

## 7.0 WATER RESOURCES AND FLOOD RISK

### Introduction

- 7.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of water resources and flood risk.
- 7.2 The chapter identifies and assesses the effects of the Development on flood risk, surface water quantity and quality, and groundwater quantity and quality as a result of the change in land use and regime during the construction and operational phases. The Development does not introduce any uses requiring wastewater drainage.
- 7.3 The chapter has been prepared by GTA Civils & Transport Ltd (GTA). GTA specialises in the preparation of flood risk assessments and drainage strategies for developments. GTA holds ISO 9001:2015 accreditation for its Quality Management System and SMAS Worksafe accreditation as a Designer for its Health & Safety Management System.
- 7.4 The author of this chapter has 27 years' experience in EIA projects, holds Incorporated Engineer (IEng) status and is an Associate Member of the Chartered Institution of Water and Environmental Management (ACIWEM).

### Policy Context

#### National Planning Policy Framework<sup>i</sup>

- 7.5 Section 14 of the NPPF requires local authorities to adopt proactive strategies to mitigate and adapt to climate change, taking account of flood risk and coastal change. The NPPF requires the application of the sequential test to steer new development to areas with the lowest risk of flooding. Wherever appropriate, the NPPF requires the use of sustainable drainage systems (SuDS) as part of major development.
- 7.6 Section 15 of the NPPF sets out that development should not contribute to unacceptable levels of water pollution and should help to improve water quality in the local environment wherever possible.

#### Planning Practice Guidance<sup>ii</sup>

- 7.7 The NPPF is accompanied by planning practice guidance (PPG) entitled "Flood risk and coastal change" (ID:7). PPG ID:7 sets out the tests and technical criteria to ensure development flood risks are mitigated appropriately.

7.8 PPG ID:34, "Water supply, wastewater and water quality" provides advice for protecting water quality.

Local Planning Policy

7.9 Guildford Borough Council's (GBC) Local Plan<sup>iii</sup> includes policies and evidence base documents relevant to water resources and flood risk summarised as follows.

*P4: Flooding, flood risk and groundwater protection zones*

7.10 Policy P4 closely reflects the NPPF and PPG ID:7 and gives priority to SuDS. It also safeguards groundwater source protection zones and principal aquifers from inappropriate development.

*ID4: Green and blue infrastructure*

7.11 Policy ID4 seeks to conserve and enhance biodiversity and habitat including the protection of watercourses. Adverse impacts on watercourse setting, function and water quality need to be avoided. Development should support the achievement of Water Framework Directive objectives.

*A35: Former Wisley airfield, Ockham*

7.12 The strategic allocation policy A35 sets out these requirements for the wider FWA site:

- "Appropriate mitigation for flood risk and flood risk management, and have regard to the recommendations of the Level 2 SFRA [Strategic Flood Risk Assessment]."
- "Limit development in flood zones 2 and 3, and no increase in flood risk on site or elsewhere."

7.13 Policy A35 also identifies an opportunity to "Reduce the risk of flooding elsewhere as far as practicable."

*Strategic Flood Risk Assessment (SFRA)*

7.14 The Guildford Borough SFRA Level 1<sup>iv</sup> gives an overview of flood risk from various sources in the borough to inform land use planning. Data and mapping are included as well as local policies and guidance on flood risk and SuDS.

7.15 The Level 2 SFRA<sup>v</sup> provides more detailed site-specific assessment for potential development within or partially within areas of identified flood risk.

7.16 The findings of the SFRA in relation to the Site are discussed in the Flood Risk Assessment (see Appendix 7.1).

*Surface Water Management Plan (SWMP)*

7.17 The Guildford SWMP<sup>vi</sup> was prepared by GBC in partnership with Surrey County Council (SCC), the Environment Agency (EA) and Thames Water. The SWMP identifies 'hotspot' areas which are prone to surface water flooding as well as action plans to reduce the risk at those locations. There are no 'hotspot' locations in the vicinity of the Site.

*Infrastructure Delivery Plan (IDP)*

7.18 The Guildford IDP<sup>vii</sup> sets out the strategy for delivering key infrastructure to service development in the borough including flood risk reduction. The IDP was prepared with input from the relevant delivery agencies including Thames Water, SCC and the EA. The IDP identifies a project required for the wider FWA site as follows:

- FRR3: Runoff management at the [wider FWA] Site to minimise surface water flood risk.

7.19 Project FRR3 needs to be implemented by the developer of the wider FWA site as part of the on-site SuDS strategy.

## Legislative Context

7.20 The Water Resources Act 1991 regulates water resources, water quality and pollution, and flood defence. Part II of the Act provides the general structure for the management of water resources. Part III then explains the standards expected for controlled waters; and what is considered as water pollution. Part IV then provides information on mitigation through flood defence.

