11. Hydrology

11.1 Introduction

11.1.1 MVV Environment Limited (the Applicant) has submitted a full planning application for a Carbon Capture Retrofit Ready (CCRR) Energy from Waste Combined Heat and Power (EfW CHP) Facility at Canford Resource Park (CRP), off Magna Road, in the northern part of Poole. Together with associated CHP Connection, Distribution Network Connection (DNC) and Temporary Construction Compounds (TCCs), these works are the Proposed Development.

11.1.2 The primary purpose of the Proposed Development is to treat Local Authority Collected Household (LACH) residual waste and similar residual Commercial and Industrial (C&I) waste from Bournemouth, Christchurch, Poole and surrounding areas, that cannot be recycled, reused or composted and that would otherwise be landfilled or exported to alternative EfW facilities further afield, either in the UK or Europe.

11.1.3 The Proposed Development will recover useful energy in the form of electricity and hot water from up to 260,000 tonnes of non-recyclable (residual), non-hazardous municipal, commercial and industrial waste each year. The Proposed Development has a generating capacity of approximately 31 megawatts (MW), exporting around 28.5 MW of electricity to the grid. Subject to commercial contracts, the Proposed Development will have the capability to export heat (hot water) and electricity to occupiers of the Magna Business Park and lays the foundations for a future CHP network to connect to customers off Magna Road.

11.1.4 The location and the extent of the Proposed Development is identified by the Red Line Boundary shown on **Figure 1.1**. In total, the Proposed Development covers an area of 10.1 hectares (Ha).

11.1.5 A full description of the Proposed Development is provided in **ES Chapter 3: Description of the Proposed Development**. A list of terms and abbreviations can be found in **ES Appendix 1.1**.

11.1.6 This Chapter of the ES has been produced by Waterman Infrastructure and Environment (WIE) to assess the Proposed Development in relation to the effects it would have upon Hydrology.

11.1.7 This Chapter presents an assessment of the likely significant effects of the Proposed Development on flood risk and surface water drainage, together with the likely significant effects of the Proposed Development on the capacity of foul and potable water supply infrastructure. The likely significant effect on groundwater quality resulting from potential ground contamination is assessed separately in **ES Chapter 9: Geology, Hydrogeology and Ground Conditions**.

11.1.8 This Chapter is supported by **ES Appendix 11.1,** the Flood Risk Assessment and Drainage Strategy, provided in Volume 2 of this ES.

11.2 Assessment Criteria & Methodology

Previous Assessment

11.2.1 No previous flood risk assessments (FRAs) or drainage strategies of relevance have been undertaken for the Proposed Development.

11.2.2 A surface water management plan was produced for the adjacent Whites Pit landfill site:

- Surface water management proposals related to the proposed extension to New Earth Solutions' fully enclosed composting facility at Canford Poole Dorset, March 2008, Report No 6358/ACD/CH/R01, Author: Graham Garner and Partners Limited (Appendix D of FRA (**ES Appendix 11.1**)

11.2.3 Two land quality assessments have been completed for the Proposed Development, as follows:

- Phase 1: Contaminated Land & Geotechnical Desk Study Report, September 2022, Report No. EX-21-001/P1, Author: Terra Firma (south) *FINAL ISSUE* (**ES Appendix 9.1**); and
- Ground Investigation Report, November 2022, Report No. EX-21-001/GIR, Author: Terra Firma (south) Revision 02 *FINAL ISSUE* (**ES Appendix 9.2**).

Legislative Context, Technical Guidance and Best Practice

Legislative Context

11.2.4 This Section details legislation, national and local policies and guidance affecting this Proposed Development pertaining to hydrology.

National Planning Policy Framework

11.2.5 The National Planning Policy Framework (NPPF) 2022[1] states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk (whether existing or future). Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere.

11.2.6 The aim of the Sequential Test is to steer new development to areas with the lowest risk of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding.

11.2.7 If it is not possible for development to be located in zones with a lower risk of flooding (considering wider sustainable development objectives), it may be necessary to demonstrate through the Exception Test that:

- the development would provide wider sustainability benefits to the community that outweigh the flood risk; and
- 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.

11.2.8 The NPPF states that when determining planning applications, LPAs should ensure that flood risk is not increased elsewhere. Where appropriate, applications should be supported by a site-specific Flood Risk Assessment (FRA). Development should only be allowed in areas at risk of flooding where it can be demonstrated that:

- within the Proposed Development, the most vulnerable development is located in areas of lowest flood risk, unless there are overriding reasons to prefer a different location;

[1] Ministry of Housing, Communities & Local Government (2021): 'National Planning Policy Framework'.

- the development is appropriately flood resistant and resilient;
- it incorporates Sustainable Drainage Systems (SuDS), unless there is clear evidence that this would be inappropriate;
- any residual risk can be safely managed; and
- safe access and escape routes are included where appropriate, as part of an agreed emergency plan.

11.2.9 Major developments should incorporate SuDS unless there is clear evidence that this would be inappropriate. The systems used should:

- take account of advice from the Lead Local Flood Authority (LLFA);
- have appropriate proposed minimum operational standards;
- have maintenance arrangements in place to ensure an acceptable standard of operation for the lifetime of the development; and
- where possible, provide multifunctional benefits.

11.2.10 Flood risk vulnerability is split into five classifications in Annex 3 of the NPPF as follows:

- essential Infrastructure, e.g., essential transport and utility infrastructure, wind turbines;
- highly Vulnerable, e.g., emergency services (those required to be operational during flooding), basement dwellings;
- more Vulnerable, e.g., residential dwellings, hospitals, schools, hotels, drinking establishments;
- less Vulnerable, e.g., retail, offices, storage and distribution, leisure, restaurants; and
- water-Compatible Development, e.g., docks, marinas, wharves.

Planning Practice Guidance

11.2.11 The Planning Practice Guidance (PPG)[2] provides additional guidance to LPAs to ensure effective implementation of the planning policies set out within the NPPF regarding development in areas at risk of flooding. An update to the PPG that affects site-specific FRAs is in force from 25 August 2022. This includes the updates as follows:

- Flood Zone 3b is now defined as 1 in 30 (3% AEP) rather than 1 in 20 (5% AEP) – this could restrict land available for development on policy grounds;
- lifetime of commercial development is now assumed at 75 years – this is likely to require an increase in climate change allowance;
- the “design flood” now includes the 1 in 100 (1% AEP) pluvial/surface water flood event, which must also be accounted for when assessing access and egress routes;
- evacuation procedures need to consider the 1 in 1,000 (0.1% AEP) extreme flood; and
- inclusion of a new "non-major" category of development that sits between minor/permitted and major.

