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WATER FRAMEWORK DIRECTIVE (WFD) SCREENING ASSESSMENT

FOR A PROPOSED DEVELOPMENT LOCATED AT GOWAN HOUSE, CARRIGLEA BUSINESS PARK, NAAS ROAD, DUBLIN 12, D12 RCC4

Report Prepared For
Malclose Limited

Report Prepared By

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1.0 INTRODUCTION

AWN Consulting Limited (AWN) has prepared this Water Framework Directive (WFD) Screening for a development at Gowan Motors, Gowan House, Carriglea Business Park, Naas Road, Dublin 12.

Malclose Limited intend to apply to Dublin City Council for a 7-year permission for a large-scale residential development principally comprising student accommodation at this 0.962 Ha site at Gowan House, Carriglea Business Park, Naas Road, Dublin 12, D12 RCC4.

Works to upgrade of the access road to the west of the site on an area measuring c. 0.081 Ha are also proposed comprising new surfacing to the carriageway, the provision of inbound and outbound bicycle lanes from the development entrance to the Naas Road, the provision of a controlled pedestrian crossing on the access road at the Naas Road junction, and the provision of a further uncontrolled pedestrian and bicycle crossing linking the subject site with the approved Concorde SHD development (ABP Ref: TA29S.312218) to the west.

On the Naas Road, works are proposed on an area measuring c. 0.086 Ha comprising the realignment and widening of the existing pedestrian footpath along the westbound carriageway of the Naas Road and the provision of linkages from the realigned footpath to the development site, and the provision of new controlled pedestrian crossings across the eastbound and westbound carriages of the Naas Road and the provision of a new uncontrolled crossing of the Luas tracks.

The development site area and roadworks areas will provide a total application site area of c. 1.13 Ha.

The proposed development will principally consist of: the demolition of the existing two-storey office/warehouse building and outbuilding (5,172 sq m); and the construction of a development in two blocks (Block 1 (eastern block) is part 2 No. storeys to part 15 No. storeys over lower ground floor and basement levels with roof plant over and Block 2 (western block) is part 9 No. storeys to part 11 No. storeys over basement with roof plant over) principally comprising 941 No. Student Accommodation bedspaces (871 No. standards rooms, 47 No. accessible studio rooms and 23 No. studios) with associated facilities, which will be utilised for short-term lets during student holiday periods. The 871No. standard rooms are provided in 123 No. clusters ranging in size from 3 No. bedspaces to 8 No. bedspaces, and all clusters are served by a communal living/kitchen/dining room.

The development also provides: ancillary internal and external communal student amenity spaces and support facilities; cultural and community floor space (1,422 sq m internal and 131 sq m external) principally comprising a digital hub and co-working space with ancillary cafe; a retail unit (250 sq m); public open space; the daylighting of the culverted River Camac through the site; an elevated walkway above the River Camac at ground floor level; a pedestrian bridge link at first floor level between Blocks 1 and 2; vehicular access at the south-western corner; the provision of 7 No. car-parking spaces, 2 No. motorcycle parking spaces and 2 No. set down areas; bicycle stores at ground and lower ground floor levels; visitor cycle parking spaces; bin stores; substations; hard and soft landscaping; green and blue roofs; new telecommunications infrastructure at roof level of Block 1 including antennas and microwave link dishes, 18 No. antennas and 6 No. transmission dishes, together with all associated equipment; boundary treatments; plant; lift overruns; and all associated works above and below ground.

The gross floor area of the development is c. 33,140 sq m comprising c. 30,386 sq m above lower ground and basement level.

Refer to Figure 1.1 below for the location of the development.

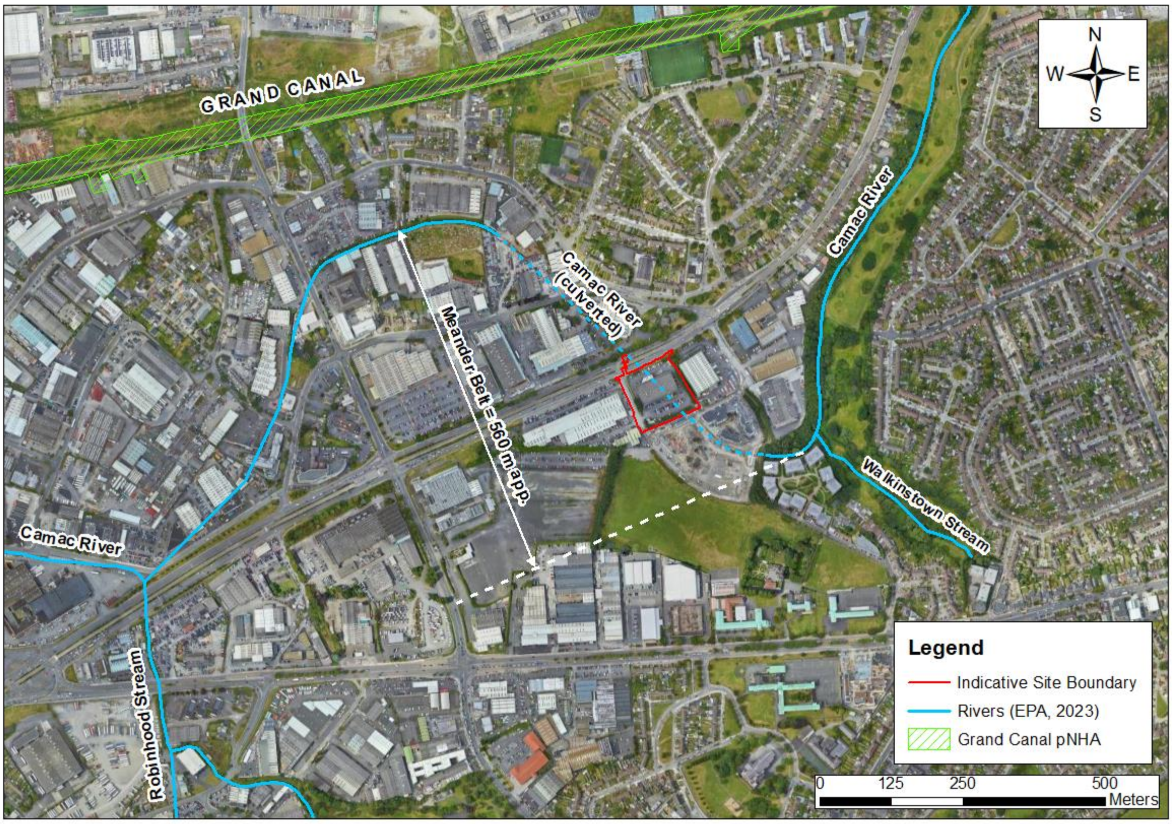

Figure 1.1 *Site Location Map with local hydrological environment*

The surrounding area comprises industrial lands which include light industrial buildings, large warehouse-type units and offices (particularly onto Naas Road). In addition, the Carriglea residential development is located adjacent to the south and is nearing completion. The Gowan Motors facility consists of a single, large 2-storey building with at grade car parking facilities. There are also two minor, ancillary structures located within the southwest and southeast corners of the site: an outbuilding which is being demolished and a substation that is being retained.

The River Camac is a culverted river lying from c. 7.5 to 10 metres below the ground floor level through the development site, and flows at an angle through the middle of the subject site from northwest to southeast. The proposed development includes for daylighting approximately 76 No. metres of the River Camac. The intention is that this would create 1,261 sq m (13% of the site area) of space allocated for the Riparian Zone.

2.0 METHODOLOGY

This WFD Screening Assessment has been prepared in response to the requirements of the Water Framework Directive. This WFD Screening relies on information regarding construction and design provided by the applicant. In addition, AWN prepared a Hydromorphological Qualitative Technical Assessment and a Hydrological &

Hydrogeological Qualitative Risk Assessment for this development, which are included as part of this application. This assessment should be read in conjunction with these reports.

This report was prepared by Marcelo Allende (BSc, BEng), and Teri Hayes (BSc MSc PGeol EurGeol). Marcelo is a Water Resources Engineer with over 15 years of experience in environmental consultancy and water resources studies. Marcelo is an Environmental Consultant with AWN Consulting, a member of the International Association of Hydrogeologists (Irish Group) and a member of Engineers Ireland (MIEI). Teri is a hydrogeologist with over 25 years of experience in water resource management and impact assessment. She has a Masters in Hydrogeology and is a former President of the Irish Group of the Association of Hydrogeologists (IAH) and has provided advisory services on water related environmental and planning issues to both public and private sector bodies. She is qualified as a competent person as recognised by the EPA in relation to contaminated land assessment (IGI Register of competent persons www.igi.ie). Her specialist area of expertise is water resource management eco-hydrogeology, hydrological assessment and environmental impact assessment.

2.1 DETERMINATION OF WATER BODY STATUS

2.1.1 WFD Risk Status

The WFD Risk score is the risk for each waterbody of failing to meet their WFD objectives by 2027. The risk of not meeting WFD objectives has been determined by assessment of monitoring data, data on the pressures and data on the measures that have been implemented. Waterbodies that are At Risk are prioritised for implementation of measures. This assessment was completed in 2020 by the EPA Catchments Unit in conjunction with other public bodies and was primarily based on monitoring data up the end of 2018. The three risk categories are:

- Waterbodies that are ‘At Risk’ of not meeting their Water Framework Directive objectives. For these waterbodies an evidence-based process was undertaken to identify the significant pressures; once a pressure is designated as ‘significant’, measures and accompanying resources are needed to mitigate the impact(s) from this pressure. These ‘At Risk’ waterbodies require not only implementation of the existing measures described in the various regulations, e.g., the Good Agricultural Practices Regulations, but also in many instances more targeted supplementary measures.
- Waterbodies that are categorised as ‘Review’ either because additional information is needed to determine their status before resources and more targeted measures are initiated or the measures have been undertaken, e.g., a wastewater treatment plant upgrade, but the outcome hasn’t yet been measured/monitored.
- Waterbodies that are ‘Not at Risk’ and therefore are meeting their Water Framework Directive objectives. These require maintenance of existing measures to protect the satisfactory status of the water bodies.

