14 WATER

14.1 Introduction

This chapter describes the likely significant effects of the proposed development in relation to surface water, the existing hydrological regime, wastewater, potable water (water supply) and flood risk. Groundwater features of relevance and hydrogeology have been considered separately in **Chapter 16**.

Chapter 3 provides a description of the proposed development and **Chapter 4** describes the construction strategy.

The following aspects are particularly relevant to the water and hydrology assessment:

- Design
    - Surface water drainage network and the Sustainable (urban) Drainage Systems (SuDS) for the proposed development.
    - Flood risk from the River Liffey immediately to the south of the proposed development;
    - Wastewater network to service the proposed development; and
    - Water supply network to service the proposed development.
- Construction
    - Earthworks, dewatering and stockpiling of materials during construction;
    - The contractor's wastewater and water supply facilities; and
    - Flood risk during construction of the proposed development.
- Operation
    - Performance of the surface water network and SuDS features during operation of the proposed development;
    - Performance of the wastewater network during operation of the proposed development;
    - Performance of the water supply network during operation of the proposed development; and
    - Flood risk during operation of the proposed development.

This chapter was checked and reviewed by Kevin Barry of Arup. Kevin holds a BE and MEngSc in Civil & Environmental Engineering and has 15 years' professional experience. He is a Senior Chartered Engineer working in Arup's Dublin office as a senior member of the water team. Kevin has significant experience of flood risk management in Ireland and has undertaken a significant number of flood risk assessment studies to support the planning applications of various developments for a range of clients across both the public and private sector.

Please refer to **Chapter 1** for further details on his relevant qualifications and experience.

14.2 Assessment Methodology

14.2.1 General

Potential direct and indirect effects in relation to surface water, wastewater, potable water and flood risk during the design, construction and operation of the proposed development have been assessed as described in **Sections 14.2.1.1-14.2.1.4**, and in accordance with the guidance and legislation outlined in **Section 14.2.2.**

14.2.1.1 Surface water/hydrological Regime

A computer model (Microdrainage simulation software) has been prepared for the catchment within the development area and has been used to assess the impact of the proposed surface water drainage network. The hydraulic model of the proposed drainage network (incorporating the proposed SuDS features) was run to simulate a 1 in 100-year rainfall event with a 20% allowance for climate change.

14.2.1.2 Wastewater

A hydraulic model (Microdrainage simulation software) has been prepared to assess the performance of the proposed wastewater network for the development. The wastewater network has been designed in accordance with the requirements of the *Irish Water Code of Practice for Wastewater Infrastructure*[1].

14.2.1.3 Water Supply

The water supply network has been designed in accordance with *Irish Water Code of Practice for Water Infrastructure*[2].

14.2.1.4 Flood Risk

A Flood Risk Assessment (**Appendix 14.1**) has considered the effects of flood risk on the proposed development. Flood risk from multiple sources has been considered including fluvial flooding, pluvial and tidal/coastal flooding.

14.2.2 Guidance and Legislation

This chapter has been prepared in accordance with the overarching EIA guidance identified in **Chapter 1,** Introduction, and in accordance with the following:

- *Council Directive 2000/60/EC*[3] establishing a framework for Community action in a field of water policy (the WFD);

[1] Irish Water, 2017. Code of Practice for Wastewater Infrastructure (Revision 1): https://www.water.ie/connections/Wastewater-Code-of-Practice.pdf [Accessed: March 2019]

[2] Irish Water, 2017. Code of Practice for Water Infrastructure (Revision 1): https://www.water.ie/our-customer-commitment/Code-of-Practice-for-Water-Supply.pdf [Accessed March 2019]

[3] Directive 2000/60/EC of the European Parliament and of the Council, as amended by Decision No 2455/2001/EC of the European Parliament and of the Council, Directive 2008/32/EC of the European Parliament and of the Council, Directive 2008/105/EC of the European Parliament and of the Council, Directive 2009/31/EC of the European Parliament and of the Council and Directive 2013/39/EU of the European Parliament and of the Council.

- *European Union Environmental Objectives (Surface Water) (Amendment) Regulations 2015 (S.I No. 386 of 2015)*[4]; and
- *European Communities (Quality of Salmonid Waters) Regulations 1988 (S.I No. 293 of 1988)*[5].

Further descriptions of each of these is outlined in **Section 14.2.2.1, 14.2.2.2** and **Section 14.2.2.3** respectively. The *Planning System and Flood Risk Management Guidelines for Planning Authorities*[6] have also been given due regard during the assessment (Refer to **Section 14.2.2.4** for further detail).

