SDCC Rathcoole Housing Development

Environmental Impact Assessment Report (EIAR)
Chapter 08: Water Environment

South Dublin County Council (SDCC)

October 2026

Quality information

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8 Water Environment

8.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) presents an assessment of the impacts of the Proposed Development upon the water environment (hydrology, hydrogeology, hydromorphology, water resources and flood risk). The Proposed Development Site (herein referred to as 'the Site') is as described in **Chapter 2 Description of Development**.

This chapter defines the Study Area, the methodology used for developing the water environment baseline and impact assessment, a description of the baseline environment in relation to water, and presents the findings of the impact assessment associated with the Proposed Development, taking into account defined mitigation measures.

The assessment has been undertaken having regard to the requirements of the EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU), as transposed into Irish law through the Planning and Development Act 2000 (as amended) and the Planning and Development Regulations 2001 (as amended).) and checks that:

- The need for the avoidance and reduction of impacts on the water environment is taken fully into account in the environmental evaluation; and
- The selection of appropriate means of preventing significant predicted impact is made through modification of the drainage design, choice of discharge location(s) and/or adoption of runoff treatment methods, with the objective of designing-out potential adverse environmental impacts.

This chapter should be read in conjunction with **Chapter 2** (Description of Development), **Chapter 6** (Biodiversity), **Chapter 7** (Land and Soils), **Chapter 9** (Air Quality), **Chapter 10** (Climate), **Chapter 14** (Material Assets – Traffic), **Chapter 15** (Major Accidents and Disasters), and, **Chapter 16** (Material Assets – Utilities) of this EIAR, which pay particular attention to the potential for impacts upon the aquatic/riparian environment, geological environment, deposition of particles from emissions, flood risk due to climate change and water usage.

8.2 Legislation, Policy and Guidance

8.2.1 Legislation

Table 8-1 summarises the European legislation and transposed Irish regulations that are of relevance to this water environment assessment and to the Site. In addition, the Inland Fisheries Acts 1959–2017, which protect fisheries and aquatic habitats, are also of relevance to the Proposed Development.

Table 8-1: European Legislation and Associated Regulations

European Directive	Legislation
EU Water Framework Directive 2000/60/EC as amended by Directive 2008/105/EC and 2013/39/EU	European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003)

European Directive	Legislation
	European Union (Water Policy) Regulations, 2014 (S.I. No. 350 of 2014) European Union (Water Policy) (Amendment) Regulations, 2022 (S.I. No. 166 of 2022) European Union (Water Policy) (Amendment) Regulations, 2025 (S.I. No. 52 of 2025) European Union (River Basin Management) Regulations 2017 (S.I. No. 534 of 2017) European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. No. 272 of 2009) European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations, 2012 (S.I. No. 327 of 2012) European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations, 2015 (S.I. No. 386 of 2015) European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations, 2019 (S.I. No. 77 of 2019) Environmental Objectives (Surface Waters) (Amendment) Regulations 2023, (S.I. No. 410 of 2023) Water Environment (Abstractions and Associated Impoundments) (Revised) Act 2022, 2025 (S.I. No. 48 of 2022)
EU Groundwater Directive 2006/118/EC and amending Commission Directive 2014/80/EU	European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010) European Communities Environmental Objectives (Groundwater) (Amendment) Regulations, 2016 (S.I. No. 366 of 2016) Environmental Objectives (Groundwater) (Amendment) Regulations 2022 (S.I. No. 287 of 2022)
Directive (EU) 2020/2184 as amended by EU (Drinking Water) (Amendment) Regulations 2022	European Union (Drinking Water) Regulations 2023 (S.I. 99 of 2023)
EU EIA Directive 2011/92/EU, as amended by Directive 2014/52/EU	European Union (Environmental Impact Assessment) (Integrated Pollution Prevention and Control) (No. 2) Regulations 2012 (S.I. No. 457 of 2012) European Union (Environmental Impact Assessment) (Flood Risk) Regulations 2012 (S.I. No. 470 of 2012) EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018, No. 404 of 2018 and No. 646 of 2018)
EU Floods Directive 2007/60/EC	European Communities (Assessment and Management of Flood Risks) Regulations, 2010 (S.I. No. 122 of 2010)
Directive 2004/35/CE on environmental liability with regards to the prevention and remedying of environmental damage as amended by Regulation (EU) 2019/1010	European Communities (Environmental Liability) Regulations 2008 (S.I. No. 547 of 2008) European Communities (Environmental Liability) (Amendment) Regulations 2011 (S.I. No. 307 of 2011) European Communities (Environmental Liability) (Amendment) Regulations 2015 (S.I. No. 293 of 2015)
Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora as amended by Council Directive 97/62/EC and COM(2025) 106	European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) Planning and Development, Heritage and Broadcasting (Amendment) Act 2021 (S.I. No. 11/2021)
Council Directive 91/676/EEC (the 'Nitrates Directive') as amended by Commission Implementing Decision (EU) 2022/696	European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2006, (S.I. No. 378 of 2006) European Communities (Good Agricultural Practice for Protection of Waters) (Amendment) Regulations, 2007, (S.I. No. 526 of 2007) European Union (Good Agricultural Practice for Protection of Waters) Regulations 2022, (S.I. No. 113 of 2022) European Union (Good Agricultural Practice for Protections of Waters) (Amendment) Regulations 2025 (S.I. No. 42 of 2025)
N/A	Planning and Development Act 2000 Planning and Development Regulations 2001 Planning and Development Act 2024
N/A	Inland Fisheries Act, 1959-2017 Inland Fisheries Act, 2010 Inland Fisheries (Amendment) Act, 2017

8.2.2 Policy

South Dublin County Council (SDCC) has prepared the 'South Dublin County Development Plan 2022-2028' (SDCC, 2022) (hereafter referred to as the 'SDCDP') in accordance with the Planning and Development Acts and consistent with both the 'National Planning Framework' (NPF) – First Revision (2025) and the 'Regional Spatial Economic Strategy' for the Eastern and Midland Region 2019–2031 (RSES, 2019). It sets out the policy objectives and the overall strategy for the planning and sustainable development of the County up to 2028 with regards to the Water Framework Directive (WFD) and the objectives of the Water Action Plan 2024: Ireland's River Basin Management Plan (RBMP) 2022-2027. The NPF, as part of Project Ireland 2040, sets out a long-term strategy for compact, sustainable growth and balanced regional development. The Water Action Plan 2024 outlines national measures to improve water quality, restore freshwater habitats, and strengthen water governance, aiming to bring at least 300 additional water bodies to good status by 2027.

The Water Services Policy Statement (WSPS) 2024–2030 sets out Ireland's strategic objectives and priorities for delivering safe, reliable and sustainable water services, guiding Uisce Éireann and rural water programmes through to 2030. Uisce Éireann have developed their own national policy, the National Water Resources Plan (NWRP) which sets out how the supply and demand for drinking water over the short, medium and long term will be balanced. It is a 25-year strategy to ensure that there is a safe, sustainable, secure and reliable drinking water supply for everyone. The plans are divided regionally, with the Proposed Development falling under the Regional Water Resource Plan – Eastern and Midlands (RWRP EM) (Uisce Éireann, 2022) which reviews the water supply needs collectively for the entire Eastern and Midlands Region.

8.2.3 Guidance

The following guidance documents are of relevance to this water environment assessment and the Proposed Development:

- Department of Environment, Housing and Local Government (DoEHLG)/Office of Public Works (OPW) (2009), 'The Planning System and Flood Risk Management - Guidelines for Planning Authorities' (OPW, 2009);
- European Commission (2003), 'Common Implementation strategy for the Water Framework Directive (2000/60/EC) – Guidance Document No 11' (EC, 2003);
- Environmental Protection Agency (EPA) (2022), 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022) (herein referred to as the EPA Guidelines);
- EPA (2008), 'A Framework for the Assessment of Groundwater Dependent Terrestrial Ecosystems under the Water Framework Directive';
- EU (2017), 'Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report' (EU, 2017);

- Institute of Geologists of Ireland (IGI) (2013), 'Guidelines for Preparation of Soils, Geology, Hydrogeology Chapters of Environmental Impact Statements' (IGI, 2013);
- Transport Infrastructure Ireland (TII) (2025), 'Water Impact Assessment for National Roads, Light Rail, Metro and Rural Cycleways – Overarching Technical Document' (TII, 2025);
- TII (2015), 'Road Drainage and the Water Environment' (TII, 2015);
- Working Group on Groundwater (2005), 'Guidance on the application of groundwater risk assessment sheets SWRA 1-6 and GWDTERA 1-9 to areas designated for the protection of habitats and species' (Working Group on Groundwater, 2005); and
- Inland Fisheries Ireland (2026). 'Guidelines on protection of fisheries during construction works in and adjacent to waters' (IFI, 2016).

8.3 Methodology

8.3.1 Study Area

For the purposes of this assessment, a Study Area (or water Zone of Influence) of 1 km from the Site has been considered in order to identify water bodies that are hydrologically connected to the Site and have the potential to be directly impacted by the activities associated with the Proposed Development. This Study Area takes account of waterbodies (both surface and groundwater) within and adjacent to the Site, their catchments, and any water dependent habitats which could be hydraulically connected to these waterbodies in which potentially significant effects could arise.

Given that watercourse flow, water quality and flood risk impacts may propagate downstream, the assessment, where relevant, also considers a wider study area of 2 km radius. Professional judgement has been applied to identify the extent to which such features are considered within the assessment. Where hydrological connectivity extends beyond this area, receptors have been considered beyond the 2 km Study Area where relevant.

8.3.2 Baseline Environment

The baseline water environment has been determined from a desktop review, a site walkover and previous site studies, as described below.

8.3.2.1 Desktop Study

The following sources of information were reviewed as part of the desktop study, including previous site studies:

- Ordnance Survey Ireland (OSI) website for historical maps of 1:2,500 scale and 1:10,560 scale and aerial photographs;
- OSI Discovery series of 1:50,000 scale;
- Geological Survey of Ireland (GSI) (2026), 'GSI Spatial Resources Map Viewer' (GSI, 2026);

- EPA (2026), 'EPA Water Maps' (EPA, 2026a);
- EPA (2026), 'Catchments.ie' (EPA, 2026b);
- EPA (2026), 'Abstraction Register' (EPA, 2026c);
- EPA (2026), 'EPA Hydronet Map Viewer' (EPA, 2026d);
- National Parks and Wildlife Service (NPWS) (2026), 'NPWS Map Viewer' (NPWS, 2026);
- Office of Public Works (OPW) (2023), 'Fluvial and Coastal Flood information mapping from the Catchment Flood Risk Assessment and Management Program (CFRAM)'. (OPW, 2023);
- Wetland Surveys Ireland (2026), 'Map of Irish Wetlands' (Wetland Surveys and Foss Environmental Consulting, 2026);
- Met Éireann (2025), 'Monthly data' (Met Éireann, 2025);
- topographic-map.com (2026), 'Ireland topographic map' (Topographic Map, 2026);
- Envirologic (2022), Hydrological Impact Assessment; Rathcoole, Co. Dublin (Envirologic, 2022);
- Faith Wilson and Dr Joanne Denyer (2021), Appendix 2B: Rathcoole Lands Ecology Assessment (Wilson and Denyer 2021); and
- Nimbosa Ecology (2021), A survey to assess the woodlands and associated semi-natural habitats at Rathcoole, Co. Dublin (Nimbosa Ecology, 2021).

In addition, a site-specific Flood Risk Assessment (FRA) has been prepared for the Proposed Development (refer to the FRA submitted with this application).

8.3.2.2 Site Surveys

A water environment site visit was carried out on 19 September 2025 by an AECOM surface water specialist and hydromorphologist to review the drainage features and watercourses within the Site. Based on observations made during the visit, a possible spring was noted within the central channel of the Rathcoole Park, around Irish National Grid (ING) O 02959 26475 (Eastings: 302959, Northings: 226475). The notes and photos from the site visit are provided in Volume 02; Appendix A8-1.

Habitat surveys were undertaken within the Site and the surrounding area in 2021[1] [2]. These surveys identified the presence of several Priority Annex I habitats within the non-designated groundwater dependent terrestrial ecosystem (GWDTE) at Rathcoole wet woodland, which is located adjacent to the Site. As part of the Proposed Development assessment, further habitat surveys were undertaken by the in 2025 within the Site. Further details can be found in Volume 01; Chapter 6 Biodiversity.

[1] Faith Wilson and Dr Joanne Denyer (2021), 'Appendix 2B: Rathcoole Lands Ecology Assessment'
[2] Nimbosa Ecology (2021), 'A survey to assess the woodlands and associated semi-natural habitats at Rathcoole, Co. Dublin'

8.3.3 Identifying Significant Environmental Effects

8.3.3.1 Source Pathway Receptors

The water environment and flood risk impact assessment has been based on a source-pathway-receptor (SPR) model. For an impact on the water environment to exist, the following is required:

A. An impact **source** (such as the release of polluting chemicals, particulate matter, or biological materials that cause harm or discomfort to humans or other living organisms, or the loss or damage to all or part of a water body);

B. A **receptor** that is sensitive to that impact (i.e. water features and the services they support); and

C. A **pathway** by which the two are linked.

The first stage in applying the SPR model is to identify the causes or 'sources' of potential impact from the Proposed Development. The impact sources have been identified through a review of the details of the Proposed Development, including the size and nature of the Site, potential construction methodologies, operational details and timescales.

The next step is to undertake a review of the potential receptors, that is, the water environment receptors that have the potential to be affected. Water features including their attributes have been identified through desk study and site survey. Baseline details are provided in Section 8.4.

The last stage of the model is to determine if there is a viable exposure pathway or a 'mechanism' linking the source to the receptor. This has been undertaken in the context of local conditions relative to the water receptors within the Study Area, such as topography, geology, climatic conditions and the nature of the impact.

The assessment of the likely significant effects is qualitative and considers the construction and operational phases. Professional judgement has been used to determine the effect significance as per the EPA Guidelines (EPA, 2022) and TII's Guidelines (TII, 2025).

8.3.4 Determination of Importance Receptors

For the purposes of the impact assessment, receptors are defined as the features that have been identified within the Study Area, or which may reasonably be affected by downstream flow from the Study Area.

A qualitative assessment has been used to assign a importance rating, also called 'value of the receptor', from negligible to very high, based on the TII's Guidelines (TII, 2025) in the absence of specific criteria for rating importance in the EPA Guidelines (EPA, 2022) and considers their likely adaptability, tolerance, and recoverability, as well as their designation. The TII's Guidelines are widely accepted as robust criteria and considered good practice for water environment EIA methodology.

Table 8-2 provides a description of the level of importance criteria for hydrological and hydrogeological features.

Table 8-2: Receptor Value Criteria

Importance	Description	Example
Very High	Attribute has a high quality or value on international or national scale or protected by EU legislation	Hydrology • River, wetland or surface water body protected by EC legislation (e.g. 'European sites' designated under the Habitats Regulations such as Special Area of Conservation (SAC), Special Protection Area (SPA), or Ramsar sites, or 'Salmonid waters' designated under the European Communities (Quality of Salmonid Waters) Regulations,1988), or national habitat legislation (e.g. Area of Special Scientific Interest (ASSI) (transboundary), Natural Heritage Areas (NHA), Drinking Water Protection Areas). • A watercourse or surface water feature (with hydrological importance, or as a result of water quality) which supports sensitive and protected ecosystems of national importance. • No or limited anthropogenic pressures on the waterbody not significantly affecting the aims of the WFD. • Regionally important potable water source. Hydrogeology • Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation (e.g. SAC or SPA status) or national legislation (e.g. NHA or ASSI (transboundary) status). • A groundwater body of hydrogeological importance to a habitat of very high value. • Groundwater provides significant baseflow to very high value surface water body. • Inner source protection area for regionally important water source. • All undesignated turloughs. Flood Risk • Essential Infrastructure or highly vulnerable development.
High	Attribute has a high quality or value on county or local scale	Hydrology • Locally important potable water source supplying a larger number of homes. • A watercourse or surface water feature (with hydrological importance, or as a result of water quality) which supports sensitive and protected ecosystems of local importance. Hydrogeology • Regionally Important Aquifer. • Locally important potable water source. • Outer source protection area for regionally important water source. • Inner source protection area for locally important water source. • Groundwater provides significant baseflow to high value surface water body. Flood Risk • More vulnerable development.
Medium	Attribute has a medium quality or value on local scale	Hydrology • Coarse fishery. • Potable water source supplying a smaller number of homes. • A watercourse or surface water feature with some but limited hydrological or water quality importance to protected ecosystems, or habitat of medium value. Hydrogeology • Locally Important Aquifer. • Outer source protection area for locally important water source. • Water source supplying large scale agriculture or industry. • Potable water source with 'moderate' or 'low' yield. • A groundwater body of hydrogeological importance to a habitat of medium value. • Groundwater provides significant baseflow to medium value surface water body. Flood Risk • Less vulnerable development.

Importance	Description	Example
Low to negligible	Attribute has a low quality or value on a local scale	Hydrology • Designated as a Heavily Modified Water Body (HMWB) or Artificial Water Body (AWB). • Water source (e.g. for agricultural use) supplying a very small number of homes. • Fish sporadically present or restricted; no species of conservation concern. • A watercourse with minimal hydrological importance to sensitive or protected ecosystems Hydrogeology • Poor Bedrock Aquifer with minimal abstractions. • A groundwater body which makes minimal contribution to sensitive or protected ecosystems. Flood Risk • Flood plain with limited constraints and low probability of flooding of residential and industrial properties. • Water compatible development.

Source: TII (2025). 'Water Impact Assessment for National Roads, Light Rail, Metro and Rural Cycleways – Overarching Technical Document'

8.3.5 Describing Magnitude of Impact

The methodology used for describing the potential impacts considers the 'quality' of the impact (i.e. whether it is adverse or beneficial), the 'probability' of the event occurring and the 'duration' of the impact (i.e. whether it is temporary, short-term, medium-term and long-term), as per the EPA Guidelines (EPA, 2022).

