14 MATERIALS

14.1 INTRODUCTION

14.1.1. This chapter reports the outcome of the assessment of likely significant effects arising from the Proposed Scheme in the consumption of material assets, and in generating and disposing of waste.

14.1.2. The objectives of this chapter are to provide a Material Assets and Waste assessment as these environmental topics have not been assessed previously as part of the ES 2016 and ESA 2019. The assessment of Materials was not a requirement under the now superseded DMRB guidance, with no adopted standard covering this topic. In order to assess potential impact on the consumption of material assets and the generation of waste as part of the recent review of the specimen design, a materials assessment has been undertaken utilising the updated standard DMRB LA 110. Previously, an interim advice note and draft guidance existed.

14.1.3. Information feeding into this Material Assets and Waste assessment was provided by the Integrated Delivery Team comprising of three Joint Ventures appointed under Early Contractor Involvement (ECI) contracts. Through late 2022 a series of in person and virtual workshops were held with the IDT to develop preliminary construction programmes and for the IDT to advise on construction related activities so that the environmental impacts during construction could be adequately assessed in this ESA 2022.

14.1.4. The chapter describes the assessment methodology (**Section 14.3 - Methodology and Significance Criteria**) and the baseline conditions (Baseline Environmental Information) relevant to the assessment. It outlines the committed mitigation measures (**Section 14.5.3 – Design and Mitigation**) and reports on the likely residual effects after these measures have been employed (**Section 14.6 - Conclusion**).

14.1.5. This chapter (and its associated figures) is intended to be read as part of the wider ESA 2022, with particular reference to **Chapter 8 - Landscape and Visual**, **Chapter 10 - Geology and Soils**, **Chapter 11 - Noise and Vibration**, and **Chapter 15 - Climate**.

14.2 LEGISLATION AND POLICY

14.2.1. This assessment has taken into account, and is in alignment with, the following legislation and policy identified as relevant to the assessment of material assets and waste.

LEGISLATION

Environment Act 2021[C1F11]

14.2.2. Part 2 of the Environment Act passed in 2021, addresses environmental governance in Northern Ireland. Schedule 2 ‘Improving the Natural Environment: Northern Ireland’ requires an environmental improvement plan and greater monitoring and reporting on the natural environment. The Draft Environment Strategy 2021[C1F12] is intended to be adopted as Northern Ireland’s Environmental Improvement Plan. This Strategy is the first of its kind for Northern Ireland and will form the basis for a coherent and effective set of interventions to improve the quality of the environment, and in doing so will impart positive change on social health and wellbeing, sustainable economic development, and enhance the position of Northern Ireland as a global environmental leader. The strategy details six strategic environmental objectives (SEO), including:

- Sustainable production and consumption on land and at sea (SEO4); and
- Zero waste & highly developed circular economy (SEO5).

Regulatory Position Statement on the Movement and Use of Treated Asphalt Waste Containing Coal Tar, 2018[147]

14.2.3. This regulatory position statement (RPS) is applicable to the use of treated asphalt waste containing coal tar in construction of hard paving structures, e.g., roads and pavements. Asphalt waste created during the repair and refurbishment of road is usually non-hazardous where the binder used is bitumen only. However, binding agents containing coal tar would be classed as hazardous waste. Under the terms of the RPS, NIEA will allow the final use of treated asphalt waste containing coal tar in certain construction operations without a waste authorisation, if the requirements of the RPS are complied with.

The Controlled Waste and Duty of Care Regulations (Northern Ireland) 2013 (as amended)[148]

14.2.4. These Regulations clarify the classification of 'household', 'commercial' and 'industrial' wastes. The Regulations introduce more stringent controls under the waste duty of care system to provide for better information contained in waste transfer notes, aid tracking waste and strengthen controls around the movement of waste.

The Waste Regulations (Northern Ireland) 2011 (as amended)[149]

14.2.5. The 2011 Regulations implements the revised Waste Framework Directive (2008/98/EC) and provide a definition of waste:

- ""waste" means any substance or object which the holder discards or intends or is required to discard; and for the purposes of this definition—
  - "holder" means the producer of the waste or the person who is in possession of it: and
  - "producer" means any person whose activities produce waste or any person who carries out pre-processing, mixing or other operations resulting in a change in the nature or composition of this waste;"

14.2.6. The Regulations set out the priority order for the prevention and management of waste, and embeds this in the Waste Hierarchy, as shown in **Plate 14-1**[150]. The Waste Hierarchy applies to any person who imports, produces, collects, carries, keeps, treats or disposes of waste.

[147] DAERA 2018. Regulatory Position Statement: The movement and use of treated asphalt waste containing coal tar. Available at [https://www.daera-ni.gov.uk/publications/movement-and-use-treated-asphalt-waste-containing-coal-tar]
[148] HM Government, (2013). The Controlled Waste and Duty of Care Regulations (Northern Ireland) 2013 [online]. Available at http://www.legislation.gov.uk/nisr/2013/255/contents/made [Accessed 08/12/2021]
[149] HM Government, (2011). The Waste Regulations (Northern Ireland) 2011 [online]. Available at: http://www.legislation.gov.uk/nisr/2011/127/contents/made [Accessed 08/12/2021].
[150] European Commission, (2019). Directive 2008/98/EC on waste (Waste Framework Directive) [online]. Available at https://eur-lex.europa.eu/eli/dir/2008/98 [Accessed 08/12/2021].

Plate 14-1 – The Waste Hierarchy

14.2.7. The Regulations also set recycling targets, whereby at least 70% (by weight) of non-hazardous construction and demolition wastes are subject to material recovery by 2020. This target excludes naturally occurring materials: specifically, those that fall under category 17 05 04 in the list of waste, defined as non-hazardous soils and stones).

14.2.8. Of particular note from the Regulations is the duty on those who produce, transport and dispose of waste to ensure that their activities do not have an adverse impact on the environment. The Regulations also set out the Duty of Care tracking system to ensure the producer, carrier and disposal operator take responsibility for proper disposal of their waste. Waste carriers must be registered and licenced, and producers of waste must ensure that their waste is removed by a registered carrier. Facilities which dispose of waste or hold waste pending disposal must be licenced to operate as a waste facility.

The Waste Management Strategy Regulations (Northern Ireland) 2009[151]

14.2.9. These Regulations (amending the Waste and Contaminated Land (Northern Ireland) Order 1997) require the Department of Environment (superseded by the Department of Agriculture, Environment and Rural Affairs) to have a waste management strategy containing policies in relation to the recovery and disposal of waste in Northern Ireland.

