OTTERPOOL PARK ENVIRONMENTAL STATEMENT

Appendix 15.3 - Water Framework Directive Screening Report

MARCH 2022

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Executive Summary

Arcadis Consulting (UK) Limited was commissioned on behalf of Folkestone & Hythe District Council (the applicant') to undertake a Water Framework Directive (WFD) Screening Assessment for the development of Otterpool Park in Kent, herein referred to as the proposed Development.

The planning application seeks permission for a new garden settlement accommodating up to 8,500 homes (Use Classes C2 and C3) and Use Class E, F, B2, C1, Sui Generis development with related infrastructure, highway works, green and blue infrastructure, with access, appearance, landscaping, layout and scale matters to be reserved.

The site is approximately 589 hectares (ha) in area and is currently largely agricultural in nature with most of the site comprising arable and pasture fields and associated farm holdings, a disused horse racing course with an artificial lake ('Folkestone Racecourse Lake'), as well as some residential and light commercial uses.

The relevant water bodies listed in the South East River Basin Management Plan (RBMP) with potential to be affected by the proposed Development are the River East Stour (GB107040019640) and the Kent Greensand Eastern (GB40701G501400) groundwater body. As well as these, there are several ordinary watercourses within the Zone of Influence (ZoI) from the site that are not included within the RBMP, namely the Racecourse Drain, the North Lympne Drain and Harringe Brook.

The proposed Development has been designed to avoid and reduce impacts on the water environment, as well as to contribute towards achieving the objectives of the WFD. This has been achieved through the masterplanning of roads and development platforms and the integration of vegetated buffers and blue green corridors to protect water bodies. Sustainable Drainage Systems (SuDS) have been incorporated throughout the proposed Development. These are extensive and comprise strategic swales, detention basins, wetlands and wet woodland as well as plot level and roadside SuDS such as soakaways, permeable paving, raingardens and swales.

These SuDS measures not only manage the impact of flood risk, but also treat potential pollution from the varying proposed land use types across the site and therefore are key to maintaining the water quality attributes of water bodies within the ZoI. It is demonstrated that the proposed Development can achieve nutrient neutrality and protects the integrity of the downstream Stodmarsh European designated Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and RAMSAR sites. The removal of approximately 63m of existing culverting along the River East Stour and approximately 218m of existing culvert along the Racecourse Drain provides opportunity for ecological and hydromorphological betterment.

There are no mitigation measures specified in the South East River Basin Management Plan for the relevant water bodies. However, it is considered that the proposed Development would not compromise any future attempts to implement any mitigation measures that would look to secure improvements in water quality.

This screening assessment concludes that the proposed Development is compliant with the WFD provided appropriate mitigation measures are implemented prior to, and during construction. These mitigation measures are presented in the accompanying Environmental Statement and will be implemented via a Code of Construction Practice document (CoCP) to be in place before any enabling or construction begins. This CoCP will evolve during detailed design and as construction methods are confirmed. An updated Water Cycle Study (ES Appendix 15.2) has been prepared and will also be further defined with detailed design. On this basis, no further assessment with respect to the WFD is proposed.

1 Introduction

1.1 Overview

Arcadis Consulting (UK) Limited was commissioned on behalf of Folkestone & Hythe District Council (F&HDC) (the applicant') to undertake a Water Framework Directive (WFD) Screening Assessment as part of an Environmental Impact Assessment (EIA) for Otterpool Park in Kent, herein referred to as the proposed Development.

1.2 Site location and setting

The site is located within the administrative area of F&HDC in Kent and spans a large area of land directly south west of Junction 11 of the M20 motorway and south of the Channel Tunnel Rail Link (CTRL).

The site is approximately 589 hectares in area and is largely agricultural in nature with most of the site comprising arable and pasture fields and associated farm holdings, a disused horse racing course with an artificial lake ('Folkestone Racecourse Lake'), as well as some residential and light commercial uses.

The site is centred on National Grid Reference (NGR) TR 112 365.

1.3 Proposed Development

The planning application seeks permission for a new garden settlement accommodating up to 8,500 homes (Use Classes C2 and C3) and Use Class E, F, B2, C1, Sui Generis development with related infrastructure, highway works, green and blue infrastructure, with access, appearance, landscaping, layout and scale matters to be reserved.

1.4 WFD requirement

A WFD Screening Assessment determines whether a proposed development is compliant with the objectives of the WFD, or if further assessment is required.

In relation to the site, the works that are most relevant to this assessment include:

- The construction of the primary road network across the site, which will cross the East Stour (Main River) at three locations (bridge crossings), as well as the potential operational impacts, as a result of an increase in traffic associated with a new road network;
- The discharges of surface water from on-site Sustainable Drainage Systems (SuDS) and from treated wastewater from the on-site Wastewater Treatment Works (WwTW) within the East Stour catchment; and
- Increased demand on surface water and groundwater resource for potable water supply to the site.

This document sets out the findings of the Screening Assessment and is structured as follows:

- Introduction, background and overview of the proposed Development;
- The WFD;
- Assessment Methodology;
- Stage 1 – Defining the study area;
- Stage 2 – Collating baseline data;
- Stage 3 – Relationship of the proposed Development with WFD water bodies;
- Stage 4 – WFD preliminary assessment;

- Cumulative Assessment; and
- Conclusions.

2 The Water Framework Directive

The WFD (Directive 2000/60/EC) came into effect in the UK through the Water Environment (WFD) (England and Wales) Regulations 2003 (UK Government 2003). The WFD Regulations were amended by the Floods and Water (Amendment etc.) (EU Exit) Regulations 2019 (the 2019 Regulations), specifically Regulation 20. This legislation upholds the substance of the WFD regime which applied pre-EU Exit with only relatively minor amendments. The WFD was put in place to:

- Enhance the status, and prevent further deterioration of aquatic ecosystems and associated wetlands which depend on those aquatic ecosystems;
- Promote the sustainable use of water;
- Reduce pollution of water, especially by 'priority' and 'priority hazardous' substances;
- Ensure progressive reduction of groundwater pollution; and
- Contribute to mitigating the effects of floods and droughts.

The WFD set objectives for all water bodies classified under the WFD and the overarching requirement was that they should reach at least 'good' status (or potential) by 2015. This date has been extended to 2027 in respect of a large number of water bodies, namely those that by 2015 had not achieved good status, but which are judged capable of reaching this target without disproportionate burdens.

The WFD requires river basin districts to be established and, for each, a management plan to be developed. WFD-related actions are managed through the River Basin Management Plan (RBMP) process. For the proposed Development, the relevant RBMP is the South East RBMP (DEFRA / Environment Agency 2015).

The WFD has important implications when planning works that may affect water bodies. Development should not cause deterioration in water body status, and ideally, such development should contribute to improving the status of the affected water bodies. Development also must not prejudice the implementation of any planned mitigation measures (as documented in the RBMP) to improve water body status.