7.21 The Flood and Water Management Act 2010 (FWMA) updated legislation to ensure better protection from flooding, manage water more sustainably, improve public services and secure water resources during periods of drought. The FWMA helps reduce flood risk by clarifying who is responsible for managing all sources of flood risk and encouraging more sustainable forms of drainage in new developments.

7.22 The FWMA established the creation of the Lead Local Flood Authority (LLFA) at county or unitary level to manage local flood risk. Each LLFA is required to prepare a Local Flood Risk Management Strategy which considers all sources of flood risk and identifies objectives to manage local flood risk to local communities.

7.23 The FWMA also laid the groundwork for national SuDS standards to be created. No legislation has yet been passed for this, but Defra has published non-statutory technical standards<sup>viii</sup> for

SuDS which are frequently referred to by LLFAs in establishing suitable standards for development. The LLFA for Guildford borough is Surrey County Council (SCC).

- 7.24 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 tied the UK into the EU Water Framework Directive (WFD) which sets environmental objectives for water bodies. The Government has announced that existing EU environmental laws will continue to operate in UK law post-Brexit.
- 7.25 The Water Environment Regulations set out how the Environment Agency (EA) monitors the ecological and chemical status of surface water bodies and the chemical and quantitative status of groundwater. The EA has published River Basin Management Plans (RBMP) to coordinate the WFD objectives in each river basin district. The RBMP information relevant to the Site is discussed later in this chapter.

### Assessment Methodology

#### Significance Criteria

- 7.26 The likely significant effects on the water environment have been assessed against criteria for determining magnitude, sensitivity and significance as set out in Tables 7.1 to 7.3 below.

**Table 7.1: Methodology for Assessing Magnitude**

| Magnitude of Impact | Criteria for assessing impact  |
|---------------------|--|
| Major               | Major/substantial alteration to key elements/features of the baseline (pre-Development) conditions such that the post Development character/composition/attributes will be fundamentally changed.  |
| Moderate            | Alteration to one or more key elements/features of the baseline conditions such that post Development character/composition/attributes of the baseline will be materially changed.   |
| Minor               | A minor shift away from baseline conditions. Change arising from the alteration will be discernible/detectable but not material. The underlying character/composition/attributes of the baseline condition will be similar to the pre-Development circumstances/situation. |
| Negligible          | Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.  |

**Table 7.2: Methodology for Determining Impact Sensitivity**

| Sensitivity of Receptor | Criteria for assessing receptors   |
|-------------------------|--|
| High                    | The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance. |
| Moderate                | The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.                   |
| Low                     | The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.   |

**Table 7.3: Effect Significance Matrix**

| Magnitude  | Sensitivity                         |                                     |                                       |
|------------|-------------------------------------|-------------------------------------|---------------------------------------|
|            | High                                | Moderate                            | Low                                   |
| Major      | Major Adverse/Beneficial            | Major – Moderate Adverse/Beneficial | Moderate – Minor Adverse/Beneficial   |
| Moderate   | Major – Moderate Adverse/Beneficial | Moderate – Minor Adverse/Beneficial | Minor Adverse/Beneficial              |
| Minor      | Moderate – Minor Adverse/Beneficial | Minor Adverse/Beneficial            | Minor Adverse/Beneficial - Negligible |
| Negligible | Negligible                          | Negligible                          | Negligible                            |

7.27 The effects considered to be significant are those which are assessed as Major or Moderate.

#### Study Area

7.28 The study area is defined by the Site boundaries as set out in Chapter 3 of this ES.

#### Surveys and Data Sources

7.29 A topographical survey completed in September 2020 by Oxford Geospatial Ltd has been used to inform the baseline conditions.

7.30 A Flood Risk Assessment (FRA) has been prepared for the Development by GTA Civils & Transport Ltd (GTA) and is included as Appendix 7.1. The methodology for the FRA complies with the National Planning Policy Framework (NPPF) and relevant planning practice guidance (PPG). It includes an assessment of the EA's flood mapping, the Guildford Borough Council SFRA, existing and proposed surface water runoff, and overview of flood risks.

7.31 WFD water quality data was obtained from the EA.

7.32 Information on ground conditions has been drawn from the ground investigation letter report by Leap Environmental (TT/LP2241/NSANG, September 2020) which is included with the planning submission documents (See Appendix 2.2 also).

#### Consultations

7.33 A pre-application enquiry was made to the LLFA at SCC. In response a Detailed Flood Risk Report was provided under reference VLLFA-PAA-GU-20-010, version 0.1 (dated 03.09.2020). This pre-application is included in the FRA (see Appendix 7.2) and covered the Development as part of the wider FWA site.

#### Specific Methodology

7.34 The assessment of potential effects related to flood risk is based on the findings of the FRA.

### Limitations and Assumptions

- 7.35 The construction of the Development could have impacts upon the water environment. The works are described in Chapter 3 to a level sufficient to allow identification of the likely significant effects on the environment and the mitigation required through qualitative assessment, drawing upon experience of EIA for similar developments. Appropriate mitigation measures are identified and these are incorporated into the Construction Environmental Management Plan (CEMP) which accompanies the planning application and is included at Appendix 3.2.