2.1.2 Background to Surface Water Body Status

Under the WFD, surface water body status is classified on the basis of chemical and ecological status or potential. Ecological status is assigned to surface water bodies that are natural and considered by the EPA not to have been significantly modified for anthropogenic purposes (i.e., culverting). Ecological potential is assigned to artificial and man-made water bodies (such as canals), or natural water bodies that have undergone significant modification. The term 'ecological potential' is used as it may be impossible to achieve good ecological status because of modification for a specific use, such as navigation or flood protection. The ecological potential represents the degree to which the quality of the water body approaches the maximum it could achieve. The worst-case classification is assigned as the overall surface water body status, in a 'one-out all-out' system (i.e., by taking the worst case of all the combined risk outcomes). This system is summarised below in Figure 2.1.

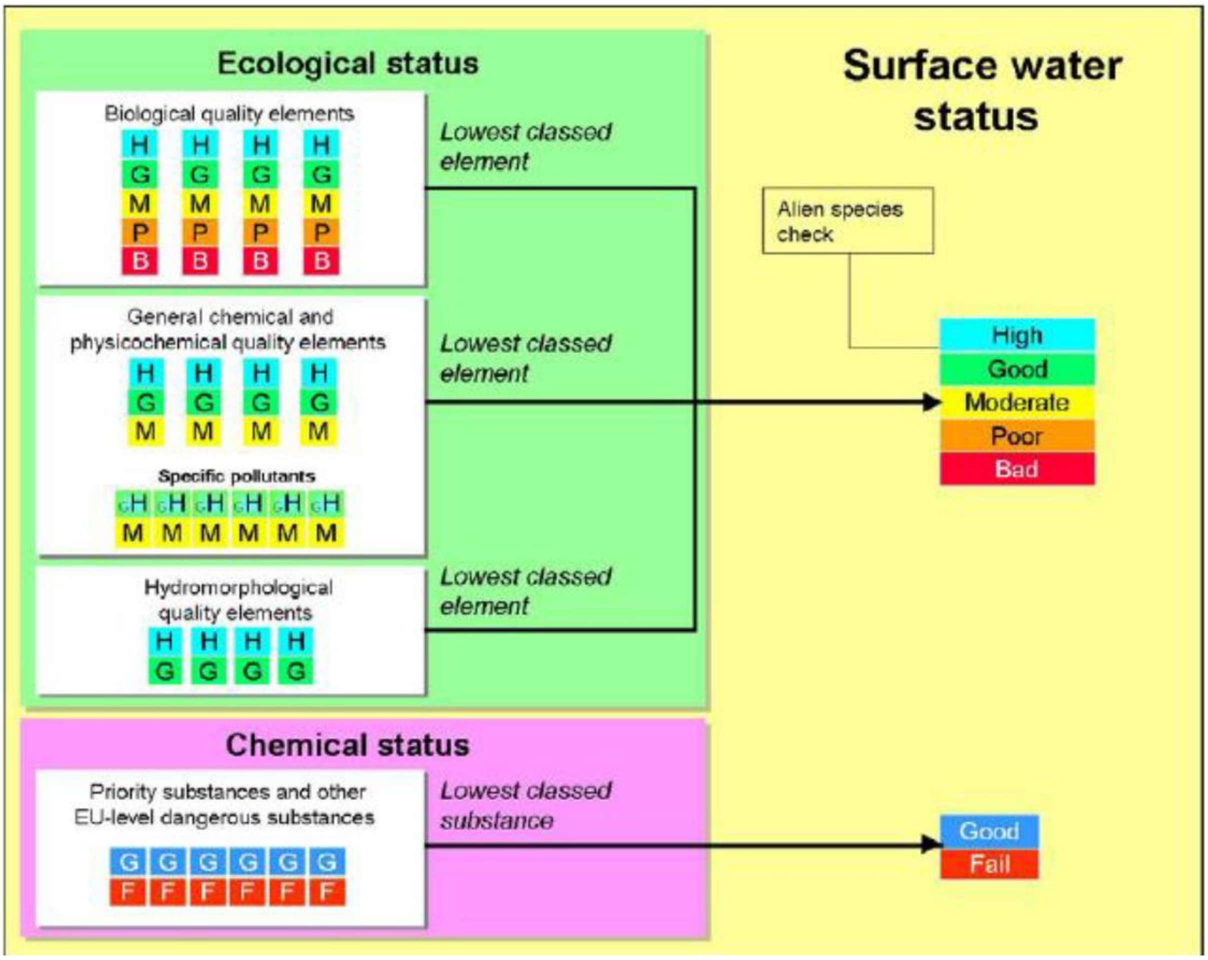

Figure 2.1 *WFD classification elements for surface water body status (Environmental Agency, 2015)*

In addition, the WFD also requires the assessment of the ecological status of water bodies associated with hydromorphological quality elements. Hydromorphology is a term used in the WFD to describe the processes operating within, and the physical form of a waterbody. The term encompasses both hydrological and geomorphological characteristics that, in combination, help support a healthy ecology. Hydromorphological elements contribute towards WFD status classification.

Chemical Status

Chemical status is defined by compliance with environmental standards for chemicals that are priority substances and/or priority hazardous substances, in accordance with the Environmental Quality Standards Directive (2008/105/EC). This is assigned on a scale of good or fail. Surface water bodies are only monitored for priority substances where there are known discharges of these pollutants; otherwise, surface water bodies are reported as being at good chemical status.

Ecological Status

Ecological status or potential is defined by the overall health or condition of the watercourse. This is assigned on a scale of High, Good, Moderate, Poor or Bad, and on the basis of four classification elements or ‘tests’, as follows:

- **Biological:** This test is designed to assess the status indicated by a biological quality element such as the abundance of fish, invertebrates or algae and by the presence of invasive species. The biological quality elements can influence an overall water body status from Bad through to High.
- **Physico-chemical:** This test is designed to assess compliance with environmental standards for supporting physicochemical conditions, such as dissolved oxygen, phosphorus and ammonia. The physicochemical elements can only influence an overall water body status from Moderate through to High.
- **Specific pollutants:** This test is designed to assess compliance with environmental standards for concentrations of specific pollutants, such as zinc, cypermethrin or arsenic. As with the physico-chemical test, the specific pollutant assessment can only influence an overall water body status from Moderate through to High.
- **Hydromorphology:** For natural, this test is undertaken when the biological and physicochemical tests indicate that a water body may be of High status. It specifically assesses elements such as water flow, sediment composition and movement, continuity, and structure of the habitat against reference or ‘largely undisturbed’ conditions. If the hydromorphological elements do not support High status, then the status of the water body is limited to Good overall status. For artificial or highly modified waterbodies, hydromorphological elements are assessed initially to determine which of the biological and physico-chemical elements should be used in the classification of ecological potential. In all cases, assessment of baseline hydromorphological conditions are an important factor in determining possible reasons for classifying biological and physicochemical elements of a water body as less than Good, and hence in determining what mitigation measures may be required to address these failing water bodies. Subsection below further elaborates on the methodology for estimating the hydromorphological status independently.

Hydromorphological Status

Hydromorphology is a relatively new discipline which is described in the Water Framework Directive. Hydromorphology is the study of physical form, condition and processes within a surface water body, that create and maintain habitat. It stems from the term ‘fluvial geomorphology’, a discipline that focuses on the processes that operate in, for example, a river system (e.g. both water and sediment production and movement, erosion, deposition), and the features that these processes create (e.g. pools, riffles, sediment bars). As these processes create and maintain such features, this in turn will create and maintain habitats for invertebrates, fish and plants.

The Environmental Protection Agency (EPA) in the Republic of Ireland and the Northern Ireland Environment Agency (NIEA), through the North South Shared Aquatic Resource (NS SHARE) project, agreed a field assessment technique for WFD classification called the River Hydromorphology Assessment Technique (RHAT) which newest version was published in 2014.

These guidelines assume that natural systems support ecology better than modified systems. Hence the RHAT method classifies river hydromorphology based on a departure from naturalness. It assigns a morphological classification directly related to that of the WFD: *High*, *Good*, *Moderate*, *Poor* and *Bad*, based on semi-qualitative and quantitative criteria.

The eight criteria that are scored by the RHAT are:

1. Channel morphology and flow types: This attribute evaluates the form of the river and its deviation from natural including the planform, cross-section, natural bed forms, flow types and obstructions.

2. Channel vegetation: This attribute relates to the presence, diversity and habitat potential of any vegetation, including woody habitat (WH), leaf litter and tree roots occurring within the channel. The river type and riparian land cover affect the type and quantity of vegetation present in terms of the amount of leaf litter provided as a source of food and the number of refuges such as underwater roots for habitat.

3. Substrate diversity and condition: This attribute evaluates the type, quantity and diversity of substrate present in the river. The dominant substrate depends on the river type and geology. It will reflect the heterogeneity of the substrate present.

4. Barriers to continuity: This attribute relates to in stream barriers which affect both the variation in velocity across the channel and the longitudinal continuity of the river. It will indicate the impacts of widening, over deepening, straightening, impoundments, weirs and dams on downstream transport of water, sediment and organic matter, and up and downstream migration of fish (salmon, trout, eel and lamprey).

5. Bank structure and stability: This attribute assesses the shape and stability of the banks of the river. Rivers are naturally dynamic entities whose pathways constantly change. The degree of expected lateral movement will depend on typology, geology, soil type and hydrology. It relates to both the degree of bank engineering, e.g. steepening, and the effect of riparian or channel use on the stability of the banks.

6. Bank and bank top vegetation: This attribute assesses the types, continuity and canopy layers of the bank vegetation. Bank top should be taken as the first obvious break in slope to 1m back. The river type, altitude, geology and riparian land use will affect the type and extent of bank vegetation present. Bank vegetation contributes to river habitat and bank stability. It will reflect the amount and extent of vegetation cover.

