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CHAPTER 8

ENVIRONMENTAL STATEMENT

FLOOD RISK AND DRAINAGE

JULY 2021

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8.0 FLOOD RISK AND DRAINAGE

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CHAPTER 8

ENVIRONMENTAL STATEMENT

FLOOD RISK AND DRAINAGE

8.1 INTRODUCTION

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8.1 INTRODUCTION

8.1.1 This Chapter assesses the effects of the proposed development on Flood Risk and Drainage related matters.

8.2.1 This Chapter describes the methods used to assess the impacts, the baseline conditions currently existing at the Site and surroundings, the potential direct and indirect impacts of the development and the mitigation measures required to prevent, reduce or offset the impacts and the residual impacts. It has been written by BWB Consulting Ltd.

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8.2 PLANNING POLICY CONTEXT

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8.2 PLANNING POLICY CONTEXT

International/National Legislation

Flood and Water Management Act

8.2.1 The Flood and Water Management Act takes forward some proposals previously published by the UK Government: Future Water, making Space for Water and the UK Government's response to Sir Michael Pitt's Review of the summer 2007 floods.

8.2.2 The Act gives the Environment Agency the strategic overview of management of flood risk in England. It gives upper tier local authorities in England responsibility for preparing and putting in place strategies for managing flood risk from groundwater, surface water and ordinary watercourses in their areas.

8.2.3 Local flood authorities, district councils, internal drainage boards and highways authorities have a duty to aim to make a contribution towards sustainable development.

The Water Act

8.2.4 The Water Act 2014 implements changes to the water abstraction management system and regulatory arrangements to make water use more sustainable.

National Planning Policy Framework

8.2.5 Prepared by the Department for Communities and Local Government, the National Planning Policy Framework (NPPF) outlines the Government's planning policies for England.

8.2.6 Within the context of water quality, climate change, flooding and coastal change, the Government's objective set out in the NPPF is the support of a transition to a low carbon economy in a changing climate, taking full account of flood risk and coastal change. To achieve this objective, the planning system should aim to:

- secure reductions in greenhouse gas emissions;
- minimise vulnerability and provide resilience to effects arising from climate change;
- avoid new development in inappropriate areas at risk of flooding by directing it away from areas at highest risk or where development is necessary, making it safe without increasing flood risk elsewhere (part of the Sequential Test);
- reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical changes to the coast; and;
- protect and enhance valued landscapes, geological conservation interests and soils; prevent both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

8.2.7 The NPPF outlines how planning policy should meet the challenges of climate change, flooding and coastal change. It retains the ethos of steering new development to areas at the lowest risk of flooding.

8.2.8 It specifies that planning applications should demonstrate that development in flood prone areas can be made safe and will not increase flood risk elsewhere, through production of a site-specific flood risk assessment.

Sequential & Exception Tests

8.2.9 As set out in the NPPF, the aim of the Sequential Test is to steer new development to areas with the lowest probability of flooding. The Flood Zones are the starting point for this sequential approach. Flood Zones 2 and 3 are shown on the Environment Agency Flood Map for Planning with Flood Zone 1 being all the land falling outside Zones 2 and 3. These Flood Zones refer to the probability of sea and river flooding only, ignoring the presence of existing defences.

8.2.10 Environment Agency Flood Zone 3 (High Probability) is considered equivalent to Flood Zone 3a and is defined in the NPPF as land having a 1 in 100 or greater annual probability of river flooding or land having a 1 in 200 or greater annual probability of sea flooding. The NPPF also defines Flood Zones 2 and 1. These zones are identified as land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding or land having between a 1 in 200 and 1 in 1,000 annual probability of sea flooding, and land having a less than 1 in 1,000 annual probability of river or sea flooding respectively.

8.2.11 Strategic Flood Risk Assessments refine information on the probability of flooding, taking other sources of flooding and the impacts of climate change into account. They provide the basis for applying the Sequential Test, on account of the Flood Zones.

8.2.12 The overall aim should be to steer new development to Flood Zone 1. Where there are no reasonably available sites in Flood Zone 1, local planning authorities allocating land in local plans or determining planning applications for development at any particular location should take into account the flood risk vulnerability of land uses and consider reasonably available sites in Flood Zone 2. If, following application of the Sequential Test, it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate.