14.2.2.1 Water Framework Directive

The *Water Framework Directive* (WFD)[3] aims at improving the water environment in the EU and requires all Member States to protect and improve water quality in all waters so that they achieve good ecological status by 2015 or, at the latest, by 2027.

The WFD has been transposed in Ireland by the European Communities *(Water Policy) Regulations 2003* (S.I. No. 722 of 2003)[7].The WFD applies to rivers, lakes, groundwater, and transitional coastal waters and requires that management plans are prepared on a river basin basis through the specified structured method.

The *River Basin Management Plans* (RBMPs) have been prepared to protect and improve Ireland's water environment. They are reviewed and updated every six years. The first RBMPs covered the period 2009 to 2014 and identified the waterbodies that may not meet the environmental objectives of the WFD by 2015. The latest RBMPs[8] (for 2018 to 2021) were published in April 2018 and these set out the actions to improve water quality and achieve 'good' ecological status in water bodies (rivers, lakes, estuaries and coastal waters) by 2027.

14.2.2.2 The European Union Environmental Objectives (Surface Water)(Amendment) Regulations, 2015.

The *European Union Environmental Objectives (Surface Water) Regulations 2015*[4]*,* as amended, provide a more complete and stringent set of surface water quality regulations which address the requirements of the WFD and *Council Directive 2006/11/EC*[9] on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community. These regulations specify the conditions and physico-chemical concentrations that should be considered in the assessment of surface water

[4] European Communities Environmental Objectives (Surface Waters) Regulations 2009 (SI No 272 of 2009) as amended by the European Communities Environmental Objectives (Surface Waters) (Amendment) Regulations 2012 (SI No. 327 of 2012); and the European Communities Environmental Objectives (Surface Water) (Amendment) Regulations 2015) (SI No 386 of 2015). And defined as "European Communities Environmental Objectives (Surface Waters) Regulations 2009 – 2015"

[5] "European Communities (Quality of Salmonid Waters) Regulations 1988 (SI No 293 of 1988)"

[6] The Office of Public Work and Department of the Environment, Heritage and Local Government in (2009) The Planning System and Flood Risk Management Guidelines for Planning Authorities

[7] "European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003) as amended by the European Communities (Water Policy) (Amendment) Regulations, 2005 (S.I. No. 413 of 2005); the European Communities (Water Policy) (Amendment) Regulations, 2008 (S.I. No. 219 of 2008); European Communities (Water Policy) (Amendment) Regulations, 2010 (S.I. No. 93 of 2010); and the European Communities (Drinking Water) Regulations 2014 (S.I. No 350 of 2014)." And defined as European Communities (Water Policy) Regulations 2003 – 2014.

[8] River Basement Management Plan for Ireland 2018-2021: https://www.housing.gov.ie/sites/default/files/publications/files/rbmp_report_english_web_version_final_0.pdf [Accessed: June 2019]

[9] European Communities (Dangerous Substances Directive) Regulations, 2006

quality. These regulations also give effect to *Council Directive 2008/105/EC*[7] on environmental quality standards in the field of water policy.

14.2.2.3 European Communities (Quality of Salmonid Waters) Regulations, 1998

Legislation for salmonid waters was first established under *Council Directive 78/659/EEC*[10] on the quality of freshwaters needing protection or improvement in order to support fish life (the Freshwater Fish Directive). *The Freshwater Fish Directive*[10] was subsequently superseded by the *European Communities (Quality of Salmonid Waters) Regulations 1985*[5].

The *Freshwater Fish Directive* defines freshwaters as being waters capable of supporting Salmon (Salmo Salar), Trout (Salmo trutta), Char (Salvelinus) and whitefish (Coregonus) and are thereby designated as Salmonid waters.

14.2.2.4 The Planning System and Flood Risk Management Guidelines for Planning Authorities

In November 2009, the (then) Department of Environment, Heritage and Local Government and the Office of Public Works jointly published this guidance. The aim of the Guidelines is to ensure that flood risk is neither created nor increased by inappropriate development.

The Guidelines are issued under Section 28 of the *Planning and Development Act 2000*[11], as amended and planning authorities and An Bord Pleanála are therefore required to implement these guidelines in carrying out their functions under the Planning Acts. The Guidelines require the planning system to avoid development in areas at risk of flooding, unless the development can be justified on wider sustainability grounds and the risk can be reduced or managed to an acceptable level.

