

Statutory Consultation 2022

Preliminary Environmental Information Report

Volume 3: Appendix 20.2

**Preliminary Water Framework Directive Compliance
Assessment**

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1 INTRODUCTION

- 1.1.1 This document reports on the compliance of the Proposed Development in accordance with the Water Framework Directive (WFD) (Standards and Classification) Directions (England and Wales) 2015 (Ref. 1), the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref. 2) and the Groundwater (Water Framework Directive) England Direction 2016 (Ref. 3)¹. It provides evidence to support the conclusion on impacts and effects documented in **Chapter 20** Water Resources in the Preliminary Environmental Information Report (PEIR).
- 1.1.2 The study area of the Proposed Development, as outlined in **Chapter 20** Water Resources, encompasses two Water Framework Directive (WFD) watercourses and a WFD groundwater body. This report summarises the assessment methodology and results with respect to achieving compliance with WFD objectives.
- 1.1.3 This WFD assessment has been completed based on the consideration of the baseline condition of the relevant surface water bodies and groundwater bodies located within the study area for the Proposed Development. It has been completed based on the latest design information and incorporates consideration of any mitigation measures identified in relation to surface water and groundwater receptors and the Proposed Development Drainage Strategy (**Appendix 20.4**).

¹ National legislation that transposes the EU Water Framework Directive (WFD) 2000/60/EC.

2 OVERVIEW OF NATIONAL LEGISLATION ON WFD

2.1 Aims

- 2.1.1 The Water Framework Directive (WFD) (Standards and Classification) Directions (England and Wales) 2015 (Ref. 1), Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref. 2) and the Groundwater (Water Framework Directive) England Direction 2016 (Ref. 3) outline objectives set to protect and enhance the quality of the water environment across England and Wales. Despite the UK's departure from the EU, the WFD remains relevant as it has been incorporated into domestic law through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. This national legislation, outlines the requirement for a holistic approach to the sustainable management of water considering the interactions between surface water, groundwater and water-dependent ecosystems.
- 2.1.2 Under the national legislation, 'water bodies' are the basic management units and are defined as all or part of a river system or aquifer. These water bodies form part of larger River Basin Districts (RBD), for which River Basin Management Plans (RBMPs) are reviewed and revised periodically by the Environment Agency (the 'appropriate agency' for RBDs located wholly in England) and environmental objectives are set. These RBMPs are produced every six years, in accordance with the river basin management planning cycle.
- 2.1.3 The national legislation requires the appropriate agency the classification of the current condition or 'status or potential' of surface water and groundwater bodies and to set a series of objectives for maintaining or improving conditions so that water bodies maintain or reach 'good status or potential'.

2.2 Requirements for new developments

- 2.2.1 To ensure compliance with the national legislation on WFD waterbodies, decision makers must consider whether proposals for new developments have the potential to:
- a. cause a deterioration of a water body from its current status or potential;
 - b. prevent future attainment of good status or potential where not already achieved;
 - c. impact on protected or priority species and habitats; and/or
 - d. provide opportunities to improve the water environment.
- 2.2.2 If a new development is shown to result in a deterioration in the status of a WFD waterbody (as defined by national legislation), or prevents future attainment of good status or potential, then an Article 4.7 derogation will need to be prepared. This entails documenting the reasons why compliance cannot be achieved taking account of the technical and financial constraints of achieving compliance.

2.3 Determination of status of WFD waterbodies

- 2.3.1 Surface water bodies and groundwater bodies are defined within national legislation on WFD waterbodies (Ref. 1, Ref. 2 and Ref. 3).
- 2.3.2 There are three types of surface water body: natural water bodies, heavily modified water bodies (HMWB) and artificial water bodies (AWB). Groundwater bodies are not subdivided based the level of development undertaken within an area.
- 2.3.3 The overall status of natural surface water bodies is determined on the basis of their ecological status and chemical status. The overall status of HMWBs and AWBs is classified based on their ecological potential and chemical status. The overall status of groundwater bodies is determined based on their quantitative status and chemical status. **Table 2.1** provides a definition of each of the WFD status classes based on the Thames River Basin District: River Basin Management Plan (Ref. 4).

Table 2.1 Definition of status in the WFD as defined in the Thames River Basin District: River Basin Management Plan

Classification descriptors	Description
High	Status achieved where the quality elements of the water body correspond to conditions undisturbed by anthropogenic activities. No restrictions on the beneficial uses of the water body. No impacts on amenity, wildlife or fisheries.
Good	Slight change from natural conditions as a result of human activity. Protects all but the most sensitive wildlife. No restrictions on the beneficial uses of the water body. No impact on amenity of fisheries.
Moderate	Moderate change from natural conditions as a result of human activity. Some restriction on the beneficial uses of the water body. No impact on amenity. Some impact on wildlife and fisheries.
Poor	Major change from natural conditions as a result of human activity. Some restriction on the beneficial uses of the water body. Some impact on amenity. Moderate impact on wildlife and fisheries.
Bad	Severe change from natural conditions as a result of human activity. Significant restriction on the beneficial uses of the water body. Major impact on amenity. Major impact on wildlife and fisheries with many species not present.

2.4 Surface water body status

- 2.4.1 Chemical status of surface water bodies is determined based on data collected on site to measure the concentrations of a range of individual substances and groups of substances associated with water quality. The measured concentration of each substance is then compared against the expected concentration if the water body was in a natural state, taking account of the overall conditions in that water body if the catchment was not developed. The classification for each substance is then combined to derive an overall chemical status applying the same status classification.
- 2.4.2 Ecological status is determined using a similar principle although it is indicator species that are monitored and examined in terms of the departure from natural conditions and expressed using the same 'status' classification descriptors high, good, moderate, poor and bad.
- 2.4.3 Natural hydromorphological features are considered in terms of ecological status and potential (for HMWB) as hydromorphological variation across and along a watercourse channel is the factor that provides the opportunity for aquatic and marginal habitat variation.

2.5 Groundwater body status

- 2.5.1 Chemical status for groundwater bodies is determined based on the levels of hazardous substances and pollutants discharged to the groundwater body.
- 2.5.2 Quantitative status for groundwater bodies is determined based on the degree to which a groundwater body is affected by direct and indirect abstraction.
- 2.5.3 For groundwater bodies, the overall classification is determined based on the worst case classification from both the chemical and quantitative status.

3 SCOPE OF THE PRELIMINARY WFD COMPLIANCE ASSESSMENT

- 3.1.1 The spatial scope of the assessment includes all WFD surface water and groundwater bodies designated under national legislation and located within the study area for the Proposed Development as described in the Water Resources chapter (**Chapter 20** in Volume 2 of the PEIR).
- 3.1.2 The study area has primarily been defined as encompassing all water resources receptors located within 1km of the Main Application Site (as defined in **Chapter 2**, and shown on **Figure 2.2** in Volume 4 to the PEIR) to capture all receptors with a defined hydraulic connection to the Proposed Development.
- 3.1.3 The study area of 1km from the Main Application Site has been extended in certain areas to include the following receptors in the PEIR:
- a. Flood risk receptors located within 100m of the off-site highway interventions in Hitchin as these are located more than 1km from the

Main Application Site. There is one WFD waterbody that has the potential to be affected by off-site works in Hitchin, the River Hiz.

