BALLINA FLOOD RELIEF SCHEME

Environmental Impact Assessment Report
Chapter 16: Material Assets: Waste and Utilities

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ACRONYMS

Term	Meaning
CDWMP	Construction and Demolition Waste Management Plan
CEMP	Construction Environmental Management Plan
CIA	Cumulative Impact Assessment
CSO	Combined Sewer Overflow
EC	European Commission
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
EU	European Union
FRS	Flood Relief Development
GNI	Gas Networks Ireland
GPR	Ground Penetrating Radar
I	Health and Safety Authority
HV	High Voltage
IEMA	Institute of Environmental Management and Assessment
LV	Low Voltage
mBGL	Metres below ground level
MCC	Mayo County Council
MV	Medium Voltage
kV	Kilovolt
OPW	Office of Public Works
OSi	Ordnance Survey Ireland
TII	Transport Infrastructure Ireland
WMP	Waste Management Plan
ZoI	Zone of Influence

16 MATERIAL ASSETS: WASTE AND UTILITIES

16.1 Introduction

This chapter of the EIAR identifies, describes and presents an assessment of the likely significant effects of the Proposed Scheme on material assets (waste and utilities). The assessment examines the potential impacts during the construction, operational and maintenance phases of the Proposed Scheme as outlined in **Chapter 5: Project Description**

Material Assets within the context of utilities and waste facilities are defined within the Environmental Protection Agency (EPA, 2015) "Draft Advice Notes for Preparing Environmental Impact Statements" as *'resources that are valued and that are intrinsic to specific places.'* The (EPA, 2022) "Guidelines on the Information to be contained in Environmental Impact Assessment Reports" states '*material assets can now be taken to mean built services and infrastructure'* and lists built services and waste management as typical topics for consideration under material assets. This assessment investigates built services including electricity, telecommunications, gas, water supply, sewerage infrastructure and waste management.

This chapter also investigates waste likely to arise from the site enabling works, construction, operation, and maintenance works required for the Proposed Scheme. The chapter outlines how materials and waste arising from the Proposed Scheme will be managed in accordance with the principles of the waste hierarchy as outlined in the European Communities revised Waste Framework Directive i.e., prevention, reduction, preparing for reuse, recycling, other recoveries, and, as the least preferred option, disposal (which includes landfilling and incineration without energy recovery).

16.2 Methodology

16.2.1 Legislation, Policy and Guidance

There is no specific legislation or guidance relating to the assessment of Material Assets: Utilities. The material assets: utilities and waste impact assessment has therefore followed the overall methodology and guidance relating to the process and preparation as set out in **Chapter 1: Introduction**. The impact of the Proposed Scheme on utilities has been assessed for the construction and operational phases by considering the impacts to electricity, telecommunications, gas, water supply and sewerage infrastructure.

Specific legislation relating to waste management which has been considered within this chapter of the EIAR includes:

- Waste Framework Directive (2008/98/EU), as amended by Directive (EU) 2018/851.
- Waste Management Acts 1996 to 2016, as amended.
- European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), as amended.

It is noted that the Waste Directive Regulations 2011, as amended, set out the exclusions from the scope of the 2008 directive which includes the following under Article 3(1)(c):

> "… *uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which is was excavated*".

Materials arising from the Proposed Scheme which fall within this provision are therefore not subject to the requirements of EU and national waste legislation.

Furthermore, Article 27 of the same regulations allows an economic operator to determine, under certain circumstances, that a material is a by-product and is not a waste. Article 27 was introduced into Irish law to implement Section 5 of the Waste Framework Directive (2008/98/EU), as amended. Excess soil and stone produced during construction activities will be classed as a by-product if it meets each of the four by-product conditions as follows:

a. Further use of the substance or object is certain.

b. The substance or object can be used directly without any further processing other than normal industrial practice.

c. The substance or object is produced as an integral part of a production process.

d. Further use is lawful in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

The key components of EU, national and local policy legislation and guidance which have influenced the Proposed Scheme are summarised as follows:

- Prevention of waste is the preferred option such that any surplus materials generated are reused within the Proposed Scheme. This means that products, materials, and resources are maintained at their highest value in the economy for as long as possible, the generation of waste is minimised, and the principles of circular economy are implemented.
- Where construction waste is generated, it should be source-separated to facilitate reuse, recycling and maximise diversion of waste from landfill.
- Where waste cannot be prevented, reused, or recycled, it should be transported and disposed of in accordance with the Waste Management Acts 1996 to 2016, as amended.
- Waste may only be transferred from site by a waste collection permit holder and delivered to an authorised waste facility i.e. a facility which holds a Certificate of Registration, Waste Facility Permit or Waste Licence.

The methodology and associated impact assessment has had regard to the general guidance regarding the undertaking of an EIA (as presented in **Chapter 1: Introduction**) and the following topic-specific guidance:

- EPA (2021) *Best Practice Guidelines for the Preparation of Resources & Waste Management Plans for Construction and Demolition Projects*.
- IEMA (March 2020) *Guide to Materials and Waste in Environmental Impact Assessment*.
- EPA (2020) *Guidance on Waste Acceptance Criteria at Soil Recovery Facilities*.
- EPA (2020) *By-Product – Guidance Note, A Guide to By-products and Submitting a By-product Notification Under Article 27 of the European Communities (Waste Directive) Regulations 2011 (S.I. No 126 of 2011).*
- EPA (2019) *Guidance on Stone and Soil By-Products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011.*
- TII (2017) *The Management of Waste from National Road Construction Projects, GE-ENV-01101*.

16.2.2 Zone of Influence

There are no guidelines or criteria to define the size of the zone of influence (ZoI) for the assessment of material assets. The material assets study area has been defined by RPS for the purpose of this assessment as the area in which there is potential for direct and indirect impact on built services (including waste facilities) because of the Proposed Scheme. This includes the site of the Proposed Scheme where potential for direct impacts may occur and an area extending 500 m from the site boundary where there is potential for indirect impacts on receptors as a result of disruption to built services. The ZoI, in terms of waste generated, will be the Ulster-Connaught Waste Region.

16.2.3 Sources of Information to Inform the Assessment

Information on material assets within the study area was collected through a detailed desktop review of existing studies and datasets, details of which are outlined in **Table 16-1**.