11.2.12 The PPG states that developers and LPAs should seek opportunities to reduce the overall level of flood risk in the area and beyond, through the layout and form of the development,

[2] Ministry of Housing, Communities and Local Government, March 2014. Planning Practice Guidance (updated August 2021)

and the appropriate application of SuDS. Referencing information provided by the Environment Agency (EA), the PPG provides advice on taking account of climate change, setting out recommended contingency allowances for net sea level rise and peak rainfall intensities. It also advises on flood resilience and resistance measures when dealing with the residual risks remaining after applying the sequential approach and mitigating actions.

11.2.13 The PPG also includes advice on flood risk vulnerability and flood zone compatibility. The following flood zones refer to the probability of river and sea flooding, without the presence of defences:

- Zone 1 - low probability: less than 1 in 1000 annual probability of river or sea flooding (<0.1%) in any year;
- Zone 2 - medium probability: between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% to 0.1%) or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% to 0.1%) in any year;
- Zone 3a - high probability: 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability flooding from the sea (>0.5%) in any year; and
- Zone 3b - the functional floodplain: where water has to flow or be stored in times of flood; identification should take account of local circumstances but would typically flood with an annual probability of 1 in 30 (3.3%) or greater in any year or is designed to flood in an extreme 1 in 1,000 (0.1%) flood.

Non-statutory Technical Standards for Sustainable Drainage

11.2.14 The Non-Statutory Technical Standards for Sustainable Drainage Systems[3] was published in March 2015 and is the current guidance for the design, maintenance and operation of SuDS.

11.2.15 The standards set out that the peak runoff rate should be as close as is reasonably practicable to the greenfield rate but should never exceed the pre-development runoff rate.

11.2.16 The standards also set out that the drainage system should be designed so that flooding does not occur on any part of the Proposed Development for a 1 in 30-year rainfall event, and that no flooding of a building (including basement) would occur during a 1 in 100 year rainfall event.

11.2.17 It is also noted within the standards that pumping should only be used when it is not reasonably practicable to discharge by gravity.

Water Industry Act

11.2.18 Wessex Water is the local Sewerage Undertaker and provides sewerage services under the guidance of the Water Industry Act 1991.

11.2.19 Under Section 106 of the Water Industry Act, the developer currently maintains the automatic right to ‘communicate’ with the public foul water sewer system.

[3] Department for Environment, Food and Rural Affairs, March 2015. Non-statutory technical standards for sustainable drainage systems

The Development Plan

11.2.20 A BCP Local Plan is currently being prepared by BCP Council. The adopted Poole Local Plan[4] was adopted in June 2018 and sets out the proposals for how Poole will grow and develop up until 2033. The Local Plan contains a set of policies that will govern development in the Borough, which is now part of the wider BCP Council administrative area. The key policies relating to this Chapter are summarised below. Development proposals within the current and future flood risk zones, or areas at risk from ground or surface water flooding will be required to undertake a FRA, based on advice set out in PPG and which should be proportionate to the scale and nature of the development proposed. A revised Strategic Flood Risk Assessment (2017) for Poole provides additional guidance on FRAs, as considered later in this Chapter.

Poole Local Plan Policy PP38 Managing Flood Risk

11.2.21 *Sustainable Drainage Systems* - Sustainable Drainage Systems will be required for all major developments, unless the relevant Surface Water Management Plan indicates otherwise or they are demonstrated to be impractical. Proposals should be appropriate to the location and designed to manage surface water run-off in accordance with the appropriate technical standards (Department for Environment, Food and Rural Affairs (Defra): Non-statutory technical standards for sustainable drainage systems (2015)).

BCP Council SFRA Explanatory Note

11.2.22 According to BCP Council's explanatory note[5], BCP Council is currently preparing a BCP-wide SFRA to inform the emerging BCP Local Plan. However, until the BCP SFRA is completed, the SFRAs produced by the legacy authorities will apply, taking account also of the EA flood map updates published since the legacy authority SFRAs were produced. In December 2021, the BCP Council published an explanatory note to give specific guidance for each of the legacy authorities, as detailed below.

11.2.23 Pending completion of the BCP SFRA, the legacy authorities' SFRAs continue to provide a comprehensive and robust flood risk evidence base, which will support the production of the emerging BCP Local Plan and the selection of site allocations within it and guides day-to-day development management decisions. This is done through the application of the 'Sequential Test' and the 'Exception Test'. National planning guidance further advocates a tiered approach to flood risk assessment and identifies two levels of the SFRA:

- Level 1: where flooding is not a major issue and where development pressures are low. The assessment should be sufficiently detailed to allow application of the Sequential Test.
- Level 2: where land outside Flood Zones 2 and 3 cannot appropriately accommodate all the necessary development creating the need to apply the NPPF's Exception Test. In these circumstances the assessment should consider the detailed nature of the flood characteristics within a Flood Zone and assessment of other sources of flooding.

11.2.24 The NPPF states that it should not normally be necessary to apply the Sequential Test to development proposals in Flood Zone 1 (land with a low probability of flooding from rivers or the sea), unless the SFRA for the area, or other more recent information, indicates there may be flooding issues now or in the future (for example, through the impact of climate change) (NPPG (para 033)). It should therefore be noted that even in areas at low risk of flooding (Flood Zone 1), there may be circumstances where the Sequential Test may need

[4] Borough of Poole Local Plan, November 2018. The Poole Local Plan.
[5] BCP Strategic Flood Risk Assessment Explanatory Note, December 2021.

to be applied, for example, where other sources of flood risk to a proposed development are identified.

Poole 2017 Revised SFRA Levels 1 and 2

11.2.25 Pending completion of the consolidated BCP SFRA, the currently adopted SFRA is the Poole 2017 Revised SFRA Levels 1 and 2[6]. For applications where the proposed development boundary (defined by a red line on the site plan accompanying a planning application), includes areas of Flood Zones 1 and 2 and/or 3 and the year 2133 Future Flood Risk Zone, the consideration of whether the application of the Sequential Test will apply will depend on the nature and layout of the development proposed.

11.2.26 Where more vulnerable uses, such as housing, are proposed to be in Flood Zones 2 and 3 or the 2133 Future Flood Risk Zone, then the whole site would be subject to the Sequential Test.

11.2.27 Where more vulnerable uses can be accommodated in areas of the site at low risk of flooding and where safe access and egress can be secured throughout the lifetime of the development, a site-specific FRA will be required that addresses any residual flood risk issues.