Hazardous Waste Regulations (Northern Ireland) 2005 (as amended)[152]

14.2.10. These Regulations set out the regime for the control and tracking the movement of hazardous waste in Northern Ireland and transpose the Hazardous Waste Directive (91/689/EC). The Regulations

[151] HM Government, (2009). The Waste Management Strategy Regulations (Northern Ireland) 2009 [online]. Available at http://www.legislation.gov.uk/nisr/2009/178/contents/made. [Accessed 08/12/2021].
[152] HM Government, (2005). The Hazardous Waste Regulations (Northern Ireland) 2005 [online]. Available at http://www.legislation.gov.uk/nisr/2005/300/contents/made [Accessed 08/12/2021].

describe the meaning and determination of waste that should be classed as hazardous. The use of consignment notes to track hazardous waste movements are described.

Waste and Contaminated Land (Northern Ireland) Order 1997 (as amended)[153]

14.2.11. Although amended by multiple legislation documents, the Order is still extant and sets out the waste management regime covering waste carrier registration and identifying and remedying contaminated land.

NATIONAL POLICY

Regional Development Strategy 2035[154]

14.2.12. This Strategy provides overarching strategic planning framework to influence development in Northern Ireland. Key measures relevant to material assets and waste include encouraging the use of building rubble to reduce depletion of natural resources (under policy RG9) and managing waste sustainably (under policy RG10) through applying the Waste Hierarchy and Proximity Principle. This is established as part of the EC Waste Framework Directive and emphasises the need to treat or dispose of waste as close as practicable to the point of generation, to minimise the environmental impacts of waste transport.

Delivering Resource Efficiency; Northern Ireland Waste Management Strategy 2013[155]

14.2.13. This Strategy sets the policy framework for the management of waste in Northern Ireland. It contains actions and targets to meet EU Directive requirements and the Department of Agriculture, Environment and Rural Affairs Programme for Government commitments. The Strategy follows the priority order for waste treatment set out in the Waste Hierarchy and has a strong focus on waste prevention (including re-use), preparing for re-use and recycling. The Strategy moves the emphasis of waste management in Northern Ireland from resource management, to resource efficiency and lifecycle thinking, whilst minimising the impact of use on the environment.

14.2.14. Key targets for Government projects (such as the Proposed Scheme) include a minimum of 10% by value of recycled content on construction projects. Furthermore, each Centre of Procurement Expertise (of which the Department is one) must adhere to an annual waste to landfill reduction target of 75% (or more) recycling or re-use of construction, demolition and excavation (CDE) wastes.

[153] HM Government, (1997). The Waste and Contaminated Land (Northern Ireland) Order 1997 [online]. Available at http://www.legislation.gov.uk/nisi/1997/2778/contents [Accessed 08/12/2021].
[154] Department for Regional Development (2010). Regional Development Strategy 2034 [online]. Available at https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/regional-development-strategy-2035.pdf. [Accessed 6/01/2022].
[155] Department of the Environment, (2013). Delivering Resource Efficiency; Northern Ireland Waste Management Strategy [online]. Available at https://www.daera-ni.gov.uk/publications/delivering-resource-efficiency-northern-ireland-waste-management-strategy. [Accessed 08/12/2021].

Waste Management Plan for Northern Ireland 2019[156]

14.2.15. The Plan provides an overview of waste management in Northern Ireland and is not intended to introduce new waste policies. The core aim of the Plan is to bring current waste management policies under the umbrella of one national plan. The Plan makes reference to the 'Delivering Resource Efficiency' - Northern Ireland Waste Management Strategy (2013), and the Northwest Region Waste Management Group (NMRWMG) Waste Management Plan, 2015[157] which incorporates the administrative area of Derry City and Strabane District Council.

14.2.16. The Plan states that the CDE sector is Northern Irelands largest waste generator. In 2009/10, the Plan indicates that approximately 70% of construction waste was recycled; this met the Waste Framework Directive target (also 70%). According to the Plan, the percentage of CDE arisings recycled was expected to rise to 79.4% in 2016; however, no data for Northern Ireland after 2009/10 is provided.

Strategic Planning Policy Statement for Northern Ireland (SPPS): Planning for Sustainable Development, 2015[158]

14.2.17. The SPPS identifies the importance of natural resource and supports their responsible exploitation. The strategic objectives and policies to be implemented through Local Development Plans focus on balancing the need for mineral development proposals against safeguarding the environment and minimising the impacts of such developments. Application of sustainable and safe restoration is also a primary objective.

14.2.18. Waste management aspects of the SPPS make reference to the Northern Ireland Waste Management Strategy (2013). A key strategic objective for waste is to promote the development of waste management and recycling facilities in appropriate locations, whilst ensuring that detrimental effects are minimised. Appropriate restoration of waste management sites after use must also be secured.

REGIONAL AND LOCAL POLICY

Derry Area Plan 2011[C11F120]

14.2.19. Policy WD1 defines those areas where planning permission for disposal of waste will not normally be granted within Areas of High Scenic Quality (AoHSV). However, paragraph 13.12 of Policy WD1 notes that exceptionally, permission may be granted for landfilling/landraising proposals for clay, sub-spoil and other inert materials. There are no other waste policies in this document. With regard to minerals, Proposal MN1 defines Area of Constraint on Mineral Development in the Faughan Valley and along the River Foyle, where there will be a presumption against planning permission for mineral extraction.

[156] Department of Agriculture, Environment and Rural Affairs, (2019). Waste Management Plan for Northern Ireland 2019 [online]. Available at https://www.daera-ni.gov.uk/consultations/Waste-Management-Plan-for-Northern-Ireland [Accessed 08/12/2021].
[157] North West Region Waste Management Group (NMRWMG) Waste Management Plan, 2015 [online]. Available at https://www.daera-ni.gov.uk/sites/default/files/consultations/daera/Waste%20Management%20Plan%20for%20Northern%20Ireland%202019.pdf
[158] Department of the Environment, (2015). Strategic Planning Policy Statement for Northern Ireland (SPPS): Planning for Sustainable Development [online]. Available at https://www.infrastructure-ni.gov.uk/sites/default/files/publications/infrastructure/SPPS.pdf [Accessed 6/01/2022].

These correspond with the AoHSV. Policy MN1 refers to the restoration of despoiled land through previously unregulated and unrestored mineral workings.

Dungannon and South Tyrone Area Plan 2010 [C11F121]

14.2.20. Policy MN2 outlines Minerals Reserve Policy Areas at Derraghadoan, north of Dungannon and at Coalisland. In terms of waste management, the Dungannon and South Tyrone Borough Council was one of eight member councils of the Southern Waste Management Partnership (SWaMP) that produced a waste management plan guided by the Waste Management Strategy for NI, detailing proposals, targets and resource requirements to achieve the area's waste management objectives over the Plan period 2006-2020. It is noted that a target of 75% of reuse and recycling of CDE waste was set.

Omagh Area Plan 1987– 2002

14.2.21. This plan is no longer available to view online. However, Omagh District Council was one of eight member councils of the Southern Waste Management Partnership (SWaMP).

Strabane Area Plan 1986 – 2001

14.2.22. This plan is no longer available to view online.

14.2.23. It is noted that these area plans are in the process of being updated with draft plans produced within each District Council area that are at various stages of review and consultation and outlined below.