### Baseline Conditions

- 7.36 The baseline scenario is taken to be the Site in its current condition and operation, prior to any demolition and remediation works taking place.
- 7.37 A detailed description of the Site is contained in Chapter 3 of this ES. A full discussion of the baseline flood risk conditions is contained in the FRA (see Appendix 7.1) and summarised here.

### Topography

- 7.38 The disused FWA runway strip lies atop a ridge running east-to-west with the Site on the northern slope. Site ground levels range from 45m above Ordnance Datum (AOD) at the south-east down to 29m AOD at the north-west. Survey contours which illustrate the topography are shown on Figure 7.1.

### Hydrology and Flood Zone

- 7.39 There are no streams or rivers within the Site. The Stratford Brook, a Main River, skirts the south and west of the wider FWA site more than 0.6km west of the Site boundary.
- 7.40 The Site lies entirely within Flood Zone 1 having less than a 1 in 1,000 annual probability of fluvial flooding.
- 7.41 There are some ditches issuing along the northern boundary which flow away from the Site. These ultimately collect in or adjacent to Boldermere, a lake lying 0.5km to the north in Ockham Common. The ditch system then flows underneath the A3 and onwards through Wisley Common. No flood zones are mapped in association with these Ordinary Watercourses. The watercourses are shown on Figure 7.1.

### Ground Conditions

- 7.42 The published geology<sup>ix</sup> for the Site comprises Bagshot Sand bedrock (Secondary A aquifer) outcropping to London Clay (unproductive strata) in the Stratford Brook valley floor. Superficial deposits of the Lynch Hill Gravel Member – Sand and Gravel (Secondary A aquifer) are shown across the higher ground.
- 7.43 The Site is not within a groundwater source protection zone. The groundwater vulnerability is defined by the Environment Agency (EA) as Medium – High.
- 7.44 The Site's topography, hydrology and geology indicate soils of slow to moderate permeability, likely reducing as ground levels decrease. Permeability in the Bagshot Formation is variable typically.
- 7.45 Intrusive ground investigations at the Site have confirmed the published geology with the natural soils comprising gravelly sands at shallow depths, typically to 1-2m, overlying variably silty and clayey sands.
- 7.46 Groundwater strikes were recorded in the majority of trial holes, generally between 1-2m below ground level (bgl). However, at some locations no groundwater was encountered even at much greater depth. This indicates that the shallow groundwater represents widespread pockets of perched groundwater rather than a consistent water table.
- 7.47 In-situ soakaway tests were undertaken in April 2014 and in September 2019. A total of 5 test locations across the Site were included in the two investigations. All of the tests failed due to poor soakage rates.
- 7.48 Refer to the ground investigation letter report for more detail on ground conditions (Appendix 2.3).

### Surface Water

- 7.49 The EA's Risk of Flooding from Surface Water (RoFSW) mapping identifies areas of risk due to potential overland flow routes and potential ponding at low spots. There are two areas of risk shown within the Site.
- 7.50 A potential flow pathway is shown along Old Lane at the east boundary. The Low Risk (1 in 1,000 annual probability) outline shows a narrow corridor of risk through the fringes of the Site at this location.
- 7.51 An area of risk is shown on the hardstanding remaining from the former hangar at the north-west of the Site. Interpreting by means of the topography, the mapping appears to show the

potential for surface water to accumulate on this flat area at the bottom of the slope, before exiting the Site to the north and north-east. The latter exit route appears to dissipate through Elm Corner.

- 7.52 Outside of the Site boundary to the north there are flow routes and low spots shown which reflecting the falling, flattening topography in this direction.
- 7.53 SCC also maintain a record of designated 'wetspots' which are largely associated with highway flooding incidents. There are no 'wetspots' at the Site itself, but there is a historic 'wetspot' shown at Elm Corner to the north of the Site.
- 7.54 Areas of identified surface water flood risk are shown on Figure 7.2. Refer to the FRA for more details.
- 7.55 The FRA also includes analysis of existing drainage catchments and outfalls, impermeable areas and runoff calculations. Figure 7.2 also illustrates the existing drainage regime.
- 7.56 The total existing impermeable coverage measures around 4.31ha, which is around 14% of the Site area. The FRA provides more detail on existing runoff rates in each catchment based on calculated rates for the brownfield and greenfield elements as shown in Table 7.4.