7. Riparian land use: This attribute relates to land cover within the zone adjacent to the river from 1m to 21m back from the bank top. It will reflect the amount and type of vegetation (i.e. whether native or not) within this zone and the intrusion of human activities. Weight should be given to the nature of the activity, proximity to the river channel, and the importance of the floodplain area to the river ecosystem (most important for lowland rivers that interact regularly with the floodplain zone).

8. Floodplain interaction: This attribute concerns the degree of lateral connectivity between the channel and floodplain. The natural connectivity depends on the river type and valley confinement. For rivers that would naturally flood over bank at high discharges, the score will reflect the degree to which channel and bank work have altered flow regimes.

2.1.3 Background to Groundwater Body Status

Under the WFD, groundwater body status is classified on the basis of quantitative and chemical status. Status is assessed primarily using data collected from the EPA monitoring network; therefore, the scale of assessment means that groundwater status is mainly influenced by larger scale effects such as significant abstraction or widespread/ diffuse pollution. The worst-case classification is assigned as the overall groundwater body status, in a ‘one-out all-out’ system. This system is summarised in Figure 2.2 below.

Quantitative Status

Quantitative status is defined by the quantity of groundwater available as baseflow to watercourses and water-dependent ecosystems, and as ‘resource’ available for use as drinking water and other consumptive purposes. This is assigned on a scale of Good or Poor, and on the basis of four classification elements or ‘tests’ as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the ecological status of associated surface water bodies.
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to “significant damage” to associated GWDTEs (with respect to water quantity).
- **Water balance:** This test is designed to identify groundwater bodies where groundwater abstraction exceeds the “available groundwater resource”, defined as the rate of overall recharge to the groundwater body itself, as well as the rate of flow required to meet the ecological needs of associated surface water bodies and GWDTEs.

Chemical Status

Chemical status is defined by the concentrations of a range of key pollutants, by the quality of groundwater feeding into watercourses and water-dependent ecosystems and by the quality of groundwater available for drinking water purposes. This is assigned on a scale of Good or Poor, and on the basis of five classification elements or ‘tests’ as follows:

- **Saline or other intrusions:** This test is designed to identify groundwater bodies where the intrusion of poor-quality water, such as saline water or water of different chemical composition, as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.
- **Surface water:** This test is designed to identify groundwater bodies where groundwater abstraction is leading to a significant diminution of the chemical status of associated surface water bodies.
- **Groundwater Dependent Terrestrial Ecosystems (GWDTEs):** This test is designed to identify groundwater bodies where groundwater abstraction is leading to “significant damage” to associated GWDTE’s (with respect to water quality).

- **Drinking Water Protected Areas (DrWPAs):** This test is designed to identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.
- **General quality assessment:** This test is designed to identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.

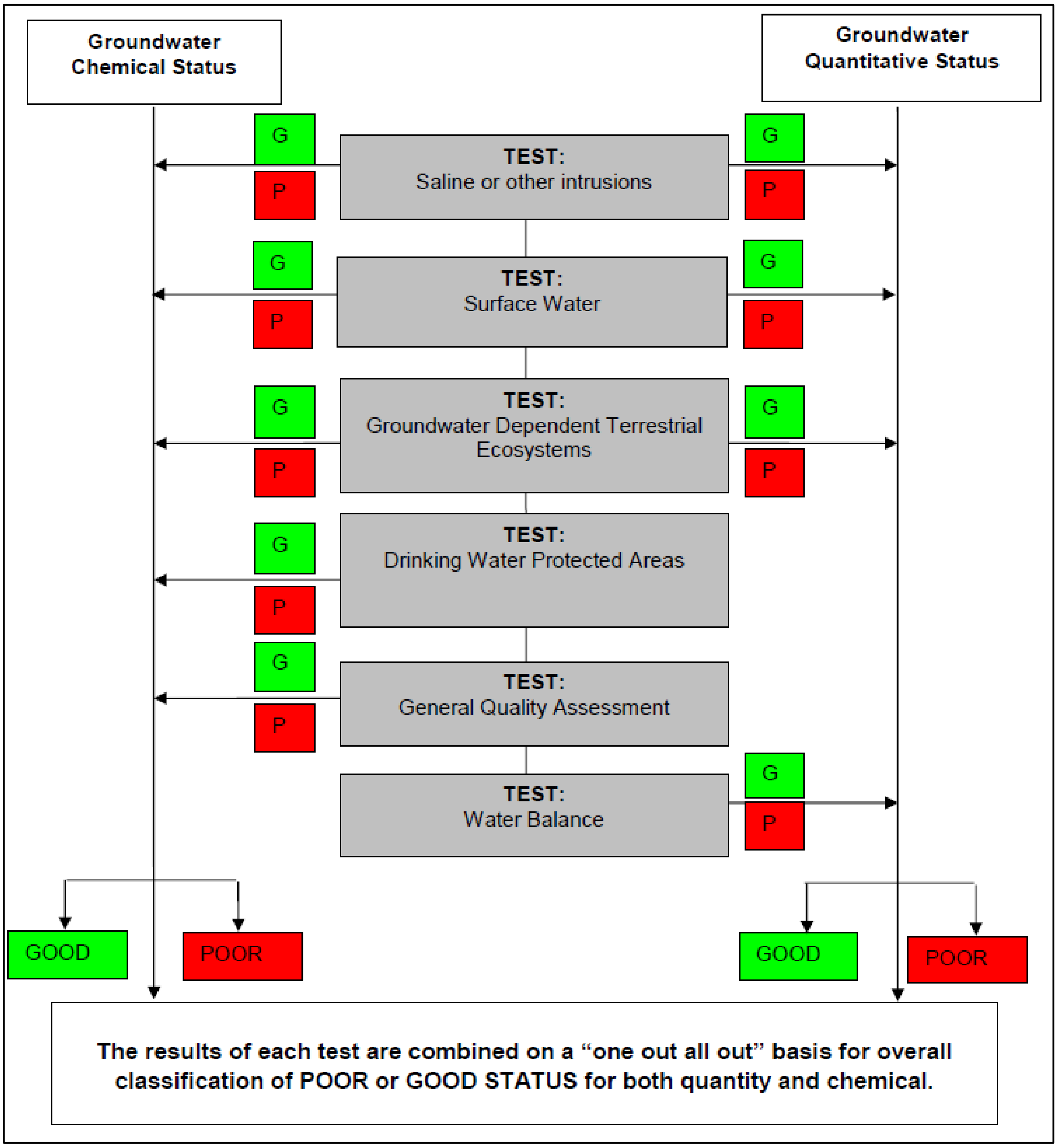

Figure 2.2 *WFD classification elements for groundwater body status (EPA, 2015)*

2.2 DETERMINATION OF NO DETERIORATION ASSESSMENT

Proposed developments that have the potential to impact on current or predicted WFD status are required to assess their compliance against the objectives defined for potentially affected water bodies.

2.3.1 Surface Water No Deterioration Assessment

Table 2.1 below presents the matrix developed by AWN and used to assess the effect of the proposed development on surface water status or potential class. It ranges from a major beneficial effect (i.e., a positive change in overall WFD status) through no effect to deterioration in overall status class. The colour coding used in Table 2.1 is applied to the spreadsheet assessment in Appendix A of this report.

Table 2.1 *Surface Water Assessment Matrix*

Effect	Description/ Criteria	Outcome
Major Beneficial	Impacts that taken on their own or in combination with others have the potential to lead to the improvement in the ecological status or potential of a WFD quality element for the entire waterbody	Increase in status of one or more WFD element giving rise to a predicted rise in status class for that waterbody.
Minor/ localised beneficial	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary improvement that does not affect the overall WFD status of the waterbody or any quality elements	Localised improvement, no change in status of WFD element
No Impact	No measurable change to any quality elements.	No change
Localised / temporary adverse effect	Impacts when taken on their own or in combination with others have the potential to lead to a minor localised or temporary deterioration that does not affect the overall WFD status of the waterbody or any quality elements. Consideration will be given to habitat creation measures.	Localised deterioration, no change in status of WFD element when balanced against mitigation measures embedded in the project.
Adverse effect on class of WFD element	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the WFD status class of one or more biological quality elements, but not in the overall status of the waterbody. Consideration will be given to habitat creation measures.	Decrease in status of WFD element when balanced against positive measures embedded in the project.
Adverse effect on overall WFD class of waterbody	Impacts when taken on their own or in combination with others have the potential to lead to the deterioration in the ecological status or potential of a WFD quality element, which then lead to a deterioration of status/potential of waterbody.	Decrease in status of overall WFD waterbody status when balanced against positive measures embedded in the project.

2.2.2 Groundwater No Deterioration Assessment

Table 2.2 below presents the matrix used to assess the effect of the proposed development on groundwater status class. It ranges from a beneficial effect but no change in status to deterioration in overall status class. The colour coding used in Table 2.2 is applied to the final 'No Deterioration Assessment' spreadsheet in Appendix A of this report.

Table 2.2 Groundwater Assessment Matrix

Magnitude of Impact of the proposed development on WFD Element	Effect on WFD Element within the assessment boundary	Effect on Status of WFD element at the Groundwater Body Scale
Impacts lead to beneficial effect	Combined impacts have the potential to have a beneficial effect on the WFD element.	Improvement but no change to status of WFD element
No measurable change to groundwater levels or quality.	No measurable change to WFD elements.	No change and no deterioration in status of WFD element
Impacts when taken on their own have the potential to lead to a minor localised or temporary effect	Combined impacts have the potential to lead to a minor localised or temporary adverse effect on the WFD element.	Combined impacts have the potential to lead to a minor localised or temporary effect on the WFD element. No change to status of WFD element and no significant deterioration at groundwater body scale.
Impacts when taken on their own have the potential to lead to a widespread or prolonged effect.	Combined impacts have the potential to have an adverse effect on the WFD element.	Combined impacts have the potential to have an adverse effect on the WFD element, resulting in significant deterioration but no change in status class at groundwater body scale.
Impacts when taken on their own have the potential to lead to a significant effect.	Combined impacts in combination with others have the potential to have a significant adverse effect on the WFD element.	Combined impacts in combination with others have the potential to have an adverse effect on the WFD element AND change its status at the groundwater body scale

2.2.2 Assessment against Future Status Objectives

River Basin Management Plans are used to outline water body pressures and the actions that are required to address them. The future status objective assessment considers the ecological potential of a surface water body and the mitigation measures that defined the ecological potential. Assessments are based on the project (including mitigation measures) risks (construction and operation) with regard to the objectives for achieving good status as set out in the 2nd Cycle RBMP 2018-2021 and *draft* 3rd Cycle RBMP 2022-2027. The assessment considers whether the proposed development has the potential to prevent the implementation or impact the effectiveness of the defined measures in these plans.