Derry City and Strabane District Local Development Plan 2032 - Draft Plan Strategy[C9F67]

14.2.24. The purpose of the Plan is to provide a framework to support the economic, social and environmental needs of the District and inform the general public, statutory authorities, developers and other interested bodies of strategic planning objectives, designations and policies, which will be used to guide development decisions.

14.2.25. The strategy for minerals development aims to protect particularly sensitive areas through Areas of Constraints on Minerals Development (ACMD) (Policy MIN2) and to identify Minerals Reserve Areas (MRA's) (Policy MIN3) whilst ensuring that sufficient local supplies of construction aggregates can be made available for use to meet likely future development needs over the LDP period. MRAs identify important mineral resources and protect them from surface development which may sterilise their future exploitation. The purpose of ACMD designation is to facilitate protection of visual amenity and natural habitat from adverse environmental effects associated with the development of minerals which occur commonly in Northern Ireland, and which are, or may be available, from less environmentally sensitive locations.

14.2.26. The restoration of newly approved quarries / mineral sites, as well as old / existing quarries will be required when the Review of Old Minerals Permissions (ROMPs) legislation is fully enacted (Policy MIN5).

14.2.27. In relation to waste, the Plan refers to the 2013 Delivering Resource Efficiency; Northern Ireland Waste Management Strategy, summarised previously in this chapter. The General Development Principles and Policies (GDP) promotes the requirement for facilities to manage waste at the highest tiers of the waste management hierarchy and divert waste from landfill.

14.2.28. There are currently no landfill sites in the Plan area, however, there are a number of public and private waste processing facilities and 11 recycling centres. It is expected that further public and private

facilities (including landfill) will be developed during the LDP period in line with Waste Planning Policies.

Mid Ulster District Council, Local Development Plan 2030 – Draft Plan Strategy C9F69

14.2.29. The Council intends to close their own operated landfill sites to meet the objective to maximise recycling. The waste management development strategy within the Draft Plan Strategy requires sustainable management with the necessary infrastructure whilst minimised impacts associated with the waste facilities.

14.2.30. The strategy for mineral development requires facilitating such sites whilst protecting the environment and minimising the impact on communities, landscapes, the water environment, and built and natural heritage. The Plan also sets out the requirement to identify mineral deposits and safeguard the resources in areas known as Mineral Reserve Policy Areas (MPRAs).

14.2.31. The Plan is supported by the Mid Ulster District Council Local Development Plan Mineral Development, Identification of Areas of Constraints on Mineral Development & Impact of Surface Development on Aggregate Resources in Mid Ulster, 2019[159], which sets out further detail on constraints related to mineral development and the impact of surface development on aggregate resources in Mid Ulster.

Fermanagh & Omagh District Council, Local Development Plan Draft Plan Strategy 2030 C9F68

14.2.32. Plan Strategy Objective 15 aims to "*sustainably manage and safeguard where appropriate our natural resources including minerals …, protecting the environments and providing … effective and sustainable waste management…*".

14.2.33. Waste management facilities will be permitted in accordance with Draft Policies WM01 and WM04. Draft Policy WM01 supports development for expansion of or creation of waste management facilities under certain conditions which include (but are not exclusive to) active or existing worked out hard rock quarry; an existing or former waste management site, including landfill site, where in the case of waste disposal, there will be restoration and aftercare arrangements in place. Waste disposal to landfill will only be permitted where it has been demonstrated there is no feasible option higher up the waste hierarchy and measures are secured for the restoration of the site for agreed after-use.

14.2.34. Draft Policy WM04 supports proposals for development of waste recycling facilities specifically to deal with CDE waste, where consistent with criteria in Draft Policy WM01.

14.2.35. Mineral's development will be permitted in accordance with Draft Policies MIN01 to MNI04. Draft Policy MIN01 includes that all proposed mineral development should include proposed details of restoration and aftercare of the site in accordance with Draft Policy MIN02.

[159] Mid Ulster District Council, (2019). Local Development Plan Mineral Development, Identification of Areas of Constraints on Mineral Development & Impact of Surface Development on Aggregate Resources in Mid Ulster [online]. Available at https://www.midulstercouncil.org/MidUlsterCouncil/media/Mid-Ulster-Council/Publications/Planning/Local%20Development%20Plan/Background-Evidence-Paper-Identification-of-AOC-on-Min-Dev-Impact-of-Surface-Development.pdf [Accessed 08/12/2021]

14.2.36. Draft Policy MIN03 states that Mineral Safeguarding Areas (MSAs) will be identified to ensure that non-mineral surface development does not prevent access to workable mineral resources. These are yet to be identified in the forthcoming Local Policies Plan.

14.2.37. The Local Development Plan Minerals (October 2018)[160] background paper has been used to inform the preparation of the Fermanagh and Omagh LDP 2030. This paper confirms that MSAs will be identified for the Local Policies Plan.

Armagh City, Banbridge and Craigavon Borough Council; Fermanagh and Omagh District Council; and Mid Ulster District Council, Joint Waste Management Plan, 2016[161]

14.2.38. This Plan sets out the arrangement for the management of waste generated within the jurisdictions of the joint councils and includes a description of the services and infrastructure needed. The Plan refers to the 70% recycling target for all non-hazardous construction and demolition waste set out in the Waste Framework Directive.

14.2.39. The Plan sets out a range of measures and actions to manage construction wastes. Government actions focus on facilitating resource efficient management of CDE wastes through the identification and prosecution of unlawful disposal; raising awareness and proving guidance; and developing markets for resource efficient waste management. The construction sector is encouraged to managed CDE arisings effectively by preventing waste, balancing cut and fill as far as possible, specifying recyclable and recycled materials, and implementing Site Waste Management Plans.

14.3 METHODOLOGY AND SIGNIFICANCE CRITERIA

14.3.1. The primary guidance used to inform the assessment process is set out in DMRB Standard LA110 Material assets and waste, herein 'LA110').

STUDY AREA

14.3.2. The study areas for Materials Assets and Waste that are applicable to the Proposed Scheme are as follows:

- The primary study area is defined by the extent of works within the Proposed Scheme Boundary. This comprises the Proposed Scheme footprint and any areas required for temporary access, site compounds, working platforms and other enabling activities;
- The secondary study area comprises the extent to which waste infrastructure is suitable and available for the management of arisings and waste generated by the Proposed Scheme. Accordingly, the second study area for waste is determined to be Northern Ireland. The second study area has been set using professional judgement of the balance between the Proximity Principle and value for money (with regard to materials and waste logistics), and considering the extent of available data to compile a baseline assessment; and

[160] Fermanagh & Omagh District Council Local Development Plan Minerals (2018) [online]. Available at Layout 1 (Page 2) (fermanaghomagh.com)

[161] Armagh City, Banbridge and Craigavon Borough Council; Fermanagh and Omagh District Council; and Mid Ulster District Council, (2016). Joint Waste Management Plan [online]. Available at https://www.midulstercouncil.org/your-council/policies-documents [Accessed 08/12/2021].