8.2.13 For the Exception Test to be passed:

- it must be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk, informed by a Strategic Flood Risk Assessment where one has been prepared; and
- a site-specific Flood Risk Assessment must demonstrate that the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall. Both elements of the test will have to be passed for development to be allocated or permitted.

8.2.14 The Planning Practice Guidance (PPG) to the NPPF provides additional guidance to local planning authorities to guide effective implementation of the NPPF on development in areas at risk of flooding. Table 1 of the PPG classifies each Flood Zone and allocates sequentially appropriate uses to each zone. Table 2 defines the flood risk vulnerability classification of different land uses.

8.2.15 Further guidance is also provided with regard to appropriate allowances for climate change and ways to manage residual flood risk.

Local Planning Policy

Local Plan

8.2.16 Plan:MK was adopted in March 2019. This sets out Milton Keynes Council's vision and framework for the future development of the area, addressing issues such as housing, the economy, infrastructure, the environment, adapting to climate change and securing good design for the period to 2031.

8.2.17 Plan:MK includes policies on managing and reducing flood risk through avoiding development in the floodplain, offering sustainable drainage solutions, and planning for climate change.

Strategic Flood Risk Assessment

8.2.18 A Strategic Flood Risk Assessment (SFRA) is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future.

8.2.19 The Milton Keynes Council Level 1 SFRA provides information on fluvial, surface water and groundwater flood risk, as well as records of historical flooding.

8.2.20 A key aim of a SFRA is to define flood risk management objectives and identify key policy considerations. The Level 1 SFRA makes a number of recommendations to help manage and reduce flood risk from new developments. These include:

- Use of the Sequential Test process to locate new developments in areas of lowest flood risk.
- Locate development away from rivers and watercourses and on low lying ground that could be used for future floodplain storage.
- Minimise new culverts or bridges over watercourses.
- Seek opportunities for development to reduce flood risk, such as through the provision of storm water attenuation and storage.
- Drainage and flood risk measures are to be designed in consideration of future climate change.

Preliminary Flood Risk Assessment

8.2.21 A Preliminary Flood Risk Assessment (PFRA) is an assessment of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff groundwater and ordinary watercourses and is prepared by Lead Local Flood Authorities (LLFA).

8.2.22 The Upper River Great Ouse Tri Lead Local Flood Authority PFRA for Bedford Borough Council, Central Bedfordshire Council and Milton Keynes Council considers flooding from surface water runoff, groundwater, ordinary watercourses and canals. It also references the historical river flooding which occurred in the local area.

Local Flood Risk Management Strategy

8.2.23 A Local Flood Risk Management Strategy (LFRMS) is prepared by a Lead Local Flood Authority to help understand and manage flood risk at a local level.

8.2.24 The LFRMS aims to ensure that the knowledge of local flood risk issues is communicated effectively so that they can be better managed. The LFRMS also aims to promote sustainable development and environmental protection.

8.2.25 The Milton Keynes LFRMS largely focuses on the Council's own objectives, but it includes a recommendation to ensure that drainage infrastructure for new development is future proofed for its design life measures to help manage and reduce flood risk.

Surface Water Management Plan

8.2.26 The Milton Keynes Surface Water Management Plan (SWMP) was prepared to understand the causes and effects of surface water flooding and establish a starting point for a long-term action plan to manage surface water in the most cost effective way. Surface water flooding in the SWMP describes flooding from sewers, drains, groundwater, runoff from land, ordinary watercourses and ditches that occurs as a result of heavy rainfall.

8.2.27 The SWMP identifies a number of Critical Drainage Catchments (CDC) where multiple or interlinked sources of flood risk cause flooding during a severe rainfall event thereby affecting people, property or local infrastructure.

8.2.28 The SWMP identifies a number of borough wide recommendations to be undertaken by Milton Keynes Council to help manage and reduce flood risk and the effects of climate change. These included the use of planning policies to manage the surface water runoff rates from new developments and promote the use of SuDS.

