Scotland England Green Link 2 - English Onshore Scheme

Environmental Statement: Volume 2

Chapter 16: Waste and Materials Management

March 2022

For: National Grid Electricity Transmission

Table of Contents

Figures

Tables

16. Waste and Materials

16.1 Introduction

This chapter of the Environmental Statement (ES) presents the results of baseline studies and the assessment of the potential impacts of the English Onshore Scheme on waste and materials. The chapter summarises the regulatory and policy framework related to waste and materials, the methodology followed for the assessment, and provides an overview of the existing baseline conditions. The assessment has identified the likely significant impacts to arise during the construction or operational phases of the English Onshore Scheme and identifies any mitigation necessary to avoid or reduce these impacts where possible.

Waste and material impacts are interrelated with, but assessed separately from, impacts on geology and soils. Reference should also be made to **Chapter 10: Geology and Hydrogeology** and **Chapter 12: Agriculture and Soils** of this ES.

This chapter is supported by the following figures:

- **Figure 16-1**: Study Area.

16.2 Planning Policy and Applicable Legislation

16.2.1 Introduction

This section sets out the legislative and policy framework for waste within UK.

16.2.2 Legislation

The following legislation underpins the assessment:

- Environment Act 2021 (Ref 16-1);
- Waste Framework Directive (2008/98/EC) (Ref 16-2);
- The Environmental Protection Act (1990) (Ref 16-3);
- The Hazardous Waste (England and Wales) Regulations (2005) as amended (Ref 16-4);
- The Waste (England and Wales) Regulations (2011) as amended (Ref 16-5);
- The Environmental Permitting (England and Wales) Regulations (2016) (Ref 16-6);
- The Waste and Environmental Permitting etc (Legislative Functions and Amendment etc) (EU Exit) Regulations 2020 (Ref 16-7); and
- Waste (Circular Economy) (Amendment) Regulations 2020 (Ref 16-8).

English and Welsh law was updated on 1 October 2020 to include changes to the Waste Framework Directive (WFD) made in 2018. This was done through the Waste (Circular Economy) (Amendment) Regulations 2020.

The Waste and Environmental Permitting etc (Legislative Functions and Amendment etc) (EU Exit) Regulations 2020 were laid before Parliament on 16 December 2020. They make amendments to ensure that the waste and environmental permitting regimes continue to operate effectively at the end of the transition period.

16.2.2.1 Waste Framework Directive

The Waste Framework Directive is the key piece of legislation. Waste is defined by the Waste Framework Directive (Directive 2008/98/EC) as ‘any substance or object which the holder discards or intends or is required to discard’. The Directive definition includes any substance or object that is discarded for disposal or that has not been subject to acceptable recovery (including re-use and recycling).

The Directive also sets out a five-step hierarchy for waste management as an important requirement which applies to anyone who produces or manages waste. The waste hierarchy requires that waste is dealt with in the following order of priority:

- prevention;
- preparing for reuse;
- recycling;
- other recovery (for example energy recovery); and
- disposal, only as a last resort.

The following considerations must also be taken into account:

- environmental protection principles of precaution and sustainability;
- proximity principle for treatment and disposal of waste to be as close to its source as possible;
- technical feasibility and economic viability;
- protection of resources; and
- overall environmental, human health, economic and social impacts.

16.2.3 National Policy

The English Onshore Scheme will be assessed with consideration to national policy that addresses the use of material resources and waste generation and its management. **Table 16-1** identifies the national policies relevant to the English Onshore Scheme.

- National Planning Policy for Waste (2014) (Ref 16-9);
- National Planning Policy Framework (2021) (Ref 16-10);
- 25 Year Environmental Plan 'Green Future: Our 25 Year Plan to Improve the Environment' (Ref 16-11);
- Our Waste, Our Resources: A Strategy for England (Ref 16-12);
- The Waste Management Plan for England (2021) (Ref 16-13); and
- The Waste Prevention Programme for England (2013) (Ref 16-14).