2.3 SOURCES OF INFORMATION

The following sources of information were used in the preparation of this report:

- Geological Survey of Ireland- online mapping (GSI, 2023).
- GSI - Geological Heritage Sites & Sites of Special Scientific Interest.
- Ordnance Survey of Ireland (OSI).
- Teagasc subsoil database.
- National Parks and Wildlife services (NPWS, 2023).
- Environmental Protection Agency (EPA) – website mapping and database information. Envision water quality monitoring data for watercourses in the area.
- 3rd Cycle Draft Erne Catchment Report (HA 36) (EPA, 2021).
- River Basin Management Plan for Ireland 2018-2021.
- Draft River Basin Management Plan for Ireland 2022-2027.
- Dublin County Council Development Plan 2022-2028.
- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW)).
- Office of Public Works (OPW) flood mapping data (www.floodmaps.ie)
- South Dublin City Council (2005), Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council.
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001).
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

This WFD assessment was based on desktop review of the Environmental Protection agency (EPA) and Local Authority Waters Programme water quality records which were obtained from the portal www.catchments.ie (accessed on 17 August 2023). From the aforementioned source of information, the WFD Status classification and Risk score were obtained for the identified water bodies.

The River Waterbody Status have been estimated in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003). The regulation objectives include the attainment of good status in waterbodies that are of lesser status at present and retaining good status or better where such status exists.

3.0 DESCRIPTION OF EXISTING HYDROLOGICAL, HYDROGEOLOGICAL AND HYDROMORPHOLOGICAL ENVIRONMENT

3.1 HYDROLOGY

The proposed development site is located within the former Eastern River Basin District (ERBD, now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD).

According to the EPA maps, the proposed development site lies within the Liffey and Dublin Bay Catchment (Hydrometric Area 09) and River Liffey sub-catchment (WFD name: Liffey_SC_090, Id 09_15) (EPA, 2023). The nearest river is the Camac River which flows culverted underneath the subject site and discharges into to the River Liffey Estuary Upper WFD (European Code IE_EA_090_0300). The Liffey Transitional Water Body discharges into the Dublin Bay (c. 12.8 Km to the east of the site).

The existing building on the site, along with the gullies serving the surface car park, connect to a local surface water system before discharging to the Camac culvert. There is an existing 450mm concrete public surface water sewer running along the northern boundary of the site within the Naas Road carriageway. A 225mm concrete public surface water sewer also runs along the northern boundary of the site within the Naas Road public footpath. Both stormwater pipes discharge to the culverted Camac River just north of the subject lands. To the north of the site, on the Naas Road, there are additional 4no. surface water sewers which discharge into the Camac River.

In terms of flow, there are no gauging stations in the surrounding area of the project. However, the Hydronet tool developed by the EPA (Hydrotool, https://epawebapp.epa.ie/hydronet/#Flow) estimates the flows that would be expected in rivers under naturalised conditions for different hydrological conditions. According to the Hydrotool, the Camac River before entering the Lansdowne Valley Park (i.e., downstream of Carriglea Development) has a dry weather flow (95%ile flow) of 0.19 m^3/s and a mean condition flow (50%ile) of 0.506 m^3/s.

Surface water quality is monitored periodically by the EPA at various regional locations along principal and other smaller watercourses. With reference to the site setting, the nearest active EPA surface waterbody monitoring station is situated along the River Cama downstream to the proposed development ('Camac Close Emmet Rd'; EPA Code: RS09C020500), which is located in the CAMAC_040 waterbody c. 2.1 km downstream (northeast) of the proposed development site. Figure 3.1 below presents the EPA surface water quality monitoring points in the context of the site and other regional drainage settings.

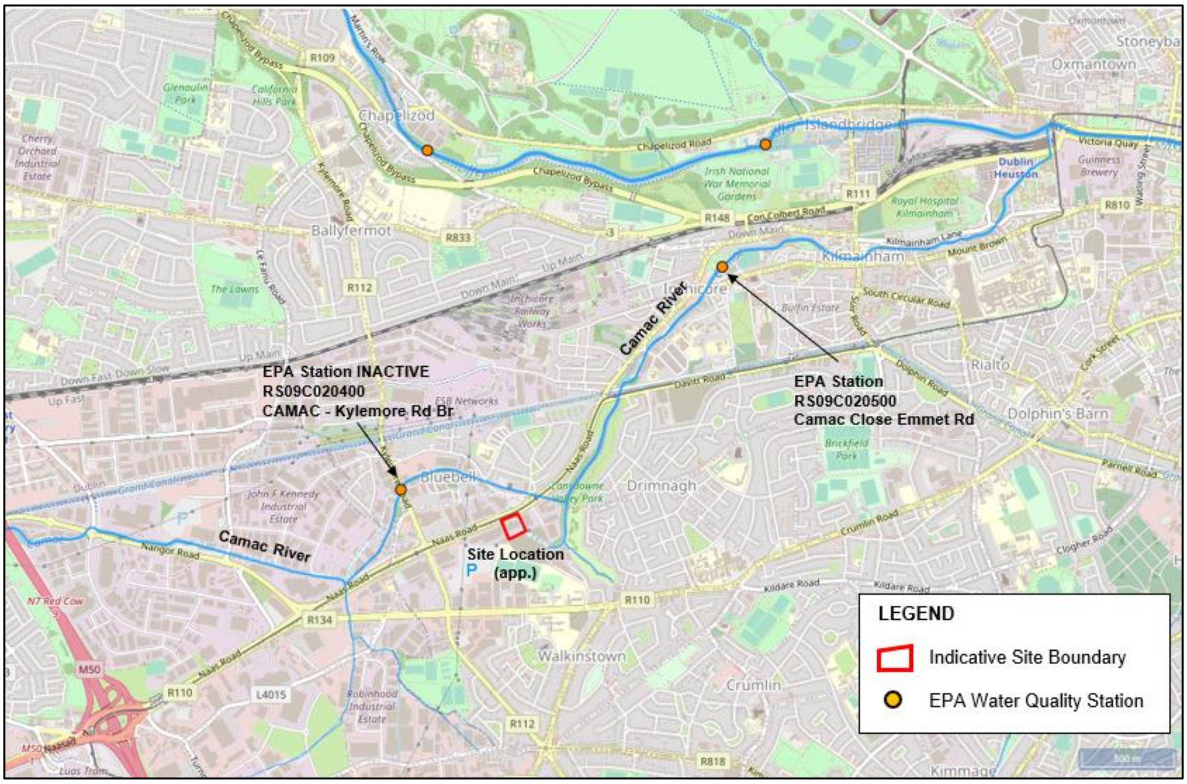

Figure 3.1 *Surface Water Quality Monitoring Point (EPA, 2023) (Site location approximated, indicative only)*

The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. The biological indicators range from Q5 - Q1. Level Q5 denotes a watercourse with good water quality and high community diversity, whereas Level Q1 denotes very low community diversity and bad water quality.

The most recent status recorded by the EPA in the water quality monitoring station located on the Camac River mentioned above is Q3 – Poor Status (2022).

In accordance with the WFD, each river catchment within the former RBD was assessed by the EPA and a water management plan detailing the programme of measures was put in place for each. The CAMAC_040 WFD surface waterbody is currently classified by the EPA as having '*Poor*' WFD water quality status (2016-2021 period) and is '*At risk of not achieving good status*' by 2027. The main pressures identified on the CAMAC_040 are associated with the presently 'poor' ecological (and biological invertebrate) status or potential and '*Poor*' hydromorphological status.

Figure 3.2 below presents the river and transitional waterbody risk EPA map.

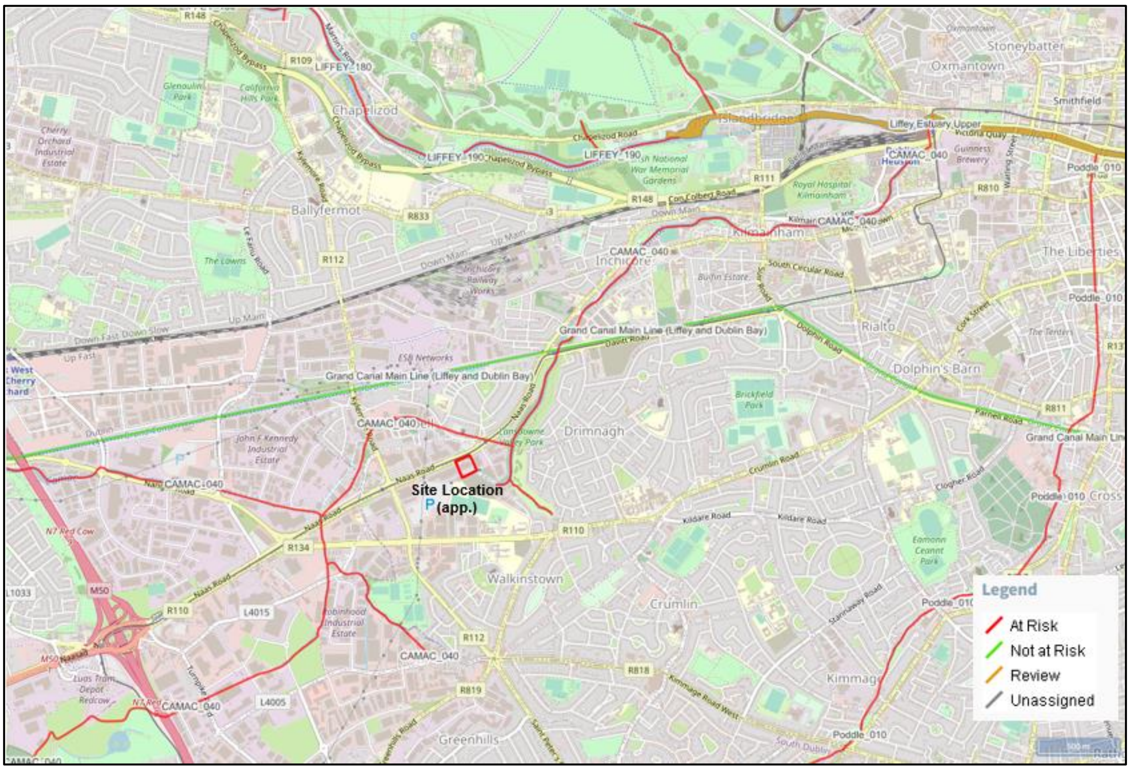

Figure 3.2 *River/Transitional Waterbody Score - 1a 'At risk of not achieving good status, WFD Ecological Status: Poor and under 'Review' (Site red boundary approximated, indicative only).*

