FEHILY TIMONEY

CONSULTANTS IN ENGINEERING, ENVIRONMENTAL SCIENCE & PLANNING

ENVIRONMENTAL IMPACT ASSESSMENT REPORT FOR THE EXPANSION OF A MATERIALS RECOVERY FACILITY AT CAPPOGUE AND DUNSINK, BALLYCOOLIN ROAD, DUBLIN 11.

Volume 2 – Main Body of the EIAR
Chapter 10 – Hydrology and Surface Water Quality

Prepared for: Padraig Thornton Waste Disposal Ltd. T/A Thorntons Recycling

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Date: November 2022

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10. CHAPTER 10 – HYDROLOGY AND SURFACE WATER QUALITY

10.1 Introduction

This chapter has been prepared to examine the potential effects of the proposed development on the hydrology and water quality in the local environment, referred to in this chapter as the study area.

The objectives of this assessment are to:

- produce a baseline study of the existing surface water environment in the area of the proposed development and associated works;
- identify any likely significant effects of the proposed development on surface water during the construction phase, operational phase and decommissioning phase of the development;
- identify mitigation measures to avoid, remediate or reduce likely significant negative effects: and,
- identify and evaluate any residual effects associated with the proposed development, including interacting and cumulative effects.

The proposed development is defined in Chapter 1 and a detailed description of the proposed development is set out in Chapter 4: Description of the Existing and Proposed Development.

The impacts of the proposed development are considered, having taken account of mitigation measures to reduce or eliminate any impacts on the surrounding hydrological regime and water quality within the study area.

The following Appendices documents have been produced in support of this chapter:

- Appendix 10.1: Surface Water Drainage Calculations
- Appendix 10.2: Laboratory Analytical Certificates (March 2022)
- Appendix 10.3: EPA Surface Water Quality Monitoring Data

These Appendices documents are contained in Volume 3 of this EIAR.

10.1.1 Statement of Competency

This chapter of the EIAR was prepared by Daniel Hayden (BSc (Hons)), MSc (Hons) and Richard Deeney (BSc (Hons)).

Daniel is an Environmental Scientist and an experienced environmental surveying and monitoring technician with 8 years' consultancy experience. Daniel has completed numerous impact assessments for hydrology, hydrogeology and geology for a variety of industrial and waste management projects in Ireland.

Richard is a Senior Environmental Scientist with 10 years' consultancy experience in Ireland. Richard has completed numerous impact assessments for a wide variety of EIAR's for projects in Ireland.

Richard has extensive experience scoping, planning, coordinating and executing EIS's/EIAR's for various types of industry, including metal processing facilities, quarries, waste facilities, landfills, power plants, holiday parks and wind farm development. Richard has a vast amount of experience completing Hydrology and Surface Water Impact Assessments for EIARs.

10.1.2 Study Area

The development site is located within the Tolka_SC_020 sub-catchment. This sub-catchment drains an area that is 60.96 km^2 in size covering sections of north and north west Dublin. This sub-catchment has been defined as the study area for the purpose of this assessment. More details on the study area as defined is provided in Section 10.3.

10.2 Assessment Methodology

The methodology adopted for this assessment is as follows:

- Desk study review of the proposed development site, third party lands and surrounding areas;
- Characterisation of the receiving hydrological environment;
- Review of the proposed development;
- Completion of hydrological survey and surface water monitoring
- Review of appropriate guidance, legislation and policy;
- Assessment of potential effects;
- Identification of Mitigation Measures; and
- Assessment of Residual Impacts.

10.2.1 Hydrological Survey and Monitoring

A survey of hydrological features present in the receiving environment was carried out by Daniel Hayden of Fehily Timoney and Company (FTCO) on the 22nd of June 2021. Surface water drainage in the local area was observed and recorded, and flow directions and drainage patterns were identified.

Baseline surface water monitoring was carried out by Daniel Hayden, with surface water samples being take from the receiving environment on 09/03/2022. This monitoring included the following:

- Field hydrochemistry measurements (electrical conductivity, dissolved oxygen, and pH) were taken at the drainage ditch which traverses the development site.
- A total of 2 no. surface water samples were collected from the surface water drainage ditch which traverses the development site. These samples were sent to an appropriately accredited testing laboratory – ALS Life Sciences for testing. The results of this testing allowed for the determination of baseline surface water

10.2.2 Relevant Guidance

In addition to the EIA Guidance listed in Chapter 1, other reference documents and online resources used in the preparation of this chapter include the following:

- Construction Industry Research and Information Association (CIRIA) (2001), Control of water pollution from construction sites. Guidance for Consultants and Contractors (C532).
- Construction Industry Research and Information Association (CIRIA) (2001), PUB C571 Sustainable construction procurement - a guide to delivering environmentally responsible projects.
- Environmental Protection Agency database (www.epa.ie);
- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- Met Eireann Meteorological Databases (www.met.ie);
- National Parks & Wildlife Services Public Map Viewer (www.npws.ie);
- Water Framework Directive Map Viewer (www.catchments.ie);
- NRA (2009), Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes;
- OPW and DoEHLG (2009), The Planning System and Flood Risk Management - Guidelines for Planning Authorities.
- Department of Housing, Planning and Local Government (DoHPLG), Draft 3rd Cycle River Basin Management Plan 2022-2027.
- UK Guidance for Pollution Prevention (GPP):
  - GPP5: Works and maintenance in or near water, Version 1.2 (NRW, NIEA, SEPA, February 2018);
  - GPP21: Pollution Incident Response Plans (NRW, NIEA, SEPA, July 2017);
  - GPP22: Dealing with Spills (NRW, NIEA, SEPA, October 2018);

10.2.3 Relevant Legislation

The relevant legislation with respect to surface water quality is outlined below:

- Local Government (Water Pollution) Act 1977, as amended
- The European Union Water Framework Directive (Directive 2000/60/EC)
- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003)
- European Union Freshwater Fish Directive, 2006 (CEC 2006/44/EC)
- European Communities (Drinking Water) (No. 2) Regulations 2007 (SI no. 278/2007).
- European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009), as amended.
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010), as amended.
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011)
- European Union (Drinking Water) Regulations 2014 (S.I. No. 122/2014), as amended
- European Union (Water Policy) Regulations 2014 (S.I. No. 350 of 2014)

The main piece of legislation governing the management of water quality is the Water Framework Directive. More detail on how the Water Framework Directive influences water policy is provided in the sections below.

10.2.3.1 Water Framework Directive

In 2000, the Water Framework Directive (WFD) (2000/60/EC) was adopted by the (then titled) European Community. In December 2003, this Directive was transposed into Irish law by, *inter alia*, the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003), as amended and subsequent amendments.

The overriding purpose of the WFD is to achieve at least "good status" in all European waters and ensure that no further deterioration occurs in these waters. European waters are classified as groundwaters, rivers, lakes, transitional and coastal waters.

The Water Framework Directive [WFD] (2000/60/EC) establishes a legal framework to protect and restore clean water across Europe and to ensure its long-term, sustainable use, requiring an integrated approach across sectors. The main tool for implementing the WFD requires the preparation of River Basin Management Plans (RBMPs) by Member States across 6-year cycles, during which management measures must be implemented so as to achieve good ecological status in all waters. The 1st Cycle RBMP covered the period 2010-2015.

The 2nd Cycle RBMP covered the period 2018-2021, however still remains in force. The broad objectives of the 2nd cycle of the RBMP are as follows:

1. Ensure full compliance with relevant EU legislation
2. Prevent deterioration of water quality
3. Meet the objectives for designated protected areas
4. Protect high-status waters

The 3rd Cycle of the plan will cover the period 2022-2027. At the time of writing this 3rd cycle plan is in draft form and under review following a period of public consultation on the plan. This plan is expected to come into force shortly.

RBMPs must include a programme of measures to protect and restore bodies of water to at least 'good status' by 2027 (with some limited exemptions). To achieve this, the Draft 3rd Cycle RBMP will build on achievements in the 2nd Cycle to ensure the long-term delivery of water quality improvement. The third plan and further cycles will involve the ongoing protection of water bodies.

10.2.3.2 Water Framework Directive Waterbody Status

The European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009), as amended, give effect to the criteria and standards to be used for classifying surface waters in accordance with the WFD.

There are five categories of surface water status: 'High', 'Good', 'Moderate', 'Poor' and 'Bad'. The status is used to determine the degree of impact by human activities on water resources.

A surface water body must achieve both good ecological status and good chemical status before it can be of good status. The chemical status of a water body is assessed based on certain chemical pollutants.

In accordance with the regulations, waters classified as 'High' or 'Good' must not be allowed to deteriorate. Waters classified as less than good must be restored to at least good status within a prescribed timeframe.

The regulations also state that, for the purpose of classification, a status of less than good is assigned in the case of a water body where the environmental objectives for an associated protected area requiring special protection by virtue of obligations arising from specific national legislation for the protection of water, or for the conservation of habitats and species directly dependent on water, are not met.

10.2.3.3 Water Framework Directive Risk

A baseline risk assessment was completed of the water bodies within each River Basin District in 2005. This assessment involved using information on water pollution indicators, point and diffuse pollution sources, water abstraction and existing commercial activities. The risk assessment indicated whether the water body would meet the criteria for "good status" or would be considered "at risk" of not meeting the standards by 2015. This assessment provided the baseline information to prepare the first cycle River Basin Management Plan and Programme of Measures necessary to comply with the WFD standards.

Following the completion of the first cycle, the status information shows that 55% of river water bodies within Ireland achieved good or high status. The river basin characterisation process for the second cycle goes beyond the classification of status and assesses whether a water body is at risk of not meeting its objectives based on the review of such information such as water quality trends, catchment pressures and expert local knowledge. There are three categories of risk, 'not at risk', 'at risk' and 'review'.

'Not at risk' requires maintenance of the existing measures in place to maintain the satisfactory status. 'At risk' waterbodies need new and often more targeted mitigation measures. 'Review' waterbodies need more monitoring and assessment.

10.2.4 Relevant Policy

The main policy document governing the management of water quality in the area in which the development site is located is the Fingal Development Plan 2017 - 2023. The development plan contains several specific policy objectives relating to surface water management and water quality. The proposed development comes under the Blanchardstown South jurisdiction. The specific objectives for Blanchardstown South include the following:

Objective SW01
Protect and enhance the County's floodplains, wetlands and coastal areas subject to flooding as vital green infrastructure which provides space for storage and conveyance of floodwater, enabling flood risk to be more effectively managed and reducing the need to provide flood defences in the future and ensure that development does not impact on important wetland sites within river / stream catchments.

Objective SW02
Allow no new development within floodplains other than development which satisfies the justification test, as outlined in the Planning System and Flood Risk Management Guidelines 2009 for Planning Authorities (or any updated guidelines).

Objective SW03
Identify existing surface water drainage systems vulnerable to flooding and develop proposals to alleviate flooding in the areas served by these systems.

Objective SW04
Require the use of sustainable drainage systems (SuDS) to minimise and limit the extent of hard surfacing and paving and require the use of sustainable drainage techniques where appropriate, for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flooding risks.

Objective SW05
Discourage the use of hard non-porous surfacing and pavements within the boundaries of rural housing sites.

Objective SW06
Encourage the use of Green Roofs particularly on apartment, commercial, leisure and educational buildings.

Objective SW07
Implement the Planning System and Flood Risk Management-Guidelines for Planning Authorities (DoEHLG/OPW 2009) or any updated version of these guidelines. A site-specific Flood Risk Assessment to an appropriate level of detail, addressing all potential sources of flood risk, is required for lands identified in the SFRA, located in the following areas: Courtlough; Ballymadun; Rowlestown; Ballyboghil; Coolatrath; Milverton, Skerries; Channell Road, Rush; Blakescross; Lanestown/Turvey; Lissenhall, Swords; Balheary, Swords; Village/Marina Area, Malahide; Streamstown, Malahide; Balgriffin; Damastown, Macetown and Clonee, Blanchardstown; Mulhuddart, Blanchardstown; Portrane; Sutton; and Howth, demonstrating compliance with the aforementioned Guidelines or any updated version of these guidelines, paying particular attention to residual flood risks and any proposed site specific flood management measures.

Objective SW08
Implement the recommendations of the Fingal East Meath Flood Risk Assessment and Management Study (FEMFRAMS).

Objective SW09
Assess and implement the recommendations of the Eastern CFRAMS when complete.