The WFD states that, if a proposed development will result in an adverse effect on a water body, which could cause a deterioration in its WFD status or could prevent actions which are required to raise the WFD status of the water body, then the proposed development must be assessed and justified. As part of the assessment, the actions proposed to mitigate the adverse impacts on the status of the water body must be examined.

3 Methodology

In order to assess whether the proposed Development is compliant with the objectives set out in the WFD, the following steps have been undertaken:

Stage 1 – Defining the study area, based on the distance of water bodies from the proposed Development and the hydrological connectivity of water bodies to the project (screening out water bodies not considered to have the potential to be impacted);

Stage 2 – Collating baseline data on the water bodies that are screened in, defining their current WFD status, their specific objectives and any mitigation measures undertaken or failures recorded to date;

Stage 3 – Defining the relationship of the proposed Development's components with the screened in water bodies (screening out components not considered to have the potential to cause impacts); and

Stage 4 – Undertaking a preliminary assessment of the remaining components of the proposed Development against the WFD elements (biological, chemical and hydro-morphological) that make up the overall WFD status of the included water bodies. This is to identify whether any components could have an impact on the WFD elements, and whether a detailed assessment is required.

Should the preliminary assessment conclude that there could be impacts on the WFD elements of the water bodies, then the steps below will be undertaken:

Stage 5 – Undertake a detailed assessment based on the findings of the preliminary assessment, in respect of any components of the proposed Development identified as likely to have an impact upon the WFD elements. This assessment will also consider any conflicts between the proposed Development and relevant RBMP mitigation measures, and any cumulative effects of the proposed Development; and

Stage 6 – Proposed programme of compliance of the proposed Development, required in accordance with Article 4.7 of the WFD.

4 Stage 1 – Defining the Study Area

The study area (or Zone of Influence [ZoI]) for this assessment includes land within the site boundary, in addition to the downstream reaches of the East Stour up to and including Ashford. Any other surface water receptor within 1km of the site boundary has also been included (see Figure 1 in Annex 1).

The study area has been defined in consultation with the relevant statutory bodies, including the Environment Agency (EA), to reflect the surrounding water environment. The study area is sufficient for the inclusion of all potentially affected surface water receptors.

Surface Water Bodies

The topography of the site is such that surface water mainly flows from east to west through two minor valleys and discharges into the East Stour. Other surface water features within the site boundary include ponds, a lake and several ditches/drains. The natural topography and existing watercourses split the site into several sub-catchments, which each ultimately convey flow to the East Stour.

The catchment of the East Stour (designated main river) drains a total area of 19.49km^2 to National Grid Reference (NGR) TR 09400 37700 located at the downstream boundary of the site. This catchment receives an average annual rainfall of 775mm. The East Stour is included in the South East RBMP and its hydrological relationship with the proposed Development is noted in Table 1 below.

As well as the East Stour, three surface water bodies, namely the Racecourse Drain, North Lympne Drain and Harringe Brook, are located within the site boundary. These small tributaries of the East Stour are not included within the South East RBMP, however there is the potential for these to be impacted given their physical proximity. Also, as they are hydrologically connected to the East Stour, these surface water bodies have been included within the scope of the assessment.

Groundwater Bodies

In addition to summarising the hydrological relationship of the East Stour with the proposed Development, Table 1 below also summarises those groundwater bodies located within the ZoI, defined as up to 1km from the site boundary.

Table 1: The hydrological relationship between each of the water bodies identified within the South East River Basin District RBMP and the proposed Development

Water body (name and WFD reference number)	Hydrological Relationship to Proposed Development
East Stour (GB107040019640)	This water body flows through the site. The proposed Development includes three bridge crossings over this water body, including a realignment of the channel at one bridge crossing. The water body would also receive surface water discharges from on-site SuDS features, as well as treated effluent from the on-site WwTW.
Kent Greensand Eastern – groundwater body (GB40701G501400)	This groundwater body lies beneath the site.

5 Stage 2 – Collating Baseline Data

5.1 Collating Baseline Data

For those water bodies screened into the assessment and included in the RBMP, baseline conditions are reported in Table 2 and 3, below. The information presented in these tables has been taken from the South East RBMP (Environment Agency's Catchment Data Explorer website, Cycle 3 2019 data, (Environment Agency 2019)).

A River Condition Survey has also been undertaken to record key characteristics of the East Stour. The survey recorded observations of channel dimensions, flow conditions and bankside/in-channel vegetation, as well as a geo-referenced photo record.

For those water bodies that have been screened into the assessment but are not explicitly included in the RBMP, data to define their baseline conditions has been collected from a topographical survey that recorded channel dimensions and from a site walkover survey, both undertaken in March 2020. Further details are provided in the Flood Risk Assessment and Surface Water Drainage Strategy prepared for the proposed Development (ES Appendix 15.1).

5.2 Water Framework Directive Baseline Conditions

Table 2 summarises baseline conditions for the East Stour water body within the boundary of the proposed Development. The surface water body has an overall moderate status, and its chemical status is failing. Key objectives for this surface water body are also set out in Table 2. No mitigation measures are documented in the South East RBMP to improve the status of this surface water body.

Surface Water Bodies

Table 2: WFD baseline conditions and objectives for the River East Stour (GB107040019640)

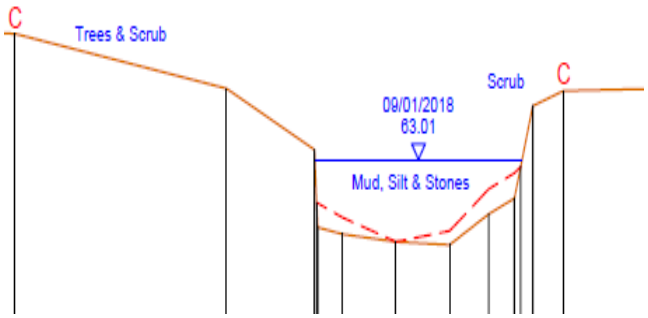
Parameter	Status
Classified as Heavily modified?	Not designated artificial or heavily modified
Current Overall Status/ Potential	Moderate (Cycle 3 2019 data)
Overall Status Objective	Good by 2027
Specific Status Objective(s)	Good Ecological Status by 2027 - Biological Quality Elements - Macrophytes and Phytobenthos Combined - Physico-chemical quality elements - Phosphate
Justification if overall objective is not good by 2015	Disproportionate burdens
Protected Area / Designation / Directives	Nitrates Directive

Parameter	Status	
Information on Ecological status (2019 Cycle 3)	Supporting Element	Status – 2019 Cycle 3
	Ecological status	Moderate
	Biological quality elements	Moderate
	Fish Invertebrates Macrophytes and Phytobenthos Combined	Good Good Moderate
	Hydromorphological Supporting Elements	Supports Good
	Hydrological Regime	Supports Good
	Morphology	Supports Good
	Physico-chemical quality elements	Moderate
	Ammonia (Phys-Chem) Dissolved oxygen pH Phosphate Temperature	High Good High Moderate High
	Specific pollutants (2014)	High (2014)
	Copper Triclosan Zinc	High High High
Information on Chemical status (2019 Cycle 3)	Supporting Element	Status – 2019 Cycle 3
	Chemical Status	Fail
	Other Pollutants	Does not require assessment
	Priority hazardous substances	Fail
	Polybrominated diphenyl ethers (PBDE)	Fail
	Mercury and its Compounds	Fail
	Priority substances	Good
	Fluoranthene	Good
	Cypermethrin	Good

Parameter	Status
Hydrological relationship with site	Three bridges would cross the channel of the East Stour. A small section of the water body would be realigned to accommodate one bridge crossing. Two culverts would be removed. Surface water from on-site SuDS features and treated effluent from the on-site WwTW would be discharged to the water body.

