A46 Link Stoneleigh Junction Phase 1
WFD Compliance Assessment
Flood Risk and Drainage
Water Quality and Water Resources

Report Number: - Revision: -

<table>
<thead>
<tr>
<th>Prepared</th>
<th>CC</th>
<th>Checked</th>
<th>NS</th>
<th>Approved</th>
<th>NS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>11-01-18</td>
<td>Date</td>
<td>11-01-18</td>
<td>Date</td>
<td>11-01-18</td>
</tr>
</tbody>
</table>
A46 Link Stoneleigh Junction Phase 1
WFD Assessment – Flood Risk, Drainage
Water Quality and Water Resources
1. **Introduction**

The WFD Assessment will provide information to identify and assess the likely significant effects of the proposed development on flooding, drainage, water quality and water resources.

The proposed development includes new roads, roundabouts, which will increase impermeable area causing significant changes to the drainage regime; which initiates an introduction of detention and infiltration basins, ponds and other attenuation features. A new bridge is also proposed to replace the existing Westley Bridge and an area of land alongside the Finham Brook corridor is to be re-profiled for floodplain compensation.

This assessment report describes the legislative and policy background; study methodology; the baseline conditions currently existing within the study area and surrounding area; and the likely impacts of the proposed development.

This report also describes the mitigation measures required to prevent, reduce or control significant adverse effects, identify enhancement opportunities, and the likely residual effects after these measures have been employed.

1.1 **Legislation and Policy Context**

**Legislative Framework**

*Water Framework Directive 2000/60/EC*

The Directive (European Community (EC), 2000) (Ref. 11.1) requires at its core a new river basin planning system which will enable water resources to be managed in a more holistic and transparent way following the principles of better regulation. Included in this is the introduction of a new and updated range of environmental standards and conditions in respect of water quality. The main objectives of this Directive are to enhance and prevent further deterioration of aquatic ecosystems and associated wetlands, encourage sustainable water usage and reduce surface water and groundwater pollution.

*Groundwater Directive 80/68/EEC*

This Directive (European Economic Community (EEC), 1980) (as amended) (Ref. 11.2) prohibits the direct or indirect discharge into groundwater of List I substances and limits discharges of List II substances so as to avoid pollution.

*Water Act 2003*

The main environmental aims of this Act (UK Parliament, 2003) (Ref. 11.3) formalize the Government’s commitment to the sustainable management and use of water resources and water conservation. The Act amends both the Water Resources Act 1991 (UK Parliament) and the Water Industry Act 1991 (UK Parliament) to improve long term water resource management and improve the operation and regulation of the water industry.
Environmental Protection Act 1990

Circular 02/2000 (Department of Environment, Transport and Regions (DETR), 2000) (Ref. 11.4), which provides guidance on the implementation of Part IIA of the Environmental Protection Act (EPA) 1990 (Ref. 11.5), describes a risk assessment methodology in terms of 'significant pollutant linkages' within a source-pathway-receptor model of the site.

Water Resources (Environmental Impact Assessment) (England and Wales) Regulations 2003

These Regulations (UK Parliament, 2003) (Ref. 11.6) provide the framework for the assessment of water management projects, projects involving water abstraction, (>20m3/day) or projects likely to have a “significant effect on the environment by virtue of its nature, size or location”.

Groundwater Regulations 1998

The Regulations (UK Parliament, 1998) (Ref. 11.7) are an environmental protection measure which complete transposition of the Groundwater Directive 80/68/EEC (as amended) (Ref. 11.2) and provide enhanced protection for groundwater.

Anti-Pollution Works Regulations 1999

These Regulations (UK Parliament, 1999) (Ref. 11.8) prescribe the contents and application of anti-pollution works notices served under Section 161A of the Water Resources Act 1991. Under the powers given in the Anti-Pollution Works Regulations 1999 (UK Parliament, 1999), the Environment Agency is able to stop construction activities at any time should a significant pollution risk be posed to the environment.

Planning Policy

Sustainable development in relation to new development proposals means that new development is required to minimize the demand placed on existing water supplies and safeguard surface and groundwater resources from pollution. This initiative places emphasis on the re-use and recycling of water used during the operation of the development or surface run-off in order to reduce the overall water demand of the development.

It is important to manage surface run-off in sustainable ways since increased surface run-off may lead to increased flood risk or the reduction in groundwater levels through the interception of water which would previously recharge an aquifer. It is Environment Agency policy to promote the use of Sustainable Drainage Systems (SuDS) wherever possible, for example through the adoption of permeable surfaces, soakaways and infiltration ponds in order to control surface water run-off quantities at source (i.e. source control).

Planning policy at the national, regional, county and local level relevant to the proposals with regard to flood risk, drainage, water quality and water resources include:

Planning Policy Statement (PPS) 1: Delivering Sustainable Development
PPS 1: Delivering Sustainable Development (Office of the Deputy Prime Minister (ODPM), 2005) (Ref. 11.9) sets out the overarching planning policies on the delivery of sustainable development through the planning system and states that:

“Development plan policies should take account of environmental issues such as the protection of groundwater from contamination and the sustainable use of water resources and the use of sustainable drainage systems in the management of run-off.”

PPS 23: Planning and Pollution Control

PPS 23: Planning and Pollution Control (ODPM, 2004) (Ref. 11.10) including Annex 1: Pollution Control, Air and Water Quality and Annex 2: Development on Land Affected by Contamination, sets out policies for pollution control to be followed at all stages of planning including preparing Regional Spatial Strategies (RSSs) and Local Development Documents (LDDs). They are also material considerations for planning applications.

National Planning Policy Framework NPPF: Development and Flood Risk

NPPF: Development and Flood Control (Communities and Local Government, Mar 2012) strengthens the controls over development within or adjacent to flood plains and increases the Environment Agency’s powers to enforce these controls. NPPF sets out Government policy on development and flood risk. Its aims are to ensure that flood risk is taken into account at all stages in the planning process to avoid inappropriate development in areas at risk of flooding and to direct development away from areas of highest risk. Where new development is exceptionally necessary in such areas the policy set out in NPPF aims to make it safe, without increasing flood risk elsewhere, and where possible, reducing flood risk overall.

West Midlands Regional Spatial Strategy 11

Chapter 2 of the West Midlands RSS 11 (Ref. 11.12) as published in January 2008, provides guidance on how the West Midlands sustainable development strategy will be implemented. Chapter 8 of the West Midlands RSS 11 describes how the West Midlands, as a region aims to conserve the natural environment, including water quality and resources.