- b. Downstream surface water and flood risk receptors identified as in hydraulic connectivity with the underlying aquifer that are located more than 1km from the Main Application Site such as the River Mimram.

3.1.4 The temporal scope is defined, in line with **Chapter 20** in Volume 2 of the PEIR, as below:

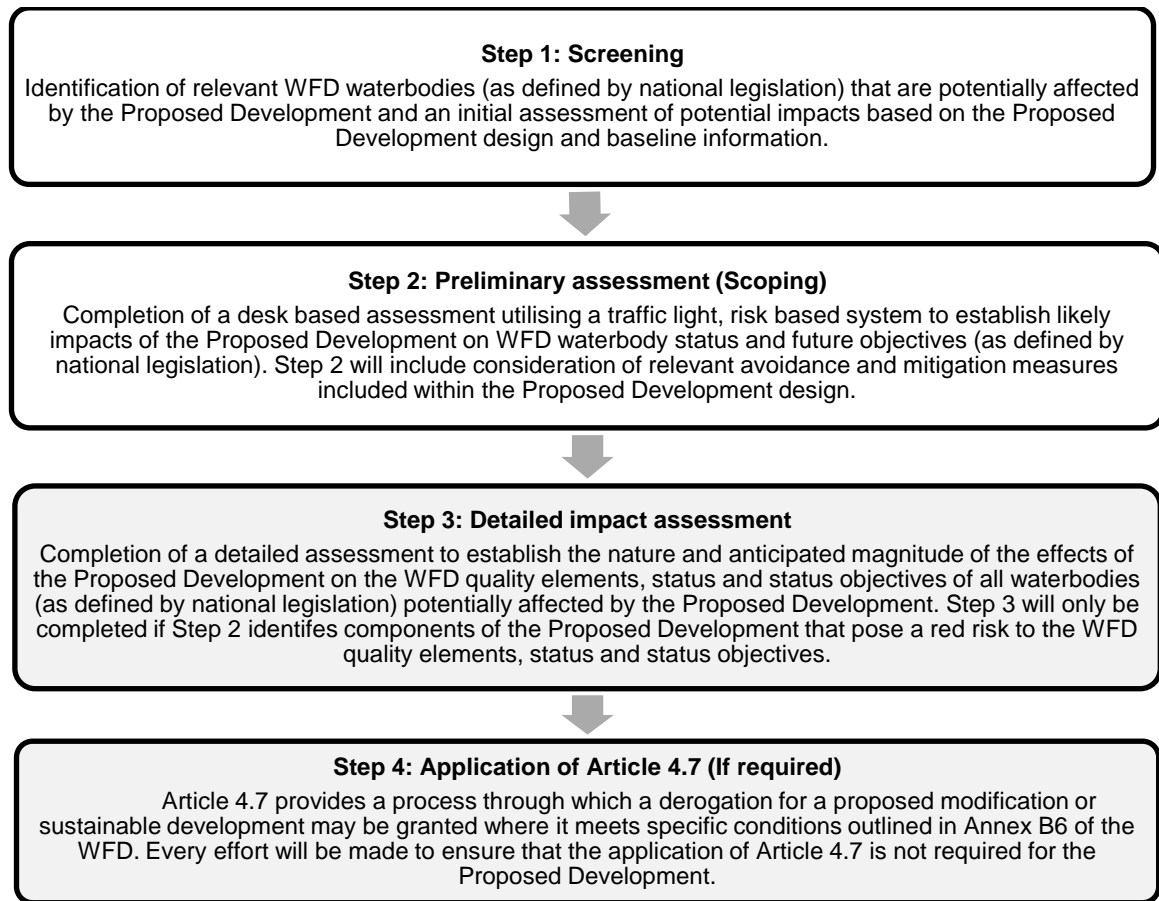
- a. Temporary effects are considered as those impacts that occur over a three year timescale (or less) as effects experienced for more than half of a WFD cycle (six years) are considered permanent. Temporary effects are considered reversible as the implementation of mitigation measures would fully mitigate the adverse effect on the receptor; and
- b. Permanent effects are considered to occur over a timescale greater than three years and are considered to be irreversible where the implementation of mitigation measures can only reduce the adverse effect on the receptor.

3.1.5 The scope of the WFD compliance assessment, as described above, has been agreed with the Environment Agency in a stakeholder consultation meeting on 1 August 2018 (See **Section 20.4** in Volume 2 of the PEIR for further details).

4 WFD COMPLIANCE ASSESSMENT METHODOLOGY

4.1 Overview

4.1.1 The WFD Compliance Assessment for the Proposed Development is being undertaken as a staged process as outlined in the diagram below. The Preliminary WFD Compliance Assessment (this document prepared to accompany the PEIR) covers Steps 1 and 2. Steps 3 and 4 will be undertaken for the relevant WFD waterbodies as part of the WFD Compliance Assessment that will be provided as an appendix to the Environmental Statement (ES).



4.2 Baseline methodology (Step 1)

4.2.1 The sources used in the desk-based assessment completed as part of the Preliminary WFD Compliance Assessment include:

- a. Environment Agency Catchment Data Explorer (Ref. 5);
- b. Thames River Basin District: River basin management plan (Ref. 5); and
- c. Luton Airport Expansion Project Hydrogeological Characterisation Report (**Appendix 20.3** in Volume 3 of the PEIR).

4.3 Assessment of compliance (Steps 2 and 3)

4.3.1 The assessment of compliance for the purpose of Step 2 (Preliminary assessment (Scoping)) has been completed based on a risk based, traffic light methodology to determine the impact of different elements of the Proposed Development on WFD status and future objectives as agreed with the Environment Agency. The assessment methodology has been applied as per **Table 4.1** below. If the Proposed Development was identified as having a medium adverse/beneficial or a high adverse/beneficial impact at Step 2 it has been screened in for further assessment at Step 3 to quantify the impact identified. Step 3 (Detailed impact assessment) will be undertaken as part of the WFD compliance assessment that will accompany the ES and will utilise the risk based, traffic light methodology outlined in **Table 4.1**.

Table 4.1 Assessment compliance methodology

Magnitude of impact on WFD waterbody	Criteria
High adverse	Adverse impact of a sufficient scale to impact on status class and/or the future objective as a waterbody scale.
Medium adverse	Localised adverse impact which, when balanced against embedded mitigation, is insufficient to affect status class and/or the future objective at a waterbody scale.
Low adverse	No measurable adverse impact on status class and/or the future objective at a waterbody scale.
Low beneficial	No measurable beneficial impact on status class and/or the future objective at a waterbody scale.
Medium beneficial	Localised beneficial impact which, when balanced against embedded mitigation, is insufficient to affect status class and/or the future objective at a waterbody scale.
High beneficial	Beneficial impact of a sufficient scale to impact on status class and/or the future objective as a waterbody scale.

4.4 Application of Article 4.7 (Step 4)

4.4.1 Step 4 will be undertaken as part of the WFD compliance assessment (provided as an appendix to the ES) if after the detailed assessment has been completed it is found that there is a potential deterioration in status of any of the water bodies that is not possible to mitigate. If this occurs, it will be necessary to present the technical reasons to support a derogation of Article 4.7 application.

5 ASSUMPTIONS AND LIMITATIONS

5.1.1 The Preliminary WFD Compliance Assessment provided in this report is based on the collation and evaluation of available documentation provided in relation to the WFD waterbodies by a number of stakeholders, including the Environment Agency, local authorities and the British Geological Society (BGS) and the information provided and referenced in the main PEIR chapter (**Chapter 20**).