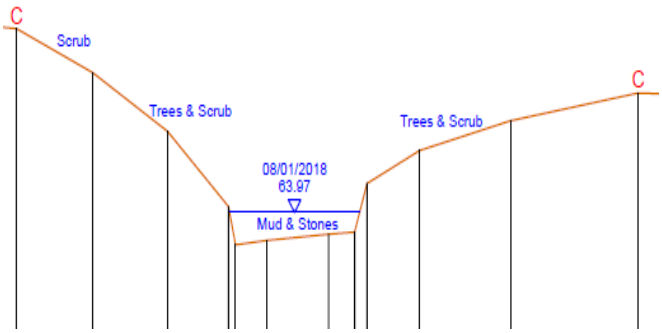
Photographs and cross-section parameters in the reaches that flow through the proposed Development are provided in the Plates 1, 2 and 3. The principal interaction considered below is at the location of the three proposed bridge crossings.

Plate 1: ESTO01_16731 Proposed Bridge Location #1



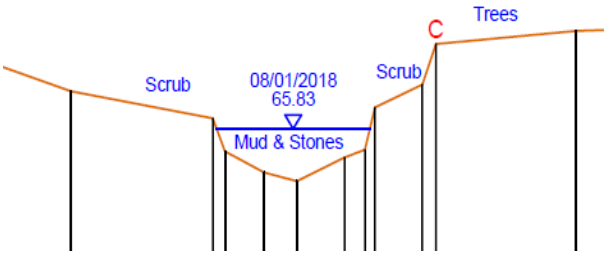
Bed Width – 2.93m; Top of Bank Channel Width – 8.04m; Water Level at time of survey – 63.01m AOD; Mud, silt and stone soft bed (max depth 0.24m); Trees and scrub bankside vegetation; sinuous channel form.

Plate 2: ESTO01_17135 Proposed Bridge Location #2



Bed Width – 1.92m; Top of Bank Channel Width – 10.03m; Water Level at time of survey – 63.97m AOD; Mud and stone soft bed; Trees and scrub bankside vegetation; sinuous channel form.

Plate 3: ESTO01_17618 Proposed Bridge Location #3



Bed Width – 1.69m; Top of Bank Channel Width – 15.73m; Water Level at time of survey – 65.83m AOD; Mud and stone soft bed; Trees and scrub bankside vegetation; sinuous channel form.

Groundwater Bodies

Table 3 summarises baseline conditions for the groundwater body beneath the proposed Development. The site overlies the Kent Greens and Eastern groundwater body (GB40701G501400). The groundwater body achieves Poor status for both chemical and quantitative quality. Key objectives for this surface water body are also set out in Table 3. No mitigation measures are reported in the South East RBMP to improve the status of this groundwater body.

Table 3: WFD baseline conditions and key objectives for Kent Greensand Eastern groundwater body (GB40701G501400).

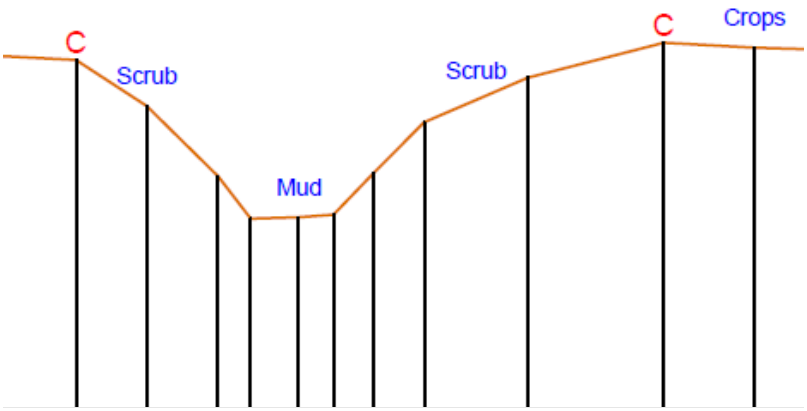
Parameter	Status
Current Overall Status / Potential	Poor (2019 Cycle 3)
Overall Status Objective	Good by 2027 - Quantitative - Quantitative Status Element - Quantitative Dependent Surface Water Body Status - Chemical (GW) - Chemical Status Element - General Chemical Test
Quantitative Status	Poor (2019 Cycle 3)
Quantitative Status elements	Quantitative Dependent Surface Water Body Status – Poor (2019 Cycle 3) Quantitative Groundwater Dependent Terrestrial Ecosystems (GWDTEs) test – Good (2019 Cycle 3) Quantitative Saline Intrusion – Good (2019 Cycle 3) Quantitative Water Balance – Good (2019 Cycle 3)
Chemical (GW) Status	Poor (2019 Cycle 3)

