Greater Dublin Drainage Project

Irish Water

Environmental Impact Assessment Report: Volume 3 Part A of 6

Chapter 21 Material Assets

June 2018

Contents

21. Material Assets

This Chapter assesses and presents the potential impacts of the Greater Dublin Drainage Project (hereafter referred to as the Proposed Project) on material assets. The material assets which may be impacted upon by the Proposed Project can be split into two main sections:

- **Major utilities and natural features; and**
- **Raw materials.**

The proposed pipeline routes will pass beneath these, where possible. It is proposed to traverse the majority of the material assets using trenchless techniques. Where this is not possible, engineering solutions have been proposed to mitigate any impact on the assets.

The major utilities and natural features which have been identified include:

- **Gas transmission infrastructure;**
- **Power transmission infrastructure;**
- **Rail infrastructure;**
- **Motorways, National Primary Roads and other roads;**
- **Water supply infrastructure;**
- **Wastewater collection infrastructure;**
- **Connolly Hospital;**
- **Communications infrastructure;**
- **Significant watercourses; and**
- **Baldoyle Bay and Portmarnock Beach.**

The resulting predicted impact of the Proposed Project on major utilities and natural features will be moderate, negative and short-term.

The raw materials which have been identified include:

- **Material for pipe bedding and surround;**
- **Various pipes for the proposed orbital sewer route and proposed outfall pipeline route (land based section and marine section);**
- **Concrete – precast elements, concrete blocks, ready mix concrete;**
- **Structural steel;**
- **Insulation materials;**
- **Glass, roof slates and various other building materials; and**
- **Mechanical and electrical equipment.**

Approximately 84,200m^3 of material will have to be sourced from quarries in the region to be used for pipe bedding and surround as well as to construct temporary access roads, temporary working areas and compounds.

The sourcing of materials during the construction of the Proposed Project on raw materials will have an imperceptible impact on the existing natural resources and other resources available. The quantities of raw material required will be reduced where possible through the reuse of suitable materials generated during the Construction Phase. Refer to Chapter 20 Waste in Volume 3 Part A of this Environmental Impact Assessment Report for further details. The resulting predicted impact of the Proposed Project will be Imperceptible, Negative and Permanent.

21.1 Introduction

Material assets are resources that are valued and that are intrinsic to specific places. These may be of human or natural origin. The Greater Dublin Drainage Project (hereafter referred to as the Proposed Project) will have the potential to impact on some significant material assets which, in turn, will have the potential to affect large sections of the population nearby.

A desktop review of the available and collected data was carried out to assist in the preparation of this Chapter. The material assets related to the Proposed Project can be split into two main sections:

- Major utilities and natural features; and
- Raw materials.

The Proposed Project will form a significant component of a wider strategy to meet future wastewater treatment requirements within the Greater Dublin Area as identified in a number of national, regional and local planning policy documents. The plant, equipment, buildings and systems associated with the Proposed Project will be designed, equipped, operated and maintained in such a manner to ensure a high level of energy performance and energy efficiency.

The table below includes a summary of the Proposed Project elements. A full description of the Proposed Project is detailed within Volume 2 Part A, Chapter 4 Description of the Proposed Project of this Environmental Impact Assessment Report (EIAR).

Proposed Project Element	Outline Description of Proposed Project Element
Proposed Wastewater Treatment Plant (WwTP)	• WwTP to be located on a 29.8 hectare (ha) site in the townland of Clonshagh (Clonshaugh) in Fingal. • 500,000 population equivalent wastewater treatment capacity. • Maximum building height of 18m. • Sludge Hub Centre (SHC) to be co-located on the same site as the WwTP with a sludge handling and treatment capacity of 18,500 tonnes of dry solids per annum. • SHC will provide sustainable treatment of municipal wastewater sludge and domestic septic tank sludges generated in Fingal to produce a biosolid end-product. • Biogas produced during the sludge treatment process will be utilised as an energy source. • Access road from the R139 Road, approximately 400m to the southern boundary of the site. • Egress road, approximately 230m from the western boundary of the site, to Clonshaugh Road. • A proposed temporary construction compound to be located within the site boundary.
Proposed Abbotstown pumping station	• Abbotstown pumping station to be located on a 0.4ha site in the grounds of the National Sports Campus at Abbotstown. • Abbotstown pumping station will consist of a single 2-storey building with a ground level floor area of 305m^2 and maximum height of 10m and a below ground basement 17m in depth with floor area of 524m^2 incorporating the wet/dry wells. • The plan area of the above ground structure will be 305m^2 and this will have a maximum height of 10m. • A proposed temporary construction compound to be located adjacent to the Abbotstown pumping station site.
Proposed orbital sewer route	• The orbital sewer route will intercept an existing sewer at Blanchardstown and will divert it from this point to the WwTP at Clonshagh. • Constructed within the boundary of a temporary construction corridor. • 13.7km in length; 5.2km of a 1.4m diameter rising main and 8.5km of a 1.8m diameter gravity sewer. • Manholes/service shafts/vents along the route. • Odour Control Unit at the rising main/gravity sewer interface. • Proposed temporary construction compounds at Abbotstown, Cappoge, east of Silloge, Dardistown and west of Collinstown Cross to be located within the proposed construction corridor.
Proposed North Fringe Sewer (NFS) diversion sewer	• The NFS will be intercepted in the vicinity of the junction of the access road to the WwTP with the R139 Road in lands within the administrative area of Dublin City Council. • NFS diversion sewer will divert flows in the NFS upstream of the point of interception to the WwTP. • 600m in length and 1.5m in diameter. • Operate as a gravity sewer between the point of interception and the WwTP site.
Proposed outfall pipeline route (land based section)	• Outfall pipeline route (land based section) will commence from the northern boundary of the WwTP and will run to the R106 Coast Road. • 5.4km in length and 1.8m in diameter. • Pressurised gravity sewer. • Manholes/service shafts/vents along the route. • Proposed temporary construction compounds (east of R107 Malahide Road and east of Saintdoolaghs) located within the proposed construction corridor.
Proposed outfall pipeline route (marine section)	• Outfall pipeline route (marine section) will commence at the R106 Coast Road and will terminate at a discharge location approximately 1km north-east of Ireland's Eye. • 5.9km in length and 2m in diameter. • Pressurised gravity tunnel/subsea (dredged) pipeline. • Multiport marine diffuser to be located on the final section. • Proposed temporary construction compounds (west and east of Baldoyle Bay) to be located within the proposed construction corridor.
Proposed Regional Biosolids Storage Facility	• Located on an 11ha site at Newtown, Dublin 11. • Maximum building height of 15m. • Further details and full impact assessment are provided in Volume 4 Part A of this EIAR.