Table 16-1: Summary of key Desktop Reports

Title	Source / Author	Year
Mayo County Development Plan 2022-2028	Mayo County Council (MCC)	2022
Ballina Town & Environs Plan 2021-2027	MCC	2022
Base mapping	OSi	2022
Base mapping	Google Earth imagery	2022
GeoDirectory	An Post	2022

Title	Source / Author	Year
Utility Providers existing assets data (to inform baseline mapping for the assessment)	Gas Networks Ireland (GNI), EirGrid, Electricity Supply Board (ESB), Uisce Éireann	2022
ComReg Site Viewer	ComReg	2022
EPA Website	EPA	2022
National Waste Statistics – Summary Report for 2020	EPA	2022
Construction and Demolition Waste Stone and Soil Recovery / Disposal Capacity	Dublin City Council (on behalf of the Regional Waste Management Offices)	2015
Construction and Demolition Waste Stone and Soil Recovery / Disposal Capacity Update Report	Regional Waste Management Planning Offices	2020
National Hazardous Waste Management Plan 2021-2027	EPA	2021

16.2.4 Key Parameters for Assessment

The key parameters for assessment that have potential to result in likely significant effects on waste and utilities are outlined below:

- Drainage network (foul, combined and storm).
- Degree of conflicts with built services including electricity networks, communication networks, gas networks and water supplies.
- Level of temporary diversions / interruptions to service during construction.
- Waste emissions arising from the Proposed Scheme which are considered in terms of the disposal route to recycling and/or recovery and/or landfill and/or energy recovery.
- Other material arising from the Proposed Scheme i.e. soil and stone, is considered in terms of sustainable diversion from the disposal/recovery tier via by-product classification to other facilities as part of the Article 27 notification process.

Requirement for alterations for permanent reinstatement of services e.g. relocation, provision of new or modified services, changes to maintenance access arrangements.

16.2.5 Assessment Criteria and Significance

The following tables (**Table 16-2** to **Table 16-4**) consider the sensitivity of the various utilities and waste facilities. The magnitude of the impacts that could arise as a result of the Proposed Scheme and the significance of impacts has also been considered. These assessments are broadly based on the requirements of the EPA Guidelines (2022).

Table 16-2: Definition of Terms Relating to the Magnitude of an Impact

Magnitude of impact	Definition
High	**Utilities:** Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements (Adverse).
	Waste: Waste generated by the development will reduce regional* landfill / incineration capacity by >10% for inert, non-hazardous waste. Waste generated by the development will reduce national landfill / incineration capacity by >1% for hazardous waste.
Moderate	**Utilities:** Loss of resource, but not adversely affecting integrity of resource; partial loss of/damage to key characteristics, features or elements (Adverse).
	Waste: Waste generated by the development will reduce regional* landfill / incineration capacity by 6-10% for inert, non-hazardous waste. Waste generated by the development will reduce national landfill / incineration capacity by <0.5-1 for hazardous waste.
Minor	**Utilities:** Some measurable change in attributes, quality or vulnerability, minor loss or, alteration to, one (maybe more) key characteristics, features or elements (Adverse).
	Waste: Waste generated by the development will reduce regional* landfill / incineration capacity by 1-5% for inert, non-hazardous waste. Waste generated by the development will reduce national landfill / incineration capacity by <0.1-0.5% for hazardous waste.
Negligible	**Utilities:** Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse).
	Waste: Waste generated by the development will reduce regional landfill / incineration capacity by <1% for inert, non-hazardous material. Waste generated by the development will reduce national landfill / incineration capacity by <0.1% for hazardous material.

Table 16-3: Definition of Terms Relating to the Sensitivity

Sensitivity	Definition
High	**Utilities:** High importance, national scale and limited potential for substitution: • High Pressure (HP) gas pipelines. • Electricity overhead lines (OHL) and underground cables >38 kV. • Transmission pipelines (potable water). • Large scale foul water infrastructure. • RNLI or large commercial or fishing vessels.
	Waste: No or extremely limited capacity / outlets to accept waste in region.
Moderate	**Utilities:** High or medium importance, regional scale, limited potential for substitution: • Medium Pressure (MP) and Low Pressure (LP) gas pipelines. • Electricity OHL and underground cables <38 kV. • Distribution pipelines (potable water). • Small scale foul water infrastructure and local collection systems. • Telecommunications infrastructure. • Moderate sized commercial vessel or recreational craft.
	Waste: Limited capacity / outlets to accept waste in region.
Minor	**Utilities:** Low or medium importance, local scale: • Local connections for water. • Electricity OHL and underground cables – low voltage.
	Waste: Capacity / outlets available to accept waste in region.
Negligible	**Utilities:** Low importance, local scale: • Domestic connections for service. • Small recreational vessels and associated infrastructure.

Sensitivity	Definition
	Waste: No expected issues with capacity / available outlets to accept waste in region.

The significance of the effect upon built infrastructure is determined by correlating the magnitude of the impact and the sensitivity of the receptor. The range of significance of effect is presented in **Table 16-4**. The final assessment for each effect is based upon expert judgement.

For the purposes of this assessment, any effects with a significance level of slight or less have been concluded to be not significant in terms of the EIA Regulations.

Table 16-4: Matrix used for the Assessment of the Significance of the Effect

Sensitivity of receptor	Magnitude of impact			
	Negligible	**Minor**	**Moderate**	**High**
Negligible	Imperceptible	Imperceptible or slight	Imperceptible or slight	Slight
Minor	Imperceptible or slight	Imperceptible or slight	Slight	Slight or moderate
Moderate	Imperceptible or slight	Slight	Moderate	Moderate or major
High	Slight	Slight or moderate	Moderate or major	Major or profound

16.2.6 Data Limitations

No data limitations were encountered in the preparation of the material assets assessment.

16.2.7 Consultation

Meetings and follow up consultations were arranged with stakeholders at all phases of the Proposed Scheme. Comments and queries from stakeholders informed design and are addressed throughout this report and summarised in **Table 16-5**.

Table 16-5: Summary of Key Consultation Issues Raised relevant to Material Assets

Date	Consultee	Response	Addressed within the Chapter
July 2020	Gas Networks Ireland	Gas networks present within study area.	Design team contacted Gas Network Ireland and identified areas of potential conflict, see **Section 16.4.1.1**.
June 2020	Irish Rail	Railway in Ballina is situated some distance from the River Moy (≥160m) and is somewhat elevated from the areas that are a high flood risk alongside the river.	No action required
August 2020	Uisce Éireann	Uisce Éireann request continued engagement through the feasibility, design, and construction stages in order to ensure public water services and sources are protected and access is maintained. Measures had been outlined on what to do through the course of the development.	Identified areas of conflict are detailed in **Section 16.4.1.1**.
July 2020	Siro	No network within the area.	No action required.
July 2020	Three Ireland	Received notification that there are no Three Ireland Sites that could be affected, however, there is an ESB mast that also hosts Eir and Vodafone services.	Telecommunications are identified in **Section 16.4.1.1**.

Date	Consultee	Response	Addressed within the Chapter
October 2020	Virgin Media	Existing Virgin Media underground services adjacent to and in the vicinity. A Virgin Media Plant Protection Officer would need be present during the work. Virgin Media have sent an AutoCAD layout.	Telecommunications are identified in **Section 16.4.1.1**.