Other Relevant Policy, Standards and Guidance

8.2.29 C753 SuDS Manual provides best practice guidance on the planning, design, construction, operation and maintenance of SuDS to facilitate their effective implementation within developments.

8.2.30 C624 Development and Flood Risk – Guidance for the Construction Industry sets out practical guidance in assessing flood risk as part of the development process. It describes the mechanisms and impacts of flooding, whether caused by rivers, the sea, estuaries, groundwater, overland flow, artificial drainage systems or infrastructure failure. The guidance recommends a tiered approach to flood risk assessment and provides a toolkit to assist practitioners in completion of assessments. It covers UK planning policy guidance for development and flood risk and is aimed at achieving a consistent approach to the implementation of that guidance, which in turn should allow developments to be planned and designed more efficiently.

8.2.31 C532 Control of Water Pollution from Construction Sites – Guidance for consultants and contractors provides help on environmental good practice for the control of water pollution arising from construction activities. It focuses on the potential sources of water pollution from within construction sites and the effective methods of preventing its occurrence.

8.2.32 The Environment Agency Pollution Prevention Guidelines (PPG) provide a suite of guidelines related to pollution prevention in a number of different scenarios. Although these were revoked in December 2015, they have not been replaced and therefore should still be followed for best practice. For this project PPG5 and PPG6 are specifically applicable to prevent pollution of the watercourses and drainage ditches and also pollution incidents related to construction.

8.2.33 Flood Risk Assessments: Climate Change Allowances - The National Planning Policy Framework (NPPF) sets out how the planning system should help minimise vulnerability and provide resilience to the impacts of climate change. NPPF and supporting planning practice guidance on Flood Risk and Coastal Change explain when and how flood risk assessments should be used. This includes demonstrating how flood risk will be managed now and over the development's lifetime, taking climate change into account. Local planning authorities refer to this when preparing local plans and considering planning applications. This advice updates previous climate change allowances to support NPPF. The Environment Agency has produced it as the government's expert on flood risk.

8.2.34 Building regulations - The Department for Communities and Local Government is responsible for policy on Building Regulations. These exist to deliver safe, healthy, accessible and energy efficient buildings. Part H of the Building Regulations specifically covers drainage. It requires that surface water is infiltrated into the ground if practicable. If infiltration is not practicable, it should be disposed into a watercourse or, less preferably, to a surface water sewer. Disposal into a combined sewer is the last resort.

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8.3 ASSESSMENT METHODOLOGY

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8.3 ASSESSMENT METHODOLOGY

8.3.1 This assessment identifies the potential impacts of the proposed development on the Flood Risk and Drainage related matters. It determines the significance of the identified effects for the construction and operation phases.

8.3.2 The effects will be assessed against the Highways Agency's assessment guidance which can be found in the Design Manual for Road and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3, Part 10, HD45/09 Road Drainage and the Water Environment (Highways Agency, 2008).

8.3.3 DMRB methodology was developed for the assessment of highways projects and many of the criteria are developed around the results of highways specific assessment tools in the DMRB. Consequently, the assessment method is not followed in its entirety; only transferrable elements are adapted for use in this assessment. In addition, DMRB assessments are only required to present the residual significance of effects of any environmental impacts after proposed mitigation, which is only appropriate if the project being assessed is a Highways Agency managed scheme.

8.3.4 The assessment methodology has been adapted accordingly, as summarised below.

8.3.5 This Chapter has been supported by a Flood Risk Assessment which is provided as an appendix. The purpose of this report is to identify flood risk to the Site in its current condition, and how this may change with the Proposed Development. The FRA also considers future flood risk that will be brought about by climate change.

8.3.6 This Chapter is also supported by a Preliminary Surface Water Drainage Strategy, presented as Appendix 7 of the Flood Risk Assessment. This outlines the principles of the drainage design, including: consideration of local and national guidance; justification of specific flow rates; volumes of attenuated storage; designing to address climate change, and the level of treatment to be provided to surface water runoff.

Assessment of Significance

8.3.7 The significance of each effect has been measured through a qualitative assessment of the importance of receptors, magnitude of the effect and the significance of the effect.

8.3.8 The sensitivity of the resource is assessed according to Table 8.1 and considers the quality, rarity and sensitivity of the resource to change.