The total Construction Phase will be approximately 48 months, including a 12 month commissioning period to the final Operational Phase. The Proposed Project will serve the projected wastewater treatment requirements of existing and future drainage catchments in the north and north-west of the Dublin agglomeration, up to the Proposed Project's 2050 design horizon.

21.2 Major Utilities and Natural Features

21.2.1 Introduction

In this Section of the Chapter, the baseline environment is examined with regards to current major utilities (any above ground or below ground services, any manmade infrastructure) and any natural features. Predicted potential impacts on these aspects of material assets resulting from the Proposed Project are evaluated, and appropriate mitigation measures are proposed.

Please note that the material assets impact assessment of the proposed RBSF aspect of the Proposed Project is addressed in Chapter 12 Material Assets in Volume 4, Part A of this EIAR.

21.2.2 Methodology

This Section has been prepared in accordance with relevant European Union and Irish legislation and guidance, including the requirements of Annex IV of Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment (Environmental Impact Assessment (EIA) Directive) and in accordance with Schedule 6 of the Planning and Development Regulations 2001 as amended (S.I. No. 600 of 2001) and conforms to the relevant requirements as specified therein.

The following guidelines were referred to and complied with while preparing this appraisal:

- *Guidelines on the Information to be Contained in Environmental Impact Statements* (Environmental Protection Agency (EPA) 2002) (and revised and draft guidelines 2015/2017 (EPA 2015b; 2017));
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements* (EPA 2003) (and revised advice notes (EPA 2015a); and
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* (Department of the Environment, Community and Local Government 2013).

The scope of the appraisal is based on a review of legislation, guidance documents, other EIAR feedback from public consultation, consultation with prescribed bodies and on a consideration of the likelihood of significant impacts arising, having regard to the nature of the baseline environment and the nature and extent of the Proposed Project. A schedule of consultations is detailed in Table 21.1. Feedback received is detailed in the relevant sections below.

Table 21.1: Schedule of Consultations

Stakeholder	Meeting Date	Additional Consultation
Bord Gáis Networks (Currently Gas Networks Ireland)	19 November 2012	In addition to the meeting, there was additional correspondence by phone and email.
EirGrid	23 November 2012	
Iarnród Éireann	14 December 2012, 14 March 2014	In addition to the meeting, there was additional correspondence by phone and email.
Rail Procurement Agency (currently Transport Infrastructure Ireland (TII))	12 April 2013, 27 June 2017	In addition to the meeting, there was additional correspondence by phone and email.
National Roads Authority (currently TII)	11 February 2013, 27 June 2017	In addition to the meeting, there was additional correspondence by phone and email.
Inland Fisheries Ireland	5 November 2012	
Fingal County Council (FCC) water operations	11 February 2014	In addition to the meeting, there was additional correspondence by phone and email.
FCC wastewater operations	27 February 2014	In addition to the meeting, there was additional correspondence by phone and email.
DCC water operations	20 March 2014	
Hibernia Atlantic	10 April 2014	In addition to the meeting, there was additional correspondence by phone and email.

This Section sets out how the appraisal of material assets, specifically utilities, road and rail infrastructure, water and wastewater infrastructure, watercourses and drainage, were evaluated for the Proposed Project. The objective of this Chapter is to identify existing material assets and determine whether these features place constraints on the Proposed Project.

21.2.3 Impact Assessment Criteria

The assessment of the potential impact of the Proposed Project on the major utilities and natural features has been undertaken in accordance with the *Guidelines on the Information to be Contained in Environmental Impact Statements* (EPA 2002) (and Revised and Draft Guidelines (EPA 2015b; 2017) which have been drafted to facilitate compliance with Directive 2014/52/EU of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment (EIA Directive).

Impacts are described in the guidelines under various headings which are summarised in Table 21.2 below. Further details on the definitions of impacts on the environment can be found in Section 3.7.3 of the Revised and Draft Guidelines (EPA 2015b; 2017).

Table 21.2: Description of Impacts as set out in the Environmental Protection Agency Draft Guidelines (EPA 2017)

Quality of Effects	
It is important to inform the non-specialist reader whether the effect is positive, negative or neutral.	**Positive Effects** A change which improves the quality of the environment (for example, by increasing species diversity, improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Describing the Significance of Effects	
'Significance' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	**Imperceptible** An effect capable of measurement but without noticeable consequences.
	Not significant An effect which causes noticeable changes in the character of the environment but without significant
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects	
Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	**Extent** Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions. (Is it the biggest, longest effect ever?)
Describing the Probability of Effects	
Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the Competent Authority can take a view of the balance of risk over advantage when making a decision.	**Likely Effects** The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Describing the Duration and Frequency of Effects	
'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	**Momentary Effects** Effects lasting from seconds to minutes
	Brief Effects Effects lasting less than a day
	Temporary Effects Effects lasting less than a year
	Short-term Effects Effects lasting one to seven years
	Medium-term Effects Effects lasting seven to 15 years
	Long-term Effects Effects lasting 15 to 60 years
	Permanent Effects Effects lasting over 60 years
	Reversible Effects Effects that can be undone, for example through remediation or restoration
	Frequency of Effects Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
Describing the Types of Effects	
Describing the types of effects	**Cumulative Effects** The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	'Do Nothing' Effects The environment as it would be in the future should the subject project not be carried out.
	'Worst case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents.
	Indirect Effects (a.k.a Secondary Effects) Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.