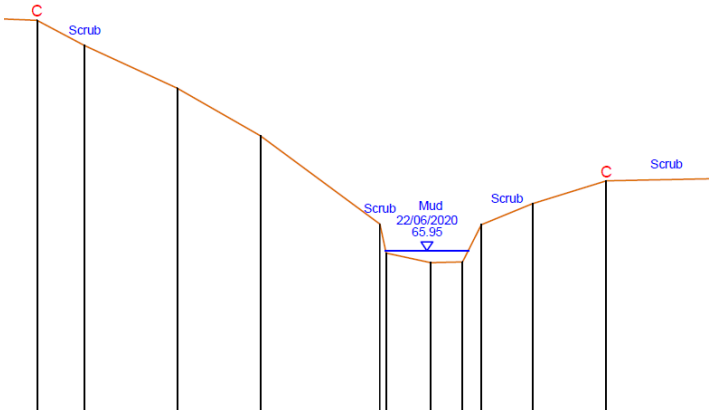
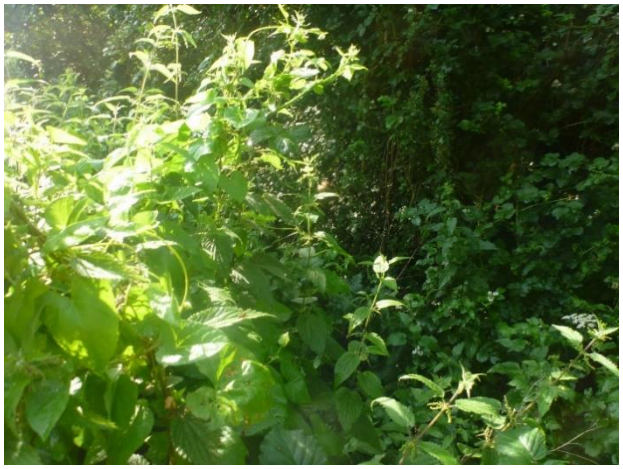
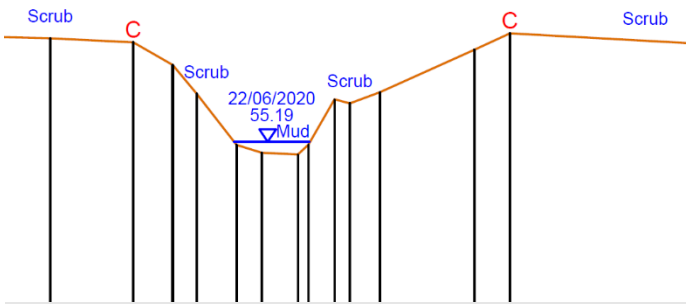
Parameter	Status
Chemical Status elements	Chemical Dependent Surface Water Body Status – Good (2019 Cycle 3) Chemical Drinking Water Protected Area – Poor (2019 Cycle 3) Chemical GWDTEs test – Good (2019 Cycle 3) Chemical Saline Intrusion – Good (2019 Cycle 3) General Chemical Test – Poor (2019 Cycle 3)
Protected Areas	Drinking Water Protected Area Nitrates Directive

5.3 Other Water bodies

As described in Section 4, there are several watercourses not included within the South East RBMP that have been screened into this assessment. These watercourses have been characterised at the location of their interaction with the proposed Development, using the sources of data noted in Section 5.1. A summary of their key features is provided in Table 4.

Table 4: Baseline information for other screened in water bodies.

Watercourse (ID)	Interaction with proposed Development	Typical cross-section parameters
Racecourse Drain	3 culverts removed New pond (online) Diversion of proportion of flow to proposed wetland drainage feature	 CROSS SECTION ID: RCD01_0844 (downstream of culvert removal #1) Bed Width - 0.74m; Top of bank channel width - 5.28m; Channel sinuosity - straight reaches.  PLATE ID: RCD01_0844 View Upstream – Vegetated banks (grassland / scrub)

Watercourse (ID)	Interaction with proposed Development	Typical cross-section parameters
North Lympne Drain	Realignment of channel at confluence with River East Stour	 CROSS SECTION ID: NLY01_0019 Bed Width – 1.3m; Top of bank channel width – 9.7m; Water level at time of survey – 65.95m AOD; Channel sinuosity - straight stretches with curved bends.  PLATE ID: NLY01_0019 View Upstream – Heavily vegetated left bank, vegetated right bank with scrub
Harringe Brook	Diversion of proportion of flow to proposed wetland drainage feature	 CROSS SECTION ID: HAR01_0166 Bed Width – 0.86m; Top of bank channel width – 4.51m; Water level at time of survey - 55.19m AOD; Channel sinuosity – straight reaches

Watercourse (ID)	Interaction with proposed Development	Typical cross-section parameters
		 PLATE ID: HAR01_0166 View Upstream – Vegetated left bank with scrub, vegetated right bank with scrub

5.4 Future Baseline

The proposed Development is expected to be constructed in phases until the full proposed Development is built out in 2042. During this period base case environmental conditions would be expected to vary from the present-day baseline described.

By 2027, which represents the end of the third cycle of the WFDs implementation, objectives for the East Stour and Kent Greensand Eastern groundwater body are set out to achieve Good overall status, an improvement from their existing Moderate and Poor statuses, respectively. Key drivers for improvements are the improved management of agricultural rural land to reduce diffuse pollution and the higher quality of point source discharges to the river from improved treatment at WwTWs.

Future Asset Management Planning (AMP) cycles (5 yearly) will deliver upgrades and efficiencies in the infrastructure that supplies potable water to the study area, in line with the regulated water industry's works. Given the water stressed nature of the area, there will be drivers to maximise water use efficiency in all new development through the adoption of Water Sensitive Urban Design principles, in line with the latest Construction Industry Research and Information Association (CIRIA) guidelines.

Similarly, in base case future years, planned implementation of improvements and investment in wastewater treatment infrastructure will contribute to reducing the risk of sewer flooding and also contribute to water quality improvements in the River East Stour catchment.

6 Stage 3 – Relationship between the Proposed Development and Screened in water bodies

Table 5 details the components of the proposed Development and their relationship to the screened in water bodies where relevant. This stage of the assessment establishes which components of the proposed Development have the potential to affect the WFD objectives of these water bodies. The table below also takes into consideration the embedded design and mitigation measures that are committed to and described in further detail in the Otterpool Park Environmental Statement (ES).

Table 5: Relationship between the proposed Development components and screened in water bodies

Proposed Development Phase	Development Activities	Mitigation Proposed	Scoped In / Scoped of Stage 4 Assessment
Construction Phase	General construction away from riparian corridors	The design of the proposed Development has incorporated blue green corridors to avoid and minimise impacts to existing surface water bodies. The ordinary watercourses identified in Section 5.3 generally have a minimum development free corridor of 15m alongside each bank (30m total). The width of the development free corridor varies along the East Stour ranges from a minimum of 20m up to 80m. Where possible, existing vegetation will be retained to reduce the likelihood of soil or other construction materials entering the water bodies. To ensure the quality of the water environment does not deteriorate during construction, a Code of Construction Practice (CoCP) will also be produced and implemented. This will document best practice construction methodologies and describe procedures for the management of environmental impacts during construction, including a Pollution Control Plan, to safeguard the quality of surface water during the construction phase. Method statements will be prepared, and activities will be managed and monitored, to include (but not be limited to) the following best practice measures: • Avoiding the storage of any potentially polluting materials near any water bodies, including stockpiles of soil to reduce potential for sedimentation. Where this is not possible, works will be undertaken in accordance with approved method statements and in accordance with environmental permitting requirements / restrictions in order to safeguard the water environment.	**East Stour (GB107040019640)** Scoped out - given the implementation of the mitigation measures proposed, it is anticipated that general construction would have negligible impacts on the surface water bodies within the study area including the East Stour and ordinary watercourses noted in Section 5.3. This development activity has therefore been