5.1.2 In preparing this assessment, a number of assumptions have been made. These are set out below:

- a. Information provided by third parties, including publicly available information and databases are correct and complete at the time of publication.
- b. Any information provided based on surveys and ground investigations that have been completed to inform the PEIR are assumed to accurately represent baseline conditions. However, owing to the dynamic nature of the environment, it is recognised that conditions may change during the construction and operational phases of the Proposed Development.

- c. The drainage systems included in the Proposed Development would be maintained according to the appropriate requirements as agreed with the relevant stakeholder organisations and permitting conditions.
- d. Engagement with stakeholders on the drainage systems and management measures required in relation to construction and operational activities will be maintained throughout the construction and operational phases.

6 BASELINE CONDITIONS

6.1.1 This section provides a description of the existing WFD surface water and groundwater bodies located in the study area of the Proposed Development. WFD surface water and groundwater bodies are shown on **Figure 20.4** in Volume 4 to the PEIR.

6.2 Surface water

River Lee: Lee (from Luton to Hoo Lakes)

- 6.2.1 The River Lee (or Lea)² is located approximately 450m to the south west of the Main Application Site. It is a major tributary of the River Thames and generally flows within an open channel in a south easterly direction. The proposed off-site highway interventions at the A1081 New Airport Way / B653 / Gipsy Lane and the Windmill Road / Manor Road / St Mary's Road / Crawley Green Road gyratory are located on culverted sections of the river.
- 6.2.2 The River Lee is designated under national legislation as part of the Lee (from Luton to Luton Hoo Lakes) waterbody (GB106038033391) which is part of the Lee Upper management catchment and is included within the Thames RBD.
- 6.2.3 The Lee (from Luton to Luton Hoo Lakes) has been designated as a HMWB under national legislation. This designation indicates that the waterbody has been heavily managed and modified by human activity.
- 6.2.4 The baseline description of the River Lee outlined in the Hydrogeological Characterisation Report (**Appendix 20.3** in Volume 3 to the PEIR) has also indicated that the River Lee is a chalk stream. Chalk streams have unique ecological characteristics and the potential for continuity with the chalk aquifer.
- 6.2.5 In the 2019 WFD classification Cycle 2 (Ref. 5), the Lee (from Luton to Luton Hoo Lakes) waterbody was classified as achieving a Bad overall WFD status, Bad ecological status and a Fail in chemical status. The Lee (from Luton to Luton Hoo Lakes) currently has an objective to achieve an overall status of Good by 2027.
- 6.2.6 The Lee (from Luton to Luton Hoo Lakes) is also located in a nitrate protected area which indicates elevated nitrate concentrations in groundwater and river waterbodies. Major sources of nitrates are fertilisers (associated with agricultural practices), atmospheric decomposition (from fossil fuel combustion and ammonia emissions from farming), leaking water mains and sewage effluent (Ref. 6).
- 6.2.7 The 2019 Cycle 2 status classification data for the waterbody are provided below in **Table 6.1**.

² This waterbody is often referred to as the River Lea but in line with Chapter 20 of the PEIR it will be referred to as the River Lee.

Table 6.1 Lee (from Luton to Luton Hoo Lakes) - 2019 Cycle 2 status and objectives

Status element	Status (2019)	Status objective
Overall status	Bad	Good by 2027
Ecological status	Bad	Good by 2027
Supporting elements (Surface water)	Moderate	Good by 2027
Biological quality elements	Bad	Good by 2027
Fish	Bad	Good by 2027
Invertebrates	Poor	-
Hydromorphological supporting elements	Supports good	Supports good by 2015 (Achieved)
Hydrological regime	Does not support good	Supports good by 2027
Physio-chemical quality elements	Moderate	Good by 2027
Ammonia	Good	Good by 2015 (Achieved)
Dissolved oxygen	Bad	Good by 2027
pH	High	Good by 2015 (Achieved)
Phosphate	Good	Good by 2015 (Achieved)
Temperature	High	High by 2015 (Achieved)
Specific pollutants status	High	High by 2015 (Achieved)
Chemical	Fail	Good by 2015 (Achieved in 2016, failed in 2019)
Priority substance status	Good	Good by 2015 (Achieved)
Priority hazardous substance status	Fail	Good by 2015 (Achieved in 2016, failed in 2019)

- 6.2.8 The reasons provided for not being able to achieve an overall Good status in previous cycles have related to sewage discharge from the water industry, urbanisation, groundwater abstraction, transport drainage and physical modifications associated with flood protection structures.
- 6.2.9 The water body is currently achieving a Bad ecological status due to:
- presence of invasive non-native invertebrate species;
 - pressures on invertebrates posed by the presence of dissolved oxygen and ammonia related to intermittent sewage discharges from the water industry; and
 - pressure on fish posed by the presence of nutrients and phosphates.
- 6.2.10 The water body has achieved a Fail in chemical status primarily attributed to a failure to achieve the appropriate thresholds in relation to priority hazardous substances polybrominated diphenyl ethers (PBDE) and perfluoro octane sulphonate (PFOS). The specific source of these substances has not been

determined by the Environment Agency but has been associated with the surrounding urban developments (Ref. 5). The use of Sustainable Drainage systems (SuDS) and rebuild of combined sewer overflows have been identified by the Environment Agency as potential mitigation measures to address these pressures (Ref. 5).

River Mimram: Mimram (Whitwell to Codicote Bottom)

- 6.2.11 The River Mimram is located approximately 3.5km to the east of the boundary of the Main Application Site. The River Mimram flows within an open channel in a southerly direction. The River Mimram is not directly affected by the Proposed Development but has been scoped into the assessment due to its interaction with the chalk aquifer underlying the Main Application Site. The River Mimram is therefore also designated as a chalk stream.
- 6.2.12 The River Mimram is designated under national legislation for WFD waterbodies as part of the Mimram (Whitwell to Codicote Bottom) waterbody (GB106038033460). As per the Lee (from Luton to Luton Hoo Lakes) waterbody, the Mimram (Whitwell to Codicote Bottom) waterbody is also part of the Lee Upper Management Catchment and sits within the Thames RBD. The Mimram (Whitwell to Codicote Bottom) has not been designated as artificial or heavily modified.
- 6.2.13 In the 2019 WFD classification Cycle 2 (Ref. 5), the Mimram (Whitwell to Codicote Bottom) waterbody was classified as achieving a Moderate overall WFD status, Moderate ecological status and a Fail in chemical status.
- 6.2.14 The Environment Agency have identified that due to an unfavourable balance of costs and benefits the Mimram (Whitwell to Codicote Bottom) has been assigned an objective of moderate overall classification which it achieved in 2015 and has maintained in 2019. However, it is noted that the overarching objective of the WFD is to achieve Good status for all designated waterbodies and this has been considered in the completion of this Preliminary WFD Compliance Assessment.
- 6.2.15 The 2019 Cycle 2 status classification data for the waterbody are provided below in **Table 6.2**.