Objective SW10
Require the provision of regional stormwater control facilities for all Local Area Plan lands and Strategic Development Zones with a view to also incorporating these control facilities in currently developed catchments prone to flooding.

Objective SW11
Ensure that where flood protection or alleviation works take place that the natural and cultural heritage of rivers, streams and watercourses are protected and enhanced to the greatest extent possible.

Objective SW12
Require an environmental assessment of all proposed flood protection or alleviation works.

Objective SW13
Provide for the schemes listed in Table SW01:

The surface water schemes listed in Table SW01 of the Fingal Development Plan 2017 – 2023 are as follows:

1. *Implementation of Final East Meath Flood Risk Assessment and Management Study (FEM-FRAMS), Measures – Flood Mitigations*
2. *Implementation of CFRAMS: Eastern CFRAMS Measures*

3. *Early Flood Warning Systems*
4. *Donabate Surface Water System*
5. *Garristown Surface Water System*

The objectives for water quality are as follows:

Objective WQ01
Strive to achieve 'good status' in all waterbodies in compliance with the Water Framework Directive, the Eastern River Basin District Management Plan 2009-2015 and the associate Programme of Measures (first cycle) and to cooperate with the development and implementation of the second cycle national River Basin Management Plan 2017-2021.

Objective WQ02
Protect and develop, in a sustainable manner, the existing groundwater sources and aquifers in the County and control development in a manner consistent with the proper management of these resources in conformity with the Eastern River Basin Management Plan 2009-2015 and the second cycle national River Basin Management Plan 2017-2021 and any subsequent plan and the Groundwater Protection Scheme.

Objective WQ03
Implement the recommendations of the Groundwater Protection Scheme.

Objective WQ04
Protect existing riverine wetland and coastal habitats and where possible create new habitats to maintain naturally functioning ecosystems whilst ensuring they do not impact negatively on the conservation objectives of any European Sites.

Objective WQ05
Establish riparian corridors free from new development along all significant watercourses and streams in the County. Ensure a 10 to 15-metre-wide riparian buffer strip measured from the top of the bank either side of all watercourses, except in respect of the Liffey, Tolka, Pinkeen, Mayne, Sluice, Ward, Broadmeadow, Corduff, Matt and Delvin where a 30m wide riparian buffer strip from top of bank to either side of all watercourses outside urban centres is required as a minimum.

Objective WQ06
Minimise the impact on surface water of discharges from septic tanks, proprietary effluent treatment systems and percolation areas by ensuring that they are located and constructed in accordance with the recommendations and guidelines of the EPA and Fingal County Council.

10.2.5 Consultation

The scope for this assessment has been informed by consultation with prescribed bodies, bodies with environmental responsibility and other interested parties as presented in Chapter 6 Scoping and Consultation in Volume 2 of the EIAR.

The following consultation responses have been considered in the preparation of this chapter:

- Stakeholder engagement responses from Inland Fisheries Ireland dated the 4th of April and the 8th of April 2022.
- Stakeholder engagement response from the Department of Housing, Local Government and Heritage Development Applications Unit dated 22nd of April 2022.

In the context of this chapter, the consultation responses from both parties related to the potential for the discharge of polluting liquid that has been entrained with environmentally harmful substances due to contact with waste material.

The proposed development has been designed to ensure that all waste accepted on-site is handled, stored and processed inside buildings and not exposed to surface water generated on-site due to rainfall.

Washwater from wash down of waste process and storage areas in MRF 2 and 3 will be directed to and stored in a below ground 'dirty water' storage tank situated at the south-east corner of building MRF 3. Discharges to foul sewer from this tank will be via a submersible pump and a rising main into the proposed new foul sewer connection. This tank will be integrity tested once every three years in accordance with Environmental Protection Agency (EPA) requirements. Washwater from wash down of waste process and storage areas in MRF 1 will be discharged directly to foul sewer. All dirty water will ultimately be directed to the Ringsend Wastewater Treatment Plant for treatment. Only uncontaminated surface water generated due to rainfall on-site will be discharged from the site to the receiving environment (via a surface water outfall). More detail on the drainage design is provided in Section 10.4.

10.2.6 Impact Appraisal Methodology

The following elements were examined to determine the potential significant effects of the proposed development on hydrology and surface water quality within the study area:

- Characterisation of the hydrological regime within the study area; and,
- Description and assessment of the likely significant effects of the proposed development.

10.2.6.1 Evaluation Criteria

During each phase (construction, operation, and decommissioning) of the proposed development, several activities will take place on site, some of which will have the potential to cause impacts on the hydrological regime and surface water quality within the study area.

The assessment of the magnitude of an impact incorporates the timing, scale, size and duration of the potential impact. The magnitude criteria for hydrological impacts are defined in the aforementioned NRA guidance and set out in Table 10-1.

Table 10-1: Estimation of Importance of Hydrology Attributes (NRA, 2009)

Importance	Criteria	Typical Examples
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status Regional important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water supply source supplying >1000 homes Quality Class B (Biotic Index Q3 -4) Flood plain protecting 5 and 50 residential or commercial properties from flooding Locally important amenity site for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Floodplain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of people

Potential impacts are assessed as being of major, moderate, minor or negligible significance. Significance criteria are presented in Table 10-2.

Table 10-2: Estimation of Magnitude of Impact on Hydrology Attributes (NRA, 2009)

Magnitude	Criterion	Description and Example
Major	Loss of attribute	Long term changes to the hydrology and water quality e.g., loss of EU-designated salmonid fishery: Change in water quality status of river reach Loss of flood storage/increased flood risk Pollution of potable source of abstraction
Moderate	Impact on integrity of attribute or loss of part of attribute	Short to medium term changes to the hydrology and water quality: loss in productivity of a fishery contribution of significant sediment and nutrient quantities in the receiving water, but insufficient to change its water quality status
Minor	Minor impact on attribute	Detectable but non-material and transitory changes to the hydrology and water quality - measurable change in attribute, but of limited size and/or proportion
Negligible	Impact on attribute but of insufficient magnitude to affect the use/integrity	No perceptible changes to the hydrology and water quality: Discharges to watercourse but no loss in quality, fishery productivity or biodiversity No increase in flood risk

The matrix in Table 10-3 determines the significance of the impacts based on the importance and magnitude of the impacts as determined by Table 10-1 and Table 10-2.

Table 10-3: Rating of Significance of Impacts (NRA, 2009)

		Magnitude of Impact			
		Negligible	Small (Minor)	Moderate	Large (Major)
Importance of Attribute	Extremely High	Imperceptible	Significant	Profound	Profound
	Very High	Imperceptible	Significant / Moderate	Profound / Significant	Profound
	High	Imperceptible	Moderate / Slight	Significant / Moderate	Severe / Significant
	Medium	Imperceptible	Slight	Moderate	Significant
	Low	Imperceptible	Imperceptible	Slight	Slight / Moderate

An assessment of the potential impact the proposed development may have on the receiving water environment having regard to these criteria is detailed in Section 10.5.

10.3 Existing Hydrological Environment

The receiving hydrological environment is described hereunder. This includes descriptions of the existing site drainage, local and regional hydrology, the wider waterbody catchment the site is situated within, flood risk and water quality in receiving surface water bodies.

10.3.1 Existing Site Surface Water Drainage

The development site encompasses the Applicant's existing waste facility situated at Cappogue Industrial Park, Dublin 11, together with lands to the south of this facility situated in the townlands of Cappogue and Dunsink. A description of existing surface water drainage at the existing waste facility and the lands to the south of this facility is provided below.

10.3.1.1 Surface Water Drainage at the Applicant's Existing Waste Facility

The surface water drainage system at the Applicant's existing waste facility was designed in compliance with Sustainable Drainage System (SuDS) principles. The existing waste facility is covered with a concrete hard stand. The site boundary, with the exception of a raised entrance gate, is surrounded by a concrete block kerb which contains storm water run-off from the site.

Rainwater falling on the concrete hardstand is conveyed via a drainage network including gulleys to two underground soakpits along the southern boundary of the site.

A storm water emergency overflow system is in place to allow excess surface water to overflow to the public stormwater network from the site. The public stormwater network is located at the adjacent access road. The flow rate of this overflow is controlled by a hydro-brake system which prevents the interceptor's capacity of 5L/s from being exceeded. The overflow system has an NSB 3 Class 1 Bypass oil separator downstream of the hydro-brake.

There is also a roof rainwater harvesting system at the existing facility with an above ground storage tank (9.7m long x 2.8m diameter) and pump. Collected rainwater is stored in the onsite water storage tank and is currently used for the road sweeper and welfare facilities. Overflow from the water storage tank flows to the wider internal surface water drainage network.

The drainage elements described above will be replaced as part of the proposed development. Once constructed, the proposed development site will no longer discharge surface water generated on-site to either the soakpits to the south of the site, or the public stormwater sewer located at the adjacent access road.

10.3.1.2 Surface Water Drainage at Lands to the South of the Existing Waste Facility

Lands to the south of the existing waste facility which are within the confines of the development site mainly consist of soft surface grassland / scrubland areas. A small drainage ditch traverses these lands in a northwest to southeast / east direction. This drainage ditch comes to the surface just to the south-west of the existing waste facility, between the existing facility and an adjoining property at Coolbrook Cottages. This drainage ditch exits the boundary of the development site at an existing surface water discharge outfall point situated to the south-east of the site.

10.3.2 Local and Regional Hydrology

The drainage ditch exiting the site at its south-eastern corner is culverted beneath the M50, before rising to the surface again on the opposite side of the motorway. From that point, it flows in an eastward direction a short distance and enters the Dunsink Landfill.

Drainage from this ditch is then directed by a stormwater drain to the attenuation pond serving this landfill. This attenuation pond drains to a northern tributary of the Scribblestown stream traversing the landfill site in a north-western to south-eastern direction, which in turn drains to the Scribblestown stream south east of the landfill site. The Scribblestown stream then runs in a southerly direction before entering the River Tolka ca. 2.0 km south east of the development site.

The River Tolka drains to the River Tolka Estuary ca. 8.4 km south east of the site, which in turn flows into Dublin Bay. Several protected Natura 2000 sites are situated at the River Tolka Estuary and in Dublin Bay. Detail regarding these protected sites and potential impact on these sites is contained in Chapter 8 – Biodiversity of Volume 2 of this EIAR and the Appropriate Assessment Screening Report accompanying this planning application. The development site is therefore hydrologically connected to a number of Natura 2000 sites, however this linkage is indirect and relatively distant in nature.

A map illustrating local and regional hydrology is shown in Figure 10-1.

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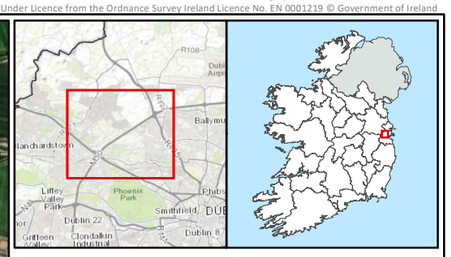

Legend

- Site Boundary
- Rivers

TITLE:	Hydrological Features Map		
PROJECT:	SID Application, EIAR and IE Licence Application for Thorntons		
FIGURE NO:	10.1		
CLIENT:	Thorntons Recycling		
SCALE:	1:20000	**REVISION:**	0
DATE:	17/08/2022	**PAGE SIZE:**	A3

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10.3.3 General Description of the Surface Waterbody Catchment

The development site lies within the Water Framework Directive (WFD) catchment HA 09 known as the Liffey and Dublin Bay catchment. This catchment includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, Co. Dublin, draining a total area of 1,616km².

The development site lies within the Tolka_SC_020 WFD sub-catchment.

The Tolka_SC_020 sub-catchment drains an area that is 60.96 km² in size covering sections of north and north west Dublin. This sub-catchment is considered to constitute the study area for the purpose of this assessment. This catchment encompasses the following sub-basins:

- TOLKA_040
- TOLKA_050
- TOLKA_060

The site lies within the TOLKA_050 sub-basin. This sub-basin contains the River Tolka and tributary streams and surface water drains, including the Scribblestown Stream and Bachelors Stream.

A map illustrating the Tolka River Catchment and wider drainage network is shown in Figure 10-2.