In the absence of specific criteria for description of the magnitude of impact in the EPA Guidelines (EPA, 2022), the criteria and examples from TII's Guidelines (TII, 2025) have been used as presented in Table 8-3.

Table 8-3: Magnitude of Impact Rating

Magnitude of Impact	Criteria for Effects	Typical Examples (Positive and Negative)
Very High	Results in complete loss of attribute and /or quality and integrity of attribute. Effects likely to be widespread, permanent and irreversible.	Hydrology • Total loss of a water body or water dependent habitat. • Reduction in WFD status. • Contribution to failure to achieve water body WFD status of good. • Total loss of fishery. • Total loss in amenity value. Hydrogeology • Total loss of aquifer. • Changes to aquifer or zone of contribution resulting in total loss of existing water supply springs and wells, river baseflow or GWDTE. • Impact affects groundwater body and WFD status.
High	Results in notable, permanent or longer-term loss of attribute and/ or quality and integrity of attribute	Hydrology • Loss or extensive change to a water body or water dependent habitat. • Extensive loss of fishery. • Calculated risk of serious pollution incident >2% annually. • Extensive reduction in amenity value. Hydrogeology • Removal of large proportion of aquifer. • Changes to aquifer or unsaturated zone resulting in large change to existing water supply springs and wells, river baseflow or ecosystems. • Potential high risk of pollution to groundwater from routine runoff. • Calculated risk of serious pollution incident >2% annually. Flood Risk • Increase in predicted peak flood level >100 mm.

Magnitude of Impact	Criteria for Effects	Typical Examples (Positive and Negative)
Medium	Results in impact on integrity of attribute or loss of attribute	Hydrology • Impact affects water body but no effect on the WFD status. • Partial loss of fishery. • Calculated risk of serious pollution incident >1% annually. • Partial reduction in amenity value. Hydrogeology • Removal of moderate proportion of aquifer. • Changes to aquifer or unsaturated zone resulting in moderate change to water supply springs and wells, river baseflow or ecosystems. • Impact affects groundwater body, but no effect on the WFD status. • Potential medium risk of pollution to groundwater from routine runoff. • Calculated risk of serious pollution incident >1% annually. Flood Risk • Increase in predicted peak flood level of 50-100 mm.
Low	Results in minor permanent change or minor short or medium-term change over a restricted extent impact on integrity of attribute or loss of small part of attribute.	Hydrology • Minor loss of fishery. • Impact does not affect water body, and WFD status remains unchanged. • Calculated risk of serious pollution incident >0.5%. • Slight reduction of amenity value. Hydrogeology • Removal of small proportion of aquifer. • Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. • Impact does not affect groundwater body, and WFD status remains unchanged. • Potential low risk of pollution to groundwater from routine runoff. • Calculated risk of serious pollution incident >0.5%. Flood Risk • Increase in predicted peak flood level of 10-50mm.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity. Minor momentary change over a localised extent.	

Source: TII (2025). 'Water Impact Assessment for National Roads, Light Rail, Metro and Rural Cycleways – Overarching Technical Document'

8.3.6 Significance of Effect

The significance of effects generally refers to the importance of the consequences resulting from a change. It reflects both the objective scientific assessment and the subjective social considerations involved.

When evaluating potential environmental effects on hydrological or hydrogeological systems, significance is determined by combining two factors:

- The importance of the relevant attributes (see Table 8-2); and
- The magnitude of the impact on these attributes (see Table 8-3).

The significance of effects has been rated in accordance with the EPA Guidelines (EPA, 2022). Mitigation measures have been devised for each potential complete pollutant linkage (comprising a source, pathway and receptor), no matter how significant the effect. Additional mitigation measures have then been considered prior to determination of residual effects. The respective interaction between magnitude of the impact and importance of the receptor is illustrated in Plate 8-1, detailed in **Chapter 1** (Introduction and Methodology) and described as:

- **Imperceptible**: an effect capable of measurement but without significant consequences;

- **Not significant**: an effect which causes noticeable changes in the character of the environment but without significant consequences;
- **Slight**: an effect which causes noticeable changes in the character of the attribute without affecting its sensitivities;
- **Moderate**: an effect that alters the character of an attribute in a manner that is consistent with existing and emerging baseline trends;
- **Significant**: an effect, which by its character, magnitude, duration or intensity, alters the sensitive aspects of the environment;
- **Very significant**: an effect, which by its character, magnitude, duration or intensity, alters most of the sensitive aspects of the environment;
- **Profound**: an effect which obliterates sensitive characteristics.

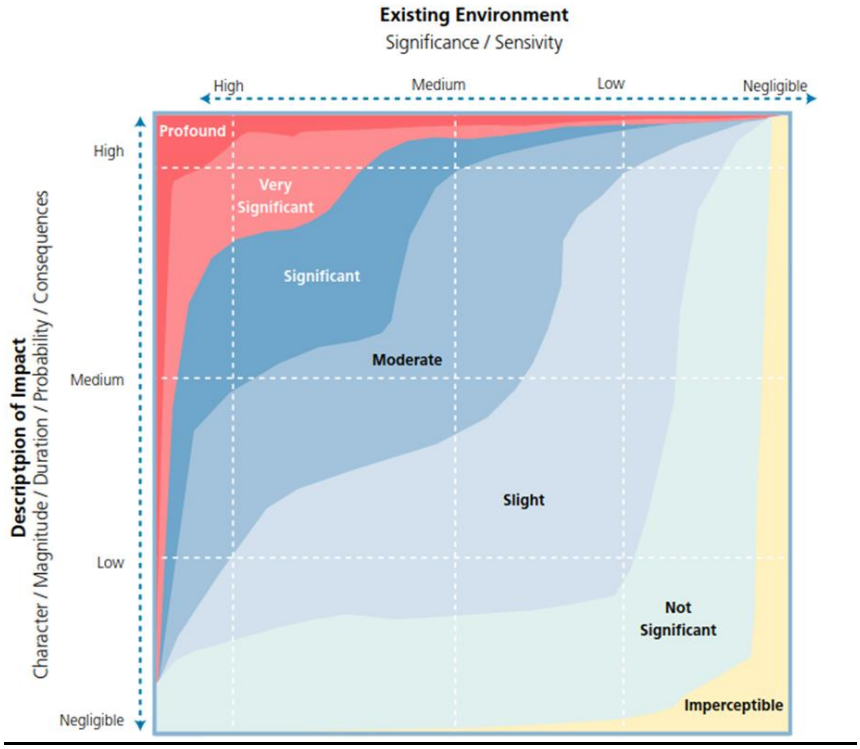


Plate 8-1: Significance of Effect Rating (EPA, 2022)

8.3.7 Indirect (or Secondary) Impacts

The TII Guidelines (TII, 2025) state that indirect and secondary effects are those that are not a direct result of the project and are often produced away from the site or because of a complex pathway.

The assessment considers both the potential direct and indirect effects of the Proposed Development on the water environment by virtue of the consideration of groundwater in combination with the surface water bodies, ecosystems and abstractions which are dependent on groundwater, and groundwater flood risk. The assessment not only considers the immediate water receptor, but also any sensitive water receptors which are in hydrological connection and have the potential to be impacted by the Proposed Development.

Therefore, the assessment of indirect and secondary effects is intrinsically considered within the assessment of significant effects on the water environment by virtue of this holistic approach.

8.3.8 Assumptions and Limitations

The assessment has been based on the description of the Site detailed within **Chapter 2** (Description of Development). In the absence of detailed plans, the following limitations apply to this assessment:

- The abstraction requirements associated with the Proposed Development have not been confirmed at the time of this assessment and will be determined during the subsequent detailed design stages.
- Details regarding an existing watercourse crossing (located at INGR: O 02714 26678) used as an access route were not available at the time of writing, and it has been assumed the crossing will remain unaltered.
- The location of the proposed drainage outfalls are subject to discussion with Inland Fisheries Ireland (IFI) and have not been confirmed at this stage. Locations have been assumed from the proposed drainage layouts. The design of the proposed outfalls is also subject to further design, in the absence of design, it is assumed the headwall is a maximum width of 2 m as a worst case scenario.
- It is assumed flow requirements were taken into account during the portal structure sizing and design.
- Detailed excavation depths and construction methodologies for proposed watercourse crossings have not been made available for this assessment at the time of writing. It will be developed and confirmed during the detailed design stage. Consequently, the assessment has been undertaken using a precautionary worst-case approach.
- Site-specific hydrogeological information is currently limited, as no Hydrogeological Risk Assessment (HRA) of the Rathcoole wet woodland non-designated site, detailed ground investigation, or water quality monitoring has been completed at this stage. The assessment is therefore subject to the level of detail currently available for the Proposed Development.
- The EIA process enables good decision-making based on the best possible available information about the environmental implications of a proposed development. However, there is often a degree of uncertainty as to the exact scale and nature of the environmental impacts, and in such cases the worst-case scenario has been considered. The assessment has been undertaken based on the Proposed Development design information available at the time of writing.
- The expected treatment performance of different Sustainable Urban Drainage Systems (SuDS) options are based on advice reported in CIRIA ‘C753 The SuDS Manual’ for use with the Simple Index Approach. This approach gives a number of example land uses which are not all directly applicable to the Proposed Development. Professional judgement has been used when deciding the example land use used, and what treatment a particular option may provide, taking into account

the design of the SuDS feature and whether it is considered to be 'optimum' or 'sub-optimum' for whatever reason.

8.4 Baseline Environment

8.4.1 Topography, Land use and Rainfall

The topography of the Site is relatively flat with a gentle downward gradient slope falling from the south-west to the north-east, with ground levels ranging from approximately 126.7 metres above Ordnance Datum (mOD) in the south to 113.0 mOD in the north-east with an average gradient of approximately 1:60.

Land use within the catchment is predominantly agricultural in the north, west, and southern areas (arable land and pastures); however, it is densely populated around the east where Dublin is situated. The south-eastern areas of the catchment are dominated by a mixture of forest, scrub, moors/heathland, and inland wetlands (EPA, 2026a). The Liffey catchment contains the largest population of any catchment in Ireland, mainly around the eastern lowlands around Dublin, but is characterised by a sparsely populated, upland south-eastern area. Land use within the Site is predominantly heterogeneous agricultural (land principally occupied by agriculture with areas of natural vegetation). The Site is bounded by urban fabric to the north and pastures to the south.

The nearest Met Éireann weather monitoring station (Met Éireann, 2026) to the Site is Casement Aerodrome which is located close to Dublin, approximately 2.5 km north-east of the Site. Based on the long-term average for this weather station, it is estimated that the area receives annual rainfall totals of 783.5 mm. According to Met Éireann, rainfall over the eastern half of the country averages between 750 – 1,000 mm per year, while rainfall in the west averages between 1,000 – 1,400 mm. The Long-Term Average (LTA) annual rainfall for Casement Aerodrome is therefore in the expected range for the eastern side of the country.

8.4.2 Hydrology

8.4.2.1 Surface Water Features

The Site is located primarily within the Liffey and Dublin Bay WFD catchment - this catchment covers an area of approximately 1,624 km^2 and is drained by the River Liffey, with all streams entering tidal waters between Sea Mount and Sorrento Point, Co. Dublin.

The Site is entirely located within the Liffey_SC_090 WFD sub-catchment (ID: 09_15). This sub-catchment contains 10 river waterbodies, one canal waterbody (the Grand Canal Main Line), one lake (Leixlip Reservoir), and one transitional waterbody (Tolka Estuary).

The Site and surrounding area contain a number of surface water features associated with the Camac_020 WFD river waterbody, including the River Camac, Coolmine Stream and Crockshane (Slade) Stream. A further non-WFD watercourse (potential spring), identified as a branch of the Coolmine Stream/Fitzmaurice Stream, is also present within the Site. All surface waterbodies (including tributaries) within the Study Area are listed in Table 8-4 and illustrated on Volume 03; Figure A8-1.

There are no transitional, canal, or coastal waterbodies within the Study Area. Volume 03, Figure A8-1 shows the surface waterbodies located within the Study Area.

Table 8-4: Surface Waterbodies within the Study Area

Waterbody name	Associated EPA WFD River Waterbody	Flow	Comments
Liffey	Liffey_170 (IE_EA_09L012100)	Flows south to north	There are three tributaries of the Liffey_070 (Rathcreedan Stream, Greenoge_09 Stream, and Jordanstwon_09 Stream) located approximately 1.6 km, 1.0 km, and 1.3 km from the Site, respectively. The waterbodies do not appear to be hydrologically connected to the Site.
Camac	Camac_020 (IE_EA_09C020250)	Flows south to north	The River Camac borders the Site along the eastern boundary. A tributary to the river's main channel (Crockshane Stream) flows along the southern edge of the Sites boundary, just outside of the Site boundary, while a second tributary to the rivers main channel (Coolmine Stream) flows along the northern edge of the Sites boundary for approximately 725 m. A tributary to Crockhane Stream (Slade Stream) flows from south to north and joins the Crockshane Stream near the Site's southern corner. A site visit carried out on 19 September 2025 described Crockshane Stream as a 'deepened ditch' approximately 2m wide, the channel is straightened and heavily shaded. The River Camac was described as morphologically valuable river channel.
	Camac_010 (IE_EA_09C020100)	Flows south to north to join Camac (09_2202).	The river flows from south to north and joins the Camac_020 outside of the Site boundary.
Branch of Coolmine Stream (also known as Fitzmaurice Stream)	Camac_020 (IE_EA_09C020250)	Flows south to northeast through the Site	There is a non-WFD watercourse that rises in Rathcoole Woodland and flows south to north-east through the western extent of the Site. This is a branch of Coolmine Stream (mapped by OPW as Fitzmaurice stream), however it is not shown on EPA mapping. Part of the stream flow is diverted to the east through the centre of Rathcoole Park directly into Camac stream (this branch is known as Coolmine Stream). The rest of the flow goes north, following which the watercourse flows through two ponds located north of the Site. It is assumed the watercourse is culverted in an easterly direction to the south of the N7 road and flows into the River Camac. The watercourse was identified as a potential spring during the site visit, further details can be found in Volume 02, Appendix A8-1. The channel has regular impoundments and opens up into wider wetland areas dominated by aquatic/riparian vegetation.
Unnamed cluster of lakes and ponds associated with golf course	No assigned WFD	N/A	There are a number of non-WFD lakes/ponds located approximately 950 m north-east of the Site within a golf course complex (Citywest Resort Golf Club). The waterbodies do not appear to be hydrologically connected to the Site.
Unnamed ponds located east of the Site	No assigned WFD	N/A	There are two non-WFD ponds both located within 160 m east of the Site, based on a review of online mapping (Bing Maps, 2026). The outflow to one lake joins the Camac_020.
Unnamed ponds/wetlands located north of the Site	No assigned WFD	N/A	There are two non-WFD ponds/wetlands both located within 155 m north of the Site, based on a review of aerial imagery (Bing Maps, 2026). Both ponds/wetlands are hydrologically connected with the branch of Coolmine Stream that flows through the Site. The ponds/wetlands were identified during the site visit, further details can be found in Volume 02, Appendix A8-1.

Source: EPA (2026), 'EPA Water Maps' Accessible at: https://gis.epa.ie/EPAMaps/Water

8.4.2.2 Surface Water Quality and WFD Ecological Status

The Q-value system, a biological index developed by the EPA, assesses river ecological status as part of the WFD Monitoring Programme. Water quality is rated on a five-point scale from 'High' (unpolluted) to 'Bad' (heavily polluted). EPA Water Map Viewer (EPA, 2026a) data indicates there are four Q monitoring stations within the Study Area - Table 8-5 lists the details for each station within the Study Area.

As reported by the EPA (see Table 8-6), the Camac_010 has improved from 'Poor' ecological status in the 2016-2021 assessment to 'Moderate" ecological status in the most recent WFD assessment 2019-2024. The Camac_020 has also improved in ecological status from 'Moderate' in the 2016-2021 assessment to 'Good" ecological status in the most recent WFD assessment 2019-2024. The Liffey_170 has remained 'Poor'. All WFD waterbodies within the Study Area are 'At Risk' of not meeting WFD objectives by 2027.

The Chemical Status of a water body is a measure of its pollution by hazardous chemicals. Waterbodies are classed as either Good status (not polluted) or failing to achieve Good status (one or more hazardous substance not meeting its environmental quality standard). Environmental Quality Standards are set to protect the most sensitive species from direct toxicity as well as predators and humans that may be exposed to chemical pollution. Chemical Status is presented in Table 8-6.

Volume 03, Figure A8-6 shows the WFD Ecological Status of surface waterbodies within the Study Area.

Table 8-5: Q-Value Monitoring Stations within the Study Area

Station Code	Waterbody name	Associated EPA WFD River Waterbody	Year	Q Value Score	Q Value Status	Pollution Status
RS09C020100	Camac	Camac_010 (IE_EA_09C020100)	2022	3	Poor	Moderately polluted
RS09C020150	Camac	Camac_020 (IE_EA_09C020250)	1991	4-5	High	Unpolluted
RS09C020200	Camac	Camac_020 (IE_EA_09C020250)	1998	2	Bad	Seriously polluted
RS09G010100	Liffey	Liffey_170 (IE_EA_09L012100)	1991	2-3	Poor	Moderately polluted

Table 8-6: WFD Water Body Ecological Status and Chemical Status

Waterbody name	Associated EPA WFD River Waterbody	WFD Ecological Status (2016-2021)	WFD Ecological Status (2019-2024)	Risk Status (3rd Cycle)	WFD Chemical Status
Camac	Camac_010 (IE_EA_09C020100)	Poor	Moderate	At Risk	Not assessed
	Camac_020 (IE_EA_09C020250)	Moderate	Good	At Risk	Not assessed
Liffey	Liffey_170 (IE_EA_09L012100)	Poor	Poor	At Risk	Pass (2016-2021) Good (2013-2018)

8.4.2.3 Waterbody Pressures

All three WFD river waterbodies located within the Study Area are subjected to significant pressures affecting their water quality status. Table 8-7 shows the significant pressures affecting each river waterbody; all three waterbodies are 'At risk' of not meeting WFD objectives.