16.3 Description of the Existing Environment

16.3.1 Baseline Environment Utilities

A review of existing utilities and associated infrastructure was undertaken as part of the design development process. The utility providers identified within, or adjacent to, the footprint of the Proposed Scheme include:

- **Electricity Supply:** ESB Networks
- **Water Mains and Foul Sewers:** Uisce Éireann
- **Telecommunications:** Eir, Virgin Media, E-Net
- **Gas Networks:** Gas Networks Ireland

Affected services within the Proposed Scheme are identified in **Section 16.4.1.1**.

Drawings showing the approximate locations of known services are provided in **Appendix 16.1**.

These drawings were prepared following liaison with the various service providers.

16.3.1.1 Electricity Supply

The identified power infrastructure consists of a mix of overhead lines (OHLs) and underground cables. A number of High Voltage (HV), Medium Voltage (MV) and Low Voltage (LV) overhead lines and cables are noted across the Proposed Scheme area. Underground ESB cables are present in all locations of the Proposed Scheme. Overhead ESB lines are only present in the Bunree and Brusna part of the Proposed Scheme.

16.3.1.2 Water Mains

Water mains are located throughout the Proposed Scheme at several locations, as follows:

- Moy
- Quignamanger
- Bunree
- Brusna

No details of the depth of water mains were available from accessible databases. GPR survey data has been acquired for sections along the River Moy. Where data is unavailable it is assumed that water mains range from approximately 1 m to 1.2 m below ground level (mBGL).

Uisce Eireann were contacted in relation to the Proposed Scheme and provided drawings indicating the affected utilities including proposed diversion. Uisce Éireann did not indicate at the time if there were any future plans to alter services in the area.

The proposed Ballina and Lough Talt Water Supply Upgrade Project[1] comprises the upgrade of the water supply network within Ballina town, an increase to the capacity of the network to allow for future growth and development, and upgrade to the water treatment facilities at Lisglennon. The proposed upgrade to the

[1] Uisce Éireann *Ballina and Lough Talt Water Supply Upgrade Project | Uisce Eireann*

supply network includes works along the Creggs Road, approximately 3m from the proposed Ballina FRS footprint. Should both the Proposed Scheme and the proposed Ballina and Lough Talt Water Supply Upgrade Project be consented, it is likely construction phases for both projects may be undertaken at the same time. Mitigation and monitoring measures detailed in section 16.4 and 16.5 below will ensure there are no significant adverse effects on utilities infrastructure and connectivity as a result of the proposed FRS. Refer to Chapter 20 interactions and Cumulative Effects for a discussion on the potential cumulative effects of both projects.

16.3.1.3 Sewers

In Ballina, surface water, foul water, combined (foul water and storm water) sewers and overflows run under the carriageway and footpaths on all sections of the Proposed Scheme. There are existing wastewater pumping stations in the proximity of the works e.g. Bachelors Walk PS. Gravity inlets, surface water overflows and discharge pipework are adjacent to/ crossing the Proposed Scheme.

Uisce Eireann records indicate that foul and combined sewers will be encountered during the construction of the Proposed Scheme.

Some details of the depth of sewers are available from Uisce Eireann from accessible databases. This information was referenced where available to assess conflicts with proposed infrastructure.

16.3.1.4 Telecommunications

Eir, Virgin Media and E-Net underground and overhead services are encountered along the Proposed Scheme at several locations, as follows:

- Moy
- Quignamanger
- Bunree
- Brusna

Eir, Virgin Media, E-Net, BT, three and Vodafone were contacted in relation to Proposed Scheme and were provided with drawings indicating the affected utilities. None of the stakeholders indicated any future proposals to alter services in the area.

16.3.1.5 Gas Networks

Low and medium-pressure gas networks occur across all sections of the Proposed Scheme.

16.3.2 Baseline Environment Waste Facilities

Table 16-6 shows licenced waste facilities in county Mayo that may be considered for the disposal of material and waste streams generated by the Proposed Scheme. MCC provides two civic amenity sites (Recycling centres), one located at Derrinumera, Newport, and the other located at Rathroeen, on the Killala Road outside Ballina. These facilities variously include integrated waste management, soil recovery, waste transfer, and landfill facilities. Detailed information on each of these facilities can be found on the EPA website.

Table 16-6: Facilities Operating under Waste Licence in County Mayo

Facility Name	License Code	Distance from Proposed Scheme (km)	Permitted Intake/ Total Capacity	Waste/ Material Authorised	Facility Type
Derrinumera Landfill Facility, Newport	W0021-03	45	38,630 tonnes	• Municipal sludge	Landfill
Rathroeen Landfill, Ballina	W0067-02	5	44,600 tonnes	• Household • Commercial • Construction	Landfill

Facility Name	License Code	Distance from Proposed Scheme (km)	Permitted Intake/ Total Capacity	Waste/ Material Authorised	Facility Type
				• Demolition • Non-Hazardous industrial • Public Cleansing • Parks waste	
McGrath Industrial Waste Ltd., Castlebar	W0143-01	39	95,000 tonnes	• Construction • Demolition • Household • Commercial • Industrial	Waste Transfer Station
Srahmore Peat Deposition Site, Bangor-Erris	W0199-01	44	225,000 tonnes	• Peat	Landfill
Lennon Quarries Limited, Belmullet	W0256-02	55	24,900 tonnes	• Soil • Stone	Soils Recovery Facility
Mullafarry Quarry Ltd	COR-MO-15-0039-02	10	24,500 tonnes	• Construction • Earthwork waste • Metal	Waste Recovery Facility
P & D Lydon Plant Hire Ltd	COR-MO-19-0059-01	32	24,999 (Construction 2,499 tonnes. Earthworks 2,499 tonnes).	• Construction • Earthwork waste	Recovery
Michael Monaghan	COR-MO-20-0065-01	55	25,000 tonnes (24,500 recovery inert waste)	• Earthworks	Recovery/ Recycling
Wills Bros, BAM Joint Venture	WFP-MO-20-0048-01	34	200,000 tonnes	• Earthworks	Recovery/ Recycling
JP Gibbons	COR-MO-20-0064-01	33	10,000 tonnes (8,000 tonnes dredged spoils earthworks and 2,000 tonnes inert waste)	• Construction • Earthworks	Recycling
VK Agri Recycling Ltd.	WFP-MO-10-0009-03		10,000 tonnes	• Plastics • Wood packaging	Recycling and storage
Michael Cannon	COR-MO-19-0057-01	42	9,000 tonnes	• Earthworks	Recovery
Erris Home Property Development Ltd	COR-MO-19-0060-01	42	35,000 tonnes (17,000 tonnes for recovery of dredge spoil and 17,000 tonnes for recovery of inert waste).	• Construction • Earthworks	Recovery
Sean & Majella Mulchrone	WFP-MO-19-0045-01	33	150,000 tonnes (100,000 tonnes for recovery of dredge spoil and 50,000 tonnes of inert waste).	• Construction • Earthworks	Recycling
Wills Bros, BAM Joint Venture	WFP-MO-20-0052-01	27	200,000 tonnes	• Earthworks	Recycling
Wills Bros, BAM Joint Venture	WFP-MO-20-0056-01	36	200,000 tonnes	• Earthworks	Recycling

