8 WATER

8.1 INTRODUCTION

This chapter was prepared by DBFL Consulting Engineers and addresses all natural water bodies including surface, freshwater (streams, bogs, ponds, rivers and lakes) and groundwater (shallow and deep) which may be affected by the proposed development. This chapter also addresses the issues of hydrogeology and the interaction between waterbodies and the surface water drainage, foul water drainage and water supply. This chapter of the EIAR identifies, describes and assesses the likely effects of the proposed development on the surrounding surface water and hydrogeological environments, as well as identifying proposed mitigation measures to minimise any effects.

This chapter was prepared by Aislínn Murtagh, Civil Engineer [M.Eng] & Darren Richardson, Civil Engineer [B.Eng], DBFL Consulting Engineers and checked by Dieter Bester [Chartered Civil Engineer).

8.2 ASSESSMENT METHODOLOGY

8.2.1 Guidelines

Body	Guidance	
Transport Infrastructure Ireland (TII) (formerly the National Roads	Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009)	
Autionty)	Environmental Impact Assessment of National Road Schemes – A Practical Guide (NRA, 2008)	
	Guidelines for The Crossing of Watercourses During the Construction of National Road Schemes (NRA, 2008)	
	Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan (NRA 2007)	
	Road Drainage and the Water Environment (DN-DNG-03065)	
	Design of Earthworks Drainage, Network Drainage, Attenuation & Pollution Control (DN-DNG-03066)	
	Drainage Design for National Road Schemes - Sustainable Drainage Options (RE- CPI-07001)	
	Drainage Systems for National Roads [DN-DNG03022]	
Office of Public Works (OPW)	The Planning System and Flood Risk Management (OPW, 2009)	
	OPW Flood Maps (<u>http://www.floodinfo.ie/)</u>	
Environmental Protection Agency (EPA)	Guidelines On the Information to Be Contained in Environmental Impact Assessment Reports (EPA, May 2022)	
	EPA Advice Notes on Current Practice (in the preparation of Environmental Imp Statements) (EPA, Sept. 2003)	
	Geo Portal (<u>https://gis.epa.ie/EPAMaps/</u>)	
Department of Housing Planning and Local Government	River Basin Management Plan for Ireland 2018 – 2021	
Inland Fisheries Ireland (IFI)	Guidelines on protection of fisheries during construction works in and adjacent to waters (Inland Fisheries Ireland 2016)	

Key guidance documents considered as part of EIAR preparation are listed below.

Body	Guidance		
Construction Industry Research	The SUDS Manual (CIRIA C753)		
(CIRIA)	Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA C532)		
	Control of Water Pollution from Linear Construction Sites (CIRIA C648)		
	Development and Flood Risk – Guidance for the Construction Industry (CIRIA 624)		
	The Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (C532) (2001)		
	Environmental Good Practice on Site Guide (C741) (2015)		
Dublin City Council (DCC)	The Greater Dublin Strategic Drainage Study [GDSDS] (Dublin City Council et al., 2005)		
South Dublin County Council (SDCC)	South Dublin County Council Planning (https://www.sdcc.ie/en/services/planning/)		
Institute of Geologists Ireland (IGI)	Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements (2013)		
Environment Agency (UK) EA	PPG1: General Guide to the Prevention of Pollution (UK Guidance Note)		

Table 8.1 Guidance Documents

8.2.2 Construction

Baseline information was gathered from relevant bodies as per Table 8.1. A consultation meeting was conducted with SDCC drainage department regarding relevant water and drainage matters in January 2025. A consultation meeting was conducted with ESB representatives regarding matters relating to the existing ESB infrastructure and substation in relation to flood risks.

8.2.3 Desktop Study

In addition to the guidance documents listed in Section 8.2, the desktop study involved collation and assessment of the relevant information from the following information sources:

- Review of existing topographical information.
- Review of the preliminary Ground Investigation carried out by IGSL Ltd.
- Review of Uisce Éireann wastewater (foul drainage) and watermain records.
- Submission of a Pre-Connection Enquiry Application to and consultation with Uisce Éireann.
- Review of SDCC surface water drainage records.
- Consultation with SDCC & ESB.
- Review of information available on the EPA online mapping service.
- Review of information available on the Geological Survey of Ireland (GSI) online mapping service.
- Review of OPW National Flood Hazard Mapping and Catchment Flood Risk Assessment and Management Studies (CFRAM Studies).
- Review of the Clonburris Strategic Development Zone (SDZ) Scheme and accompanying Strategic Flood Risk Assessment and Surface Water Strategy prepared by JBA Consulting.
- Review of the Clonburris SDZ Surface Water Management plan by DBFL Consulting Engineers.