Table 8.1: Value and Sensitivity of Receptor

Designation	Definition
High	Resource of high sensitivity to change; with a high quality and rarity on a local scale; and/or medium quality on a regional or national scale with limited potential for substitution.
Medium	Resource with a medium quality and rarity on a local scale, and/or a low quality and rarity on a regional or national scale with limited potential for substitution.
Low	Resource with a low quality and rarity, local sale and limited potential for substitution.
Negligible	Resource of little or no interest.

8.3.9 The magnitude of a potential impact is estimated according to the likely effects and importance of a feature, as shown in **Table 8.2**.

Table 8.2: Magnitude of Impact

Designation	Definition
Major Beneficial	Results in a large improvement of the attribute's quality.
Moderate Beneficial	Results in a moderate improvement of the attribute's quality.
Minor Beneficial	Results in some beneficial impact on the attribute or a reduced risk of a negative impact occurring.
Negligible	Results in an impact on the attribute, but of insufficient magnitude to affect the use or integrity.
Minor Adverse	Results in some measurable change in the attribute's quality or vulnerability.
Moderate Adverse	Results in impact on integrity of the attribute, or loss of part of the attribute.
Major Adverse	Results in a loss of attribute and/or quality and integrity of the attribute.

8.3.10 The severity of a specific potential effect is derived from both the importance and sensitivity of the feature and magnitude of the impact. This has been addressed in the criteria for estimating the significance of potential effects in Table 8.3 as a function of the importance of the receptor and magnitude of the impact.

Table 8.3: Significance of Impacts

		Sensitivity of Resource			
		High	Medium	Low	Negligible
Magnitude of Impact	Major	Major	Major	Moderate	Negligible
	Moderate	Major	Moderate	Minor to Moderate	Negligible
	Minor	Moderate	Minor to Moderate	Minor	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

Limitations to assessment

8.3.11 This assessment is based on readily available data from the Environment Agency, Milton Keynes Council, Anglian Water, and the British Geological Survey (BGS), as well as a Ground Investigation Report prepared by RSK, the accuracy of which has not been verified. The data used to inform this Chapter is understood to be the latest available data.

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8.4 BASELINE CONDITIONS

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8.4 BASELINE CONDITIONS

8.4.1 There are a number of Main Rivers located within the local area. The Tongwell Brook is the nearest, located approximately 120m to the north of the Site, flowing south-west to north-east. The Great River Ouzel or Lovat is located approximately 600m to the east of the Site. This flows in a northerly direction.

8.4.2 The site is located wholly in Flood Zone 1 – land classified to be at a low probability of flooding from rivers and the sea. This Flood Zone designation is provided as part of the Environment Agency's Flood Map for Planning, and also within the SFRA for Milton Keynes. This classification is also confirmed by modelled flood level data provided by the Environment Agency which includes for the future increases in river flows brought about by climate change.

8.4.3 There are a series of ordinary watercourses located beyond the eastern boundary of the Site. These flow away from the Site and towards the River Ouzel or Lovat. Therefore, these also pose a low flood risk to the Site. These watercourses are part of a wider network of channels managed and maintained by the Bedford Group of Drainage Boards.

8.4.4 The site is underlain by Kellaways Formation and Peterborough member bedrock (Mudstone with beds of siltstone and sandstone). This is overlain by superficial deposits of Felmersham Member sands and gravels, Head Deposits of sandy silty clay, and Glaciolacustrine Deposits and sand gravel and clay. Made Ground is also present across the site. Groundwater strikes are reported to have been generally encountered at depths of over 2m, but two shallow strikes occurred at 1.6m and 0.9m – these may be associated with localised perched groundwater in the Made Ground. The flow of groundwater is reported to be generally towards the north and the Tongwell Brook.

8.4.5 The Site is located on an area of high ground between the Tongwell Brook and the River Ouzel or Lovat, and it is significantly elevated above the potential fluvial floodplain. Therefore, the risk of groundwater flooding is considered to be low.

8.4.6 Reservoir failure flood risk mapping has been prepared by the Environment Agency, this shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. The map displays a worst case scenario and is only intended as a guide.