Facility Name	License Code	Distance from Proposed Scheme (km)	Permitted Intake/ Total Capacity	Waste/ Material Authorised	Facility Type
Coolturk Quarries Ltd	WFP-MO-15-0035-02	17	530 tonnes (200,000 tonnes recovery of inert waste, 100,000 tonnes for recovery of dredge spoil, 200,000 tonnes for non-hazardous waste and 30,000 tonnes for storage and transfer of non-hazardous waste.)	• Forestry • Construction • Metals • Earthworks	Recycling, storage and transfer.
Wills Bros, BAM Joint Venture	WFP-MO-20-0053-01	36	200,000 tonnes	• Earthworks	Recycling
Loftus Skip Hire	WFP-MO-20-0058-01	0.600	15,000 tonnes	• Earthworks • Construction • Street Cleaning Residue • Metals • Batteries • Vehicles • Packaging	Recycling and storage
McNamara Car Dismantlers & Co.	WFP-MO-11-0016-03	46	1,000 tonnes	• End of life Vehicles	Recycling and Storage
Shamrock Metal Recyclers	WFP-MO-10-0008-03	0.5	700 tonnes	• End of life Vehicles • Metals	Recycling and Storage
Mangan Concrete & Haulage Ltd	WFP-MO-20-0059-01	12	99,603 tonnes	• Earthwork	Recycling
Harrington Concrete & Quarries	WFP-MO-21-0062-01	25	100,000 tonnes	• Construction • Earthworks	Recycling
Sweeney Recycling	WFP-MO-11-0019-03	30	12,100 tonnes	• Packaging (Wood, plastic, metallic, cardboard). • Plastics • Metals • Mixed Municipal Waste	Storage and Recycling
County Plant Hire Ltd	COR-MO-21-0067-01	38	25,000 tonnes	• Earthwork	Recycling
Wills Bros, BAM Joint Venture	WFP-MO-20-0057-01	38	200,000 tonnes	• Earthwork	Recycling
Quignashee Plant Hire	COR-MO-21-0068-01	0.5	25,000 tonnes (incl. 4,500 tonnes of inert waste)	• Construction • Earthwork	Recycling
Heatsystems	WFP-MO-18-0043-02	44	37,000 tonnes (Only allows 3,650 tonnes of hazardous waste)	• Drilling earthwork waste • Forestry • Agricultural • Sludges • Plastics • Hazardous	Recycling

Facility Name	License Code	Distance from Proposed Scheme (km)	Permitted Intake/ Total Capacity	Waste/ Material Authorised	Facility Type
				• Organic and inorganic • Absorbents • Earthworks • Biodegradable	
BIGbin Waste Tech Ltd	COR-MO-21-0069-01	52	1,000 tonnes	• Household	Storage
Noone Civil Engineering & Construction Ltd	COR-MO-21-0070-01	14	25,000 tonnes	• Earthwork • Construction •	Recycling Land Treatment
BIGbin Waste Tech Ltd	COR-MO-21-0071-01	0.700	1,000 tonnes	• Household waste	Storage
Mark Carr	COR-MO-22-0073-01	9	11,000 tonnes	• Construction • Demolition • Earthworks	Recycling
Dominick O'Reilly Transport Services Ltd.	WFP-MO-17-0039-02	40	10,000 tonnes	• Sludges • End of life vehicles	Storage Transfer Recycling
Shaws Commercials	COR-MO-22-0075-01	29	200 vehicles / annum	• End of life vehicles	Storage
Patrick King	WFP-MO-22-0063-01	32	164,000 tonnes (25,000/ annum)	• Earthworks	Land Treatment
Jackson Engineering (Castlebar) Limited	WFP-MO-12-0023-03	28	20,000 tonnes	• Metals • Packaging • End of life vehicles	Storage Recycling
EirTrade Aviation Ireland Ltd	WFP-MO-17-0041-02	30	5,000 tonnes	• Metals • Packaging • End of life vehicles	Storage Recycling
Finnegans Sand Limited	WFP-MO-22-0064-01	44	100,000 tonnes	• Earthworks	Recycling
Harrington Concrete and Quarries	WFP-MO-22-0065-01	32	195,000 tonnes	• Earthworks	Recycling
Pat King	COR-MO-18-0051-02	32	5,000 tonnes	• Construction • Metals	Recycling
McGrath Industrial Waste Limited	WFP-MO-13-0030-03	28	24,800 tonnes	• Construction • Metals • Earthwork • Household • Packaging	Recycling
Michael O' Haire Plant Services & Ground Works	WFP-MO-23-0066-01	42	100,000 tonnes	• Earthwork	Recycling
P&D Lydon Plant Hire Limited	WFP-MO-23-0067-01	33	49,000 tonnes	• Earthwork	Recycling
Aughagower Community Development CLG	COR-MO-18-0052-02	42	25,000 tonnes (soil and stones – 24,500 tonnes. Concrete – 150 tonnes. Bricks – 200 tonnes. Tiles and	• Construction • Earthworks	Recycling Land treatment

Facility Name	License Code	Distance from Proposed Scheme (km)	Permitted Intake/ Total Capacity	Waste/ Material Authorised	Facility Type
			ceramics – 150 tonnes).		
Lennon Quarries Ltd	WFP-MO-14-0034-02	49	50,000 tonnes	• Construction • Packaging • Metals • Earthwork	
Bourke Waste Removals Ltd	WFP-MO-19-0044-01	37	25,000	• Packaging • Batteries • Metal	
CJ Sheeran Ltd	WFP-MO-10-0014-03	52	25,000	• Packaging	Storage Recycling
Cooneal Infill	WFP-MO-23-0068-01	5		• Construction • Earthwork	
Wills Bros, BAM Joint Venture	WFP-MO-20-0048-01	34	200,000	• Earthwork	Recycling

The Proposed Scheme will require a variety of construction methodologies resulting in the generation of various waste streams. Material that is to be discarded because it has no other use and/ or it is contaminated waste and must be disposed of appropriately. Waste is typically generated from the demolition works, excavation arisings that are classified as a waste, and at the construction compounds. The potential wastes to be generated by the Proposed Scheme and their potential for significant environmental impacts are discussed below.