- In accordance with good practice, a study area for the availability of typical materials required for the Proposed Scheme has been included. The study area for materials has the same geographical extent as that for waste management infrastructure i.e. Northern Ireland.

BASELINE DATA COLLECTION

14.3.3. Through desktop research, the baseline scenario describes the current and likely future state (in the absence of the Proposed Scheme) of:

- The types and quantity of material required associated with the operation of the existing land use within the primary study area;
- The types and quantities of waste produced associated with the operation of the existing land use within the primary study area;
- Information on availability of key construction materials required for the Proposed Scheme within the secondary study area; and
- Information on waste infrastructure and remaining landfill capacity within the secondary study area.

14.3.4. Baseline data has been sourced from publicly available data sources comprising:

- Mineral Products Association, (2021). Profile of the UK Mineral Products Industry[162];
- Department for the Economy, (2018). Annual Minerals Statements[163];
- British Geological Society, (2012). Mineral resource maps in Northern Ireland[164];
- Northern Ireland Assembly, (2016). Background paper on Waste Management in Northern Ireland[165];
- Waste and Resources Action Programme (WRAP), (2011). Construction, demolition and excavation waste arisings, use and disposal in Northern Ireland 2009/10[166];
- Armagh City, Banbridge and Craigavon Borough Council; Fermanagh and Omagh District Council; and Mid Ulster District Council, (2016). Joint Waste Management Plan[C14F161];
- Derry Area Plan Minerals: Proposals/Policies Map No 1: District Strategy (2011)[167];
- Strabane Area Plan 1986-2001[C11F123]; and
- Mid Ulster District Council, (2019). Local Development Plan Mineral Development[159].

---

[162] Mineral products Association, (2018). Profile of the UK Mineral Products Industry [online]. Available at https://mineralproducts.org/documents/Facts-at-a-Glance-2018.pdf [Accessed 08/12/2021].
[163] Department for the Economy, (2018). Annual Minerals Statements [online]. Available at https://www.economy-ni.gov.uk/publications/annual-minerals-statements [Accessed 08/12/2021].
[164] British Geological Society, (2012). Mineral resource maps in Northern Ireland [online]. Available at https://www.bgs.ac.uk/mineralsuk/planning/resource.html#NI [Accessed 08/12/2021]
[165] Northern Ireland Assembly, (2016). Background paper on Waste Management in Northern Ireland [online]. Available at http://www.niassembly.gov.uk/assembly-business/committees/2016-2017/agriculture-environment-and-rural-affairs/new-page/background-paper-on-waste-management-in-northern-ireland/ [Accessed 08/12/2021]
[166] Waste and Resources Action Programme (WRAP), (2011). Construction, demolition and excavation waste arisings, use and disposal in Northern Ireland 2009/10 [online], Available at https://www.daera-ni.gov.uk/publications/construction-demolition-and-excavation-waste-arisings-use-and-disposal-northern-ireland [Accessed 08/12/2021]
[167] Derry Area Plan (2011). Minerals: Proposals/Policies Map No 1: District Strategy [online] Available at https://wayback.archive-it.org/11112/20190703035002/https://www.planningni.gov.uk/index/policy/development_plans/devplans_az/derry_2011/derry_minerals/derry_minerals_policy.htm [Accessed 06/01/2022]

14.3.5. Baseline data has also been sourced through previous consultation with DAERA.

ASSESSMENT DATA COLLECTION

14.3.6. In accordance with LA 110, the assessment of material assets and waste is a quantitative exercise that aims to identify the following:

For material assets:

- Types and quantities of materials required to construct the Proposed Scheme;
- Information on materials that contain secondary / recycled content;
- Information on any known sustainability credentials of materials to be consumed;
- The type and volume of materials that will be recovered from off-site sources for use on the Proposed Scheme;
- The cut and fill balance; and
- Details of on-site storage and stockpiling arrangements, and any supporting logistical details.

14.3.7. An assessment of the effects of consuming materials required during the construction phase and first year of operation has been undertaken by considering the origins and sources of materials, including their general availability (production, stock, sales) and the proportion of recovered (reused or recycled) materials they contain (as well as other sustainability features).

14.3.8. The reuse of excavated and other arisings (that meet waste exemption and other recognised reuse criteria) has been evaluated as part of the assessment of materials, to determine whether the adverse impacts associated with the consumption of primary resources can be reduced.

For waste:

- The amount of waste (by weight) that will be recovered and diverted from landfill either on site or off site (i.e., for use on other projects);
- types and quantities of waste arising from the Proposed Scheme (demolition, excavation arisings and remediation) requiring disposal to landfill;
- details of onsite storage and segregation arrangement for waste and any supporting logistical arrangements; and
- potential for generation of hazardous waste (type and quantity).

14.3.9. An assessment of the remaining landfill capacity in Northern Ireland is used to determine the impacts and effects of waste generated during the construction phase and first year of operation of the Proposed Scheme.

14.3.10. The assessment considers the type and volume of waste to be generated by the Proposed Scheme and determines the potential impact on remaining landfill capacity in the secondary study area, Northern Ireland; this is completed for inert and non-inert (non-hazardous and hazardous) waste types, where data are available. Wherever waste is recovered (diverted from landfill) the influence of this action is taken into account in the assessment of significance of effect.

14.3.11. The quantitative exercise of assessment conducted for this chapter has used material and waste type and quantity data provided through ECI with the IDT.

SIGNIFICANCE CRITERIA

14.3.12. The assessment in this chapter has adopted the significance criteria set out in LA110, and as replicated in **Table 14.1**. The criteria do not require a separate assessment of sensitivity and

magnitude of change. Instead, assessment criteria are applied individually to material assets (using Column 2 of **Table 14.1**) and waste (using Column 3).

Table 14.1 - Material Assets and Waste Significance Criteria

Significance category	Description	
	Materials	Waste
Very Large	(No criteria for 'Very Large'; use details provided in 'Large').	>1% reduction or alteration in national capacity of landfill, as a result of accommodating waste from a project; or Construction of new (permanent) waste infrastructure is required to accommodate waste from a project.
Large	Project achieves <70% overall material recovery / recycling (by weight) of non-hazardous Construction and Demolition Waste (CDW) to substitute use of primary materials; and Aggregates required to be imported to site comprise <1% re-used / recycled content; and Project sterilises ≥1 mineral safeguarding site and/or peat resource.	>1% reduction in the regional capacity of landfill as a result of accommodating waste from a project; and 50% of project waste for disposal outside of the region.
Moderate	Project achieves <70% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and Aggregates required to be imported to site comprise re-used/recycled content below the relevant regional percentage target*.	>1% reduction or alteration in the regional capacity of landfill as a result of accommodating waste from a project; and 1-50% of project waste for disposal outside of the region.
Slight	Project achieves 70-99% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and Aggregates required to be imported to site comprise re-used/recycled content in line with the relevant regional percentage target*.	≤1% reduction or alteration in the regional capacity of landfill; and Waste infrastructure has sufficient capacity to accommodate waste from a project, without compromising integrity of the receiving infrastructure (design life or capacity) within the region.
Neutral	Project achieves >99% overall material recovery / recycling (by weight) of non-hazardous Construction Demolition Waste (CDW) to substitute use of primary materials; and Aggregates required to be imported to site comprise >99% re-used / recycled content.	No reduction or alteration in the capacity of waste infrastructure within the region.
Notes	*Recycled aggregate target.	