Proposed Development Phase	Development Activities	Mitigation Proposed	Scoped In / Scoped of Stage 4 Assessment
		• Soil stripping managed to ensure the minimum area of exposed soil at any one time. • Fuels and chemicals will be stored, and refuelling will take place within bunded areas to prevent leakage, and these will be located away from water bodies. Drainage from these areas will incorporate an isolation facility such that the outlet could be sealed in the event of a spill. • Concrete will be laid only following the suitable preparation of the ground surface and temporary shuttering used to contain potential leaks. • Designated washing out areas will be set up for concrete lorries with impermeable liners to protect the soil and groundwater below. • Wastewater generated from the construction compound(s) will be disposed of via appropriate means, for example pumped out and removed from site by tanker. An emergency spillage response plan will document measures to be implemented to prevent pollutants infiltrating into the soils beneath the site and reaching surface and groundwater receptors. Appropriate equipment (e.g., absorption mats) will also be made easily accessible on site to deal with accidental spillages and the plan will also provide a full list of protocols and communication channels with the EA in the event of an accidental pollution incident. Should any pollution incidents occur, the EA incident hotline will be called immediately in tandem with dealing with any spillages. To promote the sustainable use of water resources, measures will be implemented to promote general water use efficiency and particularly to reduce the use of potable water. Examples include rainwater harvesting to provide water supply for the construction welfare facilities, dust suppression and wheel washing facilities as well as leakage prevention measures. The perched groundwater table is known to be shallow (<1m bgl) in the northern part of the site. During construction of infrastructure and foundations in these areas, groundwater monitoring and control may be required. Whilst groundwater contamination has not been encountered to date, if during further works contamination is found, groundwater would be disposed of appropriately and with the necessary agreements in place. During such activities, consideration would be given to soil concentrations in the locality to ensure that contaminants do not become mobilised and enter the water environment.	***scoped out*** of any further assessment. **Kent Greensand Eastern groundwater body (GB40701G501400)** **Scoped out -** given the implementation of the mitigation measures proposed, it is considered that general construction activities would have negligible impact on this groundwater body. This development activity has therefore been ***scoped out*** of any further assessment.
	Works in, over or adjacent to water bodies for construction of bridges / surface water drainage (discharge) outfalls / culvert removals / realigning of channels		**River East Stour (GB107040019640)** Scoped in - these development activities carry a higher risk of causing deterioration of the River East Stour,

Proposed Development Phase	Development Activities	Mitigation Proposed	Scoped In / Scoped of Stage 4 Assessment
			North Lympne Drain and the Racecourse Drain. Note: these development activities do not affect the Harringe Brook. **Kent Greensand Eastern groundwater body (GB40701G501400)** **Scoped out -** given the implementation of the mitigation measures proposed, it is considered that these development activities carry a low risk of causing deterioration of the underlying groundwater body.
Operational Phase	Changes in flow conveyance and/or local hydraulics of watercourses being crossed by bridges. Increase in flood risk – increased surface water runoff from impermeable areas and due to soil	The proposed Development will utilise SuDS to manage surface water across the site, in terms of both water quality and quantity. SuDS infrastructure will be included in green infrastructure spaces that will be present throughout the proposed Development. Infiltration areas have been included in the design where the ground conditions are suitable, as well as swales, detention basins and ponds (65ha) and nutrient mitigation wetland features (25ha of wetland and 6ha of wet woodland). Permeable paving, rain gardens and green roofs will provide more localised surface water management at the property level. The site will aim to be an exemplar regarding the provision of SuDS and multi-functional green space, promoting Water Sensitive Urban Development (WSUD)	**River East Stour (GB107040019640)** Scoped in - these development activities carry a higher risk of causing deterioration of the screened in surface water bodies and

Proposed Development Phase	Development Activities	Mitigation Proposed	Scoped In / Scoped of Stage 4 Assessment
	compaction / disturbance Pollution with fuel, oils, cement or concrete Nutrient loading of receiving watercourses and downstream Stodmarsh European designated sites Increase in potable water demand and wastewater discharges	principles. This will ensure that flood risk is mitigated, whilst also reducing water demand and maximising overall environmental benefits of the proposed Development. The use of SuDS will promote good water quality standards and will also allow for the creation of new wildlife spaces and valuable open amenity areas. A variety of methods are proposed to be employed for different sources of runoff to remove hydrocarbons, metals, sediments and other impairments on water quality. The SuDs proposals will ensure that greenfield (existing) discharge rates will not be exceeded during rainfall events up to a 1 in 100 (1%) annual probability including an allowance for climate change. A new pond is proposed along the Racecourse Drain. This is an inline feature which will be used for both flood and SuDS storage as well as providing a valuable local amenity. 2 No. culverts on the River East Stour (total ~63m), as well as 3 No. culverts on the Racecourse Drain (total ~218m) will be removed to provide betterment of flow conveyance, as well ecological and hydromorphological benefits. Development in the floodplain across the site will be limited to three new road bridges over the River East Stour to connect the north riverside area to the south. To ensure these bridges do not cause constrictions to flow, which could increase flood risk on-site and upstream, the bridges have been designed in accordance with best practice and have been informed by detailed hydraulic modelling to have minimum impediment of floodplain flow conveyance. This has been achieved through bridge designs with sufficient clear spans to accommodate flows. The creation of the embankments for the new bridges, as well for roads, results in an area of the floodplain being removed. In line with EA requirements, level for level compensation will be provided. With the creation of the nutrient mitigation wetlands features, there is an opportunity to use suitable areas for the level for level compensation as required. The bridge crossings have been located away from sensitive habitats and have sufficient clear span to ensure that fauna can navigate beneath them, as well as allowing the retention of natural river channel bed materials and minimising disturbance to flow hydraulics and river channel banks and riparian habitats. A Flood Risk Activity Permit (FRAP) will be prepared for the bridge structures. In addition, ordinary watercourse consent applications under the Land Drainage Act 1991 will be obtained as required from Kent Country Council (KCC), as the Lead Local Flood Authority (LLFA), for works impacting on the flow conveyance of minor watercourses on the site. The FRAP permit and ordinary watercourse consent applications will demonstrate that:	are screened in for further assessment in Stage 4. **Kent Greensand Eastern groundwater body (GB40701G501400)** **Scoped out** - given the implementation of the mitigation measures proposed, it is considered that these development activities carry a low risk of causing deterioration of the underlying groundwater body.