16.3.3 Evolution of the Environment in the Absence of the Proposed Scheme

Should the Proposed Scheme not proceed, conditions relating to material assets identified within the ZoI will continue in line with baseline trends. Some deterioration in the area may be experienced due to damage ensued during serious flooding events, which will be expected to escalate in line with climate change trends. There is also the potential for flooding events to damage sewerage systems generating biohazard material infiltrating the flood waters. These effects would be expected to be **significant**, long-term effects.

16.4 Description of the Likely Significant Effects

16.4.1 Construction Phase

16.4.1.1 Utilities

Construction impacts were assessed and measures to mitigate effects from the Proposed Scheme are outlined throughout this EIAR but are contained mainly in **Chapter 6: Traffic and Transport** and **Chapter 7: Population**. There may also be effects during the construction stage associated with interruptions to access to a property (for example where diversions occur).

A general summary of disruption to utilities is include in **Table 16-7**.

Table 16-7: Summary of Existing Services Affected by the Proposed Scheme

Service	No. of conflicts	Comment/Constraint	Impact
Quignamanger			

Service	No. of conflicts	Comment/Constraint	Impact
Telecommunications (Eir, E-Net, Virgin Media)	Parallel but potential conflicts along length of works	Existing overflow diversion culvert to be replaced. The works will take place along an existing culvert line and as such an available corridor should be largely available. The proposed culvert is larger and as such diversions or temporary supports maybe be required for adjacent utilities. Between the U/S connection point within the rugby pitch grounds and the road, the culvert will cross 2No. watermains (200mm/ 80mm). Minor diversions of these mains may be required pending depths. At Rathmeel drive, the culvert will cross another watermain (110mm). Prior to culvert discharge, it crosses 2 further watermains (25mm) The culvert once in Cregg Road travels along the existing corridor adjacent to telecommunications cables and a 225mm AC foul sewer. A foul sewer manhole may be impacted by the works On Quay road, a culvert will be replaced, and works will be required along the full width of the road. Crossing of the following utilities will be required • 300mm Asbestos Cement (AC) main (1.5mOD) • 225mm watermain • MV/LV ESB UG • Telecommunications	**Possible Diversions:** Conflict with the gravity infrastructure (foul sewer) poses the greatest impact, however the invert level of the proposed culvert (1.0mOD) or existing main can be altered to avoid. Available corridor to construct. All other services potentially impacted by the works can be either temporarily supported during the works or temporarily or permanently diverted following liaison with stakeholders. **Risk of Accidental Damage to Pipelines:** Excavation works or heavy machinery operations near the watermains pose a risk of accidental damage. **Safety considerations:** Works will take place adjacent and under ESB infrastructure. No diversions are anticipated. Works will be undertaken adjacent to the Wastewater pumping station and set back zones will be set in the design.
ESB Underground/OH (MV/LV)	1		
Water Main	5		
Foul/Storm Water	2		
Wastewater Pumping Stations	1		
Bunree			
Telecommunications (Eir, E-Net, Virgin Media)	Parallel but potential conflicts along length of works	Replacement of existing open drain/culvert with new culvert. The works will take place along an existing culvert/channel line and as such an available corridor should be largely available. The proposed culvert is larger and as such diversions or temporary supports maybe be required for adjacent utilities. D/S where it is proposed to remove culvert and form drainage channel, an MV OH line crosses the works area. Several OH ESB crossings are noted, 3MV's, 1LV and 1HV along the route. Where the works cross the Sligo Road, a number of services will be crossed including: • Telecommunications ducts/chambers • Gas MP • Watermain Along Behy road, the culvert travels along the existing corridor adjacent to telecommunications ducts a 150mm/ 225mm watermain. A number of crossings of this watermain are noted. The culvert will impact on the Behy road pump house and associated access/ 100mm rising main.	**Possible Diversions:** All services potentially impacted by the works can be either temporarily supported during the works or temporarily or permanently diverted following liaison with stakeholders. **Risk of Accidental Damage to Pipelines:** Excavation works or heavy machinery operations near the watermains pose a risk of accidental damage. **Safety considerations:** Works will take place adjacent and under ESB infrastructure. No diversions are anticipated
ESB Underground/OH (MV/LV/HV)	**8**		
Water Main	**6**		
Brusna			

Service	No. of conflicts	Comment/Constraint	Impact
Telecommunications (Eir, E-Net, Virgin Media)	Parallel but potential conflicts along length of works	Construction of the embankments and floodwalls. A number of OH ESB lines in the vicinity of the embankment and wall construction works A 50/75/125//150mm watermain travels along the route of the proposed embankment at the bridge crossing to Rathkip/Shanaghy, along the R294 and along the route of the proposed walls north of the river. Telecommunications cables travel along the route of the proposed wall along the R294 south of the river and north of the river.	**Possible Diversions:** All services potentially impacted by the works can be either temporarily supported during the works or temporarily or permanently diverted following liaison with stakeholders. **Risk of Accidental Damage to Pipelines:** Excavation works or heavy machinery operations near the watermains pose a risk of accidental damage. **Safety considerations:** Works will take place adjacent and under ESB infrastructure. No diversions are anticipated.
ESB Underground/OH (MV/LV/HV)	5		
Water Main	Parallel but potential conflicts along length of works		
Tullyegan			
ESB Underground HV	1	No services within the vicinity of the works with the exception of an HV underground cable in the possible vicinity of the downstream end of the proposed wall	**Safety considerations:** Works will take place adjacent to ESB infrastructure. No diversions are anticipated.
Moy			
Telecommunications (Eir, E-Net, Virgin Media)	Parallel but potential conflicts along length of works	Removal and replacement of existing walls along the riverfront. The following services are within the road and along the proposed length of the PS pipework or potentially within the footprint of the proposed floodwalls **Clare Street –** • 375mm to 450mmAC combined sewer (IL 2.4 – 0.7) • Gas main 125PE 75mbar • 150mm Asbestos watermain • Telecoms **Bachelors Walk –** • 300 to 600mm AC combined sewer (IL 0.3 to -1.5) • Bachelors Walk Pump Station Overflow to river - 525mm • Surface Water Outlet (Lower Bridge) • 900mm CSO (Lower Bridge) • 150mm Asbestos watermain • Underground ESB • Telecoms **Emmett Street** • 450 - 525mmAC combined sewer (IL 1.8 to 0.0) • 900mm CSO • 150 to 225mm foul Sewer • Gas main 125PE 75mbar • 150mm Asbestos watermain • Telecoms **Cathedral Road** • 375mmAC combined sewer (IL 1.25 – 0.75) • 450mm CSO at Lower Bridge • Gas main 125PE 75mbar • 150mm Asbestos watermain • Underground ESB • Telecoms **Ridgepool Road** • 225mmAC foul sewer (IL 4 – 1.5) 2No.675mm CSO • Gas main 180PE 4bar • 150mm Asbestos watermain • Underground ESB • Telecoms **Barrett Street/ Tolan Street** • 225mmAC foul sewer (IL 4 – 1.5)	**Possible Diversions:** Conflict with the gravity infrastructure (combined sewer) poses the greatest impact, particularly the crossings of gravity pipework and outlets to the river. Corridor within the public road for the installation of drainage infrastructure will be confirmed through slit trenches at detailed design. All other services potentially impacted by the works can be either temporarily supported during the works or temporarily or permanently diverted following liaison with stakeholders. **Increase Loading Over Pipelines:** Retaining the outfalls to the River Moy will result in additional stress on the pipelines caused by the proposed flood wall. **Safety considerations:** Works will take place adjacent and under ESB infrastructure. No diversions are anticipated **Risk of Accidental Damage to Pipelines:** Excavation works or heavy machinery operations near the watermains pose a risk of accidental damage.
ESB Underground/OH (MV/LV/HV)			
Water Main			
Wastewater Pumping Stations	2		