Significance category	Description	
	Materials	Waste
	The Recycled Aggregate Targets[168] included in LA110 are applicable to England and its regions. For Northern Ireland (as detailed in Delivering Resource Efficiency; Northern Ireland Waste Management Strategy 2013[155]), Government projects have a target to include a minimum of 10% by value of recycled content on construction projects. This 10% value is used as the Recycled Aggregate Target for the Proposed Scheme.	

14.3.13. The descriptions provided in **Table 14.2** have been used to define whether effects identified are significant or not.

Table 14.2 - Descriptions for Significance of Effect

Significance Criteria	Materials Significance of Effect	Waste Significance of Effect
Very large	Significant	Significant
Large	Significant	Significant
Moderate	Significant	Significant
Slight	Not significant	Not significant
Neutral	Not significant	Not significant

CONSULTATION

14.3.14. DAERA has been previously consulted regarding information on material resource availably and landfill capacity to support the baseline data. The findings of this engagement are presented in Section 14.4 of this chapter.

ASSUMPTION AND LIMITATIONS

14.3.15. As defined in LA110, the temporal scope of the assessment comprises the construction phase and first year of operation. Professional judgement can be used to support this assertion and scope out impacts beyond the first year of operation, as – based on schemes of a similar size and nature – the Proposed Scheme is not expected to result in significant effects from material consumption during this phase. This is understood to be a proportionate approach that has good provenance in other environmental assessments for major highways schemes.

[168] Ministry of Housing, Communities & Local Government, (2009). National and regional guidelines for aggregates provision in England 2005-2020 [online]. Available at https://www.gov.uk/government/publications/national-and-regional-guidelines-for-aggregates-provision-in-england-2005-to-2020 [Accessed 08/12/2021].

14.3.16. Data on material assets and waste has been provided by ECI with the IDT as based on the specimen design, utilising their experience and expertise in buildability and construction-related issues. Conversion factors have been used where data were not provided in tonnes; this includes a 1.7t/m^3 factor for earthworks cut and fill, based on the Bath Inventory Material Density conversion factors as set out in National Highways Carbon Calculation Tool[169].

Material Assets

14.3.17. The assessment of material assets is dependent on the validity and availability of collated information, regarding the resources that are expected to be consumed during the 'in scope' lifecycle phases of the Proposed Scheme. Data for this ESA 2022 has been used for the UK only, however there are likely to be opportunities to obtain materials from the Republic of Ireland (ROI).

14.3.18. Baseline data and information for the assessment uses the most recent available published data; typically, this varies between 2016 and 2019.

14.3.19. A lifecycle assessment (including embodied carbon and water) of materials has not been included in the scope as the effort and resources required are deemed disproportionate to the benefit they would offer the assessment of significance of effect.

14.3.20. The recycled content target for aggregates is 10%, as set out in the Northern Ireland Waste Management Strategy[155]. The recycled content target is used to assess the significance of environmental effects.

Waste

14.3.21. Published data in relation to transfer, recovery and recycling infrastructure is limited and generally only available until 2010. This is the latest data published in the Waste Management Plan NI.

14.3.22. The assessment of impacts and effects on landfill void capacity is based upon the validity of the collated information, regarding the waste generated and disposed by the Proposed Scheme.

14.3.23. Hazardous wastes may be generated during the construction phase, however at the current design stage, the associated types and volumes cannot be quantified.

14.4 BASELINE ENVIRONMENTAL INFORMATION

MATERIALS CURRENTLY REQUIRED

14.4.1. The current land use through which the Proposed Scheme routes is predominantly agricultural land which requires minimal consumption of construction materials. Where the current land use is road infrastructure, materials currently required for operation and maintenance are anticipated to comprise small quantities of asphalt for minor repair works. Therefore, the current consumption of resources with the primary study area is deemed minimal.

[169] National Highways Carbon Emissions Calculation Tool/Material Densities. [Carbon emissions calculation tool - Highways England (nationalhighways.co.uk)]

AVAILABILITY OF CONSTRUCTION MATERIALS

14.4.2. Published information[162, 163,159] on the availability of the main construction materials in Northern Ireland and the rest of the UK, as required to deliver typical highways schemes has been reviewed. The information indicates that production and sales of materials for which information is available, remain buoyant in Northern Ireland and (where applicable) across the UK.

14.4.3. The production of minerals reported for Northern Ireland is summarised in **Table 14.3**.

Table 14.3 - Reported Mineral Production in Northern Ireland

Material type	Quantity Produced (Tonnes)
Basalt and igneous rock (other than granite)	3,162,418
Sandstone	4,514,920
Limestone	2,663,688
Sand and Gravel	2,290,495
Other	752,311
TOTAL	**13,383,832**
The information in this table is based on data for the period 2019, as collected from the start of 2020 to June 2021. It was noted in the source information that there was a significant drop in the return rates of information, which may be due to the impact of changes to working practices in all sectors of industry resulting from the Covid-19 pandemic.	

14.4.4. A summary (based on sales) of the availability of the main construction materials in Northern Ireland, typically required to deliver highway schemes, is provided in **Table 14.4**. No information on the baseline for the consumption or sales of metals (steel and aluminium, in particular) was identified as part of the baseline assessment process.

Table 14.4 - Sales of Construction Materials in Northern Ireland 2019

Material type	Northern Ireland
Primary aggregate	23.0 Mt
Ready-mixed concrete	2.8 Mm^3
Asphalt	2.2 Mt

14.4.5. The 2019 Mid Ulster District Councils Local Develop Plan: Minerals Development[159] indicates that Mid Ulster has more than sufficient resource to cover the estimated 18.4 million tonne (Mt) requirement of sand and gravel (as required until 2030 in line with the Local Development Plan – Draft Plan Strategy[C9F69]) with remaining reserves of 43 Mt. Remaining reserves of hard rock within Mid Ulster are, conversely, at risk with an estimated reserve of 4.75 Mt remaining, for a forecast 8.3 Mt

requirement. The report does, however, state that responses were not received from all organisations consulted for this data, so there may be 'yet unaccounted for' reserves of hard rock available within Mid Ulster.

SITE ARISINGS CURRENTLY GENERATED

14.4.6. The current land use is expected to generate minimal volumes of site arisings, limited to potential agricultural earthworks. Where the current land use is road infrastructure, arisings are anticipated to comprise small quantities of vegetation clearance and surplus materials generated during minor repair works which can be diverted from landfill. Therefore, the current generation of site arisings is deemed minimal.

