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15 Resource and Waste Management

15.1 Introduction

This chapter of the EIA describes the potential for waste to be generated during the excavation, construction and operation of the Proposed Road Scheme. Mitigation measures are proposed to reduce the impact of the waste generated by the Proposed Road Scheme in the excavation, construction and operational phases.

This chapter has been prepared by Richard Hamilton, a chartered Town Planner with over 20 years experience, a member of the Irish Planning Institute and the Royal Town Planning Institute. He is a Director in Future Analytics Consulting (FAC) which provides consultancy services in Planning, Research and Economics. Relevant EIA experience includes the M1 Motorway Service Areas-EIS for the NRA 2011; Profile Park, Grangecastle Masterplan and EIS, South Dublin (2005 – 2006), Lidl Regional Distribution Centre, Newbridge, Kildare – Planning Application and EIS (2015/2016), College Green Plaza EIA (2017), Dublin Airport, Northern Parallel Runway EIS (2005 – 2007), and Luas light rail Dublin (lines A and B) EIA.

The principal objective of sustainable resource and waste management is to use material resources more efficiently, where the value of products, materials and resources are maintained in the economy for as long as possible and the generation of waste minimised. To achieve resource efficiency there is a need to move from a traditional linear economy to a circular economy (see Figure 15-1: Circular Economy).

However, where residual waste is generated, it should be dealt with in a way that follows the waste hierarchy (see Figure 15-2: Waste Hierarchy) and actively contributes to the economic, social and environmental goals of sustainable development.

This chapter of the EIA examines the potential environmental effects of the generation and management of solid waste streams arising from the Proposed Scheme, in the context of the existing local and national resource and waste management environment. The Proposed Scheme is located within the Local Authority of Dún Laoghaire-Rathdown County Council (DLRCC).