8.4.7 The site is shown to be located partially within the potential failure floodplain of Tongwell Lake, a large waterbody which is located approximately 245m east of the site. Tongwell Lake is shown to be under the ownership and management of Anglian Water. Mapped flood depths are generally below 0.3m in the site, but they are shown to exceed 0.3m on the northern boundary.

8.4.8 The Milton Keynes Council SFRA states that 'All large reservoirs must be inspected and supervised by reservoir panel engineers. It is assumed that these reservoirs are regularly inspected and essential safety work is carried out. These reservoirs therefore present a managed risk.'

8.4.9 Based on the safety legislation in place and that Anglian Water are responsible for the management of maintenance and repair responsibilities, the actual probability of a complete failure is considered to be very low. Therefore, the risk from flooding is considered to be low.

8.4.10 The site is not currently served by foul and surface water drainage infrastructure.

8.4.11 Therefore, the site is likely to drain via a combination of natural infiltration and runoff to the surrounding area.

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8.5 POTENTIAL IMPACTS

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8.5 POTENTIAL IMPACTS

Construction Phase

8.5.1 The impacts associated with the construction phase of the Proposed Development are considered to be direct, temporary and short to medium term in length. The impacts prior to mitigation are described below.

8.5.2 The site is wholly located in Flood Zone 1 and removed from the present day and future floodplain extents associated with the nearest Environment Agency Main Rivers, it is also removed from the local ordinary watercourse network and is not subject to any significant overland surface water flow pathways. Consequently, construction works will not alter flood flows that could result in increased in flood risk elsewhere. The impact is considered to be **negligible**.

8.5.3 The use of heavy machinery on the site during the construction phase is likely to compact the soil. This can reduce infiltration rates; the movement of construction traffic could disturb the upper portions of the ground, leading to compaction, altering the degree of surface water infiltration. A reduction in infiltration rates may increase the volume and rate of runoff into local watercourses. The impact is considered to be **minor adverse** on a medium sensitivity resource.

8.5.4 Suspended soils are one of the most common causes of water pollution from construction sites. They emanate from excavations; exposed ground or stock piles; plant and wheel washing; build-up of dust and mud on roads; or pumping of contaminated surface waters of groundwater accumulated on the site. Extreme rainfall events could exacerbate runoff rates and the mobilisation of suspended solids have the potential to affect ecological habitats, block watercourses and alter flow regimes. Prior to mitigation, runoff containing suspended soils from construction work could have a **moderate adverse** impact on the local watercourse, on-site waterbody and local sewer network, considered to be a medium sensitivity resource.

8.5.5 Concrete production taking place on site or introduced by ready-mix lorries could cause small particulates to settle in the surrounding area. Wastewater from the batching plant or washing down of lorries/mixing areas could cause particulates to runoff into minor watercourses and waterbodies. The impact of this is considered to be **moderate adverse** prior to mitigation, on a medium sensitivity resource.

8.5.6 Oil, diesel and petrol are common construction site pollutants, caused by either spillages from fuel stored on the site or vehicles operating during the construction phase. Upon entering a watercourse or waterbody, hydrocarbons could lead to the build-up of a film on surface water, impacting on the oxygen content and effecting the aquatic ecosystem. Hydrocarbons have the potential to impact on watercourses and waterbodies and, prior to mitigation, is considered to have a **moderate adverse** impact on a medium sensitivity resource.

8.5.7 The uncontrolled release of substances such as solvents, cleaning agents, paints and other chemicals, liquids or solids could lead to further pollution. These could become a hazard if used in the construction process or stored on the site. These substances can be of high toxicity, thereby having a moderate adverse impact on surface water receptors, considered to be a medium sensitivity resource.

8.5.8 Due to the size of the development, there will be a heavy presence of construction staff during the development phase. There should be welfare facilities requiring sewage waste disposal, and this is considered to be negligible.

Operational Phase

8.5.9 The effects associated with the operation phase of the Proposed Development are considered to be direct, permanent and long term in length. The effects prior to mitigation are described below.