Policy QE3, Part B (iii) states that particular attention should be given to incorporating sustainability considerations, such as water efficiency and sustainable drainage.

Policy QE9 addresses water resources and water quality in relation to development plans and flood risk. Part A (i-vii) states that the Environment Agency and other relevant authorities should consider development plans in order to:

- Protect or improve water quality and where necessary significantly reduce the risk of pollution especially to vulnerable surface and groundwater in order to improve health and well-being;
- Manage demand, conserve supply, and promote local recycling of water and the multiple uses of water resources;
• Protect and enhance wetland species and habitats, particularly those subject to local biodiversity partnerships;

• Ensure that abstraction from watercourses and aquifers does not exceed sustainable levels;

• Reduce any adverse effects of development on the water environment by encouraging consideration of sustainable drainage systems where appropriate at an early stage in the design process;

• Ensure the timing and location of development respects potential economic and environmental constraints on water resources; and

• Maintain and enhance river and inland waterway corridors as key strategic resources, particularly helping to secure the wider regional aims of regeneration, tourism and the conservation of the natural, built and historic environment.

Part B states that any development that poses an unacceptable risk to the quality of groundwater or surface water should be avoided.

In addition, the West Midlands RSS 11 deals specifically with development plans and flood risk. It notes that while the implications of climate change for the severity of floods is uncertain, flood risk should be considered at all stages of the planning and development process. Where flooding is likely to be of Regional significance, the Environment Agency and relevant local authorities must assess the implications for the distribution of development and where appropriate, set out appropriate policies and measures to address them. This could include, but is not limited to,

• Defining areas where sustainable drainage systems would best contribute to reducing flood risk; and

• Improving water quality where the need to improve the performance of the floodplain, attenuate flows and provide local treatment of polluted run-off is greatest.

1.2 Guidance

The Environment Agency is responsible for maintaining and improving the quality of fresh, marine and underground waters (groundwater). The Agency aims to achieve this through the enforcement of legislation, the regulation of industry and through its influence as a statutory consultee in the planning process.

It is Environment Agency policy to promote the use of SuDS wherever possible through the adoption of swales, attenuation ponds, permeable surfaces and infiltration ponds in order to control surface water run-off quantities at source. This is further enforced by NPPF and local government guidelines, which sets out stringent restrictions on development within or adjacent to a floodplain.

The Environment Agency’s ‘Catchment Flood Management Plans’ (2004) provide guidance to local authorities on the control of development. In addition, the
Environment Agency has published flood maps that show the potential extent of an extreme flood, which may be experienced as a result of climate change. The flood maps also highlight flood defences and indicate where the risk is reduced as a result of these defences, as well as the areas potentially at risk from flood events of a 1% annual probability for rivers and 0.5% annual probability for tidal/coastal areas.

An adopted drainage network needs to meet the criteria outlined in Sewers for Adoption (WRc, 2012) (Ref. 11.15). This requires that a piped drainage system does not flood the ground in a 1 in 30 year flood, or surcharge for a 1 in 2 year event, using a design with the critical duration relevant to the Site (i.e. the worst-case for a given return period). It is good practice for new private drainage systems to also be designed to these criteria.

Practical guidance on the prevention of surface and ground water pollution is given in the Environment Agency’s Pollution Prevention Guidance (PPG) Notes, which can be accessed on the Environment Agency’s website http://www.environment-agency.gov.uk.
2. **Assessment Methodology and Significance Criteria**

2.1 **Scope of the Assessment**

The scope of the assessment has been informed by consultation with the Environment Agency, Warwickshire County Council and Severn Trent Water Ltd. The key issues for this assessment include:

- Potential changes to surface water quality during the construction and operational phases;
- Increase in surface water run-off quantities;
- Increase in water demand from new development within the Study Area;
- Increase in demand on drainage and foul water infrastructure;
- Review of the findings of the flood risk assessment undertaken for the Study Area;
- Consideration of the potential flood risks associated with groundwater, existing and proposed sewers and overland flow from adjacent higher ground; and
- Consideration of suitable mitigation options.

2.2 **Extent of the Study Area**

The Study Area comprises a 1km radius from the center of the Study Area. Potentially sensitive designated sites have been sought up to a distance of 5km downstream of the catchment of the Study Area (i.e. hydrologically linked to the drainage regime of the Study Area), although none were identified.

2.3 **Consultation**

Consultation with the Environment Agency (EA) and Warwickshire County Council (WCC) has been undertaken with regard to the Proposed Development.

2.4 **Method of Baseline Data Collation**

*Desk Study*

A desk study has been undertaken to identify sensitive surface water and groundwater receptors, drawing on information collected through the Ground Investigation (WSP; Geotechnics).

The following sources of information have also been reviewed as part of this assessment:

- Ordinance Survey (OS) map of the Study Area;
- British Geological Survey (BGS) map of the Study Area;
• Environment Agency Groundwater Vulnerability map of the Study Area;
• Environment Agency internet database (www.environment-agency.gov.uk);
• Ecology Reports Warwickshire County Council;
• Landmark Information Group – Envirocheck Report
• WCC website (http://www.warwickshire.gov.uk); and
• FRA and drainage strategy for the Study Area (WCC (submitted separately in support of the outline planning application).
• Drainage Strategy, hydraulic modelling study: Jeremy Benn Associates (JBA)

2.5 Significance Criteria

The assessments of potential effects as a result of the Proposed Development has taken into account both the construction and operational phases. The significance level attributed to each effect has been assessed based on the magnitude of change due to the development proposals, and the sensitivity of the affected receptor/receiving environment to change, as well as a number of other factors that are outlined in more detail in Chapter 4 of this report. Magnitude of change and the sensitivity of the affected receptor/receiving environment are both assessed on a scale of high, medium, low and negligible.

2.6 Impact Significance

The following terms have been used to define the significance of the effects identified:

• Major negative or positive effect: Where the Proposed Development could be expected to have a very significant effect (either positive or negative) on flooding, drainage, water quality and/or water resources;
• Moderate negative or positive effect: Where the Proposed Development could be expected to have a noticeable effect (either positive or negative) on flooding, drainage, water quality and/or water resources;
• Minor negative or positive effect: Where the Proposed Development could be expected to result in a small, barely noticeable effect (either positive or negative) on flooding, drainage, water quality and/or water resources; and
• Negligible: Where no discernible effect is expected as a result of the Proposed Development on flooding, drainage, water quality and/or water resources.
3. **Baseline Environmental Conditions**

The existing conditions within the Study Area and in the surrounding area with regard to flooding, drainage, water quality and water resources have been determined with reference to a number of information sources identified in the Desk Study.