Table 16-1: National planning policy relevant to Waste and Materials

Policy Reference	Policy Context
Overarching National Policy Statement for Energy (EN-1) (Ref 16-15)	
Paragraph 5.14.3 of Section 5.14: Waste Management	Disposal of waste should only be considered where other waste management options are not available or where it is the best overall environmental outcome.
Paragraph 5.14.6 of Section 5.14: Waste Management	The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a Site Waste Management Plan. The arrangements described and Management Plan should include information on the proposed waste recovery and disposal system for all waste generated by the development, and an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation. The applicant should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome.
Draft Overarching National Policy Statement for Energy (EN-1) (Ref 16-15)	
Paragraph 5.15.3 of Section 5.15: Resource and Waste Management	Disposal of waste should only be considered where other waste management options are not available or where it is the best overall environmental outcome.
Paragraph 5.15.6 of Section 5.15: Resource	The applicant should set out the arrangements that are proposed for managing any waste produced and prepare a Site Waste Management Plan. The

Policy Reference	Policy Context
and Waste Management	arrangements described and Management Plan should include information on the proposed waste recovery and disposal system for all waste generated by the development, and an assessment of the impact of the waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area for at least five years of operation. The applicant is encouraged to refer to the Waste Prevention Programme for England, and should seek to minimise the volume of waste produced and the volume of waste sent for disposal unless it can be demonstrated that this is the best overall environmental outcome. If the applicant's assessment includes dredged material, the assessment should also include other uses of such material before disposal to sea, for example through re-use in the construction process.
Paragraph 5.15.7 of Section 5.15: Resource and Waste Management	Where possible, applicants are encouraged to source materials from recycled or re-used sources and use low carbon materials, sustainable sources and local suppliers. Construction best practices should be used to ensure that material is re-used or recycled onsite where possible.
Paragraph 5.15.8 of Section 5.15: Resource and Waste Management	Applicants are also encouraged to use construction best practices in relation to storing materials in an adequate and protected place on site to prevent waste, for example, from damage or vandalism. The use of Building Information Management tools (or similar) to record the materials used in construction can help to reduce waste in future decommissioning of facilities, by identifying materials that can be recycled or re-used.
National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 16-16)	
N/A	No waste specific measures
National Planning Policy for Waste	
Paragraph 8	When determining planning applications for non-waste development, local planning authorities should, to the extent appropriate to their responsibilities, ensure that: • the likely impact of proposed, non-waste related development on existing waste management facilities, and on-sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities; • new, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development and, in less developed areas, with the local landscape. This includes providing adequate storage facilities at residential premises, for example by ensuring that there is sufficient and discrete provision for bins, to facilitate a high quality, comprehensive and frequent household collection service; and • the handling of waste arising from the construction and operation of development maximises re-use/recovery opportunities, and minimises off-site disposal.
25 Year Environmental Plan 'Green Future: Our 25 Year Plan to Improve the Environment' (Ref 16-11)	
	The policy document sets out the government's 25-year plan to improve the health of the environment by using natural resources more sustainably and efficiently. It aims to improve resource efficiency, and reduce levels of waste generation.
Our Waste, Our Resources: A Strategy for England (Ref 16-12)	
	The policy document sets out strategic ambitions, targets, and planned consultations to the year 2050, designed to support the following long-term goals: • double resource productivity by 2050; • eliminate avoidable waste of all kinds by 2050; • eliminate avoidable plastic waste over the lifetime of the 25 Year Environment Plan; • work towards eliminating food waste to landfill by 2030; and

Policy Reference	Policy Context
	• work towards all plastic packaging placed on the market being recyclable, reusable or compostable by 2025.
The Waste Management Plan for England (Ref 16-13)	
	The plan provides: • analysis of the current waste management situation; • information on the type, quantity and source of waste generated; • existing major disposal and recovery installations (and information on planned closures); • information on landfill diversion measures; • information on existing waste collection schemes; • information on the location criteria for site selection and on the capacity of future disposal or major recovery installations; and • general waste management policies, including planned waste management technologies and methods.
The Waste Prevention Programme for England (Ref 16-14)	
	Provides information on existing waste prevention schemes and techniques.

16.2.4 Local Policy

The English Onshore Scheme will be assessed with consideration to local policy that addresses the use of material resources and waste generation and its management. **Table 16-2** presents the local policies relevant to the English Onshore Scheme.

Table 16-2: Local planning policy relevant to Waste and Materials

Policy Reference	Policy Context
Joint Waste Local Plan for Kingston-Upon-Hull and the East Riding of Yorkshire (2004) (Ref 16-17)	No relevant policies. In process of update.
Selby District Local Plan Preferred Options Consultation 2021 (Ref 16-18)	The Local Plan does not cover minerals and waste planning as this is the responsibility of North Yorkshire County Council. The North Yorkshire County Council, City of York and North York Moors National Park Authority Minerals and Waste Joint Plan will form part of the development plan for Selby District when it is adopted.
North Yorkshire County Council Saved policies: waste local plan post-May 2009 (Ref 16-19)	Policy 5/1 Waste Minimisation Proposals for major development should include a statement identifying the waste implications of the development and measures taken to minimise and manage the waste generated. Permission will not be granted where this has not been adequately addressed. New plan in preparation.