Both Camac_020 and Liffey_170 are identified on the EPA's Water Map (EPA, 2026a) as areas for targeting agricultural measures (to reduce diffuse pollution). The Camac_020 river waterbody basin is 'Navy Flagged' which highlights excess sediment and phosphorus pressures to the waterbody which require additional measures to restore water quality. The Liffey_170 is 'Orange Flagged' which highlights excess nitrate pressures which require additional measures to restore water quality.

Table 8-7: River Significant Pressures

WFD River Waterbody name	River Significant Pressure
Liffey_170	• Urban runoff • Urban wastewater • Hydromorphology
Camac_010	• Invasive species • Hydromorphology
Camac_020	• Agriculture • Urban runoff

8.4.2.4 River Flows

EPA Map Viewer (EPA, 2026a) identifies no hydrometric stations within the Study Area. Physical catchment characteristics can be found on the web-based tool called 'Hydrotool' which is available via the EPA Water Map portal. The Hydrotool points located within the Study Area are listed in Table 8-8. It should be noted that there is a high error margin known to be associated with the Hydrotool results.

Table 8-8: Hydrotool Points within the Study Area

WFD River Waterbody name	Hydrotool Point	Q_{95} (m^3/s)	Q_{70} (m^3/s)	Q_{50} (m^3/s)
Camac_020	09_472	0.017	0.055	0.103
	09_595	0.024	0.075	0.141
	09_12	0.05	0.125	0.207
	09_622	0.043	0.108	0.184

8.4.2.5 Existing Surface Water Drainage

There is no formal surface water network onsite with runoff from the greenfield sources discharging via overland flows to Coolmine Stream, Crockshane Stream, or the River Camac (Camac_020).

8.4.2.6 Designated Sites and Protected Areas

There are no surface water dependent designated sites located within the Study Area. The Camac_020 waterbody is hydrologically connected to the South Dublin Bay SAC and the South Dublin Bay and River Tolka Estuary SPA; however, these sites are approximately 38 km downstream from the Site. Potential effects on downstream designated sites are considered further, where relevant, in **Chapter 6** (Biodiversity) and the Appropriate Assessment documentation prepared for the Proposed Development.

There are no designated Salmonid Rivers located within the Study Area or downstream of the Site.

8.4.2.7 Surface Water Abstractions

The Water Environment (Abstractions and Associated Impoundments) (Revised) Act 2022, 2025 (S.I. No. 48 of 2022) require the registration of any abstraction of 25 m^3/day or more with the EPA. If an abstraction is used for the provision of drinking water/water used for consumption, the abstraction location has been withheld to maintain security of water infrastructure in accordance with EU Directive 2016/1148.

Based on the information available in the Licence and Enforcement Access Portal (LEAP) from the EPA (EPA, 2026c), there are no surface water abstractions within the Study Area. There are also no designated Drinking Water Rivers or Lakes within the Study Area or downstream from the Site (EPA, 2026a).

8.4.2.8 Licensed Activities

According to the EPA's Map Viewer (EPA, 2026a), there are no licensed Integrated Pollution Control (IPC) sites within the Study Area. Additionally, there are no Urban Wastewater Treatment Plants (WwTW) located within the Study Area.

8.4.3 Hydrogeology

8.4.3.1 Geology

The geology within the Site and Study Area is described in **Chapter 7** (Land, Soils and Geology) with a summary provided here as background.

According to Teagasc Soils Mapping, the Site is underlain by Drumkeeran described as clayey drift with siliceous stones. The Study Area is also underlain by two other types of soil such as Urban and Elton, described as fine loamy drift with limestones (see Volume 03; Figure A7-2).

According to the GSI's Map Viewer, the Site is predominantly underlain by superficial deposits described as Till derived from Lower Palaeozoic sandstones and shales (TLPSsS) (see Volume 03; Figure A7-4). The northern boundary of the Site is underlain by Till derived from limestones (TLs). The east boundary of the Site is underlain Gravels derived from Limestones (GLs) and Alluvium (A) associated with Camac_020 WFD river water body. There is a large pocket of GLs to the north of the Site and a small one to the east of the Site along L2008 road. There are areas of bedrock outcrop[3] and subcrop[4] mapped throughout the Study Area.

According to the GSI's Map Viewer, the Site is predominantly underlain by bedrock described as Silurian Greywacke and a total of five geological formations are underlying the Study Area (as illustrated in Volume 03; Figure A7-5) that can be described from east to west as:

- Lucan Formation which consists of dark limestone and shale (calp);
- Pollaphuca Formation which consists of coarse greywacke and shale;
- Glen Ding Formation which consists of chloritic, feldspathic greywacke;
- Slate Quarries Formation which consists of slate and greywacke; and

[3] Outcrop refers to rocks exposed at the present-day erosion surface.
[4] Subcrop refers to now-buried rocks that were exposed at ancient erosion surfaces and close to the surface.

- Carrighill Formation which consists of calcareous greywacke siltstone and shale.

The Site is crossed by a north-south geological fault in its western corner. There are two other faults within the Study Area. There is a north-west to east fault to the north of the Site and a north-east to south-west fault to the east of the Site.

8.4.3.2 Aquifers

According to the GSI's Map Viewer, the Study Area is underlain by multiple formations associated with two hydrostratigraphic units[5]:

- The Lucan Formation, which underlies the north-east corner of the Site, is associated with the Dinantian Upper Impure Limestones, which is classified as a 'Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones' (Ll); and
- The Pollaphuca Formation, which underlies most of the Site, the Glen Ding Formation, the Slate Quarries Formation and the Carrighill Formation, which underlies the western extension of the Site, are associated with the Silurian Metasediments and Volcanics. The Pollaphuca Formation is classified as a 'Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones' (Pl). The Carrighill Formation, the Glen Ding Formation and the Slate Quarries Formation are classified as a 'Poor Aquifer – Bedrock which is Generally Unproductive' (Pu).

There are no mapped superficial deposits (sand and gravel) aquifers within the Site or the Study Area. The hydrostratigraphic units underlying the Site and Study Area are illustrated in Volume 03; Figure A8-2 and summarised in Table 8-9.

Table 8-9: Aquifers underlying the Site and Study Area

Geological Formation	Hydrostratigraphic Rock Unit Group	Aquifer Classification	Location
Lucan Formation	Dinantian Upper Impure Limestones	Ll – Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones.	Underlies the north-east corner of the Site
Pollaphuca Formation	Silurian Metasediments and Volcanics	Pl – Poor Aquifer – Bedrock which is Generally Unproductive except for Local Zones.	Underlies most of the Site
Carrighill Formation		Pu – Poor Aquifer – Bedrock which is Generally Unproductive.	Underlies the western extension of the Site
Glen Ding Formation			Within the Study Area
Slate Quarries Formation			Within the Study Area

8.4.3.3 Permeability, Groundwater Vulnerability and Recharge

The GSI has mapped the permeability of superficial deposits to classify how readily water can infiltrate these deposits downwards at any point in the land surface. According to the GSI's Map Viewer, the Site is mainly underlain by superficial deposits of moderate permeability where Till derived from Lower Palaeozoic

[5] The Hydrostratigraphic Rock Unit Groups map is a reclassification of the 1:100,000 bedrock geology map, created by grouping bedrock formations and members into 27 Rock Unit Group categories based on their hydrogeological properties and other factors.

sandstones and shales and Alluvium are located. Gravels derived from Limestones are mapped as having high permeability. The permeability of Till derived from limestones has not been mapped.

The GSI has mapped the vulnerability of groundwater to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. The Site is mapped as having predominantly high groundwater vulnerability to contamination (see Volume 03; Figure A8-3). The south-western corner of the Site is mapped as being of moderate vulnerability; while the north-eastern corner is mapped as being of extreme vulnerability, which indicates that the bedrock and/or groundwater is within 3 m of the surface.

The GSI has mapped groundwater recharge to provide an estimate of the average amount of rainwater that percolates down through the superficial deposits to the water table over a year. The Site is mapped as having an average recharge between 51 to 100 mm/yr associated with Till derived from Lower Palaeozoic sandstones and shales, Gravels derived from Limestones and Alluvium. The north-eastern corner of the Site is mapped as having a higher average recharge between 151 to 200 mm/yr associated with Till derived from limestones.

8.4.3.4 Groundwater Abstractions and Source Protection Areas

As with the whole of the Republic of Ireland, the WFD groundwater bodies underlying the Site are registered under Article 7 Abstraction for Drinking Water as drinking water groundwater bodies.

According to the GSI's Map Viewer, there are no groundwater abstractions recorded within the Site, but there is one groundwater abstraction recorded within the Study Area. St Bridget's Well (2921NWW007) is located approximately 550 m to the north-east of the Site and is illustrated in Volume 03; Figure A8-4. It is designated as a spring, but there are no details regarding its use and the yield.

Source Protection Areas (SPAs) are delineated by the GSI to protect groundwater drinking water sources from pollution. According to the GSI's Map Viewer, there are no SPA within the Site or the Study Area. The closest SPA is Kilteel GWS located approximately 4.4 km to the south-west of the Site.

8.4.3.5 WFD Groundwater bodies

WFD groundwater bodies are subdivisions of large geographical areas of aquifers so that they can be effectively managed to protect the groundwater and linked surface waters in line with the WFD. The Site is predominantly underlain by the Kilcullen WFD groundwater body. The north-eastern corner of the Site is underlain by the Dublin WFD groundwater body.

Significant pressures are identified by the EPA for waterbodies that are deemed to be 'At Risk' of not meeting their water quality objectives under the WFD. While there are a multitude of pressures in every waterbody, the significant pressures are those pressures which need to be addressed in order to improve water quality. Although its status is considered Good, the Kilcullen WFD groundwater body is considered at risk due to a decline in the chemical quality of its samples. There are no listed significant pressures for Dublin WFD groundwater body.

Table 8-10: WFD Groundwater Bodies underlying the Study Area

Groundwater body name	Groundwater body ID	Hydrostratigraphic Rock Unit Group	WFD overall status (2019-2024)	WFD Risk status (3rd Cycle)
Kilcullen	IE_EA_G_003	Dinantian Upper Impure Limestones	Good	At risk
Dublin	IE_EA_G_008	Silurian Metasediments and Volcanics	Good	Under review

The hydrogeological characteristics of the WFD groundwater bodies traversed by the Site, as described by the GSI, are outlined below:

- The Kilcullen WFD groundwater body (GSI, 2004a) is considered as a poor aquifer, generally unproductive except for local zones in this area, with a low permeability, low storativity and transmissivity values expected to be lower than 30 m^2/d. The majority of groundwater flow occur in the first 3 m of the rocks, in weathered zone towards rivers and springs. Groundwater flow path is of a couple of hundred metres, with discharge to the closest surface water features;
- The Dublin WFD groundwater body (GSI, 2004b) is considered as locally important aquifer in this area, with low permeability from 1 to 10 m^2/d. Most groundwater flow is taking place close to the surface with additional isolated flow along fractures and fissures recorded at depths of 30 to 50 m below ground level (bgl).

8.4.3.6 Groundwater Quality

According to the EPA's Map Viewer, there is one EPA groundwater monitoring station that monitors the chemistry of Kilcullen WFD groundwater body, but it is located approximately 26 km south-west of the Site at Gormanstown village (GWIE_EA_G_00314000006). An overview of average yearly values for monitoring WFD groundwater quality elements between 2021 and 2025 is provided in Table 8-11. According to the GSI's WFD groundwater body descriptions (GSI, 2004a), the groundwater is expected to have a very low alkalinity, total hardness values of 100 and 150 mg/l, and electrical conductivity values between 300 and 500 µS/cm.

There are multiple EPA groundwater monitoring stations that monitors the Dublin WFD groundwater body located approximately 14 km to the north-west of the Site. According to the GSI's WFD groundwater body descriptions (GSI, 2004b), the groundwater is expected to have a calcium bicarbonate signature, with high alkalinities and hardness (in the order of 300 and 350 mg/l $CaCO_3$). Electrical conductivity is also expected to be very high, between 550 and 900 µS/cm.

Table 8-11: Average Yearly Values (2021-2025) for the Monitored WFD Groundwater Quality Elements at Gormanstown USC Monitoring Station

WFD Element	2021	2022	2023	2024	2025
Alkalinity ($CaCO_3$) (mg/l)	231	312	314	316	293
Aluminium (µg/l)	1	1	1	1	2
Ammonia (N) (mg/l)	0.01	0.01	0.01	0.014	0.01
Antimony (µg/l)	0.5	0.5	0.5	0.5	0.5

WFD Element	2021	2022	2023	2024	2025
Arsenic (µg/l)	0.5	0.5	0.5	0.5	0.5
Barium (µg/l)	25	23	25	23	23
Beryllium (µg/l)	0.5	0.5	0.5	0.5	0.5
Boron (µg/l)	5	5	5	5	5
Cadmium (µg/l)	0.045	0.026	0.022	0.022	0.025
Calcium (mg/l)	117	117	106	85	107
Calculated Hardness ($CaCO_3$) (mg/l)	-		-	232	293
Chloride (mg/l)	15	14.5	14.1	20	22.4
Chromium (µg/l)	0.9	0.5	0.9	0.5	0.5
Cobalt (µg/l)	0.5	0.5	0.5	0.5	0.5
Coliform Bacteria (No./100ml)	0	0	0.17	0	0
Conductivity (µS/cm)	723	662	639	698	746
Copper (µg/l)	32	4.2	4.8	3.2	9.3
Dissolved Oxygen (mg/l)	7.7	9.1	9.7	8.3	8.8
E. Coli (No./100ml)	0	0	0.17	0	0
Fluoride (mg/l)	0.1	0.1	0.1	0.1	0.1
Iron (µg/l)	37	10	8	5	10
Lead (µg/l)	1.1	0.1	0.2	0.1	0.5
Magnesium (mg/l)	7.5	7.1	6.4	4.9	6.3
Manganese (µg/l)	2.5	2.5	2.5	2.5	2.5
Mercury (µg/l)	0.01	0.01	0.01	0.01	0.01
Molybdenum (µg/l)	0.5	0.5	0.5	0.5	0.5
Nickel (µg/l)	6.5	0.9	0.5	0.7	1.6
Nitrate (N) (mg/l)	4.6	4.7	4.2	4.5	3.9
Nitrite (N) (µg/l)	2	2	2	2	4
Orthophosphate (P) (mg/l)	0.017	0.024	0.025	0.012	0.027
Oxidation Reducing Potential (mV)	553	580	604	283	167
pH	7.2	7.3	7.1	7.4	7.5
Potassium (mg/l)	1.8	1.4	2.1	1.3	1.5
Selenium (µg/l)	0.5	0.5	0.5	0.5	0.5
Silica (SiO2) (mg/l)	8.1	8.1	8.3	8.2	8.1
Sodium (mg/l)	7.9	7	7.7	5.8	12.4
Strontium (µg/l)	197	200	183	187	193
Sulphate (mg/l)	8.9	7	7.5	6.3	5.9
Temperature (ºC)	10.2	9.8	10.7	10.4	10.6
Thallium (µg/l)	0.1	0.1	0.1	0.1	0.1

WFD Element	2021	2022	2023	2024	2025
TOC (NPOC) (mg/l)	0.5	0.7	0.7	7.3	1.8
Total Hardness (CaCO3) (mg/l)	323	321	303	-	-
Total Oxidised Nitrogen (N) (mg/l)	4.6	4.7	4.2	4.5	3.9
Total Phosphorus (P) (mg/l)	0.055	0.025	0.026	0.223	0.349
Turbidity (NTU's)	0.25	0.25	0.25	0.46	0.25
Uranium (µg/l)	1.3	1.4	1.2	1.4	1.3
Vanadium (µg/l)	0.5	0.5	0.5	0.5	0.5
Zinc (µg/l)	37.7	4.5	2.6	2.7	7.4

8.4.3.7 Groundwater Dependent Terrestrial Ecosystems

There is no central or comprehensive repository of GWDTEs data in Ireland. The mapping of designated/ protected sites by the NPWS, karst landforms by the GSI and wetland habitats by Wetland Surveys Ireland (Wetland Surveys and Foss Environmental Consulting, 2026) has been examined. There are no designated sites of groundwater interest located within the Site and the Study Area; however, there are four non-designated GWDTEs that are presented in Table 8-12.

Habitat surveys were undertaken within the Site and the surrounding area in 2021[6] [7]. These surveys identified the presence of several Priority Annex I habitats within the non-designated GWDTE at Rathcoole wet woodland, which is located within and adjacent to the Site. Specifically, these include GWDTEs habitats - 91E0 Alluvial woodland and 7220 Petrifying springs. As part of this project, further habitat surveys were undertaken in August 2025 within the Site, including a more detailed survey in the areas historically classified as Priority Annex I habitats. The results of these surveys are described in detail in **Chapter 6** (Biodiversity) and in Volume 02; Appendix A6-2 and illustrated in Volume 03; Figure A6-2a, Figure A6-2b and drawing 2430-MET-ZZ-ZZ-DR-A-101117.

These surveys indicated that the 91E0 Alluvial Woodland habitat appears relatively dry, with no obvious water logging during the spring and summer months; however, the vegetation suggests that the groundwater table remains high all year. Alluvial woodland habitats can receive hydrological inputs from both groundwater and surface water sources and, based on the habitat characteristics observed on Site, are considered to have a low to moderate dependency on groundwater. This corresponds with the Working Group on Groundwater's[8] assessment of moderate dependency for these habitats. The 91E0 Alluvial Woodland habitat that forms part of the Rathcoole wet woodland is considered to be of county or high receptor importance.