As a whole, the Liffey/Camac Subcatchment (Liffey_SC_090) is considered to have an ecological status of '*Poor*'. This is based on current monitoring carried out at this catchment level along the River Camac and Liffey. The Camac River waterbody is examined in terms of water quality as this waterbody is directly connected to the proposed development site. As mentioned above, the Camac River surface waterbody is considered to have an ecological status of '*Poor*' due to their hydromorphological / biological conditions. Refer to Figure 3.3 below.

Waterbody: CAMAC_040

Name:	CAMAC_040	Code:	IE_EA_09C020500
Subcatchments:	09_15 Liffey_SC_090	Catchments:	09 Liffey and Dublin Bay
Latitude:	53.3304763	Longitude:	-6.3428038
Cycle 1 RBD:	Eastern	Local Authority:	South Dublin County Council
Waterbody Category:	River	WFD Risk:	At risk
Protected Area:	Yes	High Status Objective:	No
Heavily Modified:	Unknown	Artificial:	Unknown
Area (Km^2):	N/A	Length (Km):	13.57
Transboundary:	No	Canal:	No

SW 2016-2021

Status	Assessment Technique	Status Confidence	Value
▾ Ecological Status or Potential	Monitoring	medium confidence	Poor
▾ Biological Status or Potential			Poor
Invertebrate Status or Potential			Poor
Supporting Chemistry Conditions			Pass
General Conditions			Pass
Oxygenation Conditions			Pass
Dissolved Oxygen (% Sat)			Pass
Other determinand for oxygenation conditions			High
Acidification Conditions			Pass
pH			Pass
Nutrient Conditions			Pass
Nitrogen Conditions			Good
Nitrate			Good
Ammonium			High
Phosphorous Conditions			High
Orthophosphate			High

Figure 3.3 *Surface Water Quality for the Camac River waterbody, EPA, 2023.*

According to the sub-catchment assessment of the Camac/ Liffey subcatchment (Liffey_SC_090) carried out by the EPA in December 2018, there are a number of pressures within this sub-catchment that impact on the hydrological environment (refer to www.catchments.ie).

The Camac River (Camac_040) waterbody is ‘At Risk’ due to hydromorphology (culverts). The below list is a list of all significant pressures identified in the sub-catchment (Figure 3.5).

Code	Name	WFD Risk	Pressure Category	Pressure Sub Category
IE_EA_090_0400	Liffey Estuary Upper	At risk	Urban Waste Water	Combined Sewer Overflows
IE_EA_09C020250	CAMAC_020	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_EA_09C020310	CAMAC_030	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_EA_09C020310	CAMAC_030	At risk	Industry	Section 4
IE_EA_09C020500	CAMAC_040	At risk	Hydromorphology	Culverts
IE_EA_09C020500	CAMAC_040	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_EA_09C020500	CAMAC_040	At risk	Urban Waste Water	Combined Sewer Overflows
IE_EA_09L012100	LIFFEY_170	At risk	Urban Waste Water	Combined Sewer Overflows
IE_EA_09L012100	LIFFEY_170	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_EA_09L012350	LIFFEY_180	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_EA_09L012350	LIFFEY_180	At risk	Urban Waste Water	Combined Sewer Overflows
IE_EA_09L012360	LIFFEY_190	At risk	Urban Run-off	Diffuse Sources Run-Off
IE_EA_09L012360	LIFFEY_190	At risk	Urban Waste Water	Combined Sewer Overflows
IE_EA_09_69	Leixlip Reservoir	Review	Anthropogenic Pressures	Unknown
IE_EA_09L011900	LIFFEY_150	Review	Urban Run-off	Diffuse Sources Run-Off
IE_EA_09L012040	LIFFEY_160	Review	Agriculture	Farmyards
IE_EA_G_089	Historic Waste Facility (S22-02779)	Review	Anthropogenic Pressures	Unknown
IE_EA_G_092	Historic Waste Facility (S22-02168)	Review	Anthropogenic Pressures	Unknown
IE_EA_G_093	Historic Waste Facility (S22-02748)	Review	Anthropogenic Pressures	Unknown

Figure 3.4 *List of main pressures for all waterbodies within the Liffey_SC_090 Subcatchment.*

3.2 HYDROGEOLOGY

3.2.1 Aquifer Classification

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater throughput (mm^3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

The bedrock aquifer underlying the site according to the GSI (www.gsi.ie/mapping) National Draft Bedrock Aquifer Map is classified as a (*Ll*) *Locally Important Aquifer – Moderately Productive only in Local Zones*.

Above bedrock, the ground within the site principally comprises sandy silty gravel with alluvial deposits; this is classified by the GSI as a locally important gravel aquifer.

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures/ fractures, the main feature that protects groundwater from contamination, and therefore the most important feature in the protection of groundwater, is the subsoil (which can consist solely of/ or of mixtures of peat, sand, gravel, glacial till, clays or silts).

Groundwater Vulnerability is a term used to represent the natural ground characteristics that determine the ease with which groundwater may be contaminated by human activities. The GSI currently denotes a '*Moderate*' (M) vulnerability classification underlaying the entire proposed development site indicating 5-10m overburden of low permeability soils. According to Site Investigations carried out by Ground Investigations Ireland, depth of the bedrock varies from 8.13m BGL to a maximum of 13.54m BGL, which is representative of a '*Low*' to '*Moderate*' vulnerability classification.

3.2.2 Groundwater Quality

The Water Framework Directive (WFD) 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater, transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. 'Good Status' was to be achieved in all waters by 2015, as well as maintaining 'high status' where the status already exists. The EPA co-ordinates the activities of the River Basin Districts, local authorities and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

The Groundwater Body (GWB) underlying the site is the Dublin GWB (EU Groundwater Body Code: IE_EA_G_008). Currently, the EPA (2023) classifies the Dublin GWB as having '*Good Status*', and its Ground Waterbody Risk score is currently '*Under Review*'. The Dublin GWB has a Good Status for chemical and quantitative categories. Therefore, the overall status is considered Good.

3.3 HYDROMORPHOLOGY

As mentioned above, a culverted section of the Camac River runs diagonally through the site, flowing in a south-easterly direction. It should be noted that the Naas Road Lands LAP (adopted January 2013, extended until January 2023 and expired in January 2023) identifies the de-culverting of the Camac River. Regionally, the Camac River naturally meanders pathway through its course through the Bluebell area. The approximated meander belt (taken from the open areas in Bluebell and Lansdowne Valley Park) is c. 560 m. At the local scale, as the Camac River runs diagonally and culverted through the site, meanders cannot be defined.

According to the Sustainable Environmental Infrastructure and Flood Risk included in the DCC Development Plan 2022-2028, the River Camac Flood Alleviation Scheme, which is under preparation, will review and improve flood protection on the Camac River catchment, with opportunities for river corridor restoration being explored as part of this initiative. It should be noted that the River Camac Flood Alleviation Scheme results are not available at the date of this report.

The hydromorphological assessment carried out by AWN (2023) estimated the WFD hydromorphological using the RHAT methodology which classifies river hydromorphology based on a departure from naturalness. The obtained results are presented in Table 3.1 below.

Table 3.1 *WFD Classification for Existing Condition of Camac River*

Attribute	Score	HM Score	∑ Scores	WFD Classification
1. Channel morphology and flow types	0	7	0.22	Poor
2. Channel vegetation	2			
3. Substrate diversity and condition	0			
4. Barriers to continuity	1			
5. Bank structure and stability	1			
6. Bank and bank top vegetation	1			
7. Riparian land use	1			
8. Floodplain interaction	0			

As can be seen above, the obtained WFD Classification for the hydromorphological status for the Camac River is '*Poor*' which is consistent with the current status of this catchment assessed by the EPA (refer to AWN report for further details).

3.4 PROJECT DETAILS

The surface water assessment and the groundwater assessment both examine the potential effects of the proposed development, which includes the construction and operation of the proposed development.