16.3 Approach to Assessment

16.3.1 Introduction

This section describes the approach to the identification and assessment of impacts resulting from the construction and operation of the English Onshore Scheme on waste.

Specific waste management considerations have been based on published guidance, including:

- Construction Code of Practice for Sustainable Use of Soils on Construction Sites (2009) (Ref 16-20);
- CL:AIRE Definition of Waste: Development Industry Code of Practice, v2 (2011) (Ref 16-21);

- Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3, Part 13 LA110 'Sustainability and Environment Appraisal - Material Assets and Waste (Ref 16-22);
- Where appropriate, DMRB LA104 Revision 1 Environmental assessment and monitoring (formerly HA 205/08, HD 48/08, IAN 125/15, and IAN 133/10) (Ref 16-23);
- Site Waste Management Plans – Guidance for Construction Contractors and Clients Voluntary Code of Practice (2004); (Ref 16-24) and
- IEMA guide to: Materials and Waste in Environmental Impact Assessment (2020) (Ref 16-25).

The waste and material resource use assessment considers two scenarios, one for construction and one for the operational phase of the scheme.

16.3.2 Summary of Consultation

16.3.2.1 Scoping Opinion Review

No comment was provided with regard to the assessment of waste in the Scoping Opinion received from the statutory consultees.

16.3.2.2 Additional Consultation

No additional consultation has been undertaken in respect of waste.

16.3.3 Assessment Method

16.3.3.1 Overview

The general methodology for EIAs has been laid out in **Chapter 5: Approach to Environmental Assessment**. The EIA methodology considers whether impacts of the English Onshore Scheme would have an effect on any resources or receptors. Assessments broadly consider the magnitude of impacts and value/sensitivity of resources/receptors that could be affected in order to classify effects.

The Materials and Waste assessment follows the approach set out in the DMRB LA110, August 2019 (Ref 16-22). This guidance identifies that the construction and maintenance of motorway and trunk roads can have environmental effects associated with the consumption and use of material assets, and the disposal/recovery of waste. Given that the English Onshore Scheme is a linear scheme, it is assumed that the English Onshore Scheme will result in the construction and operation of infrastructure of a similar nature and scale as a trunk road scheme in terms of the resources and waste it could require/generate. Guidance provided by IEMA has been used to support the assessment for magnitude of impact.

Where the need for further assessment has been established, the assessment will describe the current and likely future requirements including information on availability, types and quantities of key construction materials. For the assessment of material resource use, an assessment against the UK national demand will also be undertaken. The assessment for waste will be based on the availability of suitable waste management infrastructure and capacity in the Yorkshire and Humber region.

Project specific information for the ES will be obtained from the design team to identify the nature of the materials and quantities required for construction of the English Onshore Scheme.

16.3.3.2 Approach and Guidance

The DMRB LA110 document provides an approach to determining the significance of the potential effects that may arise from the use of material resources and the generation of waste.

In addition, professional judgement has been used to provide an assessment of effects based on several factors, including:

- the availability of the material resources;
- the type of materials required, e.g. primary/virgin materials, manufactured materials, recycled materials;
- the type of waste generated, e.g. inert, hazardous;

- the availability of suitable facilities within close proximity to the English Onshore Scheme to treat the waste generated; and
- compatibility of the Best Practicable Environmental Option (BPEO) for the waste within the context of the waste hierarchy, i.e. whether generation of the waste can be minimised, the waste can be recycled, landfilled etc.

The assessment of effects on material resources and waste generation will encompass effects arising during the construction of the English Onshore Scheme, up until the point of opening, as well as the operation (including maintenance) of the English Onshore Scheme for its lifetime.

Materials required for the construction of the English Onshore Scheme are expected to be procured from a range of different sources (which are unknown at this stage), all of which will have their own specific environmental effects, which may or may not have been subject to individual environmental assessments. Therefore, there are no obvious environmental receptors or resources for materials identified as there are for other aspect areas. Consequently, assessing the significance of the use and consumption of materials based on the value or sensitivity of a resource or receptor and the magnitude of an identified effect is precluded. Instead, the scale of use of the English Onshore Scheme relative to the current supply or capacity of a resource forms the principal measure for assessing significance.