Table 6.2 Mimram (Whitwell to Codicote Bottom) - 2019 Cycle 2 classification and objectives

Status element	Status (2019)	Status objective
Overall status	Moderate	Moderate by 2015 (achieved)
Ecological status	Moderate	Moderate by 2015 (achieved)
Biological quality elements	Bad	Good by 2027
Macrophytes and Phytobenthos combined	Moderate	Good by 2015
Fish	Good	Good by 2015 (Achieved)

Status element	Status (2019)	Status objective
Invertebrates	High	Good by 2015 (Achieved)
Hydromorphological supporting elements	Supports good	Supports good by 2015 (Achieved)
Hydrological regime	Does not support good	Supports good by 2027
Morphology	Supports good	-
Physio-chemical quality elements	Moderate	Good by 2027
Ammonia	High	Good by 2015 (Achieved)
Dissolved oxygen	High	Good by 2015 (Achieved)
pH	High	Good by 2015 (Achieved)
Phosphate	Poor	Moderate by 2015 (Achieved in 2016, failed in 2019)
Temperature	High	Good by 2015 (Achieved)
Specific pollutants status	High	-
Chemical	Fail	Good by 2015
Priority substance status	Good	-
Priority hazardous substance status	Fail	-

- 6.2.16 Note that where the status of an element is already Good or High a status objective is not set.
- 6.2.17 The Environment Agency have identified that the biological status and macrophytes and phytobenthos quality element are likely to not have achieved their objectives due to pressures associated with nutrients and phosphate contaminating the River Mimram. Specific mitigation measures have been identified in relation to the treatment of phosphorous at sewage treatment works to address this pressure.
- 6.2.18 The failure in the priority hazardous substance quality element has been attributed by the Environment Agency to issues associated with the discharge of polybrominated diphenyl ethers to the waterbody (Ref. 5). A specific source of this contaminant has not been identified but the Environment Agency has associated this with water industry processes (Ref. 5).
- 6.2.19 Groundwater abstractions have also been identified as posing a potential threat to the hydrological regime, macrophytes and phytobenthos and fish quality elements of this water body.

River Hiz: Hiz (through Hitchin)

- 6.2.20 The River Hiz is an ordinary watercourse located approximately 7km to the east of the boundary of the Main Application Site and approximately 500m from the off-site highway interventions along with the A602 within Hitchin (as described

in **Chapter 4** of Volume 2 of the PEIR). The River Hiz is a tributary of the River Great Ouse. The source of the River Hiz is understood to be the underlying chalk aquifer but it is not designated as a chalk stream.

- 6.2.21 The River Hiz is designated under national legislation as part of the Hiz (through Hitchin) waterbody (GB105033037680). As per the Lee (from Luton to Luton Hoo Lakes) waterbody and the Mimram (Whitwell to Codicote Bottom), the Hiz (through Hitchin) waterbody is also part of the Lee Upper Management Catchment and sits within the Thames RBD. The Hiz (through Hitchin) is designated as a HMWB.
- 6.2.22 In the 2019 WFD classification Cycle 2 (Ref. 5), the Hiz (through Hitchin) waterbody was classified as achieving a Moderate overall WFD status, Moderate ecological status and a Fail in chemical status.
- 6.2.23 The Environment Agency has identified a target of Good overall WFD waterbody status in 2027 for the Hiz (through Hitchin). The 2019 Cycle 2 status classification data for the waterbody are provided below in **Table 6.3**.

Table 6.3 Hiz (through Hitchin) - 2019 Cycle 2 classification and objectives

Status element	Status (2019)	Status objective
Overall status	Moderate	Good by 2027
Ecological status	Moderate	Good by 2027
Biological quality elements	Bad	Bad by 2015 (Achieved)
Macrophytes and Phytobenthos combined	High	-
Fish	Bad	Poor by 2015
Invertebrates	Poor	Bad by 2015 (Achieved)
Hydromorphological supporting elements	Supports good	Not assessed
Hydrological regime	Does not support good	Not assessed
Physio-chemical quality elements	High	Good by 2015
Ammonia	High	Good by 2015
Dissolved oxygen	High	Good by 2015
pH	High	Good by 2015
Phosphate	High	Good by 2015
Temperature	High	Good by 2015
Specific pollutants status	High	Not assessed
Chemical	Fail	
Priority substance status	Good	Does not require assessment
Priority hazardous substance status	Fail	Does not require assessment

6.2.24 The Environment Agency have identified that the invertebrate and fish quality elements are likely to not have achieved good status is due to pressures associated with transport drainage, North American signal crayfish (as an invasive non-native species), urban development and physical modifications affecting the continuity of habitats for fish species. The Environment Agency have identified the need for a mitigation measures assessment for these impacts but no further information has been provided detailing the specific nature of the mitigation measures.

6.3 Groundwater

Upper Lee Chalk

- 6.3.1 The Principal Aquifer underlying the Proposed Development study area is designated under the WFD as the Upper Lee Chalk (GB40601G602900) groundwater body. The Upper Lee Chalk groundwater body is located within the Lee Upper GW operational catchment which sits within the Thames Groundwater management catchment which in turn is within the Thames RBD. The Upper Lee Chalk groundwater body also lies within a drinking water protected and safeguarded area and, in a nitrate vulnerable zone.
- 6.3.2 The Hydrogeological Characterisation Report (**Appendix 20.3** in Volume 3 to the PIER) provides a detailed hydrogeological baseline of the Proposed Development study area. This indicates that there is a groundwater divide in the Upper Lee Chalk within the study area. The location of this groundwater divide indicates that the existing airport infrastructure in the Main Application Site is located within the River Lee catchment, whereas the area of the Proposed Development to the east of the existing airport is located within the River Mimram catchment.
- 6.3.3 In the 2019 Cycle 2 classification (Ref. 5), the overall status of the Upper Lee Chalk water body was classified as Poor on the basis that the quantitative status and chemical status have been identified as Poor.
- 6.3.4 The Environment Agency has indicated that an overall water body objective of Poor in 2015 was designated due to an unfavourable balance of costs and benefits (Ref. 5).
- 6.3.5 However, it is noted that the overarching objective for all waterbodies assigned under the national legislation for the WFD waterbodies is to achieve Good status and this has been considered in the completion of this Preliminary WFD Compliance Assessment.
- 6.3.6 The 2016 Cycle 2 status classification data for the waterbody are provided below in **Table 6.4**.

Table 6.4 Upper Lee Chalk - 2019 Cycle 2 classification and objectives

Status element	Status (2019)	Status objective
Overall status	Poor	Poor by 2015 (achieved)
Quantitative status	Poor	Poor by 2015 (achieved)

Status element	Status (2019)	Status objective
Quantitative saline intrusion	Good	Good by 2015
Quantitative water balance	Poor	Poor by 2015 (Achieved)
Quantitative Groundwater Dependent Terrestrial Ecosystems (GWDTEs)	Good	Good by 2015 (Achieved)
Quantitative dependent surface water body status	Poor	Poor by 2015 (Achieved)
Chemical status	Poor	Good by 2027
Chemical drinking water protected area	Poor	Good by 2027
General chemical test	Poor	Good by 2027
Chemical GWDTEs	Good	Good by 2015 (Achieved)
Chemical dependent surface water body status	Good	Good by 2015 (Achieved)
Chemical saline intrusion	Good	Good by 2015 (Achieved)

- 6.3.7 The quantitative water balance and quantitative dependent surface water body quality elements have been classified as Poor due to pressures associated with the abstraction of water from groundwater by the water industry and to provide public water supplies.
- 6.3.8 The classification of the chemical status of the waterbody as Poor has been attributed by the Environment Agency to the following pressures:
- a. contamination associated with urban development and transport assets;
 - b. poor nutrient management in agricultural and rural land management practices; and
 - c. contamination associated with manufacturing and industrial practices.
- 6.3.9 The Environment Agency have proposed the following mitigation measures to address these pressures:
- a. improved chemical storage and utilisation practices;
 - b. remediation of contaminated land and groundwater;
 - c. assessment and re-design of local sewerage systems and upgrades to an existing private sewage treatment works in the catchment; and
 - d. implementation of catchment sensitive farming practices.