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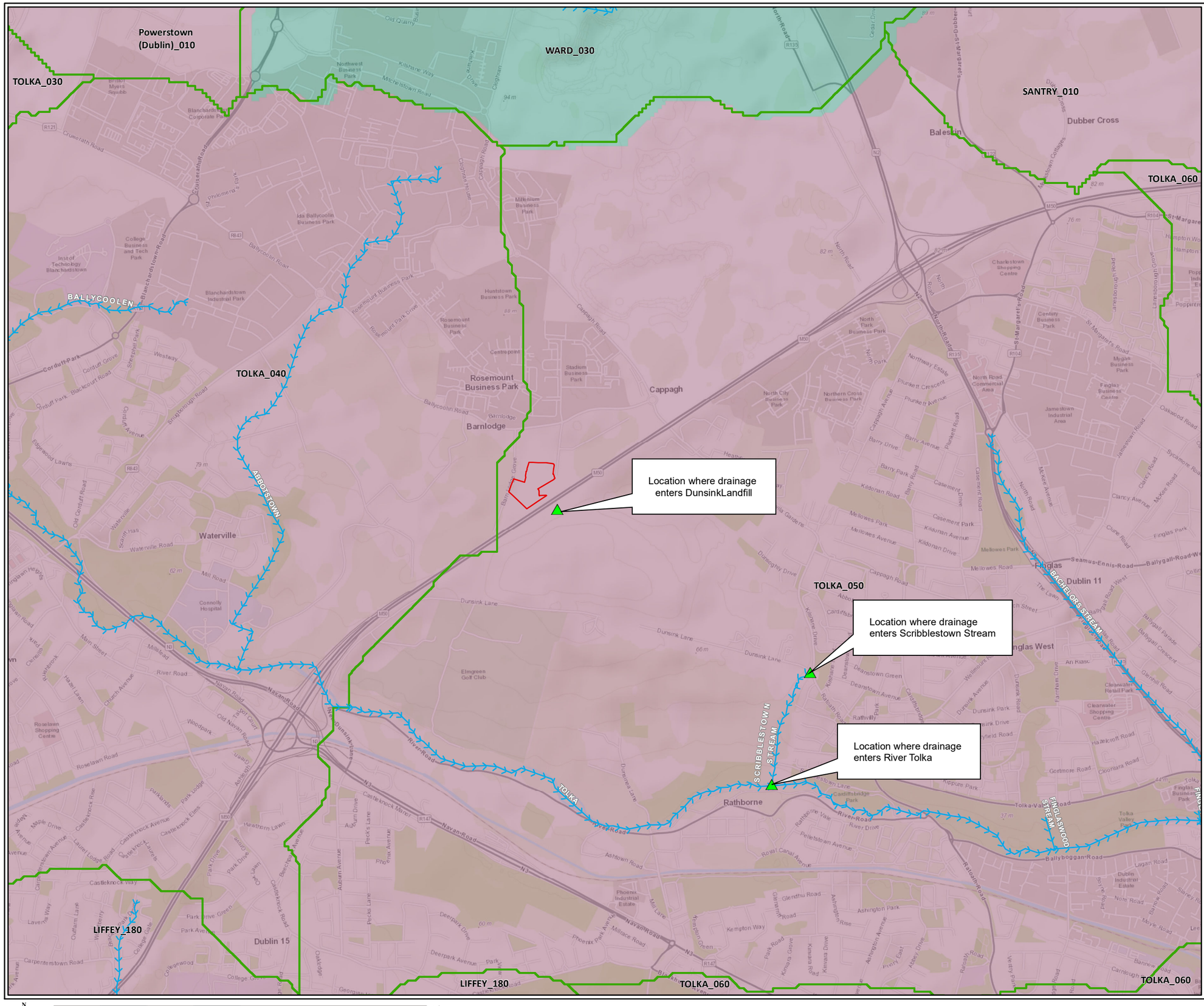

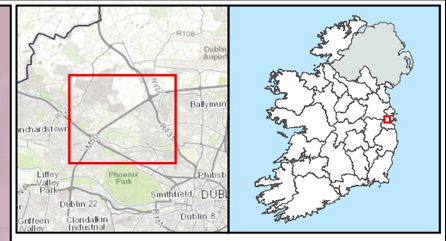

Legend

- Site Boundary
- Rivers
- WFD River Sub Basins

WFD Catchments

Catchment Name:

- Liffey and Dublin Bay
- Nanny-Delvin

TITLE: Water Framework Directive (WFD) Catchments and Wider Drainage Network			
PROJECT: SID Application, EIAR and IE Licence Application for Thorntons			
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DATE:	23/08/2022	**PAGE SIZE:**	A3

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10.3.4 Existing Flooding in the Area

The national flood hazard mapping website, www.floodmaps.ie, does not indicate any lands identified by the OPW as 'benefitting lands'[1]. in the vicinity of the development site. Upon review of historic flood events recorded by the OPW, it can be confirmed that there have been no recorded flood events at surface water bodies hydrologically connected to the development site within 2.5 km of the site.

A Provisional Flood Risk Assessment (PFRA) report and associated mapping prepared by the OPW, shows that there are no areas of the development site which are subject to fluvial flooding.

Areas that could be subject to pluvial flooding are also shown on the PFRA mapping. The process for developing the pluvial flood extent maps was based on 'dropping' various depths and intensities of rainfall over a range of durations and modelling how that rainfall would flow over the land and, in particular, pond in low-lying areas.

10.3.5 Water Quality

10.3.5.1 Water Framework Directive Risk Status and Water Quality Status of Receiving Surface Waters

The TOLKA_050 sub-basin is classed as being 'At Risk' of failing to meet its WFD objectives by 2027. The risk of not meeting WFD objectives was 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.

Water quality monitoring at the River Tolka is carried out under the Water Framework Directive Monitoring Programme by the EPA. A water quality status is assigned to surface bodies based on this monitoring. The most recent water quality status assigned to the TOLKA_050 sub-basin upstream and downstream of where the Scribblestown Stream enters the River Tolka is 'Poor.' This was based on biological and physico-chemical monitoring undertaken at the upstream 'Abbotstown Br' monitoring station, and the downstream 'TOLKA - Cardiff's Br' and 'Violet Hill Drive Finglas' monitoring stations.

The location of these monitoring stations relative to the development site is illustrated in Figure 10-3.

The most recent biological and physico-chemical monitoring undertaken at these stations is discussed in the sections immediately below.

Biological Water Quality Monitoring

The EPA scheme of Biotic Indices or Quality (Q) Values was developed to determine the status of organic pollution in Irish rivers by assessing the occurrence of macroinvertebrate taxa of varying sensitivity to pollution. The Q values recorded at the three monitoring stations on the Tolka River closest to the site are outlined in Table 10-4 and presented in Figure 10-3.

[1] A dataset prepared by the Office of Public Works identifying land that might benefit from the implementation of Arterial (Major) Drainage Schemes (under the Arterial Drainage Act 1945) and indicating areas of land subject to flooding or poor drainage.

Table 10-4: EPA Measured Q-values on the Lower Tolka River

Station ID	Location	Biological Quality Rating, Q rating									
		2005	2007	2008	2010	2013	2015	2016	2017	2018	2019
09T010800	Mulhuddart Br	3	2-3	-	2-3	2	2	-	2-3	2-3	2-3
09T011000	Abbotstown Br	3	2	2-3	-	3	-	3	-	-	3
09T011100	Violet Hill Drive Finglas	2/0	3	-	3	3	-	3	-	-	3

A Q-value rating of 2 represents 'Bad' water quality status under the WFD, while a Q-value rating of 2-3 or 3 represents 'Poor' water quality status under the WFD.

This stretch of the Tolka River can be characterised broadly as being of 'Poor' ecological status having regard to past biological quality monitoring.

Physico-Chemical Water Quality Monitoring

Physico-chemical water quality monitoring results recorded at the three relevant water quality monitoring stations along this stretch of the Tolka River were obtained from the EPA. These results are presented in full in Appendix 10-1 of Volume 3 of this EIAR. Results of the most recent monitoring carried out in 2018 at these monitoring stations are summarized and compared to applicable Environmental Quality Standards in Table 10-5.

Table 10-5: WFD Monitoring Results River Tolka

Parameter	Unit	Mulhuddart Bridge	Abbotstown Bridge	Violet Hill Drive Finglas	Environmental Quality Standard[1]
Total Alkalinity as $CaCO_3$	mg/l	248.2	243	223.4	-
BOD	mg/l	2.1	1.1	1.8	Good status ≤ 1.5 (mean)
Total Ammonia (as N)	mg/l	0.108	0.056	0.082	Good status ≤ 0.065 (mean)
Nitrate (as N)	mg/l	1.276	1.468	1.558	-
Nitrite (as N)	mg/l	0.0246	0.0198	0.0286	-
Conductivity @20C	µS/cm	669.8	698.8	661.4	-
Sulphate	mg/l	64.4	61.8	77.4	-
Chloride	mg/l	50.4	61.2	35.83	-
Ortho-Phosphate as PO_4	mg/l	0.09	0.096	0.062	Good status ≤ 0.035 (mean)

Parameter	Unit	Mulhuddart Bridge	Abbotstown Bridge	Violet Hill Drive Finglas	Environmental Quality Standard[1]
TON as N	mg/l	1.3	1.49	1.588	
pH	pH units	8	8.14	8.26	Soft Water 4.5 < pH < 9.0 Hard Water 6.0 < pH < 9.0

Notes:

1. Environmental Quality Standards (EQS) specified in the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. 272 of 2009), as amended,

Physico-chemical water quality monitoring results show that elevated levels of Biological Oxygen Demand (BOD) and Ammonia are present at Mulhuddart Bridge and Violet Hill Drive Finglas. Elevated levels of ortho-phosphate were recorded at all three monitoring stations.

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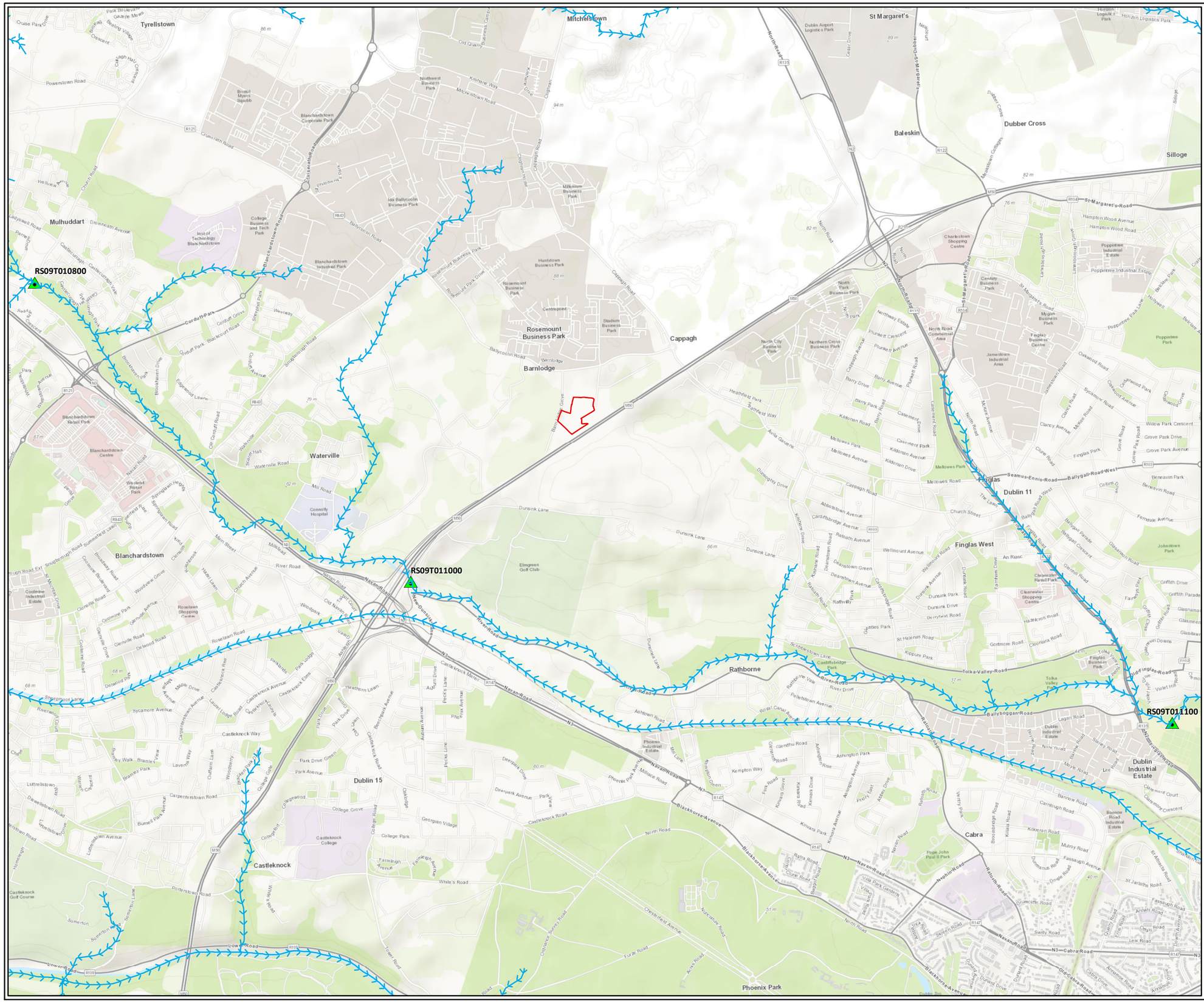