11.2.28 The Proposed Development is in Flood Zone 1 and outside the 2133 Future Flood Risk Zone.

Guidance Best Practice

11.2.29 SuDS design should follow the guidance provided in the CIRIA SuDS Manual[7], with due regard for any national or local regulatory requirements. SuDS design should, as much as possible, be based around the following:

- using surface water as a resource;
- managing rainwater close to where it falls;
- managing runoff on the surface;
- allowing rainwater to soak into the ground;
- promoting evapotranspiration;
- slowing and storing runoff to mimic natural runoff characteristics;
- reducing contamination of runoff through pollution prevention and controlling the runoff at source; and
- treating runoff to reduce the risk of urban contaminants causing environmental pollution.

Baseline Data Collection

11.2.30 The FRA and the Drainage Strategy (**ES Appendix 11.1**) and Ground Investigation Report (**ES Appendix 9.2**) were used to inform the baseline conditions of the Proposed Development and likely significant effects of the Proposed Development on surface water resources and flood risk. These reports were undertaken in accordance with the NPPF and

[6] Poole Local Plan, Managing Flood Risk, Revised Strategic Flood Risk Assessment Levels 1 and 2, November 2017. *Poole 2017 Revised SFRA Levels 1 and 2*

[7] CIRIA, 2017. *The SuDS Manual (C753)*. Available at: https://www.ciria.org/ItemDetail?iProductCode=C753F&Category=FREEPUBS

in consultation with statutory consultees including BCP Council, the EA and Wessex Water. A summary of the methodology is provided as follows. Full details are provided in **ES Appendix 11.1**.

11.2.31 A desk-based review of the Proposed Development and its surroundings was undertaken to identify likely sensitive receptors. This used aerial photography, ground conditions records and other available online information.

11.2.32 Assessments made through the desk-based review were confirmed by a Site visit on 20 June 2022.

11.2.33 The following searches were undertaken, and documents reviewed to establish the baseline conditions within the study area:

- Groundsure Enviro Insight Report (including geological records and historic mapping information, procured December 2021);
- British Geological Survey (BGS), 1:50,000 scale Geological Maps;
- DEFRA Online MAGiC geographic information viewer - https://magic.defra.gov.uk/MagicMap.aspx;
- EA flood map for planning, flood risk from surface water mapping, flood risk from reservoirs mapping;
- Wessex Water pre-planning enquiry (included within **ES Appendix 11.1**);
- a review of relevant local planning policy documents including Poole SFRA (2017) and associated mapping;
- application documents for the wider CRP and White's Pit landfill site;
- Ordnance Survey (OS) maps, topographical surveys and British Geological Society (BGS) maps;
- on-site surface water drainage records to review the existing drainage infrastructure; and
- consultation with Wessex Water to obtain sewer records.

Predicting Effects

Flood Risk Assessment

11.2.34 A FRA (refer to **ES Appendix 11.1**) has been undertaken in accordance with the requirements of the NPPF and the accompanying technical guidance[8]. The purpose of the FRA is to identify all potential sources of flooding at the Proposed Development, determine the risk posed by these flooding sources to the Proposed Development and to predict the likely effect on flood risk that the Proposed Development poses to surrounding receptors. Tidal, fluvial, pluvial (surface water), sewer, groundwater and artificial flood risks have been considered in the FRA, with allowances made for the likely effects of climate change, where relevant.

[8] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2021): 'Planning Practice Guidance – Flood Risk and Coastal Change'.

Drainage Strategy

11.2.35 Consideration is also given in the FRA to surface water drainage to ensure the Proposed Development does not increase the risk of flooding at off-site locations. Accordingly, a drainage strategy for the Proposed Development has been prepared by Waterman (refer to **ES Appendix 11.1**). This sets out the proposed surface water runoff rates, together with the type and volume of attenuation proposed. The drainage strategy has been used to inform the FRA and the qualitative assessment presented in this Chapter, which has been based on professional judgement.

11.2.36 The foul water flow rates of the Proposed Development have been calculated. Based on the calculated foul water discharge rates of the Proposed Development a qualitative assessment has been undertaken using professional judgement to assess the likely significant effects of the Proposed Development on foul water capacity.

Potable Water Demand

11.2.37 A qualitative assessment of the likely significant effects of increased demand on the capacity of potable water supply infrastructure at the Proposed Development has been undertaken. The assessment is based upon available published information from Bournemouth Water and calculations of the Proposed Development's likely potable water demand prepared by the Applicant (**ES Appendix 11.2**).

Significance Criteria

11.2.38 **Table 11-1** includes the criteria used for the classification of the receptors, whilst **Table 11-2** provides the criteria to determine the magnitude of change.

11.2.39 In accordance with the EIA Methodology, the relative significance of the likely and residual effects considered in this Chapter are based upon the scale of significance presented in Table 01-1**Table 11-3**. Note, effects that are assessed as Moderate or greater (either beneficial or adverse) are assessed as significant in EIA terms, while anything assessed as Moderate/Minor or lesser are assessed as insignificant.

Table 01-1 Receptors Sensitivity Criteria

Receptor	Sensitivity	Commentary
Surface and foul water sewers	Low	Private drainage infrastructure in rural areas
	Medium	Private drainage infrastructure in urbanised areas
	High	Public drainage infrastructure in urbanised and rural areas
Water mains	Low	Private water supply infrastructure in rural areas
	Medium	Private water supply infrastructure in urbanised areas
	High	Public water supply infrastructure in urbanised and rural areas
Aquifer	Low	Non-productive strata
	Medium	Secondary Aquifer
	High	Principal Aquifer

Receptor	Sensitivity	Commentary
Flood risk receptors	Low	Rural artefacts
	Medium	Commercial properties / Construction site
	High	Residential properties

Table 01-2 Magnitude of Change

Significance Criteria	Description of Criteria
Unchanged	• No appreciable change in flood risk. • No change to demand surface and/or foul water infrastructure. • No change to demand on the capacity of water supply and the existing water supply infrastructure. • No change in the controlled water quality.
Low	• Minor local-scale increases/reductions in flood risk. • Increase in surface and/or foul water discharge which would require modifications to existing infrastructure. • Temporary local scale reduction in demand on surface and/or foul water infrastructure. • Increase in water supply which would place additional pressure on existing local supplies and existing water supply infrastructure. • Temporary local scale reduction in water supply demand and temporary increase in the capacity of existing infrastructure. • Minor change in the controlled water quality.
Medium	• Moderate local-scale or minor regional-scale increases/reductions in flood risk. • Increase in surface and/or foul water discharge which would place undue pressure on existing infrastructure. • Minor permanent reduction in demand on surface and/or foul water infrastructure. • Increase in water supply which would place undue pressure on existing local supplies and existing water supply infrastructure. • Permanent local scale reduction in water supply demand and permanent increase in the capacity of existing infrastructure. • Moderate change in the controlled water quality.
High	• Significant local-scale or moderate to significant regional-scale • increases/reductions in flood risk. • Increase in surface and/or foul water discharge which would require new Infrastructure. • Major permanent reduction in demand on surface and/or foul water infrastructure. • Increase in water supply which would exceed the water resource capacity of the region and therefore require new sources e.g., application of an abstraction licence. • Permanent regional scale reduction in water supply demand and permanent • increase in the capacity of existing infrastructure. • Major change in the controlled water quality.