Service	No. of conflicts	Comment/Constraint	Impact
Foul/Storm Water	5	• 900mm AC CSO • Gas main 125PE 75mbar • 150mm Asbestos watermain • Underground ESB • Telecoms **Infront of Ballina Manor** • Surface water line and outlet- 300mm • Underground ESB • 900mm AC CSO	**Operational Impacts:** Flood defences are constructed in the vicinity of foul and/or combined sewers, any backfilling of materials will cause the water table to rise in the vicinity of these sewers which could potentially cause infiltration into the networks via cracks/fractures. This could result in network surcharging and out of sewer flooding. Works will be undertaken adjacent to the Wastewater pumping station.

The potential effect of utility clashes is considered short-term in nature with **high** sensitivity. The magnitude of the effects on utilities is envisaged to be **minor**. The significance matrix assesses the Proposed Scheme to impose a **short-term, slight or moderate** effect on utilities without the implementation of mitigation measures (See **Section 16.5)**. See **Appendix 16.1** to review overlap of the utilities with the Proposed Scheme.

16.4.1.2 Waste

Vegetation Removal

The appointed contractor will conduct site clearance works including felling of trees and removal of vegetation from the working areas within the lands made available for the Proposed Scheme. Vegetation removal will include tree, shrub, invasive alien species and hedge removal to allow for construction activities to take place. Vegetation clearance will be kept to the minimum required to facilitate construction and its removal will be done in accordance with the mitigation provided for the protection of biodiversity listed in **Chapter 9: Aquatic Biodiversity** and **Chapter 10: Terrestrial Biodiversity**.

The region would be classed as having a negligible sensitivity. The region has taken in approximately 37,371 tonnes of green waste in 2012; however, this is expected to increase in line with the waste plan further reducing the regions waste management sensitivity. The majority of this vegetation will be mulched for reuse on site or for transport off-site to a licensed composting facility at another location. Due to the envisaged waste comprising of <1% of the regional capacity the magnitude of the site clearance works have therefore been determined to be negligible. Based on the significance matrix, it has been assessed that the significance of processing this waste type will have an **imperceptible** effect on regional waste capacity.

Site Clearance - Building Demolitions

In addition to vegetation removal, it is proposed to demolish the majority of existing flood walls to allow for the installation of new flood walls as well as remove culverts (See **Table 16-8**).

Table 16-8: Proposed Demolition Works

Watercourse	Demolition Works	Demolition	Strategy	
			Dispose	Reuse
Moy	Demolition of masonry stone clad wall	800 m^3	720 m^3	80m^3
Quignamanger	Removal of existing culvert	375 m		
	Demolition of existing stone clad and retaining wall	100 m^3	100 m^3	
Bunree	Demolition of stone clad/masonry wall	50 m^3	50 m^3	

Watercourse	Demolition Works	Demolition	Strategy	
			Dispose	Reuse
Brusna	Demolition of masonry wall	50 m^3	50 m^3	

Building demolition waste will include a combination of bricks, asphalt, concrete, glass and rock. The non-hazardous inert waste will be segregated for recycling or recovery purposes.

Based on the Connaught - Ulster Regional Waste Plan (2015-2021) (Connaught-Ulster Waste Region, 2015), the amount of waste generated during the construction phase is anticipated to be **minor** compared to the baseline waste income. It's envisaged that the total quantity of construction and demolition waste material will make up approximately 1% of construction and demolition waste disposed of in the Connaught - Ulster waste region.

Other hazardous materials encountered from demolition works, if any, will be segregated and stored in accordance with best practice for onward management (TII, 2017) (HSA, 2016), typically by recycling or recovery with very small volumes, if any, requiring incineration. Based on the current baseline of construction and demolition waste material, it is considered that the waste facilities within the region have a **minor** sensitivity, The effect of this stream on regional landfill and incineration capacity would comprise <1% reduction in capacity and the magnitude of effect is therefore deemed to be **negligible**. Thus, the assessment of significance deems the Proposed Scheme as having an **imperceptible/slight** effect on regional capacity.

Excavation Waste

It is expected that more than 23,830 m^3 of soil and stone material will arise as a result of the Proposed Scheme. Excavated material as part of the construction works will generally consist of:

- Class 5A Fill (Topsoil)
- Class 1 or 2 Fill (Soil)
- Class 1 or 6 Fill (Rock)
- Class U1 (Soil)
- Class U1 (Pavement).

There will be some opportunities for reuse on site as, for example trench backfill. Off-site reuse options for surplus clean and inert excavated material include reuse as a by-product on other construction sites subject to Article 27 notification to the EPA. Where reuse cannot be employed, there is option for recovery at suitable authorised waste facilities i.e. facilities which have been granted a Certificate of Registration, Waste Facility Permit or EPA license. A total of 18,260 m^3 of excavation waste is proposed to be disposed. A summary of the estimated excavated and fill quantities associated with the Proposed Scheme is provided in **Table 16-9**.

Table 16-9: Excavations Required as Part of Construction Works

Watercourse	Excavation Works	Excavation m^3	Strategy m^3	
			Disposal	Reuse
Moy	Flood Wall - Excavation	5,190	5,190	
	PS and drainage pipework excavation	3,840	1780	2,060
Quignamanger	Flood wall - Excavation	360	360	
	Culvert Excavation	2,340	1,400	940
Brusna	Earth Embankment Cut Off Trench	225	225	
	Back Drain	215	215	
	Flood Wall - Excavation	2,630	2,630	
Bunree	Culvert Excavation	5,400	5,400	

Watercourse	Excavation Works	Excavation m^3	Strategy m^3
Tullyegan	Earth Embankment Cut Off Trench	30	30
	Back Drain	30	30
	Flood Wall - Excavation	1000	1000

The suitability of material for reuse is made with reference to the ground investigations completed for the Proposed Scheme; refer to **Chapter 11: Land, Soils, Geology and Hydrogeology** for further information on ground investigations undertaken to date.