Legend

- Site Boundary
- Rivers

EPA Biological Q Stations

- Operational

TITLE:	EPA Water Quality Monitoring Station Locations		
PROJECT:	SID Application, EIAR and IE Licence Application for Thorntons		
FIGURE NO:	10.3		
CLIENT:	Thorntons Recycling		
SCALE:	1:25000	**REVISION:**	0
DATE:	15/08/2022	**PAGE SIZE:**	A3

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10.3.5.2 Baseline Surface Water Quality

Baseline Surface Water Quality Monitoring undertaken as part of this assessment

One round of surface water quality monitoring was undertaken at two surface water monitoring locations identified as 'Monitoring Point (MP) 1 and 'Monitoring Point (MP) 2' along the surface water drainage ditch which traverses the development site south of the existing waste facility. These locations were identified as part of the hydrological survey undertaken within the study area. These locations are detailed in Table 10-6 and illustrated in mapping in Figure 10-4. Surface water quality results for monitoring locations MP1 and MP2 are shown in Table 10-7.

Table 10-6: Baseline Surface Water Quality Monitoring Locations

Monitoring Location	Easting	Northing	Receiving Surface Water Body
MP1	310352	239444	Scribblestown Stream / River Tolka, via surface water drainage channels
MP2	310392	239452	Scribblestown Stream / River Tolka, via surface water drainage channels

Table 10-7: Baseline Surface Water Quality Monitoring Results

Parameter	Units	Environmental Quality Standard[1]	MP1	MP2
Inorganics				
Dissolved Oxygen	mg/l		2.13	3.89
pH	pH Units	6.0< pH < 9.0	7.38	7.36
Surfactants, Anionic (MBAS)	mg/l		0.6	0.46
Chloride	mg/l		35.5	36.2
COD	mg/l		26.9	129
BOD	mg/l	Good status 1.5 (mean) or 2.6 (95%ile)	**16.9**	**47.8**
Phosphate (Ortho as P)	mg/l	Good status ≤0.035 (mean) or ≤0.075 (95%ile)	**0.675**	0.0206
Conductivity	mS/cm		0.635	0.511

Parameter	Units	Environmental Quality Standard[1]	MP1	MP2
Ammoniacal Nitrogen as NH4	mg/l	≤0.065 (mean) or ≤0.140 (95%ile)	**5.24**	**1.18**
Sulphate	mg/l		29.4	17.8
Dissolved Solids	mg/l		420	347
Suspended Solids	mg/l		9.55	14
Heavy Metals				
Mercury	µg/l	0.05	<0.01	<0.01
Arsenic	µg/l	25	0.67	0.723
Barium	µg/l		46.6	46
Beryllium	µg/l		<0.1	<0.1
Boron	µg/l		23.1	18.3
Cadmium	µg/l	0.08	<0.08	<0.08
Chromium	µg/l	4.7	<1	<1
Copper	µg/l	5	**7.93**	<0.3
Lead	µg/l	7.2	<0.2	0.753
Nickel	µg/l	20	2.46	3.96
Selenium	µg/l		<1	2.1
Vanadium	µg/l		<1	1.34
Zinc	µg/l	40	17.3	10.7
Sodium	mg/l		21	22.4
Potassium	mg/l		4.68	5.09
Phosphorus	µg/l		2560	332
TPH Criteria Working Group (TPH CWG)				
GRO >C5-C12	µg/l		<50	<50
Aliphatics >C5-C6	µg/l		<10	12
Aliphatics >C6-C8	µg/l		<10	<10
Aliphatics >C8-C10	µg/l		<10	<10
Aliphatics >C10-C12	µg/l		<10	<10
Aliphatics >C12-C16	µg/l		<10	10
Aliphatics >C16-C21	µg/l		<10	16
Aliphatics >C21-C35	µg/l		12	84
Total Aliphatics >C12-C35	µg/l		12	110

Parameter	Units	Environmental Quality Standard[1]	MP1	MP2
Aromatics >EC5-EC7	µg/l		<10	<10
Aromatics >EC7-EC8	µg/l		<10	<10
Aromatics >EC8-EC10	µg/l		<10	<10
Aromatics >EC10-EC12	µg/l		<10	<10
Aromatics >EC12-EC16	µg/l		<10	22
Aromatics >EC16-EC21	µg/l		<10	19
Aromatics >EC21-EC35	µg/l		39	46
Total Aromatics >EC12-EC35	µg/l		39	87
Total Aliphatics & Aromatics >C5-35	µg/l		52	246
Semi-Volatile Organic Compounds (SVOCs)				
4-Methylphenol	µg/l		35.8	11.4
Phenol	µg/l		8.24	<1
Volatile Organic Compounds (VOCs)				
Chloroform	µg/l		5.17	2.88
Benzene	µg/l	10	<1	<1
Toluene	µg/l		<1	3.48
Ethylbenzene	µg/l		<1	<1
m,p-Xylene	µg/l		<1	1.04
Sum of BTEX	µg/l		<5	<5

Notes:

1. Environmental Quality Standards (EQS) specified in the European Communities Environmental Objectives (Surface Waters) Regulations, 2009 (S.I. 272 of 2009), as amended,

Total Suspended Solid (TSS) levels were below the applicable EQS limit at both sampling locations and ranged between 9.55 mg/l and 11 mg/l.

Results for Ammoniacal Nitrogen at both sampling locations exceeded the Good Status EQS limit for Ammonia. Ammonia as N ranged between 1.18 and 5.24 mg/l, which is above the mean and 95%ile EQS limit for Ammonia. The presence of elevated concentrations of Ammonia is likely linked to grey water discharges upstream of the proposed development site.

Ortho-phosphate results at MP2 were below the EQS Good Status" limit. Results at MP1 were 0.675 mg/l and exceeded the applicable EQS limit.

BOD results at both locations significantly exceeded the Good Status' and 95%ile EQS limits for BOD.

Analysis of trace metals indicated a copper concentration of 7.93 µg/l at MP1 which exceeded the EQS for Copper.

Results for the TPH Criteria Working Group parameters indicated there were slight traces of gasoline or diesel range hydrocarbons detected at the MP2 sampling location downstream of the development site. Results for TPH at location MP2 (246 µg/l) were higher than MP1 (52 µg/l). This is likely due to stormwater runoff from the M50 motorway entering the ditch. Overall, the TPH levels detected are typical of stormwater runoff from roads in urban areas. The detection of BTEX compounds in the MP2 sample is further evidence of petroleum products present in drainage ditch.

Trace levels of phenolic type SVOC's and VOC chloroform was detected within the drainage ditch, highlighting the poor surface water quality downstream of the proposed site. In an Irish context, the presence of Chloroform in the environment is linked to the addition of Chlorine during water supply treatment processes and the subsequent formation of Trihalomethanes when water containing Chlorine reacts with organic matter in the natural environment.

It is evident from the results presented in Table 10-7 that surface water quality at the two monitoring locations downstream of the site are not satisfying all 'Good' status requirements with respect to physio-chemical characteristics. EQS's defined in the European Union Environmental Objectives (Surface Waters) Regulations 2009, as amended, are exceeded for Orthophosphate, Total Ammonia (mean and 95%ile), Biochemical Oxygen Demand (BOD) and Copper.

The full results for this monitoring are contained in Appendix 10.2 - Laboratory Analytical Certificates (March 2022) – of Volume 3 of this EIAR. It should be noted that these certifications of analysis refer to MP1 as 'Stream A,' and MP2 and 'Stream B.' As can be seen in Figure 10-4, both monitoring points are situated within the same drainage ditch traversing the proposed development site.

Relevant Licence Compliance Monitoring for Dunsink Landfill

Licence compliance monitoring performed in compliance with W0127-01[2] (Dunsink Landfill) monitors the water quality in the ditch to the south of the existing facility at the point before it crosses under the M50. This point is identified as SW21 under that licence. This monitoring point is at the same location as MP2 used in this assessment approximately. Monitoring is carried out at this point on a monthly, quarterly and annual basis under Dunsink Landfill's waste licence. Historic monitoring data for this point has been reviewed and analysed to inform the baseline characterization and assessment of water quality in the receiving surface waterbody environment downstream of the proposed development site.

The sampling point at this location is usually very shallow resulting in sediment capture within samples. Suspended solids are often elevated above the regulatory limit (25 mg/l) at this location. Ammoniacal N and BOD results recorded at this location are routinely elevated and are trending upwards. Domestic rubbish arising as a result of fly tipping by members of the public has been found to be present in the ditch upstream of the landfill.

Monitoring results for this monitoring point the last three months are presented in Table 10-8. These results show that Ammoniacal N exceeded its environmental quality standard in July 2022.

[2] Available for viewing online in licensing section of www.epa.ie

Table 10-8 Monthly Monitoring Results for Surface Water at SW21 / MP2

Parameter	Units	MAC [1,3]/EQS [2]	SW21 / MP2		
			26/07	24/08	06/09
pH	pH units	6.0-9.0[2]	7.36	7.43	7.92
Temperature	°C	25 [1]	14.5	16.1	15.5
Electrical Conductivity	mS/cm	1 [1]	0.435	0.407	0.39
Dissolved oxygen (Field)	mg/l	50%≥9 mg/l [3]	4.45	3.82	6.9
Dissolved oxygen (Field)	%	95%ile >80% saturation, 95%ile<120% Saturation [2]	44.5	39.2	69.1
Ammoniacal nitrogen as N	mg/l	≤0.140 (95%ile)[2]	1.42	2.83	0.763
BOD, unfiltered	mg/l	≤2.6 (95%ile)[2]	<3	-	-
Suspended solids, Total	mg/l	25 [3]	3.65	-	-

Note 1: Maximum Admissible Concentration, (MAC) for A1 waters, as classified by European Communities (Quality of Surface Water intended for abstraction of drinking water) Regulations 1989 (S.I No. 294 of 1989)

Note 2: Environmental Quality Standard (EQS), European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I No. 272 of 2009), as amended

Note 3: Salmonid Regs= European Communities (Quality of Salmonid Waters) Regulation, SI 293 of 1988.