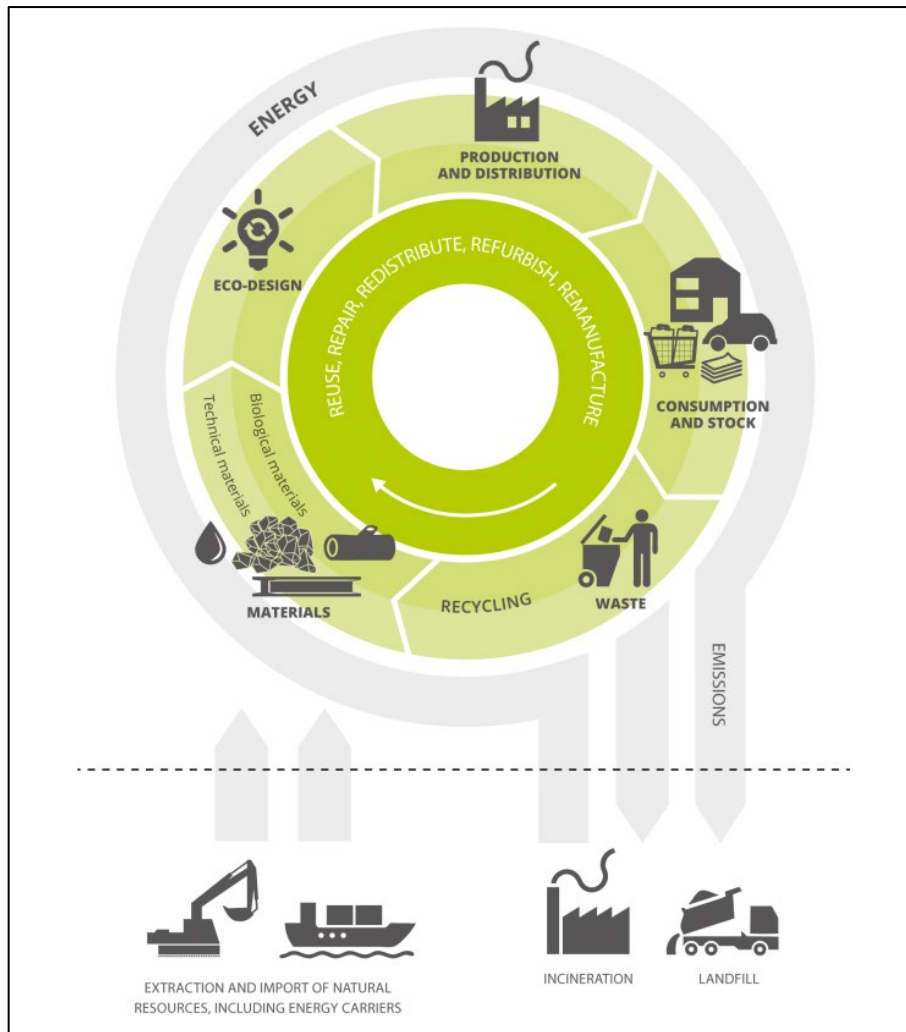


Figure 15-1: Circular Economy

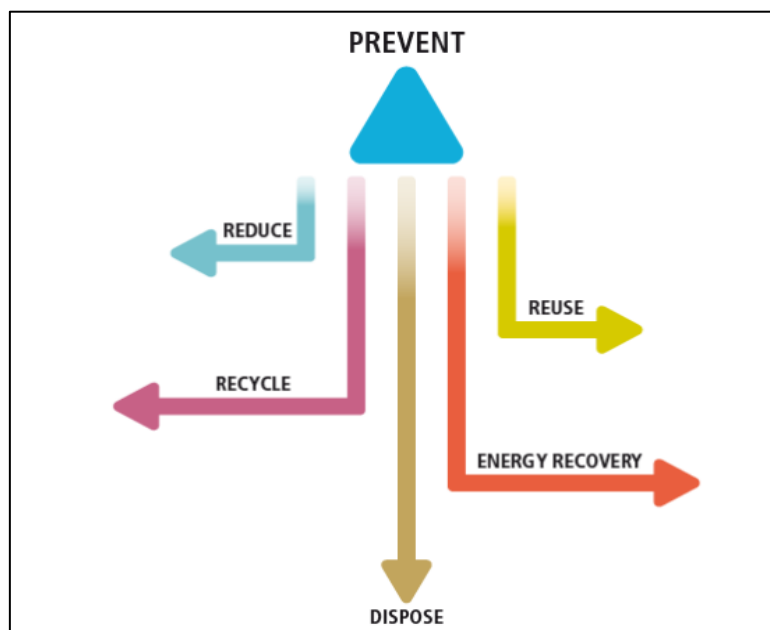


Figure 15-2: Waste Hierarchy

15.2 Assessment Methodology

15.2.1 General

This Chapter is based on the Proposed Project, as described in Chapter 5 'Description of Scheme' and Chapter 6 'Construction Strategy'. This section sets out the methodology followed in carrying out this resource and waste impact assessment. This resource and waste management assessment considers the following aspects;

- The legislative context;
- The construction phase, including excavation; and
- The operational phase.

A review was undertaken which included the following tasks;

- Review of relevant policy and legislation which creates the legal framework for resource and waste management in Ireland, including the Eastern-Midlands Regional Waste Management Plan 2015-2021;
- Description of waste generation during the construction and operational phases; and
- The Proposed Project was systematically reviewed to identify mitigation and move waste management up the waste hierarchy through implementation of best practice (refer to the aforementioned Figure 15-2).

15.2.2 Guidance and Legislation

Resource and waste management takes place in a policy and legislative framework. A review of relevant legislation, policy and best practice guidance was undertaken to inform the impact assessment and recommended mitigation.

The key components of EU, national and local policy, legislation and guidance relevant to the Proposed Project are summarised as follows;

- Prevention of waste is the preferred option such that the value of products, materials and resources are maintained in the economy for as long as possible and the generation of waste minimised;
- Where construction waste is generated it should be source separated to facilitate reuse, recycling and maximise diversion of waste from landfill;
- Where waste may not be prevented, reused or recycled it should be transported and disposed of in accordance with applicable legislation and without causing environmental pollution;
- Waste may only be transferred from the Proposed Project by a waste collection permit holder and delivered to an authorised waste facility (a facility which holds a certificate of registration, waste facility permits or waste license); and

- Businesses must keep footpaths, pavements and gutters adjacent to premises litter free. Organisers of major events also have responsibilities in relation to collection and management of litter resulting from events.

The following Legislation, Policy and Guidance documents were used to inform this chapter;

European Legislation

Directive 2008/98/EC of the European Parliament and the Council of 19th November 2008 on waste and repealing certain Directives.