Proposed Development Phase	Development Activities	Mitigation Proposed	Scoped In / Scoped of Stage 4 Assessment
		• The design of watercourses crossings will cause no increase in flood risk, either upstream or downstream; • Access to the main river network for maintenance and improvement will not be prejudiced; and • Works will be carried out in such a way as to avoid environmental damage. A Water Cycle Study (WCS) (ES Appendix 15.2) has been undertaken to ensure that the proposed Development will have no adverse impacts on water resources. WSUD principles have been set out in the strategy and would be put in place to restrict the maximum amount of extra potable water consumed by each new household to 110 litres of potable water per person per day, in line with the relevant policies, including the use of rainwater recycling proposals in targeted development areas to exceed these minimum policy requirements. The proposed Development can achieve the indicative discharge permit standards stipulated by the EA for the onsite WWTW as well as Nutrient Neutrality based on the current proposals outlined in the WCS (ES Appendix 15.2). This will be achieved by: • Direct treatment mitigation with the proposed Onsite WwTW option (based on average household occupancy rate of 2.4, PCC rate of 110 l/p/d, TP limit of 0.1 mg/l and TN limit of 7.2 mg/l); • Direct mitigation, which includes up to 24.8 ha of offline wastewater and stormwater wetlands, and 35 ha of new woodland planting, which includes 6 ha of wet woodlands; and • Indirect mitigation, which includes changing existing agricultural land use to a lower nutrient use such as stormwater SuDS and ecology/landscape mitigation. This will protect the integrity of the downstream Stodmarsh European designated sites (Special Area of Conservation [SAC], Special Protection Area [SPA] and Ramsar site) and thereby can meet the required tests under the Habitats Regulation Assessment.	

Construction and operational components of the proposed Development associated with the bridge crossings, channel realignment, the removal of culverts and construction of surface water discharge outfalls, are to be taken forward to Stage 4. At Stage 4, further consideration is given as to whether these construction / operational activities will compromise the achievement of the WFD objectives set out for the water bodies after mitigation is applied.

Further consideration will also be given to measures that will improve / provide a positive benefit to the named water bodies.

7 Stage 4 – WFD Preliminary Assessment

7.1 Approach

For those development activities screened in, an assessment has been undertaken to determine whether the works undertaken, are likely to result in:

- Failure to achieve good ecological status or good ecological potential;
- Failure to prevent any deterioration in the status of a water body;
- Permanent exclusion, or compromised achievement, of WFD objectives for a water body;
- Non-compliance or compromised implementation of other EU legislations; and/or
- Prevention of implementing any of the mitigation measures specified in the South East RBMP (2016) or detailed on the Environment Agency's Catchment Data Explorer website.

The assessment has been informed by the results of several desktop and modelling studies. These assessments have been undertaken to inform the design of the proposed Development and include:

- Hydraulic modelling of the bridge crossings and culvert removal works, detailed within the proposed Developments Flood Risk Assessment (ES Appendix 15.1);
- Nutrient neutrality budget calculations for the proposed Development, presented with the WCS prepared for the prosed Development (ES Appendix 15.2); and
- Simple Index Approach (SIA) assessment (CIRIA, 2015) to determine the adequacy of the SuDS measures to prevent the deterioration of the water quality of the surface water bodies receiving discharges from the proposed Development (see the Annex 1 of this WFD Screening Report for details).

7.2 WFD Mitigation Measures Assessment

As detailed in Section 5.2, none of the scoped in water bodies have specific mitigation measures stated in the RBMP or on the EA's Catchment Data Explorer website. However, it will be necessary to implement specific construction and operational phase mitigation measures to ensure no impacts are sustained to the WFD elements of both of the WFD water bodies, as well as the ordinary watercourses scoped into the assessment, namely the Racecourse Drain and the North Lympne Drain.

Construction and operational phase mitigation measures have been identified in the Otterpool Park ES and are set out in Chapter 3 'Need and Alternatives' (with respect to avoidance of key environmental constraints), Chapter 7 'Biodiversity', Chapter 10 'Geology Hydrogeology and Land Quality' and Chapter 15 'Surface Water Resources and Flood Risk', of the ES. These mitigation measures are summarised in Table 5 of Section 6 of this Screening Report.

Implementation of these measures would ensure that the status of the WFD water bodies, as well as the ordinary watercourses, are not compromised.

Table 6 below provides a summary of the assessment of the residual effects (effects after mitigation) of the proposed Development on surface water bodies within the ZoI.

Table 6: Summary of Residual Effects

Water body	Proposed Development Activity	Mitigation Measures	Residual risk of deterioration at the water body scale
River East Stour	New bridge crossings	No loss of open channel. Natural bed materials retained. Channel profiles would be maintained at new crossings. Wide span crossings to minimise impact on floodplain (see Plates 1 to 3 for typical cross sections of the existing channel at new bridge crossing locations and refer to the Flood Risk Assessment for the details of proposed bridge crossings– ES Appendix 15.1).	No residual risk
	Removal of culverts	Hydraulic modelling has informed 63m of culvert removal (1.3% of the total length of water body).	Beneficial at water body scale (betterment for biological quality elements and supporting hydromorphology element)
	Channel Realignment (straighten, shorten from ~143m existing channel length to ~129m) to facilitate bridge crossing construction	0.06% of total length of water body affected by shortened channel length (across the proposed Development). Natural materials would be used, including appropriate planting of vegetation. Trapezoidal channel carved out of floodplain equivalent to the existing channel capacity - further improvements will be made during the detailed design to maximise river restoration and biodiversity.	No residual risk
Racecourse Drain	Removal of culverts	Hydraulic modelling has informed 218m of culvert removal (16% of the total length of water body located within the proposed Development).	Beneficial at water body scale (biological quality elements and supporting hydromorphology element)
North Lympne Drain	Channel Realignment (lengthen ~18.7m existing channel length to 28.7~m) to facilitate bridge crossing construction	0.6% of total length of water body affected by increase channel length (across the proposed Development). Natural materials would be used, including appropriate planting of vegetation. Trapezoidal channel carved out of floodplain equivalent to the existing channel capacity - further improvements will be made during the detailed design to maximise river restoration and biodiversity.	Beneficial at water body scale (biological quality elements and supporting hydromorphology element)

8 Cumulative Assessment

The cumulative effects of the proposed Development have been assessed with reference to the development schemes listed in ES Appendix 2.5. The assessment considers those schemes that have been consented within the borough of Ashford and Folkestone & Hythe District and that have the potential to have a cumulative impact on the water environment by being situated in the same hydrological catchment as the proposed Development.

There would be no cumulative impacts on the nearby Sellindge WwTW given the proposed on-site measures to treat wastewater from the proposed Development, as described in the WCS (ES Appendix 15.2) prepared in support of the proposed Development.

There is the potential for cumulative impacts on water resources, which may be significant given the water stressed nature of the East Stour catchment. This is addressed in the WCS (ES Appendix 15.2), and associated Flood Risk Assessment and Surface Water Drainage Strategy (ES Appendix 15.1), including further recommendations as required. Therefore, detailed proposals for integrated water management, including targeted rainwater reuse (i.e. by using the stored water at SuDS, nutrient mitigation wetlands and existing Racecourse Lake) will be further assessed and developed, prior to construction of the proposed Development. This will ensure the sustainable management of water resources and flood risk management that will prevent any adverse impacts on the wider water environment. It will be expected that other developments will be designed to be sensitive to water resource usage and will follow similar sustainable and WSUD principles. It is therefore considered that the cumulative impact on water resources will be negligible.