**Table 7.4: Existing Runoff Rates per Hectare**

| Annual Probability                        | Brownfield                                  | Greenfield  |
|---|---|-------------|
| 1 in 1                                    | 43.0 litres per second per hectare (l/s/ha) | 3.7 l/s/ha  |
| QBAR("mean annual flood", approx. 1 in 2) | 67.8 l/s/ha                                 | 4.4 l/s/ha  |
| 1 in 30                                   | 156.6 l/s/ha                                | 10.0 l/s/ha |
| 1 in 100                                  | 202.8 l/s/ha                                | 14.0 l/s/ha |

#### Water Quality

- 7.57 The Site lies within the Wey catchment of the Thames river basin district. The WFD environmental objectives include all water bodies achieving 'Good' status by 2027. The Thames RBMP<sup>x</sup> now includes WFD water quality data from 2019 for two water bodies downstream of the Site, namely:

- Wey (Shalford to River Thames confluence at Weybridge); and
- Boldermere.



7.58 The locations of the water bodies in relation to the Site are shown on Figure 7.1. It should be noted that the Site represents only a very small proportion of the catchment of each water body. Table 7.5 summarises the water quality data including the reasons given for not achieving 'Good' status.

**Table 7.5: WFD Water Quality Data**

| Water Body                            | Classification Item | 2013     | 2016     | 2019            | Reasons for Not Achieving Good status (RfNAG) |
|---------------------------------------|---------------------|----------|----------|-----------------|---|
| <b>Wey (Shalford to River Thames)</b> | <b>Overall</b>      | Moderate | Moderate | <b>Moderate</b> | Physical modifications; sewage discharges     |
|                                       | Ecological          | Moderate | Moderate | Moderate        |   |
|                                       | Chemical            | Good     | Good     | Fail            |   |
| <b>Boldermere</b>                     | <b>Overall</b>      | Moderate | Moderate | <b>Moderate</b> | Fish stocking; septic tanks                   |
|                                       | Ecological          | Moderate | Moderate | Moderate        |   |
|                                       | Chemical            | Good     | Good     | Fail            |   |

7.59 The east half of the Site eventually drains via Boldermere which has an overall catchment of 174.5 ha. The west half of the Site drains via a ditch system which shares an outfall beneath the A3 with Boldermere. Thus, this watercourse route may also have some interconnectivity with Boldermere. There are no septic tanks or fish stocking activities at the Site.

7.60 Both routes eventually drain into the Wey via a system of ditch watercourses flowing through Ockham and Wisley Commons. There are no existing sewage discharges from the Site into the Wey. The Wey (Shalford to River Thames) reach catchment is 75.8 km<sup>2</sup>.

7.61 The Commons are designated as Local Nature Reserves (LNR), Sites of Special Scientific Interest (SSSI) and Special Protection Areas (SPA). The condition of the water environment within the Commons SSSI<sup>xi</sup> is currently Favourable and supports a rich flora and a nationally important odonata (dragonfly and damselfly) habitat.

7.62 The Site is within a Drinking Water Protected Area (Surface Water) under the WFD. These zones are identified by water companies and the EA as raw water sources that are 'at risk' of deterioration which would result in the need for additional purification treatment. The Wey (Shalford to River Thames confluence at Weybridge) is a supply of raw water via treatment works at Bray and Chertsey. The Protected Area's status is 'at risk' due to the use of pesticides within the catchment.

### Groundwater Quality

- 7.63 Groundwater sampling results at the Site are discussed in the ground investigation letter report (Appendix 2.2). Minor elevated concentrations of heavy metals, ammonium and a single polycyclic aromatic hydrocarbon (PAH), fluoranthene, have been recorded in six groundwater samples taken from the subject site. A single concentration of Ammonium significantly exceeded the screening level although the affected borehole falls within the hardstanding area of the former hangar apron which is not to be modified by the Development.
- 7.64 The letter report summarises that there was limited evidence of soil-based PAH contamination. The Site is within a generally low sensitivity area with regard to groundwater contamination and exceedances were generally minor and at a level which can be remediated.

### Future Baseline

- 7.65 The future baseline scenario without the Development would be with Highways England's Development Consent Order (DCO) works for the M25 Junction 10/ A3 Wisley Interchange in place at the north-west of the Site (refer to Chapter 3 for more details). Based on the scheme information available in the DCO Examination documents<sup>xii</sup> the baseline conditions with potential to change are discussed later under Cumulative Effects.

### Likely Significant Effects

- 7.66 The construction of the Development essentially comprises earthworks and soft landscaping works to create the proposed landforms and drainage basins (refer to Chapter 3 for full description). The works are limited to the existing arable areas so that the existing hardstanding areas will remain in situ. The layout of the proposed landforms, ponds and swales are illustrated on Figure 7.3. Potential effects are discussed as follows.

### Construction Phase

#### *Flood Risk and Water Quantity*

- 7.67 The construction works will not include any new large temporary hardstanding areas which could alter the drainage patterns at the Site. The physical works are confined to existing arable areas which are outside of existing flood risk pathways. The likely effect on flood risk and on the quantity of surface water and groundwater, both on and off-site, is **Negligible**.