Directive 2008/98/EC came into force on 12th December 2008 and Ireland had two years from this date to implement it into national law. The Directive lays down the five-step hierarchy of waste management options, with waste prevention as the preferred option, followed by re-use, recycling, recovery and safe disposal, in descending order.

In addition, the Directive also deals with the issue of 'end of waste' and clarifies the definitions of recovery, disposal and by-product. The Directive states that, "the recovery of waste and the use of recovered material as raw materials should be encouraged in order to conserve natural resources."

National Legislation

Waste Management Acts, 1996-2008 and Regulations Made under the Acts

The Waste Management Act, 1996 was enacted in May, 1996 and sets out the responsibilities and functions of various persons in relation to waste. This was subsequently amended by a number of acts including the Waste Management (Amendment) Act 2001 and the Protection of the Environment Act 2003. As of the 2nd April 2018, the Waste Management Acts 1996-2011 is now a collective group of Acts included in this collective citation to be construed together as one (Environment (Miscellaneous Provisions) Act 2011 (20/2011), s. 1(3)). The acts included in this group are as follows;

- Waste Management Act 1996 (10/1996);
- Waste Management (Amendment) Act 2001 (36/2001), other than s. 14;
- Protection of the Environment Act 2003 (27/2003), Part 3;
- Waste Management (Electrical and Electronic Equipment) Regulations 2005 (S.I. No. 290 of 2005), Part 5;
- Waste Management (Environmental Levy) (Plastic Bag) Order 2007 (S.I. No. 62 of 2007);
- Waste Management (Registration of Brokers and Dealers) Regulations 2008 (S.I. No. 113 of 2008);
- Waste Management (Landfill Levy) Order 2008 (S.I. No. 168 of 2008); and
- Environment (Miscellaneous Provisions) Act 2011 (20/2011), Part 4.

The Act;

- Prohibits any person from holding, transporting, recovering or disposing of waste in a manner which causes or is likely to cause environmental pollution;
- Requires any person who carries on activities of an agricultural, commercial or industrial nature to take all such reasonable steps as are necessary to prevent or minimize the production of waste;
- Prohibits the transfer of waste to any person other than an authorized person (i.e. a holder of a waste collection permit or a local authority);
- Requires the Environmental Protection Agency (EPA) to make a national plan in relation to hazardous waste;
- Requires local authorities to make waste management plans in relation to non-hazardous waste;
- Imposes certain obligations on local authorities to ensure that a service is provided for collection of household waste and to provide facilities for the recovery and disposal of such waste;
- Enables the Minister for Housing, Planning and Local Government to make Regulations for various purposes to promote better waste management; and
- Provides for substantial penalties for offences including fines, imprisonment and/or liability for clean-up measures.

Waste Management (Collection Permit) Regulations, 2007 as Amended

Waste from the proposed development may only be collected by the holder of a waste collection permit or a local authority. Waste collection permits are granted in accordance with the Waste Management (Collection Permit) Regulations, 2007 as amended. Waste storage and collection areas on site should be designed to prevent environmental pollution.

Waste Management (Shipments of Waste) Regulations 2007, S.I. No. 419

Where waste from the proposed development is exported outside of Ireland for recovery or disposal the National Trans frontier Shipment (TFS) Office within Dublin City Council must be notified. Certain financial guarantees must be in place and a certificate issued by the National TFS Office prior to the waste movement taking place.

SI 126 of 2011 – European Communities (Waste Directive) Regulations 2011

These regulations which were adopted in 2011 significantly changed the provisions of the Waste Management Acts, 1996 to 2011. The regulations detail “waste disposal” and “waste recovery” as well as setting out tests which must be complied with in order for material to be described as a “by-product” or achieve “end of waste” status.

The regulations formally set out the following waste hierarchy (as illustrated in **Figure 15-2: Waste Hierarchy**) which shall apply as a priority order in waste prevention and management legislation and policy;

- a) Prevention;
- b) Preparation for re-use;
- c) Recycling;
- d) Other recovery (including energy recovery); and
- e) Disposal.

The regulations require that all waste management plans and hazardous waste management plans in existence at the commencement of the Regulations shall be evaluated by 31st December 2012 and where appropriate be revised to be brought into line with Directive 2006/12/EC on waste.

The regulations also require the Environment Agency to establish a waste prevention Programme by December 2013.

European Policy

The following documents have been viewed as part of the European Policy side for waste management;

- European 2020 Strategy, European Commission (EC) (2010);
- Roadmap to a Resource Efficient Europe, EC (2011); and
- EC Circular Economy Strategy (2015).