The Guidelines specifically require the adoption of a Sequential Approach (to Flood Risk Management) of Avoidance, Reduction, Justification and Mitigation and they require the incorporation of Flood Risk Assessment into the process of making decisions on planning applications and planning appeals. Fundamental to the Guidelines is the introduction of flood risk zoning and the classifications of different types of development having regard to their vulnerability.

The management of flood risk is therefore a key element of any development proposal in an area of potential flood risk and should therefore be addressed as early as possible in the site master planning stage.

14.2.3 Study Area

14.2.3.1 Surface water/Hydrological regime

The study area for the hydrological assessment incorporates the red line planning application boundary containing the consented scheme and the proposed development, and section of the River Liffey which flows immediately to the south of the proposed development.

[10] European Communities (The Freshwater Fish Directive), 1978

[11] The Planning and Development Act, 2000. (S.I. No. 30 of 2000): http://www.irishstatutebook.ie/eli/2000/act/30/enacted/en/html [Accessed: June 2019]

14.2.3.2 Wastewater

The study area for the wastewater assessment incorporates the red line planning application boundary containing the consented scheme and the proposed development.

14.2.3.3 Water Supply

The study area for the water supply network incorporates the red line planning application boundary containing the consented scheme and the proposed development.

14.2.3.4 Flood Risk

The study area for the flood risk assessment incorporates the red line planning application boundary of the consented scheme and the proposed development, and the section of the River Liffey which flows immediately south of the proposed development.

14.2.4 Site Visits

A site visit was carried out by Kieran Dowdall and Alpha Barry from Arup on the 3rd May 2019. The topography of the site was studied, and several photographs were taken, which were subsequently used for the assessment.

14.2.5 Consultation

There is no change in the surface water drainage strategy for the proposed development when compared to the consented scheme (ref ABP- 306569-20). The surface water drainage strategy was discussed and agreed in principle with Dublin City Council Drainage Division during the design development process for the consented scheme.

A document outlining the Drainage and Water Supply Strategy for the proposed development was also submitted to An Bord Pleanála as part of the pre-planning application submission. In this document the proposed design and rationale for the stormwater drainage, wastewater infrastructure and potable water supply were outlined.

In addition, ongoing consultation is taking place with Irish Water in relation to the proposed wastewater and water supply infrastructure for the development.

A number of pre-planning meetings have also been held with Dublin City Council. Details of these are provided within Chapter 1 – Introduction as well as the accompanying Planning Report and Statement of Consistency prepared by Stephen Little and Associates.

14.2.6 Categorisation of the Baseline Environment

The baseline environment is the existing site, with the consented scheme (ref. ABP-306569-20), contained within the red line planning application boundary.

14.2.6.1 Surface Water/Hydrological Regime

The drainage characteristics of the existing environment were determined through a desktop study utilising existing topographical surveys and photographs from the site visit to establish the existing drainage routes and storage areas within the study area.

A desktop study was undertaken to establish the baseline information for the study area in relation to the hydrological regime. Previous flood studies that have been reviewed which include the *National Preliminary Flood Risk Assessment (PFRA)*[12] and the flood extent maps for the site that were developed as part of the National CFRAM Programme[13]. Furthermore, the *Strategic Flood Risk Assessment Report* produced as part of the *Dublin City Council Development Plan 2016-2022*[14] was reviewed with regard to the existing hydrological regime in the study area.

14.2.6.2 Wastewater

The wastewater drainage characteristics have been determined through examining existing utility records provided by Irish Water and from a survey of existing utilities in the area.

14.2.6.3 Water Supply

Existing utility records provided by Irish Water were examined in order to understand the water supply infrastructure in the area.

14.2.6.4 Flood Risk

A desktop study was undertaken to establish the baseline information for the study area in relation to flood risk. The information with respect to flood risk considered various flood studies including the *National Preliminary Flood Risk Assessment (PFRA)*[12] and the *Eastern Catchment Flood Risk Assessment and Management Study* (Eastern CFRAM) flood maps and reports[15]. The *Strategic Flood Risk Assessment Report*[14] produced as part of the *Dublin City Council Development Plan 2016-2022* was also reviewed with regard to existing and predicted flooding within the study area.

14.2.7 Impact Assessment Methodology

14.2.7.1 Surface water/Hydrological Regime

The assessment considers the proposed development and how relevant aspects have the potential to change the physical characteristics and thus the drainage and flood characteristics of the study area. The assessment specifically considers how any change interacts with the drainage network and how significant the change is in the context of the relevant legislation.