EXISTING TRANSFER, RECOVERY AND RECYCLING WASTE MANAGEMENT INFRASTRUCTURE

14.4.7. Published data in relation to transfer, recovery and recycling infrastructure is limited and generally only available until 2010. Accordingly, it cannot be stated with any certainty as to whether waste management facilities are of sufficient capacity to divert from landfill the volume and types of arising expected at site.

14.4.8. The latest available data (taken from the Waste Management Plan NI) identified that the target set by the Waste Framework Directive to recycle 70% of all non-hazardous construction and demolition waste was met for the financial year 2009/2010 in Northern Ireland[156].

14.4.9. The Local Development Plan 2030 – Draft Plan Strategy for Mid Ulster District Council [C9F69], indicates that there are 12 recycling centres in Mid Ulster, although it is not specified if these sites are for public or commercial use. The Local Development Plan 2030 – Draft Plan Strategy notes the importance of such facilities given the proposal to eventually close landfill sites in Mid Ulster and therefore the potential need to increase recycling and waste transfer stations.

14.4.10. The Local Development Plan 2032 Draft Plan Strategy for Derry City & Strabane District Council[C9F67] indicates that there are currently no landfill sites within the district, but a number of public and private waste processing facilities and 11 municipal recycling centres. It is expected that further public and private facilities will be developed across the district during the Plan period. Under Policy MIN 5, restoration of former minerals sites should normally only be filled with inert materials, subject to Waste Planning Policies WP3 and WP4.

WASTE CURRENTLY GENERATED AND DISPOSED OF

14.4.11. The agricultural land within the primary study area is not, at present, anticipated to generate significant quantities of waste. Where the current land use is road infrastructure, waste is anticipated to comprise small quantities of arisings that cannot be recovered (hence, sent to landfill), as the result of minor repair works. Therefore, the current waste generation is deemed minimal.

REMAINING LANDFILL CAPACITY

14.4.12. The remaining capacity of permitted landfill sites and capacity trend data was provided through previous consultation with DAERA. In summary, for Northern Ireland:

- Inert landfill capacity has increased from 12.4 million cubic meters (Mm^3) in 2016 to 15.3 Mm^3 in 2018. This equates to a landfill capacity in the region of 15.3 Mt in 2018 based on a conversion factor of 1 tonne per cubic metre[170];
- Non-hazardous landfill capacity has shown a significant reduction: 20.0 Mm^3 in 2013 to 8.1 Mm^3 in 2018. This equates to a remaining landfill capacity of 6.7 Mt in 2018 based on a conversion factor of 0.83 tonnes per cubic metre[170]; and
- No commercially available hazardous landfill sites are available in Northern Ireland. Hazardous wastes are (typically) understood to be transported to sites within Scotland or England.

14.4.13. By the nature of landfill activities for all types of wastes, landfill capacity is likely to become an increasingly sensitive receptor over the life of the Proposed Scheme to the end of the first full year of operation (2028).

FUTURE BASELINE

14.4.14. In the future baseline and in the absence of the Proposed Scheme, it is considered that the land use would remain predominantly agricultural, with the exception of the areas of existing road infrastructure. Therefore, the future consumption of construction and other materials is considered minimal. Similarly, the potential for future generation and disposal of waste is also considered minimal.

14.5 ASSESSMENT OF EFFECTS

POTENTIAL IMPACTS

14.5.1. During the construction phase, the Proposed Scheme would consume material resources (including those recovered from site arisings) and produce and dispose of waste. Whilst the impacts of materials consumption and waste disposal from the Proposed Scheme are considered to be adverse, permanent and direct, the reuse and recycling of arisings, as well as the use of resources with sustainability credentials, does have the potential to reduce the adverse impact of waste to landfill.

14.5.2. The direct impacts associated with material consumption, and waste generation and disposal are as follows:

- Materials: consumption of natural and non-renewable resources; and
- Waste: generation and disposal of waste and reduction of landfill capacity.

CONSTRUCTION PHASE

14.5.3. Information given in **Table 14.5** describes the type and quantities of materials required to construct the Proposed Scheme. Where available, information on the materials recycled content and sustainability credentials has been provided. It is noted that these data are the most up-to-date and complete at the time of publication.

[170]Environment Agency, (undated). About the 2012 waste management data, Available at https://webarchive.nationalarchives.gov.uk/20140328141656/http://www.environment-agency.gov.uk/research/library/data/150328.aspx. (Accessed November 2019).

Table 14.5 - Material Types and Quantities

Material Type	Quantity (tonnes)	Description of material type and use
Aggregate	1,910,000	Type 1 granular subbase for the construction of pavements (carriageway), bridge deck paving, binder for kerbs, access tracks and crane platform areas. The use of aggregate with a recycled content of 10% (based on Northern Ireland's Delivering Resource Efficiency requirements) has been committed to as part of the Proposed Scheme.
Aluminium	300	Traffic signs and lighting columns.
Asphalt	1,336,000	Asphalt concrete and hot rolled asphalt (HRA) for the construction of paved areas; bituminous bound pavements, surfacing, base and binder courses; expansion joints to structures.
Cabling	28	Armoured / power cables and cabling for communications, automated signage and lighting.
Concrete	211,000	Includes pre-cast and in-situ/ready mix (C16/20, C35/30, C32/40, C40/50, C6/8, C8/10) concrete for the construction of kerbs, footways and paved areas; bases for traffic signs and road lighting; substructure drainage, culverts and structures; formwork and piling; in situ stitching to pre-cast elements.
Equipment	6	Camera units and Variable Message Signs (VMS).
Gabion walls	11,000	Used for scour protection and retaining walls.
Imported engineering fill	3,230,000	Class 6 materials for trench infill, embankment construction, and fill above structural foundations.
Plastic	4,000	Includes polypropylene (PP), Polyvinyl Chloride (PVC) and Unplasticised Polyvinyl Chloride (UPVC) for the geotextile matting, construction of permanent structural formwork, drainage, service ducts for road lighting and telecomms.
Steel	173,200	For reinforcement, piling, fencing and safety barriers.
Timber	500	For timber rail fencing.
Waterproofing	16	Bitumen emulsion to buried concrete faces structures.

14.5.4. It is anticipated that approximately 1,450,500t of imported fill would be recovered from off-site sources for use on the Proposed Scheme.

14.5.5. The cut and fill balance has been estimated as a cut of 17.3 Mm^3 and a fill requirement of 14 Mm^3. This equates to a surplus of approximately 3.3 Mm^3 (5.6 Mt), which is included in the unacceptable earthworks figure in **Table 14.6** Note this estimate of the cut/fill balance supersedes information provided in the ES 2016 (paragraph 6.16.2).

14.5.6. Provision for temporary stockpiling materials at site, particularly earthworks for reuse, would also be incorporated into the Proposed Scheme's design.