National Policy

The first national waste policy statement was published by the Department of Environment and Local Government in 1998. A number of statements have been published since, each of which builds on the objectives of the previous plans to improve how waste is managed in Ireland, move waste away from landfill and towards a more sustainable option. The statements published to date include:

- Department of the Environment and Local Government (1998). 'Waste Management – Changing Our Ways' – A Policy Statement.
- Department of the Environment and Local Government (2002). Preventing and Recycling Waste – Delivering Change – A Policy Statement.
- Department of the Environment, Heritage and Local Government (2004). Waste Management - Taking Stock and Moving Forward.
- Department of the Environment, Heritage and Local Government (2006). National Strategy on Biodegradable Waste Management.

- Department of the Environment, Heritage and Local Government (2012). A Resource Opportunity – Waste Management Policy in Ireland.

From 2012 a number of policy documents and reports have been published which are named below;

- Department of the Environment, Heritage and Local Government (2012). A Resource Opportunity – Waste Management Policy in Ireland;
- EPA (2013 and 2014) National Waste Reports 2011 and 2012;
- EPA (2014) National Municipal Waste Recovery Capacity. An Assessment for the Department of the Environment, Community and Local Government; and
- Environmental Protection Agency (2014). National Hazardous Waste Management Plans, 2014-2020.

Regional & Local Policy

The Eastern Midlands Region Waste Management Plan 2015-2021

For the purposes of waste management planning, Ireland is now divided into three regions: the Eastern and Midlands Regional Assembly, the Southern Regional Assembly and the Northern and Western Regional Assembly. The Eastern and Midlands Region includes the Dún Laoghaire-Rathdown County Council area.

The Eastern Midlands Region Waste Management Plan 2015-2021 was launched in 2015. The strategic approach of the plan places a stronger emphasis on preventing wastes and material reuse activities. Three strategic targets have been set in the plan which include;

- Achieve a recycle rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill in favour of higher value pre-treatment processes and indigenous recovery practices.

This plan looks to 2030 and includes a goal of reaching a recycling rate of 60%.

Guidance

- European Waste Catalogue (EWC) and Hazardous Waste List (EPA, 2002);
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction & Demolition Projects (Department of the Environment, Heritage and Local Government (DoEHLG), 2006);
- Construction and Demolition Waste Management – A Handbook for Contractors & Site Managers (FÁS and The Construction Industry Federation, 2002);
- A Resource Opportunity – Waste Management Policy in Ireland (Department of the Environment, Community and Local Government, 2012); and
- Guidelines for the Management of Waste from National Road Schemes (TII, 2008).

15.2.3 Impact Assessment Methodology

Impacts significance and rating is as set out in the EIAR guidance documents described in Chapter 1 'Introduction'.

15.3 Baseline Environment

The Proposed Project is located within the Local Authority of DLRCC – located just south of the M50 in the Metropolitan area of Glenamuck/Kiltiernan.

In order to establish a baseline and review capacity in relation to construction wastes a review of published data and statistics was undertaken.

The most recent figures published by the Environmental Protection Agency (EPA) relating to construction and demolition (C&D) waste are for the year 2014 which were released on the 22nd March 2018 by the EPA. In 2014, 3,314 ktonnes of C&D waste were finally treated (recovered or disposed). Soil and stones accounted for 74% of the total quantity. Mineral waste (concrete, bricks, gypsum) accounted for 12% of the total quantity.

The quantity of C&D waste managed in Ireland is indicative of economic activity. At the peak of the economic and construction boom in 2007, approx. 17.8 million tonnes of C&D waste was collected for treatment. This fell to 3 million tonnes in 2011. From viewing the 2014 data, an increase in construction and demolition waste generation since 2011, most likely as a result of economic growth. 3.31 million tonnes of construction and demolition waste was generated in 2014 according to EPA data.

Under the Waste Framework Directive (2008/98/EC) there is a target for Member States to achieve 70% material recovery of non-hazardous, non-soil and stones C&D wastes by 2020. Ireland achieved 68% recovery in 2014. The Waste Framework Directive target only applies to a portion of all C&D wastes generated, as hazardous wastes and soil and stones wastes are excluded from the calculation.