8.5.10 The site is wholly located in Flood Zone 1 and removed from the present day and future floodplain extents associated with the nearest Environment Agency Main Rivers, it is also removed from the local ordinary watercourse network and is not subject to any significant overland surface water flow pathways. Consequently, the built development will not be an impact on flood flows that could result in an increase in flood risk elsewhere. The effect is considered to be negligible.

8.5.11 An increase in the extent of impermeable surfacing brought about by the development has the potential to change the site's surface water runoff regime, as infiltration decreases and runoff increases. There is potential for runoff rates to increase, leading to a greater flood risk throughout the catchment unless suitably mitigated. The impact is considered to have a minor adverse effect on a medium sensitivity resource.

8.5.12 Following development at the site, there is potential for mundane activities such as vehicle and machinery movement to emit pollutants. Water discharged from road or trafficked areas could be of a lower quality, impacting on nearby watercourses and groundwater, considered to have a moderate adverse impact on a medium sensitivity resource.

8.5.13 The development of this Site will increase foul flows compared to the pre-development situation. The significance is considered minor adverse on a medium sensitivity resource.

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8.6 MITIGATION MEASURES

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8.6 MITIGATION MEASURES

Construction Phase

8.6.1 It is recommended that a Construction Environment Management Plan (CEMP) is prepared which will set out detailed methodologies and monitoring requirements of the measures below to prevent adverse effects on the water environment.

8.6.2 Construction Site security should be considered to reduce potential for vandalism which may result in contaminants reaching the water environment.

8.6.3 To reduce the impact on surface water rates as a result of soil compaction, the movement of larger vehicles will be restricted around the site or by creating a designated pathway for them to follow, reducing the area impacted.

8.6.4 The erosion of exposed topsoil (including the erosion of stockpiled materials), caused by either wind or rain, is of the primary sources of suspended solids and other contaminants. As a result, large areas of exposed topsoil or similar materials will be contained and covered/watered down where possible and when not in use.

8.6.5 Wheel washing facilities and/or regular sweeping will ensure the build-up of dust and silts on haul roads will be kept to a minimum. Wheel washing facilities will be kept in a designated bunded impermeable area and surplus surface water disposed via the foul water system or adequately treated prior to discharge into a local watercourse. These facilities should be located at least 10 metres from any surface waterbody.

8.6.6 Concrete should be mixed off site where possible. Should this not be practicable, wastewater from concrete production/wastewater from lorry washing should be limited to a designated area, to be bunded over an impermeable surface to prevent runoff/infiltration elsewhere. Wastewater should either be directed into the foul sewer network or adequately treated prior to discharging into a watercourse.

8.6.7 To avoid hydrocarbons reaching the water environment from vehicles or the accidental spillage of fuels, vehicles used on the site should be regularly inspected and maintained to reduce the risk of oil/fuel leakages. Vehicle washdown areas should be at least 10 metres from surface water bodies, and take place at bunded areas over impermeable surfacing, with runoff routed through oil interceptors and treated before discharge.

8.6.8 On-site refuelling activities should be undertaken in a bunded area over impermeable surfaces to prevent runoff and infiltration. The Environment Agency's Pollution Prevention Guidance should be followed, including the regular testing of storage tanks and pipes. Surface water from such areas should be routed through an oil separator prior to disposal.

8.6.9 Where oils or fuels are stored in bulk quantities on site, the storage facilities should be suitable for above ground oil storage tanks.

8.6.10 Drip trays under vehicles should be used where appropriate, allowing oil to be collected and contained.

8.6.11 To mitigate the additional loads from construction staff, connections to the public sewers from welfare facilities should be controlled by sewer connection notices to the sewerage undertaker, Anglian Water.

Operational Phase

8.6.12 Due to the elevated nature of the Site and the identified low flood risks, there is no specific requirement to set a minimum finished floor or threshold levels.

8.6.13 To mitigate any flood risk posed by surface water runoff from within the development and overland flows generated by the on-site drainage infrastructure during exceedance events, external levels should be profiled to fall away from the buildings and main access routes and towards the nearest drainage points. Threshold levels should be set above the surrounding external ground levels to provide further mitigation from any potential surface water runoff.

8.6.14 A Drainage Strategy Report has been produced to support the planning application at this location, this is appended to the Flood Risk Assessment.