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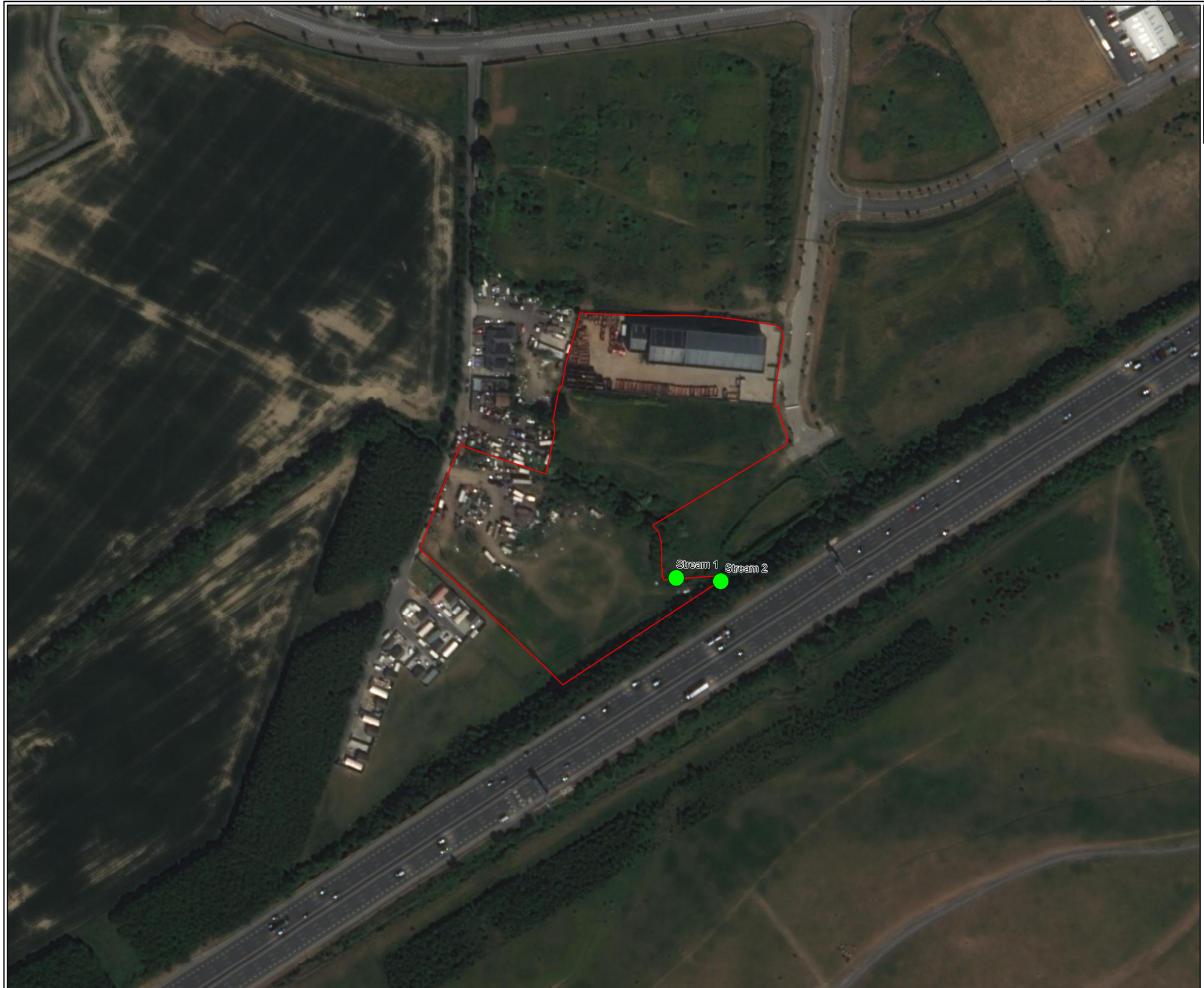

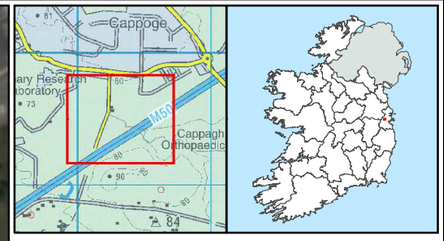

Legend

- Site Boundary
- Baseline Surface Water Quality Monitoring Locations

TITLE:	Baseline Surface Water Quality Monitoring Locations		
PROJECT:	SID Application, EIAR and IE Licence Application for Thorntons		
FIGURE NO:	10.4		
CLIENT:	Thorntons Recycling		
SCALE:	1:2500	**REVISION:**	0
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10.3.6 Characteristics and Importance of Hydrological Features

Surface water quality throughout the entirety of the Tolka_SC_020 sub-catchment including the TOLKA_050 sub-basin is generally considered to be poor. The 2nd RBMP assessment of this sub-catchment concluded that the sub-catchment is affected by numerous industrial pressures as well as urban diffuse run-off. Misconnections causing the discharge of effluent to surface waters in the sub-catchment is a known cause of water quality issues in the sub-catchment. Illegal dumping in the Dunsink Lane area is also known to cause water quality issues in the sub-catchment.[3]

The River Tolka nor its tributaries within this sub-catchment are not generally used for bathing or recreational purposes, however the River Tolka is known for coarse fishing and holds a significant stock of wild trout.

Based on the review of the existing environment and hydrological attributes of the area the importance of receiving surface water bodies as per the criteria defined in Section 10.2.6 is classified as being **Medium.** The reasons for this classification are detailed below:

- This stretch of the River Tolka and all tributary streams within the TOLKA_050 sub-basin are classed as having a 'Poor' water quality status, having regard to latest biological and physico-chemical monitoring undertaken by the EPA under the WFD Monitoring Programme.

  the receiving surface waters are not classed as protected under the EU Freshwater Fish Directive (2006/44/EC).
- The receiving surface waters within the study area do not contain any protected Natura 2000 sites.
- The receiving surface waters are not a source of potable water.
- The river is not generally not used for bathing purposes and has a low amenity value.
- The River Tolka is known for angling and holds a significant stock of wild trout. The presence of angling in the river elevates the sensitivity status of receiving surface waters from **Low** to **Medium**, having regard to criteria defined in Section 10.2.6.

10.4 Proposed Drainage for the Development

10.4.1 Drainage Design Approach and Rationale

The proposed drainage for the development has been designed with Sustainable Drainage System (SuDs) techniques, and in accordance with two key underpinning principles, which are as follows:

1. There shall be no discharge of polluting material from the development site.
2. The run-off rate from the site will be attenuated to prevent downstream flooding.

[3] WFD Cycle 2, Catchment Liffey and Dublin Bay, Subcatchment Tolka_SC_020, Characterisation Assessment, EPA (2019).

Good drainage design will be the primary mitigation measure for preventing the development from impacting on surface water quality and hydrology. For the purposes of this assessing the impact of the proposed development on surface water quality and hydrology this 'embedded mitigation' has been considered when carrying the impact assessment later in this chapter.

The design of the drainage system accords with SuDs techniques. This will provide a 'total' solution to rainwater management at the site. The SuDS techniques to be used on-site include the use of a rainwater harvesting tank, three surface water attenuation tanks, and hydrobrakes. This will allow surface water generated on-site to be conveyed more to the site surface water discharge outfall point at a slower rate.

10.4.2 Surface Water Drainage System

Detail on this surface water management infrastructure is provided below and shown in the drawing P21-150-0700 series in Volume 4 of this EIAR.

The surface water drainage system for the site will be designed to minimize surface water run-off rates and prevent the discharge of pollution material from the site. The surface water management system will be divided into three surface water management zones. Zone 1 will serve the concrete paved yard area on-site. Zone 2 will serve non-paved yard area situated to the south of the site. Zone 3 will serve all building roof areas on-site. Rainwater falling on-site will be collected in one of these three systems.

Areas surrounding MRF 1, MRF 2, MRF 3, the Administration Building, the Vehicle Workshop and the Vehicle Wash will be covered with a concrete hard stand. Surface water run-off from these hard stand areas, known as Zone 1, will:

- Be directed to and attenuated in a below ground AquaCell stormwater infiltration and attenuation system, with a plan area c. 600 m^2 in size.
- Discharged via a by-pass hydrocarbon retention interceptor Class 1 into the existing surface water outfall drain at greenfield run-off flow rates.

Yard areas to the south of the site will be surfaced with a permeable 'granular fill' formation. Surface water run-off generated in these areas, known as Zone 2, will:

- Be directed to and attenuated in a below ground AquaCell stormwater infiltration and attenuation system, with a plan area c. 300 m^2 in size.
- Discharged via a by-pass hydrocarbon retention interceptor Class 1 into the existing surface water outfall drain at greenfield run-off flow rates.

Zone 2 is a non-paved area which will be surfaced with granular fill. This granular fill formation will be compacted and will have low levels of permeability. This surface will be similar to a 'cap' which be found at a designed landfill. It will minimize percolation of surface water to ground and will result in increased surface water run-off in this area. Surface water run-off rates in this area will be less than in hard-standing areas to an extent however (which results in a reduced attenuation volume requirement for this area). This area will be served by filter drains to promote run-off to the infiltration and attenuation tank serving this area.

By virtue of its density and given the low permeability nature of the compact granular fill formation, any spilled oil generated in this area (associated with vehicle parking, for example) will rest and reside atop the surface of the formation, before becoming entrained in surface water run-off and directed to the oil separator serving this zone.

All rainwater collected from roof areas of buildings, known as Zone 3, will drain to a proposed rainwater harvesting tank. The volume of this tank is 470 m^3. 350 m^3 of this volume will be utilized for water supply on-site. 120 m^3 of this volume will utilized to augment firewater needs in the event a fire on-site. This fire water supply will be augmented by mains water supply.

Overflow stormwater from this tank will be:

- Be directed to and attenuated in a below ground AquaCell stormwater infiltration and attenuation system, with a plan area c. 800 m^2 in size.
- Subsequently directed to the Zone 2 Surface Water Management System

Two hydrobrakes will be provided to control run-off rates, with one serving Zone 1, and one serving Zone 2 and 3.

Calculations for determining greenfield run-off rates and the required volume of attenuation for each zone have been provided in Appendix 10.3. The results obtained are as follows:

- Zone 1 - 288 m^3
- Zone 2 - 150 m^3
- Zone 3 - 408 m^3

Attenuation facilities have been designed and sized on a preliminary basis to accommodate these volumes (which are for a 1 in 100-year rainfall event). A 20% additional allowance on rainfall has been made to account for climate change. Attenuation facilities have been designed to ensure flows will leave the site at greenfield runoff in accordance with the requirements of the Greater Dublin Strategic Drainage Study (GDSDS).

Surface water from all zones will eventually drain to an existing outfall to the south-east of the site. An emergency shut off valve will be provided before this outfall point, to ensure that the site can be rendered 'watertight' in the event of a spill.

10.4.3 Foul Water Drainage System

Wash water and domestic wastewater generated on-site will be discharged to public gravity foul sewer via a proposed connection at Entrance 2.

Washwater from wash down of waste process and storage areas in MRF 2 and 3 will be directed to and stored in a below ground 'dirty water' storage tank situated at the south-east corner of building MRF 3. Discharges to foul sewer from this tank will be via a submersible pump and a rising main into the proposed new foul sewer connection. This tank will be integrity tested once every three years in accordance with EPA requirements. Washwater from wash down of waste process and storage areas in MRF 1 will be discharged directly to foul sewer.

The individual areas of the waste processing building will be washed down at different intervals depending on the level of contamination of the waste being stored or processed within the areas. For the purposes of quantifying foul water discharge, the maximum foul water flow resulting from building washdown will occur during a concentrated cleaning event. Assuming a 4-hour cleaning event using a standard industrial power washer, with a flow rate of 1,000l/hour (Karcher High Pressure HD10 or similar), results in 4 m^3 of foul water discharge. The foul water system is designed taking the assumption that at peak hours there may be two people washing down the buildings resulting in 8 m^3 of foul water discharge.

Domestic wastewater generated in sanitary facilities at the Administration Building and MRF 3 on-site will be directed to the proposed new foul sewer connection via foul pipe. The foul line from the Administration Building will be gravity fed. Discharges to foul sewer from the MRF 3 building will be via a submersible pump and a rising main into the proposed new foul sewer connection.

In terms of sanitary foul water flow from the administration building, and assuming a maximum of 24 persons working at the facility, wastewater loading is calculated using the 'EPA Wastewater Treatment Manual, Treatment Systems for Small Communities, Business, Leisure Centres and Hotels' for an industrial office and/or factory with canteen at:

- Flow - 60 l/day per person
- BOD – 30 g/day per person

This results in 1.4 m^3 per day of sanitary foul water.

Truck washwater generated at the truck wash will be discharged via a submersible pump and a rising main into the proposed new foul sewer connection. With an assumed flow rate of 100 l/ minute and a wash duration of 15 minutes, the truck wash on-site is estimated to generate 1.5 m^3 of washwater per wash. Assuming 10 truck washes occur a day, the total volume of truck washwater effluent generated per day will be 15 m^3.

The total maximum foul water flow from the site is therefore 24.4 m^3. Foul water discharges will be regulated under the prospective Industrial Emission (IE) licence for the facility, which will be granted and enforced by the EPA.

10.4.4 Culverting Works to be undertaken during the Construction Phase of the Proposed Development

The open surface water drainage ditch traversing the site will need to be culverted. A description of the construction works required for these culverting works is provided in Chapter 4 – Description of Existing and Proposed Development, of this EIAR.