Table 01-3 Significance of the Effects Criteria

	Magnitude of the Impacts			
Receptors Sensitivity	**High**	**Medium**	**Low**	**Unchanged**
High	*Major*	*Moderate*	*Moderate/Minor*	*Insignificant*
Medium	*Moderate*	*Moderate*	*Minor/Insignificant*	*Insignificant*
Low	*Moderate*	*Minor*	*Insignificant*	*Insignificant*

Geographical Scope

11.2.40 The FRA considers flood risk within the Proposed Development's Red Line Boundary, as set out in **Figure 1.1** and the immediate surrounding area. However, for consistency across the EIA, this Chapter also considers any wider effects to surrounding rivers and developments. The geographical scope is defined as follows:

- 'Local' effects are those affecting neighbouring receptors;
- 'District' effects are those which are likely to occur to receptors within the Poole area;
- 'Sub-regional' effects are those affecting Poole and nearby towns;
- 'Regional' effects are those affecting receptors across Dorset; and
- 'National' effects are those affecting receptors within the UK.

Temporal Scope

11.2.41 The general approach to temporal and geographical extent of potential effects is reproduced below.

- 'Short' to 'medium-term' effects are considered to be those associated with the site preparation and construction works; and
- 'Long-term' effects are those associated with the completed and operational EfW CHP Facility.

Consultation

11.2.42 Wessex Water were consulted in a pre-planning enquiry in November 2022, to assess the capacity of their foul sewer network to receive flows from the Proposed Development (refer to **ES Appendix 11.1**). They have supplied an asset map and confirmed that further capacity appraisal and a detailed process review is required to understand the scope of the improvement works. Further consultation will be undertaken post planning.

11.2.43 An EIA Scoping Opinion was requested from BCP Council in April 2022 (see **ES Appendix 5.1**). A Scoping Opinion was received in October 2022 (see **ES Appendix 5.2**). This set out that officers accepted the conclusions that impacts on hydrology and the water environment should be scoped into the ES as summarised in **Table 11-4** below. The likely significant effects identified were agreed and it is shown below where each of these are addressed.

Table 01-4 Summary of EIA Scoping Opinion Comments

ID	BCP Scoping Opinion Comments	Where is it addressed in the EIA
W01	The scoping opinion noted that the Proposed Development should employ SuDS and note the Flood Water Management Act (2010) within the submission.	**ES Appendix 11.1** FRA and Drainage Strategy, Section 4
W02	The scoping opinion required that the assessment on surface water runoff should include any alterations to site access required, including the shared roads off Magna Road.	**ES Appendix 11.1** FRA and Drainage Strategy, Section 4
W03	Impacts on surface water quality – water discharges from the Proposed Development could have a potential significant effect on the surface water quality environment (Knighton Stream and the River Stour). This could also come from uncontrolled surface runoff from areas in the Proposed Development that may be affected by contaminants.	**ES Appendix 11.1** FRA and Drainage Strategy, Table 4
W04	Impacts on conveyance within surface watercourses – the CHP Connection and DNC Corridor crossing of Knighton Stream could reduce the conveyance within this watercourse and cause an increase in flood risk to nearby receptors.	**Section 11.5.6** of this Chapter
W05	Impacts on runoff from the Proposed Development – the increase in impermeable surfaces could result in increased runoff from the Proposed Development which would increase flood risk to nearby receptors.	**ES Appendix 11.1** FRA and Drainage Strategy, Section 4.10 to 4.12
W06	Impacts on runoff from nearby sites – The replacement of the existing surface water sewer running through the Proposed Development could result in increased runoff from the wider CRP and White's Pit sites which would increase flood risk to nearby receptors.	**ES Appendix 11.1** FRA and Drainage Strategy, Section 3.4 to 3.8
W07	Impacts on groundwater quality – Uncontrolled water discharges from the Proposed Development into the potentially permeable subsurface geology could have a significant effect on the groundwater quality environment.	**ES Appendix 11.1** FRA and Drainage Strategy, Section 3.14 to 3.15
W08	Impacts on the foul sewer system – The Proposed Development would result in an increase in foul water flows into the wider CRP and public sewer network, potentially requiring upgrade and/or reinforcement works.	**ES Appendix 11.1** FRA and Drainage Strategy, Section 5
W09	The design of the CHP connections under Knighton Stream will be informed by BCP Council's requirements.	**ES Chapter 3: Description of The Proposed Development**
W10	A surface water drainage strategy will be developed that ensures that discharges of runoff from the Proposed Development would be in line with local and national policy requirements. Sufficient treatment would be included in the strategy to ensure that surface or groundwater quality does not deteriorate post-development. It will also ensure that runoff from the wider CRP and White's Pit does not increase.	**ES Appendix 11.1** FRA and Drainage Strategy, Section 4

ID	BCP Scoping Opinion Comments	Where is it addressed in the EIA
W11	Capacity checks will be carried out on both the private and public sewer systems and upgrades carried out as required.	**Appendix 11.1** FRA and Drainage Strategy and **Table 11-5** of this Chapter

Assumption and Limitations

11.2.44 The assessment relies on available data, and best endeavours have been made to ensure that the data is accurate and up to date. It is assumed that information received from the EA and Wessex Water is accurate and up to date. Notwithstanding this, the methodology is considered robust, utilising reasonably available information, and conforms to the requirements of local and national guidance and planning policy.

11.2.45 The information and conclusions contained in this Chapter are based on the findings of the Terra Firma (South) Phase 1 desk top study, Phase 2 ground investigation report (**ES Appendix 9.1** and **ES Appendix 9.2**, respectively) and EA mapping.

11.2.46 The conclusions resulting from these assessments are not necessarily indicative of future conditions or operating practices at or adjacent to the Proposed Development.

11.3 Baseline Conditions

Current Baseline

Watercourses

11.3.1 The Proposed Development is located in the catchment of the River Stour which flows in a south easterly direction, approximately 1.8km to the north east of the Proposed Development. The River Stour is designated as a Main River by the EA.

11.3.2 Knighton Stream flows from south-west to north-east approximately 180m south-east of the main body of the Proposed Development. It is crossed by the proposed CHP Connection Corridor and DNC corridor. As an ordinary watercourse, this comes under the jurisdiction of BCP Council.