*Water Quality*

- 7.68 The works will involve vegetation clearance and movement of large volumes of soil including temporary stockpile creation. There will be large areas of exposed earth until grass cover is established. Therefore, during the works there is an increased risk of silt pollution where soil is washed into the downstream watercourses by heavy rainfall.
- 7.69 The works will require heavy plant with on-site refuelling provision. The risk of pollution of surface water due to spillage is therefore increased during the construction phase.
- 7.70 The magnitude of the impact of a pollution incident could be Moderate if a high silt volume or a large fuel/oil spillage was washed into the downstream watercourses. The receiving surface water environment is assessed as High sensitivity due to the Thames Basin Heaths SPA and the Ockham and Wisley Commons SSSI with nationally important habitat downstream. Without mitigation in place, the likely effect of a surface water pollution incident is assessed as **Moderate Adverse**. Mitigation measures are discussed in the next section.
- 7.71 The ground investigation letter report assesses the risk of contaminated groundwater and proposes no specific remedial measures. This is on the basis that the construction of the Development does not include removal of the existing hardstanding areas where the localised elevated concentrations of contaminants were identified. The report recommends a watching brief during the works with any suspect soils to be investigated by an environmental consultant and appropriate remedial measures put in place where deemed appropriate. The risk of mobilisation of contaminants into the groundwater environment during the works is assessed as **Negligible**.
- 7.72 The groundwater body beneath the Site would not be impacted by silt wash-off, but could be impacted by fuel/oil spillage. The Site is not within a source protection zone. A spill would be localised and, if allowed to remain in situ, would break down over time in the soil. Despite this and the low permeability of the soils, the affected groundwater could eventually emerge in the SSSI habitat albeit in low concentrations. The sensitivity is therefore assessed as Moderate rather than Low and the significance of a groundwater pollution incident is assessed as **Minor Adverse**. Mitigation measures are discussed in the next section.
- 7.73 Aside from the pollution risk, which is temporary in nature, the construction works will not introduce any activities which would work against the WFD water quality objectives for Boldermere and the Wey.

## Operational Phase

### *Flood Risk and Water Quantity*

- 7.74 In its completed state the Development will comprise green open space and ponds. No new impermeable surfaces will be created, and the existing hardstanding areas will remain in situ. Hence, the impermeable surface coverage at the Site will be unchanged. Existing outfall locations and catchment areas have been preserved. The likely effect on flood risk and the quantity of surface water and groundwater, both on and off-site, is **Negligible** overall.
- 7.75 The Ockham and Wisley Commons SSSI habitat could be sensitive to any change in drainage patterns at the Site. As the impermeable surfacing coverage is unchanged by the Development, there will be no difference in the overall volume of runoff from the baseline conditions and no detrimental impact on the sensitive downstream habitat.
- 7.76 The introduction of the new ponds will help to regulate peak flows slightly, in that runoff water will be captured in the ponds and retained for a short while before discharging via the outfall. With no flow controls installed this effect may not be pronounced, but it will help to slightly reduce downstream flooding and the erosive effect of peak storm flows without affecting the overall volume of runoff. The significance of this effect of is assessed as **Minor Beneficial**.
- 7.77 The changes in levels for the landform alterations and new ponds could affect groundwater if proposed surface levels are reduced below the local groundwater level. This effect would be localised and temporary in nature as the pond outlets will regulate water levels once installed. The proposed level changes are between +4m and -2m and are therefore not significant. The shallow groundwater depths at the north of the site indicate that emergence potential is already high. The magnitude of this impact is assessed as Minor and the sensitivity is assessed as Low. The significance of this effect is assessed as **Negligible**; however, consideration of groundwater levels will be made at detailed design stage to determine whether each pond location would best be groundwater-fed or lined.

### *Water Quality*

- 7.78 In its completed state the Development does not introduce any source of pollution risk. The new ponds and swales will provide additional means of pollution capture, settlement and bioremoval compared to the baseline conditions. Further the change of land use away from agriculture should mean the cessation of pesticide application at the Site. These benefits will be small in proportion to the whole Wey catchment. Therefore, the significance of the effect of the Development on surface water quality is assessed as **Minor Beneficial**.

7.79 The effect will be slight on groundwater as the water in the ponds and swales will generally be runoff which exceeds the modest infiltration potential of the soil. The effect on groundwater quality is assessed as **Negligible**.

7.80 The Development does not introduce any activities which would work against the WFD water quality objectives for the catchment.