9 Summary and Conclusions

A screening assessment has been undertaken in relation to the proposed Development against WFD objectives.

The WFD water bodies that were screened in were limited to the East Stour (GB107040019640) and the Kent Greensand Eastern groundwater body (GB40701G501400), in addition to ordinary watercourses namely the Racecourse Drain, North Lympne Drain and Harringe Brook.

The review of the proposed Development components concluded the potential for negative effects on surface water bodies linked to some specific construction activities and during operation. These activities were taken forward to stage 4 of the assessment.

Stage 4 concluded that implementation of the mitigation measures outlined in Table 5, and in more detail in Chapters 3, 7, 10, and 15 of the ES, would ensure that the status of the screened in water bodies would not be compromised. Some beneficial residual effects were also concluded, linked to the removal of existing culverts on the East Stour and Racecourse Drain, providing for improvements to the hydromorphological and biological quality elements of these watercourses.

The assessment identified that the residual effects of the proposed Development activities on the screened in groundwater body would be negligible, following the implementation of suitable mitigation measures, during construction and in the operational phase.

This assessment concludes that the proposed Development is compliant with the objectives of the WFD and on this basis, no further assessment is proposed.

10 References

DEFRA / Environment Agency (2009). South East River Basin District Management Plan: 2016.

Environment Agency (2016). Catchment Data Explorer website. http://environment.data.gov.uk/catchment-planning/ManagementCatchment/1014.

European Commission (Joint Nature Conservation Committee (JNCC)) (1992). Directive 92/43/EEC on the Conservation of natural habitats and of wild fauna and flora.

UK Government (2003). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003.

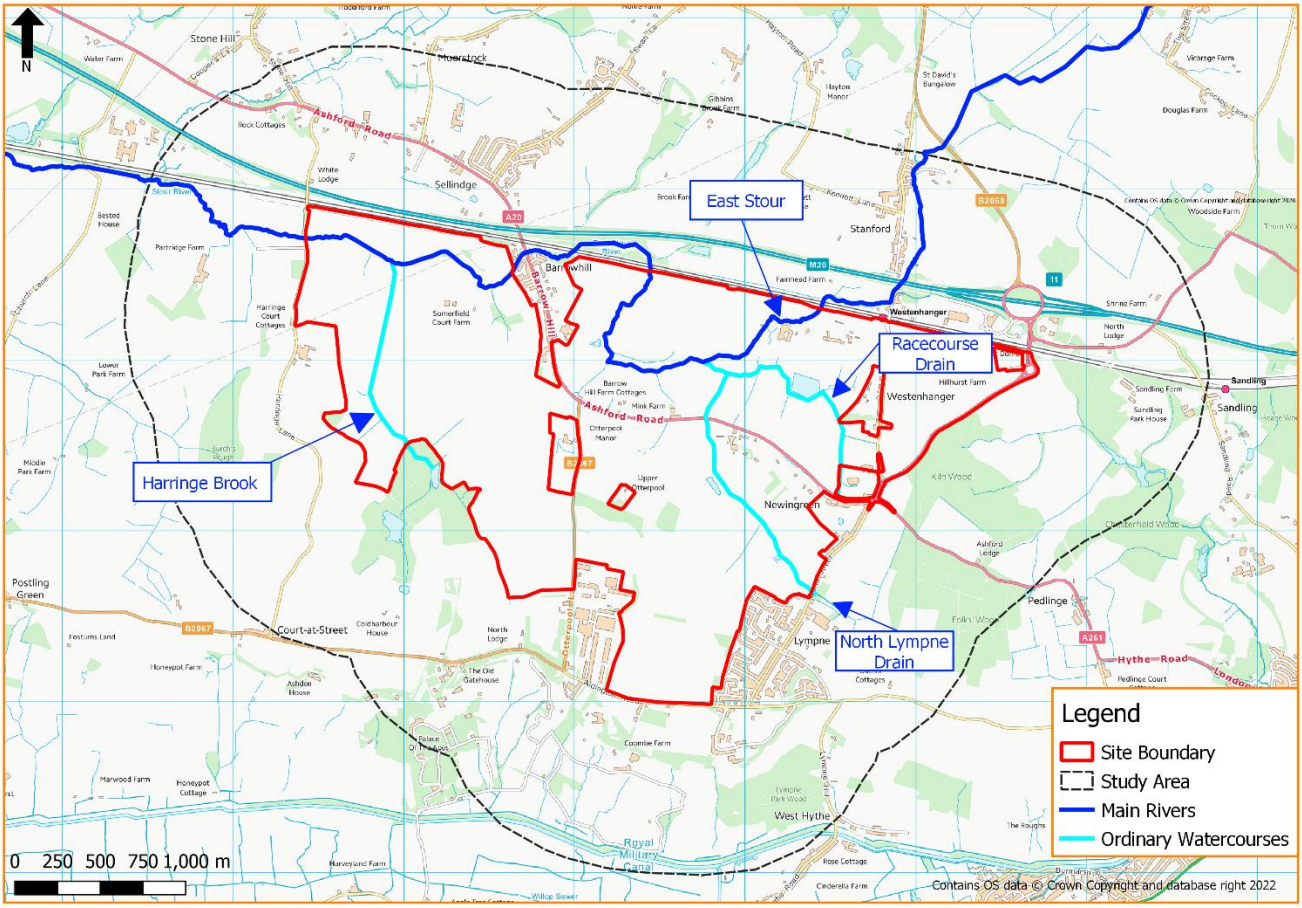
UK Government (2009). Eels (England and Wales) Regulations 2009.

UK Government (2010). Conservation of Habitats and Species Regulations 2010.

Annex 1

Supporting information

Figure 1 – Study Area



SIA Assessment

A Simple Index Approach (SIA) assessment (as detailed in 'The SuDS Manual (C753)') has been undertaken to provide a high level assessment of water quality pollution risks during the operational lifetime of the proposed Development. The SIA comprises two components which are:

- Pollution Hazard Indices (PHI) of between 0 and 1, based on the pollutant levels likely for different land-use types, where higher values indicate higher pollutant levels; and
- Pollution Mitigation Indices (PMI) of between 0 and 1, based on the ability of SuDS components or groundwater protection measures to treat pollutants, where higher values indicate higher treatment efficiency.

PHI and PMI values are given for three broad pollutant types. These are:

- Total suspended solids (TSS);
- Metals; and
- Hydrocarbons.

A simple flow chart (Figure A1-1) is then followed to determine the effectiveness of the SuDS components against the risk of pollution.