In addition, the previously classified 7220 Petrifying Springs habitat was not observed to contain any tufa formation or indicator species for this habitat. Based on the habitat surveys, this habitat is considered to be a calcareous spring; despite no obvious upwelling of water being noted or obvious spring vegetation. However, spring habitats can vary seasonally and are sometimes only visible in winter (the survey was

[6] Faith Wilson and Dr Joanne Denyer (2021), 'Appendix 2B: Rathcoole Lands Ecology Assessment'
[7] Nimbosa Ecology (2021), 'A survey to assess the woodlands and associated semi-natural habitats at Rathcoole, Co. Dublin'
[8] Working Group on Groundwater (2005) Guidance on the application of groundwater risk assessment sheets SWRA 1-6 and GWDTERA 1-9 to areas designated for the protection of habitats and species.

carried out in summer). Nevertheless, as a spring had already been identified in this area by recognised experts (Wilson and Denyer, 2021), it has been assumed that this spring was still present. Calcareous springs are fed by groundwater emerging from the subsurface, typically driven by a change in slope or in geological or hydrogeological conditions, i.e. a fault or geological boundary. Based on the available information, there is no obvious topographical or geological reason for a spring to emerge at this location.

Table 8-12: Non-designated GWDTEs within the Study Area

Name	Status	Wetland type	Approx. distance from the Site (m)
Rathcoole wet woodland	C+ rating: County conservation value	River, Annex I Alluvial Woodland (i.e. wet woodland (oak ash or willow alder)), scrub, wet grassland, calcareous spring	Traversed
Rathcoole Park ponds	C+ rating: County conservation value	Artificial pond, river, reed swamp, scrub	Adjacent
Saggart citywest golf course ponds west	F rating: Unknown value – survey required	Artificial pond, scrub, reed swamp	450
Saggart citywest golf course ponds east	F rating: Unknown value – survey required	Artificial pond, scrub, reed swamp	970

8.4.3.8 Karst Landforms

According to the GSI's National Karst Database, there are no karst landforms within the Site or Study Area.

8.4.4 Flood Risk

A Stage 2 FRA was undertaken in April 2026 which involved the establishment of flood sources, the extent of the flood risk, potential impacts of the Proposed Development and possible mitigation measures. This has been used to inform the flood risk impact assessment contained herein.

A summary of this FRA can be found below, further details can be found in the FRA Report (see FRA submitted with this application).

8.4.4.1 Fluvial Flood Risk

With regards to fluvial flooding, www.floodinfo.ie provides future scenario online mapping, which indicates that there are flooding risks associated with the branch of Coolmine Stream (Fitzmaurice Stream) through the Site. Flood risks are also associated with Crockshane Stream, located along the southern and western perimeter of the Site (see Volume 03; Figure A8-5). A 30% climate change model is available for viewing, which highlights further flooding events throughout the Site and on the south-east corner of the existing Rathcoole Park. Therefore, based on the material reviewed as part of the Stage 2 FRA and the analysis undertaken, it was concluded that the Site is classified as Flood Zone A and a Justification Test was required.

The Site is also noted to be subject to fluvial flooding, primarily along the extents of the River Camac, running along the eastern boundary of the Site. It must be noted that the Camac Flood Alleviation Scheme is currently underway, which is to assess the risk of flooding in key parts of the Camac catchment area which will in turn, inform engineering options to further reduce the risk of flooding in these areas.

The Justification Test concluded that the full extents of both residential development areas (Development Areas A and B), and the primary site access route/roadway, are situated slightly outside the extents of Flood Zone A. Additionally, at areas within close proximity to Flood Zone A, existing levels are not proposed to be changed when developing these proposals. For the development extents situated slightly outside the extents of Flood Zone A, existing levels are not proposed to be changed when developing these proposals. Therefore, there will be no increase in flood risk as a result of developing these areas as part of the Proposed Development.

8.4.4.2 Pluvial Flood Risk

The Stage 2 FRA reviewed the available information on pluvial flooding and concluded that the available mapping does not indicate a significant existing pluvial flood risk to the Site.

8.4.4.3 Coastal Flood Risk

The Stage 2 FRA concluded that there is no risk associated with coastal flooding for the Site.

8.4.4.4 Groundwater Flood risk

Groundwater flooding can occur during lengthy periods of heavy rainfall, typically during later winter/early spring when the groundwater table is already high. If the groundwater level rises above surface level, it can pond at local points and cause periods of flooding. Geological soil conditions as provided by GSI mapping concluded that the Site is classified as having a moderate subsoil permeability. Additionally, the Site is noted to be located within a high vulnerability classification, which indicates a high vulnerability to groundwater contamination. In the absence of site-specific ground investigation data, AECOM has prepared a scope of works for a project-specific ground investigation. This will characterise ground and groundwater conditions and assess infiltration and bearing capacity across the Site, informing the proposed drainage and pavement design for the residential development. At the time of writing, these ground investigations have not yet been undertaken.

8.4.5 Summary of Baseline Conditions

The Site is located mainly on the Pollaphuca Formation, and the west part is located on the Carrighill Formation, which are qualified as a poor aquifer, except for local zones in the Pollaphuca Formation. They constitute the Kilcullen WFD groundwater body and is a receptor of **very high** importance. The north-eastern corner of the Site is located on the Lucan Formation, which is a locally important aquifer, and constitutes the Dublin WFD groundwater body, also a receptor of **very high** importance. The Site is located in an area of high vulnerability with a zone of moderate vulnerability in the southwest and extreme vulnerability in the north-east.

The Study Area contains three WFD river waterbodies as well as one non-WFD waterbody (a branch of Coolmine Stream, also known as Fitzmaurice Stream) and a potential spring. Camac_020 is considered **high** importance due to Good water quality, while Camac_010 and Liffey_170 are considered **medium** importance, whilst the branch of Coolmine Stream is considered **high** importance. There is also a cluster of unnamed non-WFD lakes and ponds located within the Study Area that may also be at risk - these are considered **low** importance.

The description of the underlying groundwater bodies indicates that the groundwater table is expected in the first few metres of the bedrock and would be hydraulically connected to the river waterbodies.

There are no EPA surface water abstraction points within the Study Area. One spring is recorded within the Study Area by the GSI's Map Viewer and is a receptor of **low** importance.

There are no karst landforms and no designated sites of interest to surface water and groundwater within the Study Area. There are several non-designated sites, two artificial ponds which are considered of **low** importance, one wet woodland habitat within which 91E0 Annex I Alluvial Woodland has been identified (see 2430-MET-ZZ-ZZ-DR-A-101117), which is considered a receptor of county or **high** importance (Rathcoole Wet Woodland), whilst the Rathcoole Park Ponds are also considered **high** importance.

The Justification Test concluded that the full extents of both residential development areas (Development Areas A and B), and the primary site access route/roadway, are situated slightly outside the extents of Flood Zone A. Additionally, at areas within close proximity to Flood Zone A, existing levels are not proposed to be changed when developing these proposals. For the development extents situated slightly outside the extents of Flood Zone A, existing levels are not proposed to be changed when developing these proposals. Therefore, there will be no increase in flood risk as a result of developing these areas as part of the Proposed Development.

Table 8-13: Receptor Sensitivity/Importance within the Study Area

Receptor	Location Relative to the Proposed Development	Sensitivity/Importance
Watercourses		
River Camac (Camac_010)	The river flows from south to north and joins the Camac_020 outside of the Site boundary.	Medium • River Camac_010 is of Moderate water quality. • The watercourse does not appear to be a locally important potable water source. • Previous aquatic surveys (Mayfly Ecology, 2024) carried out on watercourses within the Study Area identified that the Camac_010 did not have white-clawed crayfish present during the survey, however crayfish had been recorded in 2013 at the same site in 2013 during an EPA survey. Crayfish are either absent from the section of the Camac surveyed or occur in such low numbers that the survey method did not detect them.
River Camac (Camac_020)	The river Camac borders the Site along the eastern boundary. A tributary to the rivers main channel (Crockshane Stream) flows along the southern edge of the Site's boundary while a second tributary to the rivers main channel (Coolmine Stream) flows along the northern edge of the Site's boundary for approximately 725 m.	High • A site visit determined signs of a morphologically valuable river channel. • The River Camac_020 is of Good water quality. Previous aquatic surveys (Mayfly Ecology, 2024) carried out on watercourses within the Site identified poor macroinvertebrate quality and no suitable crayfish habitat at Crockshane and Coolmine Streams, whilst the Camac had suitable crayfish habitat (though the species was absent) and moderate macroinvertebrate quality. In addition, three -spined stickleback were recorded in the Coolmine Strem, with no other fish observed during the surveys.
Tributaries of the River Liffey (Liffey_170)	There are three tributaries of the Liffey_070 (Rathcreedan Stream, Greenoge_09 Stream, and Jordanstwon_09 Stream) located approximately 1.6 km, 1.0 km, and 1.3 km from the Site, respectively. The waterbodies do not appear to be hydrologically connected to the Site.	Medium • The Liffey_170 is of Poor water quality. • The watercourse does not appear to be locally important potable water source.

Receptor	Location Relative to the Proposed Development	Sensitivity/Importance
Coolmine Stream / Fitzmaurice Stream (Camac_020)	Rises in Rathcoole Woodland and flows south to north through the Site. A section also flows north-east along the northern edge of the Site which then discharges into the Camac_020. Another branch flows west across Rathcoole Park and is mapped as forming part of the Camac_020 waterbody.	High • Watercourse supports county importance level wetlands (Rahcoole Park ponds and wet woodland). • Mapped as part of the Camac_020 is of Good water quality, however not main channel. • The site visit identified the watercourse to be choked with aquatic/riparian vegetation. • Contains significant sediment deposition. • Regular impoundments located along the watercourse (heavily modified).
Drains and ditches	There is potential for additional drains/ditches to be identified as the project develops and therefore cannot be ruled out.	Low • Unmapped drains and ditches are likely to have minimal hydrological importance to sensitive or protected ecosystems.
Wetlands and lakes (not GWDTE)		
Unnamed ponds located east of the Site	There are two non-WFD ponds both located within 160 m east of the Site, based on a review of online mapping (Bing Maps, 2026). The outflow to one lake joins the Camac_020.	Low • Located upstream from the Site. • Non-WFD.
WFD Groundwater Bodies		
Kilcullen	Underlying the majority of the Site.	Very High • Contribute to Wicklow Mountains SAC (blanket bogs).
Dublin	Underlying the north-eastern corner of the Site.	Very High • Contribute to South Dublin Bay and River Tolka Estuary SPA (wetlands and waterbirds).
Groundwater Abstractions		
St Bridget's Well – 2921NWW007	Located approximately 550 m north-east of the Site.	Low
Non-designated GWDTEs		
Rathcoole Wet Woodland	Within and adjacent to the Site.	High • C+ rating: County conservation value, and characterised as 91E0 Annex I Alluvial Woodland-
Rathcoole Park ponds	Adjacent to the north of the Site. Both ponds/wetlands are hydrologically connected with the branch of Coolmine Stream that flows through the Site. The ponds/wetlands were identified during the 19/09/2025 site visit, further details can be found in Volume 02, Appendix A8-1.	High • C+ rating: County conservation value • A site visit determined one of these ponds to be artificial with marginal riparian vegetation, the other was described as a wider wetland area dominated by aquatic/riparian vegetation and is a possible location of a spring.
Saggart citywest golf course ponds west	Located within 500 m to the east of the Site. The waterbodies do not appear to be hydrologically connected to the Site.	Low
Saggart citywest golf course ponds east	Located within 960 m to the east of the Site. The waterbodies do not appear to be hydrologically connected to the Site.	Low
Flood Risk		
Pluvial	The Stage 2 FRA concluded that based on available data there is no recorded pluvial flooding within the Site or surrounding vicinity.	Very High • Dwellings are considered highly vulnerable developments in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities (OPW, 2009). • Constructions works are considered highly vulnerable.

Receptor	Location Relative to the Proposed Development	Sensitivity/Importance
Coastal	The Stage 2 FRA concluded that there is no risk associated with coastal flooding for the Site.	Very High • Dwellings are considered highly vulnerable developments in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities (OPW, 2009). • Constructions works are considered highly vulnerable.
Fluvial	Parts of the Site fall within Flood Zone A (high probability of flooding where the probability of flooding is greatest (greater than 1% or 1 in 100 for river flooding and 0.5% or 1 in 200 for coastal flooding))	Very High • Dwellings are considered highly vulnerable developments in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities (OPW, 2009). • Constructions works are considered highly vulnerable.
Groundwater	The GSI's Groundwater Flood Mapping indicates that there are no areas with a probability of groundwater flooding or of historic groundwater flooding within the Site or Study Area.	Very High • Dwellings are considered highly vulnerable developments in accordance with The Planning System and Flood Risk Management Guidelines for Planning Authorities (OPW, 2009). • Constructions works are considered highly vulnerable.

8.5 Potential Impacts

8.5.1 Construction Phase

During the Proposed Development construction phase, potential surface water and groundwater environment impacts may occur in the absence of mitigation, including the following:

- Changes in surface and groundwater quality as a result of uncontrolled construction site runoff including excessive fine sediment and polluting substances such as fuel, hydraulic fluids, solvents, grouts, paints and detergents, etc. These effects may arise during sediment-generating activities such as site clearance, levelling, stockpiling, formation of site roads and compounds, installation of underground services, and foundation works for the portal watercourse crossing. Alteration of pH in surface water and groundwater features may also occur as a result of the use of concrete and lime during construction activities;
- Pollution of surface and groundwater quality from accidental spills and leaks of fuels and chemicals, which may be associated with storage and use of construction chemicals and refuelling of construction vehicles;
- Changes in surface water flows, drainage networks, groundwater levels and flows and contributions to Surface Water Dependent Ecosystems (SWDEs), GWDTEs, springs and abstractions due to uncontrolled site runoff, construction of watercourse crossings, i.e. bridges, expansion of impermeable areas and storage of material within floodplains and dewatering and related discharge activities;
- Impacts on watercourse morphology due to the installation of road outfalls; and
- Increase of flood risk due to blockage of drains or existing culverts as a result of increased materials and other debris being transported via runoff and temporary flooding may occur due to excavations and soil removal activities.

The potential impact of infiltration from the drainage systems/SuDS on groundwater, both in terms of levels and quality, has been scoped out. As the potential for infiltration at the Site is unclear, no infiltration has been proposed throughout the Site at present, with the exception of the swales[9] and filter drains**Error! Bookmark not defined.** (see 60739527-ACM-XX-00-DR-CE-10-0520 and 60739527-ACM-XX-00-DR-CE-10-0521).

8.5.1.1 Sedimentation of Surface and Groundwater

Various construction activities, including earthworks and dewatering, have the potential to release sediment and cause unacceptable sediment mobilisation in the catchment area. Vegetation removal, site stripping and bulk earthworks could leave deposits exposed to temporary erosion by wind or rain and this could potentially lead to temporary increases in sediment loading of the surface water network. Inundation by suspended sediments may also be caused by runoff from material stockpiles. Excessive sediments in runoff may eventually be transported and enter sensitive water bodies. Generally, excessive fine sediment in runoff is chemically inert and affects the water environment through smothering riverbeds and plants, temporarily changing water quality (e.g. increased turbidity and reduced photosynthesis), and causing physical and physiological adverse impacts on aquatic organisms (e.g. abrasion, irritation etc.).

Potential Impact on Surface Water Receptors

- Proposed watercourse bridge crossings require works within close proximity to the watercourse during construction, thereby creating a risk of sediment mobilisation;
- Increased sedimentation from the Site may lead to blockage of drains or culverts due to the transport of silt, sand, gravel, and other debris in surface runoff;
- Runoff containing large amounts of suspended solids and direct work within the watercourse from culvert construction could potentially adversely impact surface water receptors quality and flow. The impact is considered a direct effect of a negative nature. It is considered likely to occur in the absence of sufficient mitigation measures, however, is likely to be temporary.

The magnitude of impact is predicted to be medium on the surface water environment in the absence of mitigation for all waterbodies that are worked on directly, and low on the waterbodies that are worked on indirectly. Table 8-15 in Section 8.7.1.1 summarises each water receptor and the associated magnitude of the impact from runoff laden with sediment, or mobilised sediment within watercourses. As a result, the effect is anticipated to be **Significant** for high importance waterbodies (Camac_020 and the branch of Coolmine Stream (also called Fitzmaurice Stream)) and **Slight** for the rest of the surface water receptors such as Camac_010, Liffey_0170, drains/ditch waterbodies, and the unnamed non WFD ponds located east of the Site that are not GWDTEs.

Potential Impact on Groundwater Receptors

The hydrogeological characteristics of the Site indicate that where superficial deposits of moderate permeability are present, these materials are likely to limit vertical infiltration and provide a degree of attenuation. Runoff is expected to follow surface or near-surface flow pathways, reducing the likelihood of

[9] AECOM (April 2026) Proposed Residential Development at Rathcoole, Co. Dublin, Stage 2A Infrastructure Report.

direct recharge to the underlying aquifer. Where the protective cover is limited, in areas where bedrock is close to or exposed at the surface, the capacity of attenuation is reduced. Superficial deposits of high permeability increase the potential for contaminants within uncontrolled runoff to infiltrate to groundwater.

Runoff containing large amounts of suspended solids and direct work within the watercourse from culvert construction could potentially adversely impact groundwater bodies and GWDTE's quality, and groundwater bodies flow. The impact is considered an indirect effect of a negative nature. It is considered likely to occur in the absence of sufficient mitigation measures, however, is likely to be temporary.

