Chapter 23

Material Assets: Resource and Waste Management

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23 MATERIAL ASSETS: RESOURCE AND WASTE MANAGEMENT

23.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) identifies, describes, and presents an assessment of the likely significant effects of the proposed N2 Slane Bypass and Public Realm Enhancement Scheme (hereafter referred to as the 'Proposed Scheme') on the topic of Material Assets: Resource and Waste Management during both the construction and operational phases.

The assessment presented is informed by the following key chapters of the EIAR: **Chapter 4 – Description of the Proposed Scheme** and **Chapter 5 – Description of the Construction Phase**. The chapter specifically addresses waste likely to arise from the site enabling works, construction, operation, and maintenance works of the mainline bypass, improvement works to the existing N51 and works conducted to enhance the Slane village public realm. This 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 Waste Framework Directive (Directive 2008/98/EC as amended, including by Directive 2018/851/EU), as transposed into Irish Law by the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011), as amended by the European Union (Waste Directive) (Amendment) Regulations 2016 (SI No. 315 of 2016) and the European Union (Waste Directive) Regulations 2020 (SI No. 323 of 2020) 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).

Other chapters relevant to the resource and waste management assessment include:

- **Chapter 2 – Background and Need:** Sets out relevant waste policy.
- **Chapter 7 – Traffic and Transport:** Identification of haul routes to materials and waste management facilities.
- **Chapter 8 – Population:** Details of impacts on community and socio-economic aspects.
- **Chapter 9 – Noise and Vibration:** Details of impacts relating to noise and vibration aspects during construction.
- **Chapter 10 – Air Quality:** Details of impacts relating to air quality aspects during construction.
- **Chapter 11 – Human Health:** Details of impacts relating to human health aspects during construction.
- **Chapter 18 – Land, Soils, Geology and Hydrogeology:** Soil quality and details of site and ground investigations.
- **Chapter 19 – Climate:** Use of sustainable materials.

23.2 Methodology

The Material Assets – Waste Management assessment has followed the overall methodology and guidance relating to the EIA process and preparation as set out in **Section 1.3.3** of **Chapter 1 – Introduction**. The impact of the Proposed Scheme in terms of Waste Management has been assessed for the construction and operational phases by considering the nature and quantities of waste produced, its management and treatment including recovery and reuse as a natural resource.

Waste emissions and soil/stone arisings will be generated primarily during the construction phase, and to a much smaller degree during the operational/ maintenance phase of the Proposed Scheme. This resource and waste management assessment was carried out by way of a combination of desk-based studies and liaison with the design team.

23.2.1 Legislation, Policy, and Guidance

23.2.1.1 Legislation

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; and
- European Union (Waste Directive) Regulations 2011 – 2020.

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 2011 Waste Directive Regulations, as substituted by Article 15 of SI 323/2020 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; and*
- *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.*

23.2.1.2 Policy

Consideration has been given to the following relevant policy documents in the preparation of this chapter; further detail can be found in **Appendix 23.1**:

- European Commission – Circular Economy Action Plan (EC, 2020);
- Department of the Environment, Climate and Communications – Waste Action Plan for a Circular Economy (DECC, 2020);
- Regional Waste Management Planning Offices (RWMPO) Draft National Waste Management Plan for a Circular Economy (RWMPO, 2023); and
- Eastern-Midlands Waste Regional Office – Regional Eastern-Midlands Regional Waste Management Plan 2015-2021 (EMWRO, 2015).

23.2.1.3 Guidance

The methodology and associated impact assessment has had regard to the general guidance regarding the undertaking of an EIA (as presented in **Section 1.3.3** of **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 (2020a) Guidance on Waste Acceptance Criteria at Soil Recovery Facilities.
- EPA (2020b) 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, as amended by S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2020. TII (2017) The Management of Waste from National Road Construction Projects, GE-ENV-01101; and
- TII (2017) Guidelines for the Management of Waste from National Road Construction Projects, GE-ENV-01101, Transport Infrastructure Ireland, December 2017.

23.2.2 Zone of Influence

The zone of influence (ZoI) for the resource and waste management element of the Proposed Scheme comprises of two functional areas described as follows:

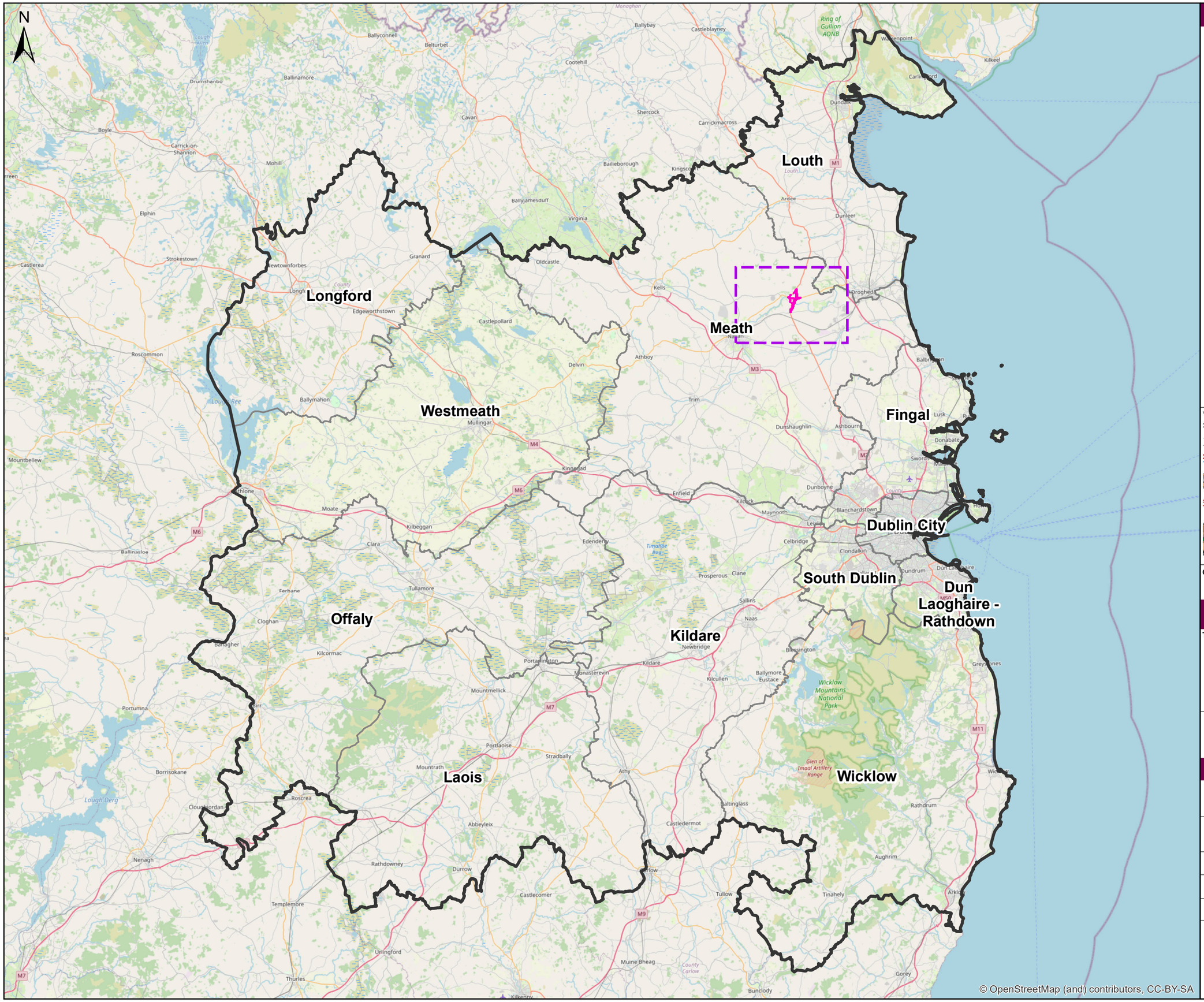
- **Regionally:** The location of waste facilities within the Eastern and Midlands Region that are suitable to accommodate waste materials arising from the construction, operation, and maintenance of the Proposed Scheme (refer to **Figure 23.1** below); and
- The **Proposed Scheme:** The materials / waste generated within the lands made available for the footprint of the Proposed Scheme which includes the Slane village public realm enhancement proposals.

23.2.3 Sources of Information to Inform the Assessment

The following are the desktop sources of information utilised for the preparation of this chapter:

- EPA website - www.epa.ie/environment-and-you/circular-economy;
- N2 Slane Bypass Option Selection Report (RPS for Meath County Council [MCC], 2020);
- EPA (2020c) National Waste Statistics – Summary Report for 2019 and 2020;
- Dublin City Council (on behalf of the Regional Waste Management Offices) (2015) Construction and Demolition Waste Stone and Soil Recovery / Disposal Capacity;
- Regional Waste Management Planning Offices (2020) Construction and Demolition Waste Stone and Soil Recovery / Disposal Capacity Update Report;
- Eastern-Midlands Regional Waste Management Plan 2015-2021;
- EPA (2021) National Hazardous Waste Management Plan 2021-2027.
- National Waste Collection Permit Office (NWCPO) website: http://facilityregister.nwcpo.ie/;
- Site Investigations for Phase 2 and 3 for details of site and ground investigations undertaken at route selection and at design stage; refer to details in **Chapter 18 – Land, Soils, Geology and Hydrogeology**; and
- Use of sustainable materials is considered in **Chapter 19 – Climate**.

Estimates of waste generation likely to arise during the demolition, construction and operational phases of the Proposed Scheme have been calculated by the design team based on the current design information.