8.2.4 Assessment Methodology

The assessment of the potential effects of the proposed development on the water environment was carried out according to best practice and the methodology specified in the available guidance documents. Various bodies – including TII, the OPW and the EPA – provide detailed guidance on the preparation of and content required for an EIAR in relation to the water environment.

8.2.5 Application of Methodology

This chapter has been prepared in accordance with the following best practice methodology: EPA "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports" (May 2022) and the TII "Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes".

The significance of the identified potential impacts is a function of the combination of the sensitivity of the receptor and the magnitude of the potential impact. The generalised significance terms used in this assessment are in line with the EPA Guidelines, reproduced below.



Figure 8.1 Significance Effects Matrix

8.2.6 Study Area

The proposed development sites are in the administrative area of SDCC and are part of the Clonburris SDZ. The subject sites for this development are situated in the north-westerly and westerly area of the Clonburris SDZ land.

<u>Site 3</u> is situated west of the R136 Grange Castle Road (also referred to as the Outer Ring Road) and north of the Kildare/Cork Railway line.

<u>Site 4</u> is situated south of the Kildare/Cork Railway line and west of the R136 Grange Castle Road (also referred to as the Outer Ring Road).



<u>Site 5</u> is situated north of the Kildare/ Cork Railway Line, East of the R136 Grange Castle Road (also referred to as the Outer Ring Road) and is bisected by the Thomas Omer Way Road.

Figure 8.2 Site location (Site Boundary Indicative)

8.3 RECEIVING ENVIRONMENT

8.3.1 Existing Site Conditions

<u>Site 3:</u> The lands at Kishoge Site 3, measuring approximately 34 acres, are currently characterised by transitional agricultural landscapes and border mature housing developments to the west and north.

<u>Site 4:</u> The lands at Kishoge Site 4, measuring approximately 26 acres, currently have both an emergency traveller accommodation site (Lynch's Lane) and as a South Dublin County Council Parks Department depot. A plantation of semi-mature trees comprises much of the north of the site. The Kildare/Cork Railway line forms the northern boundary with Lynch's Lane marking the southern extent.

<u>Site 5:</u> The site comprises two separate plots on opposing sides of the E-W trending Thomas Omer Way (L1059). The plot to the south of the existing road measures almost 10 acres and is bounded by the R136 to the west and by Lynch's Lane (L5218) to the east. The site tapers to the south where it meets the Kildare/Cork Railway line at Kishoge rail station. North of Thomas Omer Way, a c. 3.5acre greenfield site is wedged between the L1059 to the south and Foxborough housing estate to the north. New social housing developments – Griffeen Court and Omer Walk – have recently been constructed east of the site.

8.3.2 Topography

Overall, the topography of the subject sites is relatively flat throughout, with some localised gradients on all sites. On Site 3 there is a slight fall from the southeast, with the lowest area on the northwest area of the site. Site 4 shows a steady fall from south to north. Site 5 north of Thomas Omar Way is

overall relatively flat and south of Thomas Omer Way the site falls from north to south. A topographical survey is provided as a background to the layout drawings issued with this report.

8.3.3 Existing Surface Water Features and Hydrology

The Kishoge sites are within the River Liffey Catchment. The study area affects two primary hydrological sub-catchments, the Griffeen and the Camac. The subject sites for this development are located within the "Liffey" sub-catchment. The Grand Canal is located to the south, the River Griffeen to the west, and the River Camac to the east of the proposed development.

8.3.4 Regional Hydrogeology

Limestone bedrock underlies the entire site. The bedrock is described in geological mapping as a dark Limestone and Shale (calp) and is part of a formation known as the Lucan Formation. The bedrock aquifer underlying the entire site is classified by Geological Survey Ireland as a "Locally Important Aquifer – bedrock which is moderately productive only in local Zones".