The magnitude of impact is predicted to be medium on the groundwater environment in the absence of mitigation for all waterbodies that are worked on directly, and low on the waterbodies that are worked on indirectly. Table 8-15 in Section 8.7.1.1 summarises each water receptor and the associated magnitude of the impact from runoff laden with sediment, or mobilised sediment within watercourses. As a result, the effect is anticipated to be **Significant** for the underlying WFD groundwater bodies (e.g. Kilcullen and Dublin), **Moderate** for the non-designated GWDTE Rathcoole wet woodland, and **Slight** for the rest of the relevant water receptors (e.g. St Bridget's Well, Rathcoole Park ponds, Saggart Citywest ponds west and east).

8.5.1.2 Accidental Spillage and Leaks

Any construction activities carried out close to surface waters involve a risk of pollution due to accidental spillage and leaks. While liquids such as oils, lubricants, paints, bituminous coatings, preservatives and weed killers present the greatest risk, fuel spillages from machinery operating close to watercourses also present a risk. The refuelling of general construction plant operating close to water bodies or GWDTEs also pose a significant risk of pollution, depending on how and where it is carried out. Like uncontrolled site runoff, the risk is greatest where works occur over areas of sub cropping or outcropping bedrock and close to waterbodies.

Accidental spillage may potentially result in a direct or indirect impact to surface water, groundwater, springs or GWDTEs should contaminants enter surface waters directly or migrate through the subsoils and underlying groundwater. It has been assumed that the WFD groundwater body underlying the Site has the potential to be exposed and is vulnerable to direct impacts from accidental spillages. The impact would arise during the construction phase; however, the duration of any resulting effect would depend on the nature and scale of the release and the affected receptor.

Accidental spillages and leaks are considered unlikely to occur and should they occur are likely to be temporary. The magnitude of impact is predicted to be medium on the water environment in the absence of mitigation for all waterbodies that are worked on directly, and low on the waterbodies that are worked on indirectly. A summary of the water receptors and the associated magnitude of the impact from accidental spillage and leaks is presented in Table 8-15.

The effect is anticipated to be **Significant** for the underlying WFD groundwater bodies (e.g. Kilcullen and Dublin), **Moderate** for Camac_020, Coolmine Stream (also called Fitzmaurice Stream) and the non-designated GWDTE Rathcoole wet woodland, and **Slight** for the rest of the relevant water receptors (e.g. Camac_010, Liffey_0170, drains and ditches encountered on the Site, unnamed ponds located east of the Site, St Bridget's Well, Rathcoole Park ponds, Saggart Citywest ponds west and east).

8.5.1.3 Use of Concrete and Lime

Lime and concrete (specifically, the cement component) is highly alkaline, and any spillage could enter surface water or migrate though subsoils and groundwater impacting surface water and groundwater quality.

The impact is considered an indirect effect of a negative nature and of a temporary duration given it is only associated with the construction programme. Impacts associated with the use of concrete and lime are considered unlikely to occur and should they occur, they would be limited to a one-off release. The magnitude of impact is predicted to be medium on the water environment in the absence of mitigation for all waterbodies that are worked on directly, and low on the waterbodies that are worked on indirectly. Table 8-15 provides an assessment of the water receptors and the associated magnitude of impact of the use of concrete and lime. The effect is anticipated to be **Significant** for the underlying WFD groundwater bodies (e.g. Kilcullen and Dublin), **Moderate** for Camac_020, Coolmine Stream (also called Fitzmaurice Stream) and the non-designated GWDTE Rathcoole wet woodland, and **Slight** for the rest of the relevant water receptors (e.g. Camac_010, Liffey_0170, drains and ditches encountered on the Site, unnamed ponds located east of the Site, St Bridget's Well, Rathcoole Park ponds, Saggart Citywest ponds west and east).

8.5.1.4 Watercourse Crossings and Outfalls

Hydromorphology

Watercourse Crossings

One watercourse crossing is proposed to be constructed across a branch of Coolmine Stream (also known as Fitzmaurice Stream) that flows through the Site to provide vehicular access. The proposed portal structure shall be a single span precast concrete structure. The internal span of 3.5 m has been determined based on the topographical survey which ties into the existing top of watercourse. The vertical clearance will be 1.5 m from the top of the watercourse to the soffit of the structure. Based on CFRAM Map the 0.1% Water level is 121.97m OD (Node Label – 09FITZ00086) which will provide a freeboard of 3.547 m where the minimum requirement is 0.3 m.

The proposed structure will maximise the use of precast elements to minimise environmental impact and construction time on the site. No instream works will be required during construction, and temporary silt fencing will be erected which is required to protect the watercourse. The current excavation volume associated with the proposed structure is approximate 150 m^3 each side of the watercourse however will be refined further during geotechnical detailed design. The abutments are assumed to be set back 1 m from the watercourse. Crane positioning for the lifting of precast elements will be determined by the Contractor however it can be assumed they will be located north-west of the watercourse as it provides sufficient working room for mobilisation and demobilisation of the crane plus provide site access for large equipment and precast elements.

Construction activities associated with a portal structure design would result in the disturbance and mobilisation of sediment from the riparian margins without suitable mitigation due to the excavation for spread footing foundations close to the watercourse banks. The design of the crossing would require no direct in channel works and will not restrict the flow of water within the channel, maintaining flow regime

and morphological process continuity. The morphological impact is considered an in-direct effect of negative nature and of a temporary duration during the construction phase.

A second crossing is proposed across the same branch of the watercourse (around INGR: O 02714 26678); however, this crossing already exists within the park and it is assumed no modifications will be made to the crossing.

In the absence of mitigation, the magnitude of impact on hydromorphology is predicted to be low on this branch of Coolmine Stream/Fitzmaurice Stream, and the significance of effect is anticipated to be **Moderate,** given the watercourse supports county importance level wetlands (Rathcoole Park ponds and wet woodland).

Outfalls

Two outfalls are proposed to be installed along a branch of Coolmine Stream/Fitzmaurice Stream. The design of the proposed outfalls is subject to further design, in the absence of design, it is assumed the headwall is a maximum width of 2 m as a worst-case scenario. Construction activities associated with these outfalls would result in the disturbance and mobilisation of sediment from the riparian margins, and the permanent removal of riparian vegetation and natural bank material. The morphological impact is considered a direct effect of negative nature and permanent during the construction phase.

Given the watercourse supports county importance level wetlands (Rathcoole Park ponds and wet woodland), in the absence of mitigation, the magnitude of impact is predicted to be medium on this branch pf Coolmine Stream/Fitzmaurice stream, and the significant of effect is anticipated to be **Significant**.

8.5.1.5 Excavation and Dewatering

Excavation and dewatering activities associated with the Proposed Development, such as for structure foundations, underground services, drainage infrastructure, wastewater pump station and attenuation basins have the potential to alter natural groundwater levels, flows, and contribution to watercourses, GWDTEs and to the identified spring source.

No ground investigations or site-specific groundwater level monitoring have been undertaken to date and, consequently, site-specific information on groundwater conditions is not currently available. In the absence of site-specific groundwater level monitoring data, a conservative assessment has been undertaken assuming that groundwater levels may occur at depths of less than 3 m bgl across the Site. On this basis, localised temporary dewatering may be required during construction where groundwater is encountered within excavations. However, the requirement for, extent and methodology of any temporary dewatering cannot be confirmed at this stage and would depend on the actual ground conditions encountered, excavation depths, construction sequencing and temporary works design.

Excavations associated with the Proposed Development will vary depending on the infrastructure element, as follows:

- Typical housing foundations are anticipated to require excavations of approximately 0.25 m to 0.425 m bgl (see 2A IR submitted with this application – 60765651-ACM-XX-XX-RP-SE-000003);

- Excavations for the proposed attenuation ponds are expected to accommodate permanent water depths of between 1 m and 1.5 m (see RATH-ACM-XX-00-DR-C-000501, RATH-ACM-XX-00-DR-C-000502 and RATH-ACM-XX-00-DR-C-000600), together with approximately 0.3 m of topsoil and 0.2 m of crushed granular material (see RATH-ACM-XX-XX-DR-C-000531), resulting in a maximum excavation depth of approximately 2 m bgl;

- Excavation depths for the proposed watermain will vary according to local ground levels and engineering requirements. The watermain will have a cover depth ranging from approximately 0.5 m to 1.2 m, with pipe diameters varying between 0.1 m and 0.45 m and bedding thicknesses of approximately 0.1 m to 0.2 m (see RATH-ACM-XX-00-DR-C-000510). The maximum excavation depth for the watermain is therefore anticipated to be approximately 1.85 m bgl;

- Excavations for the proposed road network will generally be less than 1 m; however, some road sections, such as Road 03, will require excavations exceeding 1 m bgl (see RATH-ACM-XX-00-DR-C-000601 and RATH-ACM-XX-00-DR-C-000602);

- Filter drains will typically require excavations to a depth of approximately 1 m to 2 m bgl (see Appendix A of the 2A IR submitted with this application – 60765651-ACM-XX-XX-RP-SE-000003); and

- For sections of the proposed surface water drainage network (see RATH-ACM-XX-00-DR-C-000502 and RATH-ACM-XX-XX-DR-C-000510), deeper pipe installations will be required, with the currently indicated excavation depths ranging from approximately 2.45 m to 5.924 m bgl. The maximum excavation depth relates to the drainage network as currently designed; however, the final excavation depths for all associated drainage structures, including backdrop and cascade manholes, have not been confirmed at this stage.

- For sections of the proposed foul water drainage network, the currently indicated excavation depths range from approximately 2.8 m to 5.113 m bgl. These depths are based on the current civil design and may be subject to refinement as the detailed design progresses.

Where excavations extend below the shallow groundwater table, temporary groundwater control or dewatering may be required to facilitate construction. Given that the Site is located within an area of predominantly high groundwater vulnerability, with moderate vulnerability in the south-west and extreme vulnerability in the north-east, and is underlain by poor aquifers, any such groundwater control measures is anticipated to result in localised and temporary changes to shallow groundwater conditions.

In the absence of mitigation measures, the magnitude of impact associated with localised dewatering where excavations extend below groundwater level is considered temporary and localised on groundwater levels and flows.Table 8-15 The magnitude of the impact is predicted to be low on the water environment. Details of the significance of effects on the water body receptors are given in Table 8-15. The significance of effect is anticipated to be **Moderate** on the underlying WFD groundwater bodies (e.g. Dublin and Kilcullen) and **Slight** on Camac_020, Coolmine Stream (also called Fitzmaurice Stream), drains and ditches encountered on the Site, non-designated GWDTE Rathcoole wet woodland. The significance of effect from localised dewatering is anticipated to be **Not Significant** or **Imperceptible** for the rest of the relevant water receptors

(e.g. Rathcoole Park ponds, St Bridgets Well groundwater abstraction, and Saggart Citywest ponds west and east).

8.5.1.6 Flood Risk

Construction activities can temporarily increase flood risk by altering natural drainage patterns and increasing surface water runoff. This is primarily due to the expansion of impermeable areas and the storage of materials within floodplains, which can disrupt fluvial, overland and groundwater flow paths, leading to changes in the rate and volume of runoff and potentially exacerbating local flooding. Blocked drains or culverts due to the accumulation of suspended sediments or transported debris can also contribute to elevated flood risk.

Surface Water (Pluvial)

Pluvial flooding is the result of rainfall-generated overland flows which arise before runoff can enter any watercourse or sewer. It is usually associated with high intensity rainfall. The FRA (see FRA submitted with this application) states that the CFRAM study did not carry out a review of the pluvial flooding extent, however the SDCC Strategic Food Risk Assessment (SFRA) included an indicative pluvial flood mapping overview map, which shows that it is not predicted that the Site will be impacted by pluvial flooding. In the absence of mitigation measures to protect construction workers such as an Emergency Response Plan or measures to mitigate the generation of surface water from increased suspended sediments or transported debris on Site, there may be potential impacts from pluvial flooding.

Coastal

The FRA (see FRA submitted with this application) concluded that based on the information reviewed, there is no risk associated with coastal flooding for the Site.

Fluvial

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain. Floodinfo.ie[10] provides future scenario online mapping, which indicates that there are flooding risks associated with the Coolmine Stream through the Site, as well as the Crockshane Stream, located along the southern and western perimeter of the Site. A 30% climate change model is available for viewing, which highlights further flooding events throughout the Site and on the south-east corner of the existing Rathcoole Park. The FRA (see FRA submitted with this application) Justification Test concluded that the full extents of both residential development areas (Development Areas A and B), and the primary Site access route/roadway, are situated slightly outside the extents of Flood Zone A. Additionally, at areas within close proximity to Flood Zone A, existing levels are not proposed to be changed when developing these proposals. For the development extents situated slightly outside the extents of Flood Zone A, existing levels are not proposed to be changed when developing these proposals. Therefore, there will be no increase in flood risk as a result of developing these areas of the Proposed Development. In the absence of mitigation measures to protect construction workers such as an Emergency Response Plan or measures to mitigate

[10] Floodinfo.ie (2026) 'Flood Maps' Available at: Flood Maps - Floodinfo.ie (Last accessed Augst 2026).

the generation of surface water from increased suspended sediments or transported debris on Site, there may be potential impacts from fluvial flooding.

Groundwater

Groundwater flooding can occur during lengthy periods of heavy rainfall, typically during later winter/early spring when the groundwater table is already high. If the groundwater level rises above surface level, it can pond at local points and cause periods of flooding. The FRA (see FRA submitted with this application) concluded that geological soil conditions as provided by GSI mapping concluded that the Proposed Development is classified as having a moderate subsoil permeability. Additionally, the Site is noted to be located within a high vulnerability classification, which indicates a high vulnerability to groundwater contamination. In the absence of site-specific ground investigation data, AECOM has prepared a scope of works for a project-specific ground investigation. This will characterise ground and groundwater conditions and assess infiltration and bearing capacity across the Site, informing the proposed drainage and pavement design for the residential development. At the time of writing, these ground investigations have not yet been undertaken. In the absence of mitigation, excavations have potential to flood, risking construction workers and generating waters that might contribute to flooding on site or off site.

Flood Risk Summary

Increased flood risk is considered a direct impact of a negative nature and with a temporary duration as it is given associated with the construction phase. Impacts associated with localised flooding due to construction activities are considered likely to occur and should they occur are likely to be temporary. The magnitude of impact from fluvial, pluvial, and groundwater flood risk is predicted to be medium in the absence of mitigation. When considering the construction workers on the Site who are a very high importance receptor, the significance of effect is anticipated to be **Significant**.

8.5.2 Operational Phase

During the operational phase, the following potential water environment impacts may occur in the absence of mitigation, including:

- Potential increase in volume and rate of surface water from new impervious areas, leading to an impact on flood risk, upstream and downstream of the Proposed Development. The introduction of new impervious surfaces may also reduce infiltration which may result in a reduction in groundwater recharge;
- Changes in surface water and groundwater quality associated with diffuse urban runoff from the Proposed Development, including contaminants from vehicle use on access roads and parking areas (i.e. oil, petrol, diesel, tyre wear and brake pads residues), as well as the application of salts and grit during winter maintenance, which may be mobilised into surface water and groundwater receptors;
- Potential increase in water demand and pressure on local water resources due to operational use and possible leakage within the Proposed Development. Mains water will be required to supply dwellings; and

- Potential increase in foul water loading from the Proposed Development may add pressure on local existing service networks.

8.5.2.1 Surface Water and Groundwater Pollution

Runoff

Surface water runoff will be generated from all impermeable surfaces within the Site, including hardstanding areas, rooftops, and any other surfaces exposed to rainfall or wash-down activities. These surfaces prevent infiltration, resulting in direct runoff that may carry pollutants.

If not adequately treated or appropriately discharged to designated surface water bodies, this runoff may contain hazardous substances. Such contaminants pose a risk of entering natural water environments, potentially impacting aquatic ecosystems, GWDTEs and groundwater quality. Effective management and mitigation measures are therefore essential to prevent environmental degradation and ensure compliance with water quality standards.

Impacts on receiving water bodies from runoff should be anticipated. Runoff to receiving watercourses from an increase in hardstanding is considered an indirect effect of negative nature in the absence of mitigation measures. They are considered unlikely to occur and should they occur are likely to be permanent. The magnitude of impact is predicted to be medium on the water environment in the absence of mitigation for all waterbodies that are directly, impacted and low on the waterbodies that are indirectly impacted. As a result, the significance of effects is anticipated to be **Significant** for the underlying WFD groundwater bodies (e.g. Kilcullen and Dublin), Camac_020, the branch of Coolmine Stream (also called Fitzmaurice Stream) and the non-designated GWDTE Rathcoole wet woodland. The effect is anticipated to be **Slight** for the rest of the relevant water receptors (e.g. Camac_010, Liffey_0170, drains and ditches encountered on the Site, unnamed ponds located east of the Site, St Bridget's Well, Rathcoole Park ponds, Saggart Citywest ponds west and east).

Accidental Spillages

Increased runoff may carry pollutants from Site activities (e.g. vehicle movements or firefighting in which fire water runoff may contain heavy metals, hydrocarbons, suspended solids, and per- and polyfluoroalkyl substances from foams etc.), introducing pollutants such as hydrocarbons into receiving waters, potentially affecting water quality in nearby surface water receptors, especially during rainfall events, due to wash-off of accumulated pollutants from impervious surfaces.

Impacts on receiving water bodies due to accidental fuel spillages from vehicles or fire events should be anticipated. Accidental spillage and leaks are considered an indirect effect of negative nature. They are considered unlikely to occur and should they occur are likely to be temporary. The magnitude of impact is predicted to be medium on the water environment in the absence of mitigation for all waterbodies that are worked on directly, and low on the waterbodies that are worked on indirectly. As a result, the significance of effects is anticipated to be **Significant** for the underlying WFD groundwater bodies (e.g. Kilcullen and Dublin), Camac_020, the branch of Coolmine Stream (also called Fitzmaurice Stream) and the non-designated GWDTE Rathcoole wet woodland. The effect is anticipated to be **Slight** for the rest of the relevant water receptors (e.g. Camac_010, Liffey_0170, drains and ditches encountered on the Site,

unnamed ponds located east of the Site, St Bridget's Well, Rathcoole Park ponds, Saggart Citywest ponds west and east).