An indicative breakdown of the composition of construction and demolition waste is set out in Table 15-1 below. These figures should be considered as a guide only – as construction and demolition waste can vary depending on the nature of the development and waste can vary significantly from one project to another, depending on the nature of the development and the waste management practices employed on-site.

Table 15-1 Material Categories of C&D Waste Treated

Material from C&D sources	Quantity (tonnes)	% of material stream in reference to total
Metal waste	173,810	5.24%
Glass waste	2,904	0.09%
Paper and cardboard waste	211	0.01%
Plastic waste	348	0.01%
Wood waste	52,155	1.57%
Waste containing PCBs	2	0.00%
Mixed waste	2,504	0.08%
Mineral waste	401,409	12.11%
Asbestos waste	6,246	0.19%
Soil and stones	2,463,749	74.35%
Residue from treatment of mixed waste	210,520	6.35%
Total	3,313,858	100.00%

The construction sector also generates hazardous waste such as lead-acid batteries, waste electrical and electronic equipment, asbestos solvent-based paints and varnishes, pesticides and waste oils which can be seen in the above Table 15-1.

15.3.1 Operational Wastes

Wastes generated during the operational phase typically comprise municipal waste.

15.4 Predicted Impacts

15.4.1 Do Nothing Scenario

The resource and waste management impact assessment assumes that under the “Do Nothing” scenario the Proposed Project will not be developed. Consequently, there will be a neutral impact on resource and waste management.

15.4.2 Construction Phase

An estimated 57,500m³ material will be excavated for roads and an estimated 51,600m³ material will be excavated for ponds in the course of the works. A summary of excavated material is included in Table 15-2 below.

Table 15-2 Preliminary Material Volumes

Description	Quantity
Excavation for Roads	57,500m ³
Excavation for Ponds	51,600m ³
Re-use of Excavated Material in Road Construction	39,500m ³
Surplus Soils Volume	69,600m ³
Imported Road Gravels	30,100m ³
Imported Concrete and Asphalt Surfacing	11,000m ³

A significant proportion of the surplus excavation material from the project is likely to consist of soil and stones which may be accepted for recovery or recycling at waste licensed and permitted facilities. The contractor will reuse 39,500m³ of excavated material in road construction. This means that there will be a surplus of 69,600m³. Measures to minimize surplus soil generation and maximise the sustainable reuse of this material is outlined within the mitigation measures for land and soils in Chapter 13.

All excavated material which cannot be reused within the proposed development will be removed from the site. Where contaminated soil is encountered this will be delivered to appropriately licensed waste facilities for recovery/disposal as appropriate. The predicted impacts of excavation waste prior to implementation of mitigation measures is expected to be not significant.

Construction works, site offices and temporary works facilities are likely to generate construction waste. Construction waste is defined as waste which arises from construction and renovation activities. Also included within the definition are surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of on-site activities.

Construction waste can vary significantly from site to site but typically would include the following non-hazardous fractions;

- Soil and stone;

- Concrete, brick, tiles and ceramics;
- Asphalt/tar;
- Metals
- Wood; and
- Other.

The hazardous waste streams which could arise from construction activities may include the following;

- Waste electrical and electronic components;
- Batteries;
- Asbestos;
- Wood preservatives;
- Liquid fuels; and
- Contaminated soil.

In the case of the Proposed Project the most likely type of construction waste will be surplus concrete and unusable or damaged construction materials such as paving slabs.

The predicted impact of construction waste prior to implementation of mitigation measures is expected to be slight, negative and short-term.

15.4.3 Operational Phase

It is expected that there will be negligible waste generation on completion of the proposed road development. Wastes generated from maintenance of the proposed road development will be removed and managed by local authority staff and any contractors undertaking the work.

15.5 Mitigation Measures

Mitigation measures are set out in the sections below to minimise the effect of the Glenamuck District Roads Scheme on the environment, reduce the quantity of waste sent for final disposal and to promote sustainable waste management practices.

Waste from the Glenamuck District Roads Scheme will be managed in accordance with the principles of the waste hierarchy seen in Figure 15-1 i.e. prevent, reduce, re-use, re-cycling, energy recovery and disposal.

The contractor will minimise waste disposal so far as is reasonably practicable.