[12] The National Preliminary Flood Risk Assessment (PFRA) Overview Report (2012) http://www.cfram.ie/wordpress/wp-content/uploads/2013/06/PFRA-Main-Report.pdf [Accessed: October 2018]

[13] Eastern CFRAM Flood Extent Maps: http://www.floodinfo.ie/map/floodmaps/ [Accessed: October 2018]

[14] Dublin City Council (DCC), 2016. Strategic Flood Risk Assessment: http://www.dublincity.ie/sites/default/files/content/Planning/DublinCityDevelopmentPlan/Strategic%20Flood%20Assessment%20(SFRA)%20Vol%207.pdf [Accessed: March 2019]

[15] Eastern CFRAM reports and maps available to download from: http://www.floodinfo.ie/ [Accessed: October 2018]

The baseline data (particularly the topography) has been used to establish drainage characteristics within the study area. The proposed development has been assessed to ascertain if there would be any likely significant effects on the natural drainage and the sewer network within the study area.

14.2.7.2 Wastewater

The assessment considers the proposed development and how it will have the potential to alter the wastewater network in the area. Records of the existing wastewater network in the area were obtained from Irish Water to inform the design development. A computer model of the proposed wastewater sewer network has been prepared and this will be sufficient to assess the likely significant effects of the proposed development.

14.2.7.3 Water Supply

The assessment considers the proposed development and how it will have the potential to alter water supply network in the area. Records of the existing water supply network in the area were obtained from Irish Water to inform the design development and this will be sufficient to assess the likely significant effects of the proposed development.

14.2.7.4 Flood Risk

Flood risk has been assessed by determining the baseline conditions (fluvial, pluvial and tidal/coastal flood extents) and establishing the likely significant effect of the proposed development on flood risk. For the Parkgate Street site a desktop study (Site Specific Flood Risk Assessment) is sufficient to assess the likely significant effects of the proposed development on flood risk.

14.3 Receiving Environment (Baseline Situation)

14.3.1 Site Location and Setting

The site is located at 42A Parkgate Street, Dublin 8. The site is bordered to the north by Parkgate Street, to the south by the River Liffey, to the west by the Parkgate Business Centre and to the east by both the River Liffey and Parkgate Street.

The site is the area within the red line planning application boundary and contains the consented scheme (ref. ABP-306569-20) and the area of the proposed development.

This site lies within the area covered by the *Dublin City Council Development Plan 2016-2022*[16] and is zoned for mixed-use and residential development.

Existing ground levels across the site vary from approximately 3.30m OD at the southwest boundary to 5.50m OD at the northeast boundary. For a detailed description of the proposed development refer to **Chapter 3.**

[16] Dublin City Council, 2016. Dublin City Development Plan 2016-2022. http://www.dublincity.ie/main-menu-services-planning-city-development-plan/dublin-city-development-plan-2016-2022 [Accessed: March 2019]

14.3.2 Hydrology Baseline Environment

The proposed development is located within Hydrometric Area (HA09)[17] which is the EPA Classification for the surface water catchment drained by the River Liffey and all streams entering tidal water in Dublin Bay. HA09 falls within the Eastern River Basin District Area (ERBDA)[18] and has an area of 1,616km².

14.3.3 Surface Water Bodies

The site is located in the vicinity of the River Liffey which flows immediately to the south of the proposed development.

The EPA monitoring station in the vicinity of the proposed development is station No. RS09LO12360 located at Lynch's Lane approximately 0.2km downstream of Chapelizod ridge (310423, 234138).

The most recent EPA river quality survey took place in 2019 and the associated report (generated online at www.epa.ie/QValue/webusers)[17] indicated that the water quality in the area nearest the proposed scheme (RS09LO12360) was considered to be "Moderate", i.e. "Slightly Polluted". The previous four samples of survey Q (Quality) ratings are indicated in Table 14.1.

Biological Quality Rating (Q Value)				
Station	Year			
	2007	2013	2010	2016
RS09LO12360	3-4	3-4	3-4	3-4

Table 14.1: River Liffey Biological Quality Ratings (EPA,2021)

14.3.4 Surface Water Drainage

Surface water from an area that incorporates circa 94% of the existing site (i.e. the site before the construction of the consented scheme and the proposed development) discharges directly from the site into the River Liffey. The remaining 6% of the existing site area (localised roof areas) discharges to a combined 450mm sewer on Parkgate Street.