11.3.3 A further surface water sewer from the White's Pit landfill site runs through the Proposed Development from the northwest and leaves the Proposed Development Boundary at an outfall in the south-east corner. This has been incorporated into the surface water drainage strategy, detailed in the drainage section of the current baseline conditions.

Flood Risk

11.3.4 According to the EA Flood Map for Planning (in **ES Appendix 11.1**), all of the Proposed Development within the Red Line Boundary) is shown to be located wholly within Flood Zone 1, denoting a less than 0.1% annual probability of flooding and as such is classified as being at low risk of fluvial and tidal flooding.

11.3.5 The EA Surface Water Flood Maps (in **ES Appendix 11.1**) show various areas at risk of surface water flooding between very low (less than 0.1% annual probability) and high risk (greater than 3.33% annual probability). There are areas at high and medium risk (between 3.33% and 1% annual probability) located in the south-western half of the Proposed

Development, however this is associated with an historic surface water attenuation pond associated with White's Pit landfill that has been filled. There are some areas at medium and low (between 1% and 0.1% annual probability) risk of surface water flooding on the north-eastern part of the Proposed Development. These are areas of ponding associated with the hard standing located in this area.

11.3.6 In TCC1, the eastern boundary has an area at low risk of flooding from surface water and there is an area of high risk (greater than 3.33% annual probability) on the existing entrance road at the easternmost part of the Proposed Development within the Proposed Development Boundary. This area shows depths of 150-300 mm in the high-risk scenario in **ES Appendix 11.1**.

11.3.7 On the route to TCC2 (also on the DNC Connection route), where it crosses Knighton Stream, there is a medium risk of surface water causing overtopping onto the track. This area shows depths of 150-300mm in the medium risk scenario in **ES Appendix 11.1**.

11.3.8 The DNC Compound is at very low risk of surface water flooding.

11.3.9 As detailed in the Ground Investigation Report by Terrafirma (South) in September 2022 (**ES Appendix 9.2**), post investigation monitoring has confirmed groundwater levels between 4.20m and 7.43m below ground level, which is considered relatively low. The BCP Council SFRA mapping indicates that the Proposed Development is located in an area with greater than 50% to 75% susceptibility to groundwater flood emergence. A review of the SFRA geology mapping and the BGS online Geology of Britain indicate that the Proposed Development is underlain by the Poole Formation composed of Sand, Silt and Clay. The ability of groundwater to rise towards the Proposed Development will be controlled by the exact composition of the bedrock below. The fact that the Proposed Development (including the surrounding Red Line Boundary) is not located in a significant topographic low spot means that the risk of groundwater flooding is likely to be low.

11.3.10 Based on the EA's Risk of Flooding from Reservoirs mapping, the Proposed Development is outside the maximum extent of flooding in the event of a reservoir breach. As such the risk of flooding from artificial sources can be considered low.

Drainage

11.3.11 The EfW CHP Facility Site is currently composed of two separate parts. The south-western part is a currently filled in former attenuation storage pond that forms the end of pipe treatment for runoff from the White's Pit landfill site. Examination of the surface water management strategy for White's Pit (**ES Appendix 11.1**) shows that the EA permitted surface water discharge point to the Knighton Stream is located within this feature. It can safely be assumed that this feature provides both attenuation and treatment of surface water which will need to be replicated in the post-development scenario. The EfW CHP Facility Site is not served by a public foul sewer system.

11.3.12 The north-eastern part of the EfW CHP Facility Site is currently occupied by a non-operational low carbon gasification and pyrolysis energy facility. This is a mixture of roof, hardstanding and some landscaped areas. It is assumed that the roof and hardstanding areas are currently positively drained and discharge at an unrestricted rate. The EfW CHP Facility Site is not served by a foul sewer system., The office located on the Proposed Development currently is served by a septic tank(s).

11.3.13 In the Proposed Development Boundary, access to CRP is via a 1 km dedicated hard surfaced 7.5 m wide private road (Arena Way), which is constructed to adoptable standards. There is no asset information on drainage for the private entrance road. It drains into swales at the side of the road and there are no changes proposed to this area. The remaining areas

such as the proposed TCCs and the DNC Connection route and compound are currently undeveloped and there is no existing drainage serving these areas.

Water Quality

11.3.14 In the Ground Investigation Report by Terrafirma (South) in September 2022 (**ES Appendix 9.2**), the Aquifer Designation Map for the area shows the Proposed Development to be underlain by a 'Secondary A' aquifer. These aquifers consist of permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers. Surface and perched groundwater flows from the Proposed Development are likely to be in a southerly direction following the natural topography of the wider area.

11.3.15 The contamination risk assessment included in the Ground Investigation Report confirmed there were no contaminants of concern. Human health risks are low with respect to the proposed end use and no mitigation measures will be required for the Proposed Development. The Proposed Development is also low risk to the aquatic environment based on the chemical evaluation and its environmental setting.

Future Baseline

11.3.16 The baseline conditions for water resources and flood risk are not considered to evolve. On this basis the 'future' baseline conditions would remain the same as reported within the Baseline Conditions section. It should be noted that in relation to the flood risk, the available EA data takes into account the impact of climate change on future flood levels.

11.4 Inherent Design Mitigation

11.4.1 The following mitigation will be provided to mitigate the potential effects:

- Surface water and drainage measures implemented within the Construction Environmental Management Plan (CEMP), an Outline CEMP accompanies this ES, see **ES Appendix 3.2**;
- The Outline CEMP includes temporary measures to control surface water runoff during the construction of the Proposed Development. Such measures would include the provision of adequate drainage to manage surface water run-off. Construction of the drainage system should be designed and managed to comply with BS 6031:2009 'The British Standard Code of Practice for Earthworks'[9], which details methods that should be considered for the general control of drainage on construction sites. Discharge rates and volumes of water discharged would be agreed with the EA and Wessex Water. Where appropriate, cut-off drainage would be provided around the Proposed Development during the construction works when there is no on-site drainage network in place;
- The Outline CEMP also includes measures to reduce the risk of silt and pollutants entering the surface water drainage system. Temporary stockpiling of materials would be located away from the Knighton Stream and drains, and drums would be stored in designated bunded safe areas within the construction site;

[9] British Standards (2009): BS 6031:2009 'The British Standard Code of Practice for Earthworks', December 2009.