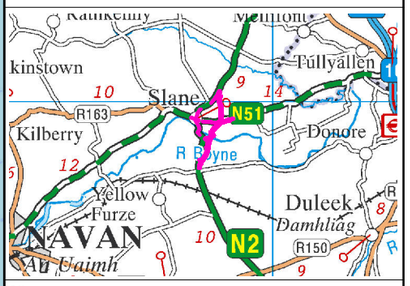


Legend

- Proposed Scheme
- Eastern-Midlands Waste Management Region
- County Boundary

Data Source:
Eastern-Midlands Waste Management Plan 2015-2021
CSO County Boundaries

0 5 10 20
Kilometres



Client
Meath County Council

N2 Slane Bypass and Public Realm Enhancement Scheme

Title

Figure 23.1

Zone of Influence for Resource and Waste Management

West Pier
Business Campus,
Dun Laoghaire,
Co Dublin, Ireland.

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Issue Details

File Identifier: MDT0806-RPS-00-N2-DR-Z-AG-3046		
Status: A1	**Rev:** C01	**Model File Identifier:** MDT0806-RPS-01-N2-M2-C-XM1001 MDT0806-RPS-01-PR-M2-C-XR9000
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Checked: CMcG		**Scale:** 1:600,000 (A3)
Approved: NO'N		**Projection:** ITM

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23.2.4 Key Parameters for Assessment

The key parameters to be assessed in this chapter include, 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.

23.2.5 Assessment Criteria and Significance

The significance category descriptions and significance criteria used in the assessment of the impacts of the Proposed Scheme arising from the generation of waste materials are set out in **Table 23-1** and have been based on the IEMA (March 2020) Guide to Materials and Waste in Environmental Impact Assessment. For the purposes of the assessment, the receptor is the available capacity in the disposal tier on the waste hierarchy i.e. landfill, and incineration without energy recovery. The sensitivity of available capacity is therefore assessed by examining the current trends in landfill/ incineration without energy recovery capacity and depletion according to the criteria outlined in **Table 23-1**. In the baseline description, the capacities of licensed facilities in the EMR has also been considered and set out in relation to excess soil and stone, as well as other materials arising; this has also informed the assessment.

The estimated amounts of waste arising from the Proposed Scheme during the construction and operational phases are then compared to assess their impact on available landfill and incinerator capacity. Infrastructure for the processing and recovery of materials and on-site reuse of materials are both recognised in the IEMA Guidelines as beneficial and contributors to the assessment of magnitude of effect where they can be used to divert materials away from landfill and incineration without energy recovery in favour of higher tier waste management options. The criteria for defining magnitude in this chapter are outlined in **Table 23-2**.

Table 23-1: Sensitivity of Landfill / Incinerator Void Capacity (based on IEMA, 2020)

Void Capacity Type	Description	Sensitivity
Inert and Non-hazardous Waste		
Across construction and/or operation phases, the baseline/future baseline (i.e., without development) of regional (or where justified, national)* ***inert and non-hazardous*** *void capacity is expected to:*	Remain unchanged or is expected to increase through a committed change in capacity.	**Negligible**
	Reduce minimally: by <1% as a result of wastes forecast	**Low**
	Reduce noticeably: by 1-5% as a result of wastes forecast	**Medium**
	Reduce considerably: by 6-10% as a result of wastes forecast.	**High**
	Reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or would require new capacity or infrastructure to be put in place to meet forecast demand.	**Very High**
Hazardous Waste		
Across the construction and/or operation phases, the baseline/future baseline (i.e., without development) of regional (or where justified, national)* ***hazardous*** *void capacity is expected to…*	Remain unchanged or is expected to increase through a committed change in capacity.	**Negligible**
	Reduce minimally: by <0.1% as a result of wastes forecast	**Low**
	Reduce noticeably: by 0.1-0.5% as a result of wastes forecast.	**Medium**
	Reduce considerably: by 0.5-1% as a result of wastes forecast	**High**
	Reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or would require new capacity or infrastructure to be put in place to meet forecast demand.	**Very High**

* *Regional is appraised for the purposes of this Proposed Scheme.*

Table 23-2: Definition of Terms Relating to the Magnitude of an Impact

No Change	Negligible	Minor	Moderate	Major
Inert and Non-hazardous Waste				
Zero waste generation and disposal from development.	Waste generated by the development will reduce regional* landfill / incineration without energy recovery capacity by <1%.	Waste generated by the development will reduce regional* landfill / incineration without energy recovery capacity by 1-5%.	Waste generated by the development will reduce regional* landfill / incineration without energy recovery capacity by 6-10%.	Waste generated by the development will reduce regional* l landfill / incineration without energy recovery capacity by >10%.
Hazardous Waste				
Zero waste generation and disposal from development.	Waste generated by the development will reduce national landfill / incineration without energy recovery capacity by <0.1%	Waste generated by the development will reduce national landfill / incineration without energy recovery capacity by <0.1-0.5%	Waste generated by the development will reduce national landfill / incineration without energy recovery capacity by <0.5-1%	Waste generated by the development will reduce national landfill / incineration without energy recovery capacity by >1%

** Or where justified, national. Regional is appraised for the purposes of this Proposed Scheme.*

The significance of the effect on sensitive receptors is determined by correlating the magnitude of the impact and the sensitivity of the receptor, outlined in **Table 23-3**. Where a range of significance of effect is predicted, the final assessment for each impact is based upon expert judgement. The definitions for significance in **Table 23-3** are as defined in the EPA Guidelines on the information to be contained in EIAR (2022), with 'moderate' and 'major' using the EPA definitions of 'significant' and 'very significant' respectively.

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:

- ***Profound:*** An effect which obliterates sensitive characteristics;
- ***Major:*** An effect which, by its character, magnitude, duration, or intensity significantly alters most of a sensitive aspect of the environment;
- ***Moderate:*** An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends;
- ***Slight:*** An effect which causes noticeable changes in the character of the environment without affecting its sensitivities; and
- ***Imperceptible:*** An effect capable of measurement but without significant consequences.

Table 23-3: Matrix used for the assessment of the Significance of the Impact

Sensitivity of Receptor	Magnitude of Impact: No Change	Negligible	Minor	Moderate	Major
Negligible	Imperceptible	Imperceptible	Imperceptible to Slight	Imperceptible to Slight	Slight
Low	Imperceptible	Imperceptible to Slight	Imperceptible to Slight	Slight	Slight to Moderate
Medium	Imperceptible	Imperceptible to Slight	Slight	Moderate	Moderate to Major
High	Imperceptible	Slight	Slight to Moderate	Moderate to Major	Major to Profound
Very High	Imperceptible	Slight	Moderate to Major	Major to Profound	Profound

23.3 Description of Existing Environment (Baseline Scenario)

Construction waste, including demolition and excavation waste, will be the main type of waste generated because of the Proposed Scheme. Construction waste will arise primarily during construction, but also during the operational maintenance phase. There will also be small quantities of municipal-type waste generated during construction (i.e. from site and office staff) and operation (i.e. associated with maintenance activities).

Baseline data has been collected with a focus on these waste streams, at national and regional level including construction, demolition, and excavation waste arisings, as well as information on regional and national waste transfer and treatment and disposal facilities capacity.

23.3.1 Suitable Licensed Waste Facilities

Table 23-4 shows licenced waste facilities in the Eastern and Midlands Region (EMR) that may be considered for the disposal of material and waste streams generated by the Proposed Scheme. There are over 80 licensed waste facilities within the region and two further facilities that have applied for waste licenses that are capable of the disposal of materials arising. These include integrated waste management, soil recovery, waste to energy, and landfill facilities. Detailed information on each of these facilities can be found on the EPA[1] and the National Waste Collection Permit Office (NWCPO)[2] websites.

23.3.2 Historic Waste Facilities

There are two small unlicensed and disused legacy dump sites close to Slane village, located in the Fennor and Slane Castle townlands (approximately 970 m and 2.3 km respectively) to the west of the Proposed Scheme. There is limited information available, however Environmental Risk Assessments for Unregulated Waste Disposal Sites undertaken by MCC indicated both sites are classed as ‘low risk’ due to limited source-pathway-receptor linkages to sensitive receptors. Neither one of the two sites is crossed by the Proposed Scheme.

23.3.3 Construction and Demolition Waste

Construction and demolition waste (CDW) is typically composed mainly of soil and stone (representing the majority) but also concrete, brick, metals, mixed CDW etc. Some of this CDW material may be hazardous, such as bituminous mixtures arising from road surfacing works. Currently, the majority of CDW generated in Ireland is recycled, recovered, or reused. Where recycling, recovery or reuse is not feasible, it is disposed of at suitably licensed facilities.

The main route for soil and stone recovery is through backfilling, where soil and stone waste material is used for land improvement or other engineering purposes. This is typically processed through a licensed or permitted facility. Significant progress has been made in recent years in diverting soil and stone from becoming a waste arising, with excess soil and stone instead being diverted to reuse through Article 27 routes.

The quantity of CDW generated and collected in Ireland increased to 8.8 million tonnes in 2019, an increase[3] on previous years. The majority (96%) of CDW underwent final treatment in Ireland in 2019. Of this, over 82% of the CDW collected was used as backfill as the main soil recovery process. Despite the high level of recovery, 10% also was reported as going for disposal and only 7% for recycling (including wood, glass, and plastics).

The Proposed Scheme is located within the administrative area of Meath County Council, which is part of the Eastern-Midlands Region (EMR). Regional waste management is guided by the Eastern Midlands Region Waste Management Plan 2015-2021 which was published in 2015. A successor waste plan is in preparation which is focused nationally and was published in draft for consultation in May 2023. This new, single, National Waste Management Plan will direct waste policy across all three regions, but the three regional management structures remain in place. The plan will set policy direction for the next six years in common across all three regions. The final published plan may add additional target(s), but it will not materially

[1] EPA website: https://epawebapp.epa.ie/terminalfour/waste/index.jsp?disclaimer=yes&Submit=Continue

[2] NWCPO website: http://facilityregister.nwcpo.ie/

[3] www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition Accessed July 2022.

change how waste management facilities are operated. The EU Waste Framework Directives (2008/98/EC and 2018/851/EU), transposed into Irish Law by the European Union (Waste Directive) Regulations, 2011 - 2020, require Member States to take the necessary measures to achieve the minimum recycling/ recovery target of 70% by weight for non-hazardous CDW, excluding naturally occurring materials, by 2020. The EPA reported an 84% material recovery of non-hazardous CDW, excluding naturally occurring materials in Ireland in 2019.