14.3.5 Wastewater

Drainage records provided by Irish Water indicate that there are existing 300mm and 450mm combined sewers on Parkgate Street discharging into city centre sewers and subsequently to the wastewater treatment plant in Ringsend, for appropriate treatment, prior to discharge to Dublin Bay.

The existing building in the study area was until recently in operation as a warehouse which has now closed, and wastewater effluent discharged into the combined sewer on Parkgate Street. There were less than 10 persons working in the warehouse at any time and as such the effluent volume which discharged from the site is estimated to be very low.

As the warehouse is currently not operational there is no wastewater effluent discharging from the site.

[17] EPA, 2018. EPA River Quality Biological Data Results. http://www.epa.ie/QValue/webusers/PDFS/HA9.pdf?Submit=Get+Results/ [Accessed: March 2019]
[18] ERBDA, 2010a. ERBD River Basin Management Plan 2009-2015.

14.3.6 Water Supply

Records provided by Irish Water indicate that the site is serviced by a connection to an existing 150mm public main on Parkgate Street. The existing building was until recently in operation as a warehouse. There were less than 10 persons working in the warehouse at any time and as such the water demand from the site was estimated to be less than 0.6m^3/day.

As the warehouse is currently not operational there is no water demand from the site.

14.3.7 Flood Risk

There are two recorded flood events in the vicinity of the site which have been identified from an examination of the OPW Flood Hazard Mapping website (www.floodmaps.ie)[19]. These flood events occurred at the Ashling Hotel approximately 100m from the proposed development and at the Bridgewater Quay Apartments approximately 400m from the proposed development. Flood depths for both these events was between 0.1m and 0.5m. There is no record of the actual site having flooded in the past. More details on these flood events are contained within the site-Specific Flood Risk Assessment Report in **Appendix 14.1.**

There is a very low risk of fluvial and tidal/coastal flooding from the River Liffey along the southern boundary of the site. This is indicated in the flood extents maps produced as part of Eastern CFRAM[15] study. A small area of the site bordering the River Liffey therefore lies within Flood Zone A.

An examination of the OPW's *National Preliminary Flood Risk Assessment (PFRA)*[12] mapping indicated that there is potential for pluvial flooding in the study area.

The site is in close proximity to the River Liffey and the site investigation conducted during August and September 2019 identified hydraulic connectivity between the groundwater levels and the tidal levels. As the existing ground levels are higher than the tidal levels the risk of groundwater flooding is considered to be low.

As per the OPW Flood Risk Management Guidelines[6] a Justification Test for the development was required and was undertaken as part of the Flood Risk Assessment.

The Plan-Making Justification Test relevant to the proposed development was completed and passed as part of the Strategic Flood Risk Assessment (SFRA) undertaken for the *Dublin City Council Development Plan 2016-2022*.

The Development Management Justification Test requires that two criteria must be met which are outlined in Section 5.15 of the *Planning System and Flood Risk Management Guidelines for Planning Authorities*[6]. With regards to the first criterion, the applicable policy context is the *Dublin City Council Development Plan 2016-2022*. The development plan as adopted took full account of the OPW Guidelines and incorporated the SFRA as part of the appraisal of the plan. We can therefore state that this criterion is passed. With regard to the second criterion, we consider that it has also been met by virtue of the fact that:

- The proposed development will not increase the risk of flooding at adjacent sites; and
- The proposed development includes measures to minimise flood risk.

[19] The Office of Public Works (OPW), National Flood Hazard Mapping Web Site. http://www.floodmaps.ie/ [Accessed: March 2019]

14.4 Potential Effect of the Proposed Development

14.4.1 Construction Phase

14.4.1.1 Water Quality

There are numerous substances used on construction sites that are potential pollutants to water bodies that could affect surface water quality. Runoff from the working areas during construction may contain increased sediment loads, suspended solids and contaminants. This is typical on construction sites and working areas of this nature.

A summary of potential pollutants of relevance to water quality is provided below:

- Potential sources of pollution from site drainage include runoff and erosion from site earthworks and stockpiles. This has the potential to pose a risk to nearby watercourses as the site will be exposed to rainfall which has the potential to produce silt laden runoff;
- Other major pollutants present include fuels and lubricants required for plant and equipment on site;
- The washing of construction vehicles and equipment also pose a pollution risk to watercourses in the area if undertaken in inappropriate locations and in the absence of effective management and mitigation; and
- Any accidental spillages of fuel and/or discharge of oil from leaks in vehicles or fuel tanks;

In the absence of mitigation, the construction activities outlined above have the potential to alter the water quality temporarily in the study area. This would be considered a short-term effect and the significance of this effect is moderate/slight.