3.4.1 Construction Phase

The key activities for the WFD assessment are as follows:

- **Daylighting of the Camac River**: The development proposes the reopening of the culverted section of the Camac River in association with the Camac Flood Alleviation Scheme. The River Camac is a culverted river lying from c. 7.5 to 10 metres below the ground floor level through the development site. The proposed development includes for daylighting approximately 76 no. metres of the River Camac. The intention is that this would create 1,261 sq m (13% of the site area) of space allocated for the Riparian Zone. The general procedure of works for the daylighting of the culvert are as follow:
    - Excavating to uncover the current Camac culvert. To ensure the stability of the surrounding ground, a sloping gradient with a ratio of 1:2 will be implemented, commencing from a point 5 meters away from the culvert's front face.
    - Retaining walls will be constructed on both sides of the culvert.
    - Demolition of the existing culvert lid.
    - Excavating and creating sloped ground at the land boundaries to reach the necessary formation levels. The sloped ground serves as a temporary work system to counter soil surcharge.
    - Installation of contiguous piled wall along a portion of the south-eastern boundaries. The 450mm Ø contiguous piled wall is designed to cantilever in the temporary condition..
- **Ground Works:** It is known that ground works will comprise excavation and levelling for the daylighting of the Camac River, foundations, basement and piling and laying of associated services for the buildings and movement of soil for landscaping purposes.
- **Dewatering:** No significant dewatering will be required during the construction phase which would result in the localised lowering of the water table. However, localised perched groundwater within the cohesive deposits/ or surface water

run-off during and after heavy rainfall events may be necessary to pump out during the excavation of the proposed basement and for the daylighting of the culverted Camac River and other excavation works.

- **Surface Water Run-off**: There may also be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry. If dewatering is required, water shall be treated prior to discharge to the existing public sewer network or Camac River. This shall include treatment via petrol interceptor and treatment for silt removal either via silt trap, settlement tanks or ponds.

The potential effects identified are as a result of:

- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates) – arising from dewatering, excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from poor on-site toilets and washrooms.
- Temporary land-take during the construction phase (excavation works); Development has taken place on the site in accordance with an extant planning permission granted. Under this permission, excavation of the site progressed to a depth of approximately 3m below the surrounding ground level. There will be soil, stones made ground excavated to facilitate construction of the daylighting of the Camac River, new foundations, basement, and the installation of underground services. It is not envisaged that bedrock will be encountered during excavation works.
- Piling and below ground working causing mobilisation of contaminants during the construction and operational phases.

3.4.2 Operational Phase

The proposed daylighting of the Camac River will include natural riverbanks that will aim to improve the quality of the River Camac and enhance biodiversity at the river level, a combination of grey and green bioengineering solutions are proposed such as vegetated rip-rap and willow staking, spiling and mattressing.

Improvement of the ecological and Hydromorphological conditions of the Camac River are expected as part of the proposed daylighting of the Camac River. To establish softer, more natural riverbanks that will aim to improve the quality of the River Camac and enhance biodiversity at the river level, a combination of grey and green bioengineering solutions are proposed such as vegetated rip-rap and willow staking, spiling and mattressing. According to the Hydromorphological Assessment carried out by AWN, as a result of the proposed new development the hydromorphological condition would be improved from '*Poor*' to '*Good*' at the site, as established in the River Hydromorphology Assessment Technique (RHAT) guidelines.

There is no abstraction of groundwater proposed. There is no bulk chemical or fuels required during operation. As such the only potential for a leak or spill of petroleum hydrocarbons is from vehicles. Unmitigated spills may lead to local contamination of soil. However, it is noted that during the operational phase any accidental discharge will more likely impact stormwater drainage due to the hardstand and drainage infrastructure proposed and any releases to drainage will be mitigated through petrol interceptors.

The proposed incorporation of hardstand area and the use of SUDs design measures will have a minor effect on local recharge to ground; however, the impact on the overall groundwater regime will be insignificant considering the proportion of the site area in relation to the total aquifer area. It is noted that a significant proportion of the site is unpaved, and recharge will continue as current.

3.5 MITIGATION AND DESIGN MEASURES

The design has taken account the potential impacts of the proposed development on the hydrological environment local to the area where construction is taking place. The only potential for impact during construction is accidental releases and there is limited potential for any contaminant release during operation.

3.5.1 Construction Phase

The following mitigation measures will be implemented during the construction phase.

Daylighting of the Camac River.

During the process of daylighting the river Camac, several mitigations will be employed. To create a new central river channel, sandbags will be placed on both sides of the culvert, and protective sheeting will be installed over the top of the river channel. To facilitate the demolition phase, a temporary working platform with handrails will also be installed. These measures are intended to ensure the safe and controlled restoration of the river while minimizing potential risks and environmental impacts.

Suspended solids management.

As there is potential for run-off to directly discharge / recharge to a watercourse / groundwater (Camac River Surface Waterbody/ Dublin GWB) underlying the site and in order to manage the potential impact associated with sediment and sediment runoff the following mitigation measures will be implemented during the construction phase.

- During earthworks and excavation works care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts.
- Run-off water containing silt will be contained on site via settlement tanks and treated to ensure adequate silt removal.
- Silt reduction measures on site will include a combination of silt fencing and settlement measures (silt traps, silt sacks and settlement tanks/ponds).
- Any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.
- A power washing facility or wheel cleaning facility will be installed near to the site compound for use by vehicles exiting the site when appropriate,
- A stabilised entranceway consisting of an aggregate on a filter cloth base that is located at any entry or exit point of the construction site.

- Aggregate will be established at the site entrance points from the construction site boundary extending for at least 10 m.
- The temporary storage of soil will be carefully managed. Stockpiles will be tightly compacted to reduce runoff and graded to aid in runoff collection.
- Construction materials, including aggregates etc. will be stored a minimum of 20-meter buffer distance from any surface water bodies and surface water drainage points.
- Aggregate materials such as sands and gravels will be stored in clearly marked receptacles within a secure compound area to prevent contamination.
- Movement of material will be minimised to reduce the degradation of soil structure and generation of dust.
- Excavations will remain open for as little time as possible before the placement of fill. This will help to minimise the potential for water ingress into excavations.
- Weather conditions will be considered when planning construction activities to minimise the risk of run-off from the site.
- Any surface water run-off collecting in excavations will likely contain a high sediment load. This will not be allowed to directly discharge directly to the stormwater sewer.

In addition to the measures above, all excavated materials will be visually assessed by suitably qualified persons for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of potential contaminants to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be segregated and appropriately disposed of by a suitably permitted/licensed waste disposal contractor.

Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be established prior to the commencement of the initial infrastructure construction works to collect and discharge any treated construction water during construction.

Cement/concrete works

Where feasible all ready-mixed concrete will be brought to 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 contaminated storm water to the underlying subsoil.

No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the site within 10 meters of an existing surface water drainage point. Washouts will only be allowed to take place in designated areas with an impervious surface where all wash water is contained and removed from site by road tanker or discharged to foul sewer submit to agreement with Irish Water / DCC.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

Hydrocarbons and other construction chemicals

The following mitigation measures will be implemented during the construction phase in order to prevent any spillages to ground of fuels and other construction chemicals and prevent any resulting to surface water and groundwater systems:

- Designation of bunded refuelling areas on the Site.
- Provision of spill kit facilities across the Site.
- Where mobile fuel bowsers are used, the following measures will be taken:
  - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use.
  - The pump or valve will be fitted with a lock and will be secured when not in use.
  - All bowsers to carry a spill kit and operatives must have spill response training.
  - Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In the case of drummed fuel or other potentially polluting substances which may be used during the construction phase, the following measures will be adopted:

- Secure storage of all containers that contain potential polluting substances in a dedicated internally bunded chemical storage cabinet unit or inside a concrete bunded area;
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be stored within temporary bunded areas, doubled skinned tanks or bunded containers to a volume of 110% of the capacity of the largest tank/container. Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.
- All drums to be quality approved and manufactured to a recognised standard.
- If drums are to be moved around the Site, they will be secured and on spill pallets; and
- Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area or within the construction compound (or where possible off the site) which will be away from surface water gulleys or drains minimum 20 m buffer zone). In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as “Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors” (CIRIA 532, 2001) will be complied with.

The construction contractor will be required to implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

Disposal of collected water (rainfall run-off and perched water)

Rainfall at the construction site will be managed and controlled for the duration of the construction works until the permanently intercepted and attenuated surface water drainage system of the proposed site is complete. Dewatering water from excavation works within overburden deposits will be contained within the site, treated (if required) and discharged. This water will be discharged into the culverted Camac River.

A staged treatment system (treatment-train) will be in place during construction works to intercept and remove any potential contamination prior to discharge. The treatment-train will ensure the quality of the discharge water is maintained and will comprise hydrocarbon interception for removal of petrol/diesel, settlement tanks for silt removal, and pH balancing.

The discharges to storm water network shall comply with the requirements of discharge to be established in the discharge licence to Dublin City Council (for storm water network).

Wastewater Management

Foul wastewater discharge from the site will be managed and controlled for the duration of the construction works.

Site welfare facilities will be established to provide sanitary facilities for construction workers on site. The main contractor will ensure that sufficient facilities are available at all times to accommodate the number of employees on site. Foul water from the offices and welfare facilities on the site will discharge into the existing sewer on site (the cabins may initially need to have the foul water collected by a licensed waste sewerage contractor before connection to the sewer line can be made).

The construction contractor will implement emergency response procedures, and these will be in line with industry guidance. All personnel working on the Site will be suitably trained in the implementation of the procedures.

Management of Surface Water Flow Paths

During construction a site drainage and protection system will be built to reduce the flow of run-off from the site, prevent soil erosion, and protect water quality in the Camac River. Temporary excavated channels, bunds, or ridges or a combination of the three, may be constructed to divert sediment-laden water to an appropriate sediment retention structure. These will be installed to provide permanent diversion of clean stormwater away from erosion exposed soil areas, or to provide a barrier between exposed areas and unexposed areas of the construction site. Runoff diversion channels/bunds need regular maintenance to keep functioning throughout their life.

Silt fences will be installed around the perimeter of the site where construction is proposed to detain flows from runoff so that deposition of transported sediment can occur through settlement. Inspection and maintenance of the silt fences during construction phase is crucial to ensuring that they work as intended. They will remain in place throughout the entire construction phase.

It is envisaged that a number of geotextile lined settling basins and temporary mounding's and/or silt fences will be installed to ensure silts do not flow off site during the construction stage. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed. All inlets to the settling basins will be 'riprapped' to prevent scour and erosion in the vicinity of the inlet.

Surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary drainage system shall be established prior to the commencement of the initial infrastructure construction works to collect and discharge any treated construction water during construction.

3.5.2 Operational Phase

The proposed development stormwater drainage network design includes sustainable drainage systems (SuDS) these measures by design ensure the stormwater leaving the site is to be attenuated and treated within the new development site boundary to ensure suitable quality, before discharging to the Camac River.

The purpose of the proposed design is to:

- Treat runoff and remove pollutants to improve quality.
- Restrict outflow and to control quantity.
- Increase amenity value.
- Improve the ecological status of the Camac River through its daylighting.

The layout of the proposed surface water drainage network is shown on BMCE Drawing Set included with this Application. It is proposed to separate the surface water and wastewater drainage networks, which will serve the proposed development, and provide independent connections to the local public surface water and wastewater sewer networks respectively.

3.6 ASSESSMENT OF SOURCE PATHWAY LINKAGES

This section presents the information related to the current waterbody status identified in the development area.

The proposed development site lies within the Liffey and Dublin Bay Catchment (Catchment ID: 09) and the Liffey_SC_090 WFD Sub-Catchment 09-15 (Camac_040 WFD River Sub Basin; EPA, 2023).

The Groundwater Body (GWB) underlying the site is the Dublin GWB (EU Groundwater Body Code: IE_EA_G_008).

This WFD Screening has identified 2 (1) no. WFD surface water bodies and one (1) no. WFD groundwater bodies of relevance due to the close proximity and/or connection of these waterbodies during the construction and operation of the proposed development. The water bodies are listed in Table 3.2 below.

Table 3.2 *WFD water bodies located within the study area*

Type	WFD Classification	WFD Status (2016-2021)	WFD Risk	Waterbody Name / ID	Location
Surface Water	River	Poor	*At Risk of not achieving good status*	Camac_040 (IE_EA_09C020500)	Located underneath he proposed development site.
	Transitional	Moderate	At Risk of Not Achieving Good Status	Liffey Estuary Lower (IE_EA_090_0300)	Located c. 6 km m to the east of the proposed development site.
Groundwater	Groundwater	Good	*Under Review*	Dublin Groundwater Body (GWB) (IE_EA_G_008)	Groundwater body immediately underlying the proposed development site.

During the construction phase, there will be a direct connection to the Camac River through discharge to its culverted section (following settlement and treatment where required). During operational phase, there is also a direct connection to the Camac River bodies through the projected daylighting of its culverted section underneath the site and also through the projected stormwater drainage.

There will also be indirect hydrological connection to Liffey River Estuary Lower transitional waterbody through the foul water discharge which will be treated off site at Ringsend Waste Water Treatment Plant (WWTP). It should be noted that the peak effluent discharge, calculated for the proposed development as 13 l/s would equate to 0.12% of the licensed discharge at Ringsend WWTP [peak hydraulic capacity]. This flow would not have a measurable impact on the overall water quality within Liffey River Estuary Lower and Dublin Bay and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive).

The table below (Table 3.3) describes the S-P-R model for the site and includes the robust mitigation and design measures which will be incorporated into the proposed development throughout the construction and operational phases.

Table 3.3 *Pollutant Linkage Assessment (with mitigation)*

Source	Pathways	Receptors considered	Risk of Impact	Mitigation Measures
Construction Impacts (Summary)				
Discharge to ground of runoff and dewatering. Unmitigated leak from an oil tank to ground/ unmitigated leak from construction vehicle (1,000 litres worst case scenario).	Bedrock protected by >8-13m low permeability overburden. Low fracture connectivity within the limestone will limit any potential for offsite migration.	Limestone bedrock aquifer (Locally Important Aquifer)	Low risk of migration through poorly connected fracturing within the limestone rock mass. No likely impact on the status of the aquifer/off site migration due to mitigation measures (i.e., CEMP), low potential loading, natural attenuation within overburden and discrete nature of fracturing reducing off site migration.	Only potential for temporary impacts due to accidental releases. A CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the CEMP and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling of machinery and chemical handling, control of water during the construction phase and treatment of discharge water where required.
Discharge to ground of runoff water with High pH from cement process/ hydrocarbons from construction vehicles/run-off containing a high concentration of suspended solids	Indirect pathway to hydrological environment via stormwater drainage	Hydrological environment (Camac River)	No perceptible risk due to the implementation of the mitigation measures	
Operational Impacts (Summary)				
Discharge of untreated water off-site	Indirect pathway to hydrological environment via surface water drainage system	Hydrological environment (Camac River)	No perceptible risk due to the implementation of the mitigation and design measures which includes SuDS techniques and the use of interceptors along the drainage system.	The proposed development is designed to ensure the protection of the hydrological environment such as delivery and distribution and use of oil interceptors on the stormwater system and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented.
Discharge of foul water to the Ringsend Waste Water Treatment Plant (WWTP)	Indirect pathway to Liffey Estuary Lower through public foul sewer post treatment at the WWTP.	Hydrological environment (Liffey Estuary Lower)	No perceptible risk to the hydrological environment and the WWTP Even without treatment at Ringsend WWTP, the peak effluent discharge (13 l/s which would equate to 0.12% of the licensed discharge at Ringsend WWTP); would not impact on the overall water quality within Liffey Estuary Lower and therefore would not have an impact on the current Water Body Status (as defined within the Water Framework Directive).	Wastewater discharge to be agreed with Irish Water (IW) in a Wastewater Connection Application.

4.0 NO DETERIORATION ASSESSMENT

4.1 HYDROLOGICAL ENVIRONMENT

The proposed development has a direct hydrological connection to the Camac River (Camac_040 WFD Surface Waterbody) as it is proposed stormwater drainage discharges into the Camac River underneath the site.

There are mitigation and design measures which will be implemented during the construction phase to protect the hydrological and hydrogeological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of waterbodies long-term and as such will not impact on trends in water quality and over all status assessment.

It is expected that localised groundwater dewatering will be required as part of the excavation works; however, it will be associated with perched groundwater within the subsoils and not with the regional aquifer within the bedrock. As such the proposed development will not have an impact on the quantitative aspects in consideration of water body status such as baseflow for the hydrological waterbodies.

The project-specific CEMP which the works Contractor will develop will implement strict mitigation measures to ensure the protection of the hydrological (and hydrogeological) environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative or morphology of the nearby watercourses.

There are limited indirect discharges of water during the operational phase to open waterbody/ watercourse and no long-term groundwater dewatering for the proposed development. The discharges will be adequately treated via SuDS measures, hydrobrake (or equivalent) and oil/water interceptor to ensure there is no long-term negative impact to the WFD water quality status of the receiving watercourse. The SuDS and proposed measures have been designed in detail with the ultimate aim of protecting the hydrological (& hydrogeological) environment. The SuDS and project design measures will be maintained correctly as per specifications to ensure long-term/ on-going integrity of same.

There are no changes to the overall hydrological and hydrogeological regime as a result of the proposed development. There are no proposed diversions of any drainage ditches or waterbodies as part of the proposed development.

Overall, the potential effects on the current status of the waterbodies are considered *no impact i.e. no change to the WFD status or elements in terms of the hydrological environment*.

4.2 HYDROGEOLOGICAL ENVIRONMENT

As mentioned above, it is expected that localised groundwater dewatering will be required as part of the excavation works. Given the depth of bedrock underlying the site (8-13 below ground level), the expected dewatering would be associated with perched groundwater within the overburden deposits. It can also be expected minor ingress of rainfall in the excavations will also occur during construction phase. The Basement Impact Assessment undertaken by BMCE (2023) demonstrates that there is no significant impact from the basement construction proposal. Based on our analysis, the proposed basement can be built safely without causing unacceptable detriment to the local surface water conditions, land stability, groundwater conditions or adjacent structures.

The construction of the proposed basement development will not adversely / unduly impact on the underlying groundwater conditions, groundwater or surface water flow, existing patterns of surface water drainage (including infiltration into groundwater), and that groundwater quality, quantity and classification will be protected. As such the proposed development will not have an impact on the quantitative aspects in consideration of water body status such as baseflow for the hydrological waterbodies. During operation there is no current proposal for dewatering.

For the construction phase, there are mitigation and design measures which will be implemented during this phase to protect the hydrogeological environment. There is a potential of accidental discharges during the construction phase, however these are temporary short-lived events that will not impact on the water status of the underlying bedrock aquifer long-term and as such will not impact on trends in water quality and over all status assessment.

The project-specific CEMP which the works Contractor will develop will implement strict mitigation measures to ensure the protection of the hydrogeological environment during construction which will ensure that there will be no negative impact on the quantitative or qualitative of the underlying bedrock limestone aquifer (Dublin GWB).

In terms of the operational phase, the risk to the aquifer is considered to be low due to the use of oil interceptors on the stormwater system prior to discharge from the site.

Overall, the potential effects on the WFD status to the waterbodies are considered no impact *i.e., no change to the current status or elements in terms of the underlying hydrogeological environment*.

4.3 HYDROMORPHOLOGICAL ENVIRONMENT

During the process of daylighting the river Camac, several mitigations will be employed. To create a new central river channel, sandbags will be placed on both sides of the culvert, and protective sheeting will be installed over the top of the river channel. To facilitate the demolition phase, a temporary working platform with handrails will also be installed. These measures are intended to ensure the safe and controlled restoration of the river while minimizing potential risks and environmental impacts.

For the operational phase, the hydromorphological assessment carried out by AWN (2023) estimated the WFD hydromorphological using the RHAT methodology which classifies river hydromorphology based on a departure from naturalness. The obtained results are presented in Table 4.1 below.

Table 4.1 *WFD Classification for Proposed Daylighting of Camac River*

Attribute	Score	HM Score	∑ Scores	WFD Classification

1. Channel morphology and flow types	3	23	0.72	Good
2. Channel vegetation	3			
3. Substrate diversity and condition	3			
4. Barriers to continuity	3			
5. Bank structure and stability	2			
6. Bank and bank top vegetation	3			
7. Riparian land use	2			
8. Floodplain interaction	4			

As can be seen above, as a result of the proposed new development the hydromorphological condition would be improved to '*Good*' at the specific site location (refer to the AWN report for further details).