The excavated material to be reused on site will be tested to ensure compliance with the requirements of Class 1 or Class 2 general fill as defined in *Specification for Road Works Series 600 – Earthworks* (TII, 2013).

Soil and stone material that is excavated, but which is not suitable for reuse on site, or is surplus to requirements, will be stockpiled, tested and classified. Those suitable for reuse will be transported to a soil recovery facility. Where feasible classification for reuse on other construction site(s), as a by-product under Article 27, will be considered. Where the material is not suitable for reuse it will be categorised in accordance with the *Waste Classification - List of Waste and Determining if Waste is Hazardous or Non-hazardous* (EPA, 2018).

Waste will only be transferred from site by a waste collection permit holder and delivered to an authorised waste facility i.e. a facility which holds a Certificate of Registration, Waste Facility Permit or Waste Licence, for the specific waste types it receives. There are permitted and licenced waste management facilities which can accept the waste product as infill at their facilities depending on the quality of the soil extracted.

Numerous facilities have been identified that have the capacity to deal with large quantities of construction soil. The EPA and local authority have a combined capacity to treat 1.6 million tonnes and due to reduced construction activities, these facilities were only receiving approximately 32% of their capacity. It is envisaged that this capacity coupled with the expected increase in excavated material, there will be a **minor** sensitivity to this quantity of waste. The waste arising from this Proposed Scheme will likely result in in a **minor** magnitude, contributing to approximately 1-5% of the regional waste capacity. The significance of the effect has therefore been determined to be **Imperceptible or slight**.

Individual Waste

In the construction of the infrastructure necessary for the Proposed Scheme, a small amount of general individual waste will be generated by day-to-day activities of the construction staff during the construction phase. This will be comprised of the staff's food waste, foul waste and fuel waste generated by the individual's personal transport.

Individual waste from staff will be generated primarily through the construction phases of the Proposed Scheme. The sensitivity of this Proposed Scheme is envisaged to be **negligible**. The quantities of waste generated by individual staff is expected to be minimal where it will contribute <1% of waste to the regional landfill/ incineration. Therefore, the magnitude of the effect is determined to be **negligible**.

The significance of the effects from the generation of individual waste has therefore been determined to be **imperceptible**, which is not significant in EIA terms.

16.4.2 Operational Phase

16.4.2.1 Utilities

No significant effects to utilities are predicted during the operational and maintenance phase of the Proposed Scheme.

16.4.2.2 Waste

No significant effects to waste are predicted during the operational and maintenance phase of the Proposed Scheme.

16.5 Mitigation Measures

16.5.1 Construction Phase

16.5.1.1 Utilities

Mitigation measures will be considered on an individual basis, and each conflict location will be discussed with the relevant utility provider. However, there are a number of measures that will be implemented across the Proposed Scheme, where required, and these are outlined as follows:

- All existing services will be confirmed prior to construction using service records, further Ground Penetrating Radar (GPR) surveys and slit trenches to ensure that their position is accurately identified before excavation works commence across all sections of the Proposed Scheme.
- Enabling works on utilities shall be programmed to maintain connections, or at least minimise downtimes, to public and private customers where conflicts arise.
- Early consultation shall be undertaken with service providers to enable providers to reroute their service during non-peak periods to maintain connections to customers.
- For unknown utilities encountered during construction works, further liaison with utility providers will be required to establish the preferred solution.
- Where diversions, or modifications are required to utility infrastructure:
  - It will be planned in advance by the appointed contractor and adequate notice (not less than 14 days) will be given to all impacted properties.
  - Notification shall include information on when interruptions and works are scheduled to occur and the duration of such interruption. Any required works will be carefully planned by the appointed contractor to ensure that the duration of interruptions is minimised in so far as is practicable.
- Where works are required in and around known utility infrastructure, precautions will be implemented by the appointed contractor to protect the infrastructure from damage and avoid unplanned interruptions.
- Any damage to services as a result of the Proposed Scheme shall be repaired / replaced without delay.
- Safety procedures will be put in place to minimise the risk to utility provider personnel and the general public during works on services. Protection measures during construction will include warning signs and markings indicating the location of utility infrastructure, safe digging techniques in the vicinity of known utilities, and in certain circumstances where possible, isolation of the section of infrastructure during works in the immediate vicinity.
- Alternative connections shall be provided before any connections are severed. Supply to existing services will be maintained as far as possible during construction.
- All proposed relocation / diversion works shall be delivered through the appropriate service provider processes e.g. Uisce Eireann Developer Services – Diversion process.
- Site specific method statements and risk assessments detailing safe means of works for working in close proximity to existing underground and overground existing services shall be prepared at detailed design stage. Works effecting underground services shall be carried out strictly in accordance with the Health and Safety Authority *Code of Practice for Avoiding Danger from Underground Services* (HSA, 2016).
- Works affecting electricity services must also be carried out strictly in accordance with the *Code of Practice for Avoiding Danger from Overhead Electricity Lines* (ESB, 2019). Where construction equipment passes under lines, goalpost barriers will be established within a lateral distance of 6 m either side of the line, ensuring that tall vehicles will not come into contact with OHLs during construction. A no-tip zone will also be established within 10 m of power lines. All proposed poles will be placed at a sufficient distance from proposed earthworks.
- See **Section 11.5.1.4** of **Chapter 11: Land, Soil, Geology and Hydrogeology** addresses the measures in place for backfilling of materials which would cause the water table to rise in the vicinity of foul and/ or combined sewers which could potentially cause infiltration into the networks.

16.5.1.2 Waste

A Waste Management Plan (WMP) shall be prepared by the appointed Contractor to deliver the mitigation presented in this chapter of the EIAR. The WMP will be prepared in accordance with the *Best Practice Guidelines for the Preparation of Resources & Waste Management Plans for Construction and Demolition Projects* (EPA, 2021).

The WMP will, as a minimum address the following aspects of the Proposed Scheme:

- Analysis of the waste arising/material surpluses
- Methods proposed for the prevention, reuse, and recycling of wastes
- Material handling procedures
- Proposals for disposal of waste at appropriately licensed facilities only
- Proposals for education and a workforce and plan dissemination programme.