16.3.3.3 Significance Criteria

Significant environmental effects are likely to arise from those materials or waste which:

- arise in the largest quantities;
- are primary/virgin materials;
- have hazardous properties; and
- comprise a large proportion of the value of the English Onshore Scheme.

Therefore, the significance of effect is assigned in accordance with the effect categories outlined in **Table 16-3** and the significance criteria in **Table 16-4** below.

Table 16-3: Effect categories and typical descriptors

Effect Category	Description
Neutral/Negligible*	**Material assets** • 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 individual material type is equal to or greater than 1% by volume of the regional baseline availability*. **Waste** • no reduction or alteration in the capacity of waste infrastructure within the region.
Minor*	**Material assets** • 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. • one or more materials is between 1-5% by volume of the regional baseline availability* **Waste** • <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.
Moderate	**Material assets** • project achieves less than 70% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and

Effect Category	Description
	• aggregates required to be imported to site comprise re-used/recycled content below the relevant regional percentage target. • one or more materials is between 6-10% by volume of the regional baseline availability*. **Waste** • >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 requires disposal outside of the region.
Large	**Material assets** • 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. • one or more materials is >10% by volume of the regional baseline availability*. **Waste** • >1% reduction or alteration in the regional capacity of landfill as a result of accommodating waste from a project; and • >50% of project waste requires disposal outside of the region.
Very Large	**Material assets** • No criteria: as criteria for Large category above. **Waste** • >1% reduction or alteration in national capacity of waste infrastructure as a result of accommodating waste from a project; and • the English Onshore Scheme would require new (permanent) waste infrastructure to be constructed to accommodate waste.

* DMRB has been modified based on professional judgement, IEMA guidance for magnitude of effect and project requirements.

Table 16-4: Significance criteria for material resources and waste generation

Significance	Description
Not significant	Material assets:
	• Category description met for Neutral or Minor effect
	Waste generation:
	• Category met for Neutral or Minor effect
Significant	Material assets:
	• Category description met for Moderate or Large effect
	Waste generation:
	• Category met for Moderate, Large or Very Large effect

16.4 Study Area

The study area for the purposes of waste and materials is considered to consist of two geographically distinct study areas to examine the use of material resources and the generations and management of waste.

The first study area will be based on the entire area within the site boundaries of the English Onshore Scheme as this constitutes the area within which construction materials would be consumed (used, re-used and recycled) and waste would be generated.

The second study area will focus on an area sufficient to identify the suitable waste management infrastructure likely to accept the waste generated by the English Onshore Scheme, so that its location and capacity can be assessed. This study area must also take into consideration the local sources and availability of materials required for the construction and operation of the English Onshore Scheme which may be impacted. Therefore, for the purpose of this assessment the study will focus primarily on

Yorkshire and the Humber region (as defined by the Office for National Statistics 2017 boundaries) within which the English Onshore Scheme is located. The North East region has also been included in the second study area owing to the proximity of the regional border to the English Onshore Scheme (approximately 60km at parts), and the potential for waste generated by the English Onshore Scheme to be transferred to the North East region for management. Office of National Statistics reginal boundaries have been used for the second study area, in order to align with those used by the UK Government to report waste statistics.

The study area for English Onshore Scheme passes through mineral safeguarding area (MSA) for sand and gravel in East Riding of Yorkshire region.