Impacts during the Construction Phase and Operational Phase which the Proposed Project may have on the material assets are also examined, and mitigation measures which may be required to minimise any adverse impacts of the Proposed Project are identified and considered.

Following assessment of the predicted potential impacts of the Proposed Project, the Proposed Project was methodically reviewed so that mitigation methods could be conceived that will avoid, prevent or reduce any negative impacts as a result of the Proposed Project. These are described in further detail in Section 21.2.6.

The evaluation is based on the fact that existing best practices in design, construction and operation are employed for the Proposed Project as set out in this EIAR.

21.2.4 Baseline Environment

During the routing process of the proposed pipeline routes, major utilities and natural features were taken into consideration as outlined in Table 21.3. For a full list of routing constraints, refer to the *GDD Routing Report* (Jacobs Tobin 2018).

Table 21.3: Major Utility Routing Constraints

Description of Constraint	Comment
James Connolly Memorial Hospital and grounds	Provides a constraint to routing in a north or north-easterly direction. Connection to additional 9C Sewer catchment required which dictates the routing direction. Route available in direction of the M50 Motorway.
Existing gas transmission infrastructure which lies immediately north of, and runs parallel to, the M50 Motorway to west of Cappagh Road.	Constraint to maintaining route in close proximity to the M50 Motorway. It is necessary to divert route slightly to the north.
Proposed Metro West route.	Constraint to maintaining route in close proximity to the M50 Motorway. proposed orbital sewer route will now run parallel to the Metro West route through these lands
Electricity Supply Board (ESB) substation at N2 National Road/M50 Motorway interchange	Critical Constraint. Constraint to maintaining route in close proximity to the M50 Motorway. This constraint, coupled with the proposed routing of the Metro West route in this area, forces the proposed orbital sewer route to the north around the substation.
Metro West depot (proposed)	Forms a northern boundary to any potential route. Available route to south of proposed depot.
Metro Link depot (proposed)	Forms a northern boundary to any potential route. Available route to south of proposed depot.
Metro Link route (proposed) – particularly the section in tunnel from depot through the Dublin Airport complex.	Critical Constraint. As Metro Link will be constructed in tunnel from the depot through the airport grounds, it is preferable to route the proposed orbital sewer route south of the proposed depot and cross the Metro Link route when it is at ground level. Satisfactory clearances can be achieved to the proposed Metro Link infrastructure to south of proposed depot.

Although care has been taken to align the proposed pipeline routes away from major utilities and natural features, the Construction Phase and Operational Phase of the proposed WwTP, Abbotstown pumping station, orbital sewer route and outfall pipeline route (land based section and marine section) will have some impact on material assets in the form of crossings as outlined below.

Major Utilities

Gas Transmission Infrastructure

The high pressure gas transmission pipelines identified near the Proposed Project are shown on Figure 21.1 Gas Transmission Infrastructure – Location of Crossing Points with Proposed Pipeline Routes and include:

- A north–south transmission pipeline running from Blanchardstown to an above ground installation west of Lusk, with spurs serving Dublin Airport and DCC. The crossings of this transmission pipeline are identified as

Locations 1, 2 and 3 on Figure 21.1 Gas Transmission Infrastructure – Location of Crossing Points with Proposed Pipeline Routes; and

- An east–west transmission pipeline routed from the landing point of the subsea interconnector, north of Rush, to the above ground installation west of Lusk and on westward. However, this will not be impacted upon by the Proposed Project.

Power Transmission Infrastructure

The existing power infrastructure identified near the Proposed Project consists of:

- Low voltage and medium voltage network (10 kilovolts (kV) to 20kV);
- High voltage network (38kV, 110kV, 220kV and 400kV);
- East-West Interconnector land section; and
- East-West Interconnector subsea section.

The identified power infrastructure consists of a mix of overhead lines (OHLs) and underground cables. The high voltage network and the East-West Interconnector, together with the proposed orbital sewer route and the proposed outfall pipeline route (land based section), are shown on Figure 21.2 Power Transmission Infrastructure – Location of Crossing Points with Proposed Pipeline Routes and Wastewater Treatment Plant Site.

The proposed orbital sewer route and outfall pipeline route (land based section) will have to cross under/over the 38kV, 110kV and 220kV infrastructure. However, this would be considered to be normal infrastructure which would be encountered in any civil engineering works in an urban environment. Furthermore, the preliminary design of the proposed pipeline routes will place them at a deeper level and will pass beneath the electricity infrastructure. The construction of the proposed WwTP at Clonshagh will require the diversion of the 38kV OHL at this location prior to works commencing at this site.

No crossing of the East-West Interconnector is required.

Rail Infrastructure

The rail infrastructure identified near the Proposed Project includes:

- The existing Dublin to Belfast Railway;
- The proposed Metro Link and Metro West lines;
- Metro Link (a Railway Order is in place and the project has been tendered. The project is due to begin construction in 2021); and
- Metro West (no Railway Order in place).

The existing Dublin to Belfast railway line, as shown in Figure 21.3 Railway Infrastructure – Location of Crossing Points with Proposed Pipeline Routes and Figure 21.4 Dublin to Belfast Railway – Proposed Trenchless Crossing, runs north to south across the proposed outfall pipeline route (land based section). The Proposed Project team made contact with Irish Rail in 2012 and 2014 and maintains contact through continuous wayleave negotiations since. Irish Rail have indicated that the current preliminary design of the proposed outfall pipeline route (land based section) and details at the crossing point are acceptable in principle.

The Proposed Project team contacted TII in June 2017, and TII advised that it has no technical issues with the proposed orbital sewer route crossing under the Metro Link or Metro West Lines. The Metro Link infrastructure is identified in Figure 21.3 Railway Infrastructure – Location of Crossing Points with Proposed Pipeline Routes.