Details on facilities in the EMR which manage CDW are presented in **Table 23-4**, listed by county.

23.3.4 Hazardous Waste

The EPA reported 557,221 tonnes of hazardous waste were generated in Ireland in 2020 and 580,977 tonnes in 2019 (EPA, 2020c). The contribution of the construction sector to this figure in 2020 was 32% from sources including dredge spoil contaminated soil, asbestos, asphalt, and contaminated wood, concrete, bricks, metals, tiles etc.[4] Typically these wastes are treated off-site at hazardous waste treatment facilities in Ireland, or at facilities in other countries

While there has been an increase in the treatment of hazardous waste in Ireland, the majority continues to be exported for treatment. Irish hazardous waste treatment facilities treated 103,931 tonnes of hazardous waste to non-hazardous status in 2020.

Details on facilities in the EMR which deal with hazardous waste are presented in **Table 23-4**.

23.3.5 Municipal and Other Wastes

Municipal waste is made up of household waste and commercial waste that is like household waste. The EPA reported that in in 2019, Ireland generated 3.1 million tonnes of municipal waste in 2019 of which 37% was recycled (e.g., materials recycling composting/anaerobic digestion. It was also reported that 40% of all municipal waste (was exported for final treatment in 2019, including recycling (56%) energy recovery (36%) and composting (7%).

The landfill facilities in the EMR comprise:

- Knockharley Landfill in Kentstown, Co. Meath: Authorised to accept, for landfill, up to 440,000 tonnes per annum comprising up to 435,000 tonnes of non-hazardous wastes including incinerator bottom ash (IBA) as well as household, commercial and industrial wastes including residual fines, non-hazardous contaminated soils, construction, and demolition (C&D) wastes and baled recyclables, and up to 5,000 tonnes of stable non-reactive hazardous waste (approx. 7 km by road south of Slane). This facility has an expected closure date of 2024.[5] This landfill facility operates at or near full capacity; and
- Drehid Landfill, Co. Kildare: Authorised to accept 385,000 tonnes per annum (approx. 70 km by road from Slane. The Landfill was authorised with a closure date of 2028. This facility operates at or near full capacity.

Note that the Proposed Scheme has an opening year of 2026, and it is likely that Knockharley will be closed for accepting landfill void material by the time the Proposed Scheme is under construction. As it is considered that very little material arising from the Proposed Scheme will go to landfill void, the Proposed Scheme is not reliant on landfill capacity to manage the waste streams and materials arising as there are other suitable facilities within the EMR.

There are two waste-to-energy facilities in the EMR, each having long-term contracts to operate:

- Indaver Waste-to-Energy Facility, Carranstown, Duleek, Co. Meath: This facility operates at or near full capacity (approx. 18 km by road from Slane); and

[4] www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/hazardous Accessed July 2022.

[5] Note: The formal 'closure' applies to void material. Fines screened out of any mixed solid wastes arisings could be the only materials going to landfill and these in very small volumes; refer to **Table 23-5** to **Table 23-8** for estimated volumes of the various streams. Should Knockharley Landfill close in 2024, there would remain a demand for materials such as soil and stone capping which is not placed in void as part of the post-closure landfill restoration. Further, an Order by An Bord Pleanála (ABP-303211-18) states that the landfill will accept waste until the landfill cells are full according to contouring (no dates or tonnage given), therefore an exact date for landfill closure is uncertain. The facility operates other waste management processes, of which landfill is one (landfill to 440k, landfill to full contours, IBA ash facility, MSW fines management, and leachate management).

- Dublin Waste to Energy (Covanta Plant), Pigeon House Road, Dublin City: This facility operates at or near full capacity (approx. 55 km by road from Slane).

Details on these and other relevant facilities in the EMR which deal with municipal waste are presented in **Table 23-4**. A map showing the locations of these facilities are shown on **Figure 23.2**.

Table 23-4: Facilities Operating under Waste Licence in the Eastern-Midlands Waste Management Region

Facility Name / Licensee	EPA Licence No.	Annual Authorised Intake / Total Capacity (t or m^3)	Waste / Material Authorised	Type of Facility	Approx. Distance from Proposed Scheme (km)
MEATH					
Clashford Recovery Limited	W0265	Annual: 190,000 t Total: 2,618,000 t Closure date: unknown	Soil, Stone, Dredging soil: 170,000 t CDW: 20,000 t	Soil Recovery Facility	19.89
Kiernan Sand & Gravel Ltd.	W0262	Annual: 187,400 t Total:1,105,500 t Closure date: 2024	Soil, Stone, Dredging soil: 167,400 t CDW: 20,000 t	Soil Recovery Facility	21.63
Mullaghcrone Quarry (Roadstone)	W0278	Annual: 100,000 t Total: 1,800,000 t Closure date: unknown	Soil, Stone, Dredging Spoil	Soil Recovery Facility	7.56
Thornton Waste Disposal Ltd, Dunboyne	W0206 (IED)	Annual: 50,000 t Total: *Unknown*	Civic Amenity: 1,980 t (Max. Haz: 480 t) Recovery: 48,020 t (Max. CDW: 28,020 t)	Materials Recovery / Civic Amenity Facility	29.11
Bord Na Móna Recycling Ltd, Clonmagaddan	W0131 (IED)	Annual: 95,000 t	HH: 38,000 t Comm / Ind.: 33,250 t CDW: 23,750 t	Waste Transfer Station	9.78
Starrus Eco Holdings Limited	W0140 (IED)	Annual: 250,000 t	Non-Haz: 120,000 t Non-Haz IBA: 130,000 t	Integrated Waste Management Facility	2.65
Kilmainhamwood Compost	W0195	Annual: 40,000 t	Non-Haz BD: 40,000 t	Composting/Anaerobic Digestion	24.08
Kilsaran Concrete Unlimited Company	W0296	Annual: 400,000 t Total: *Unknown*	Soil & stone other than 17 05 03	Materials Recovery Facility	16.16
Indaver Carranstown	W0167 (IED)	Annual: 235,000 t	Non-Haz: 225,000 t Haz: 10,000 t	Waste-to-Energy Facility	8.92
Basketstown Landfill Facility	W0010	Annual: *Unknown* Total: *Unknown*	Inert subsoil and topsoil for restoration of facility	Landfill - Restoration and aftercare	23.04

Facility Name / Licensee	EPA Licence No.	Annual Authorised Intake / Total Capacity (t or m^3)	Waste / Material Authorised	Type of Facility	Approx. Distance from Proposed Scheme (km)
Knockharley Landfill Ltd.	W0146 (IED)	Annual: 200,000 t Total: 3,616,955 m^3	CDW	Landfill, Storage of MSW and Recyclables, and Recovery of IBA	4.77
Murphy Concrete Manufacturing Limited	W0151	Annual: 750,000 t Total: 3,800,000 t	Inert CDW for Disposal: 738,00 t Inert CDW for Recovery: 12,000 t	Landfill	18.48
LOUTH					
Dundalk Landfill & Civic Waste Facility	W0034	Annual: 20,000 t Total: *Unknown*	MSW: 19,000 t CDW: 1,000 t	Integrated Waste Management Facility	33.79
Oxigen Environmental (Coes Road)	W0144	Annual: 90,000 t Total: *Unknown*	HH: 35,000 t; Comm: 5,000 t; non-Haz Ind.: 30,000 t; CDW: 20,000 t	Waste Transfer Station and Recycling Facility	32.60
Drogheda Landfill	W0033	Annual: 10,000 t Total: *Unknown*	HH / Comm / Rec	Landfill	9.77
Whiteriver Landfill Site	W0060 (IED)	Annual: 96,000 t Total: 1,654,456m^3	HH: 31,200 t; Comm: 20,800 t; CDW: 5000 t; Non-Haz Ind. Sludge: 300 t; Non-Haz Ind. Solid: 34,700 t; Waste for Restoration: 4,000 t	Landfill	10.71
DUBLIN					
Huntstown Inert Waste Recovery Facility (Roadstone)	W0277	Annual: 1,595,000 t Total: 9,450,000 t Closure date: 2033	Inert soil & stone: 1,500,000 t CDW: 95,000 t	Soil Recovery Facility	33.17
Milverton Waste Recovery (Roadstone)	W0272	Annual: 400,000 t Total: 2,470,000 t Closure date: 2024	Soil and stone	Soil Recovery Facility	30.64
IMS Hollywood	W0129	Annual: 500,000 t Total: *Unknown*	Inert CDW and dredging spoil	Landfill	23.58
Covanta Poolbeg	W0232 (IED)	Annual: 600,000 t Total: *Unknown*	Non-Haz: 500,000 t Comm / Ind.: 100,000 t	Waste to Energy Facility	44.86
Sita Environmental Ltd.	W0035	Annual: *Unknown* Total: *Unknown*	Hazardous	Hazardous Waste Facility	42.62
Indaver Ireland Limited	W0036 (IED)	Annual: 50,000 t	Haz: 38,700 t	Hazardous Waste Transfer Station	43.52

