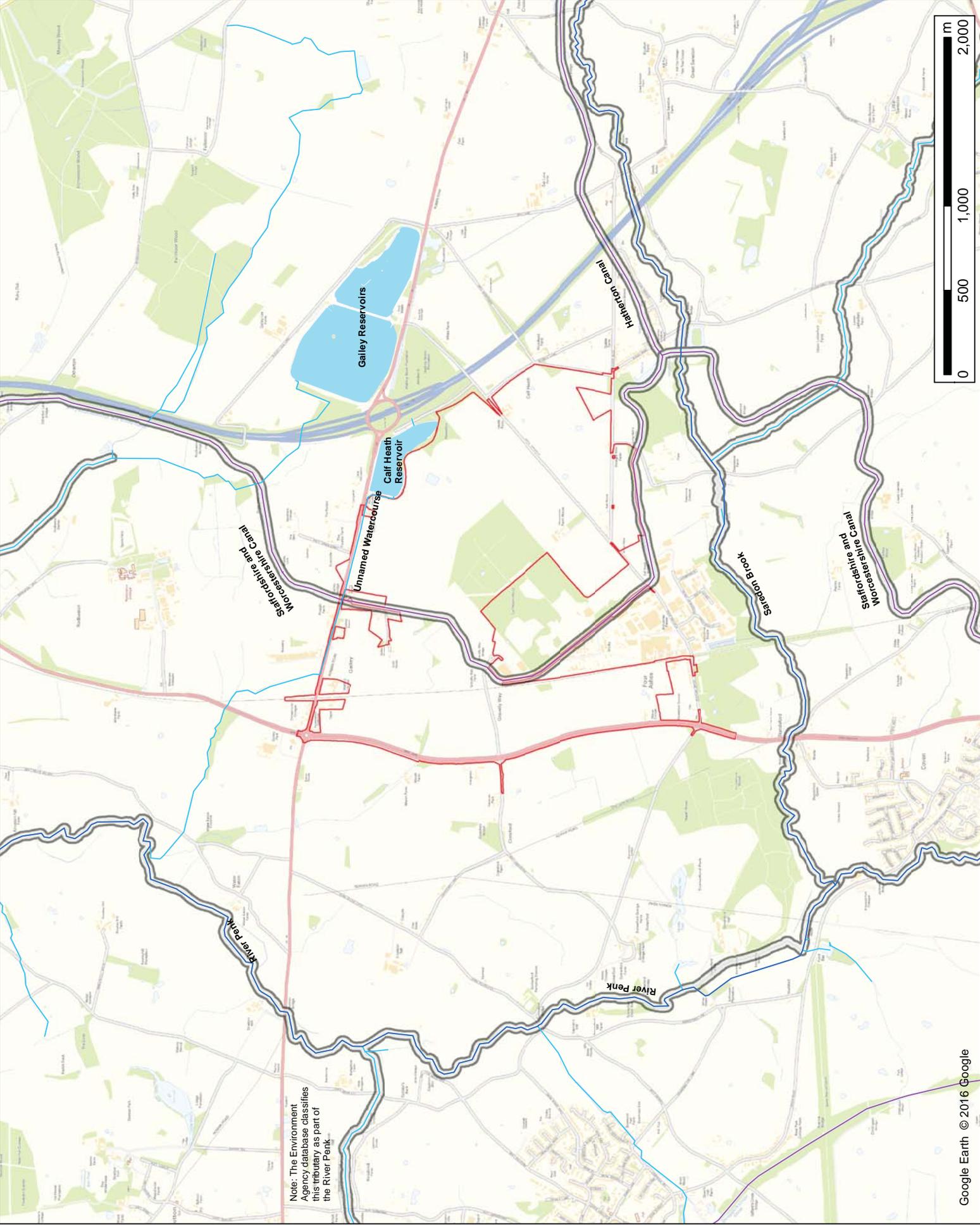
Project Title  
**West Midlands Interchange**

Project Number  
**UK15-22821**

Figure 3  
WFD Designations



Date 14/06/2018  
Scale 1:20,000 @A3



Note: The Environment Agency database classifies this tributary as part of the River Penk.