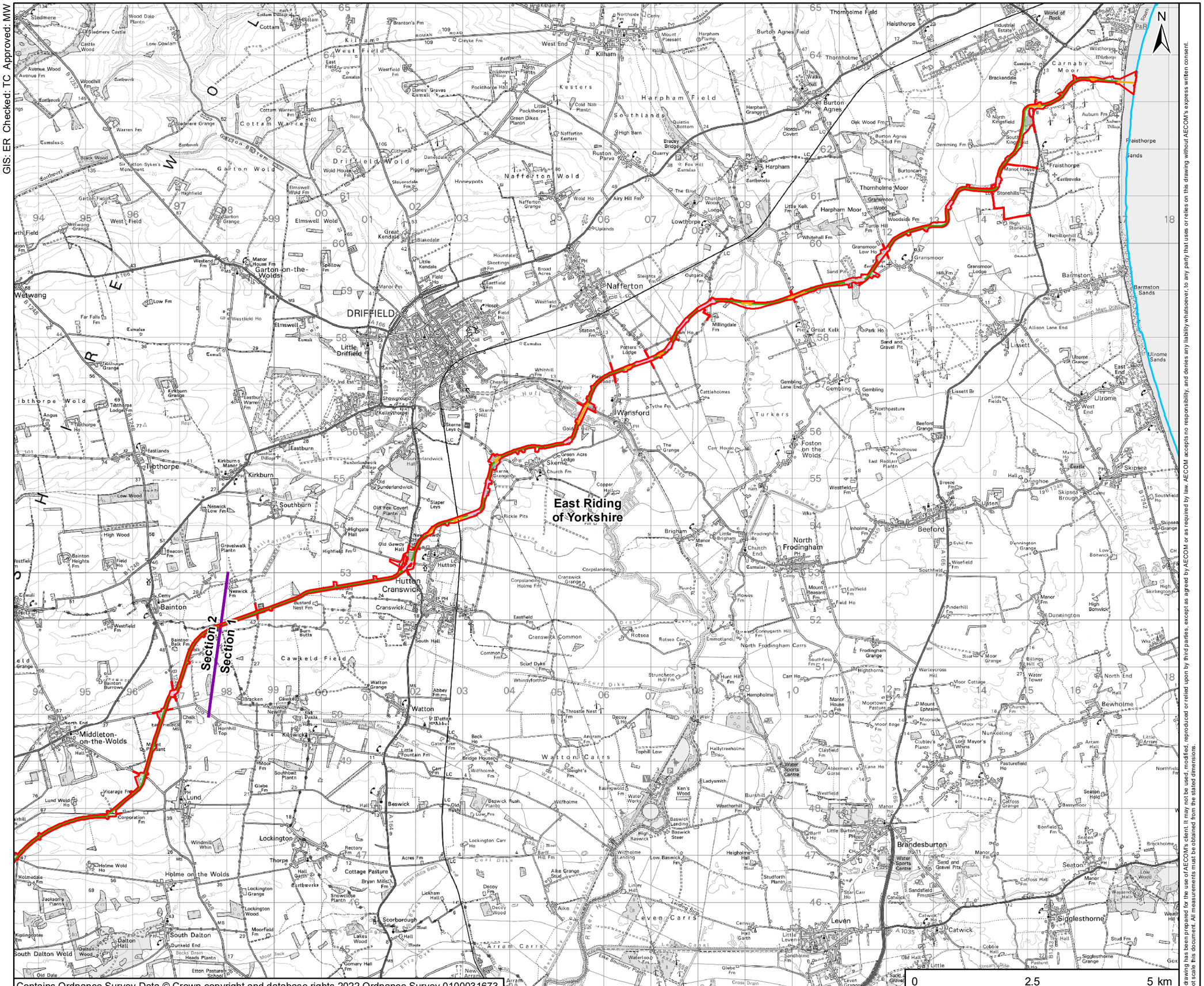
16.4.1 Overview

The study area has been divided into four sections:

- Section 1 – Landfall to Bainton;
- Section 2 – Bainton to Market Weighton;
- Section 3 – Market Weighton to River Ouse; and
- Section 4 – River Ouse to Drax Substation.

The extent and boundaries of these sections is shown in **Figure 16-1** which refers to the first study area only. The second study area is not identified in the figure as this relates to authority boundaries only.

GIS: ER Checked: TC Approved: MW



Coordinate System: British National Grid

Scale @ A3 1:75,000

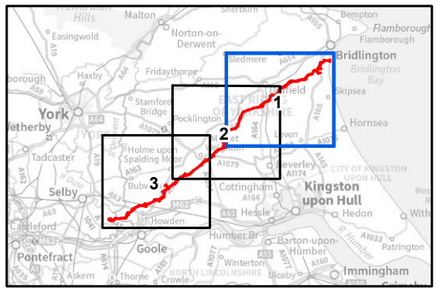
nationalgrid

PROJECT

Scotland England Green Link 2

KEY

- Planning Application Boundary
- Route Section Break
- Mean Low Water Springs
- HDD - Proposed
- HDD - Unless Otherwise Agreed to be Open Cut
- DC Cable Alignment – Open Cut
- DC Cable Route Working Width (40m)
- Temporary Attenuation Pond and Outfall
- Temporary Construction Compound