14.4.1.2 Surface water/Hydrological Regime

The construction activities associated with the enabling works are described in detail in **Chapter 4**. These works will have the effect of temporarily altering the hydrological and drainage characteristics of the site.

Construction activities such as stockpiling and excavations can block overland drainage flow paths, which can result in potential flood risk.

Construction activities that have the potential to impact the hydrological regime include:

- Temporary stockpiling of material at working areas;
- Wash water from dust suppression sprays; and
- Spillage of fuel and lubricants from maintenance of construction vehicles and mechanical equipment.

The construction activities outlined above have the potential to alter the hydrological regime temporarily in the study area. This would be considered a short-term effect and the significance of this effect is moderate/slight.

14.4.1.3 Wastewater

Effluent and sanitary waste will be generated from facilities provided for the construction staff on site. This waste will be discharged to the existing combined sewer on Parkgate Street or as otherwise agreed with Dublin City Council. This would be considered a short-term effect and the significance of this effect is imperceptible.

14.4.1.4 Water Supply

The contractor will require a water supply connection for onsite personnel during construction. This would be considered a short-term effect and the significance of this effect is imperceptible.

14.4.1.5 Flood Risk

The proposed development will have no impact on floodplain storage and conveyance and will also not increase flood risk off site during construction. This is therefore considered a short-term effect and the significance of this effect is imperceptible.

14.4.1.6 Indirect Effects

There are no identified indirect effects at the construction stage in relation to water.

14.4.1.7 Cumulative

In preparing this chapter, consideration was given to the developments listed in **Appendix 21.1** in relation to relevant cumulative and in combination effects.

Additionally, the main impacts from the proposed development arise during construction.

The construction of the consented scheme and the construction of the proposed development will take place concurrently. It is unknown at this stage if the construction works associated with other developments would be occurring at the same time at the construction of the consented scheme and proposed development.

Notwithstanding, given the nature and scale of the developments identified, no cumulative effects in relation to water are predicted to occur if anyone, or all of these developments occur concurrent to the construction of the proposed development.

There are therefore no predicted significant cumulative effects in relation to water associated with the proposed development.

14.4.2 Operation Phase

14.4.2.1 Surface Water/Hydrological Regime

The proposed development will include the construction of a new roof and hardstanding areas. Surface water from these areas will be captured by a new drainage network designed in accordance with the standards outlined in the *Greater Dublin Strategic Drainage Study (GDSDS)*[20], *Greater Dublin Regional Code of Practice for Drainage Works*[21], Part H of the *Building Regulations*[22] and BS EN 752 *Drain and*

[20] Dublin City Council, 2005. Greater Dublin Strategic Drainage Study (GDSDS). http://www.greaterdublindrainage.com/wp-content/uploads/2011/11/GDSDS-Final-Strategy-Report-April-051.pdf [Accessed: March 2019]

[21] Dublin City Council, Greater Dublin Regional Code of Practice for Drainage Works. http://www.dublincity.ie/sites/default/files/content//WaterWasteEnvironment/WasteWater/Documents/Greater_Dublin_Regional_Code_of_Practice_V6-0.pdf [Accessed: March 2019]

[22] Department of the Environment, Heritage and Local Government, 2010. Building Regulations 2010 Part H Drainage and Water Disposal. https://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/DevelopmentandHousing/BuildingStandards/FileDownLoad%2C24906%2Cen.pdf [Accessed: March 2019].

sewer systems outside buildings[23]. The new drainage network for the proposed development will connect to consented surface water drainage network adjacent to Block A, prior to discharging to the River Liffey.

The surface water runoff will pass through the SuDS features proposed as part of the proposed development and also through those included in the consented development. The SuDS features will have the effect of both treating and temporarily storing surface water. The volume of water discharging directly to the River Liffey is therefore expected to be reduced from the current discharge volume.

Therefore, the operational phase of the proposed development is predicted to have an overall positive long-term impact on the water and hydrology within the study area.

14.4.2.2 Wastewater

The proposed development includes a new wastewater network designed in accordance with the *Irish Water Code of Practice for Wastewater Infrastructure* [1] and *Part H of the Building Regulations*[22].

Wastewater from the proposed development shall drain by gravity and discharge to the consented wastewater network adjacent to the proposed Block A development, prior to discharging to the existing 450mm dia. combined sewer on Parkgate Street.