The proposed culvert will be designed and carried out under Section 50 licence from the Office of Public Works. The design of the culvert shall be finalized at detailed design stage; however, the following design standards will be met for the culvert in accordance with the requirements of the Section 50 licensing regime:

- The culvert must be capable of passing a fluvial flood flow with a 1% annual exceedance probability (AEP) or 1 in 100-year flow without significantly changing the hydraulic characteristics of the watercourse.
- If the land potentially affected does not include dwellings and infrastructure, a culvert must be capable of operating under the above design conditions while causing a hydraulic loss of no more than 300 mm (excluding the culvert gradient).

- If the land potentially affected includes dwellings and infrastructure, it must be demonstrated that those dwellings and/or infrastructure are not adversely affected by constructing the culvert.
- A culvert diameter, height and width must not be less than 900 mm to facilitate maintenance access and reduce the likelihood of debris blockage.

The culverting works will be carried out in accordance with the requirements of Inland Fisheries Ireland's Guidelines on the Protection of Fisheries during Construction in and Adjacent to Waters.

In general, the culvert will be designed and constructed to ensure it does not cause any negative hydraulic, hydrological or surface water quality impacts downstream.

10.5 Potential Effects

The potential impacts of the construction, operation and decommissioning phases of the proposed development, as described in Chapter 4 of this EIAR, on receiving environment hydrology and surface water quality are assessed in the following sections.

The potential impacts are assessed in accordance with the evaluation criteria outlined in Section 10.2. The potential hydrological effects are summarised in Table 10-9. The proposed mitigation measures to reduce or eliminate potential effects are then presented in Section 10.6 and residual effects are identified in Section 10.7.

10.5.1 'Do Nothing' Impacts

If the proposed development did not take place, the development site will remain as it is currently. The existing waste facility operated by the Applicant on the northern half of the development will continue to operate in accordance with the terms of the planning consent and waste facility permit consent for the facility.

Lands to the south of the existing waste facility will remain as disused grassland/scrubland. There is a risk that these lands and the drainage ditch traversing them may continue to be affected by fly tipping by members of the public.

The 'Do Nothing' scenario will result in an **Adverse, Slight to Moderate** impact on the receiving surface water environment.

10.5.2 Construction Phase Impacts

The construction phase of the proposed development has the potential to impact the receiving surface water environment, including the surface water hydrological regime and surface water quality. An evaluation of these potential impacts has been carried out having regard to the following main construction activities to be carried out during the construction phase of the proposed development:

- Advance works
- Development of temporary construction site compound
- Site clearance

- Site earthworks
- Installation of site services and surface water management systems
- Construction of site hard stand and granular formation surfaces
- Construction of site buildings and structures
- Installation of additional ancillary site infrastructure and elements

Detail regarding these proposed construction activities is contained in Chapter 4 – Existing and Proposed Development of this EIAR.

10.5.2.1 Advance Works

Advance works will consist of the following three activities:

- Demolition and Decommissioning of Existing Facility Elements
- Re-location of Existing Overhead Electrical Powerline
- Culverting of the Existing Open Surface Water Drainage Ditch

The construction activities associated with this stage of construction may cause the following direct effects on the receiving hydrological and surface water environment.

- Temporary, small sized, rubble stockpiles generated during demolition activities may result in the generation of alkaline surface water run-off to the receiving surface water environment.
- Soil disturbance and erosion because of minor excavations and the temporary storage of materials represents a potential source of increased sediment in surface water runoff. Suspended solids could potentially lead to siltation and physical effects on receiving surface water quality.
- Damming, pumping, excavation and backfilling works associated with the culverting of the surface water drainage ditch traversing the site pose a particular risk to surface water quality present in this drainage ditch.
- The use of plant and machinery during advance works will require the use of fuels and oils. Their use presents potential for spills and leaks which could contaminate receiving surface waters.

Prior to mitigation, the magnitude of the effect from these works is **Moderate** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Moderate.**

10.5.2.2 Development of Temporary Construction Site Compound

The construction activities associated with this stage of construction may cause the following direct effects on the receiving hydrological and surface water environment.

- Soil and fill material disturbance associated with the formation of the hard-core surface area for this compound, mobile plant movements and the delivery of construction phase infrastructure represents a potential source of increased sediment in surface water runoff. Suspended solids could potentially lead to siltation and physical effects on receiving surface water quality.
- The use of plant and machinery during advance works will require the use of fuels and oils. Their use presents potential for spills and leaks which could contaminate receiving surface waters.

Prior to mitigation, the magnitude of the effect from these works is **Minor** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Slight.**

10.5.2.3 Site Clearance

The construction activities associated with this stage of construction may cause the following direct effects on the receiving hydrological and surface water environment.

- Vegetative and top-soil stripping associated with Site Clearance represents a potential source of increased sediment in surface water runoff. Suspended solids could potentially lead to siltation and physical effects on receiving surface water quality.
- The use of plant and machinery during advance works will require the use of fuels and oils. Their use presents potential for spills and leaks which could contaminate receiving surface waters.

Prior to mitigation, the magnitude of the effect from these works is **Moderate** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Moderate.**

10.5.2.4 Site Earthworks

The construction activities associated with this stage of construction may cause the following direct effects on the receiving hydrological and surface water environment.

- Soil disturbance and erosion as a result of excavations and earthworks, and the temporary storage of materials, represents a potential source of increased sediment in surface water runoff. Suspended solids could potentially lead to siltation and physical effects on receiving surface water quality.
- The use of plant and machinery during advance works will require the use of fuels and oils. Their use presents potential for spills and leaks which could contaminate receiving surface waters.

Prior to mitigation, the magnitude of the effect from these works is **Moderate** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Moderate.**

10.5.2.5 Installation of Site Services and Surface Water Management Systems

The construction activities associated with this stage of construction may cause the following direct effects on the receiving hydrological and surface water environment.

- Breaking and stripping of hard stand areas where required may result in the generation of alkaline surface water run-off to the receiving surface water environment.
- Soil disturbance and erosion because of excavations and the temporary storage of materials represents a potential source of increased sediment in surface water runoff. Suspended solids could potentially lead to siltation and physical effects on receiving surface water quality.
- The use of plant and machinery during advance works will require the use of fuels and oils. Their use presents potential for spills and leaks which could contaminate receiving surface waters.

Prior to mitigation, the magnitude of the effect from these works is **Moderate** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Moderate.**

10.5.2.6 Construction of Site Hard Stand and Granular Formation Surfaces

The construction activities associated with this stage of construction may cause the following direct effects on the receiving hydrological and surface water environment.

- Concrete and other cement-based products are highly alkaline and corrosive and can have significant negative impacts on water quality. Entry of cement-based products into receiving surface water bodies represents a risk to the aquatic environment. Wash out of concrete chutes and concrete pours are the activities most likely to generate a risk of cement-based pollution during concrete works generally.
- Soil and fill material disturbance associated with the formation of the hard-core surface area at southern sections of the site represents a potential source of increased sediment in surface water runoff. Suspended solids could potentially lead to siltation and physical effects on receiving surface water quality.
- The use of plant and machinery during advance works will require the use of fuels and oils. Their use presents potential for spills and leaks which could contaminate receiving surface waters.

Prior to mitigation, the magnitude of the effect from these works is **Moderate** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Moderate.**

10.5.2.7 Construction of Site Buildings and Structures

The construction activities associated with this stage of construction may cause the following direct effects on the receiving hydrological and surface water environment.

- Soil disturbance and erosion because of excavations and earthworks, and the temporary storage of materials, represents a potential source of increased sediment in surface water runoff. Suspended solids could potentially lead to siltation and physical effects on receiving surface water quality

- Concrete and other cement-based products are highly alkaline and corrosive and can have significant negative impacts on water quality. Entry of cement-based products into receiving surface water bodies represents a risk to the aquatic environment. Wash out of concrete chutes and concrete pours are the activities most likely to generate a risk of cement-based pollution during concrete works generally.
- The use of plant and machinery during advance works will require the use of fuels and oils. Their use presents potential for spills and leaks which could contaminate receiving surface waters.

Prior to mitigation, the magnitude of the effect from these works is **Moderate** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Moderate.**

10.5.2.8 Installation of Additional Ancillary Site Infrastructure and Elements

The construction activities associated with this stage of construction may cause the following direct effects on the receiving hydrological and surface water environment.

- The use of plant and machinery during advance works will require the use of fuels and oils. Their use presents potential for spills and leaks which could contaminate receiving surface waters.

Prior to mitigation, the magnitude of the effect from these works is **Minor** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Slight.**

10.5.3 Operational Phase Impacts

Operational phase activities associated with the proposed development may cause the following direct effects on the receiving hydrological and surface water environment.

- Traffic and mobile plant movement and parking associated with facility operations may result in minor accidental leaks or spills of fuel/oil which in turn may run-off to the surface water environment.
- The storage of diesel fuel on-site, and the storage of oils in the vehicle maintenance building on-site, may result in the accidental release / loss of containment of these materials and their discharge to the receiving surface water environment.
- The ‘track out’ of waste material from inside buildings may result in this material coming into contact with surface water generated on-site and the entrainment of environmental hazardous substances in surface water.

Prior to mitigation, the magnitude of the effect from the operational activities listed above is **Moderate** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Moderate.**

Operational phase activities associated with the proposed development may cause the following more impactful direct effects on the receiving hydrological and surface water environment.

- The outbreak of a fire at the facility may result in the generation of substantial volumes of contaminated firewater (i.e., firewater affecting by the content of waste material) which could accidentally run-off to the receiving surface water environment.

Prior to mitigation, the magnitude of the effect from the operational activities listed above is **Major** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Significant**

Operational phase activities associated with the proposed development may cause the following indirect effects on the receiving hydrological and surface water environment.

- The storage of 'dirty water' at an underground storage tank on-site may result in the accidental release / loss of containment of polluting liquid material and its discharge to the groundwater. Once it has entered groundwater, this polluting material may be directed by way of groundwater flow into a connected downstream surface water body.

Prior to mitigation, the magnitude of the effect from this activity is **Minor** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Slight.**

10.5.4 Decommissioning Phase

In the event a cessation of waste processing activities occurs at this facility, the site will be decommissioned in accordance with a Closure, Restoration, Aftercare Management Plan (CRAMP) for the facility (which will be prepared as a condition of the prospective IE licence.

Impacts associated with decommissioning are likely to be of a much smaller magnitude than impacts associated with the construction of the proposed development.

It is intended to wind the operation down gradually until such time all wastes and materials are removed from the site.

All built infrastructural elements of the site will remain as they are in-situ. As such, there will be no disturbance of soils, earthworks or demolition activities during the decommissioning phase of the proposed development.

The proposed stormwater drainage and attenuation system will remain as constructed and will continue functioning and controlling stormwater run-off from the site.

All hard-standing areas and drainage systems including interceptors will be cleaned and washed down. Residual materials including wastes, washwater, interceptor sludges, diesel fuel, and oils stored in the vehicle maintenance building, and any 'dirty water' present in the underground storage tank on-site, will be removed from the site and disposed of at an appropriately authorised waste management facility. Residual materials will be managed in accordance with the CRAMP for the proposed facility and will be classified before being dispatched off-site.

Prior to mitigation, the magnitude of the effect from decommissioning works is **Minor** in nature. The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Slight.**

10.5.5 Cumulative Impacts

As identified in the EPA's 2nd RBMP cycle assessment for the Tolka_SC_020 sub-catchment, industrial pollution, urban diffuse pollution, pollution due to misconnections and illegal dumping are affecting water quality within this sub-catchment.

Various industrial land uses in the local area may potentially create polluting discharges to surface waters. Several industrial land uses are located to the northeast of the site along the Cappagh Road including a Materials Recovery Facility, Huntstown Quarry, and a concrete batching plant. Dunsink Landfill is situated south of the site on the opposite side of the M50.

Potential exists for surface water discharges from the proposed development and polluting discharges in the wider sub-catchment area combining and having a cumulative impact on the receiving hydrological and surface water environment.