Additional information on ground conditions and contamination is derived from the ground investigation work carried out by others.

### 3.1 Geology and Hydrogeology

The British Geological Survey (BGS) mapping shows the site to be underlain by Kenilworth Sandstone Formation. No superficial deposits are recorded.

BGS records of historic boreholes along the A46 and near the Westley Bridge have been reviewed as part of this study.

The typical borehole contained layers of sandy clay, silty clay and sandy silt with gravel and silty sand. Sandstone was encountered at varying levels between 3.0m and 6.0m bgl (below ground level). Groundwater was encountered in some of the boreholes at some 1.85m bgl near the Westley Bridge and 3.0m bgl along the A46 route.

In line with the EA mapping, the site is shown to be located above a Principal Bedrock Aquifer within high vulnerability zone. A plan provided by the Environment Agency (EA) as part of the consultation undertaken for this study suggests the site to be located in Zone 2 - Outer Protection Zone.

An intrusive ground investigation has been undertaken on site. Soakaway tests were carried out on site by Geotechnics in September 2017 (Project No PC176864) and draft results provided for review. Tests were taken at four different locations along the Stoneleigh Road. Results from three trial pits show varying infiltration rates between 1.1 - 2.2 x 10^-5 m/s. In one trial pit located next to the northern A46 slip road a higher value of 1.43x10^-4 m/s was derived. It has since been concluded that valid results were only obtained from one trial hole (1.42 x 10^-5 m/sec^-1). It is understood that further tests are planned to be undertaken, as part of the detailed drainage process, in order to assess the infiltration potential across the whole site.

### 3.2 Rainfall

The annual average rainfall for the period 1981 to 2010 for the nearest Meteorological Office weather station to the Study Area (Bablake Weather Station) is 692.8mm, with the wettest months being November to January. This compares with the higher averages of 838mm for England and 775.9mm for the Midlands Region (Met Office, 2008).
### 3.3 Surface Water Drainage

The Finham Brook is a lower tributary of the River Sowe; it flows through Kenilworth and Warwickshire, England, to join the Sowe near Finham. Its principal tributaries include the Canley Brook, which drains the Tile Hill and Canley areas of Coventry, and the Inchford Brook which rises near Beausale, and then flows in an arc through the parish of Beausale, Haseley, Honiley and Wroxall. The length of the Finham and Inchford brooks is 15 miles (24 km), which have a total catchment area of 71 square kilometres (27 sq. mi).

The brook rises near Burton Green south-west of Coventry, and flows initially in a south-easterly direction, to reach the outskirts of Kenilworth. It joins the Inchford Brook near Kenilworth Castle, where it is crossed by the Tiltyard causeway, beyond which it turns east to flow through Kenilworth. Next to the castle it is crossed by Castle Road via Kenilworth Ford. In times of high flow this point becomes impassable for vehicles, although pedestrians can cross via the adjacent footbridge. It then flows through Abbey Fields until it is crossed by the A452, and continues through the Mill End area of the town, and alongside the Common to meet the Canley Brook near Crackley. The brook continues in a north-easterly direction, passing beneath the dual carriageway of the A46, to flow through Finham sewage works, to meet the Sowe upstream of Stoneleigh.

The Inchford and Finham brooks were dammed by the Tiltyard causeway to create a lake and water defence for Kenilworth Castle by King John in the 13th century. Its tributary Canley Brook was the site of a medieval watermill, near Crackley.

Areas of Kenilworth are susceptible to flooding from the brook. A flood warning service exists for the catchment, in conjunction with that for the Sowe, Sherbourne and the Canley Brook. The Kenilworth ford also has a localized warning system using signs to inform drivers when the road is flooded, and when they should use an alternative route.

The brook has been assessed under the Water Framework Directive, and has been divided into its upper and lower reaches with a separate assessment for the Canley Brook. All three fall into the moderate category, which is the middle band of the five part framework scale, which ranges from high, good, and moderate, through to poor and finally bad.

Surface water run-off from the Study Area is likely to comprise a combination of existing greenfield runoff from surrounding countryside and run-off from the road surfaces (run-off commonly contains elevated concentrations of certain pollutants, particularly hydrocarbons and sediments). Both foul and surface water sewerage systems are not present within the Study Area.

A topographical survey was undertaken by On Centre Surveys in January 2017. The survey indicated that the topography varies significantly with variations from A46 to Finham Brook and Stoneleigh Road. However, the general levels of the land from A46 roundabout to Westley Bridge is from 76mAO D to 63mAO D +/-.
### 3.4 Flooding

Reference to the Environment Agency Indicative Floodplain Map and the more detailed baseline modelling work undertaken by Halcrow in preparation of the FRA indicates that most of the Study Area lies within Flood Zone 1. However the area around Westley Bridge and Finham Brook lies within Flood Zones 3a and 3b. Further information on the baseline with respect to flooding is contained within the FRA, submitted separately in support of the outline planning application.

### 3.5 Surface Water Quality

The Environment Agency assesses the quality of watercourses by considering nutrients, chemistry, and biology under its General Quality Assessment (GQA) scheme. The chemical and biological aspects can be broken down into grades ranging from A which is ‘Very Good’ to Grade F which is ‘Bad’.

There are a number of surface water features located on or near (within 5km) of the Study Area. A summary of the GQA Classification for the most prominent hydrological features is presented in Table 3.1.

The Environment Agency maintains a water quality monitoring locations on Finham Brook and Canley Brook (National Grid Reference 427100, 277500). Results at this monitoring site are available for chemical and nutrient (nitrate and phosphate) parameters and are presented in Table 3.1.

<table>
<thead>
<tr>
<th>Watercourse</th>
<th>Water Quality Measurement Location</th>
<th>GQA (Chemical)</th>
<th>GQA (Biology)</th>
<th>GQA (Nitrate)</th>
<th>GQA (Phosphate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finham Brook</td>
<td>Confluence with Canley Brook</td>
<td>B</td>
<td>B</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Canley Brook</td>
<td>Confluence with Finham Brook</td>
<td>A</td>
<td>C</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

Based on the information presented in Table 3.1; it would appear that the chemical water quality of the watercourses in the area is high, with the quality of water of the Canley Brook at the confluence with the Finham Brook being recorded as Very High. This suggests that the water flowing into the rivers is generally uncontaminated by chemical pollutants. This is considered to reflect the rural catchment. Data collected on the Finham Brook, at the confluence between the Finham Brook and the Canley Brook, suggests that the biological health of these two watercourses is good.
It has been reported that signs of otters, water voles and white clawed crayfish have been found within the River Avon catchment. These species have been identified within the UK Biodiversity Action Plan (UKBAP) as species requiring particular attention in terms of conservation. Otters and Water Voles have also been included within the Local Biodiversity Action Plan (LBAP).