The mitigation measures implemented in the design are outlined in Section 21.2.6.

Motorways, National Primary Roads and Other Roads

Motorways and National Primary Roads identified near the Proposed Project include:

- Motorways: M1 Motorway and M2 Motorway;
- National Primary Roads: N2 National Road;
- Regional Roads: R135 Finglas Road, R122 Road, R108 Road, R132 Swords Road, R107 Malahide Road, R124 Road, R106 Coast Road; and
- Other roads as outlined in Table 21.4.

Details of these crossings are shown in Figure 21.5 N2 National Road – Proposed Trenchless Crossing, Figure 21.6 Collinstown Cross – Proposed Trenchless Crossing and Figure 21.7 M1 Motorway – Proposed Trenchless Crossing. Table 21.4 provides a summary of the road crossings.

Table 21.4: Road Crossings

Feature Type	Pipeline Route	Description
Regional and other roads	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Cappagh Road
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	R135 Finglas Road
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	R122 Road
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	R108 Ballymun Road
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	R132 Swords Road
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Clonshaugh Road
	Proposed outfall pipeline route (land based section)	R107 Malahide Road
	Proposed outfall pipeline route (land based section)	R124 Road
	Proposed outfall pipeline route (marine section)	R106 Coast Road
	Proposed outfall pipeline route (marine section)	Golf Links Road
Local roads	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Local road west of Premier Business Park
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Access road to Premier Business Park
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Dubber Cottages
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Sillogue Green

Water Supply Infrastructure

An overview of the strategic trunk water supply mains near the Proposed Project is provided in Figure 21.8 Water Supply Infrastructure – Crossing Points with Proposed Pipeline Routes.

The proposed orbital sewer route and the proposed outfall pipeline route (land based section) associated with the proposed WwTP will require crossings of the following strategic trunk water supply mains:

- 24”, 450mm and 800mm North Fringe trunk main from Ballycoolin to Cappagh, Dublin City;
- Three instances of the 400mm supply to Dublin Airport along the R132 Swords Road;
- 24” trunk main between Swords and Clonshagh, Dublin City; and
- 450mm and 560mm trunk main between Swords and Donaghmede, Dublin City.

Wastewater Collection Infrastructure

The wastewater pipelines identified near the Proposed Project are:

- 9C Sewer (varying in diameter from 900mm to 1,350mm);
- Offtake from the NFS; and
- Rising main from Sutton pumping station.

The 9C Sewer will be intercepted and diverted to the proposed WwTP. The catchment of the NFS will also be intercepted west of the proposed WwTP at Clonshagh at the junction of the proposed access road to the proposed WwTP. A number of existing branches of the NFS which originate north of the M50 Motorway, e.g. Dublin Airport, Coldwinters, Dubber and Clonshaugh Road, will be diverted to the proposed orbital sewer route.

Communications Infrastructure

There is a large amount of communications and telecoms infrastructure near the Proposed Project, and this would be considered to be normal infrastructure which would be encountered in any civil engineering works in rural and urban environments and the crossing of this infrastructure will be managed in the normal way. Also, during the course of the Proposed Project, the Hibernia Atlantic Ltd. Dublin to Southport subsea cable, which connects Ireland to the United Kingdom (UK), was identified in near the proposed outfall pipeline route (marine section), and this will require a crossing.

Connolly Hospital

Connolly Hospital is located adjacent to part of the Proposed Project. The proposed orbital sewer route begins in the public park to the west of the hospital and proceeds though the grounds of the hospital in a south-easterly and easterly direction (as indicated on Diagram 21.1) before crossing into the ground of the National Sports Campus.

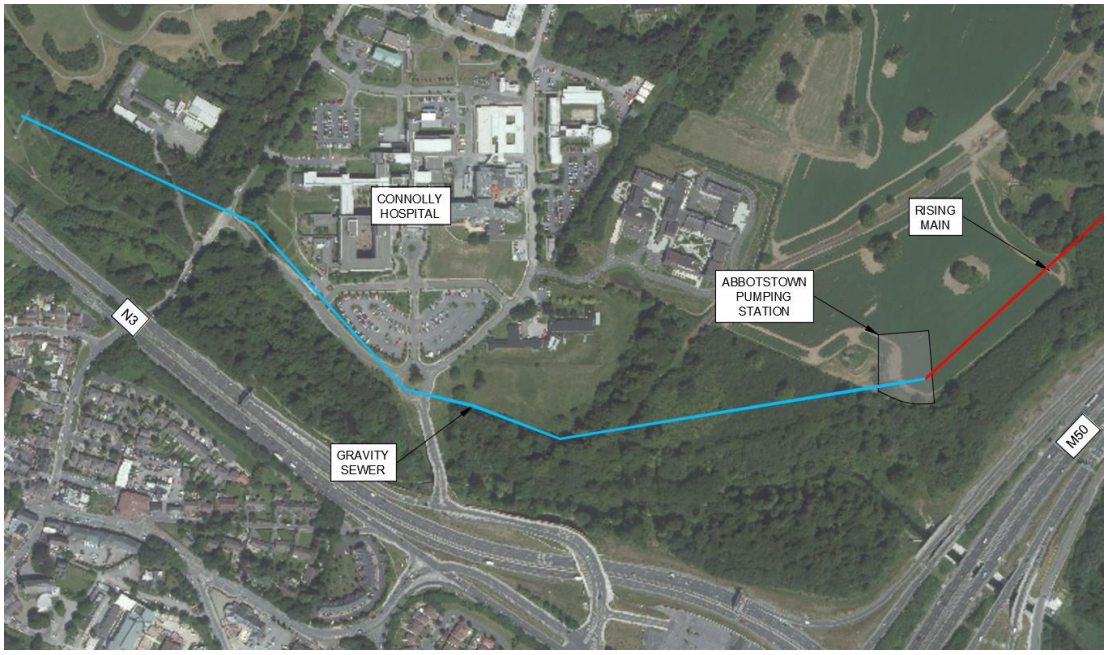

Diagram 21.1: Connolly Hospital Crossing

Natural Features

Significant Watercourses

The Proposed Project will cross six rivers and streams, which generally flow from west to east. The locations at which the proposed orbital sewer route and outfall pipeline route (land based section) will cross these watercourses are shown on Figure 21.9 Watercourses – Crossing Points with Proposed Pipeline Routes. A summary of the watercourse crossing locations is provided in Table 21.5.