The contractor will be obliged to implement and maintain the measures and actions contained within in the EIAR during the construction phase. Measures to be implemented on site shall include:

- **Source Segregation:** Source separating wastes into dry mixed recyclables, biodegradable, and residual wastes. Clear labelling of waste bins, containers, skip containers and storage areas, including waste stream colour coding and photographs as appropriate.
- **Waste Auditing:** Good record keeping being conducted by the contractor including quantities (tonnes) and type of waste and materials leaving the site. The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material, which is recovered, and which is disposed.
- **Appropriate Storage:** Ensuring that all areas where liquids (including fuel) are stored, or cleaning is carried out, are in designated impermeable areas that are isolated from the surrounding area and within a secondary containment system, e.g., by a roll-over bund, raised kerb, ramps or stepped access. The location of any fuel storage facilities shall be considered in the design of the construction compounds. These are to be designed in accordance with relevant guidelines and codes of best practice and will be fully bunded. Good housekeeping at the site (daily site clean-ups, use of disposal bins, etc.) is to be conducted during the construction phase.
- **Efficient Removal:** Where possible the removal of topsoil will be avoided, and all topsoil shall be assessed for reuse within the Proposed Scheme ensuring appropriate handling, processing and segregation of material. The excavated material will be reused for side-slope protection of the new embankment at Shanaghy Heights and regrading adjacent to the new flood walls. The Construction Environmental Management Plan (CEMP) will detail that minimal excavations will be maintained using shoring or trench boxes. This plan will identify actions on site to minimise the loss of topsoil and soils. Soils removed during excavations will be reinstated as soon as possible and suitable inert material will be used as infill to protect the quality of the surrounding subsoil. The WMP will address the analysis of waste arisings, methods proposed for the prevention, reuse and recycling of wastes and material handling procedures.

If unforeseen waste or hazardous material is encountered during the course of the Proposed Scheme, the appropriate authorities will be notified, and the material will be deposited at an appropriate waste facility. There is a possibility that unforeseen or hazardous material is encountered during excavation works.

Concrete waste will be dealt with using an Article-28 notification. These notifications will allow the concrete waste to be fully recovered. By-product notifications (under Article 27 of the EC Waste Directive Regulations 2011) provide an opportunity for reuse of surplus clean soil & stone material arising from construction activity. At the time of construction, options for Article 27 by-product status will be reviewed, subject to waste management and planning requirements being fully met. Such opportunities offer potential to further reduce indirect effects of waste management resulting from the transport of materials from site, notably traffic, noise and air emissions from transport-related haulage.

16.5.2 Operational Phase

16.5.2.1 Utilities

No significant effects have been identified for the operational phase and as such no further mitigation measures are required.

16.5.2.2 Waste

The waste hierarchy principles shall be fully implemented throughout the operational and maintenance phase to ensure that the circular economy approach is supported. Prevention, preparing for reuse, recycling and recovery will be enforced with appropriate waste management facilities chosen to accept disposed waste.

The drainage design for the Proposed Scheme includes for four pumping stations and petrol interceptors. As a precautionary measure, any sediments and other waste material for disposal during maintenance should be considered hazardous unless testing of material is available to prove otherwise and it must be disposed of accordingly in an appropriately licensed facility. Sediment and waste may require pre-treatment prior to disposal at a landfill site. This can take place either as the material is extracted or at the landfill site itself

Any waste arising from the operational and maintenance phases of the Proposed Scheme will be deposited at an appropriate facility (as listed in **Table 16-6**) in accordance with the current national waste policy. This is necessary so that all waste is disposed of to the best possible facility type in order to adhere to the circular economy and resource opportunity strategies.

All waste to be removed from the site will be required to be collected by valid waste collection permitholders. All facilities to which waste will be taken will have appropriate waste licenses or permits, under the Waste Management Act 1996 to 2016, as amended, and the regulations thereunder.

16.6 Residual Impacts

16.6.1 Utilities

Effects during construction after the introduction of mitigation measures are expected to be short-term in nature and **not significant**.

The Proposed Scheme will protect the key utilities in Ballina from flooding events during the Operational Phase. As a result of the Proposed Scheme, the area may become more attractive for residential and business purposes. This improved attractiveness will likely support improvements in key utilities established in Ballina in the future. The Proposed Scheme will also protect existing key utilities, thus reducing the disruptions to these facilities in the future. The residual effect of the operational phase is predicted to have a **slight** positive, long-term effect.

16.6.2 Waste

Following implementation of the mitigation measures as outlined in **Section 16.5**, most waste materials generated during the construction phase will be reused either within the Proposed Scheme or will be sent for recovery/recycling at authorised facilities. The residual effects of the Proposed Scheme in terms of waste management during the construction phase, following the implementation of mitigation measures, are considered to be adverse but minor and short-term in nature.

The predominant source of other material that will be generated from undertaking the proposed works arises from soil excavations. This material is not considered a waste and will be diverted through suitable sustainable routes; licensed waste facilities across the Eastern-Midlands Region have capacity to accept the estimated quantities which will be notified as a by-product (under Article 27 of the EC Waste Directive Regulations 2011, as amended).

The waste generated during operation and maintenance phases of the Proposed Scheme will not be significant as it will mainly be associated with occasional maintenance works. The residual effect on resource and waste management is expected to be **slight**.

16.7 Monitoring

16.7.1 Construction Phase

16.7.1.1 Utilities

No monitoring to test the predictions made within the material assets assessment is considered necessary for utilities. Further investigations into utilities will be necessary during the detailed design stage. Methods such as ground penetrating radar (GPR), slit trenching and consultation in the verge areas can be used to verify or locate existing services.

16.7.1.2 Waste

Monitoring will be undertaken and recorded by the contractor as follows:

- Records shall be kept of all truck movements relating to the removal of site clearance vegetation, topsoil and construction soil. The records shall include quantity, nature/ type and quality of the material, and the excavation and disposal locations.
- Records shall be kept on the quantity, nature/ type and quality of all waste leaving the construction site including individual waste and typical construction site waste.
- Segregation of construction site waste shall be carefully monitored with waste audits taking place at regular intervals.

16.7.2 Operational Phase

16.7.2.1 Utilities

No monitoring is proposed for utilities.

16.7.2.2 Waste

No monitoring is proposed for waste.

16.8 Interactions and Cumulative Effects

Inter-relationships are the impacts and associated effects of different aspects of the Proposed Scheme on the same receptor. The potential for cumulative effects has been considered for the construction and operation of the Proposed Scheme cumulatively with other projects. Please see **Chapter 20 Interactions and Cumulative Effects** for further details on the potential interactions and cumulative effects for waste and utilities.

16.9 Schedule of Environmental Commitments

Please see **Chapter 22 Schedule of Environmental Commitments** which sets out all the mitigation and monitoring commitments to minimise the potential impacts for waste and utilities during the construction and operational phase of the Proposed Scheme.

16.10 Chapter References

Connaught-Ulster Waste Region, 2015. *Connaught-Ulster Region: Waste Management Plan 2015-2021,* s.l.: s.n.

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EPA, 2020. *Guidance on Waste Acceptance Criteria at Soil Recovery Facilities.,* s.l.: s.n.

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