7 ASSESSMENT

7.1 Step 1: Screening

River Lee: Lee (from Luton to Luton Hoo Lakes)

Construction

Main Application Site

- 7.1.1 Construction activities completed during Phases 1, 2a and 2b of the Proposed Development in the Main Application Site have the potential to impact the quality of the underlying aquifer. As the River Lee is a chalk stream and interacts with the underlying aquifer it would potentially be indirectly affected by any changes to the underlying aquifer. Therefore, the assessment of the potential impact of construction activities on the River Lee is screened in for further assessment at Step 2.

Off-site works

- 7.1.2 Construction activities associated with the off-site highway interventions at A1081 New Airport Way / B653 / Gypsy Lane and the Windmill Rd / Manor Rd / St. Mary's Rd / Crawley Green Rd (as described in **Chapter 4** of Volume 2 of the PEIR) have the potential to affect the River Lee as a result of changes in water quality associated with highway drainage which may discharge into the waterbody. The assessment of the potential impact of construction activities associated with the off-site highway interventions is therefore screened in for further assessment at Step 2.

Operation

Main Application Site

- 7.1.3 In Phase 1 of the Proposed Development, surface water discharge from the new Car Park P6 (as shown in the Overview Layout plan for 21.5 mppa as provided in the Drainage Design Statement (**Appendix 20.4** in Volume 3 of the PEIR) and an area to the north of the runway (which currently discharges to the central soakaway) would discharge to the Thames Water surface sewerage network that discharges to the River Lee.
- 7.1.4 During Phases 2a and 2b, the quality of the underlying aquifer may be impacted during operation due to the discharge of potentially contaminated surface water runoff and foul water to ground via infiltration basins and permeable paving. As the River Lee is chalk stream and interacts with the underlying aquifer, it has the potential to be indirectly impacted by any changes to groundwater quality.
- 7.1.5 Therefore, the assessment of the potential impact of the operational activities in the Main Application Site for Phases 1, 2a and 2b on the Lee (Luton to Luton Hoo lakes) waterbody is screened in for further assessment at Step 2.

Off-site works

- 7.1.6 The proposed off-site highway interventions in Phase 2a at the A1081 New Airport Way / B653 / Gipsy Lane and the Windmill Rd / Manor Rd / St. Mary's Rd / Crawley Green Rd (as described in **Chapter 4** of Volume 2 of the PEIR) are located on culverted sections of the River Lee. Runoff from the off-site car parks (P1 and P2 in Volume 4 of the PEIR) is assumed to discharge to the River Lee during Phases 1, 2a and 2b.
- 7.1.7 Therefore, the Lee (Luton to Luton Hoo lakes) waterbody has the potential to be affected by the works associated with the off-site works and is screened in for further assessment in Step 2.

River Mimram

Construction

Main Application Site

- 7.1.8 Construction activities completed during Phases 1, 2a and 2b of the Proposed Development in the Main Application Site have the potential to impact the quality of the underlying aquifer. As the River Mimram is a chalk stream and interacts with the underlying aquifer it would potentially be indirectly affected by any changes to the underlying aquifer. Therefore, the assessment of the potential impact of construction activities on the Mimram (Whitwell to Codicote Bottom) WFD waterbody is screened in for further assessment in Step 2.

Off-site works

- 7.1.9 The works associated with all of the proposed off-site highway interventions have not been identified as having any direct effects on the River Mimram and would not involve any works that would directly interact with the underlying aquifer which could result in indirect effects on the River Mimram. Therefore, the assessment of the potential impact of off-site works on the Mimram (Whitwell to Codicote Bottom) WFD waterbody is screened out for further assessment in Step 2.

Operation

Main Application Site

- 7.1.10 There would be no direct impacts on the Mimram (Whitwell to Codicote Bottom) as a result of the Proposed Development due to the distance between the works and the actual watercourse.
- 7.1.11 During Phases 2a and 2b, the quality of the underlying aquifer may be impacted during operation due to the discharge of potentially contaminated surface water runoff and foul water to ground via infiltration basins and permeable paving. As the River Mimram is chalk stream and interacts with the underlying aquifer, it has the potential to be indirectly impacted by any changes to groundwater quality.

- 7.1.12 Therefore, the assessment of the potential indirect impact of the Phase 2a and 2b works only on the Mimram (Whitwell to Codicote Bottom) waterbody is screened in for further assessment in Step 2.

Off-site works

- 7.1.13 There would be no direct or indirect impacts on the Mimram (Whitwell to Codicote Bottom) as a result of the Proposed Development due to the distance between the works and the actual watercourse. Therefore, the assessment of the potential impact of off-site works on the Mimram (Whitwell to Codicote Bottom) WFD waterbody during operation is screened out for further assessment in Step 2.

River Hiz: Hiz (through Hitchin)

Construction

Main Application Site

- 7.1.14 The River Hiz is located approximately 7km to the east of the boundary of the Main Application Site and there are no construction activities due to be completed during Phases 1, 2a and 2b of the Proposed Development that have the potential to impact the Hiz (through Hitchin) WFD waterbody. The potential impact of construction activities on the River Hiz is screened out for further assessment at Step 2.

Off-site works

- 7.1.15 Construction activities associated with the off-site highway interventions in Phases 2a and 2b at A505 Moormead Hill / B655 Pirton Rd / Upper Tilehouse Street, A602 Park Way / A505 Upper Tilehouse Street, and A602 Park Way / Stevenage Road (as described in **Chapter 4** of Volume 2 of the PEIR) have the potential to affect the River Hiz as a result of changes in water quality associated with highway drainage which may discharge into the waterbody. The assessment of the potential impact of construction activities associated with the off-site highway interventions is therefore screened in for further assessment at Step 2.

Operation

Main Application Site

- 7.1.16 The River Hiz is located approximately 7km to the east of the boundary of the Main Application Site and therefore are no operational activities due to be completed during Phases 1, 2a and 2b of the Proposed Development that have the potential to impact the Hiz (through Hitchin) WFD waterbody. The potential impact of construction activities on the River Hiz is screened out for further assessment at Step 2.

Off-site works

- 7.1.17 The A505 Moormead Hill / B655 Pirton Rd / Upper Tilehouse Street, A602 Park Way / A505 Upper Tilehouse Street, and A602 Park Way / Stevenage Road (as

described in **Chapter 4** of Volume 2 of the PEIR) off-site highway interventions proposed in Phases 2a and 2b are located approximately 500m from an open section of the River Hiz. Therefore, the Hiz (through Hitchin) waterbody has the potential to be affected by the works associated with the off-site works and is screened in for further assessment in Step 2.