Figure 8.3 Extract from GSI online mapping service (Groundwater Resources)

8.3.5 Site Hydrology and Groundwater

During the preliminary Ground Investigation for the overall development, groundwater was encountered at a depth of 1.9m on Site 3, 2.5m on Site 4 and 2.3m on Site 5. For the overall three sites, groundwater was located at a depth of approx. 2-3m during preliminary ground investigations. Groundwater vulnerability is classed as "High" or greater on the proposed sites, due to the shallow depth to bedrock. Areas of highest vulnerability correspond to areas of near surface bedrock and thin soil depths. It is noted that the aquifer vulnerability classification does not consider the nature of the underlying "receiving" aquifer with respect to resource value or significance of pollution occurring and is only a reflection on the protection afforded to the aquifer by overlying deposits.



Figure 8.4 Groundwater Vulnerability

8.3.6 Flooding and Flood Risk

As part of the desktop study, historic and predicted flood risk mapping published by the OPW on the flood Hazard Mapping Website <u>http://www.floodinfo.ie/</u>was reviewed.

According to the OPW CFRAM (Catchment Flood Risk Assessment and Management) maps, under the Present-Day Scenario:

- Site 3 is located in Flood Zone C Low probability of flooding event.
- Site 4 is located predominatly in Flood Zone C with a small portion of it also affected by Flood Zone B. Therefore, there is a low to medium risk of flooding on this site.
- Site 5 is located in Flood Zone C Low probability of flooding event.

See Figure 8.5 below showing the extents of flood zones in the area according to CFRAM maps (Present-Day Scenario).

Historical flood maps/data indicate there are no recorded historical flood events within the proposed site boundaries. The closest recorded recurring flood events are at the Beech Row Bungalows, approximately 1600m to the east of the sites, and Cappaghmore Culvert, located approximately 2000m to the east of the sites.

The Eastern CFRAM study details the predicted risk for a variety of fluvial and coastal flood scenarios. The mapping does not include the watercourse reaches affected by the proposed scheme and only maps downstream flooding.

The OPW undertook an Irish Coastal Protection Strategy Study (ICPSS) which produced coastal/tidal flood extents maps for the Irish coastline from a 0.5% AEP tidal flood level. This map indicates that the site is far outside the extents of any coastal/tidal flood zone.



Figure 8.5 OPW CFRAM River Flood Extents - Present Day Scenario

According to the Strategic Flood Risk Assessment (SFRA) completed within the SDCC Development Plan 2022-2028, which models the High-End Future Scenario (HEFS):

- Site 3 is located in Flood Zone C Low probability of flooding event.
- Site 4 is located largely in Flood Zone C and B with a portion of it also affected by Flood Zone A. Therefore, there is a medium to high risk of flooding on this site.
- Site 5 is located in Flood Zone C Low probability of flooding event.

See Figure 8-6 showing extents of flood zones in the area according to the SDCC SFRA (HEFS).



Figure 8.6 South Dublin County Council Development Plan 2022-2028 Flood Extents Map

Site-specific Flood Risk Assessments have been carried out for Sites 3, 4, and 5.

<u>Site 3</u>: Although the site is not situated in a high risk (Flood Zone A) or moderate risk (Flood Zone B) flood zone, the assessment was carried out focusing on the proximity of the Griffeen River to the west and the existing 38kV ESB substation located within the site boundary. The assessment concludes that the ESB substation is not at risk to flooding from nearby watercourses or from the proposed development, proposed attenuation ponds or excess surface water runoff within the site.

<u>Site 4:</u> Although CFRAM predictive flood risk mapping shows that the site is unaffected by flooding, the maps do not specifically model or provide flood outlines for the adjacent Kilmahuddrick Stream. As part of the Flood Risk Assessment, JBA Consulting Engineers have developed a hydraulic model of the Griffeen River which also includes a detailed representation of the Kilmahuddrick Stream (which is not modelled in CFRAM maps). The assessment concluded that, under current land conditions, the site is predominantly located in Flood Zone C, but a small area of the southeast corner is located within Flood Zone B, due to fluvial flooding from the Kilmahuddrick Stream. The south-eastern section, post-development, will not be within Flood Zone B due to proposed construction levels build-up on the existing floodplain, where a greater flow returns to the Kilmahuddrick Stream and directed downstream towards the existing culvert beneath the railway. Compensatory storage has been proposed to the north of the site to balance floodplain volume loss.

<u>Site 5:</u> The subject site is located fully in Flood Zone C (low risk of flooding). Through implementation of best practice engineering methods, it is not envisaged that the proposed development will be at risk of nor exacerbate flood risk at the site and its immediate vicinity.

Refer to the individual Flood Risk Assessments and engineering reports for further site-specific flood risk details.