- to reduce the water demand of the Proposed Development during the construction works, all relevant contractors would be required to investigate opportunities to minimise and reduce the use of water in accordance with the CEMP. These would include:
  - selection and specification of equipment;
  - implementation of staff-based initiatives such as turning off taps, plant and equipment when not in use;
  - use of recycling water systems in functions such as wheel washes and toilets;
  - rainwater harvesting system for equipment and vehicle washing; and
  - where possible, water from excavation would be used for dust suppression during construction.
- water consumption throughout the construction works would be monitored, either through sub-metering or utility bills to allow a comparison against best practice benchmarks;
- the Outline CEMP sets out measures to ensure that the existing sewers are adequately protected and/or diverted in line with best practice. Requirement for asset protection measures during the construction works would be confirmed with Wessex Water during the future design stages;
- the design of the CHP connections under Knighton Stream will be informed by consultation with the EA and in line with their requirements;
- a surface water drainage strategy has been developed that ensures that discharges of runoff from the Proposed Development are in line with local and national policy requirements. Sufficient treatment has been included in the strategy to ensure that surface or groundwater quality does not deteriorate post-development. It also ensures that runoff from the Proposed Development and White's Pit does not increase; and
- checks will be carried out on both the private and public sewer systems to confirm capacity or required upgrades as mentioned previously in the Consultation section of this Chapter.

11.5 Potential Environmental Impact and Effects

Construction phase

Groundwater Flow and Flooding

11.5.1 As detailed above, post investigation monitoring has confirmed groundwater levels to be between 4.20m and 7.43m below ground level, which is considered relatively low. The maximum extent of the waste bunker would be approximately 12 metres below ground level (m bgl) and therefore below the recorded ground water level. As such, it is expected that the excavation works would lead to an increase in groundwater flood risk during construction of the waste bunker within the Proposed Development.

11.5.2 The deepest areas of the main building are the waste bunkers. Dewatering (if required) would be undertaken during construction of these elements.

11.5.3 Given the lack of historical groundwater flooding on the Proposed Development and within the local area, the relatively low groundwater level and the Proposed Development being above a secondary aquifer, the risk of flooding from groundwater to the Proposed

Development is assessed as low. As such, the effect of groundwater flow and flooding during construction is considered to be *short-medium term, local* and of *minor adverse significance (not significant)*. Dewatering of excavations would be implemented where required through an appropriate environmental permit.

Surface Water Drainage and Flood Risk

11.5.4 Construction works, including earthworks, storage of waste stockpiles, sewer diversions and temporary site drainage, have the potential to give rise to changes in the surface water run-off regimes particularly during periods of heavy rainfall.

11.5.5 It is noted that within the Proposed Development Boundary, the TCCs and associated temporary access roads will be surfaced with permeable materials where practicable and any areas of hardstanding would be managed as part of the construction phase drainage strategy.

11.5.6 For the CHP Connection Corridor and DNC Corridor, the CHP route will pass beneath the Knighton Stream to ensure it does not restrict flow within the stream. Construction of the shared CHP Connection Corridor and DNC Corridor crossing will be undertaken in consultation with the EA, to ensure no negative impacts to the stream. The DNC Compound is at very low risk of surface water flooding.

11.5.7 The inherent mitigation measures stated in the Outline CEMP (as detailed in **Section 11.4**) and additional mitigation in the construction phase drainage strategy would control surface water runoff from the Proposed Development. Given the construction activities, *the sensitivity of the receptor is medium* and *the magnitude is low* due to the local scale of effect, as such the potential effect is considered to be *minor/insignificant*.

Change in Potable Water Demand

11.5.8 The Proposed Development would introduce new land uses resulting in an increase in potable water demand. The potable water requirements are provided in **ES Appendix 11.2.**

11.5.9 South West Water and Bournemouth Water's joint 'Water Resources Management Plan' (July 2019)[10] indicates that over a forecast period of the next 25 years there is a projected balance of supply and demand for the full planning period. This plan involves a variety of measures including leakage reduction, water efficiency activity and help in identifying opportunities to act as a donor to other regions, such as the inclusion of a water transfer option to Southern Water.

11.5.10 As a result of the above measures, water demand should be maintained within Bournemouth Water's region for the next 25 years. Given it is a public water supply infrastructure *the sensitivity of the receptor is high* and *the magnitude is low* due to the local scale of effect, as such the potential effect is considered to be *moderate/minor adverse (not significant)*.

Change in Foul Water Drainage Capacity

11.5.11 The Proposed Development would introduce new land uses resulting in an increase in foul water discharge. As set out in **ES Appendix 11.1**, the proposed foul discharge rates have been calculated at 3.8l/s.

11.5.12 A pre-planning enquiry has been submitted to Wessex Water to ensure that the existing public sewer network has adequate capacity to accommodate the proposed foul water flows from the Proposed Development. Wessex Water has responded that they require a further

[10] South West Water Bournemouth Water Final Water Resources Management Plan August 2019

capacity appraisal and a detailed process review will be required to understand the scope of any necessary improvement works. Further consultation will be undertaken post planning.

11.5.13 The expected flows during construction of the Proposed Development are included in **ES Appendix 11.2**.

11.5.14 Provided that Wessex Water confirms there is sufficient capacity within the network post planning, and given it is public water supply infrastructure in a rural area, *the sensitivity of the receptor is high* and *the magnitude is low* due to the local scale of effect. As such, the potential effect is considered to be *moderate/minor adverse (not significant).*

Operational phase

Tidal and Fluvial Flood Risk

11.5.15 According to the EA Flood Map for Planning (Figure 2 of **ES Appendix 11.1**), the Proposed Development is shown to be located wholly within Flood Zone 1 denoting a less than 0.1% annual probability and as such is classified as being at low risk of fluvial and tidal flooding.

11.5.16 Given it is a commercial property, *the sensitivity of the receptor is medium* and *the magnitude is low* due to the local scale of effect, as such the potential effect is considered to be *minor adverse/insignificant*.

Groundwater Flood Risk

11.5.17 The maximum extent of the waste bunker would be approximately 12m bgl and therefore would be below the recorded ground water level.

11.5.18 Given the lack of historical groundwater flooding on the Proposed Development and within the local area and the relatively low groundwater level, the risk of flooding from groundwater to the Proposed Development is assessed as low, however *the sensitivity of the receptor is medium* due to the Proposed Development lying above a Secondary Aquifer. *The magnitude is low* due to minor local-scale increases/reductions in flood risk**.** As such, the effect of groundwater flow and flooding during operation of the Proposed Development is considered to be *insignificant*.

Surface Water Flood Risk

11.5.19 The inclusion of SuDS and the management of surface water would likely result in a *long-term, local, beneficial effect of minor significance (not significant)* on surface water flooding, both on and off-site by reducing the peak rate of surface water runoff by 98% when compared to the existing rate. The surface water drainage strategy (**ES Appendix 11.1**) is to discharge to the brook south of the Proposed Development then into Knighton Stream at a flow rate of 5.2l/s. The required attenuation storage volume is approximately 2,500m^3.