All the watercourses in the area have high or very high measured concentrations of the nutrients nitrate and phosphate. This is indicative of the rural nature of the river catchments and the agricultural activity undertaken within them. Accordingly the area has been classified as lying within a Nitrate Vulnerable Zone.

There is no direct water quality data regarding the Westwood Brook, however, a good indication of the environmental health of this watercourse can be given using observations from site visits and on nearby watercourses, particularly the Canley Brook and the Finham Brook. Based on the measured water quality of these two watercourses, at locations downstream of the inflow from the Westwood Brook, it is considered that the chemical water quality of the Westwood Brook would also be expected to be high.

However, based on field observations, it is also expected that the watercourse is not biologically rich due to the fact that it appears dominated by a low flow regime, resulting in shallow depths at times of normal flows. Flows are also expected to be ‘flashy’ at times of rainfall events, resulting in instances when the flow increases significantly over a short period of time and then quickly falls back to normal conditions making it unfavorable to most aquatic fauna.

In keeping with the observed water quality data it is expected that the nutrient concentrations of the Westwood Brook are going to be high, due to diffuse pollution from surrounding farmland.

As can be seen from Table 3.1, the chemical quality of Canley Brook correlates to water which is suitable for potable supply after advanced treatment, suitable for other abstractions; can support Cyprinid fisheries; and natural ecosystems, or those corresponding to good cyprinid fisheries.

The biology grade of D ‘Fair’ is described as showing considerable differences from that expected for an unpolluted river of this size, type and location. Sensitive species are scarce and contain only small numbers of individuals. There may be a range of species that tolerate pollution and some of these may have high numbers of individuals.

Nitrate levels are considered to be ‘Moderate’ (GQA Grade 4), with levels of phosphates are considered to be ‘High’ (GQA Grade 4).

### 3.6 Discharge Consents

There are 5 discharge consents within 1km of the Study Area. One is within 250m of the site. The remaining 4 are between 250 and 300m from the site. The discharge consents
are for the discharge of trade effluent into Finham Brook, and for discharge of sewerage and surface water, via Severn Trent Water Sewage Disposal Works.

3.7 Pollution Incidents

The Environment Agency categorises pollution incidents according to their severity, and describes the effect of each on water, land and air. With respect to water resources, these are summarised as:

- Category 1 Incidents – serious effect on water resources;
- Category 2 Incidents – significant effect on water resources;
- Category 3 Incidents – relatively minor effect on water resources; and
- Category 4 Incidents – no effect on water resources (but there may be effects on air or land).

There is one recorded pollution incident in the Envirocheck Report located some 250-500m from the site; this is recorded as occurring on the 18th May 2015. The incidents Oils and Fuel: Kerosene and Aviation Fuel.

- Water Impact: Category 3 – Minor Incident.
- Land Impact: Category 2 – Significant Incident

A further 5 pollution incidents have been reported, 500 to 1000m from the Study Area between 1996 and 1999. All of these reported incidents were Category 3 (Minor) Incidents and were caused by unknown oils, diesel oil, gas oil, unknown chemicals, organic wastes and miscellaneous substances.

3.8 Water Abstractions

Details of the water abstractions in the vicinity of the Westley Bridge, Finham Brook, have been obtained from the Envirocheck Report. From this information it would appear that there are 4 licensed abstractions between 251 and 500m from the study area; there a further 2 licensed abstractions between 501 and 1000m, and a further 14 abstractions located up to 2km from the site.

The Site is located within the ‘Total Catchment’ area of the groundwater ‘Source Protection Zone’ for public water

3.9 Future Baseline

In the absence of development it is likely that the existing drainage regime and water demand profile for the Study Area will remain the same. The exception will be climate change related effects, which are likely to increase the likelihood of extreme rainfall events and flooding events.

The effects of climate change i.e. the future baseline, have been taken into account as required by NPPF and is presented in the FRA.
4. **Assessment of Impacts, Mitigation and Residual Impacts**

The following provides a description of the key potentially significant impacts that the proposed A46 Stoneleigh junction improvements may cause with regard to the water environment. Impacts have been predicted and assessed assuming simultaneous development of all facilities and therefore may be considered to represent the worst case scenario.

It is accepted that an increase in the developed impermeable area may lead to an increased risk of flooding. As a result, it is now a requirement to inform the planning process of how flood risk is to be mitigated at the time planning permission is sought. For the proposed site, Flood Risk and a Drainage Strategy have been examined in detail and this has been addressed in separate reports. Issues related to flood risk would not be addressed in this chapter unless other issues, not related to flooding, arise from a particular activity.

**Land Drainage and Flood Defence Improvement Works**

1. **Sustainable Drainage Systems**

The proposed scheme will increase the impermeable area draining into the Finham Brook by approximately 1.2ha. A detailed drainage strategy is to be undertaken for the whole the Study Area and appropriate SuDS elements implemented. This will be undertaken in further detail at later detailed design stages.

SuDS elements will be incorporated as part of the Proposed Development to reduce potential drainage and water quality impacts. The outline drainage strategy sets out the options that are likely to be available for use at later detailed design stages, such as balancing ponds, infiltration techniques, swales etc.

Annex 1 to PPS 23 (Ref. 12.8) indicates the need to incorporate SuDS into development proposals to reduce the effect of diffuse pollution (such as run-off from road surfaces) whilst also providing a contribution to biodiversity and local amenity and recreation.

2. **Floodplain Compensation**

The floodplain compensation scheme will involve lowering the right bank of the Finham Brook on the upstream side of the Westley Bridge by a depth of up to 1.0m.

As well as the Construction Environmental Action Plan (CEMP); a Landscape Management Plan and Environmental Protection Plan (EPP) may be required to ensure that those features of ecological interest along the river corridor are not damaged by reprophiling works.

As outlined in sections 4.1 and 4.2 relevant precautions will be adhered to during the construction and operation phases.
3. **Construction of New Westley Bridge**

The proposed bridge over the Finham Brook will carry the re-aligned C32 Kenilworth to Stoneleigh Road which leads up to and from the Dalehouse Lane Roundabout and improved interchange over the A46.