Facility Name / Licensee	EPA Licence No.	Annual Authorised Intake / Total Capacity (t or m^3)	Waste / Material Authorised	Type of Facility	Approx. Distance from Proposed Scheme (km)
		Total: *Unknown*	Non-Haz: 11,300 t		
Starrus Eco Holdings Limited	W0039 (IED)	Annual: 150,000 t Total: *Unknown*	MSW Comm / Ind.	Waste Transfer Station and Recycling	43.52
Sorundon Limited T/A Irish Environmental Services	W0040	Annual: 3,440 t Total: *Unknown*	Non-Haz: 240 t Haz: 3,200 t	Hazardous Waste Facility	42.42
Dean Waste Co. Limited	W0042	Annual: 150,000 t Total: *Unknown*	Comm/Ind Non-Haz: 45,000 t CDW: 105,000 t	Waste Transfer Station	42.78
Thorntons Recycling Centre (Ballyfermot)	W0044 (IED)	Annual: 250,000 t Total: *Unknown*	HH: 115,000 t; Comm: 30,000 t; CDW: 30,000 t; Ind Non-Haz: 74,000 t; Haz: 1,000 t	Waste Transfer Station and Recycling	41.13
Key Waste Management Limited	W0045	Annual: 300,000 t Total: *Unknown*	Comm / Ind Non-Haz: 100,000 t CDW: 200,000 t	Waste Transfer Station	43.70
Starrus Eco Holdings Limited	W0079	Annual: 145,000 t Total: *Unknown*	Non-Haz	Waste Transfer Station	45.10
Sita Environmental Limited, Lower	W0083	Annual: 10,000 t Total: *Unknown*	Haz	Hazardous Waste Facility	42.11
Swalcliffe Limited	W0097	Annual: 50,000 t Total: *Unknown*	Comm: 25,000 t CDW: 25,000 t	Landfill	42.90
Balleally Landfill	W0009 (IED)	Annual: 451,500 t Total: 1,290,000m^3	HH: 152,500 t; Comm: 200,000 t; SS: 30,000 t; CDW: 63,000 t; Ind. Sludge: 6,000 t	Landfill	32.58
Ballyogan Landfill Facility	W0015	Annual: 400,000 t Total: *Unknown*		Landfill	53.67
Safety Kleen Ireland Limited	W0099 (IED)	Annual: *Unknown* Total: *Unknown*	Haz: Waste Oil; Oil filters; Oil/Sand Mixtures or Mixtures of Oil and Other Material; Pharmaceutical Waste; Cytotoxic Waste; Solvents; Photographic Processing Waste; Paint and Ink; Brake fluid; Antifreeze; Wastes for Incineration; Laboratory waste for incineration; Fluid Recovery Service (FRS) Waste Non-Haz: Dried Paints, Dried Varnish & Dried Lacquer; Degreasing Solvent; Aqueous Brake Cleaner	Haz Waste Temporary Storage	45.46

Facility Name / Licensee	EPA Licence No.	Annual Authorised Intake / Total Capacity (t or m^3)	Waste / Material Authorised	Type of Facility	Approx. Distance from Proposed Scheme (km)
National Recycling & Environmental Protection Limited	W0112	Annual: *Unknown* Total: *Unknown*	Haz	Hazardous Waste Facility	41.92
Dunsink Landfill	W0127	Annual: 195,500 t Windrow) or 200,000 t (Vessel) Total: *Unknown*	Bring Centre: 3,500 t; Compost (Green): 3,000 t; White Goods: 3,000 t; Inert Waste for Restoration: 186,000 t;	Landfill (Closure and Restoration) Civic Amenity Composting	35.64
IMS	W0129	Annual: 500,000 t Total: *Unknown*	CDW and Inert dredging spoil	Landfill	23.58
Oxigen Environmental	W0152 (IED)	Annual: 160,000 t Total: 254,400 t	HH / Comm: 251,400 t Ind: 3,000 t	Municipal Waste Baling Station	42.73
Starrus Eco Holdings Limited	W0183 (IED)	Annual: 270,000 t Total: 466,500 t	MSW: 165,000 t; Comm / Ind.: 160,000 t; CDW: 54,000 t; Bio: 87,500 t	Non-Haz Rec and WTS	33.76
Starrus Eco Holdings Limited	W0188 (IED)	Annual: 95,000 t Total: *Unknown*	HH: 15,000 t; Comm: 37,500 t; CDW: 5,000 t; Ind: 37,500 t	Waste Transfer Station	44.07
Rilta Environmental	W0185 (IED) *(note: licence under review)*	Annual: 60,000 t Total: *Unknown*	HH: 7,000 t; SS: 2,000 t; CDW: 1,000 t; Ind Sludge: 2,000 t; Comm / Ind: 15,000 t; Haz: 33,000 t	Waste Transfer Station *(note: licence under review)*	43.29
Rilta Environmental	W0192 (IED)	Annual: 111,000 t Total: *Unknown*	Haz: 106,000 t; Comm: 500 t; CDW: 500 t; Ind Sludge: 1,000 t; Other Ind: 3,000 t	Hazardous Waste Facility	43.57
JFK Environmental Limited	W0196 (IED)	Annual: 35,400 t Total: *Unknown*	Haz: 35,250 t Ind: 150 t	Hazardous Waste Facility	41.87
Green Circular Economy Unlimited Company	W0205 (IED)	Annual: 250,000 t Total: *Unknown*	Dry Rec HH: 20,000 t; Comm: 95,200 t; Ind: 95,200 t; BD: 33,600 t; CDW: 3,000 t; Haz: 3,000 t	MRF	40.76
Oxigen Environmental	W0208 (IED)	Annual: 350,000 t Total: *Unknown*	HH (Dry Rec); 180,000 t; Comm (Dry Rec): 40,000 t; Ind (Dry Rec): 19,000 t; Ind Sludge: 1,000 t; CDW: 80,000 t; Haz: 30,000 t; Haz (Medical): 10,000 t	MRF	43.18
Bord Na Móna Recycling Limited	W0222 (IED)	Annual: 95,000 t Total: *Unknown*	HH: 13,200 t Non-Haz CDW: 29,000 t Non-Haz Comm/Ind: 52,800 t	Waste Transfer Station	30.79
Thornton Waste Disposal Limited,	W0227 (IED)	Annual: 95,000 t Total: *Unknown*	HH: 40,000 t Comm: 20,000 t	Waste Transfer Station	41.87

Facility Name / Licensee	EPA Licence No.	Annual Authorised Intake / Total Capacity (t or m^3)	Waste / Material Authorised	Type of Facility	Approx. Distance from Proposed Scheme (km)
			Ind: 15,000 t CDW: 20,000 t		
Fingal Landfill	W0231 (IED)	Annual: 500,000 t Total: *Unknown*	HH / Comm: 348,000 t CDW: 50,000 t Treated SS: 10,000 t Ind Non-Haz Sludge: 2,000 t Ind Non-Haz: 90,000 t	Landfill	26.07
KILDARE					
Silliot Hill Landfill	W0014	Annual: 67,200 t Total: *Unknown*	HH / Comm: 60,000 t; AnSS: 2,000 t; Compost: 5,200 t	IWMF	61.03
Kilcullen Landfill Limited	W0081	Annual: 275,000 t Total: *Unknown*	Comm: 228,750 t; CDW: 7,750 t; non-Haz Ind: 24,750 t; Sludge: 13;750 t	Landfill	61.44
KTK Sand & Gravel Limited	W0156	Annual: 242,000 t Total: *Unknown*	CDW	Landfill	61.37
Athy Civic Amenity Centre	W0175	Annual: 5,500 t Total: *Unknown*	HH: 3,295 t Comm: 2,200 t Haz: 5 t	Waste Transfer Station	82.00
Bord na Móna Plc (Kilberry)	W0198 (IED)	Annual: 96,000 t Total: *Unknown*	Non-Haz BD	Composting	77.74
Drehid Waste Management Facility	W0201 (IED)	Annual: 385,000 t Total: 5,040,000m^3	Non-Haz -MSW / Comm / Ind.: 360,000 t (Landfill) 25,000 t (Composting) Inert: *No limit were used in landfill engineering*	Landfill	45.40
Behans Land Restoration Limited	W0247	Annual: 400,000 t Total: *Unknown*	Soil and Stone (except 17 05 03) 344,000 t CDW: 56,000 t Concrete. Bricks, tiles and ceramics, mixture of above items bar 17 01 06	Soil Recovery Facility	55.68
Walshestown Restoration Ltd.	W0254	Annual: 330,000 t Total: 2,400,000 m^3	CDW, Soil and Stones, Tailings. Materials listed.	Landfill	56.29
GLASSCO Recycling Limited	W0279	Annual: 150,000 t Total: *Unknown*	Non-Haz HH / Comm	MRF	51.40

Facility Name / Licensee	EPA Licence No.	Annual Authorised Intake / Total Capacity (t or m^3)	Waste / Material Authorised	Type of Facility	Approx. Distance from Proposed Scheme (km)
Drehid Mechanical Biological Treatment (MBT) Facility	W0283 (IED)	Annual: 250,000 t Total: *Unknown*	Non-Haz HH / Comm / Ind	MBT	46.49
N&C Enterprises Limited	W0292	Annual: 345,000 t Total: 1,500,000 t Closure date: unknown	Exhausted quarry void Natural soil and stone	Soil Recovery Facility	51.99
Kildare Sand & Gravel Limited	W0295	Annual: 345,000 t Total: 1,500,000 t	Soil and Stones (bar 17 05 03) Dredging Spoil	Inert WRF	61.44
OFFALY					
Derryclure Landfill	W0029	Annual: 100,000 t Total: 1,564,000 m^3	HH: 45,500 t; Comm: 39,500 t; non-Haz Ind.: 11,000 t; TMS: 2,000 t; CDW: 2,000 t	Landfill	79.61
Clonbulloge Ash Repository	W0049 (IED)	Annual: 70,000 t Total: *Unknown*	Non-Haz Ind	Landfill	59.46
Bord Na Móna Recycling Limited, Cappincur Industrial Estate	W0104 (IED)	Annual: 80,000 t Total: *Unknown*	MSW: 40,000 t Comm / Ind: 20,000 t CDW: 20,000 t	MRF	76.51
KMK Metals Recycling Limited	W0113 (IED)	Annual: 35,000 t Total: *Unknown*	Haz and Non-Haz including metallic and WEEE	Haz Disposal and Recovery	76.43
WESTMEATH					
Ballydonagh Landfill	W0028	Annual: 60,000 t Total: 553,750 m^3	HH / Comm: 53,500 t CDW: 2,000 t Ind: 4,500 t	Landfill	93.15
Marlinstown Landfill	W0071	Annual: 103,000 t Total: *Unknown*	Inert: 97,300 t HH: 2,500 t Non-HH: 500 t	Landfill Restoration and Aftercare	52.89
Soltec (Ireland) Limited	W0115 (IED)	Annual: 5,000 t Total: *Unknown*	Organic Solvents	Waste Solvent Recovery	56.13
Mulleady's Limited	W0197 (IED)	Annual: 50,000 t Total: *Unknown*	HH Dry Rec: 10,000 t; Comm / Ind: 30,000 t; CDW: 8,000 t; Haz (End-of-life Vehicles): 2,000 t	Waste Transfer Station	57.35