8.5.2.2 Surface Water Flows, Groundwater Levels and Flows

During the operational phase, surface water runoff will be generated from impermeable surfaces within the Site, including hardstanding areas, rooftops and other developed surfaces exposed to rainfall. These impermeable surfaces will reduce natural infiltration of rainfall into the ground and increase the volume and rate of runoff generated across the Site.

The current proposed surface water drainage network is designed to cater for surface water runoff generated from the introduction of circa 23,070 m^2 of hardstanding areas. For Development Area A, the current proposed surface water drainage network is proposed to discharge to an existing 450 mm pipe which is part of the concrete surface water network at Mulally's Lane, which ultimately drains west into a 600 mm surface water asset. For Development Area B, the proposed surface water network is proposed to outfall to the existing Coolmine Stream, located adjacent to the north-west of the Proposed Development (the exact location is yet to be determined and agreed with IFI). The Proposed Development also incorporates a significant recreational landscape centred on the provision of both formal and informal sporting facilities. Collected water from each grass pitch will be conveyed to a new silt-trap manhole incorporating a flow-control (hydrobrake) unit, which restricts discharge to the greenfield runoff rate for the drained area before outfalling to the Coolmine Stream to the north of the Site (the exact location is yet to be determined and agreed with IFI).

In the absence of mitigation measures, the increased runoff has the potential to alter the existing surface water drainage regime by increasing peak runoff rates and reducing the time taken for rainfall to reach surrounding drainage systems or receiving surface water bodies. This may result in changes to local surface water flow patterns and could increase the potential for localised flooding, erosion or hydraulic pressure on downstream drainage infrastructure during periods of intense rainfall.

The reduction in infiltration may also decrease groundwater recharge within the Site, potentially resulting in localised reductions in groundwater levels and changes to the natural groundwater flow regime. Alterations to groundwater recharge and flow patterns could affect the hydrological conditions of GWDTEs.

Runoff generation and reduced natural infiltration is considered an indirect effect of negative nature in the absence of mitigation measures. They are considered likely to occur and should they occur are likely to be long-term. The magnitude of impact is predicted to be medium on the surface water environment in the absence of mitigation for all surface waterbodies that are worked on directly, and low on the surface waterbodies that are worked on indirectly. Similarly, the magnitude of impact is predicted to be low on the groundwater bodies that are affected directly and negligible on the groundwater bodies that are affected indirectly. As a result, the significance of effects is anticipated to be **Significant** for Camac_020, Coolmine Stream (also called Fitzmaurice Stream), **Moderate** for the underlying WFD groundwater bodies (e.g. Kilcullen and Dublin) and the non-designated GWDTE Rathcoole wet woodland, **Slight** for the rest of the relevant surface water receptors (e.g. Camac_010, Liffey_0170, drains and ditches encountered on the Site, unnamed ponds located east of the Site), **Not Significant** for the non-designated GWDTE Rathcoole Park Ponds, and **Imperceptible** for St Bridget's Well, Saggart Citywest ponds west and east.

8.5.2.3 Water Demand

The operational phase of the Proposed Development may result in increased water demand, placing additional pressure on local water resources. This demand, combined with the potential for leakage within the Site's water infrastructure, could contribute to inefficient water use and strain on existing supply systems. It is expected that during operation, the Proposed Development will require up to 53,055 l/d of clean water for 130 units as based on Uisce Éireann's Code of Practice for Water Infrastructure.

The 4 No. housing units at Development Area A are proposed to be serviced via a new 100 mm diameter watermain connection to the existing 101.6 mm unplasticised polyvinyl chloride (uPVC) watermain running along Coolamber Road, located to the immediate north of this development area. For Development Area B, it is proposed to service this development area via a new 100 mm diameter watermain connection to the existing 101.6 mm uPVC watermain running along Coolamber Drive, located to the north-west of this development area. The proposed watermain infrastructure is to be designed in accordance with the Uisce Éireann Code of Practice for Water Infrastructure and will include the necessary fire hydrant and sluice valve provisions. For further information regarding proposed water supply, refer to the 2A IR submitted with this application.

A confirmation of feasibility without any infrastructure upgrades from Uisce Éireann was received on the 05/08/2026. Accordingly, no adverse impact on any water body is anticipated as a result of the Proposed Development and the significance of effect is therefore anticipated to be **Negligible**.

8.5.2.4 Foul Water Loading

The operational phase of the Proposed Development may result in increased foul water, placing additional pressure on local existing wastewater services. It is expected that in operation, the Proposed Development will produce up to 58,291 l/d of foul water from 130 units as based on Uisce Éireann's Code of Practice for Water Infrastructure.

For Development Area A, it is proposed to provide a foul drainage network, to cater for the 4 No. proposed housing units in this development area, by connecting to the existing 150 mm diameter concrete foul sewer at Mulally's Lane, located immediately outside the western boundary of the Site. The Tay Lane Wastewater Pumping Station (WWPS), which serves the existing foul sewers to the north-west of the Proposed Development, is currently close to capacity. Therefore, it is proposed to provide foul water drainage network, to cater for the remaining 126 No. housing units proposed in Development Area B, by connecting to the existing 225 mm diameter foul sewer at Beechwood Lawns, located immediately outside the northern boundary of the Site. For further information regarding proposed foul water loading, refer to the 2A IR submitted with this application.

A confirmation of feasibility subject to upgrades and conditions from Uisce Éireann was received on the 05/08/2026. Accordingly, no adverse impact on any water body is anticipated as a result of the Proposed Development and the significance of effect is therefore anticipated to be **Negligible**.

8.5.2.5 Flood Risk

During operation, increased impervious surfaces may lead to higher volumes and rates of surface water runoff, reducing infiltration and altering natural drainage patterns. Increased pressure on existing drainage

infrastructure neighbouring the Proposed Development can potentially lead to overflow or reduced capacity during storm events. Additionally, drainage networks have the potential to be blocked and lose capacity, which can ultimately lead to surface water flooding.

Surface Water (Pluvial)

Pluvial flooding is the result of rainfall-generated overland flows which arise before runoff can enter any watercourse or sewer. It is usually associated with high intensity rainfall. The FRA (see FRA submitted with this application) states that the CFRAM study did not carry out a review of the pluvial flooding extent, however the SDCC SFRA included an indicative pluvial flood mapping overview map, which shows that it is not predicted that the Site will be impacted by pluvial flooding. The proposed drainage strategy as outlined in **Chapter 2** (Description of Development) will further minimise flood risk from surface water.

Coastal

The FRA (see FRA submitted with this application) concluded that based on the information reviewed, there is no risk associated with coastal flooding for the Site.

Fluvial

Fluvial flooding is the result of a river exceeding its capacity and excess water spilling out onto the adjacent floodplain. Floodinfo.ie[11] provides future scenario online mapping, which indicates that there are flooding risks associated with the Coolmine Stream through the Site, as well as the Crockshane Stream, located along the southern and western perimeter of the Site. A 30% climate change model is available for viewing, which highlights further flooding events throughout the Site and on the south-east corner of the existing Rathcoole Park. The Justification Test concluded that the full extents of both residential development areas (Development Areas A and B), and the primary Site access route/roadway, are situated slightly outside the extents of Flood Zone A. Additionally, at areas within close proximity to Flood Zone A, existing levels are not proposed to be changed when developing these proposals. For the development extents situated slightly outside the extents of Flood Zone A, existing levels are not proposed to be changed when developing these proposals. Therefore, there will be no increase in flood risk as a result of developing these areas of the Proposed Development. The proposed drainage strategy as outlined in **Chapter 2** (Description of Development) will further minimise flood risk from fluvial sources.

Groundwater

Groundwater flooding can occur during lengthy periods of heavy rainfall, typically during later winter/early spring when the groundwater table is already high. If the groundwater level rises above surface level, it can pond at local points and cause periods of flooding. The FRA (see FRA submitted with this application) concluded that geological soil conditions as provided by GSI mapping indicate that the Proposed Development is classified as having a moderate subsoil permeability. Additionally, the Site is noted to be located within a high vulnerability classification, which indicates a high vulnerability to groundwater contamination. In the absence of site-specific ground investigation data, AECOM has prepared a scope of works for a project-specific ground investigation. This will characterise ground and groundwater conditions

[11] Floodinfo.ie (2026) 'Flood Maps' Available at: Flood Maps - Floodinfo.ie (Last accessed Augst 2026).

and assess infiltration and bearing capacity across the Site, informing the proposed drainage and pavement design for the residential development. At the time of writing, these ground investigations have not yet been undertaken.

Flood Risk Summary

Due to the span life of the Proposed Development the impact on surface water and flood risk is considered to be a direct long-term impact. The magnitude of impact from fluvial, pluvial, and groundwater flood risk is predicted to be medium in the absence of mitigation. When considering residents, properties, and surrounding infrastructure which are a very high importance receptor, the significance of effect is anticipated to be **Significant**.

8.5.3 Indirect, Secondary & Transboundary Effects

Potential indirect and secondary effects, including effects on downstream surface water receptors and groundwater-connected receptors, have been considered within the assessments presented above. No additional significant indirect or secondary effects have been identified.

Given the nature and location of the Proposed Development, no transboundary effects on another state or jurisdiction are anticipated.

8.6 Mitigation Measures

8.6.1 Pre Construction Phase

8.6.1.1 Outline Construction Environmental Management Plan (oCEMP)

An oCEMP has been prepared to accompany the planning application for the Proposed Development - this oCEMP should be read in conjunction with this EIAR. A detailed construction-stage Construction Environmental Management Plan (CEMP) will be prepared by the Contractor prior to commencement of works and will incorporate the mitigation measures identified in this EIAR and the oCEMP. The Contractor's CEMP will set out relevant environmental avoidance or mitigation measures to reduce potential environmental impacts identified in Section 8.5 and the potential residual effects.

The mitigation measures proposed in this section and set out below will be implemented in the oCEMP and included in the Contractor's CEMP. It is acknowledged that for some issues, there are multiple ways in which they may be addressed and methods of dealing with pollutant risk will be continually reviewed and adapted as construction works progress (e.g. the management of construction site runoff containing excessive levels of fine sediments).

8.6.1.2 Resource Waste Management Plan

Prior to the commencement of development, and as part of the Contractor's CEMP, a Resource Waste Management Plan (RWMP) will be prepared. The RWMP will include the classification, handling and management of all waste generated during the construction stage in accordance with best practice guidelines such as Irish Waste Regulations and the EPA *'*Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Waste Projects*'* (EPA, 2021).

Material excavated during construction, if deemed suitable by a competent environmental scientist, will be re-used on Site where possible, e.g. backfill. Excavated material will be reused within the Site where suitable and practicable. Surplus material that cannot be reused will be managed off-site in accordance with the RWMP and relevant waste legislation and guidance.

8.6.1.3 Monitoring

Pre-construction surface water quality and groundwater level monitoring is recommended to establish baseline conditions before construction begins; regular monitoring should be undertaken during construction to ensure mitigation measures are implemented correctly.

8.6.2 Construction Phase

8.6.2.1 General Management

All project stakeholders have a responsibility to protect the environment. Periodic inspections of the construction works will be conducted to address issues including dust, litter, surface water, waste management and general housekeeping. These inspections will be conducted by the appointed contractor/ dedicated environmental manager and shall be documented and provided to the SDCC on a monthly basis. SDCC, or its appointed consultants, shall also reserve the right to carry out audits, inspections, monitoring and/or spot checks of the works and any systems being implemented both on-site and off-site in connection with the works to ascertain whether they comply with the Contractor's CEMP.

General mitigation measures and good practice are detailed below (and to be included in the Contractor's CEMP):

- All environmental observations, incidents and near-misses shall be recorded and reported to the necessary stakeholders within 24-hours and the timeframe for close-out agreed at the outset of the project between the Applicant and the contractor. Good practices will also be recorded;
- General surface water management measures will have regard for CIRIA's The SuDS Manual (2015), Environmental Good Practice on Site Guide (2023) and Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors (2001) and TII's Road Drainage and the Water Environment (TII, 2015) and Standard for Highways' Design Manual for Roads and Bridges (DMRB) LA 113, Road Drainage and the Water Environment (National Highways, 2020);
- Audit findings in the form of Corrective Action Requests will be recorded and actioned;
- The construction of the Proposed Development will be phased such that there is no reduction in the total available storage volume of existing systems for either clean or polluted surface water runoff at any point during the project;
- The extent of exposed ground will be minimised at all times during construction and any stockpiles outside areas specifically designed for the purpose will be covered to prevent the creation of any contaminated runoff;

- Areas where stockpiles are located will be positively drained through a grit trap where silt will be collected before water is discharged. Wheel-wash down areas will also be drained through a grit trap;
- The locations of refuelling, storage of oil/fuel, concrete mixing and washing areas will be established where practicable, at a designated location within the Site coordinated with the Contractor. A buffer zone of at least 10 m between this and any excavations will be provided (CIRIA, C811);
- Pollution prevention will be achieved with both physical and procedural measures such as; temporary sediment forebays within a designated attenuation basin during construction, suitable interceptors within the permanent and temporary surface water drainage networks and suitable storage of construction materials;
- Periodic inspections of the construction works will be conducted to address surface and ground water contamination;
- No discharge to existing infrastructure/watercourses/ground shall be permitted to take place without the appropriate consents or approvals;
- The appointed contractor will identify, and risk assess existing drainage systems and put in place measures to prevent possible contamination from surface runoff emanating from the works;
- The appointed contractor shall comply with all national laws and regulations controlling pollution of the environment. Necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, bitumens, chemicals, or other harmful materials shall be taken;
- Ditches and water streams will be clearly identified on Site and shown on method statements and site plans;
- Topsoil and subsoil will not be stored directly adjacent to the watercourse, but will be stored a minimum of 20 m from the watercourse, with additional mitigation such as silt fences installed if there is a risk of sediment entering the watercourse. No topsoil or subsoil will be stored within a surface water flooding area unless supported by a risk assessment (i.e. consideration of weather forecast and duration of storage) and additional mitigation (i.e. drainage bypass channel for overland flow). Where site constraints mean that it is not possible to maintain a 20 m buffer from a waterbody, additional mitigation measures will be implemented to provide an adequate barrier between the potential source of contaminated runoff and the receptor; and
- Foul sewage arising from temporary toilets and sanitary facilities on the Site will initially be discharged to an on-site receptacle which will be emptied by tanker on a regular basis for disposal. As this control measure will be incorporated into the Site set-up, additional specific mitigation measures are therefore not required to address foul sewage during the construction phase and are not discussed further in following sections.

8.6.2.2 Temporary Construction Areas and Construction Compounds

Construction compounds and temporary areas will be installed to provide controlled zones for fuel storage, refuelling, plant maintenance, and material handling, ensuring that all higher-risk activities are managed within contained and supervised environments. These areas will incorporate pollution-prevention measures such as bunded storage, designated refuelling points, drip trays, and watercourse booms to minimise risks to land, soils, and water quality.

Compounds should be located away from any watercourses or sensitive water dependent habitats (20 m buffer) and should not be located within any flood zones (e.g. Flood zone A or B).

8.6.2.3 Water Management Plan

A Water Management Plan (WMP) will be prepared as part of the Contractor's CEMP. The scope of the water quality monitoring programme will be developed at a post-consent stage and in consultation with relevant stakeholder, taking account of any conditions attached to permits, licences, consents, or the planning approval. Monitoring requirements will be informed by appropriate baseline data and implemented throughout construction, as required, to protect surface water and groundwater resources. Water quality monitoring will be required of all potentially affected water features and may include daily visual and olfactory observations or after heavy or prolonged rainfall, in situ monitoring using a calibrated hand-held probe, and potentially grab samples on a regular or ad hoc basis for analysis at an accredited laboratory.

To ensure that monitoring during construction is effective, a pre-construction baseline will be determined at appropriate locations along the Proposed Development, for 6 months minimum to establish the baseline. Water quality monitoring will continue throughout the construction period for as long as there are activities ongoing that have the potential to result in a significant water pollution incident. The WMP will also detail pre-construction and construction groundwater level and quality monitoring to be undertaken as there is close interaction between groundwater and surface water across the Site. The scope of the monitoring will be discussed with the EPA and SDCC by the Contractor. Groundwater level and quality monitoring will continue throughout the construction period for as long as there are below ground activities ongoing that have the potential to result in a significant impact on the groundwater level or quality.

8.6.2.4 Sedimentation of Surface Waters

Due to the proximity of the construction work to waterbodies, care must be taken to prevent the mobilisation of sediment to nearby watercourses. The following mitigation measures would be implemented to reduce the potential for sedimentation during the construction phase:

- Excavations will only remain open for the shortest possible time to reduce groundwater ingress. Silt traps will be placed around the Site to reduce silt loss, and these will be inspected and cleaned or replaced regularly;
- Runoff from spoil heaps will be prevented from entering watercourses by diverting it through settlement ponds and removing material off-site as soon as possible to designated storage areas;
- Silt traps will be placed at any crossing points to avoid siltation of drainage channels and, if the need arises, silt fences will be used during the course of works in order to reduce the potential for

pollution of watercourses. These will be maintained and cleaned regularly throughout the construction phase;

- Good construction practices will also be used during the construction phase, such as wheel washers and dust suppression on-site roads and at the Site access points; and
- Surface water run-off from working areas will not be allowed to discharge directly to any surface waterbodies. To achieve this, the drainage system will be constructed prior to the commencement of major site works. All design and construction will be carried out in accordance with CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors and C811 Environmental Good Practice on Site Guide.