The proposed bridge will comprise a single 17.0m skew clear span pre-stressed beam reinforced concrete composite integral deck on reinforced concrete abutments with bored concrete piled foundations. The overall square width of the bridge is approximately 31m.

The bridge has been designed with additional width to allow for further improvements to the C32 Kenilworth to Stoneleigh Road.

The edge of the proposed bridge will be located approximately 3.0 metres from the face of the existing Westley Bridge, in order to provide an adequate margin in which to carry out maintenance of both bridges.

4.1 **Construction**

4.1.1 **Contamination of Surface Waters**

A number of surface water features are present within the Study Area boundary. Pollution may occur via the following pathways:

- Pollution from the operation of construction vehicles or inappropriate maintenance of storage areas (e.g. oil storage), chemical or oil leaks/spillages and general construction activities (including any dewatering of groundwater);

- Damage to soil stability or inappropriate storage of spoil resulting in increased sediment loading of surface water run-off; and,

- Potential mobilisation of any existing contamination to water resources as a result of earthworks, trench excavations and other construction activities.

- Disposal of water from the dewatering process may cause pollution of surface waters. Given adherence to best practice and the Environment Agency Pollution Prevention Guidance Notes, the impact of this would be likely to be negligible.

Excavations may disturb sediment, which can be transported and deposited within waterbodies and watercourse across and downstream of the site. Additional sediment inputs may reduce visibility and light penetration, bury habitats and reduce dissolved oxygen, ultimately harming aquatic life. Given the sensitivity of aquatic species in the Westley Bridge, Finham Brook are, in particular great crested newts and water voles, this would be expected to result in an impact of moderate adverse significance.

Construction activities may introduce the potential risk of surface water and groundwater pollution from spillages or leakages of construction related materials. Spilt fuel and oils may potentially migrate into watercourses and groundwater, either through direct infiltration or via mixing with rainwater run-off. While a significant spillage incident,
located close to sensitive receivers would result in an impact of major adverse significance, adherence to best practice guidance through a Code of Construction Practice would reduce the risk, and the impact of such an incident. Impacts of less significant spillages and more isolated receptors would result in moderate adverse and minor adverse impacts. The impact caused by residual spillages and contamination throughout the construction phase would be expected to be negligible.

The operation of construction vehicles and general construction activities can potentially give rise to the contamination of surface water by pollutants such as hydrocarbons, suspended solids and construction material.

The movement of plant and machinery may damage soil stability, e.g. create creating boggy conditions during wet weather and dust during dry periods. This has the potential to increase sediment loading of surface run-off entering the sewer system. Inappropriate storage of spoil and construction materials such as sand may be mobilised into the aquatic environment as a result of rainfall and this may also increase the sediment loading to surface water run-off.

It is anticipated that the Proposed Development will necessitate earthworks including the breaking up of hardstanding, some site levelling, trench excavation and installation of building foundations. Dewatering of foundations is another source of sediment and potentially contaminated water that may require disposal during construction.

Due to the topography of the Study Area, without appropriate mitigation measures, there is a potential for contaminants, including sediments, to reach Finham Brook without appropriate mitigation measures, particularly from leaked or spilled chemicals or dust from excavation and demolition works. Contamination pathways include direct leakage/spillage/entrance into surface waters or via any outfall drains.

There would therefore be a direct, short term, temporary impact of up to moderate negative significance on receiving waters from any surface water contamination.

Areas under construction close to Finham Brook, particularly Westley Bridge, or with direct sewer connections are more likely to have an impact than construction works at locations farther away, or with no sewer connection.

**Mitigation**

A Construction Environmental Management Plan (CEMP) for the Proposed Development will be put in place to manage and control all the construction activities, including management of surface water run-off and the appropriate storage of construction materials, fuels and chemicals. The CEMP will detail the procedures and methods that must be followed to minimise the potential effects of construction activities. The CEMP will be developed in consultation with WCC, the Environment Agency and other authorities, as required prior to the commencement of construction activities. Contractors working on the scheme will be required to comply with the CEMP and will be briefed accordingly.

The CEMP will make reference to the provisions of the Environment Agency’s Pollution Prevention Guidance Notes (PPGs), in particular:
• **PPG 1**: General Guide to the Prevention of Water Pollution;
• **PPG 5**: Works In, Near or Liable to Affect Watercourses;
• **PPG 6**: Working at Construction and Demolition Sites;
• **PPG 8**: Safe Storage and Disposal of Used Oils;
• **PPG 13**: Vehicle Washing and Cleaning;
• **PPG 20**: Dewatering Underground Ducts and Chambers; and,
• **PPG 21**: Pollution Incident Response Planning;

Construction activities would also comply with appropriate regulations and follow best practice construction techniques, such as the guidelines contained within Control of Water Pollution from Construction Sites (C532) (CIRIA, 2001) (Ref. 11.28).

Any fuels, oils or chemicals used during the construction activities will be stored on impervious bases and adequately bunded, in accordance with PPG 6: Working at Construction and Demolition Sites and relevant legislation. Surface water run-off will be managed by the appropriate use of temporary bunding, settlement tanks or ponds and/or oil separators to ensure the protection of the wastewater quality in receiving drains from sediment load and potential contaminants.

Other areas of the Study Area where activities which may result in the release of potentially contaminative substances (e.g. oils/chemicals), such as where construction vehicles would be present and at wheel washing facilities, would also be sited over impervious bases and drained to the temporary drainage system where required via settlement ponds/tanks and/or separators, as described above.

Construction vehicles will be properly maintained to reduce the risk of the escape of potentially polluting substances (such as hydrocarbons) and will operate only when required. Any waters known to be contaminated or which cannot be discharged into a local road drainage network will be pumped into suitable storage tanks for appropriate treatment and disposal off-site, in accordance with legal requirements.

To minimise sediment or contaminated dust reaching receiving waters, dampening down of spoil, excavated areas and during demolition will be undertaken, particularly during dry and windy weather. All construction vehicles transporting materials and stored construction and waste materials will be covered to minimise potential contaminants escaping.

During any dewatering activities, reference will be made to the Environment Agency’s PPG 20. The advice of the Environment Agency will also be sought in advance of dewatering. The use of temporary bunding or settlement ponds/tanks to store water removed from excavations provides a level of attenuation, thereby reducing the risk of localised flooding and the risk of local water resources becoming polluted.

**Summary:**
Ground permeability can be retained by limiting ground compaction during the construction process. In addition, materials can be used in the construction processes that are designed to allow water to infiltrate, whilst being robust enough to allow building works to continue. In addition, these mitigation measures would help prevent any increase in the risk of flooding.