The proposed access road to the proposed WwTP site and proposed NFS diversion sewer will require a crossing of the Mayne River.

Much of the Proposed Project will be routed through agricultural lands, many of which will contain land drainage which may require diversion during the works.

There are no canals or other significant manmade watercourses near the Proposed Project.

Table 21.5: Watercourse Crossing Locations

Feature Type	Pipeline Route	Description
Watercourses	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Tributary of Tolka River
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Santry River
	Proposed orbital sewer route (Blanchardstown – Clonshagh)	Mayne River
	Proposed outfall pipeline route (land based section)	Cuckoo Stream
	Proposed outfall pipeline route (land based section)	Tributary of Mayne River
	Proposed NFS diversion sewer	Mayne River

Baldoyle Bay and Portmarnock Beach

The proposed outfall pipeline route (marine section) will cross Baldoyle Bay and Portmarnock Beach and sand dunes. Following discussions with Portmarnock Golf Club, the proposed outfall pipeline route (marine section) shall be located in a manner which will minimise intrusion on the golf course. The appointed contractor(s) shall be required to continue to liaise with Portmarnock Golf Club before and during construction works.

Examination of the marine and coastal zone constraint mapping, mapped during the Preliminary Screening stage of the Alternative Sites Assessment process, identified that significant constraints are posed to the location of an outfall pipeline off the coast of north County Dublin by designated shellfish waters – the Balbriggan/Skerries Shellfish Area and the Malahide Shellfish Area. These designations are provided for under Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (Water Framework Directive) and are to protect and improve shellfish waters in order to support shellfish life and growth.

Two outfall locations were considered during the Alternative Sites Assessment:

- The undesignated area between the Balbriggan/Skerries Shellfish Area and the Malahide Shellfish Area (the northern outfall study area); and
- The undesignated area south of the Malahide Shellfish Area (the southern outfall study area).

The southern outfall was chosen due to:

- The feasibility of tunnelling under the Baldoyle Bay Special Area of Conservation/Special Protection Area and termination within the Rockabill to Dalkey Island candidate Special Area of Conservation. The Proposed Project will be designed, constructed and operated to ensure that it will not adversely affect the integrity of any Natura 2000 sites;

- The southern outfall exhibits better initial dilution and mixing characteristics for the treated wastewater plume than the northern outfall; and
- Tunnelling of the southern outfall poses less technical difficulty than tunnelling of the northern outfall.

The route of the proposed outfall pipeline route (marine section) through these lands is indicated on Diagram 21.2.

Diagram 21.2: Baldoyle Bay and Portmarnock Beach Crossing

Summary of Major Utilities and Natural Features

Table 21.6 provides a summary of the number of crossings of major utilities and natural features by the Proposed Project.

Table 21.6: Crossings of Major Utilities and Natural Features by the Proposed Pipeline Routes

Feature Type	Feature/Infrastructure	No. of Crossings
Major utilities	Gas transmission	3
	High voltage power transmission	23
	Rail – existing	1
	Rail – proposed (Metro Link)	3
	M1 Motorway	1
	N2 National Road	1
	Other significant roads	14
	Water supply – trunk watermains	9
	Wastewater collection – large diameter	3
	Communications infrastructure	1
	Connolly Hospital	1
Natural features	Rivers and streams	6
	Baldoyle Bay and Portmarnock Beach	1

21.2.5 Predicted Potential Impacts

'Do Nothing' Scenario

Should the construction of the Proposed Project not occur, there will be no impact on any of the major utilities or natural features nearby.

'Do Something' Scenario

Should the Proposed Project proceed as planned, it will impact upon the major utilities and natural features near the proposed pipeline routes, as detailed in Section 21.2.4.

The implementation of the mitigation measures as outlined in Section 21.2.6 will ensure that the proposed pipeline routes and the proposed WwTP are designed to take account of the identified assets, major utilities and natural features. The proposed Abbotstown pumping station will not impact major utilities and natural features.

The resulting predicted impact of the Proposed Project will be moderate, negative and short-term.

Worst Case Scenario

The worst case scenario would result if the design of the Proposed Project did not take account of the identified major utilities and natural features, or if the construction methodology employed impacts on the identified major utilities and natural features.

The resulting predicted impact of the worst case scenario for the Proposed Project will be Significant, negative and short-term.

21.2.6 Mitigation Measures

As outlined in Section 21.2.4 major utilities and natural features were taken into consideration when routing the proposed pipeline routes to minimise impacts. Although care has been taken to align the proposed pipeline routes away from major utilities and natural features, the construction and operation of the Proposed Project will have some impact on these in the form of crossings. Following assessment of the potential impacts, the Proposed Project was methodically reviewed and mitigation methods were developed that will avoid, prevent or reduce any negative impacts on the environment as a result of the Proposed Project. The mitigation measures are described below.

Major Utilities

Gas Transmission Infrastructure

The Proposed Project team has had discussions with the owner of the assets (Gas Networks Ireland) who have confirmed in principle that they do not see a major difficulty with the proposed pipeline routes crossing the gas transmission network. The preliminary design of the proposed pipeline routes takes account of the requirement to cross these assets without interfering with them during the Construction Phase or the Operational Phase. The proposed pipeline routes will be designed with a vertical separation distance of 2m to 3m from the crown of the proposed pipeline route to the underside of the gas transmission pipeline at these locations. Crossings will be carried out by means of trenchless techniques to minimise disruption to the services.