### **Mitigation Measures**

#### Construction Phase

7.81 From the foregoing assessment, mitigation measures are needed during the construction works to prevent silt or oil pollution entering surface water and groundwater. The risk will need to be controlled by means of good-practice site management and this issue is dealt with in the Construction Environmental Management Plan (CEMP) which accompanies the planning application and is included at Appendix 3.2. The CEMP includes measures as follows (refer to the CEMP document for more information):

- Outlets protected with geotextile or straw bales;
- Action plans to protect watercourses from spillages;
- Pumped discharges for dewatering to be filtered through a silt interceptor;
- Storage and filling points etc for oils, fuels or chemicals will be sited on impervious bases in a bunded compound with sump;
- Tanks will be double-bunded, secured and sited away from drainage systems;
- Phasing of earthworks and seeding coordinated to limit the duration that bare soils are exposed;
- Temporary silt fencing installed at toe of slopes and stockpiles, uphill of ditches and ponds etc.;
- Use of biodegradable erosion control matting along above-ground flow routes; and Regular inspections of all pollution control measures.

7.82 These mitigation measures represent normal best-practice site management techniques and are not unique to this Development. To ensure the measures remain in place for the duration of the works the CEMP states that the Applicant and the Principal Contractor will monitor and record site conditions and operations to ensure the provisions set out in the CEMP are adhered to. A formal review of the CEMP will be carried out after commencement to ensure all provisions are adhered to, and to identify any potential improvements to operations. A record of this review will be provided to GBC upon request.

## Operational Phase

- 7.83 No adverse effects requiring mitigation have been identified for the completed Development.

**Residual Effects**

## Construction Phase

- 7.84 With the CEMP in place the risk of a pollution event is greatly minimised. The robust, well-managed action plans will also help to ensure any pollution event is contained and cleaned up promptly before it can enter the water environment, or urgently remediated before any lasting adverse effects are experienced. With the mitigation measures in place, the baseline conditions will be unchanged and the residual effects of the Development will be **Negligible**.

## Operational Phase

- 7.85 No adverse residual effects have been identified for the completed Development.

**Cumulative Effects**

- 7.86 The list of proposed developments for consideration in a cumulative assessment is found in Chapter 2 of this ES. Table 7.6 summarises whether these proposals could have potential cumulative effects with the Development. The focus is limited to the likely adverse effects as a result of the Development which have been identified in this chapter; namely, the potential for water quality in the Ockham and Wisley Commons SSSI downstream to be impacted during the construction phase. Identified cumulative effects are then discussed afterwards.

**Table 7.6: Cumulative effects screening summary**

| <b>Project Reference</b>                   | <b>Description and Location</b>  | <b>Comments</b>   | <b>Likely Significant Cumulative Effects</b> |
|--|--|---|--|
| 08/P/01472<br>(GBC)                        | Composting facility at the west of the Site.                                   | This development drains west to the Stratford Brook. The SSSI lies to the north-east and would not likely be affected by a pollution incident.                                    | No   |
| 19/P/00377<br>(GBC)                        | RHS Wisley 'Hilltop' development, 350m north-west.                             | This development drains north to the Wey. Wisley Common lies to the east but the RHS watercourses flow northwards. The SSSI would not likely be affected by a pollution incident. | No   |
| -<br>(DCO scheme)                          | M25 Junction 10/A3 Wisley Interchange Improvement, north and west of the site. | Part of this national infrastructure project will involve works adjacent to the SSSI and within the SSSI drainage catchment.  | Yes  |
| 19/P/02223<br>(GBC)                        | 520 dwellings at Garlick's Arch, 2.9km south-west.                             | This development is hydrologically remote from the SSSI.  | No   |
| 19/P/01541<br>(GBC)                        | 110 dwellings at Lollesworth Fields, East Horley, 2.9km south.                 | This development lies within the Stratford Brook catchment but is hydrologically remote from the SSSI.  | No   |
| 19/P/02240<br>(GBC)                        | Creation of public open space adjacent to Garlick's Arch, 2.9km south-west.    | This development is hydrologically remote from the SSSI.  | No   |
| PLAN/2018/0359<br>(Woking Borough Council) | 169 dwellings at West Byfleet, 4km north-west.                                 | This development lies on the opposite side of the Wey and downstream of the SSSI.   | No   |
| 19/P/00027<br>(GBC)                        | 75 dwellings at Clockbarn Nursery, Send, 4.5km south-west.                     | This development is hydrologically remote from the SSSI.  | No   |
| 14/P/02109                                 | Replacement secondary school and 295 dwellings at Effingham, 5km south-east.   | This development is in the Mole catchment and is hydrologically remote from the SSSI.   | No   |
| -<br>(GBC, pre-planning)                   | The Proposed Wisley New Settlement, south and west of the Site.                | Part of the wider FWA site is in the same catchment as the Site and drains into the SSSI.   | <b>Yes</b>                                   |

7.87 There are two proposed developments identified as having potential for a significant cumulative effect on the water environment. These are discussed in turn below.