Dewatering of the site is likely to have a negligible impact. However, dewatering should only be undertaken when it is absolutely necessary and the effects of dewatering should be monitored and checked regularly. The use of cut-offs is preferable but again should only be used where appropriate.

The release of sediments to the water environment, during the construction phase can be limited by the adoption of sediment control measures such as sediment traps and fences. This would reduce the impact of increased sedimentation on the surface water environment to minor.

Chemicals and fuel oils would be stored in a bunded area within the site compound. This area would also be used for refuelling of the vehicles. The bund would be designed according to CIRIA guidelines on Construction of Bunds for Oil Storage Tanks and the design would be agreed with the Environment Agency prior to construction. The area would be secured to prevent unauthorised access or vandalism and fuel tanks would be locked when unattended. The bunded area would be constructed to ensure that no infiltration into the ground could occur and that all drainage would be collected and passed through both a petrol interceptor (fitted with a stop valve) and silt trap prior to discharge. Maintenance, including regular inspection, of the bunded area would be undertaken.

All site personnel would be trained in both normal and emergency procedures in order to reduce the likelihood and minimise the impact of a pollution incident.

Pollution control equipment would not only be stored in the site compound, but also on machinery, as appropriate. Drip trays would also be carried and used on all machinery.

All repair and maintenance work to machinery would be carried out off site, where practicable. Only emergency repairs would be carried out on site.

These procedures should reduce the risk of a large spillage and ensure that the impact of day to day activities is negligible.

Residual Effects

Provided the aforementioned mitigation measures identified previously are implemented, the potential residual effect upon surface water quality and resources during construction is considered to be direct, short term, temporary and of minor negative significance.

4.1.2 Alteration of Surface Water Drainage Regime

Construction activities on open undeveloped areas will result in soil compaction and will result in a small, temporary increase in the volume and the rate of surface water run-off.
on the Study Area and to the existing highway sewer system; this may pose a localised flood risk. There is also a possibility that construction debris may block the existing drainage system, if not appropriately managed.

Construction works undertaken within undeveloped areas may lead to a reduction in the ground surface permeability ability and thus a reduction in water infiltration. In the initial stages of construction, this is caused by the movement of machinery compacting ground, although as construction progresses, natural ground may become replaced by areas of temporary or permanent hard-standing.

The effects of reduced infiltration are:

- An increase in surface water run-off following rainfall events, leading to increased flow rates in watercourses and flood risk. The impact of this would be moderate adverse in significance;

- A reduction in groundwater recharge and disruption of groundwater flow paths.

Earthworks and ground excavations may expose sub-surface water bearing strata and ground water seepage may require dewatering and off-site disposal. Seepage and migration of groundwater may contribute to a lowering of local groundwater levels and settlement within underlying strata.

Owing to the insignificant rates of seepage reported during previous ground investigations, the impact of this is likely to be negligible. Similarly, the impact to groundwater levels and flow–paths, and interaction with surface waters, as a result of dewatering or piling are expected to be negligible, due to the limited extent of water bearing strata under the site.

As a result, the impact of the Proposed Development on the drainage regime during construction may be direct, short term, temporary and of **minor negative** significance.

**Mitigation**

To prevent localised flooding during the construction phase, a temporary surface water drainage system will be employed by the contractor. This will comprise surface water run-off facilities, which, in addition to containing any contaminated run-off as described previously, will provide on-site attenuation for surface water flows and thereby reduce flow rates and negate flood risk.

Where possible, water should be prevented from entering excavations through the use of cut-off drains and well point dewatering or cut-off walls for ground water. During dewatering activities the use of temporary retention basins to store water removed from excavations provides a level of attenuation, thereby reducing the risk of localised flooding. Suitable excess water could be discharged to the highway sewer.

*Best practice recommendations for the prevention of localised flooding during construction will be outlined in more detail in the CEMP.*
Residual Effects

It is considered that if measures for attenuating the flow of surface water are implemented appropriately, any residual effect as a result of an increase in the volume and rate of surface water run-off from the Study Area during construction would be of direct, short term, temporary negligible significance.

4.2 Operation

Construction of new road surfaces would inevitably result in the permanent loss of permeable surface and replacement with finished hard-standing. The effects of reducing the ground's ability to allow water infiltration are:

- An increase in quantity and flow of surface water run-off from rainfall events, leading to increased flood risk. Given the scale of the proposed gross external area to be developed, the impact of this may be considered moderate adverse in significance; and,
- A reduction in groundwater recharge, together with disruption of groundwater flow-paths.

A further result of the increase in impermeable surface may be a change in the quantity of sediment, particularly sediment from roads contaminated with hydrocarbons, ultimately discharged to surface watercourses and water bodies.

Residual and ongoing release of contaminants to the surface water environment may be expected as a result in increased vehicular activity across previously undeveloped areas. However, the introduction of filter drains, fuel interceptors, detention basins and ponds will ensure that contamination from vehicular activity is reduced to minimal impact.

4.2.1 Contamination of Surface Water Resources

Any contamination of water resources may lead to deterioration in surface water quality, and may impact on the general nature conservation value of the Finham Brook. It is therefore important to ensure that the Proposed Development does not contribute to any deterioration of these surface water resources compared to the baseline conditions.

Mitigation

All potential minor pollutants should be confined to the proposed highway surfaces within the Study Area. It is recommended that all piped discharges are passed through trapped gullies and/or petrol interceptors prior to discharge to attenuation facilities to minimise the risk of pollution entering Finham Brook.

The standing water in attenuation facilities will allow residual sediments to settle; whilst residual organic pollutants will be exposed to the elements and the overall volume of water in the attenuation facilities will dilute pollutants significantly. It is recommended that balancing ponds or flood attenuation wetlands are considered as part of the detailed drainage strategies (to be prepared at later detailed design stages) as plants have the
capacity to absorb and filter pollutants. Any effects, however unlikely, will therefore be local in extent.

The permeability of ground can be retained in developed areas by using appropriate materials for areas of hard-standing that allow infiltration and by landscaping so that areas of natural vegetation are retained. If these measures are combined with an appropriate drainage system, as discussed in the FRA, the impact of the development can be reduced to negligible, in terms of both groundwater recharge and flood risk.

Contamination of watercourses by day to day releases of contaminants and sediments can be mitigated by employing petrol interceptors and sediment traps within the design of the surface drainage system designed for the site. The installation of these would ensure that the impact of the development is negligible.