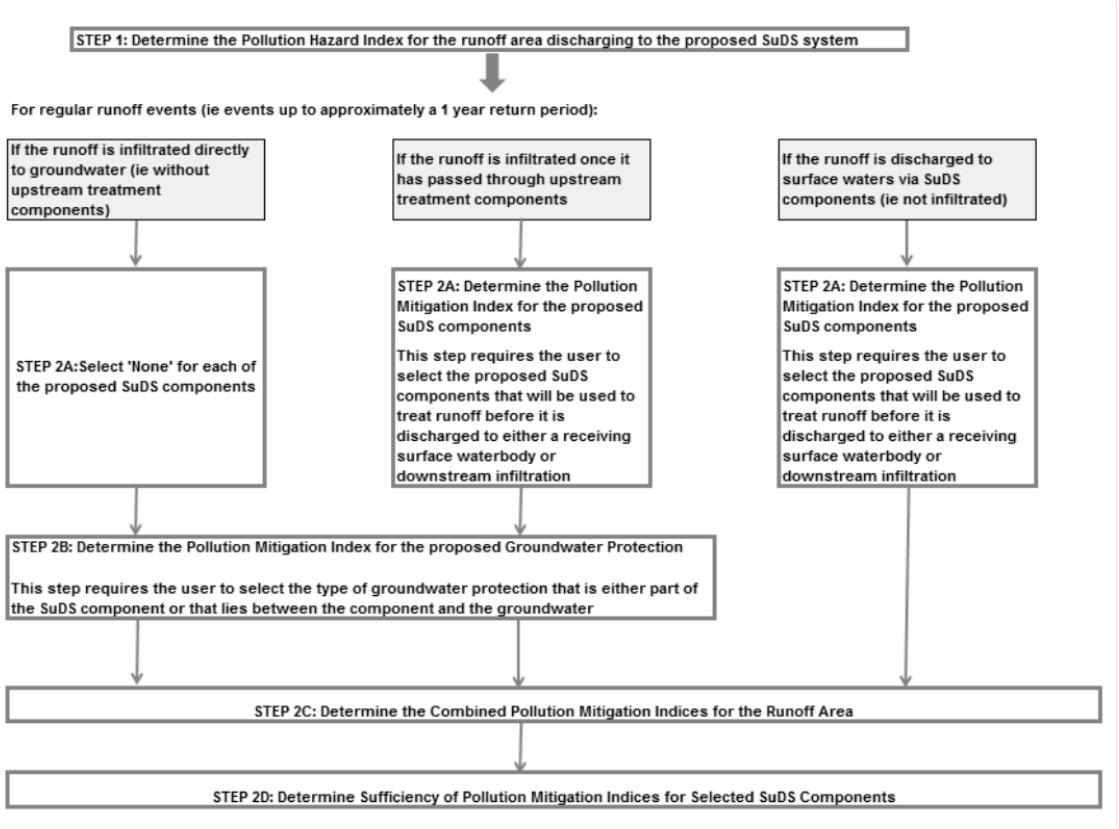


Figure A1-1: Simple Index Approach. Process Flow Chart

For step 1 various runoff area land use descriptions were applied to represent the proposed Development. The SIA tool requires that land use descriptions be selected from a set of pre-determined options. The land use descriptions used for this assessment, and the elements of the proposed development they represent, are shown below in Table A1-1, in addition to the corresponding pollution hazard index for each land use.

Table A1-1: Runoff Area Land Use Descriptions and Pollution Hazard Indices

SIA Runoff Area Land Use Description	Land Use Development Type	Pollution Hazard Level	Pollution Hazard Indices		
			Total Suspended Solids	*Metals*	*Hydrocarbons*
Non-residential car parking with frequent change (e.g. hospitals, retail)	Commercial	Medium	0.7	0.6	0.7
Residential roofing	Residential	Very Low	0.2	0.2	0.05
Low traffic roads (e.g. residential roads and general access roads, <300	Road Network	Low	0.5	0.4	0.4

traffic movements/day					

The proposed Development has been split up into a series of surface water drainage zones in order to best manage runoff across the site. Within each drainage zone, there are a combination of land use development types, for example residential, roads and commercial.

For the purpose of the SIA assessment, the primary development type within each drainage zone has been assessed. SuDS measures within each drainage zone have then been tested to demonstrate their sufficiency in protecting the water quality of the receiving watercourse (the River East Stour). This is necessary owing to the limitation of the SIA tool in allowing a single land use type to be assessed at a time.

Drainage proposals incorporate a combination of swales, attenuation basins and wetlands to receive runoff from the proposed Development. For specific SuDS per drainage zone see Table 2 below.

An assumption has been made within the assessment that there is no cross-drainage zone interaction, i.e. runoff would only reach a wetland feature if one were located within the drainage zone in question. Therefore, this is a precautionary assumption as it does not account for any additional treatment of runoff when there is hydraulic connectivity between the drainage zones.

The results of the assessment are also presented in Table A1-2.

Table A1-2: Effectiveness of SuDS components for each primary land use development type in the different drainage zones

		Land Use Development Type / Pollution Hazard Indices WQ Parameters								
		Residential			Commercial			Roads		
Drainage Zone	SuDS	Total Suspended Solids	Metals	Hydrocarbons	Total Suspended Solids	Metals	Hydrocarbons	Total Suspended Solids	Metals	Hydrocarbons
Barrowhill	Tier 1: Swale									
	Tier 2: Detention Basin									
	Tier 3: Wetland									
	Tier 1 and 2									
	Tier 1, 2 and 3									
East Otterpool	Swale									
	Detention Basin									
	Wetland									
	Tier 1 and 2									
	Tier 1, 2 and 3									
East Triangle South	Tier 1: Swale									
	Tier 2: Detention Basin									
	Tier 1 and 2									
East Triangle	Tier 1: Swale									
	Tier 2: Detention Basin									
	Tier 1 and 2									
Newingreen	Tier 1: Swale									
	Tier 2: Detention Basin									
	Tier 1 and 2									
River Stour	Tier 1: Swale									
	Tier 2: Detention Basin									
	Tier 3: Wetland									
	Tier 1 and 2									
	Tier 1, 2 and 3									
South Otterpool	Tier 1: Swale									
	Tier 2: Detention Basin									
	Tier 1 and 2									
West Otterpool	Tier 1: Swale									
	Tier 2: Detention Basin									
	Tier 1 and 2									
Westenhanger	Tier 1: Swale									
	Tier 2: Detention Basin									
	Tier 3: Wetland									
	Tier 1 and 2									
	Tier 1, 2 and 3									

Sufficient Insufficient Proposed SuDS Treatment Train for Drainage Zone

The results of this high level, precautionary assessment indicates that in each drainage zone a combination of Swales and Detention Basins (Tier 1 and 2 of the proposed SuDS Treatment Train) would be sufficient to treat runoff from all the proposed land uses that have been assessed. In some drainage zones the proposed SuDS treatment train incorporates a third tier, comprising nutrient mitigation stormwater wetlands. These would function to manage flood risk and drainage on the site, with a dual benefit of providing additional water quality improvements to discharges received by the River East Stour.

It is therefore concluded that subject to detailed design, sufficient SuDS measures are included in the drainage design for the proposed Development to protect the water quality of receiving watercourses.

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