8.4 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

The proposed development is a mixed use, primarily residential development. This report assesses all three sites within the Kishoge area:

<u>Site 3:</u> The proposed development comprises 580 no. residential units in a mix of house, apartment, duplex and triplex units comprising 1-bedroom, 2-bedroom and 3-bedroom typologies; 2-storey childcare facility; all associated and ancillary site development and infrastructural works including surface level car parking, bicycle parking, hard and soft landscaping and boundary treatment works, including public, communal and private open space, public lighting, bin stores and foul and water services. Vehicular access to the site will be from existing Adamstown Avenue and the consented Northern Link Street, granted permission under application Ref. SDZ24A/0033W.

<u>Site 4:</u> The proposed development comprises 436 no. residential units in a mix of house, apartment, duplex and triplex units comprising 1-bedroom, 2-bedroom, 3-bedroom and 4-bedroom typologies; a childcare facility on the ground floor of Block F; retail unit; community building; employment uses and all associated and ancillary site development and infrastructural works including surface level car parking, bicycle parking, hard and soft landscaping and boundary treatment works, including public, communal and private open space, public lighting, bin stores and foul and water services. Vehicular access to the site will be via the Northern Link Road, where planning is submitted and awaiting approval.

<u>Site 5:</u> The proposed development comprises 236 no. residential units including 55 no. social housing units, 113 no. affordable purchase units and 68 no. cost rental units. The scheme provides for a mix of 1, 2 and 3-bedroom units in a range of dwelling typologies, as follows:

- a) 35 no. houses
- b) 110 no. duplex units
- c) 33 no. triplex units, and
- d) 58 no. apartments

The proposal also includes all associated and ancillary site development and infrastructural works including a total of 219 no. car parking spaces at undercroft and surface level, bicycle parking, hard and soft landscaping and boundary treatment works, public, communal and private open space, public lighting, waste storage areas and foul and water services. Vehicular access to the site will be from Thomas Omer Way and the Northern Link Street (NLS) granted permission under concurrent application Reg. Ref. SDZ24A/0033W

Refer to Chapter 5 of this EIAR for detailed project description.

The Site Layout has been designed to minimise impact on the existing topography, while satisfying the surface water drainage requirements of the proposed development.

The vertical and horizontal alignments of the roads and footpaths have been optimised with the finished floor levels of the proposed building, seeking to minimise cut and fill materials (within constraints of road and building design criteria and landscape considerations). The finished development will allow for over ground flood routes in the event of a storm exceeding the 100-year storm.

See below for proposed cut and fill volumes for each of the development sites. (Figure 8.7, Table 8.2, Figure 8.8 below).

<u>Site 3</u>



Figure 8.7 Predicted Cut and Fill Volumes

<u>Site 4</u>

CUT AND FILL VOLUMES				
	SITE STRIP (m3)	CUT (m3)	FILL (m3)	CUT FOR REUSE (m3)
KSG4	42,542	5,690	71,065	5,690

Table 8.2 Site 3 Predicted Cut and Fill Volumes



Figure 8.8 Site 5 Predicted Cut and Fill Volumes

8.4.1 Existing Surface Water Features and Hydrology

Existing surface water runoff generated on site discharges towards the west via existing drainage ditches. These ditches will be made redundant with the construction of the new surface water network for the development. Surface water runoff from the new roads, footpaths and buildings will be collected in a new gravity sewer network within the roads and footpaths of the new development.

The proposed surface water drainage strategy for this planning application has been developed in accordance with the agreed measures in the overall Clonburris Surface Water Management Plan (SWMP).

The key objectives of the drainage strategy are as follows:

- Provide adequate infrastructure to discharge surface water generated on site to the trunk surface water sewer constructed as part of the greater SDZ.
- Minimise the risk of flooding of the development and avoid a flood risk increase upstream or downstream of the site.
- Provide an allowance for the effects of climate change.
- Implement a treatment train of Sustainable Drainage Systems (SuDS) measures within the drainage network to improve water quality prior to discharge to receiving watercourses.
- Establish the Key Infrastructural requirements required to implement the surface water management measures set out by the SWMP.

The SWMP intended for the proposed developments to discharge via a bulk drainage system that has been granted planning permission in conjunction with the application for the Northern Link Street (see ref: SDZ24A/0033W).

Trunk surface water sewers and regional attenuation are to be constructed as part of the strategy to serve all lands in the southern and northern portion of the SDZ, including the proposed developments.