Facility Name / Licensee	EPA Licence No.	Annual Authorised Intake / Total Capacity (t or m^3)	Waste / Material Authorised	Type of Facility	Approx. Distance from Proposed Scheme (km)
LAOIS					
Kyletalesha Landfill	W0026 (IED)	Annual: 47,100 t Total: 1,888,937m^3	HH: 28,400 t; Comm: 13,400 t; non-Haz Ind: 3,000 t; SS: 1,800 t; CDW: 500 t	Landfill	85.91
Ray Whelan Limited	W0158	Annual: 33,000 t Total: *Unknown*	HH: 21,450 t; Comm: 2,310 t; non-Haz Ind: 4,620 t; CDW: 4,620 t	Waste Transfer Station	94.88
Enva Ireland Limited	W0184 (IED)	Annual: 110,000 t Total: *Unknown*	Waste Oil/ Hydrocarbon: 30,000 t; Soil (including contaminated soil): 40,000 t; Other Haz and Non-Haz: 40,000 t	Treatment and Transfer Facility	89.43
Bord Na Móna Recycling Limited, Kyletalesha & Kyleclonhobert	W0194 (IED)	Annual: 99,000 t Total: *Unknown*	Non-Haz HH /Comm / Ind.: 80,000 t; Non-Haz Sludge: 3,000 t; WEEE: 5,000 t; CDW: 5,000 t; SS: 6,000 t	WTS and Rec	85.81
WICKLOW					
Ballymurtagh Landfill Facility	W0011	Annual: 1,000 t Total: *Unknown*	HH Rec: 1,000 t	Landfill	93.22
Marrakesh Limited	W0048	Annual: 100,000 t Total: *Unknown*	CDW	Landfill	65.58
Starrus Eco Holdings Limited (Fassaroe)	W0053 (IED)	Annual: 200,000 t Total: *Unknown*	HH / Comm: 143,560 t CDW: 54,040 t Haz: 2,400 t	IWMF	60.40
Rampere Landfill	W0066 (IED)	Annual: 50,000 t Total: *Unknown*	Treated SS: 3,000 t HH / Comm: 47,000 t	Landfill	80.74
J.W. Carnegie and Company Limited	W0080	Annual: 150,000 t Total: 2,020,000 t	Inert CDW	Landfill	55.34
Ballynagran Residual Landfill	W0165 (IED)	Annual: 175,000 t Total: 2,770,000m^3	HH: 62,500 t; Comm: 67,500 t; Ind: 45,000 t; CDW (Recovery, Restoration and Site Development): 28,000 t	Landfill	85.84
Kings Trees Services Composting Facility	W0218 (IED)	Annual: 40,000 t Total: *Unknown*	Non-Haz Bio	Composting Facility	86.55
Fassaroe Waste Recovery Facility	W0269	Annual: 570,000 t Total: 750,000 t	Soil & Stone: 550,000 t CDW: 20,000 t	Soil Recovery Facility	60.63
Calary Quarry	W0293	Annual: 300,000 t	Soil and Stone	Soil Recovery Facility	64.60

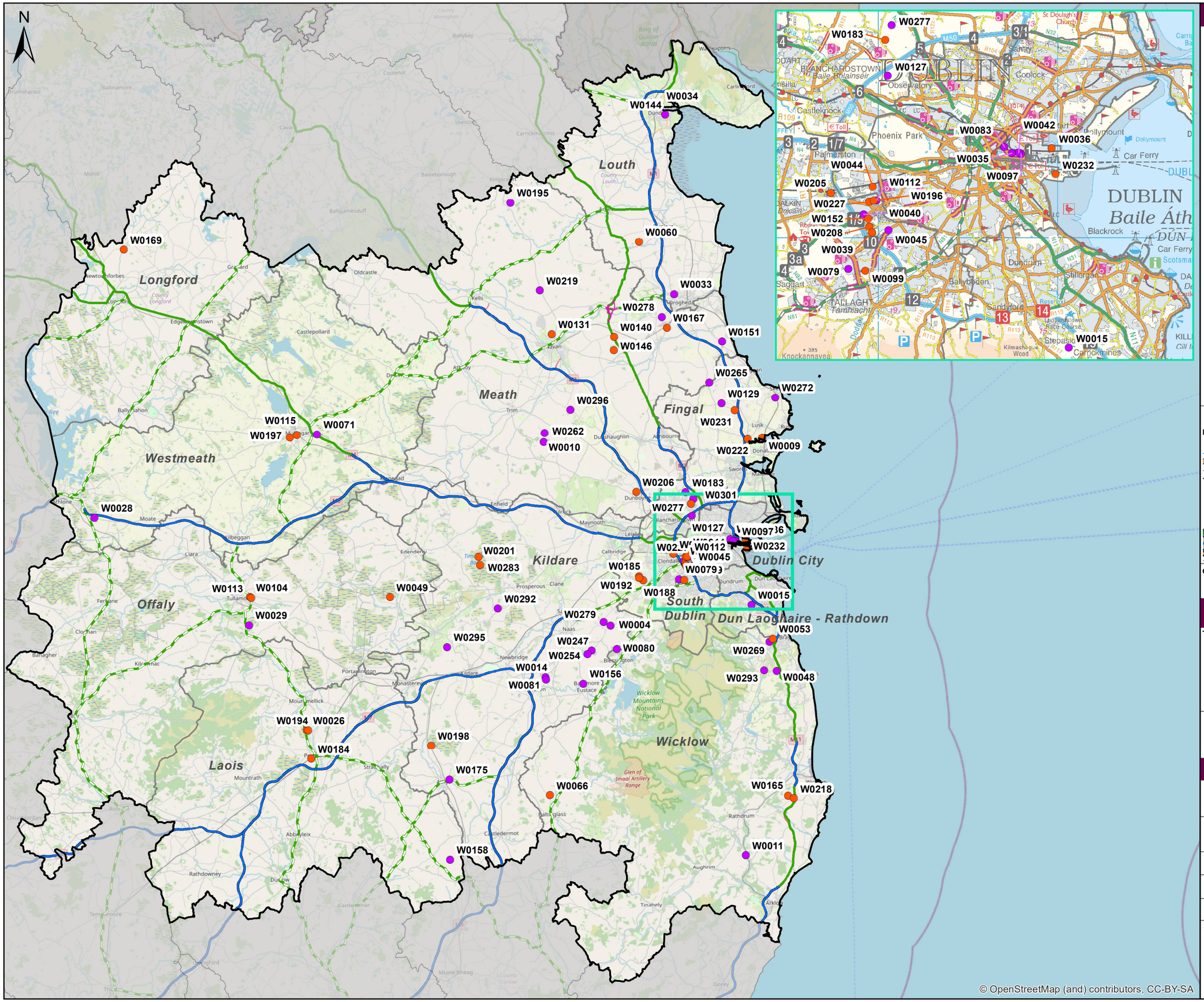
Facility Name / Licensee	EPA Licence No.	Annual Authorised Intake / Total Capacity (t or m^3)	Waste / Material Authorised	Type of Facility	Approx. Distance from Proposed Scheme (km)
		Total: *Unknown*	Dredging Spoil		
LONGFORD					
Mulleady's Limited	W0169 (IED)	Annual: 95,000 t Total: *Unknown*	MSW / Comm/ Ind: 68,000 t; CDW: 17,280 t; Road Sweepings: 970 t; Farm Plastics: 8,750 t	Waste Transfer Station and Recycling Facility	82.88

Note: *EPA licensed facilities typically report capacities in tonnes which is a unit of mass; the cut/fill balance figures included in* ***Chapter 4*** *are based on cubic metres which is a unit of volume. The Waste Management (Landfill Levy) Regulations 2008 (S.I. No. 199 of 2008) provides a conversion factor for inactive or inert waste such as subsoil/ sands. The factor for converting cubic metres to tonnes: multiply cubic meters by a factor of 1.5.*

Table Key:

Materials and Waste Categories: ***AnSS:*** *Anaerobic Stabilised Sludge;* ***BD:*** *Biodegradable;* ***Bio:*** *Biowaste;* ***CDW:*** *Construction and Demolition Waste;* ***Comm:*** *Commercial Waste;* ***Haz:*** *Hazardous Waste;* ***HH:*** *Household Waste;* ***Ind:*** *Industrial Waste;* ***MSW:*** *Municipal Solid Waste;* ***Non-Haz:*** *Non-Hazardous Waste;* ***Non-Haz IBA****: Non-Hazardous Incinerator Bottom Ash;* ***Rec:*** *Recyclable* ***SS:*** *Sewage Sludge;* ***TMS:*** *Treated Municipal Sludge.*

Licensed Facility Type: ***HWF:*** *Hazardous Waste Facility;* ***IED:*** *Industrial Emissions Directive licence;* ***IWMF:*** *Integrated Waste Management Facility;* ***MBT:*** *Mechanical Biological Treatment;* ***MRF:*** *Material Recovery Facility;* ***SRF:*** *Soil Recovery Facility;* ***WtE:*** *Waste-to-Energy;* ***WTS:*** *Waste Transfer Station;* ***WW:*** *Wastewater Treatment.*



Legend

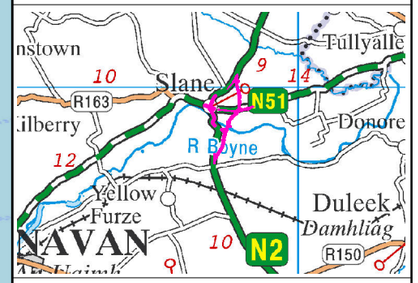
- EPA Licenced Waste Facilities
- EPA Licenced IED Facilities
- Proposed Scheme
- Eastern Midlands Waste Management Region

National Road Network

- Motorway
- National Primary Road
- National Secondary Road

Data Source: TII National Roads Dataset 2021,
EPA Licenced Waste Facilities, EPA Licenced IE Facilities 2023

0 5 10 20
Kilometres



Client
Meath County Council

N2 Slane Bypass and Public Realm Enhancement Scheme

Title

Figure 23.2

EPA Licenced Waste Facilities in the Eastern-Midlands Region

West Pier
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Issue Details

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Checked: CMcG		Scale: 1:600,000(A3)
Approved: NO'N		Projection: ITM

NOTE:

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

In the absence of the Proposed Scheme, traffic would continue to use the existing sub-standard section of the N2 National Primary Route.