The proposed development will result in an additional effluent volume discharging to the public sewer. To address this, a section of the existing sewer network on Parkgate Street shall be upgraded as part of the consented scheme. This will create capacity for the wastewater discharge from the consented and proposed development in the combined sewer.

It is noted that the capacity of the Ringsend Water Treatment Plant, where effluent from the proposed development will be treated, is currently constrained. Planning permission has been granted for an upgrade of the Ringsend Wastewater Treatment Plant, including an increase in treatment capacity. This upgrade is currently underway. Further discussion on the Ringsend Wastewater Treatment Plant and the effects of the proposed development on the water quality in Dublin Bay is given in the Natura Impact Statement accompanying this planning application.

A Confirmation of Feasibility Statement has been provided by Irish Water, confirming that the connection of the consented development and the proposed Block A development to their network can be facilitated.

The proposed development is therefore predicted to have an overall neutral effect within the study area in relation to wastewater.

14.4.2.3 Water Supply

The proposed development includes a new water supply network designed in accordance with the *Irish Water Code of Practice for Water Infrastructure*[2] and *Part B of the Building Regulations*[24]. The water supply connection for the proposed development will be from the consented water supply system (ref.

[23] British Standards Institution (BSI), 2017. Drain and Sewer Systems Outside Buildings – Sewer System Management. https://shop.bsigroup.com/ProductDetail/?pid=000000000030302483 [Accessed: March 2019]
[24] Department of the Environment, Heritage and Local Government, 2006. Technical Guidance Document B - Fire Safety. https://www.housing.gov.ie/sites/default/files/migrated-files/en/Publications/DevelopmentandHousing/BuildingStandards/FileDownLoad%2C1640%2Cen.pdf. [Accessed: March 2019]

ABP-306569-20) adjacent to Block A, with connection to the existing 150mm dia. public watermain on Parkgate Street and cross connection to the parallel 600mm public main, as directed by Irish Water.

The proposed development will result in an additional water demand on the existing public water mains supply.

A Confirmation of Feasibility Statement has been provided by Irish Water, confirming that the connection of the consented development and the proposed Block A development to their network can be facilitated.

The development is however predicted to have an overall neutral effect within the study area in relation to water supply.

14.4.2.4 Flood Risk

The proposed development will have no impact on floodplain storage and conveyance. The proposed development includes the provision of SuDS features in the drainage design and will not increase flood risk off site during operation. As such the proposed development is predicted to have an overall neutral effect within the study area in relation to flood risk.

14.4.3 Do-Nothing Scenario

It is not practicable to complete the consented scheme without a further grant of permission for the proposed development.

In the scenario where the proposed development and the consented scheme do not proceed as planned, the existing hydrology in the study area will remain as currently identified in the desk study, site visits and site-specific investigations, and as described in **Section 14.3.**

14.4.3.1 Indirect Effects

There are no identified indirect effects at the operational stage in relation to Water.

14.4.3.2 Cumulative Effects

In preparing this chapter, consideration was given to the developments listed in **Appendix 21.1** in relation to relevant cumulative and in combination effects.

The operation of the consented scheme and the operation of the proposed development will take place concurrently.

Notwithstanding, no significant cumulative effects in relation to water have been identified for the proposed development in the operational phase.

14.5 Mitigation Measures

14.5.1 Construction Phase

The employment of good construction management practices will minimise the risk of pollution of soil, surface water and groundwater. The following site specific measures will be implemented for the proposed development:

- Earthworks operations shall be carried out such that surfaces shall be designed with adequate falls, profiling and drainage to promote safe run-off and prevent ponding and flooding; and
- Run-off will be controlled to minimise the water effects in outfall areas; and
- All concrete mixing and batching activities will be located in areas away from watercourses and drains; and
- Good housekeeping (site clean-ups, use of disposal bins, etc.) will be implemented on the site.

In order to prevent the accidental release of hazardous materials (fuels, cleaning agents, etc.) during construction site activity, all hazardous materials will be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks will be used on the site during the construction phase of the project. Safe materials handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the proposed development. The contractor's sanitary facilities will discharge into the existing combined sewer on Parkgate Street or as otherwise agreed with Dublin City Council.