The subject sites are known as "Kishoge Site 3 ,4 & 5" and are within the planning scheme for the Clonburris SDZ.



Figure 8.9 SDZ SWMP Catchment Breakdown

Refer to the individual site engineering design reports, submitted with this planning application, for additional details on proposed drainage for the development sites:

Site 3 by DBFL Consulting - 'KSG3-DBFL-XX-XX-RP-C-0001 Infrastructure Design Report'.

Site 4 by CS Consulting - 'KSG4-CSC-00-XX-RP-C-0002 Engineering Services Report'.

Site 5 by RPS Consulting - 'KSG5-RPS-ZZ-XX-RP-C-50001 Engineering Design Report'.

8.4.2 Regional Hydrogeology

The ground investigations carried out for the subject sites indicate that the bedrock in the area is quite shallow. The proposed construction is envisaged to consist of conventional foundations and pavement makeup with some local excavations for services and plant. By monitoring the groundwater levels at multiple points within the subject sites, it was determined that the groundwater levels at multiple points within the proposed sites ranged from: Site3: 1-2m, Site 4: 1-2m, and Site 5: 2.3-4m.

8.4.3 Site Hydrology and Groundwater

The ground investigation carried out indicates that the groundwater level is approximately 2m below the ground. Therefore, it is possible that there may be infiltration of groundwater into excavations on site. Short term dewatering of excavations may be required.

8.4.4 Flooding and Flood Risk

The drainage network (including SuDS systems) has been designed to catch stormwater runoff will discharge to the trunk surface water network within the SDZ. For Site 3, overland flood routing has been incorporated to direct any excess surface water away from ESB substation and dwellings in the case of the network reaching full capacity. For Site 4, raising of levels to the east of the site and

compensatory storage to the north have been incorporated to alleviate flood risk. Site 5 is not envisaged to have any significant flood risk to, or in the vicinity of, the proposed development.

As mentioned in Section 8.3.6, full details and flood mitigation measures can be found in the site-specific Flood Risk Assessments (FRAs) for sites 3, 4 and 5.

8.5 POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

8.5.1 Construction Stage

This section identifies potential effects to the water environment caused by construction of the proposed development, in the absence of mitigation measures.

Potential effects that may arise during the construction stage include:

- Contamination of surface water runoff to local watercourses due to weathering and erosion of the surface soils during construction activities.
- Improper discharge of foul drainage from contractor's compound to local watercourses.
- Cross contamination of potable water supply to construction compound and associated risk to human health.
- Surface water runoff to local watercourses during the construction stage may contain increased silt levels (e.g. runoff across areas stripped of topsoil) or become polluted by construction activities.
- Discharge of rainwater pumped from excavations.
- Accidental spills and leaks associated with storage of oils and fuels, leaks from construction machinery and spillage during refuelling and maintenance contaminating the surrounding surface water and local hydrogeological environments.
- Concrete runoff, particularly discharge of wash water from concrete trucks.
- Discharge of vehicle wheel wash water to local watercourses.
- Infiltration of groundwater into excavations.
- Construction of culverts can disturb stream sediments and increase turbidity locally within the watercourse.
- Concrete, bentonite and other cement-based products would be used during construction activities. These materials are highly alkaline and corrosive and can have significant negative effects on local watercourse surface water quality if improperly handled. Cement based products can also be detrimental to waterbody environs by altering the water's pH.
- Changes in surfacing caused by vegetation stripping or gravel placement may also affect runoff or rates in local watercourses.
- Changes in surfacing or drainage approach may affect groundwater recharge patterns.

8.5.2 Operational Stage

Potential operational stage effects on water are listed below:

- Increased impermeable surface area may potentially increase surface water runoff to local watercourses.
- Accidental hydrocarbon leaks on the proposed roads and subsequent discharge into local drainage networks.
- Contamination of surface water from foul sewer leaks.

8.5.3 Risk to Human Health

There are not understood to be any potable abstractions from surface water or groundwater downstream of the sites. Therefore, there is not considered to be any significant risk to human health associated with impact to water receptors.

8.5.4 'Do Nothing'

There are no predicted effects to the water environment should the proposed development not proceed.