14.5.7. The data in **Table 14.6** describes the types and quantities of waste and arisings which will be diverted from landfill from the construction of the Proposed Scheme. Volumes are estimated on a worst-case scenario using the specimen design information and are likely to change during development of the detailed design.

Table 14.6 – Waste and Arising Types and Quantities to be Diverted from Landfill

Arising Type	Quantity (tonnes)	Comments
Recovered demolition materials	No data available at this stage	It is anticipated that the various arisings generated from demolition of structures, including bus stops and buildings, will be segregated and stored prior to being sent off-site for recycling at local facilities. It is anticipated that up to 92% by volume of CDE waste is to be recovered in this manner.
Excavated Topsoil (Class 5)	2,975,000	It is anticipated that all excavated topsoil would be reused on the Proposed Scheme, subject to further investigation and in accordance with relevant waste management legislation.
Acceptable earthworks [171]	17,391,000	It is anticipated that all acceptable excavated earthworks would be reused on the Proposed Scheme as engineering fill and landscaping, subject to further investigation and in accordance with relevant waste management legislation.
Unacceptable earthworks (Class U1A) [172]	8,976,000	It is anticipated that all unacceptable earthworks would be reused on the Proposed Scheme in proposed deposition areas, subject to further investigation and in accordance with relevant waste management legislation.
Concrete and aggregate/ road planings	Currently not quantified	100% reuse is anticipated for these arisings.
Vegetation (trees)	Currently not quantified	To be taken off site for recycling.
Invasive plant species and injurious weeds	Currently not quantified	Invasive species including Japanese knotweed, giant hogweed and Himalayan balsam are located across the Proposed Scheme. These will require treatment and disposal on site, potentially within fully lined cells.

[171] Acceptable materials are any materials excavated or generated through demolition that can be processed and classified as an engineering material for reuse in the project according to relevant specifications.
[172] Unacceptable materials are those materials generated through excavation or demolition that are not able to be efficiently processed to an engineered material specification. Examples of this would be peat, very weak rock and (inter alia) contaminated land.

Arising Type	Quantity (tonnes)	Comments
Steel	Currently not quantified	Derived from road signage, barriers, temporary sheet piles and props. These would be diverted from landfill for recycling and/or reuse off site.
General construction wastes e.g., plastics / packing, surplus materials and off cuts	Currently not quantified	Wastes are likely to be processed at a recycling / recovery facility, rather than disposed of to landfill, in accordance with the Waste Hierarchy.

14.5.8. A summary of the type of waste anticipated to be disposed of to landfill generated during the construction phase of the Proposed Scheme is provided in **Table 14.7**. At this stage of the design, these volumes of waste have not been quantified.

Table 14.7 – Forecast Waste Types to be Sent to Landfill

Waste Type	Comments
Plastic	Existing road furniture, ducting and pipework will not likely be suitable for recycling. This waste is expected to be disposed of in accordance with relevant waste management legislation.
Hazardous waste	Hazardous or contaminated soils may be encountered on site. These will be disposed of in accordance with relevant waste management legislation.

DESIGN AND MITIGATION

14.5.9. The following design and mitigation measures for material assets and waste are to be applied to the Proposed Scheme.

Earthworks

14.5.10. It is anticipated that earthworks on the Proposed Scheme can be optimised to minimise the potential for offsite disposal to be required. Site won materials can be processed to produce, for example, high value materials such as aggregates for earthworks and drainage, hence reducing the requirement for importing virgin or other aggregates. The Contractor will follow the approach as set out in **Appendix 5-1 – Outline Construction Environmental Management Plan**.

14.5.11. The design has included measures to reduce the surplus material by depositing the majority in specified deposition areas along the Proposed Scheme (refer to **Appendix 5-6 – Deposition Bund Schedule** for further information). The deposited material would be subject to investigation (and potentially treatment) and would be managed as part of a Materials Management Plan.

14.5.12. CDE is forecast to comprise the largest proportion of waste generated by the Proposed Scheme. Preliminary ground investigations for the Proposed Scheme indicates that the material from the main cuttings on the Proposed Scheme is suitable for reuse on the site either as engineering fill or for landscaping purposes. Therefore, a high rate of diverting non-hazardous waste from landfill is

anticipated. The suitability of fill/site-won materials intended for reuse will be checked prior to use through sampling and chemical analysis.

14.5.13. Any CDE which is geotechnically or chemically unsuitable for reuse within the Proposed Scheme will require disposal or treatment prior to any reuse off-site (in accordance with the current waste regulatory framework). Up to 92% by volume is to be separated and reused as General Earthworks Fill.

14.5.14. The reuse of existing road construction materials, such as surfacing planings for capping materials, will be adopted where feasible.

Contaminated Land Management

14.5.15. There are currently 124 potentially contaminated sites identified across the Proposed Scheme. Arisings from contaminated land may be segregated into various stockpiles based on contaminant levels / constituents. Various management techniques such as stabilisation of the contaminants through the addition of additives such as lime or cement may be adopted. Where treated contaminants can be reused within the permanent works, they will be deployed away from watercourses to further minimise risk to the aquatic environment. The aim will be to treat and reuse the materials or dispose of on site in specific locations, with agreed protection measures, to minimise the need for contamination to be disposed of.

Materials Management

14.5.16. In order to promote sustainable resource management on the Proposed Scheme, a Sustainable Procurement Plan will be prepared, implemented and maintained throughout the duration of the pre-construction phase. The Plan will provide a framework to ensure that materials and goods are sourced responsibly, in accordance with good and best practice for sustainability. The following methods for mitigating effects through procurement activities and contractor tender specifications are as follows:

- Where aggregates for earthworks, drainage and pavement need to be imported, the current commitment is to procure these from local sources within Northern Ireland, such as authorised quarries;
- The reuse of site won rock material to generate aggregates will be maximised across the works. It is envisaged that all site-won rock will be reused on the project. Where feasible, the Proposed Scheme will consider the use of recycled aggregates for compound construction and haul roads, for example;
- Subject to strength and stiffness requirements, secondary materials such as Pulverised Fuel Ash (PFA) and Ground Granulated Blast furnace Slag (GGBS) will be considered in concrete mix designs to maximise their use and benefits in the permanent works design, for both in-situ and pre-cast concrete works;
- Preference will be given to recycled plastics for drainage pipes and ducting. In addition, offcuts from these products will be returned to the suppliers, so that they can be reincorporated in the manufacturing process or duly recycled;
- Pavement planings will be sought from works both within, and within the vicinity of the Proposed Scheme; where acquired, it is the intention to use local blacktop recycling facilities that will allow the re-incorporation of this material into the permanent works pavement either as a bituminous or Type 1 materials; and
- Steel reinforcement and structural steel sections will be procured from suppliers who re-fabricate or manufacture these products from recovered ferrous scrap, where feasible.