Power Transmission Infrastructure

The proposed pipeline routes have been designed, where possible, to avoid OHLs and their support structures, and the design is such that the proposed pipeline routes will be at a deeper level and will pass beneath the electricity infrastructure.

OHLs shall be protected in accordance with the *Code of Practice for Avoiding Danger from Overhead Electricity Line*s (ESB Networks 2008). Should any equipment or machinery be required to pass underneath the OHL, a passageway through barriers will be created which ensures safe clearance distances.

The 38kV power lines crossing the proposed WwTP will have to be diverted prior to works commencing at this site to avoid any disruption. An application has been made to ESB Networks for connection to the National Grid and diversion of the power line. This will be followed up at detailed design stage.

Rail Infrastructure

The proposed outfall pipeline route (land based section) crosses the Dublin-Belfast rail line. The Proposed Project team has had discussions with Irish Rail who have indicated that the proposed crossing point and details are acceptable in principle, subject to the following requirements being met with respect to any crossing of the Dublin-Belfast rail line:

- Crossings shall be a minimum of 4.7m from the crown of the pipe to track bed level;
- Crossings shall be perpendicular where possible;
- If two (or more) crossings are required, they shall be in a single conduit or there should be a separation between them (of the order of 5m);
- Crossings shall not be at track joint positions;
- Crossings shall take account of stanchion locations for OHLs associated with DART trains running on this line; and
- A survey of track position and level will be required.

The current design of the crossing meets with the requirements of Irish Rail, and incorporates a trenchless crossing and a minimum distance of 4.7m from the crown of the proposed outfall pipeline route (land based section) to the rail track level.

Metro Crossings

TII advised that they have no difficulty with the proposed orbital sewer route crossing under the proposed Metro Link or Metro West lines. A depth of 3m below the track is sufficient to mitigate potential impacts and must be included in the final design.

The actual construction methodology for this crossing will be dependent on the actual construction timeframes for the respective projects. However, the preliminary design of the proposed orbital sewer route is such that a trenchless method for crossing will be suitable and implemented, should the Metro infrastructure be in place prior to construction of the Proposed Project. Conventional open cut methods will be suitable at the crossing point should the timeframes of both projects permit.

Motorways, National Primary Roads and Other Roads

The proposed pipeline routes will require crossings of road infrastructure. Previous discussions with TII (formerly the National Roads Authority) confirmed that a formal application to the TII for permission to construct the proposed pipeline routes beneath national roads or motorways, in accordance with Section 53 of the Roads Act, 1993, will be required prior to seeking permission from An Bord Pleanála for planning consent.

TII also confirmed that all crossings must be achieved by trenchless techniques such as tunnelling or directional drilling. Designs for crossings will take into account the road drainage and fibre optic infrastructure, and will mitigate any potential impact on this existing infrastructure. Exact details of each crossing is not required at this time. However, prior to construction, individual designs will be submitted by the appointed contractor(s) for each crossing to the TII for agreement.

A meeting was held in June 2017 with TII, at which TII advised that a letter of support would be provided but that that these documents would not be signed/sealed until planning permission has been granted. Formal applications to TII have been made for the crossings of the N2 National Road and M1 Motorway as requested and in accordance with Section 53 of the Roads Act, 1993.

Water Supply Infrastructure

Following discussions with FCC water operations and DCC water operations, who operated the water supply infrastructure prior to handover to Irish Water, it was confirmed that the major water assets had been identified. FCC and DCC, and now subsequently Irish Water, advised that they do not have any objections in principle and that they would have no issue with the proposed pipeline routes passing beneath their infrastructure. However, normal good practice must be followed. Particular requirements which were identified include:

The proposed orbital sewer route shall go beneath water mains with the following constraints:

- Vertical separation to be a minimum of 500mm;
- Horizontal separation to be 6m; and
- At crossings, there shall be no joints over joints.

The preliminary design of the proposed pipeline routes has taken into account these requirements at all crossing points of water supply infrastructure. However, normal good practice must be followed.

Wastewater Collection Infrastructure

Following discussions with FCC wastewater operations section, it was confirmed that the major wastewater collection infrastructure had been identified. The wastewater operations section did not have any objections to the proposals in principle and advised they would have no issue with the proposed pipeline routes passing beneath their infrastructure.

Communications Infrastructure

A required crossing of the proposed outfall pipeline route (marine section) with the Hibernia Atlantic Ltd. Dublin to Southport submarine cable has been identified as illustrated in Diagram 21.3.

Diagram 21.3: Hibernia Atlantic Ltd. Dublin to Southport Submarine Cable Crossing

Discussions with Hibernia Atlantic Ltd. indicate that there is no requirement for planned maintenance to this cable. Currently, only maintenance to repair damage to the cable is expected to be carried out, if necessary. It was advised that there are significant cost implications if the cable is out of service as the company must lease capacity from other providers to provide a service to their customers.

Hibernia Atlantic Ltd. have indicated that the risks shall be mitigated by providing an engineering solution to protect the subsea cable during the construction of the proposed outfall pipeline route (marine section).

The exact nature of the crossing will be subject to detailed design and approval by Hibernia Atlantic Ltd. prior to the start of construction. However, the outline technical proposal and principles which shall be adhered to for the crossing are detailed below.

The cable location shall be confirmed by the appointed contractor(s) with assistance from the asset owner (Hibernia Atlantic Ltd) by means of inducing a detectable frequency and experienced divers using a probe. The appointed contractor(s) will uncover and mark the cable to mitigate the risk of accidental damage.

In order to construct the section of the proposed outfall pipeline route (marine section) that will have to cross the subsea cable, the subsea cable shall be protected by means of a cable protection system, at which point it will be supported to allow the excavation beneath the cable and installation of the proposed outfall pipeline route (marine section) beneath the cable. Further information on this crossing method is included in the Outline Construction Environmental Management Plan (CEMP).

The exact details of this technical proposal are subject to site investigation, detailed design and agreement with the asset owner (Hibernia Atlantic Ltd). It is also likely that Hibernia Atlantic Ltd. will have some supervisory presence during the works adjacent to the subsea cable.