In the absence of the Proposed Scheme, the use of natural and man-made construction materials and associated waste arisings associated with the construction of the bypass and associated public realm enhancements would not occur.

In line with government policy, there would be a continued shift toward electric vehicles (EVs) with the older diesel and petrol fleet becoming obsolete, generating associated waste stream and new demand for materials for the newer EV fleet. This will occur with and without the Proposed Scheme.

Available capacity in waste management facilities will continue to be used by new developments and refurbishment works in line with national planning commitments but guided by the National Waste Management Plan (in preparation during 2022).

23.4 Description of Likely Significant Effects

Sections 23.4.1 and **23.4.2** provide a description of the likely significant effects of the Proposed Scheme on material assets: resource and waste management in cumulation with other existing development in the area. A description of the likely significant effects in cumulation with other approved development i.e., development not yet built, is presented in **Section 23.4.3** based on the detailed methodology for the CIA included in **Chapter 25**.

The impact interactions between material assets: resource and waste management and other environmental factors are identified and described in **Chapter 26** and assessed throughout **Sections 23.4.1** to **23.4.3**.

The likely materials arising from the construction and operation phases of the Proposed Scheme are listed below. Most materials arising are associated with the construction phase, including site enabling works and clearance, through to completion of the Proposed Scheme. During the operational phase, ongoing maintenance of the roads and public realm area will generate more limited material streams.

Where materials are consumed and waste is generated, it is acknowledged that, depending on how they are managed, indirect effects may arise e.g., from haulage, noise, dust, nuisance, vehicle emissions and water pollution. Such effects are assessed by other EIA disciplines; refer to **Chapters 5 – Description of the Construction Phase**, **Chapter 7 – Traffic and Transport**, **Chapter 8 – Population**, **Chapter 9 – Noise and Vibration**, **Chapter 10 – Air Quality**, **Chapter 11 – Human Health** and **Chapter 17 – Water**. A list of the typical wastes anticipated to arise are presented in **Table 23-5**. Where published information and data is available, estimated quantities are included.

Where quantifiable information is not available, the types of non-hazardous wastes arising will likely comprise: biodegradable waste (from cleared vegetation); mixed dry recyclables; bitumen; end-of-life construction vehicle tyres; concrete; mixed concrete, bricks, tiles, ceramics, glass etc. from the demolition of buildings; wood, plastic, iron and steel, and insulation (other than asbestos) from construction; electrical components; and general mixed waste, including commercial and municipal (i.e. black bin) waste.

Table 23-5: Estimated Amounts of Key Streams of Materials Arising During Construction and Demolition

Description	Estimated Amount[1]	EWC Code[2]	On-site Management	Off-site Management
Surplus Material Arisings – suitable for Article 27 Reuse				
Topsoil	60,000 m^3	17 05 04	Stockpiling separately for reuse on-site or to consign off-site	Article 27 reuse
Soil	520,000 m^3	17 05 04	Stockpiling separately for reuse on-site or to consign off-site	Article 27 reuse, diversion to soil recovery facility
Rock	80,000 m^3	17 05 04	Stockpiling separately for reuse on-site or to consign off-site	Article 27 reuse, diversion to soil recovery facility

Description	Estimated Amount[1]	EWC Code[2]	On-site Management	Off-site Management
Non-hazardous Waste Arisings				
Food, biodegradable kitchen, and canteen waste	5,830 kg[2]	20 01 08	Segregated bin	Recycling
Hazardous Waste Arisings				
Liquid fuels	1 m^3	13 07 01-03*	Segregated storage container	Management at a dedicated facility
Insulation materials and asbestos-containing construction materials (ACM)	1,500 kg †	17 06 04*	Segregated storage container	Management at an Asbestos containing materials management facility
Other construction and demolition wastes (including mixed wastes) containing hazardous substances	100 m^3	17 09 03*	Segregated storage container	Management at a dedicated facility
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	1 m^3	20 01 13*, 19*, 27-30*	Segregated storage container	Management at a dedicated facility
Batteries and accumulators	50 kg	20 01 33* & 34	Segregated storage container	Management at a dedicated facility
Demolition Arisings from three CPO properties				
*These are addressed in **Table 23-6** below*				

[1] Where possible, an estimate of the amount of waste streams is set out based on available of data / reporting by the EPA, namely the National Waste Statistics Reports, and experience from similar projects. 'No data' indicates that there is no published data that would allow for accurate quantification of these waste streams.

[2] Guidance on classification of waste according to EXC-Stat categories. Available at: https://ec.europa.eu/eurostat/documents/342366/351806/Guidance-on-EWCStat-categories-2010.pdf/0e7cd3fc-c05c-47a7-818f-1c2421e55604

[3] Estimated from 200 site staff, over 106 weeks, at 0.55 kg/person/waste = 5,830

† Volumes subject to full site asbestos-containing materials (ACM) survey. Estimated from CPO 148 roof area of approx. 10 m x 10 m, and estimated weight of 15 kg/m^2

23.4.1 Construction Phase

23.4.1.1 Site Clearance – Vegetation

The appointed contractor will conduct site clearance works including felling of trees and removal of vegetation from the working areas within the Proposed Scheme. Vegetation (see **Table 23-5**) will be removed during site clearance works. Vegetation removal will include tree, shrub, 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 15 – Biodiversity: Terrestrial Ecology** and **Chapter 16 – Biodiversity: Aquatic Ecology**.

Most of this vegetation will be mulched for reuse on site or for transport off-site to a licensed composting facility at another location. The capacity of the waste facilities available for acceptance of the vegetation far exceeds the projected arisings; none will be consigned to landfill or incineration without energy recovery and as a result, regional landfill and incineration without energy recovery capacity will not be affected. The receptors potentially impacted by the clearing process and eventual disposal, are deemed to be of low importance and rarity at a local scale. The sensitivity of the receptors has been classed as no change.

Organic waste removed during site clearance will be mulched for reuse on site or for transport off-site to a licensed composting facility. As the organic waste will be either reused or recycled, and none will be consigned to incineration without energy recovery or landfill, it is not expected to reduce the regional landfill capacity at all. Therefore, the magnitude of this impact is therefore deemed as no change.

The significance of the site clearance works have therefore been determined to be **imperceptible**, which is not significant in EIA terms.

23.4.1.2 Site Clearance – Building Demolitions

In addition to vegetation removal, it is proposed to demolish four upstanding buildings as follows:

- **CPO 118:** Derelict gatehouse at N51 West, Ch. 700.
- **CPO 119:** Occupied private dwelling and small shed adjacent, Ch. 825.
- **CPO 121:** Occupied private dwelling at N51 East, Ch. 75; and
- **CPO 148:** Agricultural buildings and an uninhabited dwelling at the northern roundabout tie-in.

The waste generated from these three demolitions are estimated in **Table 23-6**.

Table 23-6: Estimated Mass of Demolition Waste Arisings

Demolition Waste Sources	Estimated Area of Structure(s) (m^2)	Estimated Mass of Demolished Material (t)
CPO 118: Derelict gatehouse at N51 West Ch. 700 – derelict bungalow (no windows, boarded up doorway, mostly stone left, no roof remaining)	43	12.9
CPO 119: Occupied private dwelling, 150 m^2 and small shed adjacent 10 m^2	160	48
CPO 121: Occupied Private dwelling at N51 East Ch. 75 – occupied bungalow - 158 m^2, plus a small adjacent building, 50 m^2	208	62.4
CPO 148: Agricultural buildings (two farm buildings, single storey, mix of block, timber, and corrugated steel, 147 m^2 and 110 m^2 respectively) and an uninhabited dwelling (86 m^2) at North Roundabout	257	77.1
	86	25.8
Total mass of waste arising	**–**	**226**

The composition of the specific waste streams arising will be determined by surveys (including asbestos survey) at detailed design, but preliminary estimates are used in **Table 23-7** below.

Table 23-7: Estimated Types and Volumes of Non-hazardous Demolition Waste and Proposed Management

Material	Typical Composition	Estimated Tonnage	On-site Management	Off-site Management
Mixed CDW	33%	75	Stockpiling separately	Recovery
Wood	28%	63	Segregated skip	Recycling
Plasterboard (Gypsum materials)	10%	23	Segregated skip	Recycling
Ferrous Metals	8%	18	Segregated skip	Recycling
Concrete	6%	14	Segregated skip	Recycling
Mixed other wastes	15%	34	Stockpiling separately	Recovery
Total	**100%**	**226**		

Other materials that may arise include:

- Mixtures of concrete, bricks, tiles, and ceramics
- Glass
- Insulations from construction, other than asbestos
- Insulation materials and asbestos-containing construction materials (thought to be present)
- Other construction and demolition wastes (including mixed wastes) containing hazardous substances
- WEEE streams

The volume of building demolition waste generated will have no impact on the relevant waste facilities. Therefore, the receptors potentially impacted by the generation and eventual disposal of building demolition waste are deemed to be of negligible importance and rarity. As such, the sensitivity of the receptor has been classed as negligible for non-hazardous materials, and negligible for hazardous materials.

Building demolition waste will include a combination of bricks, concrete, tiles, glass, plaster, plasterboard, and wood. The non-hazardous inert waste will be segregated for recycling or recovery purposes with none proposed for management by landfill or incineration without energy recovery. The magnitude of the impact of these streams on regional landfill and incineration without energy recovery capacity is zero and is therefore deemed to be negligible.