Mitigation during the construction phase will also include implementing best practice during earthworks operations to avoid sediments draining to the River Liffey, in accordance with:

- *ICE (2015) Earthworks, A Guide (2nd Edition)[25]; and*
- *TII (2013) Specification for Road Works Series 600 - Earthworks.[26]*

In addition to the above, construction phase mitigation measures for the proposed development are described in a detailed Construction Environmental Management Plan (CEMP) which is contained in **Appendix 4.1**. The CEMP will be implemented by the Contractor for the duration of the construction phase. The CEMP will cover all potentially polluting activities and include an emergency response procedure. All personnel working on the site will be trained in the implementation of the procedures.

The CEMP for the proposed development will be formulated in consideration of standard best practice and will align with the guidance set out in the following documents:

- CIRIA – Guideline Document C532 Control of Water Pollution from Construction Sites (CIRIA, 2001)[27]; and
- CIRIA – Guideline Document C624 Development and Flood Risk - guidance for the construction industry (CIRIA, 2004)[28]; and
- CIRIA (2015) Environmental Good Practice on Site C692 (4th Edition) (C762)[29].
- The CEMP will comprise all of the construction mitigation measures, which are set out in this EIAR, and any additional measures which are required by the conditions attached to the An Bord Pleanála decision.

[25] Institute of Civil Engineers ICE, 2015. Earthworks, A Guide (2nd Edition) https://www.icevirtuallibrary.com/isbn/9780727741851 [Accessed October 2018]

[26] Transport Infrastructure Ireland, 2013. Specification for Road Works Series 600 – Earthworks (including Erratum No. 1, dated June 2013) http://www.tiipublications.ie/library/CC-SPW-00600-03.pdf [Accessed October 2018]

[27] CIRIA, 2001. Guidance Document C532 Control of Water Pollution from Construction Site: https://www.ciria.org [Accessed October 2018]

[28] CIRIA, 2004. Guidance Document C624 Development and Floor Risk – guidance for the construction industry: https://www.ciria.org [Accessed October 2018

[29] CIRIA, 2015. Environmental Good Practice on Site C692 (4th Edition): https://www.ciria.org [Accessed October 2018]

14.5.2 Operation Phase

The proposed development will incorporate SuDS features in order to improve water quality and reduce the quantity of surface water discharging into the receiving system. The water supply network will include low flow devices with the aim of minimising water usage.

14.6 Monitoring

14.6.1 Construction Phase

14.6.1.1 Surface water/Hydrological regime and Water Quality

Visual monitoring will be undertaken as part of the regular site audits during the construction of the proposed development to ensure existing surface water runoff is draining from the site and is not exposed to any contaminants.

14.6.1.2 Wastewater

The contractor will be required to ensure that the sanitary facilities for the site personnel are maintained and effluent storage is regularly emptied and disposed of.

14.6.1.3 Water Supply

The contractor will be required to ensure that the water supply to the site is maintained and free of contaminants.

14.6.1.4 Flood Risk

The contractor is required to monitor the weather forecasts to inform the programming of earthworks and stockpiling of materials.

14.6.2 Operation Phase

There are no monitoring activities required during the operation phase of the proposed development.

14.7 Residual Effects

14.7.1 Construction Phase

14.7.1.1 Surface water/Hydrological regime and Water Quality

With the implementation of mitigation measures described in **Section 14.5.1**, there will be no significant residual effect on hydrology, drainage characteristics of the site or water quality during construction.

14.7.1.2 Wastewater

There are no significant residual effects expected in relation to wastewater arising from the construction phase of the proposed development.

14.7.1.3 Water Supply

There are no significant residual effects expected in relation to water supply arising from the construction phase of the proposed development.

14.7.1.4 Flood Risk

There will be no significant residual effect on flood risk caused by the construction of the proposed development.

14.7.2 Operation Phase

14.7.2.1 Surface water/Hydrological regime and Water Quality

As the proposed development is predicted to have an overall neutral long-term impact on water and hydrology within the study area there no mitigation measures required and as such there will be no significant residual effect on hydrology, drainage characteristics of the site or water quality during operation.

14.7.2.2 Wastewater

There is no significant impact expected to the public sewer as a result of the proposed development. Any increase in discharge will be compensated by a reduction in the expected surface water runoff into the combined sewers from the proposed development.

14.7.2.3 Water Supply

The development will result in additional demands on the public water network however the instillation of low flow devices will minimise the impact of the proposed development on the existing water supply network.

14.7.2.4 Flood Risk

There will be no significant residual effect on flood risk caused by the operation of the proposed development.

15.0 Difficulties Encountered

There were no difficulties encountered in the preparation of this chapter.