8.6 MITIGATION MEASURES (AMELIORATIVE, REMEDIAL OR REDUCTIVE MEASURES)

8.6.1 Incorporated Design Mitigation

The project layout design has evolved in order to avoid conflict with the water environment. Design evolution to minimise environmental impact has been prioritised throughout the various design stages to prevent significant adverse impacts on the local water environment/hydrology. These measures will seek to avoid or minimise potential effects, in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

All new foul drainage lines will be constructed in accordance with Uisce Éireann Standards. Foul sewers will be pressure tested and will be subject to a CCTV survey in order to identify any possible defects prior to being made operational.

The design of proposed site levels (roads, buildings etc.) has been carried out in such a way as to replicate existing surface gradients where possible, therefore replicating existing overland flow paths, and not concentrating additional surface water flow in a particular location.

SuDS features such as permeable paving parking spaces, bioretention area, and brown roofs, to provide additional storage and promote infiltration of and treatment of surface water run-off, have been provided in landscaped areas.

All new surface water drainage on the proposed sites will be pressure tested and will have a CCTV survey carried out prior to being made operational. The site is attenuated to mimic the greenfield scenario as part of the overall SDZ.

Due to the inter-relationship between surface water and soils, hydrogeology and ecology, the mitigation measures discussed are also considered applicable to these sections and this chapter should be read in conjunction with Chapter 6 Biodiversity and Chapter 7 Land and Soils.

8.6.2 Construction Stage

The nature of the proposed development dictates that the greatest potential impact on surface waters associated with the development will be in the construction stage. In order to prevent / minimise potential impacts, it is necessary to devise mitigation measures to be adopted as part of the construction works on site.

A Preliminary Construction Management Plan (prepared by DBFL Consulting Engineers) is included with the planning application. A Construction and Environmental Management Plan will be put in place by the Contractor to implement the mitigation measures from the EIAR. The plan will be resubmitted to the planning authority prior to construction to incorporate any conditions and/or modifications imposed by the local authority and the plan will be maintained by the contractor during the construction stage. The Preliminary Construction Management Plan includes a range of sitespecific measures which will include the following mitigation measures.

Erosion and Sediment Control

The following measures are proposed for erosion and sediment control:

H_1: Measures will be implemented to capture and treat sediment laden surface water runoff (e.g. sediment retention ponds, surface water inlet protection, fencing and signage around).

H_2: Specific exclusion zones and earth bunding adjacent to any open drainage ditches prior to discharge of surface water at a controlled rate.

H_3: Groundwater pumped from excavations will be directed to on-site settlement ponds.

H_4: Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds.

H_5: On-site settlement ponds will include geotextile liners and riprapped inlets and outlets to prevent scour and erosion.

H_6: Surface water discharge points during the construction stage will be agreed with South Dublin County Council's Environment Section prior to commencing works on site.

H_7: Weather conditions and seasonal weather variations will be considered when planning excavations and the stripping of topsoil, with an objective of minimizing soil erosion.

Accidental Spills and Leaks

The following measures are proposed for accidental spills and leaks:

H_8: In order to mitigate against spillages contaminating the underlying soils and geology, all oils, fuels, paints and other chemicals will be stored in a secure bunded hardstand area.

H_9: Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets (when not possible to carry out such activities off site).

H_10: An Emergency Response Plan prepared by the contractor prior to construction will detail the procedures to be undertaken in the event of a spillage of chemicals, fuels or hazardous wastes. Spillage kits will be available and construction staff will be familiar with the emergency procedures and use of the equipment.

H_11: Pouring of concrete including wash down and washout of concrete from delivery vehicles will be controlled in an appropriate facility to prevent contamination.

H_12: Regular samples will be taken from soils affected by earthworks which shall be analysed for contamination.

H_13: An emergency first aid kit will be provided in a designated area within the site compound.

8.6.3 Operational Stage

The operational stage of this development is unlikely to have any significant adverse impacts on the local water environment/hydrology due to the environmental design considerations incorporated into the development. These measures will seek to avoid or minimise potential effects, in the main through the implementation of best practice construction methods and adherence to all relevant legislation.

8.7 RESIDUAL IMPACT OF THE PROPOSED DEVELOPMENT

8.7.1 Impact on Climate

It is considered that by implementing the proposed construction and operational stage mitigation measures above, the significance of the identified impacts will be reduced to a "Not Significant" residual impact on the identified hydrological/hydrogeological receptors.

8.7.2 Construction Stage

Under a "worst case" scenario, the accidental release of fuel, oil, paints or other hazardous material occurs on site during the construction stage, through the failure of secondary contaminant or a materials handling accident on the site. If this were to occur over open ground, then these materials could infiltrate through the soil contaminating the groundwater or flow overland and contaminate surface water receptors.