11.5.20 The risk of flooding from surface water to the Proposed Development is assessed as low. Given it is a commercial property, *the sensitivity of the receptor is medium* and *the magnitude is low* due to the local scale of effect, as such the potential effect is considered to be *minor adverse/insignificant.*

Sewer Surcharging Flood Risk

11.5.21 The Proposed Development would result in an increase in flow rate of approximately 3.8l/s into the public foul sewer, which would need to be agreed with Wessex Water by submitting a pre-planning enquiry and secured under Section 106 of the Water Industry Act 1991. A

pre-planning enquiry was submitted in November 2022. A response (Appendix E of the FRA (**ES Appendix 11.1** of this Chapter)) was received in November 2022, however Wessex Water were unable to confirm capacity within their network as further capacity appraisal and a detailed process review is required to understand the scope of any necessary improvement works.

11.5.22 Given the requirement for an agreement with Wessex Water for the discharge of foul water, that there is no recorded history of sewer flooding at the Proposed Development and that the sewers are expected to continue to be adequately maintained and regularly cleaned, the flood risk is assessed to be low. Given it is private drainage infrastructure in a rural area, *the sensitivity of the receptor is low* and *the magnitude is low* due to the local scale of effect, as such the potential effect is considered to be *insignificant*.

Change in Potable Water Demand

11.5.23 The Proposed Development would introduce new land uses resulting in an increase in potable water demand. The potable water requirements are listed in **ES Appendix 11.2**.

11.5.24 South West Water and Bournemouth Water's joint 'Water Resources Management Plan' (July 2019)[11] indicates that over a forecast period of the next 25 years there is a projected balance of supply and demand for the full planning period. This plan involves a variety of measures including leakage reduction, water efficiency activity and to help identify opportunities to act as a donor to other regions such as the inclusion of a water transfer option to Southern Water.

11.5.25 As a result of the above measures, water demand should be maintained within Bournemouth Water's region for the next 25 years. It is private water supply in a rural area, and so *the sensitivity of the receptor is low* and *the magnitude is low* due to the local scale of effect. Consequently, the likely effect of the Proposed Development on potable water demand would likely be *insignificant*.

Change in Foul Water Drainage Capacity

11.5.26 The Proposed Development would introduce new land uses resulting in an increase in foul water discharges. As set out in **ES Appendix 11.1**, the proposed foul discharge rates have been calculated at 3.8l/s.

11.5.27 A pre-planning enquiry has been submitted to Wessex Water to ensure that the existing public sewer network has adequate capacity to accommodate the proposed foul water flows from the Proposed Development. Wessex Water have responded that they require further capacity appraisal and a detailed process review is required to understand the scope of any necessary improvement works. Further consultation will be undertaken post planning.

11.5.28 The expected flows during operation of the Proposed Development are included in **ES Appendix 11.2**.

11.5.29 It is private drainage infrastructure in a rural area, and so *the sensitivity of the receptor is low* and *the magnitude is low* due to the local scale of effect. Provided that Wessex Water confirms there is sufficient capacity within the network post planning, it is considered that the Proposed Development would have an *insignificant* effect upon the capacity of foul water drainage infrastructure and sewage treatment works.

[11] South West Water Bournemouth Water Final Water Resources Management Plan August 2019

Water Quality

11.5.30 During normal operation of the Proposed Development, the pollution hazard, as outlined in Table 26.2 of the CIRIA SuDS Manual[12], would be classed as medium to high. It is therefore important that the proposed drainage strategy is designed to mitigate the potential for contamination.

11.5.31 The pollution hazard and proposed mitigation indices, based on the CIRIA SuDS manual, are total suspended solids, metal and hydrocarbons and they all score as 'PASS' as shown in Table 4 of the FRA and Drainage Strategy (**ES Appendix 11.1**). A worst-case scenario has been assumed, whereby runoff is routed through only filter drains, the piped on-site drainage network, the downstream ditch, and the filter beds before discharging to the Knighton Stream. The reed beds are arranged as a matrix consisting of three rows and two columns. However, they are considered as three features (one for each row) even though they are more likely cascading and could be considered as six. In reality, a higher level of water quality treatment than presented will be achieved for much of the Proposed Development. Despite the conservative assumptions made in this assessment, the quality of water discharged from the Proposed Development would be appropriate.

11.5.32 The flood risk receptor is the Knighton Stream from the potential for contaminated runoff from a commercial property, and so *the sensitivity of the receptor is medium. The magnitude is low* due to the minor change in the controlled water quality. Consequently, the likely effect of the Proposed Development on water quality would likely be *minor adverse/insignificant*.

Decommissioning

11.5.33 For the purpose of the assessment, a working assumption has been made that the Proposed Development has an operational lifespan of 50-years. However, it should be noted that it is common for such developments to be operational for longer periods. It is anticipated that the process of decommissioning would involve the termination of operational activity, following which there would be electrical and process isolation and demolition activities. The EfW CHP Facility Site (including the CHP Connection) and the DNC would be left in a clear and secure condition in accordance with a Decommissioning Plan. The decommissioning process is anticipated to last for one year.

11.5.34 The environmental effects associated with the decommissioning phase would be of a similar level to those reported for the construction phase works, albeit with a lesser duration, of one year.

11.6 Additional Mitigation

11.6.1 Further capacity appraisal and a detailed process review is required by Wessex Water to understand the scope of any necessary improvement works post planning approval (included in **Table 11-5**).

11.6.2 The implementation of water efficiency measures would be incorporated into the Proposed Development to minimise the potable water demand as far as possible.

11.6.3 A maintenance programme of key drainage infrastructure should be put in place to ensure that beneficial likely effects are maintained as the likely residual effect (refer to **ES Appendix 11.1** for further details on frequency and type of maintenance required for the SuDS). This is included in **Table 11-5**.

[12] CIRIA, 2017. *The SuDS Manual (C753)*. Available at: https://www.ciria.org/ItemDetail?iProductCode=C753F&Category=FREEPUBS

11.7 Residual Effects

11.7.1 The residual effects would be the same as reported above due to the effective inherent mitigation measures being sufficient to deal with the *minor adverse to insignificant* effects assessed above.

11.7.2 For the *moderate to minor* effects on potable water demand and foul water drainage capacity, the actions required are included in **Table 11-5**.

11.8 Implications of Climate Change

11.8.1 Surface water runoff will be restricted to the greenfield rate of 2.2l/s/ha. A surface water storage volume of c.2,500m^3 will be provided to ensure the capacity of the drainage network is not exceeded for the 1:100 +45% climate change event.

11.8.2 In line with the drainage hierarchy, the proposed drainage strategy is to discharge directly to the Knighton Stream. Runoff from the EfW CHP Facility Site will be drained towards verges where SuDS features such as filter drains or swales will be used to convey flow into the piped drainage network.