Any asbestos materials encountered will be segregated and stored in accordance with best practice for onward management (TII, 2017, and HSA & EPA, 2017). Asbestos is exported from Ireland for disposal as there is no landfill in Ireland to deal with this waste. As this destination will be outside of Ireland, the magnitude of the impact of this stream on regional landfill and incineration without energy recovery capacity is zero and is classed as negligible.

Other hazardous materials encountered from demolition works, if any, will be segregated and stored in accordance with best practice for onward management (TII, 2017 and HSA, and EPA, 2017), typically by recycling or recovery with very small volumes, if any, requiring landfill or incineration without energy recovery. The impact of this stream on regional landfill and incineration without energy recovery capacity would comprise <1% reduction in capacity and the magnitude of impact is therefore deemed to be negligible.

The significance of effects resulting from the building demolition works are therefore determined to be **imperceptible**, which is not significant in EIA terms.

23.4.1.3 Topsoil

Prior to commencement of construction, an estimated 60,000 m^3 of topsoil will be excavated. Approximately 35,000 m^3 of this topsoil will be removed from the proposed mainline bypass route. A further estimated 8,700 m^3, 4,700 m^3 and 7,600 m^3 will be removed from areas which will accommodate the side roads, access tracks and attenuation ponds respectively. Approximately 15,150 m^3 of the topsoil will be reused on site once the bypass and improvements works have been completed. The excess 45,000 m^3 of topsoil will have to be removed from site for reuse. Excavated topsoil will generally consist of Class 5A Fill (Topsoil). Local soils and seedbank identified for re-use by the ecology/ landscape specialists will be removed and stored in a suitable location.

The future baseline of non-hazardous landfill or incineration without energy recovery capacity is not expected to reduce due the volumes produced by the Proposed Scheme. As such, the sensitivity of the receptor has been classed as negligible. The excess topsoil that is removed from site will be available for use on other projects/schemes in accordance with the guidelines for Article 27. As such, the receptors potentially impacted by the clearing process and eventual disposal are deemed to be of low importance and rarity at a local scale. The magnitude of the impact is therefore deemed as no change.

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

23.4.1.4 Construction Soils

It is expected that approximately 520,000 m^3 of surplus soil and approximately 80,000 m^3 of surplus rock material will arise because of the Proposed Scheme. The material will be generated following excavation along the entire mainline route to ensure compliance with TII construction standards. Excavated material as part of the construction works will generally consist of:

- Class 1 or 2 Fill (Soil);
- Class 1 or 6 Fill (Rock);
- Class U1 (Soil); and
- Class U1 (Pavement).

Class 1 or 2 fill (soil) and Class U1 (soil) are soil classifications used in construction projects. Class 1 or 2 fill (soil) may be suitable for use as fill material in construction projects.

Class U1 (soil) is unacceptable material that does not comply with the permitted constituents and material properties. Use of Class U1 (soil) in construction projects can cause ground movements that can damage property.

There will be some opportunities for reuse on site as, for example, noise bunds, visual screens etc. estimated to comprise approximately 185,000 m^3 of such material. 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, the next management option is recovery at suitable authorised waste facilities i.e., facilities which have been granted a Certificate of Registration, Waste Facility Permit or EPA license. A summary of the estimated excavated and fill quantities associated with the Proposed Scheme is provided in **Table 23-8**.

Table 23-8: Estimated Earthworks Quantities

Earthworks Balance (m^3)	Topsoil	Soil	Rock
Excavated Fill (Acceptable Material)	60,000	235,000	80,000
Estimated Requirement for Proposed Scheme	15000	100,000	65,000
Surplus	45,000	135,000	15,000
Total Surplus of Acceptable Material		**195,000**	
Total Surplus of Unacceptable Material (requires processing for export as by-product)		**325,000**	
Total Surplus[6]		**520,000**	

Potential recycling/ recovery activities include processing of stone to produce construction aggregate, infilling of quarries, raising land for site improvement or development.

The suitability of material for reuse is made with reference to the ground investigations completed for the Proposed Scheme; refer to **Chapter 18** for further information on ground investigations undertaken to date. The ground investigation results indicate that between 80% and 95% of the material that will be generated from the cut sections of the proposed mainline bypass will be suitable for reuse as engineering fill.

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 Transport Infrastructure Ireland (TII) publication (2013) Specification for Road Works Series 600 – Earthworks.

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. Where feasible, classification for reuse on other construction site(s), as a by-product under Article 27, will be considered. Otherwise, those suitable for reuse will be transported to a soil recovery facility. Where the material is not suitable for reuse it will be categorised in accordance with the EPA (2018) document, Waste Classification: List of Waste and Determining if Waste is Hazardous or Non-hazardous.

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.

Any contaminated soil and stone material that may arise will be sent to a facility for processing before either reuse or export, however no contaminated soils are anticipated. It is expected that a minimum quantity of material will require such processing. Only material found to be unsuitable for immediate reuse or recovery purposes will be sent forward to such a facility.

Numerous facilities have been identified that have the capacity to deal with large quantities of construction soil. The design team developed the traffic impact assessment using selected facilities; see **Chapter 5**, **Section 5.5.2**).

The receptors potentially impacted by the construction soils are deemed to be of low importance at a local scale. The quantities discussed above are not expected to reduce future baseline capacity. Incineration

[6] 520,000 m3 of surplus soil is 780,000 tonnes of soils (density=1.5). The RWMPO Soil and Stone Recovery & Disposal Capacity Update Report of 7 December 2020 lists management capacity on the market as:

- EMR Annual Capacity (Active and Available) = 2.4 million Tonnes of licenced soil recovery facility capacities
- EMR Remaining Capacity (Lifetime) = 1,333,523 tonnes of Permitted Soil Recovery Facility Capacities (2018)

without energy recovery capacity will not be affected. As such, the sensitivity of the receptors has been classed as negligible.

Given the large quantity of excess material arising from the Proposed Scheme, despite reuse on site, and noting its onward destination to a named soil recovery facility, it is expected that the capacity of landfill will remain unchanged. A very small volume of contaminated soil and stone (if any) would require landfill disposal or thermal recovery. Therefore, the magnitude of the impact is deemed to be negligible.

The significance of the effect has therefore been determined to be **imperceptible**, which is not significant in EIA terms.

An Article 27 notification is required for each outlet to which the project exports soil and stone. These Article 27 notifications for soil and stone movement should be made within a 10-week period as recommended by the EPA however six months in advance of the proposed commencement of soil and stone movement is recommended to allow for agreements to be put in place.

23.4.1.5 General Construction Site Waste

Typical construction waste arisings such as concrete and reinforcing steel waste, used formwork/ falsework and packaging material will be produced during construction activities for the Proposed Scheme. There is likely to be an element of Waste Electrical and Electronic Equipment (WEEE) and metal material waste that arises from the construction site when installing street lighting or other electrical fixtures. Fuel, lubricants, oil, hydraulic fluids, spill kits, plant nappies and absorbent mats used to maintain the machinery or used during refuelling activities and equipment used in the construction of the infrastructure, are also considered in this section. **Table 23-5** lists the materials expected to arise due to the construction of the Proposed Scheme. The table also estimates volumes or weights associated with each material (where known) and it lists how they will be managed on-site and off-site.

The application of the waste hierarchy, as defined in the EU Waste Framework Directive is the starting point for all construction site waste management during this project. The waste hierarchy, in order of preference, is waste prevention and then re-use which are the most preferred options, followed by recycling (including composting), then energy recovery, while waste disposal through landfills should be the very last resort.

The receptors potentially impacted by the generation and eventual disposal of typical construction waste are deemed to be of negligible sensitivity. Due to the quantities of waste predicted, the opportunities for beneficial reuse and recycling and comparatively large waste facility capacity, the sensitivity of the regional landfill and incineration without energy recovery capacity is expected to reduce minimally by <1% because of wastes forecast. As such, the sensitivity of these receptors has been classed as low.

It is predicted that with the proposals for waste management on-site and off-site, the magnitude of change of regional landfill or incineration without energy recovery capacity will be less than 1% and so the magnitude of the impact to both are deemed to be negligible.

The significance of the effect has therefore been determined to be **imperceptible**, which is not considered significant in EIA terms.

23.4.1.6 Road Scheme Drainage

The attenuation ponds will collect sediment throughout the construction phase of the Proposed Scheme. However, it is anticipated that the ponds will not be de-silted until sometime after construction had ceased.

The outlets that will be used to manage contaminated sediment is likely to be incineration with energy recovery (i.e., not landfill or incineration without energy recovery). Due to the small volume of sediment generated and comparatively large capacities of the outlets, the outlets will have a negligible vulnerability to this impact. The future baseline of non-hazardous landfill and incineration without energy recovery capacity is expected to remain unchanged due the volumes produced by the Proposed Scheme. As such, the sensitivity of the receptors has been classed as negligible.

During the construction phase, small volumes of sediment will be collected in the on-site wheel washes, oil/petrol interceptors and vortex grit separators and silt bags. The quantities of waste generated here are expected to be very small with the likelihood that the regional landfill and incineration without energy recovery capacity will reduce minimally and less than 1%. Therefore, the magnitude of the impact is determined to be low.

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

23.4.1.7 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 comprise of the staff's food and canteen waste and foul/sewage waste.

Maintenance requirements for the construction plant used on the Proposed Scheme will be both preventative and corrective. There will be maintenance staff undertaking works at regular intervals, approximately every six months. There will be a small amount of waste associated with this activity arising from general waste which can be attributed to the individuals carrying out the maintenance works. This will likely be a small amount of food waste and foul waste.

Individual waste from staff will be generated through the construction phases of the Proposed Scheme. The quantities of waste generated by individual staff is expected to be minimal with the waste generated by the Proposed Scheme likely to reduce regional landfill/ incineration without energy recovery capacity by <1%. Therefore, the magnitude of the impact is determined to be negligible.