15.5.1 Proposed Mitigation Measures-Excavation, Construction and Demolition Phases

Proposed mitigation measures for the excavation, construction and demolition phases of the Scheme are as follows;

- **Construction and Demolition Waste Management Plan:** Preparation of a Construction and Demolition Waste Management Plan which meets the requirements of the DoEHLG Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG, 2006a) is recommended.

Where waste generation cannot be avoided this will maximise the quantity and quality of waste delivered for recycling and facilitate its movement up the waste hierarchy away from landfill disposal and reduce its environmental impact.

- **ICE Demolition Protocol:** In addition to the general measures outlined above a demolition audit in accordance with the ICE Demolition Protocol 2008 or similar guidance will be considered at detailed design stage for those structures which will be demolished as part of the proposed development.
- Possibilities for re-use of clean non-hazardous excavation material as fill on the site or in landscaping works will be considered following appropriate testing to ensure material is suitable for its proposed end use. Where excavation material may not be re-used within the proposed works the Contractor will endeavor to send material for recovery or recycling so far as is reasonably practicable. The contractor will ensure that any off-site interim storage facilities for excavated material have the appropriate waste licenses or waste facility permits in place.
- **Source Segregation:** Waste produced will be segregated. Where possible metal, timber, glass and other recyclable material will be segregated during demolition works and removed off site to a permitted/licensed facility for recycling. Waste stream colour coding and photographs will be used to facilitate segregation.
- **Material Management:** 'Just-in-time' delivery will be used so far as is reasonably practicable to minimize material wastage.
- **Supply Chain Partners:** The contractor will engage with the supply chain to supply products and materials that use minimal packaging, and segregate packaging for reuse.

- **Waste Auditing:** The contractor will record the quantity in tonnes and types of waste and materials leaving the development site during the construction phase. The name, address and authorization details of all facilities and locations to which waste and materials from the construction phase 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 disposed of.

15.5.2 Proposed Mitigation Measures – Operational Phase

There are no impacts envisaged during the operational phase of the proposed scheme. Therefore, no operational mitigation measures are required.

15.6 Residual Impacts

The resulting residual impacts of excavation waste will be neutral, slight and short term.

The resulting residual impact of construction and demolition waste will be slight, neutral and short term.

Based on the scheme description the residual impact of operational waste will be neutral.

There is likely to be significant available capacity within existing Irish waste management infrastructure to manage the excavation, construction and operational waste from the Glenamuck District Roads Scheme.

15.7 Difficulties Encountered

No difficulties were experienced during the process in regards to waste management.

15.8 References

- Department of Environment, Community and Local Government (1998) Waste Management Changing our Ways. DoECLG, Dublin, Ireland;
- Department of Environment, Community and Local Government (2006) Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects. DoECLG, Dublin, Ireland;
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- EPA (2018) Construction and Demolition Waste Statistics for Ireland-EPA Waste Data Release, 22 March 2018. Latest Reference Year 2014. Johnstown Castle Estate, Wexford, Ireland;
- EPA (2017) Ireland-Progress towards EU waste targets-November 2017, Johnstown Caste, Wexford;
- EPA (2014) National Waste Report 2012, Johnstown Castle, Wexford, Ireland;
- EPA (2014) National Municipal Waste Recovery Capacity. An Assessment for the Department of the Environment, Community and Local Government. Johnstown Castel, Wexford;
- EPA (2014) National Hazardous Waste Management Plans, 2014-2020. Johnstown Castle, Wexford;
- EPA (2014) National Municipal Waste Recovery Capacity. An Assessment for the Department of the Environment, Community and Local Government. Johnstown Castle, Wexford, Ireland;
- EPA (2015) Waste Classification-List of Waste and Determining if Waste is hazardous or Non-Hazardous. Johnstown Castle, Wexford, Ireland;
- EPA (2015a) Revised Guidelines on the Information to be contained in Environmental Impact Statement Draft. EPA, Johnstown Castle Estate, Wexford, Ireland;
- EPA (2015b) Advice Notes for Preparing Environmental Impact Statements Draft. EPA. Johnstown Castle Estate, Wexford, Ireland;
- EPA (2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Draft August 2017. Johnstown Caste Estate, Wexford, Ireland;

- FÁS and Construction Industry Federation (CIF) (2002) Construction and Demolition Waste Management-A Handbook for Contractors and Site Managers. FÁS Environmental Unit, Upper Baggot Street, Dublin 4;
- Guidelines for the Management of Waste from National Road Schemes (TII, 2008).