Overall, the potential effects on the WFD status to the waterbodies are considered to lead to beneficial effect, *i.e., combined impacts have the potential to have a beneficial effect on the WFD element and improvement to the current status or elements in terms of the local hydromorphological environment*.

4.4 ASSESSMENT IN TERMS OF FUTURE GOOD STATUS

The Camac River, Liffey Estuary Lower and Dublin GWB are examined in terms of water quality as these sections of waterbodies are indirectly connected to the proposed development site. Currently, the EPA classifies the WFD Ecological Status for the Camac River waterbody as having '*Poor Status*' and the Liffey Estuary Lower as '*Moderate Status*' (2016-2021) based on current monitoring with a current WFD River Waterbody risk score of '*At risk of not achieving good status*' in both waterbodies. Therefore, the objective is currently not being achieved for them. However, a local improvement on the WFD Hydromorphological Status (from '*Poor*' to '*Good*' is expected as part of the daylighting of the Camac River. This is a local result and is not applicable to the entire waterbody; according to the Sustainable Environmental Infrastructure and Flood Risk included in the DCC Development Plan 2022-2028, the River Camac Flood Alleviation Scheme, which is under preparation, will review and improve flood protection on the Camac River catchment, with opportunities for river corridor restoration being explored as part of this initiative.

According to the sub-catchment assessment of the Liffey/Camac subcatchment (Liffey_SC_090) carried out by the EPA in December 2018, there are a number of pressures within this sub-catchment that impact on the hydrological environment. Hydromorphology (culverts) was identified as the likely significant pressure within Camac River. The EPA classifies the WFD Ecological Status for the Dublin groundwater body as having '*Good Status'* (2016-2021) and its WFD Waterbody risk score is '*under review*' (refer to www.catchments.ie).

As mentioned above, the main pressure for obtaining good status is hydromorphology (culverts). The proposed development will include the daylighting of the Camac River which is in line to the WFD objectives to be achieved by 2027.

The 2nd cycle of the RBMP 2018-2021 does not include the Camac River as an Area for Action, and therefore has not been highlighted for restoration by the *draft* 3rd cycle of the RBMP 2022-2027. However, the key objective for this waterbody is to have a *Good* status by 2027.

The objective of the Dublin GWB is Good for 2021. Therefore, the objective is currently being met.

At present there are no local targeted measures within the catchments to maintain or achieve improvements to the status of the water bodies. However, the River Camac Flood Alleviation Scheme, which is under preparation, will review and improve flood protection on the Camac River catchment. In addition, the following are some pressures associated with waterbody catchments:

- Physical Modifications.
- Management of pollution from agricultural activities.
- Management of pollution from sewage and waste water.
- Management of pollution from urban environments.
- Changes to natural flow and levels of water.
- Managing invasive non-native species.

Based on the above information it is not considered that any of the aspects of the proposed development will prevent the WFD objectives from being achieved or to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

5.0 CONCLUSIONS

Appendix A contains the surface water and groundwater assessments where the above potential effects are considered. The colour coded system referred to in Table 2-1 and Table 2-2 above is used to give a visual impression of the assessment.

The WFD assessment indicates that, based on the current understanding of the proposed development, there is no potential for adverse or minor temporary/ long-term or localised effects on the Camac River surface waterbody. Therefore, it has been assessed that the proposed development will not prevent attainment, or potential to achieve, future good status or to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

The WFD assessment indicates that there is no potential for adverse or minor temporary or localised effects on the Dublin groundwater body. Therefore, it has been assessed that it is unlikely that the proposed development will prevent attainment, or potential to achieve the WFD objectives or to meet the requirements and/or objectives in the second RBMP 2018-2021 (River Basin Management Plan) and draft third RBMP 2022-2027.

No further assessment of WFD is recommended given that no deterioration or change in water body status is expected based on the current understanding of the proposed development during construction and operation.

6.0 STUDY LIMITATIONS

The conclusions and recommendations listed above are based on our current understanding of the site. This has been formed from review of historical maps, review of current and previous environmental and engineering reports for the proposed development site. This information is taken as being accurate and true.

Public databases held by the EPA, GSI, OPW, NPWS and OSI have been consulted and the most recent available data has been referenced.

No subsurface or destructive testing was carried out as part of this assessment.

7.0 REFERENCES

- EPA, (2023). Environmental Protection Agency, on-line mapping; Available on-line at: http://gis.epa.ie/Envision [Accessed: 10-08-2023].
- GSI, (2023). Geological Survey of Ireland; Available on-line at: www.gsi.ie [Accessed: 10-08-2023].
- NPWS, (2023). National Parks & Wildlife Service; Available on-line at: www.npws.ie [Accessed: 10-08-2023].
- OPW, (2020). The National Preliminary Flood Risk Assessment (PFRA) Overview Report; Flood Relief & Risk Management Division, Engineering Services, Office of Public Works (OPW).
- OPW, (2023). Office of Public Works; Available on-line at: www.opw.ie [Accessed: 10-08-2023].
- Ordnance Survey of Ireland (OSI).
- Teagasc subsoil database.
- 3rd Cycle Draft Erne Catchment Report (HA 36) (EPA, 2021).
- River Basin Management Plan for Ireland 2018-2021.
- River Basin Management Plan for Ireland 2018-2021.
- Draft River Basin Management Plan for Ireland 2022-2027.
- Dublin County Development Plan 2022-2028.

APPENDIX A
WATER FRAMEWORK DIRECTIVE ASSESSMENT MATRIX

Risk screening of potential to cause deterioration of current WFD status

	Surface Water	Scheme Elements	**Proposed Development**						Mitigation Measures	Overall Impact with mitgation measures
	Camac River Surface Waterbody IE_EA_09C020500	Phase (Construction/ Operation)	Construction	Construction	Construction	Construction	Operation	Operation		
		Identified Quantitative Impacts	Increased run-off and sediment loading	Temporary land-take during the construction phase	Pollution due to accidential discharges or spillages during the construction phase	Scour during the construction phase	Increase in Hardstanding	Storage of Fuel		
WFD Status	Macrophytes and phytobenthos - combined	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	**Construction:** The project-specific CEMP will include robust mitigation measures to protect the underlying hydrogeological environment. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling machinery and chemical handling and control of water during the construction phase. **Operation:** The proposed development is designed to ensure the protection of the hydrological environment such as delivery and distribution and use of oil interceptors on the stormwater system and the use of SuDS techniques. The proposed daylighting of the Camac River is expected to improve the local ecological and hydromorphological condition of the river. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. Details are to be agreed with Dublin CC	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Macroinvertebrates		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Fish		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
Physio-Chemical Status	Total Ammonia	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Total Nitrogen		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Ortho-Phosphate		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
Hydromorphological Elements	Quantity and dynamics of river flow	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Positive change anticipated due to the daylighting of the Camac River.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Connection to Groundwater		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	River continuity		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Positive change anticipated due to the daylighting of the Camac River.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	River depth and width variation bed		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Positive change anticipated due to the daylighting of the Camac River.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Structure and substrate of river bed		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Positive change anticipated due to the daylighting of the Camac River.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Structure of riparian zone		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	Positive change anticipated due to the daylighting of the Camac River.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status

Risk screening of potential to cause deterioration of current WFD status								
	Groundwater	Scheme Elements	**Proposed Development**				Mitigation Measures	Overall Impact
	IE_EA_G_008	Phase (Construction/ Operation)	Construction	Construction	Operation	Operation		
	Dublin GWB	Identified Quantitative Impacts	Increased run-off and sediment loading	Pollution due to accidental discharges or spillages during the construction phase	Increase in Hardstanding	Storage of Fuel		
Quantitative Elements	**Saline or other intrusions.** To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	**Construction:** The project-specific CEMP will include robust mitigation measures to protect the underlying hydrogeological environment. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent conditions relevant to the proposed development. These include management of soils, re-fuelling machinery and chemical handling and control of water during the construction phase. No signficant dewatering is required which could impact on quantitaive status. **Operation:** The proposed development is designed to ensure the protection of the underlying hydrogeological environment such as use of oil interceptors on the stormwater system and prior to discharge from the site and the use of SuDS techniques. In order to limit the surface water discharge from the site to pre-development, greenfield rates, and to ensure improvement in the overall surface water quality before ultimate discharge the principles of Sustainable Drainage Systems, (SuDS) are to be implemented. No signficant abstraction is required which could impact on quantitaive status.	No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Surface water. To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of groundwater abstractions on the condition of GWDTE'S.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Water balance To identify groundwater bodies where abstractions exceed the available resource.		Not Applicable (no dewatering anticipated)	Not Applicable (no dewatering anticipated)	Not Applicable (no water supply from borehole anticipated)	Not Applicable (no water supply from borehole anticipated)		Not Applicable
Chemical Elements	**Saline or other intrusions.** To identify groundwater bodies where the intrusion of poor quality water as a result of groundwater abstraction is leading to sustained upward trends in pollutant concentrations or significant impact on one or more groundwater abstractions.	Predicted change to status elements (green = none, amber = possibly, red = likely)	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Surface water. To assess the impact of groundwater abstractions on the ecological status of surface water bodies.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Groundwater Dependent Terrestrial Ecosystems (GWDTE's) To assess the impact of nutrient concentrations in groundwater (primarily phosphates) on GWDTE's.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	Drinking Water Protected Areas (DrWPAs) To identify groundwater bodies failing to meet the DrWPA objectives defined in Article 7 of the WFD or at risk of failing in the future.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status
	General quality assessment To identify groundwater bodies where widespread deterioration in quality has or will compromise the strategic use of groundwater.		No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.	No measurable change anticipated.		No anticipated impacts to the hydrological environment with no deterioration to the WFD Status