The volume of individual waste generated will have no impact on the facilities chosen to accept that waste. Therefore, the receptors potentially impacted by the generation and eventual disposal of individual waste are deemed to be of negligible importance and rarity at a local scale. The future baseline of non-hazardous landfill and incineration without energy recovery capacity in the region is expected to remain unchanged due the volumes of individual waste produced by the Proposed Scheme; therefore, the magnitude of impact is negligible.

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

23.4.2 Operational Phase

The key waste streams arising in the operational phase are described in the following sections.

23.4.2.1 Road Scheme General Road Waste Arising

Minor quantities of general road waste (such as litter, fly tipped waste, tyre shreds etc.) and construction and demolition wastes will be generated during the operational and maintenance phase of road part of the Proposed Scheme.

General road waste generated during the operational and maintenance phase of the Proposed Scheme will require off-site transfer for either reuse, recycling, recovery, or disposal, and quantities are not significant in a way that they will impact on the available and expected waste management capacities in the EMR.

The waste facilities that will accept the operational and maintenance wastes are deemed to be of low sensitivity, as the future baseline of non-hazardous landfill and incineration without energy recovery capacity is expected to be reduced by less than 1% by the general waste produced by the Proposed Scheme.

The impact will be of regional spatial extent, long term duration, continuous and low reversibility. The magnitude of impact is considered to be negligible as the quantities of waste generated by the Proposed Scheme will reduce regional landfill/ incineration without energy recovery capacity by <1%.

Overall, the significance of effect will therefore be **imperceptible to slight**, which is not significant in EIA terms.

23.4.2.2 Road Scheme Drainage System

The drainage design for the scheme includes both oil/petrol interceptors and vortex grit separators and silt bags to control hydrocarbons and sediment entering the attenuation ponds. De-silting of the attenuation ponds will take place during the operation and maintenance phase of the Proposed Scheme. Ongoing inspection and maintenance will be required for the vortex grit separators, the oil/petrol interceptors, attenuation ponds, and filter drains, in line with **Chapter 4**, **Section 4.3**.

As the ponds are designed to collect and treat contaminants associated with runoff, (sediment removed from the pond may contain low levels of metals, hydrocarbons, and other pollutants) the maintenance regime will take account of this during the management of any sediment or plant material from the ponds, as well as the de-contamination of the pond when it has reached the end of its useful life. Contaminated sediment or plant material will require appropriate management that will be determined by its composition, likely disposal by incineration without energy recovery or landfill. The quantity of sediment produced during the operation and maintenance phases of the Proposed Scheme is expected to be small.

The waste facilities that will accept the operational and maintenance waste are deemed to be low sensitivity. Given the anticipated small volumes expected to go to disposal by incineration without energy recovery or landfill, the impact will be of local spatial extent, long term duration, continuous and low reversibility with a negligible magnitude of impact.

The significance of effect will therefore be **Imperceptible to slight**, which is not significant in EIA terms.

23.4.2.3 Public Realm Litter Wastes Arising

Waste arising in the public realm during the operational and maintenance phase relates primarily to litter and may include fly tipped waste. Litter is currently generated in Slane village and is currently managed by Meath County Council. Quantities of litter are not anticipated to change as a result of the public realm enhancement proposals for the Proposed Scheme.

Litter generated will continue to require collection and off-site transfer for appropriate management, either reuse, recycling, recovery, or disposal and quantities are not significant in a way that they will impact on the available and expected waste management capacities in the region. The sensitivity of the receptor is therefore considered to be low. The impact will be of regional spatial extent, long term duration, continuous and low reversibility. Given the small volumes of litter anticipated to arise, the magnitude of impact is considered to be negligible.

The significance of effect will therefore be **imperceptible to slight**, which is not significant in EIA terms.

23.4.3 Cumulative Impact

A cumulative impact assessment (CIA) has been undertaken to consider potential for cumulative impact of the Proposed Scheme with other approved development. The detailed methodology for the CIA is described in **Chapter 25 – Cumulative Effects**. The assessment has considered cumulative sources and impact pathways which could impact on material assets: resource and waste management.

The projects listed in **Appendix 25.2** have been assessed. Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/ temporal scales involved. The CIA for Material Assets: Resource and Waste Management takes into account the impact associated with the Proposed Scheme together with other approved projects. Each project has been considered on a case-by-case basis for screening in or out of this chapter's assessment based upon data confidence, effect-receptor pathways and the spatial/temporal scales involved.

There are approved projects in the ZoI for the resource and waste management topic which will result in waste and materials arising from these other developments. However, there is capacity in the resource and waste management system based on the baseline review of facilities as outlined in **Chapter 23**, **Section 23.3**. As the Proposed Scheme itself is not having a significant effect in terms of materials and wastes arising, it is therefore considered that here will be no significant negative cumulative effects arising from the Proposed Scheme with other approved projects.

23.5 Mitigation Measures

23.5.1 Construction Phase

The Proposed Scheme will be delivered in compliance with the Standard and Technical documents related to the environment as presented in **Chapter 5**, **Section 5.10** (Environmental Management During Construction), including details of the Environmental Operating Plan.

A Resource and Waste Management Plan (RWMP) will be prepared by the appointed Contractor to deliver the mitigation presented in this chapter of the EIAR. The RWMP 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 RWMP 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; and
- Proposals for education and a workforce and plan dissemination programme.

A Waste Manager will be nominated who will have overall responsibility for the implementation of all waste processes. In conjunction with this, a clear responsibility structure will be introduced for the construction staff/contractor to ensure issues encountered are raised at an appropriate level and acted upon. This is essential in ensuring that all waste is properly dealt with.

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 will 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:** Waste fuels/oils will be generated from equipment used on-site during construction and will be classified as hazardous waste. Paints, sealants, and hazardous chemicals etc. will be stored in secure, bunded locations. All hazardous waste will be separately stored and labelled, in appropriate lockable containers, prior to removal from site by an appropriately permitted waste collection service provider.
- **Efficient Removal:** Waste generated on site will be removed as soon as practicable following generation for delivery to an authorised waste facility.

Any waste arising from the construction phase of the Proposed Scheme will be deposited at an appropriate facility (as listed in **Table 23-4**) in accordance with the current national waste policy. This is necessary so that all waste is disposed of to the best possible facility type to adhere to the circular economy and resource opportunity strategies.

If unforeseen waste or hazardous material is encountered during 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.

Staff will be trained in how to identify contamination and how to manage it if encountered. Identification will include visual checks for unusual discolouration, oil sheens, anthropogenic materials, and checks for olfactory clues such as hydrocarbon or other odours. Suspect contaminated material will be sampled and appropriately analysed at laboratory.

Records will be kept on the quantity nature/type and quality of all waste leaving the site.

Noting the efforts already made through the design evolution for the Proposed Scheme in terms of reuse of cut material in noise and visual bunds, integral to the scheme (see **Chapter 9 – Noise and Vibration** and **Chapter 12 – Landscape and Visual**), further opportunities will be sought through detailed design stage to reuse soil and stone material arising from excavation works on site to further reduce the quantity of material needing to be removed off-site.

Concrete waste will be recycled into a new aggregate product by a specialist contractor (operating under Article 28 of the EC Waste Directive Regulations 2011 (referred to as end of waste material))[7].

By-product notifications (under Article 27 of the EC Waste Directive Regulations 2011) provide an opportunity for reuse of surplus clean soil and stone material arising from construction activity. At the time of construction, options for Article 27 by-product status or similar will be reviewed by MCC and the appointed contractor, 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.

Exported materials, particularly soils, will be carefully managed to restrict the spread of invasive alien plant species (IAPS); refer to **Chapter 15 – Biodiversity: Terrestrial Ecology** for further information on the management of IAPS.

Sustainable practices will be implemented when choosing materials to be used in the construction of the Proposed Scheme, including the use of cement containing high levels of GGBS or recycled steel; refer to **Chapter 19 – Climate** for further information relating to sustainable materials.

23.5.2 Operational Phase

The waste hierarchy principles will 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 both petrol/oil interceptors and vortex grit separators to ensure control of hydrocarbons and sediment entering the attenuation ponds. Notwithstanding these controls, given the sensitive nature of the receiving environment any sediments or vegetated material for disposal during maintenance will be considered contaminated unless testing of material is available to prove otherwise and it will be disposed of accordingly in an appropriately licensed facility. Sediment and plant waste is likely to require pre-treatment prior to disposal at a landfill site. This will take place either as the material is extracted or at the landfill site itself.

Under no circumstances will sediment or vegetation arising from pond maintenance be disposed of on-site.

Any waste arising from the operational and maintenance phases of the Proposed Scheme will be deposited at an appropriate facility (as listed in **Table 23-4**) in accordance with the current national waste policy at the time. 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 permit holders. 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.

Records will be kept on the quantity nature/type and quality of all waste leaving the site.

23.6 Residual Impacts

23.6.1 Construction Phase

Following implementation of the mitigation measures as outlined in **Section 23.5**, 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 of short-term duration.

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 EMR have capacity to accept the estimated quantities

[7] EPA: End of Waste (Art. 28). Retrieved March 24, 2022. EPA lists suppliers of concrete aggregate recycling services, available at: www.epa.ie/our-services/licensing/waste/end-of-waste-art-28

which will be notified as a by-product (under Article 27 of the EC Waste Directive Regulations 2011, as amended).

23.6.2 Operational Phase

The waste generated during operation and maintenance 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 negligible.

23.7 Monitoring

Monitoring is proposed for the construction and operational phases as set out in the following sections.

23.7.1 Construction Phase

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

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

23.7.2 Operational Phase

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

- Contractors will be contractually obliged to ensure that good housekeeping practices are employed for all maintenance activities; and
- Records will be kept detailing the de-silting of the attenuation ponds, including quantity, nature/ type and quality of the sediment and the permitted waste facility where it is disposed.

23.8 Chapter References

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EPA (2021) Best Practice Guidelines for the Preparation of Resources & Waste Management Plans for Construction and Demolition Projects.

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EPA (2020b) 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).

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