8.7.3 Operational Stage

"Worst case" scenarios envisioned are extreme occurrences of the potential effects identified above in conjunction with failure of mitigation measures during the operational stage including:

- Significant contamination event.
- Flooding due to extreme event or unsuitable drainage measures.

Considering the relatively standard nature of the works involved, the likelihood of a "worst case" event is extremely low.

8.8 MONITORING

8.8.1 Construction Stage

Proposed monitoring during the construction stage in relation to the water environment is as follows:

- Adherence to the Construction and Environmental Management Plan.
- Construction monitoring of the works (e.g. inspection of drainage installation etc, inspections of works adjacent to existing watercourses).
- Monitoring in relation to the surface water.
- Monitoring sediment control measures (sediment retention ponds, surface water inlet protection etc.).
- Monitoring of discharge from sediment retention ponds (e.g. pH, sediment content).

8.8.2 Operational Stage

Proposed monitoring during the operational stage in relation to the water environment are as follows:

• Regular inspection and maintenance of the drainage, attenuation systems and SuDS features.

8.9 **REINSTATEMENT**

There are no reinstatement works considered to be necessary in this case.

8.10 INTERACTIONS

Potential impacts between the hydrology of the development during construction and operational stages with various other chapters of this EIAR report have been considered to ensure any potential interactions do not result in a negative effect on the Hydrology of the proposed development.

Interactions between the Hydrology and Biodiversity Chapters have been considered. During the design of the proposed surface water management system, significant measures have been taken to ensure surface water is managed to enhance the biodiversity of the proposed development, compared to the predeveloped state of the sites. An extensive suite of SuDS features is proposed,

where surface water is routed to planted areas, promoting sustainable surface water management and adding to the biodiversity of the proposed development.

8.11 DIFFICULTIES ENCOUNTERED

Potential impacts between the hydrology of the development during construction and operational stages with various other chapters of this EIAR report have been considered to ensure any potential interactions do not result in a negative effect on the Hydrology of the proposed development.

Interactions between the Hydrology and Biodiversity Chapters have been considered. During the design of the proposed surface water management system, significant measures have been taken to ensure surface water is managed to enhance the biodiversity of the proposed development compared to the pre-developed state of the sites. An extensive suite of SuDS features is proposed, where surface water is routed to planted areas, promoting sustainable surface water management and adding to the biodiversity of the proposed development.

8.12 CUMLATIVE IMPACTS

The proposed surface water drainage infrastructure has been designed in accordance with the relevant guidelines. Any other developments currently under construction or other committed development in the vicinity of the site would have to be similarly designed in relation to permitted surface water discharge, surface water attenuation and SuDS.

All proposed developments in the area are to follow the Clonburris Surface Water Management Plan (SWMP) for the Clonburris SDZ, which accounts for the wider development of the SDZ. Therefore, no potential cumulative impacts are anticipated in relation to surface water drainage and flooding.

Refer to the below list below for committed and planned projects in the wider vicinity of the project.

	Applicant	Description	No. Dwellings	Non-Resi (sqm)
Ref: SD179A24/0004	SDCC	118no. homes located off	118no. homes	N/A
Date of Grant: Nov 2024		R136 Outer Ring Road and	nomes	
Status Casatad Daminian		south of Thomas Omer Way,		
Status: Granted Permission		Lucan. Co. Dublin. According		
		to the SDCC Planning Portal, a		
		decision is yet to be made.		
Ref: SDZ24A/0032W	Department of	The retention and completion	N/A	N/A
Data of Grant: TPC	Education	of revisions to a section of the		
		comprising the omission of		
Status: At further		the pedestrian/cycle access		
information stage		off Thomas Omer Way.		
Ref: SD7244/0033W	Clonhurris	Clophurris Northern Link	Ν/Δ	N/A
	Infrastructure	Street (CNLS) Stage 2 Roads -	1.,//	
Date of Grant: 10.02.2025	Limited	The construction of c. 2.3km		
		of new CNLS Link Street and		
Status: Granted Permission		approximately 800m of side		
		12 signalised junctions.		
		Approximately 2 km of		
		upgrade of existing streets.		
		Provision of 2 main public		
		parks centrally and drainage		
		infrastructure works.		