## Construction Phase

*M25 Junction 10/A3 Wisley Interchange*

7.88 The DCO scheme documents include an Environmental Statement (ES) with Chapter 8 addressing "Road drainage and the water environment". The DCO ES identifies the potential for a pollution incident to occur during the construction phase. Based on available programming information, the works would be taking place concurrently with the Development construction works and therefore the probability of a pollution incident occurring which affects the SSSI water environment could be increased. The significance of the cumulative effect is assessed as **Moderate Adverse**.

7.89 Outline mitigation measures are set out in the DCO ES including but not limited to the following:

- All works to be undertaken with regard to Pollution Prevention Guidelines;
- Areas which may generate contaminated water, such as oil storage areas, to be bunded with self-contained treatment facilities; and
- No discharge to groundwater.

7.90 On the basis that the same robust management and action plans will be in place as for the Development, the residual cumulative effect should be **Negligible**.

*The Proposed Wisley New Settlement (WNS)*

7.91 At this stage a parameters plan and phasing programme are still in preparation for The Proposed WNS. As Enabling Works, the Development would naturally take place in advance of the construction of The Proposed WNS assuming that a planning application is submitted and approved. Some overlap of works may be possible which could increase the probability of a pollution incident occurring which affects the Ockham and Wisley Commons SSSI. As before, the significance of this cumulative effect is assessed as **Moderate Adverse**.

7.92 An ES and a CEMP are in preparation for The Proposed WNS to support a future planning application. These documents will set out the necessary mitigation measures to manage pollution risk during the construction.

7.93 On the basis that the same robust management and action plans will be in place as for the Development, the residual cumulative effect should be **Negligible**.



## Operational Phase

- 7.94 No adverse effects upon the water environment have been identified for the completed Development, thus the Development would not contribute to a significant cumulative effect alongside other completed developments in the catchment.
- 7.95 The DCO scheme surface water drainage strategy relies on soakaway drainage or, if necessary, attenuated discharge to the existing watercourses. The scheme will be required to meet the NPPF in terms of not increasing flood risk through development runoff. No significant change is expected.
- 7.96 The introduction of a drainage system to deal with surface runoff at this location may help to reduce surface water flood risk on the land to the north, although this has not been tested.
- 7.97 The use of traditional highway gullies with traps and swales within the scheme will help to reduce pollutants from the new road entering the receiving watercourses. No significant change is expected.
- 7.98 A future planning application for The Proposed WNS development is anticipated to include SANG creation and SuDS attenuation within the Enabling Works Site. This may include minor drainage works within the Site to integrate the new drainage basins into The Proposed WNS SuDS attenuation system. All such proposals will be subject to EIA at that time, which would assess the likely significant effects upon flood risk, water quantity and water quality, including cumulative and residual effects.
- 7.99 The FRA in Appendix 7.1 has nevertheless considered the likely attenuation strategy for the Proposed WNS and contains more information on runoff rates and storage volumes. By including anticipated capacity within the new drainage basins at this stage, future intrusive works at the Site will be minimised and the potential for cumulative effects will be reduced.
- 7.100 Minor beneficial effects on water quantity and quality were identified as a result of the Development due to the introduction of the ponds and swales. The DCO drainage strategy is based on sustainable drainage principles. Likewise, The Proposed WNS will be expected to incorporate a site-wide SuDS treatment train to mitigate any pollution impacts in the operational phase. The new ponds at the Site are intended to form a part of the SuDS network.
- 7.101 On the basis that these two proposed developments will incorporate pollutant removal within the drainage systems by means of SuDS features, the cumulative effect of the operational phases should remain as **Minor Beneficial**.

## Summary

- 7.102 The assessment has been made drawing upon the Flood Risk Assessment along with topographical survey and ground investigation data. Consultations with the EA and the LLFA included provision of flood records and water quality data. Likely significant effects on the water environment have been assessed by determining the magnitude of impact and the sensitivity of receptor.
- 7.103 The Site lies in Flood Zone 1 away from any fluvial flood risk areas. The ground conditions comprise low permeability soils with pockets of shallow groundwater. The land drains northwards via a network of ditches which flow through the Ockham and Wisley Commons SSSI downstream. The overall water quality status for Boldermere in the SSSI is Moderate, but forms part of a nationally important dragonfly habitat.
- 7.104 Likely effects have been assessed with one significant (Moderate) adverse effect identified; namely, the risk of a pollution incident occurring during the construction phase of the Development. If silt or oil contamination enters the surface water environment a detrimental impact on water quality could result within the SSSI. No adverse effects were identified for the operational phase.
- 7.105 Mitigation will be required during the construction phase in the form of a robust pollution prevention plan comprising practical measures and a monitoring regime drawing on best-practice site management. These mitigation measures are detailed within the Construction Environmental Management Plan (CEMP) which accompanies the planning application and is included at Appendix 3.2. The CEMP includes a formal review process.
- 7.106 With the mitigation measures in place, the baseline conditions will be unchanged and the residual effects of the Development will be **Negligible**.
- 7.107 Table 7.7 contains a summary of the likely significant effects of the Development. As a receptor the Ockham and Wisley Commons SSSI downstream is given national importance.