**Residual Effects**

Although increased sources of pollution to water resources may be introduced (e.g. through the increase in vehicle movements on the Site), the implementation of the prevention and mitigation measures will ensure that the risk of contamination of receiving waters is negligible compared to baseline conditions. There is therefore considered to be an indirect, long term, permanent negligible to minor negative impact to receiving surface waters as a result of the operation of the Proposed Development.

Without appropriate mitigation measures the most significant impact on the water environment related to the proposed developments would be the effect of sediment releases on aquatic flora and fauna, during construction. This can be mitigated by employing appropriate sediment control measures during construction. All other impacts of the development are likely to be negligible even without further mitigation.

### 4.2.2 Alteration of the Surface Water Drainage Regime

Much of the Proposed Development is infill on Greenfield areas around the existing highway. However the proposed surface water drainage strategy will seek to improve the existing hydrology in terms of the volume and rate of surface water run-off so as not to increase the risk of flooding downstream of the Study Area. It is anticipated that the surface run-off would be maintained through the implementation of a SuDS and consequently during the operational phase of the Proposed Development, the surface water run-off rates will be significantly reduced. Further information is contained in the FRA. Operation of the Proposed Development is therefore likely to have a direct, long term, permanent, negligible impact on the drainage regime compared to baseline conditions.

**Mitigation**

It is proposed that surface water run-off generated from the Proposed Development will be drained through a series of linked attenuation facilities (exact details to be confirmed at later detailed design stages), prior to discharging to the existing surface water network at a greatly reduced rate. This will also ensure that the 1 in 100 year storm event and surface water run-off for all storm events up to and including the 1 in 100 year +40% will be accommodated.
Residual Effects

There will be a reduction in the amount of surface water run-off generated as a result of the Proposed Development due to the proposed attenuation facilities. The Proposed Development will therefore maintain the current baseline conditions and have a residual direct, long term, permanent, negligible impact on the drainage regime. In redeveloped areas, improvements to the existing drainage arrangements are likely and minor positive impacts are likely to occur.

4.2.3 Risk from Fluvial Flooding

The Proposed Development has been designed to accommodate for the 1 in 100 year plus 40% climate change allowance. The risk of flooding will be avoided through location of buildings outside the floodplain and the impact will therefore be of direct, long term permanent negligible significance.

Mitigation

No additional mitigation measures are required.

Residual Effects

As the Proposed Development has been designed to accommodate for significant flood events now and in the future as a result of climate change, there is considered to be a residual flood risk effect of direct, long term permanent negligible significance.

4.2.4 Increased Pressure on Water Resources due to an Increase in Water Demand

The Proposed Development will not have any influence on water demand.

4.2.5 Increased Pressure on Foul Sewerage Infrastructure

The Proposed Development will not affect the existing Foul Sewerage Infrastructure.

4.3 Monitoring and Follow Up

The attenuation systems and on-site sewers will be adopted under a maintenance agreement maintained by Warwickshire County Council (WCC), within the local road network; and by Highways England (HE) within the strategic road network.

4.4 Limitations and Assumptions

The following assessment is based on information gained from the desk study and the interpretation of the drainage strategy and FRA for the Study Area, qualitative professional judgement and consultation with relevant organisations and data sources. Water quality was not sampled at any surface water features on, or in the vicinity of the Study Area.
An assessment of the effects of the Proposed Development on groundwater quality and effects from migrating contamination to surface waters has not been considered in this report. However the study states how prevention measures will significantly reduce any risk flood or contamination.
5. **Summary**

This assessment has been undertaken to determine the potential effects of the Proposed Development on flood risk and drainage; water quality and water resources. Measures to prevent or minimise any negative impacts have been determined and the subsequent residual effects after these measures were implemented were assessed.

The potential effects are listed in Table 5.1 Summary of Impacts and Effects, (Appendix B) can be summarised as:

Temporary construction phase impacts including contamination of surface water resources and increase in localised flood risk;

Permanent operational phase impacts including contamination of water resources;

Alteration of the surface water drainage regime (and associated effects, including discharge rates and flood risk);

This project will not initiate an Increase in water demand; or, increased pressure on the foul sewerage network.

The Environment Agency maintains a water quality monitoring stations at a number of locations on Finham Brook to assess water quality under the General Quality Assessment (GQA) scheme. A desktop review of information relevant to the Site, including the Envirocheck Report for the Canley Regeneration Area and the Environment Agency website indicate that there has been a general improvement in the overall water quality of the Canley Brook between 1990 and 2006.

The majority of the Proposed Development will avoid building within Flood Zones 2 and 3 and the implementation SuDS techniques will accommodate increased surface water run-off associated with new areas of hardstanding and ensure there is no significant residual flood risk.

The construction of the proposed Westley Bridge is within Flood Zone 3a and 3b. However, the development will not increase flood risk due to its open span design. An area upstream of the bridge will provide floodplain compensation.

The implementation of mitigation measures will ensure that there are no significant residual or cumulative effects on water quality or any important and sensitive water resources during either the construction or operational phase.

To mitigate against the contamination of surface water and altering the drainage regime during construction a Construction Environmental Management Plan (CEMP) will be developed, in consultation with WCC, for the Study Area, to manage and control all the construction activities.
6. References


The Environmental Protection Act (1990)


The Groundwater Regulations (1998)

The Anti-Pollution Works Regulations (1999)

Office of the Deputy Prime Minister (2005) PPS 1: Delivering Sustainable Development

Office of the Deputy Prime Minister (2004) PPS 23: Planning and Pollution Control

Department of Communities and Local Government (2006) PPS 25: Development and Flood Risk


WRc (2006), Sewers for Adoption (6th edition)


Environment Agency PPG 1: General Guide to the Prevention of Water Pollution

Environment Agency (2007) PPG 5: Works in, near or Liable to Affect Watercourses

Environment Agency PPG 6: Working at Construction and Demolition sites


Environment Agency PPG 20: Dewatering Underground Ducts and Chambers


CIRIA (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532)
7. Appendices
Appendix A

Environment Agency – Finham Brook Catchment Data Explorer
Environment Agency – Finham Brook Catchment Data Explorer

Finham Brook - confluence Canley Brook to confluence River Sowe
### Environment Agency – Finham Brook Catchment Data Explorer