MAY 2025

Ref: SDZ23A/0043	Cairn Homes Properties	Kishoge Urban Centre- construction of a mixed-use	495	2,502sq.m of retail floorspace
Date of Grant: 17-Apr-2024	Limited	development arranged in 11		192 cg. m.crocho
Status: Granted Permission		& 7 storeys, comprising: 495		405 Sq. 11 creche
		no. residential units, including 449 no. apartments.		
Ref: SDZ23A/0018	Cairn Homes	Clonburris SW- construction of	565	N/A
Date of Grant: 11-Dec-2023	Limited	apartments, duplex		
Status: Granted Permission		apartments and houses.		
	Clean Deal	Adamataun Futancian 205	205	NI (A
Rel. 30223A/0004		Additistown Extension- 385	303	N/A
Date of Grant: 15-Dec-2023	Holdings	Build-to-Rent duplex /		
Status: Granted Permission	Limited	apartments, 72 duplex / apartments and 104		
		apartments), ranging between		
		This permission was amended		
		under SDZ24A/0018W.		
Ref: SDZ22A/0018	Carin Homes Properties Itd	Clonburris UC & SW- mixed- use development comprising	594	creche c. 609sq. m
Date of Grant: 31-Oct-2023		594 apartments, office		office use c. 4,516sq.m
Status: Granted Permission		creche and urban square.		Block B retail: 1 unit
		This permission was amended under SDZ24A/0019W.		(c.147.5sq. m)
				Block E retail: 3 units
				(C.106.2sq.m,
				c 492 2sg m)
Ref: SD722A/0017	Carin Homes	Clophurris SW- Construction	157	N/A
	Properties Ltd.	of 157 dwellings.	13,	
Date of Grant: 16-May-2023				
Status: Granted Permission				
Ref: SDZ22A/0011	Department of	Proposed 2-storey primary	N/A	Primary School
Date of Grant: 16-Feb-2023	Education	school comprising 16 no. classrooms with an additional		(3,355sqm)
Status: Granted Permission		2 classroom Special Educational Needs Unit		
Ret: SDZ22A/0010	Kelland Homes Ltd.	Clonburris UC & SE- construction of 294 no.	294	1 no. 2 storey creche (c.520.2m2)
Date of Grant: 02-May-2023		dwellings, creche and retail / commercial unit.		1 no. 2 storey retail /commercial unit
Status: Commenced August		This permission was amended		(c.152.1m2)
Ref: SD228/0003	SDCC	Kishogue SW- 263 residential	263	N/A
Date of Grant: 11-Jul-2022		units		
Status: Part & Annroved by				
Status: Part & Approved by SDCC				
Ref: SD228/0001	SDCC	Canal extension-118 residential units made up of	118	N/A
Date of Grant: 13-Jun-2021		houses, duplexes, triplexes,		
Status: Part 8 Approved by				
	Corin Harris	Claphurric CM. The	560	innovation but
Ref: SUZZIA/UUZZ	Carin Homes Properties Ltd.	condurris SW- The construction of 569 dwellings,	569	(626sq.m)

Date of Grant: 23-Aug-2022		a creche, innovation hub and open space.		creche (c. 547sq.m)
Status: Commenced Jan		This permission was amended		
2023		under SDZ23A/0029 resulting		
		in 2no. additional units.		
		This permission was amended		
		again under SDZ24A/0028W.		
Ref: SDZ21A/0013	Department of	Kishoge Cross- A 3 storey,	N/A	Post Primary School
	Education	1,000 pupil post primary		
Date of Grant: 21-Feb-2022		school including a 4 classroom		
		Special Educational Needs		
Status: Granted Permission		Unit with a gross floor area of		
		11,443sq.m including sports		
		hall		
Ref: SDZ20A/0021	Clonburris	Southern Link Street-	N/A	Roads & Drainage
	Infrastructure	construction of c. 4.0km of a		Infrastructure
Date of Grant: 12-Aug-2021	Ltd.	new road, known as		
		Clonburris Southern Link		
Status: 10 year permission		Street		

It is expected that any imported soil will be removed prior to construction commencing. Therefore, no potential cumulative impact are anticipated.

No cumulative impact or consequences are anticipated between the proposed development and future SDZ stages.

8.13 "DO NOTHING" EFFECT

There are no predicted effects to the water environment should the proposed development not proceed.

8.14 DIFFICULTIES ENCOUNTERED IN COMPILING THE CHAPTER

No significant difficulties were encountered during the assessment.