**Table 7.7: Water Resources & Flood Risk**

| Potential Effect                                | Nature of Effect<br>(Permanent/<br>Temporary) | Significance<br>(Major/Moderate/Minor)<br>(Beneficial/Adverse/Negligible) | Mitigation /<br>Enhancement<br>Measures | Geographical Importance* |    |   |   |   |   |   | Residual Effects<br>(Major/Moderate/Minor)<br>(Beneficial/Adverse/Negligible) |
|---|---|---|---|--------------------------|----|---|---|---|---|---|---|
|   |   |   |   | I                        | UK | E | R | C | B | L |   |
| <b>Construction</b>                             |   |   |   |                          |    |   |   |   |   |   |   |
| Change in flood risk                            | Temporary                                     | Negligible  | N/A                                     |                          |    | Y |   |   |   |   | Negligible  |
| Pollution of watercourses                       | Temporary                                     | Moderate Adverse  | Pollution prevention plan as CEMP       |                          |    | Y |   |   |   |   | Negligible  |
| Mobilisation of contamination into groundwater  | Temporary                                     | Negligible  | N/A                                     |                          |    |   |   |   |   | Y | Negligible  |
| Pollution of groundwater (spills etc)           | Temporary                                     | Minor Adverse   | Pollution prevention plan as CEMP       |                          |    |   |   |   |   | Y | Negligible  |
| <b>Completed Development</b>                    |   |   |   |                          |    |   |   |   |   |   |   |
| Change in flood risk                            | Permanent                                     | Negligible  | N/A                                     |                          |    | Y |   |   |   |   | Negligible  |
| Pond creation on water quantity in SSSI         | Permanent                                     | Minor Beneficial  | N/A                                     |                          |    | Y |   |   |   |   | Minor Beneficial  |
| Change in ground levels on groundwater quantity | Permanent                                     | Negligible  | N/A                                     |                          |    |   |   |   |   | Y | Negligible  |
| Water quality in receiving surface waters       | Permanent                                     | Minor Beneficial  | N/A                                     |                          |    | Y |   |   |   |   | Minor Beneficial  |
| Water quality of groundwater                    | Permanent                                     | Negligible  | N/A                                     |                          |    |   |   |   |   | Y | Negligible  |
| <b>Cumulative Effects</b>                       |   |   |   |                          |    |   |   |   |   |   |   |
| <i>Construction</i>                             |   |   |   |                          |    |   |   |   |   |   |   |
| Pollution of water environment in SSSI          | Temporary                                     | Moderate Adverse  | Pollution prevention plans, CEMPs       |                          |    | Y |   |   |   |   | Negligible  |
| <i>Completed Development</i>                    |   |   |   |                          |    |   |   |   |   |   |   |
| Water quantity and quality in SSSI              | Permanent                                     | Minor Beneficial  | N/A                                     |                          |    | Y |   |   |   |   | Minor Beneficial  |

**\* Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

## REFERENCES

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- <sup>i</sup> Ministry of Housing, Communities and Local Government (February 2019), *National Planning Policy Framework*
- <sup>ii</sup> Ministry of Housing, Communities and Local Government (October 2019), *Planning Practice Guidance* (<https://www.gov.uk/government/collections/planning-practice-guidance>)
- <sup>iii</sup> Guildford Borough Council (April 2019), *Guildford borough Local Plan: strategy and sites 2015 – 2034*
- <sup>iv</sup> Guildford Borough Council / Capita (July 2016), *Guildford Borough Level 1 Strategic Flood Risk Assessment*
- <sup>v</sup> Guildford Borough Council / Capita (May 2016), *Guildford Borough Council Level 2 Strategic Flood Risk Assessment*
- <sup>vi</sup> Guildford Borough Council / Halcrow Group Ltd (October 2014), *Guildford Surface Water Management Plan*
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- <sup>viii</sup> Department for Environment, Food and Rural Affairs (March 2015), *Non-statutory technical standards for sustainable drainage systems*
- <sup>ix</sup> British Geological Survey (2020), *Geology of Britain viewer* (<https://www.bgs.ac.uk/map-viewers/geology-of-britain-viewer>)
- <sup>x</sup> Environment Agency (2015), *Thames River Basin Management Plan* (<https://environment.data.gov.uk/catchment-planning/ManagementCatchment/3114>)
- <sup>xi</sup> Natural England (2020), *Designated Sites* (<https://designatedsites.naturalengland.org.uk>)
- <sup>xii</sup> Highways England (2020), *M25 junction 10/A3 Wisley interchange improvement* (<https://infrastructure.planninginspectorate.gov.uk/projects/south-east/m25-junction-10a3-wisley-interchange-improvement>)