Acquiring Materials from Donor or other Off-Site Locations

14.5.17. A number of materials required for the Proposed Scheme will be recovered from off-site local sources within Northern Ireland, such as authorised quarries, as detailed in **Table 14.8**.

Table 14.8 - Material Assets to be Recovered from Off-Site Locations

Material Asset from Recycled / Secondary Source	Quantity	Units
10mm Single Size Bedding	99,000	t
14mm Single Size Bedding	52,700	t
40mm Single Size Bedding	162,000	t
Filter Type A&C	20,500	t
Filter Type B	399,400	t
Type 1 Subbase	1,059,000	t
Type 3 Subbase	36,000	t
Class 6 Fill	1,066,500	t
Geotextile materials	1,184,300	m^2
Steel Reinforcement	38,700	t
Pipes	252,000	m
Ducting	270,000	m
Pre-cast concrete manholes	3,260	nr
Blacktop	2,840,000	m^2
Kerbs	50,000	m
Precast bridge beams	14,200	m
Concrete	147,000	m^3
Safety Barrier	45,000	m
Stock Fencing	100,000	m
Culverts	1,235	m

14.5.18. It is recognised that in order to maximise resource efficiency and minimise waste on the Proposed Scheme, good practice principles must be considered as early as possible by the Contractor in development of their detailed design. In delivering the Proposed Scheme, each Contractor will be required to hold Resource Efficiency Workshops to identify opportunities and define objectives for

designing out waste. As part of this process, the following opportunities will be reviewed and refined during design, and their feasibility established. Wherever a measure cannot practicably be adopted, justification will be agreed with the client:

- specifying the need for the value chain to remove or take back packaging;
- implementation of LEAN construction methods;
- specification of reused, recycled and recyclable materials;
- specification of responsible sourced materials e.g., in accordance with BES6001;
- specification of alternative construction methods – off site fabrication / modularisation;
- alignment or compliance with CEEQUAL to assess scheme performance in accordance with a recognised industry standard;
- assessment of end-of-life options for materials and assets, to minimise disposal; and
- assessing the opportunity to use mechanisms such as, but not limited to:
  - CL:AIRE 'Definition of Waste: Development Industry' Code of Practice for excavated materials;
  - NIEA waste exemptions; and
  - BRE SMART Waste.

14.5.19. The Contractors' Site Waste Manager will also document within a Site Waste Management Plan (SWMP) any opportunities implemented to reduce waste, and update this throughout the construction phase of the Proposed Scheme, using actual waste data including quantities, types and the chosen waste management option.

Peat Strategy

14.5.20. There are pockets of peat present within the Proposed Scheme site boundary; a defined strategy for managing this resource is therefore required.

14.5.21. The preferred environmental option is to retain peat in situ during the construction and operation of the Proposed Scheme, where this is technically feasible. A number of locations have been identified for alternatives to excavation, based on current design and datasets available. During the detailed design phase, further options and locations will be considered for the adoption of construction methods that will remove or reduce the need to remove extensive areas of peat, as well as indirect effects on adjacent peat deposits due to the Proposed Scheme, such as additional drainage. Such methods may include piling through the peat to support the road structure, the application of ground improvements such as controlled modulus columns or "floating" the new construction via geotextile membranes over the peat body.

14.5.22. Where it is deemed necessary to remove the peat for the construction of the road, the focus of the design will be to return the peat, where possible, to its original location post-construction e.g. where the peat has been removed to allow an embankment to be constructed, the peat may be returned to the toe and sides of the embankment as surface dressing, where no structural support is required, peat instability has been reviewed and this can be satisfactorily accommodated within the drainage design. The peat must be handled with care to preserve, to the greatest extent possible, the integrity of the resource and ensure wet ground conditions are retained.

14.5.23. Where the peat must be removed and cannot be replaced, it will be taken to the deposition areas provided within the Proposed Scheme Boundary. Consideration shall be given to promote peat restoration and peat habitat creation at such locations.

14.6 CONCLUSION

14.6.1. This section provides an assessment of the likely significant effects during construction using the criteria set out within **Section 14.3 - Methodology and Significance Criteria** and the mitigation measures in **Section 14.5.3 - Design and Mitigation**. The assessment uses available material and waste data provided by early contractor involvement with the IDT as based on the specimen design and the significance threshold assigned following mitigation.

14.6.2. The following assessment findings and conclusions are provided based on the information and data reviewed in this chapter.

MATERIALS

14.6.3. The Proposed Scheme achieves more than 90% overall material recovery/recycling (by weight) of non-hazardous CDW to substitute the use of primary materials. This results in a slight adverse effect, which is not significant.

14.6.4. 2,895,500t of reused/recycled aggregates is estimated to be used on the Proposed Scheme; this equates to approximately almost 57% of the total aggregates (5,140,000t). This exceeds the Recycled Aggregate Target of 10% resulting in a slight adverse effect, which is not significant.

14.6.5. Although there are pockets of peat present within the Proposed Scheme Boundary, the Proposed Scheme design has applied peat as a constraint to reduce potential effect. There is a strategy integral to the Proposed Scheme to manage this resource in order to minimise disturbance as far as reasonably practicable, with further refinement anticipated at the detailed design stage in terms of locations and cost-effective options for further reduction of effect and volumes of peat excavation; the overarching aim of this approach is that peat resources will therefore not be sterilised. The mitigations applied mean that the large and very large effect category thresholds for resource sterilisation in LA110 are not expected to be exceeded, and hence the associated effects are not significant.

WASTE

14.6.6. For waste diverted from landfill, the baseline information suggests that there is sufficient recovery capacity within the region to accommodate surplus arisings from the Proposed Scheme (use of specific facilities will be determined by the Contractor during the construction phase).

14.6.7. Anticipated volumes for waste disposal have not been quantified at this stage but – subject to the mitigation measures being adopted – are expected to be minimal in the context of 2018 landfill capacity. Waste to be disposed of is therefore anticipated to result in a less than 1% reduction (equivalent to less than 153,000t for inert waste and 67,000t for non-hazardous waste) in remaining regional landfill capacity (as of 2018). This would result in a slight adverse effect, which is not significant.

14.6.8. Based on the available data, no waste disposal is expected to occur outside of Northern Ireland. However, it is important to note that should any hazardous waste be encountered, this will require disposal outside of Northern Ireland. Typically, this is sent to other regions of the UK, although there may be an opportunity to send to facilities located in the ROI. It is, nevertheless, reasonable to assert that any small volumes of hazardous waste that may need disposal will not, following the mitigation / treatment measures proposed, exceed 1% of the recipient landfill capacity. This would result in a slight adverse effect, which is not significant.

OVERALL EFFECTS AND SIGNIFICANCE

14.6.9. Taking into account the evidence presented in this chapter (including commitments to mitigation measures), the overall significance of effect for material assets, and for waste, is considered to be slight adverse in both cases. In accordance with the criteria and thresholds set out in DMRB LA110, the effects for both material assets, and waste, are therefore assessed to be not significant.