11.8.3 It is considered that the information provided satisfies the requirements of the NPPF and local policy.

11.9 Cumulative Effects

11.9.1 It is considered that the Proposed Development will not increase cumulative effects from surrounding developments as 100% of runoff will discharge into Knighton Stream. The impermeable area is not proposed to increase. Cumulative effects would therefore remain the same as reported for residual effects.

11.9.2 For the Cumulative Effects Assessment, a schedule of committed schemes to be considered is set out in **ES Chapter 5: Approach to Assessment**.

11.9.3 Consented schemes have been included if they produce uplift of more than 1,000m^2 gross external area (GEA) of mixed-use floor space or over 80 residential units. A 5km threshold has been applied on the basis that beyond this distance significant cumulative effects are not considered to be likely, therefore primary consideration has been given to schemes within this radius. However, consideration has also be given to committed schemes beyond this radius where the size or nature of the scheme could result in cumulative effects on a wider geographical scale. The list also contains two schemes which fall below the size criteria above, however, they have been included due to their proximity to the Proposed Development.

11.9.4 For the purposes of assessing hydrology this list has been further reduced to a 1km buffer zone, as shown in **ES Appendix 11.3**, and excludes any sites that do not contribute to the Knighton Stream or River Stour i.e., those in a different hydrological catchment.

Construction

11.9.5 Water resources and flood risk associated with construction effects of a development are typically site-specific. It is expected that both the Proposed Development and the cumulative schemes would implement their own CEMPs to mitigate potential risk from flooding. Accordingly, it is unlikely that there would be any cumulative flood risk effects for the

Proposed Development and surroundings. It is therefore considered that potential cumulative residual flood risk effects would be *insignificant*.

11.9.6 Construction works are unlikely to significantly alter or displace groundwater flows and surface water runoff from the sites as the activities would be controlled through the implementation of CEMPs, where required. Should dewatering of perched water be required during the construction of the waste bunkers associated with the cumulative schemes and occur simultaneously, it is unlikely that there would be a significant cumulative 'drawdown' effect owing to the likely depth of the true groundwater. Given this, the cumulative effect on groundwater and surface water flooding on, and immediately surrounding, the Proposed Development during construction would be *insignificant*.

Operation

11.9.7 With regard to flood risk, this assessment has assumed that in order for an applicant to submit a planning application and in order to achieve planning consent, all cumulative schemes have been approved by the EA. This would mean that each cumulative scheme in isolation, and in combination, would not result in an unacceptable increase in flood risk. It is therefore considered that potential cumulative residual flood risk effects, once the Proposed Development is completed and operational, would be *insignificant*.

11.9.8 Similarly, in line with planning policy requirements, it is assumed that all cumulative schemes would ensure that sufficient surface water attenuation is achieved. Should some or all of the cumulative schemes adhere to the LLFA and EA requirements, then significant reductions to existing surface water run-off have the potential to result in significant beneficial effects. Consequently, the overall likely residual cumulative effect in relation to flood risk is considered to range from *insignificant to long-term, local and of minor beneficial significance*.

11.9.9 The cumulative schemes would increase the demand for potable water, foul drainage and sewerage treatment as a result of the increased resident population and occupants of commercial uses. Upgrades to infrastructure would be subject to site-specific discussions with Bournemouth Water to ensure adequate supply and Wessex Water to ensure adequate capacity is available for each committed development. Assuming upgrades to service infrastructure are undertaken as necessary, the cumulative effect would be *insignificant*.

11.10 Summary

11.10.1 The residual or cumulative effects would be the same as reported above due to the effective embedded mitigation measures being sufficient to deal with the *minor to insignificant* effects assessed above.

11.10.2 Inherent mitigation measures proposed are sufficient to manage flood risk from tidal/fluvial, groundwater, surface water and sewer flooding.

11.10.3 A summary of the assessment is set out in **Table 11-4** overleaf.

Table 01-4 Summary of Effects

Receptor	Sensitivity of Receptor	Nature of potential impact	Proposed mitigation	Residual effect	Significant / not significant
CONSTRUCTION PHASE					
Secondary Aquifer	Medium	Groundwater flow and flooding	N/A	Local, short-medium term, minor adverse	Not significant
Commercial properties/Construction-site	Medium	Surface water drainage and flood risk	N/A	Insignificant	Not significant
OPERATIONAL PHASE					
Commercial properties	Medium	Tidal and fluvial flood risk	N/A	Insignificant	Not significant
Secondary Aquifer	Medium	Groundwater flood risk	N/A	Insignificant	Not significant
Commercial properties	Medium	Surface water flood risk	N/A	Local, long-term, minor beneficial	Not significant
Private drainage infrastructure in rural areas	Low	Sewer surcharging flood risk	N/A	Insignificant	Not significant
Private water supply infrastructure in rural areas	Low	Change in potable water demand	N/A	Insignificant	Not significant

Receptor	Sensitivity of Receptor	Nature of potential impact	Proposed mitigation	Residual effect	Significant / not significant
Private drainage infrastructure in rural areas	Low	Change in foul water drainage capacity	N/A	Insignificant	Not significant

11.11 Mitigation Commitments Summary

Table 01-5 Summary for Securing Mitigation

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g., planning condition/legal agreement)	To be delivered by	Auditable by
CONSTRUCTION PHASE				
Change in Potable Water Demand	To ensure potable water capacity is sufficient during construction.	The implementation of water efficiency measures would be incorporated into the Proposed Development to minimise the demand as far as possible.	Applicant/EPC Contractor	Applicant/EPC Contractor
Change in Foul Water Drainage Capacity	To ensure foul water capacity is sufficient during construction.	Further capacity appraisal and a detailed process review is required to understand the scope of any necessary improvement works.	Applicant/EPC Contractor	BCP Council
OPERATIONAL PHASE				
Surface Water Flood Risk	Prevent drainage component build up and reduced operability.	A maintenance programme to be included post planning (Refer to details in Appendix 11.1).	Applicant	BCP Council

Identified receptor	Type and purpose of additional mitigation measure (prevent, reduce, offset, enhance)	Means by which mitigation may be secured (e.g., planning condition/legal agreement)	To be delivered by	Auditable by
Change in Potable Water Demand	To ensure potable water capacity is sufficient during operation.	The implementation of water efficiency measures would be incorporated into the Proposed Development to minimise the demand as far as possible.	Applicant/ EPC Contractor	Applicant/ EPC Contractor
Change in Foul Water Drainage Capacity	To ensure foul water capacity is sufficient during operation.	Further capacity appraisal and a detailed process review is required to understand the scope of any necessary improvement works.	Applicant/ EPC Contractor	BCP Council