Upper Lee Chalk

Construction

Main Application Site

- 7.1.18 The quality of the underlying aquifer may be impacted during the construction of the Proposed Development due to an increase in pollutant and sediment loading in runoff across the Main Application Site associated with construction activities. Excavation and piling works in Phases 2a and 2b also have the potential to mobilise contaminants across the Main Application Site that could discharge to the underlying aquifer.
- 7.1.19 The remediation works in Phases 2a provide an opportunity to remove potential sources of contaminants that could be harmful to the underlying aquifer across the Main Application Site.
- 7.1.20 The assessment of the potential impact of construction activities on the Upper Lee Chalk WFD waterbody is therefore screened in for further assessment in Step 2.

Off-site works

- 7.1.21 The works associated with all of the proposed off-site highway interventions would not involve any construction works that would directly interact with the underlying aquifer. However, there is potential for contaminated runoff from the highways affected by the off-site interventions to discharge into gully drains and soak away to groundwater.
- 7.1.22 Therefore, there is the potential for the Upper Lee chalk waterbody to be indirectly affected by the works associated with the proposed off-site highway interventions and will be screened in for further assessment in Step 2.

Operation

Main Application Site

- 7.1.23 In Phase 1, there would be an increase in pollutant loading in the runoff discharged from the Main Application Site to ground via the existing central soakaway (as shown in the Drainage Design Statement, **Appendix 20.4**). This has the potential to impact the quality of the underlying aquifer.
- 7.1.24 In Phases 2a and 2b, surface water runoff and foul water from across the Main Application Site would be discharged to ground via an infiltration basins and permeable paving for particular car parks. This has the potential to impact the quality of the underlying aquifer.

7.1.25 Therefore, the assessment of the potential impacts of the Main Application Site on the Upper Lee Chalk WFD waterbody is screened in for further assessment in Step 2.

Off-site works

7.1.26 The works associated with all of the proposed off-site highway interventions would not involve any construction works that would directly interact with the underlying aquifer. However, there is potential for contaminated runoff from the highways affected by the off-site interventions to discharge into gully drains and soak away to groundwater. The assessment of potential impacts of the off-site works on the Upper Lee Chalk WFD waterbody is therefore screened in for further assessment in Step 2.

Step 1: Screening summary

Table 7.1 Step 1 screening summary

WFD Waterbody	Screened in for preliminary impact assessment? (Y/N)
River Lee: Lee (from Luton to Luton Hoo Lakes)	
Construction	Y (Main Application Site and off-site works)
Operation	Y (Main Application Site and off-site works)
River Mimram: Mimram (Whitwell to Codicote Bottom)	
Construction	Y (Main Application Site only)
Operation	Y (Main Application Site only)
River Hiz: Hiz (through Hitchin)	
Construction	Y (off-site works only)
Operation	Y (off-site works only)
Upper Lee Chalk	
Construction	Y (Main Application Site and off-site works)
Operation	Y (Main Application Site and off-site works)

7.2 Step 2: Preliminary assessment (Scoping)

River Lee: Lee (From Luton to Luton Hoo Lakes)

Construction

Main Application Site and off-site works

7.2.1 The Draft CoCP provided in **Appendix 4.2** in Volume 3 to the PEIR outlines the requirements for lead contractors to prepare a Construction Surface Water Management Strategy (CSWMS) as part of their Environmental Management System (EMS) to protect the quality of surface water resources during construction.

- 7.2.2 The CSWMS will include the following measures which would ensure no adverse impacts on surface water quality:
- a. Identification of water resources within the study area identified in the ES which could be affected during the construction works.
 - b. Identification of sources of potential pollution to surface water receptors (including relevant plans) and implementation of plans to manage pollution (including reference to a pollution incident response plan).
 - c. Precautions to be taken when working adjacent to surface water receptors, where appropriate, to manage flood risk and the potential for deposition of silt or release of other forms of suspended material or pollution.
 - d. Procedures for managing surface water runoff from construction operations. This must include obtaining the necessary approval from the relevant statutory water undertaker for any connections to a public sewer.
 - e. Provision of facilities to appropriately manage foul water discharge, including the required approval from the relevant statutory water undertaker for any discharges to a public sewer.
 - f. Completion of a risk assessment and identification of mitigation measures to manage water consumption during construction. This should include agreement with the relevant statutory water undertaker.
 - g. Implementation of water efficiency measures to minimise water consumption.
 - h. Monitoring of surface water consumption and quality of water resources within the study area.
- 7.2.3 The following guidance would also be followed during construction to ensure a good practice approach to managing potential impacts on surface water quality:
- a. The Design Manual for Roads and Bridges LA113: Road drainage and the water environment (Ref. 7);
 - b. The SuDS Manual (C753) (Ref. 8);
 - c. Control of water pollution from construction sites: Guidance for consultants and contractors (C532) (Ref. 9);
 - d. The Environment Agency Guidance on pollution prevention:
 - Prevention of pollution for businesses (Ref. 10);
 - Reporting an environmental incident (Ref. 11);
 - Getting permission to discharge to surface or groundwater (Ref. 12);
 - Storage of oil (Ref. 13);
 - Oil storage regulations (Ref. 14);
 - Discharging sewage with no mains drainage (Ref. 15);
 - Works on or near water (Ref. 16); and

- Manage water on land (Ref. 17).

7.2.4 The implementation of these measures during construction would ensure that there is no measurable adverse impact on the WFD status of the Lee (from Luton to Hoo Lakes) and the achievement of the future objective defined for the waterbody during construction. Therefore, the construction of the Proposed Development in Phases 1, 2a and 2b would result in a **low adverse impact** on the Lee (from Luton to Hoo Lakes) WFD waterbody.

Operation

Main Application Site

- 7.2.5 In Phase 1 of the Proposed Development, appropriate treatment measures would be implemented prior to the discharge connection to the Thames Water network to treat potentially contaminated runoff from Car Park P6. The treatment measures would include petrol interceptors as a primary treatment process and a secondary treatment process to remove residual hydrocarbons, silts and heavy metals. This would ensure that the surface runoff from the car park is appropriately treated prior to discharging to the Thames Water network and subsequently the River Lee.
- 7.2.6 The implementation of these treatment measures during operation in Phase 1 would ensure that any potential discharges to the Thames Water Network would be treated appropriately and this would ensure that there are no measurable indirect impacts on the water quality of the River Lee.
- 7.2.7 The main drainage infrastructure would be installed in Phase 2a of the Proposed Development. This would include the installation of the new water treatment plant (WTP), attenuation tanks and two underground infiltration tanks for the Proposed Development as shown in the Overview Layout plans for 27 mppa and 32 mppa provided in the Drainage Design Statement (**Appendix 20.5** in Volume 4 of the PEIR).
- 7.2.8 The new drainage system would include real-time monitoring of contaminant level and volume to determine if runoff from across the Main Application Site would be diverted into storage tanks if trigger levels are reached. From the storage tanks, contaminated runoff would then be diverted to the WTP before discharging into a new infiltration tank located in the northern extent of the Main Application Site. Surface runoff that does not reach the trigger levels would be directed to a new large infiltration tank located at the south eastern extent of the Main Application site.
- 7.2.9 The WTP would consist of a single plant that encompasses two treatment processes with separate discharges to two infiltration tanks - one process for sewage load from the Terminal 2 building and a second process for surface runoff which would include treatment of de-icing agents. The treatment processes to be implemented at the WTP are described in detail in the Drainage Design Statement (**Appendix 20.4** in Volume 4 of the PEIR). The design of the treatment processes have been informed by the Hydrogeological Characterisation Report (**Appendix 20.3** in Volume 4 of the PEIR) in consultation with the Environment Agency.