The construction phase of the proposed development may also coincide with the construction of the following proposed development:

- Permission was granted on 07th July 2022 for development comprising: (i) construction of 5 no. industrial / warehouse / logistics units contained within 3 no. blocks and creation of vehicular access point (Planning reference: FW22A/0061), c.150m east of the proposed development.
- Permission was granted on 26th May 2022 for the construction of a security hit, 2 no. warehouse/ light industrial units, warehouse/ logistic unit and associated site works (Planning reference: FW21A/0149), c.200m northeast of the proposed waste facility.
- Permission was granted on 01st June 2022 for the construction of 4 no. industrial units consisting of offices, workshops and accessories (Planning reference: FW21A/0190), c.400m northeast of the proposed waste facility.

There may be limited potential for cumulative impacts in conjunction with these developments; these would be likely to be limited to small increases in sediment in surface water during construction activities. While these developments are within 500m of the proposed development, there is no hydrological link between these sites and the proposed development or to any European site.

During both the construction and operational phases of the proposed development the potential cumulative effect on hydrology and surface water quality from construction and operational phase activities, in combination with other current land uses and committed development in the study area, is **Moderate** (prior to mitigation). The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Moderate.**

During the decommissioning phase of the proposed development, the potential cumulative effect on surface hydrology and water quality from decommissioning phase activities, in combination with other land uses and committed development in the study area, is **Minor** (prior to mitigation). The importance of the receiving hydrology and surface water environment is **Medium**. The significance of these potential effects, prior to mitigation, is **Slight**.

10.5.6 Summary of Potential Effects

A summary of unmitigated potential effects on the receiving hydrology and surface waters associated with the carrying out of the proposed development is provided in Table 10-9.

Table 10-9: Summary of Unmitigated Potential Effects on the Receiving Hydrology and Surface Waters

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation	
				Magnitude	Significance
Construction Phase					
Advance Works	Generation of alkaline surface water run-off from temporary rubble stockpiles. Advance works may cause increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate
Installation of Temporary Construction Site Compound	Works may cause increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Minor	Slight
Site Clearance	Earthworks and heavy machinery movements contributing to increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate
Site Earthworks	Earthworks and heavy machinery movements contributing to increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate
Installation of Site Services and Surface Water Management Systems	Breaking and stripping of hard stand areas where required may result in the generation of alkaline surface water run-off to the receiving surface water environment.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation	
				Magnitude	Significance
	Earthworks and heavy machinery movements contributing to increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.				
Construction of Site Hard Stand and Granular Formation Surfaces	Release of cement-based product to temporary drainage system which may lead to increased alkalinity in the receiving watercourse and degradation of aquatic environment. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate
Construction of the Materials Recovery Facility	Earthworks, temporary stockpiles and traffic/mobile plant movements contributing to increased sediment loads in surface water. Release of cement-based product to temporary drainage system which may lead to increased alkalinity in the receiving watercourse and degradation of aquatic environment. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate
Installation of Additional Ancillary Site Infrastructure and Elements	Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Minor	Slight

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation	
				Magnitude	Significance
Operational Phase					
Facility traffic, fuel / oil storage, refuelling of vehicles, track out of waste	Release of hydrocarbons or fuel spill with potential for contamination. Entrainment of environmental hazardous substances in surface water and the discharge of this surface water to the environment.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate
Accidents	Outbreak of fire at the facility which could result in the discharge of contaminated firewater to surface waters.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Major	Significant
	The storage of 'dirty water' at an underground storage tank on-site may result in the accidental release / loss of containment of polluting liquid material and its discharge to the groundwater. Once it has entered groundwater, this polluting material may be directed by way of groundwater flow into a connected downstream surface water body.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Minor	Slight
Decommissioning Phase					
Loss of containment of fuel, oil, dirty water or washwater during decommissioning works	Loss of containment of fuel, oil, dirty water or washwater during decommissioning works.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Minor	Slight

10.6 Mitigation Measures

The following sections outlines appropriate mitigation measures to avoid or reduce the potential impact of the proposed development on receiving hydrology and surface waters during the construction phase.

10.6.1 Mitigation by Design and Best Practice

For the construction phase of the proposed development, the following design and best practice measures will be implemented to prevent the occurrence of surface water pollution and ensure the protection of the receiving surface waters:

- The works will be designed and checked by a civil engineer, suitably qualified and experienced in demolition and site clearance and construction methodologies.
- Any excavation and construction related works will be subject to a design risk assessment at detailed design stage to evaluate risk levels for the construction, operation, and maintenance of the works. Identified impacts will be minimised by the application of principles of avoidance, prevention, and protection.
- A method statement for each element of the works will be prepared by the Contractor prior to any element of the work being carried out.
- The Contract will require programming of the works such that earthworks are not scheduled during severe weather conditions. Where such weather is forecast, suitable measures will be taken to secure the works. The Project Manager is the person responsible for determining when works are to be stopped due to weather.

For the operational phase of the proposed development, the following design and best practice measures will be implemented to prevent the occurrence of water pollution and ensure the protection of the receiving surface water:

- To ensure the highest standards of environmental protection, the proposed development has been designed to operate in accordance with the following environmental protection standards:
    - European Commission (2018) BREF on Waste Treatment.
    - European Commission (2018) BATC on Waste Treatment.
    - EPA (2011) BAT Guidance Note on the Waste Sector.
- Stormwater entering the drainage systems on-site will be directed to suitably designed stormwater attenuation systems. The attenuation volume provided has been designed to accommodate a 1:100-year event in addition to a 20% climate change allowance volume. A hydrobrake will be situated after the attenuation tank and will also be used to limit/control flow off-site. These systems will serve to prevent the rapid release of stormwater generated on hard-standing areas on-site.
- Stormwater existing the attenuation systems will drain via hydrobrake to NSB 3 Class 1 Bypass Oil Separators (Interceptors). This system will serve to prevent the uncontrolled the release of spilled fuels of oils that may have accidentally become entrained in stormwater on-site.

10.6.2 Construction Phase Mitigation

The proposed mitigation measures to reduce and protect the receiving surface waters from the potential impacts during the construction phase of the proposed development are outlined below.

10.6.2.1 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) has been prepared for the proposed development and is included in Volume 3, Appendix 4.2. The CEMP defines the work practices, environmental management procedures and management responsibilities relating to the construction phase of the proposed development. The CEMP describes how the Contractor for the main construction works will implement a site Environmental Management System (EMS) to meet the specified contractual, regulatory and statutory requirements including the requirements identified as part of the environmental impact assessment process.

The CEMP will be updated prior to construction to take account of any amendments arising during the consenting process and relevant conditions attached to the planning permission and will be implemented for the duration of the construction phase of the project. The CEMP will be a live document and will be reviewed and updated as required.

The CEMP defines the following construction phase control measures in relation to surface water management.

10.6.2.2 Measures to Protect the Surface Waters during Culverting Works

The culverting of the existing open surface water drainage ditch will be carried out during advance works stage of the construction phase. The following mitigation measures will be adopted during the proposed culverting works:

- The surface water drainage ditch will need to be temporarily dammed during culverting works (E.g. Using pea gravel bags and geosynthetic textile). This will be done progressively in sections. This will allow culverting construction works to be isolated from flowing water. A water pumping system will be used to allow for the transport of water downstream during culverting works.
- These works will only be carried out during a period of dry weather conditions to prevent the run-off of sediment from working areas to the drainage ditch.
- Culverting works will be carried out in a careful and precautionary manner, and in accordance with a defined method statement. The working areas will be kept as tidy as possible for the duration of the works. All excavated / excess material will be immediately removed from the working area on an ongoing basis as works progress.
- All personnel carrying out culverting relates works will be obliged to read and fully understand the method statement for the proposed works. A toolbox talk regarding the method statement, the carrying out of the works generally, and the need to protect the quality of water passing through the drainage ditch will be carried out immediately prior to the commencement of works.
- Temporary cut off trenches will be used to divert surface water run-off away from working areas in and around the drainage ditch during culverting works.
- Regular inspections of working areas will be undertaken to assess and confirm the implementation of the agreed control measures.

- Any machines working in or around the drainage ditch must be protected against leakage or spillage of fuels, oils, greases, and hydraulic fuels (e.g. using drip trays).
- The culvert piping itself will be pre-cast thereby substantially reducing the potential for cement based materials becoming entrained in surface water run-off.

10.6.2.3 Sediment Control Measures

The following sediment control measures are proposed to prevent becoming entrained in surface water run-off during the construction phase of the proposed development:

- The drainage ditch currently traversing the site will be culverted during the advance works stage of construction. This will prevent the release of sediment and cement-based material generated during later stages of construction on-site from discharging to this water body.
- To minimize soil disturbance and potential for sediment becoming entrained in surface water, all excavations will be constructed and backfilled as quickly as possible. Excavations will stop during or prior to heavy rainfall events.
- Temporary cut-off trenches and earthen bunds will be used to prevent entry of surface water into excavations, temporary stockpiles, and disturbed working areas, thereby preventing surface waters from being exposed to disturbed soils.
- Standing water, which could arise in excavations, has the potential to gradually become affected by an increased concentration of suspended solids because of the disturbance to soils. These waters, where they arise, will be pumped from these excavations promptly to prevent this from occurring.
- Good housekeeping will be practiced on-site to prevent discharge of polluting material to the surface water environment (I.e., post work clean down, end of day clean down, visual inspection and maintenance of the site drainage system elements).
- A temporary sediment basin/earthen weir will be established at the point of surface water discharge from the site during construction to ensure settlement of suspended solids in surface water prior to discharge. This temporary formation will be regularly inspected and maintained.

10.6.2.4 Measures for Preventing Hydrocarbons Spills

Fuel for vehicles and mobile plant will initially be stored in an existing fuel storage tank situated within the existing waste management facility building. Construction vehicles will come to this area for re-fuelling. Once the MRF 3 building and site infrastructural elements at the southern sections of the site are constructed, the existing waste management facility, including the fuel storage tank within it will be decommissioned, and the existing building will be upgraded. From this point on, fuel will be stored at the newly constructed fuel storage tank situated to the south of the site and construction phase re-fuelling will take place at this location.

Specific mitigation measures relating to the management of hydrocarbons are as follows:

- Refuelling of construction plant and machinery will be carried out at a designated refuelling location which is / will be served by an oil separator. Spill kits will be provided at these locations.
- Refuelling of plant during construction will only be carried out by trained personnel.
- A specially trained and dedicated environmental and emergency spill response team will be appointed before commencement of construction on-site.

- Appropriately sized drip trays will be utilized on-site to prevent the release of fuels or oils during refuelling operations or other work activities.
- Spill kits containing oil soakage pads and booms will be made available on-site to ensure prompt and adequate clean-up of any accidental fuel or oil spills.
- An Emergency / Spill Response Procedure will be prepared, and all construction site operatives will be briefed on the response measures required during the site inductions and routine toolbox talks.
- All site plant will be inspected at the beginning of each day prior to use. Defective plant shall not be used until the defect is satisfactorily fixed. Only emergency breakdown maintenance will be carried out on site and appropriate containment facilities will be provided to ensure that any spills from breakdown maintenance vehicles are contained and removed off site. All major repair and maintenance operations will take place off-site. Vehicles entering the site will be in good working order, free from leakage of fuel or hydraulic fluid.

10.6.2.5 Measure for Preventing the Release of Cement Based Materials

The following mitigation measures are proposed to prevent the release of cement-based products to the receiving surface water environment during the construction phase of the proposed development:

- All rubble arising due to demolition will be collected and safely contained in skips / storage containers before immediate dispatch off-site.
- When cast-in-place concrete is required; all work must be done in dry conditions and must be completed isolated from any flowing water which may enter the drainage ditch to the south of site.
- No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place.
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site.
- Where concrete is delivered on site, only the chute need be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed.
- A designated impermeable cement washout container should be provided on-site at a designated area for chute cleaning. This washout facility shall be situated away from surface water drains. This area will be effectively isolated from any flowing water which may enter the drainage ditch which travels to the southeast of the site,
- Weather forecasting will be utilized to ensure concrete pours are only undertaken during dry weather conditions.
- Concrete pour sites will be made free of standing water prior to carry out the pour. Plastic covers will be available on-site to prevent entrain of surface water in poured concrete in the case of sudden rainfall.
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.

10.6.3 Operational Phase Mitigation

This section sets out the mitigation measures that will be employed during the operational stage of the proposed development.