8.6.15 It is proposed that runoff from the site is limited to the equivalent greenfield rate, as agreed with the Bedford Group of Drainage Boards, for events up to and including the 1 in 100-year plus climate change storm event. This will represent a reduction in the peak rate at which water is released into the wider catchment.

8.6.16 Water will be attenuated at the site prior to discharge using Sustainable Drainage Systems (SuDS), with storage provided up to the 1 in 100 year plus climate change event, using a combination of above and below ground features, including ponds and oversized pipes. The site is to be separated into sub-catchments for the purposes of surface water drainage, with attenuated storage provided for each catchment, such that runoff is captured and stored close to source.

8.6.17 A 40% climate change allowance is to be provided when sizing storage at the site, in accordance with national and local guidance. Limiting runoff from the site, and accommodating it on-site up to the aforementioned event, provides betterment over the current drainage regime.

8.6.18 The use of Sustainable Drainage Systems will also provide treatment prior to water leaving the site, as a result of provision of a suitable surface water management train. It is envisaged that this will include a combination of oil separators, catchpit manholes, filtration planting within ponds, and filter drains.

8.6.19 Foul water from the site will be drained separately to surface water and will directed to the Anglian Water Public sewers. Discussions with Anglian Water will be required to establish whether any reinforcement works are required within the public sewer network.

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8.7 RESIDUAL IMPACT ASSESSMENT

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8.7 RESIDUAL IMPACT ASSESSMENT

Construction Phase

8.7.1 During construction it is recommended that a Construction Environment Management Plan (CEMP) is prepared which will set out detailed methodologies and monitoring requirements to prevent adverse effects on the water environment and flood risk. As a result, there will be negligible residual impacts from the development during the construction phase.

8.7.2 Assuming welfare facilities are appropriately installed and managed at the site, there will be a negligible residual impact from the construction phase.

Operational Phase

8.7.3 The site is wholly located in Flood Zone 1 and removed from floodplain extents associated with the nearest Environment Agency Main River, it is also removed from the local ordinary watercourse network and is not subject to any significant overland surface water flow pathways. Therefore, the impact on flood risk is considered to be negligible.

8.7.4 The surface water drainage strategy will limit runoff from the site to the equivalent greenfield runoff rate, up to and including the 1 in 100-year storm including a 40% allowance for future climate change, and provide attenuation up to the same event. Moreover, SuDS will be installed to provide water quality benefits. Overall, the drainage strategy will have a minor beneficial impact.

8.7.5 Subject to any necessary reinforcement works, the impact on the foul water network is considered negligible.

CLIMATE CHANGE

8.7.6 Consideration of the potential implications of future climate change has been incorporated into this assessment. Specifically, the site has been shown to fall outside of floodplain with increased river flows, and the mitigation measures have been designed to ensure the Proposed Development will remain safe for its lifetime without increasing flood risk to third party land, due to the below measures.

- It is proposed that runoff from the site is limited to the equivalent greenfield runoff rate up to include the 100-year plus climate change runoff rate, reducing the rate at which water is released into the wider catchment.
- Water will be attenuated at the site prior to discharge using Sustainable Drainage Systems, with storage provided up to the 1 in 100 year plus climate change event.

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8.8 CUMULATIVE IMPACT ASSESSMENT

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8.8 CUMULATIVE IMPACT ASSESSMENT

8.8.1 It is anticipated that local schemes undertaken in the vicinity of the application Site, as set out in Chapter 13, are or will be subject to the same national and local guidance on Flood Risk and Drainage. Consequently, there are unlikely to be any cumulative impacts.

8.8.2 It is assumed that mitigation implemented for neighbouring schemes will be undertaken to this standard, hence there should be no need for cumulative mitigation measures.

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8.9 CONCLUSIONS

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8.9 CONCLUSIONS

8.9.1 It is considered that any potential effects arising from both the construction and operational phases of the development will be negligible or minor beneficial following the implementation of the appropriate mitigation.

REFERENCES

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2. HM Government, The Water Act 2003, HMSO, 2003

3. HM Government, National Planning Policy Framework, HMSO, July 2021

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