8.6.2.5 Control of Concrete and Lime

The following mitigation measures will be designed to ensure that no concrete and lime sediment contamination will enter watercourses:

- All ready-mixed concrete will be brought to the Site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out, which will include measures to prevent discharge of alkaline wastewaters or wash-water to the surface water drainage system or to the underlying subsoil;
- Wash down and washout of concrete transporting vehicles will take place at an appropriate bunded area and direct discharge of wash-water to surface waters will be strictly prohibited;
- The appointed contractor will be required to manage and mitigate concrete works ensuring that no concrete is laid during wet weather, so no concrete will be washed off the Site and into the surface water drains or water bodies; and
- Other mitigation measures include the use of barriers, avoiding the use of lean mix concrete near surface water features, keeping records of quantities of concrete used and monitoring pH levels in surface water features if necessary.

8.6.2.6 Fuel and Chemical Handling

It will be necessary to adopt the following mitigation measures at the Site in order to prevent spillages to ground and drains of fuels, and to prevent any consequent surface water impacts:

- Fuel will be stored and used in accordance with the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 and relevant fire safety, environmental, and HSA codes of practice;
- Designate a bunded storage area at the Contractor's compound(s) and away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks will be bunded to a volume of 110% of the capacity of the largest tank / container within the bunded area, which includes 10% more capacity than is needed;
- Drainage from the bunded area will be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled so that appropriate remedial action can be taken in the

event of a spillage. When moving drums from the bunded storage area to locations within the Site, a suitably sized spill pallet will be used for containing any spillages during transit;

- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. Spill kit facilities will be provided at the fuelling area in order to provide for any accidental releases or spillages in and around the area. Any used spill kit materials should be disposed of via a hazardous waste contractor. Only construction equipment and vehicles free of all oil/fuel leaks will be permitted on the Site;
- All washing down of vehicles and equipment will take place in designated areas and wash water will be prevented from passing untreated into watercourses;
- Where mobile fuel bowsers are used on the Site in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe, tap or valve must be fitted with a safety lock where it leaves the container and locked shut when not in use. Each bowser should carry a spill kit and each bowser operator must have spill response training. No refuelling will be allowed within 50 m of a watercourse;
- Adequate stocks of hydrocarbon absorbent materials (e.g. spill-kits and / or booms) will be held on-site in order to facilitate response to accidental spills. Spill response materials will also be stored on all construction vehicles; and
- Concrete washout is prohibited within a minimum of 20 m of any body of water, including ditches and ponds, or surface water drains, and within 5 m of a foul drain. Where practical, this will increase to 50 m.

The Contractor shall describe in a Pollution Incident Response Plan (PIRP) the actions taken in the case of a possible leak or spill event, and in an Environmental Emergency Plan (ERP) the actions taken in the case of a flood event. These actions will be hierarchal meaning that as the risk increases the Contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase.

8.6.2.7 Watercourse Crossings and Outfalls

Hydromorphology

Watercourse Crossings

One watercourse crossing (a portal structure) is proposed across a branch of Coolmine Stream (also known as Fitzmaurice Stream). A second crossing is proposed at an existing location (around INGR: O 02714 26678), and it is assumed no modifications will be made to this structure. The following mitigation measures would prevent any consequent surface water impacts:

- Open span bridges would require an environmentally sensitive design, e.g. abutments would be an appropriate size for the flow;

- The proposed structure will maximise the use of precast elements to minimise environmental impact and construction time on the Site;
- Temporary silt fencing will be erected which is required to protect the watercourse;
- Excavations will only remain open for the shortest possible time to reduce groundwater ingress. Silt traps will be placed to reduce silt loss;
- To minimise habitat loss, vegetation will be removed in a controlled manner and stored in hessian lined containers to preserve before reinstating;
- Restoration of the bank material following construction. All excavated materials will be recycled on site and used for backfill, surplus materials will be stockpiled, tested for contamination and sent to relevant land fill;
- Imported materials will be minimised where possible to avoid cross-contamination;
- Locating stockpiles on hard-standing and visqueen sheeting;
- Undertaking concrete work in dry conditions and preventing site wastewater from being discharged to gullies; and.
- Relevant guidance from Inland Fisheries Ireland (2026). 'Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters' should be applied.

Outfalls

Two outfalls are proposed to be installed along a branch of Coolmine Stream/Fitzmaurice Stream. The design of the proposed outfalls is subject to further design, in the absence of design, it is assumed the headwall is a maximum width of 2 m as a worst-case scenario. The following mitigation measures would prevent any consequent surface water impacts:

- Excavations will remain open for the shortest possible period of time and the bank material and vegetation will be reinstated as possible;
- Imported materials will be minimised where possible to avoid cross-contamination;
- Use of concrete will be in dry conditions and wastewater from works will be managed in accordance with other surface waters according to the CEMP;
- Measures reported in Inland Fisheries Ireland (2026). 'Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters';
- Scour protection to minimise the risk of erosion; and.
- Locating stockpiles on hard-standing and visqueen sheeting.

8.6.2.8 Groundwater Control and Dewatering

The localised control or removal of groundwater may be required to enable the construction of the Proposed Development, particularly for element of the SuDS drainage network and foul water drainage network, where excavations may extend to depths greater than 3 m bgl.

Prior to the commencement of construction, the need for temporary dewatering will be reviewed following completion of a ground investigation and any associated baseline groundwater monitoring. Where groundwater is encountered within excavations and dewatering is considered necessary, the Contractor will minimise the impact of any groundwater control activities during construction on the water receptors and will prepare a Construction Groundwater Control Strategy at the detailed design stage, in consideration of CIRIA 'Groundwater Control: Design and Practice, Second Editions' (CIRIA, 2016). Furthermore, best practice mitigation measures will be followed to avoid and or minimise impact on groundwater and will be included in the Contractor's CEMP.

The strategy will outline such best practice mitigation measures as, but not limited, to the following:

- A sump hole will be created, and pumps will be installed and used to remove the groundwater from the excavation. The groundwater will be pumped to an outfall area with silt mitigation measures, as advised by the relevant consenting requirements;
- Groundwater control measures will be selected through the Groundwater Control Strategy, based on the actual groundwater conditions encountered during the works and the sensitivity of nearby water receptors. Appropriate measures may include the installation of a physical cut-off barrier (such as a temporary cut-off wall or sheet piles) between the sump hole and any nearby water receptors requiring protection, artificial recharge of groundwater or surface water, or the controlled discharge of a portion of the pumped water directly to a suitable water receptor. Where discharge is proposed, the chemistry and sediment content of the discharge water will be monitored to ensure that it does not adversely affect the receiving water receptor;
- If discharging water to a nearby watercourse, the rate of discharge will need to be agreed with the SDCC to ensure that there is no unacceptable increase in flood risk or risk of scour. Any discharge will need to be undertaken with the agreement of the relevant statutory regulator and will need to comply with the pollution prevention requirements set out in the Contractor's CEMP;
- An outfall area will be created using silt bags on the hoses with a silt fence or a combination of two silt mitigation measures. The outfall area will be set up away from any watercourse crossings so the pumped water can naturally disperse into the surrounding area;
- Once the outfall has been set up, will be inspected prior to pumping. During this process, the outfall area will be monitored, and water quality of the discharge will also be regularly monitored;
- In addition, the Contractor's CEMP will include a WMP outlining a programme of groundwater level and quality monitoring at ground investigation monitoring boreholes at the Site, and adjacent to sensitive water bodies, wetlands and controlled discharge of water abstracted during dewatering; and

- Managing the risk from groundwater flooding through appropriate working practices (during excavations) and with adequate plans and equipment in place for dewatering to ensure safe dry working environments.

Mitigation measures to protect the superficial deposits and bedrock geology during construction are outlined in **Chapter 7** (Land, Soils and Geology).

8.6.2.9 Flood Risk

To minimise the impact of flood risk during construction on the water receptors, it will be necessary to adopt the following mitigation measures at the Site:

- During the construction phase, the Contractor will monitor the weather forecasts daily and review the weekly and monthly weather forecasts each week, and plan works accordingly. For example, works in the channel of any watercourses will be avoided or halted were there to be a significant risk of high flows or flooding;
- The Contractor will sign up to flood warning alerts and describe in the Emergency Response Plan the actions it will take in the event of a possible flood event. These actions will be hierarchal, meaning that as the risk increases the Contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase;
- The Contractor will be required to produce an Emergency Response Plan as part of the detailed CEMP which will provide detail of the response to an impending flood event and include:
    - A 24-hour ability to mobilise staff in the event of a flood warning;
    - The removal of all plant, machinery and material capable of being mobilised in a flood for the duration of any holiday close down period where there is a forecast risk that the Site may be flooded;
    - Details of the evacuation and site closedown procedures;
    - Arrangements for removing any potentially hazardous material and implement more stringent protection measures;
    - If water is encountered during below ground construction, suitable de-watering methods would be used; and
    - Safe egress and exits are to be maintained at all times when working in excavations. When working in excavations a banksman is to be present at all times.

8.6.3 Operational Phase

8.6.3.1 Drainage Strategy

From a surface water perspective during the Proposed Development operational phase, the surface drainage network should be maintained and cleaned under a maintenance plan to ensure flows are not restricted within the system. During the operational phase, the proposed surface water drainage system

and SuDS features will be maintained in accordance with an appropriate maintenance regime to ensure their continued effective operation and to prevent restrictions to flow. The drainage strategy incorporates attenuation, flow control and SuDS measures to manage surface water runoff and flood risk.

At present, a series of SuDS features to intercept, convey and treat surface runoff before it enters the positive (piped) drainage system have been proposed. The proposed SuDS recommendations include:

- Bio-retention/rain gardens (wherever possible);
- Vegetated swales;
- Attenuation basins;
- Permeable paving (at all car park spaces);
- Filter drains;
- Tree pits (wherever possible);
- Oil separator should be provided;
- Soft landscape areas (provided wherever bio-retention areas cannot be provided).

SuDS are designed to manage water quantity, protect water quality and reduce/prevent the likelihood of flooding from the Proposed Development, whilst also maximising amenity and biodiversity benefits associated with surface water management. The proposed SuDS features will be designed in accordance with CIRIA C753 SuDS Manual, providing adequate interception and treatment volume on the Site. The above-mentioned SuDS measures are discussed in further detail in the 2A IR submitted with this application and have been developed based on the latest proposed Site layout.

The Simple Index Approach outlined in The SuDS Manual C753 (CIRIA C753, 2015) is guided by land use and SuDS performance evidence to determine the appropriateness and efficiency of different types of SuDS for removing pollutants. Figure 8-1 shows the different land use types that can be used in the Simple Index Approach and the pollution hazard index they pose, for this assessment the land use type ‘individual property driveways, residential car parks, low traffic roads, and non-residential car parking with infrequent change’ has been used. Figure 8-2 shows the total SuDS mitigation index for each type of SuDS. To deliver adequate treatment the selected SuDS should have a total pollution mitigation index that equals or exceeds the pollution hazard index.

The above-mentioned proposed SuDS for the drainage strategy have been assessed for surface water receptors. Bio-retention, vegetated swales, and permeable paving were all found to be adequate for removing total suspended solids (TSS), metals and hydrocarbons. Attenuations basins were assessed by their closest match in Figure 8-2 (detention basins) and soft landscaping was assumed to be filter strips. Attenuation basins were found to be adequate for TSS, metals and hydrocarbons while soft landscaping was found to only be not adequate for TSS.

Table 8-14 shows the results for this assessment.

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very low	0.2	0.2	0.05
Other roofs (typically commercial/ industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1]	Medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1]	High	0.8[2]	0.8[2]	0.9[2]

Figure 8-1: Pollution Hazard Indices for Different Land Use Classifications (CIRIA C753, 2015)

	Mitigation indices[1]		
Type of SuDS component	TSS	Metals	Hydrocarbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4[2]	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond[4]	0.7[3]	0.7	0.5
Wetland	0.8[3]	0.8	0.8
Proprietary treatment systems[5,6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Figure 8-2: Indicative SuDS Mitigation Indices for Discharges to Surface Waters (CIRIA C753, 2015)

Table 8-14: Simple Index Approach Results for the Proposed Drainage Strategy SuDS (Surface Water)

Proposed SuDS type	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Bio-retention / rain gardens	Adequate	Adequate	Adequate
Vegetated Swales	Adequate	Adequate	Adequate

Proposed SuDS type	Total Suspended Solids (TSS)	Metals	Hydrocarbons
Attenuation basins (closest match being detention basin)	Adequate	Adequate	Adequate
Permeable paving (at all car park spaces)	Adequate	Adequate	Adequate
Soft landscape areas (assumed filter strips)	Not Adequate	Adequate	Adequate

The proposed surface water drainage system will minimise the environmental impact to receiving watercourses from rainfall events. Accidental spillage of fuel from cars or fire water runoff from firefighting will be directed to the surface water drainage system. Integrated SuDS will provide adequate treatment of polluted surface water runoff before it is discharged to any receiving surface waterbodies. In trafficked areas, an oil separator should be provided upstream of the proposed outfalls from the Site.

The proposed on-site surface water drainage strategy is to retain the existing surface water flow paths, where possible, inclusive of open watercourses and land drains within the Site boundary. A new gravity surface water network will be provided to convey surface water flows which will be designed to ensure that the discharge from the Proposed Development will be restricted to the associated greenfield runoff rate, and that sufficient attenuation storage will be provided to achieve this. Further information can be found in the 2A IR submitted with this application.

The current proposed surface water drainage network is designed to cater for surface water runoff generated from the introduction of circa 23,070 m^2 of hardstanding areas, proposed as part of this development. Two separate surface water drainage networks are proposed with two separate outfalls, each catering for the runoff generated from the 2,070 m^2 and 21,000 m^2 of hardstanding areas from Development Area A and Development Area B, respectively (see Figure 1.2 in the 2A IR submitted with this application). For Development Area A, the current proposed surface water drainage network is proposed to discharge to an existing 450 mm concrete surface water network at Mulally's Lane, which ultimately drains west into a 600 mm surface water asset. For Development Area B, the proposed surface water network is proposed to outfall to the existing Coolmine Stream, located adjacent to the north-west of the Proposed Development. The exact outfall location is to be determined and agreed with IFI, and scour protection is to be provided at the outfall to minimise the risk of erosion. The Proposed Development incorporates a significant recreational landscape centred on the provision of both formal and informal sporting facilities. Collected water from each grass pitch will be conveyed to a new silt-trap manhole incorporating a flow-control (hydrobrake) unit, which restricts discharge to the greenfield runoff rate for the drained area before outfalling to the Coolmine Stream to the north of the Site. The exact outfall location is to be determined and agreed with IFI, and scour protection is to be provided at the outfall to minimise the risk of erosion.

In the FRA submitted with this application, the Justification Test concluded that the full extents of both residential development areas (Development Areas A and B), and the primary Site access route/roadway, are situated slightly outside the extents of Flood Zone A. Additionally, at areas within close proximity to Flood Zone A, existing levels are not proposed to be changed when developing these proposals. For the development extents situated slightly outside the extents of Flood Zone A, existing levels are not proposed to be changed when developing these proposals. Therefore, there will be no increase in flood risk as a

result of developing these areas of the Proposed Development. Moreover, the proposed surface water drainage network for the Proposed Development has been designed to cater for a 1 in 100-year rainfall event, with an additional 20% allowance included for future increases in rainfall intensities due to climate change, further mitigating the risk of future flood events.

8.7 Residual Impacts

8.7.1.1 Construction Phase

Residual effects are those that remain following the implementation of mitigation measures. The implementation of mitigation measures as outlined in Section 8.6 will reduce the likelihood and magnitude of the potential impacts on the water environment during the construction phase. With respect to water, the significance of the potential effects on each receptor during the construction phase is provided in Table 8-15. No significant effects have been identified following the implementation of defined mitigation measures.