Connolly Hospital

Following discussions with representatives from Connolly Hospital regarding the proposed orbital sewer route passing through their lands, it was indicated that maintaining access for emergency vehicles throughout the Construction Phase is the most significant issue. In order to ensure that vehicle access is maintained, the Proposed Project will be constructed using trenchless techniques at this location. This will reduce the impact on the lands and ensure emergency vehicle access is maintained to the hospital at all times. Other issues of concern raised by representatives from Connolly Hospital included potential impacts of the Proposed Project on future potential development. This was mitigated through the realignment of the pipeline and the use of a narrower proposed construction corridor width through the hospital lands, and dust and noise management which is covered in Chapters 14 Air Quality, Odour and Climate and Chapter 15 Noise and Vibration in Volume 3 Part A respectively.

Natural Features

Significant Watercourses

Inland Fisheries Ireland indicated at a meeting that, in the first instance, all crossings of watercourses shall be undertaken using trenchless techniques where practicable. However, should this prove unworkable then each watercourse crossing technique must be agreed in advance with Inland Fisheries Ireland and shall be designed and planned to take place during a time that will minimise impacts on the aquatic environment and fish populations.

The proposed NFS diversion sewer will be constructed using trenchless techniques and will be routed under the Mayne River. The proposed access road to the proposed WwTP will, however, require a crossing of the Mayne River. This will be achieved by installing a single box culvert in the Mayne River, ensuring that there will be minimal disruption to the Mayne River.

An application for consent under Section 50 of the Arterial Drainage Act, 1945 is required for this crossing, and this is currently being progressed through Irish Water.

Land Drainage

The proposed pipeline routes will cross agricultural lands, many of which will contain land drainage. There is no readily available mapping of such drainage. These drains will be identified during the Construction Phase by the appointed contractor(s). Affected land drains will be redirected in a manner that maintains existing land drainage, and these drains shall be reinstated appropriately. Any drains intercepted will be marked and mapped to allow for proper reinstatement of these drains at completion. Appropriate construction monitoring, including Agricultural Liaison Officers, will be employed during the Construction Phase.

Baldoyle Bay and Portmarnock Beach

The proposed outfall pipeline route (marine section) will be tunnelled from a launch compound (proposed temporary construction compound no. 10) east of Baldoyle Bay to a reception shaft (proposed temporary construction compound no. 9) on the west of Baldoyle Bay. The proposed outfall pipeline route (marine section) will also be tunnelled to a subsea interface east of Portmarnock Beach. The implementation of trenchless techniques mitigates the impact the proposed outfall pipeline route (marine section) would otherwise have on these assets. The Proposed Project team undertook extensive consultation and detailed consideration of the proposed outfall pipeline route (marine section) to ensure that the impact on Portmarnock Golf Club and public amenities were minimised. Following discussions with Portmarnock Golf Club, the proposed outfall pipeline route (marine section) was located in a manner which will minimise intrusion on the golf course. The appointed contractor(s) shall be required to continue to liaise with Portmarnock Golf Club before and during construction works. The public amenities, such as the existing car park and public walkway to the beach, have been considered through the design process also. The majority of the carpark will be kept operational through the Construction Phase and the walkway to the beach will remain open.

21.2.7 Residual Impacts

The potential for the Proposed Project to impact or interrupt utility supply has been assessed. All utility services near the Proposed Project have been identified and include transport infrastructure and natural features. Locations where the proposed pipeline routes cross existing infrastructure have been identified.

Discussions have been held with all asset owners and their requirements have been identified and incorporated into the design. While there is interaction between the Proposed Project and existing infrastructure, the locations of interaction have been identified and planned for, and therefore, the potential for interruption is limited. As such, it is considered that the resulting predicted impacts to major utilities and natural features will be moderate, negative and short-term, as a result of the Proposed Project.

21.3 Raw Materials

21.3.1 Introduction

In this Section, the baseline environment is examined with regards to raw materials which will be required throughout the Construction Phase of the Proposed Project. Potential impacts on the surrounding environment resulting from the Proposed Project are evaluated, and appropriate mitigation measures are proposed.

The main types of materials that will be required during the Construction Phase of the Proposed Project include:

- Aggregates for pipe bedding and surround;
- Various pressure and gravity pipes for the proposed orbital sewer route and the proposed outfall pipeline route (land based section and marine section);

- Materials for chamber and manhole construction;
- Concrete: precast elements, concrete blocks and ready-mix concrete;
- Structural steel;
- Insulation materials;
- Glass, roof slates and other building materials; and
- Mechanical and electrical equipment.

Materials required during the Construction Phase of the Proposed Project will be sourced from local suppliers, where possible. This will include the use of bedding material from local quarries and general construction materials.

21.3.2 Methodology

This Section assesses the impacts that the import of materials for the Proposed Project will have on the surrounding environment. The type of materials required are outlined in Section 21.3.1.

A desktop review was undertaken to determine which materials can be sourced from the area and those which will have to be imported from outside the vicinity of the Proposed Project. The predicted impacts are analysed in this Section in accordance with the criteria set out in Section 21.2.3 and the measures to mitigate these impacts are identified in this Section. Finally, the residual impacts of the Proposed Project on raw materials following implementation of the mitigation measures are discussed.

21.3.3 Baseline Environment

There are various sources of materials in the Greater Dublin Area near to the proposed pipeline routes. There are various quarries where aggregates and concrete products can be sourced (refer to Figure 21.10 Quarry Locations in the Greater Dublin Region).

Some of the materials required for the construction of the Proposed Project are not manufactured in Ireland, such as ductile iron pipes and polyethylene pipes, and will have to be imported.

Natural Resources

Stone will be used for pipe and bedding surround. It is estimated that approximately 84,200m^3 of material will be sourced from quarries in the region. Efforts will be made to reuse and recycle as much of the generated excess material as practicable during construction to construct proposed temporary access roads, temporary working areas and temporary construction compounds.