10.6.3.1 Regulatory Control

Facility operations will be carried out in accordance with the conditions an IE licence enforced by the EPA. This authorisation will define strict environmental protection standards in relation to the proposed facility. This authorisation will necessitate the development and implementation of an Environmental Management System (EMS) for the proposed facility. This authorisation will require the Applicant to carry out and report surface water monitoring at the facility on a periodic basis.

10.6.3.2 Proposed Surface Water Management Measures

The following Surface Water Management Measures have been proposed to prevent the discharge of polluting material to the receiving surface water environment during the operational phase of the proposed development:

- Surface water drainage system inspections and maintenance
- Dirty water storage and management
- Material storage control measures
- Firewater retention systems
- Accident prevention / management plans
- Measures to prevent the track out of waste
- Surface water quality monitoring

Surface Water Drainage System Inspections and Maintenance

Drainage systems including drains, gullies and oil interceptors will be inspected regularly. These systems will be cleaned and maintained as necessary. Oil interceptors periodically in accordance with manufacturer specifications to ensure they function correctly at all times.

Dirty Water Storage and Management

Washwater from wash down of waste process and storage areas in MRF 2 and 3 will be directed to and stored in a below ground 'dirty water' storage tank situated at the south-east corner of building MRF 3. Discharges to foul sewer from this tank will be via a submersible pump and a rising main into the proposed new foul sewer connection. This tank will be integrity tested once every three years in accordance with EPA requirements. This tank will be constructed using reinforced mass concrete and in accordance with underground tank construction specifications defined in the EPA's Guidance Note on Storage and Transfer of Materials for Scheduled Activities (2004). Washwater from wash down of waste process and storage areas in MRF 1 will be discharged directly to foul sewer. These arrangements are shown on a Proposed Services – Surface and Foul Water Drainage drawing provided in Volume 4 of this EIAR (Drawing reference: P21-150-0700-0003).

Material Storage Control Measures

Diesel fuel will be stored in a 45,000 litre tank situated adjacent to the Vehicle Maintenance Building. This tank will be stored within a reinforced mass concrete bund to prevent the accidental discharge of diesel from the primary containment tank.

This bund will be constructed in accordance with secondary retention system specifications defined in the EPA's Guidance Note on Storage and Transfer of Materials for Scheduled Activities (2004). This bund will be integrity tested once every three years in accordance with IE licence requirements.

Relatively small volumes of oils will be stored in the Vehicle Maintenance Building. These oils will be stored in sump pallets to prevent the accidental release of oils from primary oil containers. These sump pallets will be integrity tested once every three years in accordance with the aforementioned EPA guidance to ensure their ongoing functionality.

Firewater Retention Systems

The proposed development has been designed to ensure that contaminated firewater that could be generated at waste storage and process areas is retained on-site, in accordance with the EPA's Guidance Note to Industry on Fire Water Retention Facilities. The provision of sufficient firewater retention capabilities will be a requirement of the EPA's IE licence for the facility.

All firewater generated in the MRF 1, MRF 2 and MRF 3 buildings will be retained within these buildings. These buildings will have an impervious concrete perimeter and access points will be suitably ramped/raised, which will allow the buildings to act as retention structures during a fire event.

A fire quarantine area will be situated at the hard stand yard in front of the MRF 3 building. This area will be utilised by the applicant in the event of fire. Waste affected by heat / high temperatures will be hauled to this area in order to prevent fire spread on-site during an emergency event. Firewater will be applied onto waste stored in this quarantine area to suppress waste material affected by fire and reduce the temperature of the waste materials. In the event of a fire, drainage at this dedicated fire quarantine area will be retained through the utilization of emergency slam shut valves. The slam shut valves will be automatically triggered through the activation of the on-site fire alarm. The valves can also be manually shut. When the slam shut valves are closed, and when the stormwater drainage system serving the fire quarantine area is sealed, contaminated firewater generated and accumulating in this area will be retained in this area initially, before flowing into the MRF 3 building by way of gravity fall.

Any firewater generated on-site will be retained on-site until sampling and analysis of firewater has taken place and approval is granted by Irish Water to discharge the firewater to foul sewer.

These systems will ensure that contaminated firewater generated on-site will be retained on-site, rather than being discharged to the receiving surface water environment by way of site surface water discharge points.

The firewater retention system will be consistent with EPA design requirements defined in their Guidance Note to Industry of Fire Water Retention Facilities (2019).

10.6.3.3 Accident and Emergency Management

A Fire Protection and Prevention Plan, an Accident Prevention Policy, Emergency Response Procedures and Spill Control Procedures will be developed and implemented during the operational phase of the facility to prevent, control and manage potential fire and spill events that may lead to the discharge of polluting material to the receiving surface water environment. All employees will be made aware of these plans and will be provided training in the implementation of these plans relevant to their role. Spill kits will be provided throughout the site at appropriate points to allow for the prompt clean-up of any spills which occur on-site.

10.6.3.4 Measures to Prevent Waste Material 'Track Out'

The following measures will be implemented during operations to prevent waste being tracked out of buildings and coming into contact and contaminating surface water generated on-site:

- Waste haulage vehicles will tip waste away from entrances to buildings.
- Waste will be tipped away from the edge of stockpiles and loading shove will push up tipped materials into stockpiles. This will prevent the dispersal of waste being tipped straight onto stockpiles.
- Loading shovels will move with the shovel set at floor level so that it pushes and collects waste in front of it and so that waste does not get adhere to the wheels or undercarriage of the vehicle.
- The yard area will be swept and cleaned daily.

10.6.3.5 Surface Water Quality Monitoring

Surface water quality monitoring will be implemented on an ongoing basis at the site during facility operations in accordance with the requirements of the IE licence to ensure the efficacy of the operational phase surface water management mitigation measures proposed, and to ensure that only uncontaminated surface water is discharged from the site to the receiving surface water environment.

This monitoring will be undertaken under the IE licence for the facility, which will be granted and enforced by the EPA. A monitoring programme will be developed in accordance with monitoring related provisions relating to emissions to waters prescribed in the European Commissions' Commission Implementing Decision (EU) establishing best available techniques (BAT) conclusions for waste treatment, under Directive 2010/75/EU of the European Parliament and of the Council.

The adoption and implementation of the monitoring programme will ensure and verify that only uncontaminated stormwater is discharged from the site to the surface water body to the south of the site and will ensure that operational phase stormwater discharges will have no impact on the water quality of that body.

10.6.3.6 Decommissioning Phase Mitigation

Decommissioning and closure of the facility will take place in accordance with the Closure, Restoration and Aftercare Management Plan developed for the facility, and in accordance with the requirements of the EPA's Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites (2012).

Where appropriate, the same mitigation measures defined for construction and operational phase activities will be applied during the decommissioning phase (I.e., spill prevention measures, use of oil interceptors).

All site washdown and decontamination will take place in accordance with defined method statements. Surface water drainage systems will be sealed shut during washdown / decontamination. Wash water arisings will be retained, taken up and dispatched to an appropriately authorized wastewater treatment facility for final treatment.

10.6.3.7 Mitigation Measures to prevent Cumulative Impacts

The mitigation measures as defined have been developed to ensure that only uncontaminated surface water is released to the receiving environment throughout all phases of the proposed development. Upon the adoption of these mitigation measures the proposed development will have no impact on receiving surface waters and will not contribute to any cumulative impact land use in the wider area may be having on receiving surface waters present in the catchment.

10.7 Residual Impacts

The proposed development will not impinge on the Water Framework Directive objectives to restore good water quality status at receiving surface waters. The proposed development will be constructed, operated and decommissioned in a manner that ensures it will have no impact water quality in the receiving water environment, or on the water quality status of receiving surface waters.

A comprehensive set of design and mitigation measures have been developed to robustly protect the receiving hydrological environment, and to ensure that only uncontaminated waters are discharged from the proposed development site to the receiving surface water environment. The construction, operational and decommissioning phase mitigation measures defined will be implemented in a robust manner so as to prevent the discharge of any polluting material to the hydrological environment and the deterioration of water quality. The proposed development will not contravene the principles and policies defined under the Water Framework Directive (I.e., Article 4(1)), or on the objectives defined in the current 2nd RBMP, or the drafted objectives defined in the draft 3 RMBP, which is expected to come into force shortly.

The residual significance of the effects of the proposed development on the receiving surface water environment will be **Imperceptible** taking account of mitigation measures as outlined in Section 10.6.

A summary of the residual impacts to hydrology and surface water due to the proposed development is presented in Table 10-10.

10.8 Interactions

Hydrology and Surface Water Quality interacts with other environmental attributes as follows:

Population and Human Health (Chapter 7) – the protection of the health of human receptors and the mitigation of potential impacts is closely linked to the maintenance of surface water quality and the prevention of impacts to sensitive hydrological features.

Biodiversity (Chapter 8) – the protection of biodiversity is integral to the existing hydrological regime and surface water quality. The prevention of potential impacts to the biodiversity are directly linked to the protection of hydrological features and surface water quality.

Soils, Geology and Hydrogeology (Chapter 9) – the development and disturbance of the underlying land and soil and potential impacts is directly linked to the existing hydrological regime and surface water quality. The protection of the hydrogeological regime is integral to the protection of hydrological features and surface water quality. The prevention of potential impacts to the underlying hydrogeological regime are directly linked to the protection of hydrological features and surface water quality.

It has been concluded in this EIAR that the proposed development will not have any significant effect on population and human health, biodiversity, or soils, geology and hydrogeology, respectively. There will therefore be no potential for these environmental topics interacting with hydrological elements and having a significant impact on hydrology or surface water quality.

Conversely, the proposed development will not result in any significant impact the receiving surface water environment that may in turn result in indirect effects on population and human health, biodiversity, or soils, geology and hydrogeology.

Table 10-10: Residual Impact Significance for Sensitive Receptors

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Construction Phase							
Advance Works	Generation of alkaline surface water run-off from temporary rubble stockpiles. Advance works may cause increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate	Negligible	Imperceptible
Installation of Temporary Construction Site Compound	Works may cause increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Minor	Slight	Negligible	Imperceptible
Site Clearance	Earthworks and heavy machinery movements contributing to increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate	Negligible	Imperceptible
Site Earthworks	Earthworks and heavy machinery movements contributing to increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate	Negligible	Imperceptible

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Installation of Site Services and Surface Water Management Systems	Breaking and stripping of hard stand areas where required may result in the generation of alkaline surface water run-off to the receiving surface water environment. Earthworks and heavy machinery movements contributing to increased sediment loads in surface water. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate	Negligible	Imperceptible
Construction of Site Hard Stand and Granular Formation Surfaces	Release of cement-based product to temporary drainage system which may lead to increased alkalinity in the receiving watercourse and degradation of aquatic environment. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate	Negligible	Imperceptible
Construction of the Materials Recovery Facility	Earthworks, temporary stockpiles and traffic/mobile plant movements contributing to increased sediment loads in surface water. Release of cement-based product to temporary drainage system which may lead to increased alkalinity in the receiving watercourse and degradation of aquatic environment. Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Moderate	Negligible	Imperceptible

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
Installation of Additional Ancillary Site Infrastructure and Elements	Potential for surface water contamination from fuel spills/leakages.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Minor	Slight	Negligible	Imperceptible
Operational Phase							
Facility traffic, fuel / oil storage, refuelling of vehicles, track out of waste	Release of hydrocarbons or fuel spill with potential for contamination. Entrainment of environmental hazardous substances in surface water and the discharge of this surface water to the environment.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Moderate	Facility Traffic, fuel / oil storage, and refuelling of vehicles	Negligible	Imperceptible
Accidents	Outbreak of fire at the facility which could result in the discharge of contaminated firewater to surface waters.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Major	Accidents	Negligible	Imperceptible
	The storage of 'dirty water' at an underground storage tank on-site may result in the accidental release / loss of containment of polluting liquid material and its discharge to the groundwater.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Minor	Slight	Negligible	Imperceptible

Activity	Potential Impact	Receptor	Sensitivity	Prior to Mitigation		Post Mitigation	
				Magnitude	Significance	Magnitude	Significance
	Once it has entered groundwater, this polluting material may be directed by way of groundwater flow into a connected downstream surface water body.						
Decommissioning Phase							
Loss of containment of fuel, oil, dirty water or washwater.	Loss of containment of fuel, oil, dirty water or washwater.	Local surface water drainage ditch to the south of the site, Scribblestown Stream, River Tolka	Medium	Minor	Slight	Negligible	Imperceptible

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