- 7.2.10 This location of the infiltration tanks and WTP are shown in the Overview Layout plans for 27 mppa and 32 mppa provided in the Drainage Design Statement (**Appendix 20.4** in Volume 4 of the PEIR).
- 7.2.11 The drainage system for the fire training ground would be self-contained. Surface water runoff would discharge to soakaway unless real time monitoring determines the presence of contaminants. During fire training activities, surface water runoff would be diverted to a holding tank and would not drain to ground under any circumstances. Effluent generated from fire activities (containing foam and hydrocarbon breakdown constituents) would be directed into the existing public foul sewerage system (subject to the necessary consents) or tankered away for appropriate treatment.
- 7.2.12 The storage tanks at the new fuel farm area would be surrounded by a bund. Surface water would drain through petrol interceptors with sensors to measure water quality. If contamination trigger levels are exceeded, the water would be diverted away from the infiltration tank and towards the WTP. Following treatment, it would then be discharged to the treated infiltration tank. If a substantial leak occurred from the tanks, then the drainage would close completely and the fuel spill would be tankered off-site for treatment.
- 7.2.13 The installation of the drainage infrastructure in Phase 2a would ensure that any potential discharges to the underlying aquifer in Phases 2a and 2b would be treated appropriately. This would ensure that there are no measurable indirect impacts of the water quality of the River Lee in Phases 2a and 2b.
- 7.2.14 On the basis of the preliminary assessment, there would be no measurable impacts on the WFD status of the Lee (from Luton to Luton Hoo Lakes) and the achievement of the future objective defined for the waterbody during operation. Therefore, the operation of the Proposed Development in Phases 1, 2a and 2b would result in a **low adverse impact** on the Lee (from Luton to Luton Hoo Lakes) WFD waterbody.

Off-site works

- 7.2.15 The proposed off-site highway interventions in Phase 2a at the A1081 New Airport Way / B653 / Gipsy Lane and the Windmill Rd / Manor Rd / St. Mary's Rd / Crawley Green Rd (as described in **Chapter 4** of Volume 2 of the PEIR) are located on culverted sections of the River Lee in Phase 2a.
- 7.2.16 The drainage design for the additional off-site highway interventions has been developed and would be completed in accordance with contemporary standards of sustainable drainage design. This would provide improvements required to mitigate any potential changes to water quality as a result of the off-site highway interventions. Therefore, the operation of the off-site works would result in a **low adverse impact** on the Lee (from Luton to Luton Hoo Lakes)

River Mimram: Mimram (Whitwell to Codicote Bottom)

Construction

Main Application Site

- 7.2.17 As outlined in paragraphs **7.2.1 - 7.2.3**, the Draft CoCP and CSWMS will include measures and reference to appropriate guidance which would ensure no adverse impacts on surface water quality.
- 7.2.18 The processing and treatment of a portion of the former landfill waste prior to reuse in Phase 2a would provide the opportunity to remove potential sources of contaminants. This would result in a beneficial impact on the underlying aquifer. As the historic landfill is located within the Mimram groundwater catchment, this would lead to an indirect beneficial effect on the River Mimram.
- 7.2.19 The implementation of these measures during construction would ensure that there is no measurable impact on the WFD status of the Mimram (Whitwell to Codicote Brook) and the achievement of the future objective defined for the waterbody during construction. The beneficial impact on the Mimram (Whitwell to Codicote Brook) waterbody as a result of the processing and treatment of the former landfill waste is indirect and is not of a sufficient magnitude to result in any measurable impact on the WFD waterbody status and/or future objective at a waterbody scale. Therefore, the construction activities within the Main Application Site would result in a **low beneficial impact** on the River Mimram.

Operation

Main Application Site

- 7.2.20 The installation of the main drainage infrastructure during Phase 2a as described in paragraphs **7.2.7-7.2.13** would ensure that there are no measurable indirect impacts on the water quality of the River Mimram in Phases 2a and 2b as a result of changes to the groundwater quality in the underlying aquifer.
- 7.2.21 In Phases 2a and 2b, a capping layer would be provided for the extent of the historic landfill affected by operational activities to minimise surface water infiltration into the underlying waste and prevent generation of future landfill leachate. The majority of the capping layer would be installed during Phase 2a. The implementation of the capping layer on the landfill would result in a beneficial impact on the quality of the underlying aquifer. As the historic landfill is located within the Mimram groundwater catchment, this would lead to an indirect beneficial effect on the River Mimram.
- 7.2.22 The implementation of the capping layer on the landfill in combination with the installation of the main drainage infrastructure during Phases 2a and 2b, would result in beneficial impact on the WFD status of the Mimram (Whitwell to Codicote Brook) and the achievement of the future objective defined for the waterbody during operation. The beneficial impact on the Mimram (Whitwell to Codicote Brook) waterbody is indirect and is not of a significant magnitude to result in any measurable impact on WFD waterbody status and/or future objective at a waterbody scale. Therefore, the operational activities within the

Main Application Site would result in a **low beneficial impact** on the River Mimram.

River Hiz: Hiz (through Hitchin)

Construction

Off-site works

- 7.2.23 As outlined in paragraphs **7.2.1 - 7.2.3**, the Draft CoCP and CSWMS would include measures and reference to appropriate guidance which would ensure a **low adverse impact** on the Hiz (through Hitchin) during construction. This would be achieved through preventing potentially polluting matter from reaching the River Hiz.

Operation

Off-site works

- 7.2.24 The off-site highway interventions at A505 Moormead Hill / B655 Pirton Rd / Upper Tilehouse Street, A602 Park Way / A505 Upper Tilehouse Street, and A602 Park Way / Stevenage Road (as described in **Chapter 4** of Volume 2 of the PEIR) are located approximately 500m from the open channel of the River Hiz.
- 7.2.25 The drainage design for the additional off-site highway interventions will be completed in accordance with contemporary standards of sustainable drainage design. This would provide improvements required to mitigate any potential changes to water quality as a result of the off-site highway interventions. Therefore, the operation of the off-site works would result in a **low adverse impact** on the Hiz (through Hitchin).

Upper Lee Chalk

Construction

Main Application Site and off-site works

- 7.2.26 The Draft CoCP provided in **Appendix 4.2** in Volume 3 to this PEIR outlines the requirements for lead contractors to implement measures to avoid adverse impacts on the underlying aquifer during construction works. The key measures include:
- a. completion of groundwater monitoring and analysis in accordance with the Draft CoCP;
 - b. provision a Piling Risk Assessment in accordance with appropriate methodology in agreement with the Environment Agency;
 - c. use of appropriate measures in historic landfill mass to monitor and periodically remove leachate as required;
 - d. implementation of appropriate remediation measures as outlined in the Remediation Strategy (**Appendix 17.3** in Volume 3 of the PEIR);

- e. implementation of appropriate measures to control the mobilisation of contaminants to the underlying aquifer during construction;
- f. ongoing engagement with relevant local authorities and the Environment Agency regarding control or protection measures required during construction;
- g. validation testing of remediated ground or groundwater and preparation of appropriate reports;
- h. completion of a risk assessment and identification of mitigation measures to manage water consumption during construction. This would include agreement with the relevant statutory water undertaker;
- i. implementation of water efficiency measures to minimise water consumption; and
- j. monitoring of water consumption for construction activities.