Table 8-15: Summary of Residual Impacts: Construction Phase

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effects	Significance of Effect
Changes in water quality due to: • Sedimentation • Pollution from accidental spillages and leaks • Fuel and Chemical handling • Use of concrete and lime	Watercourses	Camac_010	Medium	Within Study Area	Low Temporary	Slight	**Sedimentation:** • Topsoil and subsoil stored at a minimum of 20 m from watercourse. • Silt traps. • Settlement ponds/tanks. • Use of wheel washer and dust suppression. • Temporary sediment forebays. • No direct discharges into waterbodies. • Treatment and testing of pumped water/discharges. • Good construction practices. **Spillages and leaks:** • Good construction practice aligned to Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001. • Designated bunded storage area. • Designated impermeable refuelling areas. • Spill kits. • Wash water treatment. • Concrete washout at minimum 20 m from waterbodies and 5m of foul drain.	No significant residual effects due to the implementation of mitigation measures.	Imperceptible
		Camac_020	High	Within the Site	Medium Temporary	Significant			Not Significant
		Liffey_170	Medium	Within Study Area	Low Temporary	Slight			Imperceptible
		Coolmine Stream/ Fitzmaurice Stream	High	Within the Site	Medium Temporary	Significant			Not Significant
		Drains/ditches	Low	Potential for drains and ditches to be encountered as the project develops	Medium Temporary	Slight			Imperceptible
	Non-WFD Lakes (not GWDTEs)	Unnamed ponds located east of the Proposed Development	Low	Within Study Area	Low Temporary	Slight			Imperceptible
	WFD Groundwater Bodies	Kilcullen	Very High	Underlying the majority of the Site.	Medium Temporary	Significant			Not Significant
		Dublin		Underlying the northeastern corner of the Site.	Medium Temporary	Significant			Not Significant
	Groundwater Abstractions	St Bridget's Well	Low	Located approximately 550 m north-east of the Site	Low Temporary	Not Significant			Imperceptible
	Non-designated GWDTEs	Rathcoole wet woodland (including Annex I Alluvial Woodland of low to moderate dependency on groundwater)	High	Underlying most of the Site.	Medium Temporary	Significant			Imperceptible
		Rathcoole Park ponds		Adjacent to the north of the Site.	Low Temporary	Slight			Imperceptible
		Saggart citywest golf ponds west	Low	Located within 500 m to the east of the Site.	Low Temporary	Not Significant			Imperceptible
		Saggart citywest golf ponds east		Located within 960 m to the east of the Site.	Low Temporary	Not Significant			Imperceptible

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effects	Significance of Effect
							Fuel and Chemical Handling • Fuel will be stored and used in accordance with the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 and relevant fire safety, environmental, and HSA codes of practice. • Designate a bunded storage area at the Contractor's compound(s) and away from surface water gullies or drains for oils, solvents and paints used during construction. • Drainage from the bunded area will be diverted for collection and safe disposal. • Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. • All washing down of vehicles and equipment will take place in designated areas and wash water will be prevented from passing untreated into watercourses. • Where mobile fuel bowsers are used on the Site in the event of		

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effects	Significance of Effect
							a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe, tap or valve must be fitted with a safety lock where it leaves the container and locked shut when not in use. • Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and / or booms) will be held on-site in order to facilitate response to accidental spills. • Concrete washout is prohibited within a minimum of 20 m of any body of water, including ditches and ponds, or surface water drains, and within 5 m of a foul drain. Where practical, this will increase to 50 m		
Alteration of surface water flows, groundwater levels and flows due to uncontrolled site runoff	Watercourses	Camac_010	Medium	Within Study Area	Low Temporary	Slight	• On-site identification of waterbodies and representation onsite plans. • Reduction of direct runoff to ground and to watercourses during dewatering. • No discharge to existing infrastructure/	No significant residual effects due to the implementation of mitigation measures.	Imperceptible
		Camac_020	High	Within the Site	Medium Temporary	Significant			Not Significant
		Liffey_170	Medium	Within Study Area	Low Temporary	Slight			Imperceptible
		Coolmine Stream/ Fitzmaurice Stream	High	Within the Site	Medium Temporary	Significant			Not Significant
		Drains/ ditches	Low	Potential for drains and ditches to be encountered as the project develops	Medium Temporary	Slight			Imperceptible

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effects	Significance of Effect
	Non-WFD Lakes (not GWDTEs)	Unnamed ponds located east of the Proposed Development	Low	Within Study Area	Low Temporary	Not Significant	watercourses/ ground without approval. • Construction of a detailed drainage system. • Good construction practices. • Construction Control Strategy will be prepared by the Contractor at the detailed design stage, in consideration of CIRIA 'Groundwater Control: Design and Practice, Second Editions' (CIRIA, 2016).		Imperceptible
	WFD Groundwater Bodies	Kilcullen	Very High	Underlying the majority of the Site.	Medium Temporary	Significant			Not Significant
		Dublin		Underlying the northeastern corner of the Site.	Medium Temporary	Significant			Not Significant
	Groundwater Abstractions	St Bridget's Well	Low	Located approximately 550 m north east of the Site	Low Temporary	Not Significant			Imperceptible
	Non-designated GWDTEs	Rathcoole wet woodland (including Annex I Alluvial Woodland of low to moderate dependency on groundwater)	High	Underlying most of the Site.	Medium Temporary	Significant			Imperceptible
		Rathcoole Park ponds		Adjacent to the north of the Site.	Low Temporary	Slight			Imperceptible
		Saggart citywest golf ponds west	Low	Located within 500 m to the east of the Site.	Low Temporary	Not Significant			Imperceptible
		Saggart citywest golf ponds east		Located within 960 m to the east of the Site.	Low Temporary	Not Significant			Imperceptible
Changes to flood risk by uncontrolled site runoff	N/A	Construction workers and land on and off site	Very High	Within the Site	Medium Temporary	Significant	• Phased construction. • Good construction practices. • During the construction phase, the Contractor would monitor the weather forecasts daily and review the weekly and monthly weather forecasts each week, and plan works accordingly. For example, works in the channel of any	No significant residual effects due to the implementation of mitigation measures.	Not Significant

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effects	Significance of Effect
							watercourses would be avoided or halted were there to be a significant risk of high flows or flooding. • The Contractor will sign up to flood warning alerts and describe in the Emergency Response Plan the actions it will take in the event of a possible flood event. These actions will be hierarchal, meaning that as the risk increases the contractor will implement more stringent protection measures. This is important to ensure all workers, the construction site and third-party land, property and people are adequately protected from flooding during the construction phase. • The Contractor would be required to produce an Emergency Response Plan as part of the detailed CEMP which would provide detail of the response to an impending flood event.		
Watercourse crossing	Watercourses	Coolmine Stream/ Fitzmaurice Stream	High	Within the Site	Low temporary	Moderate	• Open span bridges would require an environmentally sensitive design, e.g. abutments would be an appropriate size for the flow.	No significant residual effects due to the implementation of	Not Significant

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effects	Significance of Effect
							• The proposed structure will maximise the use of precast elements to minimise environmental impact and construction time on the Site; • Temporary silt fencing will be erected which is required to protect the watercourse; • Excavations will only remain open for the shortest possible time to reduce groundwater ingress. Silt traps will be placed to reduce silt loss. • To minimise habitat loss, vegetation will be removed in a controlled manner and stored in hessian lined containers to preserve before reinstating. • Restoration of the bank material following construction. All excavated materials will be recycled on site and used for backfill, surplus materials will be stockpiled, tested for contamination and sent to relevant land fill. • Imported materials will be minimised where possible to avoid cross-contamination. • Locating stockpiles on hard-standing and visqueen sheeting. • Undertaking concrete work in dry conditions and preventing site	mitigation measures.	

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effects	Significance of Effect
							wastewater from being discharged to gullies.		
Outfall construction	Watercourses	Coolmine Stream/ Fitzmaurice Stream	High	Within the Site	Medium permanent	Significant	• Excavations will remain open for the shortest possible period of time and the bank material and vegetation will be reinstated as possible; • Imported materials will be minimised where possible to avoid cross-contamination; • Use of concrete will be in dry conditions and wastewater from works will be managed in accordance with other surface waters according to the CEMP; • Measures reported in Inland Fisheries Ireland (2026). 'Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters'; • Scour protection to minimise the risk of erosion; and. • Locating stockpiles on hard-standing and visqueen sheeting.	No significant residual effects due to the implementation of mitigation measures	Not Significant
Alteration of surface water flows, groundwater levels and flows due to localised dewatering	Watercourses	Camac_010	Medium	Within Study Area	Negligible Temporary	Slight	• Dewatering mitigation measures such as a Construction Groundwater Control Strategy will be put in place.	No significant residual effects due to the implementation of mitigation measures.	Imperceptible
		Camac_020	High	Within the Site	Low Temporary	Imperceptible			Imperceptible
		Liffey_170	Medium	Within Study Area	Negligible Temporary	Slight			Imperceptible
		Coolmine Stream/ Fitzmaurice Stream	High	Within the Site	Low Temporary	Slight			Imperceptible

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effects	Significance of Effect
		Drains/ ditches	Low	Potential for drains and ditches to be encountered as the project develops	Low Temporary	Imperceptible			Imperceptible
	Non-WFD Lakes (not GWDTEs)	Unnamed ponds located east of the Proposed Development	Low	Within Study Area	Negligible Temporary	Moderate			Imperceptible
	WFD Groundwater Bodies	Kilcullen	Very High	Underlying the majority of the Site.	Low Temporary	Moderate			Imperceptible
		Dublin		Underlying the north eastern corner of the Site.	Low Temporary	Imperceptible			Imperceptible
	Groundwater Abstractions	St Bridget's Well	Low	Located approximately 550 m north-east of the Site	Negligible Temporary	Slight			Imperceptible
	Non-designated GWDTEs	Rathcoole wet woodland (including Annex I Alluvial Woodland of low to moderate dependency on groundwater)	High	Underlying most of the Site.	Low Temporary	Not Significant			Imperceptible
		Rathcoole Park ponds		Adjacent to the north of the Site.	Negligible Temporary	Imperceptible			Imperceptible
		Saggart citywest golf ponds west	Low	Located within 500 m to the east of the Site.	Negligible Temporary	Imperceptible			Imperceptible
		Saggart citywest golf ponds east		Located within 960 m to the east of the Site.	Negligible Temporary	Imperceptible			Imperceptible

8.7.1.2 Operational Phase

The implementation of mitigation measures outlined in Section 8.6 above will reduce the likelihood and magnitude of the potential impacts on the water environment during the Proposed Development operational phase. With respect to water, the significance of the potential effects on each receptor during the operational phase is provided in Table 8-16. No significant effects have been identified following the implementation of defined mitigation measures.

Table 8-16: Summary of Residual Effects: Operational Phase

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effect	Significance of Effect
Changes in water quality due to runoff	Watercourses	Camac_010	Medium	Within Study Area	Low Long-term	Slight	Surface runoff collected throughout drainage system network.	No significant residual effects due to the implementation of mitigation measures.	Imperceptible
		Camac_020	High	Within the Site	Medium Long-term	Significant			Not Significant
		Liffey_170	Medium	Within Study Area	Low Long-term	Slight			Imperceptible
		Coolmine Stream/ Fitzmaurice Stream	High	Within the Site	Medium Long-term	Significant			Not Significant
		Drains/ ditches	Low	Potential for drains and ditches to be encountered as the project develops	Medium Long-term	Slight			Imperceptible
	Non-WFD Lakes (not GWDTEs)	Unnamed ponds located east of the Proposed Development	Low	Within Study Area	Low Long-term	Slight			Imperceptible
	WFD Groundwater Bodies	Kilcullen	Very High	Underlying most of the Site.	Medium Long-term	Significant			Not Significant
		Dublin		Underlying the northeastern corner of the Site.	Medium Long-term	Significant			Not Significant
	Groundwater Abstractions	St Bridget's Well	Low	Located approximately 550 m north-east of the Site	Low Long-term	Slight			Imperceptible
	Non-designated GWDTEs	Rathcoole wet woodland (including Annex I Alluvial Woodland of low to moderate dependency on groundwater)	High	Underlying most of the Site.	Medium Long-term	Significant			Not Significant
		Rathcoole Park ponds		Adjacent to the north of the Site.	Low Long-term	Slight			Imperceptible
		Saggart citywest golf ponds west	Low	Located within 500 m to the east of the Site.	Low Long-term	Slight			Imperceptible
		Saggart citywest golf ponds east		Located within 960 m to the east of the Site.	Low Long-term	Slight			Imperceptible
Changes in water quality due	Watercourses	Camac_010	Medium	Within Study Area	Low Temporary	Slight	• Periodic clearance of	No significant residual effects	Imperceptible

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effect	Significance of Effect
to accidental spillages		Camac_020	High	Within the Site	Medium Temporary	Significant	surface drainage network. • Implementation of SuDS to improve water quality prior to water being discharged from the Site. • Full retention oil separator. • No direct discharges off-site.	due to the implementation of mitigation measures.	Not Significant
		Liffey_170	Medium	Within Study Area	Low Temporary	Slight			Imperceptible
		Coolmine Stream/ Fitzmaurice Stream	High	Within the Site	Medium Temporary	Significant			Not Significant
		Drains/ ditches	Low	Potential for drains and ditches to be encountered as the project develops	Medium Temporary	Slight			Imperceptible
	Non-WFD Lakes (not GWDTEs)	Unnamed ponds located east of the Proposed Development	Low	Within Study Area	Low Temporary	Slight			Imperceptible
	WFD Groundwater Bodies	Kilcullen	Very High	Underlying the majority of the Site.	Medium Temporary	Significant			Not Significant
		Dublin		Underlying the north-eastern corner of the Site.	Medium Temporary	Significant			Not Significant
	Groundwater Abstractions	St Bridget's Well	Low	Located approximately 550 m north-east of the Site	Low Temporary	Slight			Imperceptible
	Non-designated GWDTEs	Rathcoole wet woodland (including Annex I Alluvial Woodland of low to moderate dependency on groundwater)	High	Underlying most of the Site.	Medium Temporary	Significant			Not Significant
		Rathcoole Park ponds		Adjacent to the north of the Site.	Low Temporary	Slight			Imperceptible
		Saggart citywest golf ponds west	Low	Located within 500 m to the east of the Site.	Low Temporary	Slight			Imperceptible
		Saggart citywest golf ponds east		Located within 960 m to the east of the Site.	Low Temporary	Slight			Imperceptible
Alteration of surface water flows, groundwater levels and flows due to	Watercourses	Camac_010	Medium	Within Study Area	Low Temporary	Slight	• Surface runoff collected throughout drainage system network.	No significant residual effects due to the implementation of mitigation measures.	Imperceptible
		Camac_020	High	Within the Site	Medium Long-term	Significant			Not Significant
		Liffey_170	Medium	Within Study Area	Low Long-term	Slight			Imperceptible

Description of Effect(s)	Receptor Type	Receptor Name	Importance	Rationale	Magnitude of Impact	Significance of Effect	Mitigation Measure(s)	Residual Effect	Significance of Effect
uncontrolled site runoff		Coolmine Stream/ Fitzmaurice Stream	High	Within the Site	Medium Long-term	Significant			Not Significant
		Drains/ ditches	Low	Potential for drains and ditches to be encountered as the project develops	Medium Long-term	Slight			Imperceptible
	Non-WFD Lakes (not GWDTEs)	Unnamed ponds located east of the Proposed Development	Low	Within Study Area	Low Long-term	Slight			Imperceptible
	WFD Groundwater Bodies	Kilcullen	Very High	Underlying the majority of the Site.	Low Long-term	Moderate			Not Significant
		Dublin		Underlying the north-eastern corner of the Site.	Low Long-term	Moderate			Not Significant
	Groundwater Abstractions	St Bridget's Well	Low	Located approximately 550 m north-east of the Site	Negligible Long-term	Imperceptible			Imperceptible
	Non-designated GWDTEs	Rathcoole wet woodland (including Annex I Alluvial Woodland of low to moderate dependency on groundwater)	High	Underlying most of the Site.	Low Long-term	Moderate			Not Significant
		Rathcoole Park ponds		Adjacent to the north of the Site.	Negligible Long-term	Not Significant			Imperceptible
		Saggart citywest golf ponds west	Low	Located within 500 m to the east of the Site.	Negligible Long-term	Imperceptible			Imperceptible
		Saggart citywest golf ponds east		Located within 960 m to the east of the Site.	Negligible Long-term	Imperceptible			Imperceptible
Increase of flood risk (fluvial, pluvial and groundwater)	N/A	Residents, properties and surrounding infrastructure	Very High	Within Study Area	Medium Temporary	Significant	• Implementation of Drainage Strategy. • Obstructions to the floodplain will not increase flood risk.	No significant residual impacts due to the implementation of mitigation measures	Not Significant

8.8 Cumulative Impacts

The developments identified in the planning search have been reviewed to determine whether they could interact with the Proposed Development through shared surface water, groundwater, drainage or flood-risk pathways. Developments with no credible hydrological or hydrogeological pathway for cumulative effects have been screened out.

8.8.1 Construction Phase

With regard to cumulative impacts from other projects within the Study Area, these projects are all being completed on or under lands owed by either SDCC or the Department of Education. There is likely to be overlap between construction and operation of several adjacent schemes and construction of the Proposed Development. This creates the potential for temporary to short-term construction related pollutants, such as sediment, oils, and chemicals to impact watercourses within the Study Area. A search of planning applications within 2 km of the Site is presented in Appendix 1-3. Applications of note include:

- New primary school, including 20 classrooms, with a gross floor area of 3,449 m^2 over three storeys (SDCC planning ref: SD23A/0336). The Proposed Development will be using the new road approved under the school's application which will provide access to the school's site, although the Proposed Development will require some changes to the approved road layout to provide connection to the proposed residential and recreational areas.

Should these developments be constructed at the same time as the Proposed Development, there is a potential for cumulative effects associated with accidental spills and leaks and the use of concrete and lime.

Nearby projects are subject to their own separate EIARs and planning applications, and will incorporate measures to protect the water environment. They are being constructed on lands that are subject to strict regulatory control. The Zone of Influence of each project is considered to be 1 km, and assuming all developments adhere to their respective CEMPs and other relevant mitigation measures, there will be limited, if any, physical interaction with other projects. The cumulative impact to the water environment is considered to be short-term, negligible and imperceptible which is **Not Significant**.

8.8.2 Operational Phase

When operational, the Proposed Development will be required to operate in compliance with legislation, embedded control measures will be in place and will limit, if any, physical interactions with other operational or proposed projects. The Proposed Development and any other operational or proposed projects will have a drainage strategy, FRAs, and related mitigation measures in place to ensure the development adheres to permit conditions. Therefore, the cumulative impact on the water environment is considered to be long-term, negligible and imperceptible, which is **Not Significant**.

8.9 'Do Nothing' Scenario

The 'Do-Nothing' scenario is outlined within the EPA Guidelines as "*the situation or environment which would exist if a proposed development, project or process were not carried out. This scenario needs to take*

account of the continuation or change of current management regimes, as well as the continuation or change of trends currently evident in the environment".

In the absence of the Proposed Development, no significant changes to hydrological and hydrogeological receptors are likely to occur under the current regime. The nature or value of the Study Area, in terms of WFD status, water resources and designated water dependent sites, would continue unchanged.

8.10 Summary

The assessment of the water environment identified potential impacts from the Proposed Development construction phase, including sedimentation of surface waters, accidental spills and leaks of fuels and chemicals to surface waters, and potential for pH changes to water due to use of concrete and lime. The assessment also considered that excavation activities, including any temporary groundwater control or dewatering, may give rise to temporary localised changes in groundwater levels and flow regimes.

For the operational phase, the assessment identified potential impacts associated with the pollution of water from runoff and accidental spillages, which may lead to changes in surface water and groundwater quality, as well as an increase of the flood risk.

The assessment concludes that, subject to the implementation of defined mitigation measures (including adherence to the Contractor's CEMP, Groundwater Control Strategy and appropriate design of the Proposed Development drainage system), effects on the water environment would be **Not Significant** during both construction and operation. Cumulative effects are also considered to be **Not Significant**.

8.11 References

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