<table>
<thead>
<tr>
<th>Id</th>
<th>GB109054044480</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>River</td>
</tr>
<tr>
<td>Hydromorphological designation</td>
<td>not designated artificial or heavily modified</td>
</tr>
<tr>
<td>Easting</td>
<td>432020</td>
</tr>
<tr>
<td>Northing</td>
<td>274095</td>
</tr>
<tr>
<td>NGR</td>
<td>SP3202074095</td>
</tr>
<tr>
<td>Catchment area</td>
<td>6.523 km²</td>
</tr>
<tr>
<td>Length</td>
<td>5.085 km</td>
</tr>
</tbody>
</table>

### Upstream Water Bodies

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finham Brook – Source to Confluence with Canley Brook</td>
</tr>
<tr>
<td>Canley Brook – Source to Confluence with Finham Brook</td>
</tr>
</tbody>
</table>

### Downstream Water Bodies

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sowe – confluence with Withy Brook to confluence with River Avon</td>
</tr>
</tbody>
</table>
## Water body classification

<table>
<thead>
<tr>
<th></th>
<th>2009 Cycle 1</th>
<th>2016 Cycle 2</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Water Body</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Good by 2027</td>
</tr>
<tr>
<td>Ecological</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Good by 2027</td>
</tr>
<tr>
<td>Biological quality elements</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Good by 2027</td>
</tr>
<tr>
<td>Fish</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Invertebrates</td>
<td>Moderate</td>
<td>Good</td>
<td>Good by 2015</td>
</tr>
<tr>
<td>Macrophytes</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Macrophytes and Phytobenthos Combined</td>
<td>-</td>
<td>Moderate</td>
<td>Good by 2027</td>
</tr>
<tr>
<td>Hydromorphological Supporting Elements</td>
<td>Supports Good</td>
<td>Supports Good</td>
<td>Supports Good by 2015</td>
</tr>
<tr>
<td>Hydrological Regime</td>
<td>Does Not Support Good</td>
<td>Does Not Support Good</td>
<td>Supports Good by 2021</td>
</tr>
<tr>
<td>Morphology</td>
<td>Supports Good</td>
<td>Supports Good</td>
<td>-</td>
</tr>
<tr>
<td>Physico-chemical quality elements</td>
<td>Good</td>
<td>Moderate</td>
<td>Good by 2027</td>
</tr>
<tr>
<td>Ammonia (Phys-Chem)</td>
<td>High</td>
<td>High</td>
<td>Good by 2015</td>
</tr>
<tr>
<td>Biochemical Oxygen Demand (BOD)</td>
<td>-</td>
<td>High</td>
<td>-</td>
</tr>
<tr>
<td>Dissolved oxygen</td>
<td>High</td>
<td>High</td>
<td>Good by 2015</td>
</tr>
<tr>
<td>pH</td>
<td>High</td>
<td>High</td>
<td>Good by 2015</td>
</tr>
</tbody>
</table>
Environment Agency – Finham Brook Catchment Data Explorer

<table>
<thead>
<tr>
<th></th>
<th>2009 Cycle 1</th>
<th>2016 Cycle 2</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphate</td>
<td>Good</td>
<td>Moderate</td>
<td>Good by 2027</td>
</tr>
<tr>
<td>Temperature</td>
<td>High</td>
<td>High</td>
<td>Good by 2015</td>
</tr>
<tr>
<td>Specific pollutants</td>
<td>High</td>
<td>-</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Ammonia (Annex 8)</td>
<td>High</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Copper</td>
<td>High</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Triclosan</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Zinc</td>
<td>High</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Supporting elements (Surface Water)</td>
<td>-</td>
<td>-</td>
<td>Not assessed</td>
</tr>
<tr>
<td>Chemical</td>
<td>Does not require assessment</td>
<td>Good</td>
<td>Good by 2015</td>
</tr>
<tr>
<td>Other Pollutants</td>
<td>Does not require assessment</td>
<td>Does not require assessment</td>
<td>Does not require assessment</td>
</tr>
<tr>
<td>Priority hazardous substances</td>
<td>Does not require assessment</td>
<td>Does not require assessment</td>
<td>Does not require assessment</td>
</tr>
<tr>
<td>Cadmium and Its Compounds</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Di(2-ethylhexyl)phthalate (Priority hazardous)</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nonylphenol</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Tributyltin Compounds</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Priority substances</td>
<td>Does not require assessment</td>
<td>Does not require assessment</td>
<td>Does not require assessment</td>
</tr>
</tbody>
</table>
## Environment Agency – Finham Brook Catchment Data Explorer

<table>
<thead>
<tr>
<th></th>
<th>2009 Cycle 1</th>
<th>2016 Cycle 2</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead and Its Compounds</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nickel and Its Compounds</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

### Linked protected areas

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

### List of protected areas

<table>
<thead>
<tr>
<th>PA Name</th>
<th>ID</th>
<th>Directive</th>
<th>Type</th>
<th>More information</th>
</tr>
</thead>
<tbody>
<tr>
<td>590</td>
<td>NVZ12SW015900</td>
<td>Nitrates Directive</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix B

Finham Brook WFD Compliance Assessment
Table 5.1: WFD Compliance_A46 Link Stoneleigh Junction Phase 1_Summary of Impacts and Effects

<table>
<thead>
<tr>
<th>Description of Likely Significant Effects</th>
<th>Significance of Impacts</th>
<th>Summary of Mitigation / Enhancement Measures</th>
<th>Significance of Residual Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>major, moderate, minor, negligible</td>
<td>positive/negative</td>
<td>(P/T)</td>
</tr>
<tr>
<td>Construction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Contamination of Surface Waters</td>
<td>minor</td>
<td>neg</td>
<td>T</td>
</tr>
<tr>
<td>Alteration of the Drainage Regime</td>
<td>minor</td>
<td>neg</td>
<td>T</td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential Contamination of Surface Waters</td>
<td>minor</td>
<td>neg</td>
<td>P</td>
</tr>
<tr>
<td>Alteration of the Drainage Regime</td>
<td>minor</td>
<td>neg</td>
<td>P</td>
</tr>
<tr>
<td>Risk From Fluvial Flooding</td>
<td>minor</td>
<td>neg</td>
<td>P</td>
</tr>
<tr>
<td>Increased Pressure on Water Resources Due to an Increase in Water Demand</td>
<td>minor</td>
<td>neg</td>
<td>P</td>
</tr>
<tr>
<td>Increased Pressure on Sewage Infrastructure</td>
<td>minor</td>
<td>neg</td>
<td>P</td>
</tr>
</tbody>
</table>

Key To Table
(P/T) Permanent or Temporary
(D/I) Direct or Indirect
ST/MT/LT Short Term/ Medium Term/ Long Term
N/A Not Applicable