7.2.27 The guidance outlined in paragraph **7.2.3** would also be applied to manage potential impacts on groundwater quality.

7.2.28 The processing and treatment of the former landfill waste prior to reuse in Phase 2a would provide the opportunity to remove potential sources of contaminants, this would result in a beneficial impact on the underlying aquifer.

7.2.29 The implementation of the measures outlined in the Draft CoCP and the processing and treatment of the former landfill waste during construction would result in a locally beneficial impact on the WFD status of the Upper Lee Chalk and the achievement of the future objective defined for the waterbody during construction. As the impact on the Upper Lee Chalk waterbody is not anticipated to affect the status class and/or future objective at a waterbody scale the impact is identified as **medium beneficial**.

Main Application Site

7.2.30 In Phase 1, surface water discharge from the proposed apron and existing, but reconfigured, long stay car park (P5) would be discharged to the existing central soakaway in the Main Application Site as shown in Overview Layout plan for 21.5 mppa provided in the Drainage Design Statement (**Appendix 20.4** in Volume 3 to the PEIR). Live monitoring of contaminants would be implemented to ensure no contaminated flows are directed to the central soakaway. If contaminants are identified, then discharges would be diverted to proposed storage tanks within the Main Application Site. These tanks would then be emptied in a controlled manner to the Thames Water foul network and would not discharge to ground.

7.2.31 The installation of the main drainage infrastructure during Phase 2a as described in paragraphs **7.2.7-7.2.13** would ensure that there are no measurable indirect impacts on the water quality of the Upper Lee Chalk in Phases 2a and 2b.

7.2.32 In Phases 2a and 2b, a capping layer would be provided for the extent of the historic landfill affected by the operation activities to minimise surface water infiltration into the underlying waste and prevent generation of future landfill

leachate. The implementation of the capping layer on the landfill would result in a beneficial impact on the quality of the underlying aquifer. The majority of the capping layer would be implemented in Phase 2a.

7.2.33 The implementation of the capping layer on the landfill in combination with the installation of the main drainage infrastructure during Phases 2a and 2b, would result in a locally beneficial impact on the WFD status of the Upper Lee Chalk and the achievement of the future objective defined for the waterbody during operation. As the impact on the Upper Lee Chalk waterbody is not anticipated to affect the status class and/or future objective at a waterbody scale the impact is identified as **medium beneficial**.

7.2.34 In line with the assessment methodology outlined in **Section 4**, a detailed assessment of the Proposed Development on the Upper Lee Chalk WFD waterbody would be completed to quantify this impact.

Off-site works

7.2.35 The drainage design for the additional off-site highway interventions has been developed and would be completed in accordance with contemporary standards of sustainable drainage design. This would provide improvements required to mitigate any potential changes to water quality as a result of the off-site highway interventions that could result in a measurable impact on the WFD waterbody status and the achievement of future objectives set at a waterbody scale. Therefore, the operation of the off-site works would result in a **low adverse impact** on the Upper Lee Chalk.

Step 2: Preliminary Assessment Summary

Table 7.2 Step 2: Preliminary Assessment Summary

WFD Waterbody	Preliminary assessment outcome	Screened in for detailed impact assessment? (Y/N)
River Lee: Lee (from Luton to Luton Hoo Lakes)		
Construction	Low adverse impact	N (Main Application Site and off-site works)
Operation	Low adverse impact	N (Main Application Site and off-site works)
River Mimram: Mimram (Whitwell to Codicote Bottom)		
Construction	Low beneficial impact	N (Main Application Site only)
Operation	Low beneficial impact	N (Main Application Site only)
River Hiz: Hiz (through Hitchin)		
Construction	Low adverse impact	N (Off-site works only)
Operation	Low adverse impact	N (Off-site works only)
Upper Lee Chalk		
Construction	Medium beneficial impact	Y (Main Application Site only)
Operation	Medium beneficial impact	Y (Main Application Site only)

7.2.36 In line with the assessment methodology outlined in paragraph 4.3.1, if the Proposed Development is identified as having a medium adverse/beneficial or high adverse/beneficial impact on a WFD waterbody at Step 2 then it will be screened in for detailed impact assessment at Step 3. Therefore, the detailed impact assessment (Step 3) will be undertaken for the Upper Lee Chalk (focused on the Main Application Site works) in the WFD Compliance Assessment prepared to accompany the ES.

GLOSSARY AND ABBREVIATIONS

Term	Definition
AWB	Artificial Water Bodies
BGS	British Geological Society
DCO	Development Consent Order
ES	Environmental Statement
EU	European Union
HEWRAT	Highways England Water Risk Assessment Tool
HWMB	Heavily Modified Water Bodies
PEIR	Preliminary Environmental Information Report
Principal aquifer	Layers of rock or drift deposits that have high fracture permeability and/or high intergranular meaning that they usually provide a high level of water storage and transmission.
RBD	River Basin District
RBMP	River Basin Management Plan
SuDS	Sustainable Urban Drainage Systems
WFD	Water Framework Directive

REFERENCES

- Ref 1 Secretary of State (2015) Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015
- Ref 2 Secretary of State (2017) Water Environment (WFD) (England and Wales) Regulation
- Ref 3 Department for Environment, Food and Rural Affairs (2016) Groundwater (Water Framework Directive) England Direction 2016
- Ref 4 Environment Agency (2015) Part 1: Thames river basin district River basin management plan [online] [Accessed 10th September 2021]
- Ref 5 Environment Agency (2018) *Catchment Data Explorer* [online] [Accessed 19th September 2021]
- Ref 6 Environment Agency (2019) 2021 River Basin Management Plan [online] [Accessed 19th September 2021]
- Ref 7 Highways England (2020) *LA113 – Road drainage and the water environment* [online] [Accessed 19th September 2021]
- Ref 8 CIRIA (2015) *The Sustainable Urban Drainage System (SuDS) Manual (C753)* [online] [Accessed 19th September 2021]
- Ref 9 CIRIA (2001) *Control of water pollution from construction sites: Guidance for consultants and contractors (C532)* [online] [Accessed 6th September 2021]
- Ref 10 Environment Agency (2019) Pollution prevention for businesses [online] [Accessed 6th September 2021]
- Ref 11 Environment Agency (2021) Report an environmental incident [online] [Accessed 6th September 2021]
- Ref 12 Environment Agency (2021) Discharges to surface water and groundwater: environmental permits [online] [Accessed 10th September 2021]
- Ref 13 Environment Agency (2020) Oil storage regulations for businesses [online] [Accessed 11th September 2021]
- Ref 14 Environment Agency (2021) Storing oil at your home or business [online] [Accessed 7th September 2021]
- Ref 15 Environment Agency (2021) Septic tanks and treatment plants: permits and general binding rules [online] [Accessed 10th September 2021]
- Ref 16 Environment Agency (2021) Check if you need permission to do work on a river, flood defence or sea defence [online] [Accessed 12th September 2021]
- Ref 17 Environment Agency (2015) Manage water on land: guidance for land managers [online] [Accessed 19th September 2021]