Topsoil will be stockpiled and stored on-site to be reused again for the same purpose. Any subsoil arising from the excavation will similarly be stored on-site to be reused as backfill. For further details, refer to Chapter 20 Waste in Volume 3 Part A of this EIAR.

Bentonite, which will be required for tunnelling operations, will be imported and mixed with water on-site to the required consistency. The quantity of bentonite required will be minimised through the recycling of drilling fluid. Bentonite is classified as a hazardous material and will be treated as such. It will be stored and handled within a contained unit. Any surplus bentonite generated will be disposed of at a suitably licensed waste facility.

Water will be required for various activities that occur during the Construction Phase, such as tunnelling operations, hydrostatic testing, welfare facilities and washing and cleaning of plant and machinery. Water will be

sourced locally from watermains or other sources. This will be recycled and disposed of appropriately in accordance with the Outline CEMP for construction.

Other Resources

Concrete will be required during the Construction Phase for a number of aspects of the work, including:

- The proposed Abbotstown pumping station;
- The proposed WwTP.
- Proposed temporary construction compounds utilised for tunnelling;
- Launch and reception shafts;
- Chambers; and
- Thrust and anchor blocks;

There will also be structural steel imported for the construction of the proposed Abbotstown pumping station and the proposed WwTP along with concrete blocks, roof slates and wall and roof panels.

Concrete segments for the proposed Abbotstown pumping station and tunnel access shafts will be manufactured off-site and delivered to the proposed temporary construction compound, when required. Any waste concrete generated during the Construction Phase is classified as a construction and demolition waste and will be crushed and used as backfill, where possible. Any excess material will be transported to a suitably licensed facility for recycling or disposal in accordance with the measures detailed in Chapter 20 Waste in Volume 3 Part A of this EIAR.

Other materials, such as concrete blocks, structural steel, roof slates and roof and wall panels, will also be imported.

The most significant impact resulting from the import of materials will be the increase in traffic on the roads surrounding the Proposed Project. The impacts and mitigation measures associated with traffic and transportation for the Proposed Project are described in more detail in Chapter 13 Traffic and Transport in Volume 3 Part A of this EIAR.

21.3.4 Predicted Potential Impacts

'Do Nothing' Scenario

Should the construction of the Proposed Project not occur, there will be no impact on the raw materials nearby.

'Do Something' Scenario

The sourcing of materials during the Construction Phase of the Proposed Project will have an imperceptible impact on the existing natural resources and other resources available. The quantities of raw material required will be reduced where possible through the reuse of suitable materials generated during the Construction Phase. There will be an increase in traffic on the surrounding roads due to the number of Heavy Goods Vehicles required to transport the material (refer to Chapter 13 Traffic and Transport in Volume 3 Part A of this EIAR).

The resulting predicted impact of the Proposed Project will be Imperceptible, negative and permanent.

Worst Case Scenario

A significant impact on raw materials near the Proposed Project would result if there is no reuse of materials on-site or no mitigation measures employed throughout the Proposed Project. This would require the removal of all

excavated materials from site and the importation of material required for backfill and surround. There will be a much higher volume of traffic on the surrounding roads should the worst case scenario occur.

Should there be a complete requirement for raw materials to be imported, this will have an increased Significant impact upon natural and other resources. The predicted impact in the worst case scenario is Significant, negative and permanent.

21.3.5 Mitigation Measures

Consideration will be given to the sustainable sourcing of all materials. Materials arising from the excavation of the open cut and trenchless methods will be reused where possible. This, and the methodologies chosen at design stage, will result in a decrease in the amount of imported material, in turn reducing the impact of traffic on the surrounding roads and resulting in less demand on non-renewable sources such as quarries.

Bentonite used for the tunnelling process will be recycled within a closed system during tunnelling, thereby minimising the quantity required.

Other mitigation measures which will be employed in relation to raw materials are outlined below:

- Design will be optimised to minimise the requirements for raw materials;
- Materials will be reused where possible (such as excavated rock);
- Raw materials will be sourced locally where possible; and
- Raw materials will be managed in accordance with the Outline CEMP for construction.

21.3.6 Residual Impacts

The potential for the Proposed Project to impact natural and other resources has been assessed, and it is noted that if the Proposed Project proceeds it will require the use of non-renewable materials.

Mitigation measures, where materials generated during the course of the Proposed Project are reused on-site, have been identified and shall be adhered to. These measures include the use of surplus excavated material as landscaping material or sub-bases for the site roads and hardstanding or the crushing and screening of rock for use as aggregate. This approach will result in a significantly reduced requirement for the import of raw materials for the Construction Phase of the Proposed Project. For further details, refer to Chapter 20 Waste in Volume 3 Part A of this EIAR.

The resulting residual impact upon raw materials near the Proposed Project will be Imperceptible, negative and permanent.

21.4 Difficulties Encountered in Compiling Required Information

No difficulties were encountered when compiling information for this Chapter.

21.5 References

Department of the Environment, Community and Local Government (2013). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.

Environmental Protection Agency (2002). Guidelines on the Information to be Contained in Environmental Impact Statements.

Environmental Protection Agency (2003). Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.

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Environmental Protection Agency (2015b). Revised Guidelines on the Information to be Contained in Environmental Impact Statements.

Environmental Protection Agency (2017). Draft Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.

ESB Networks (2008). Code of Practice for Avoiding Danger from Overhead Electricity Lines.

Jacobs Tobin (2018). Greater Dublin Drainage Routing Report.

Directives and Legislation

Arterial Drainage Act 1945

European Union (1985). Directive 85/337/EEC of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment [1985].

European Union (2006). Directive 2006/113/EC of the European Parliament and of the Council of 12 December 2006 on the quality required of shellfish waters [2006].

European Union (2014). Directive 2014/52/EU of 16 April 2014 on the assessment of the effects of certain public and private projects on the environment [2014].

Planning and Development Regulations 2001 – S.I. No. 600 of 2001

Roads Act 1993