TITLE

Figure 16-1
Study Area

REFERENCE

SEGL2_T_ES_1-3_v4_20220530

SHEET NUMBER: 1 of 3

DATE: 30/05/2022

GIS: ER Checked: TC Approved: MW

Coordinate System: British National Grid

Scale @ A3 1:75,000

nationalgrid

PROJECT

Scotland England Green Link 2

KEY

- Planning Application Boundary
- Route Section Break
- District Borough Unitary Boundary
- HDD - Proposed
- HDD - Unless Otherwise Agreed to be Open Cut
- DC Cable Alignment – Open Cut
- DC Cable Route Working Width (40m)
- Temporary Attenuation Pond and Outfall
- Temporary Construction Compound

TITLE

Figure 16-1
Study Area

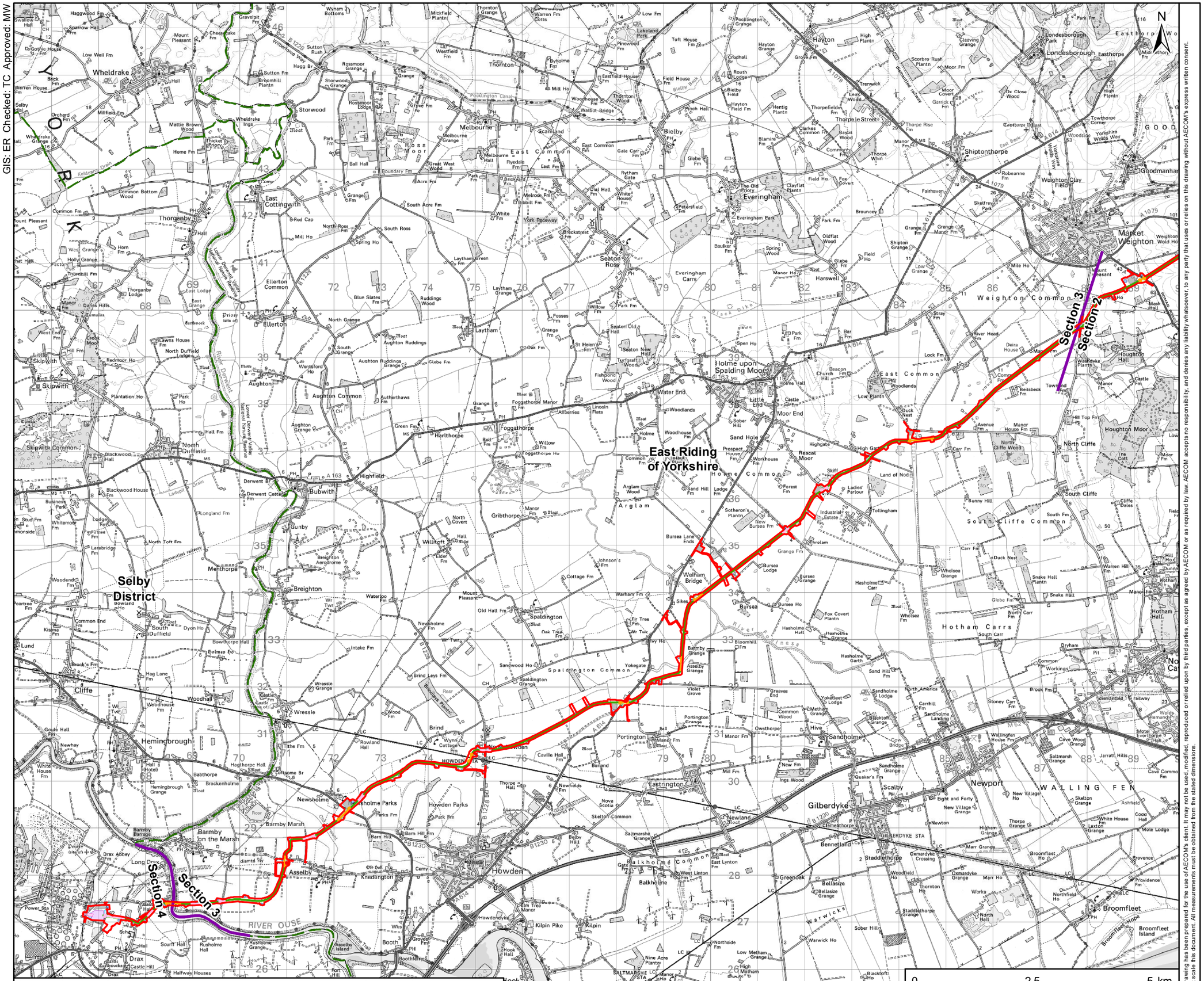
REFERENCE

SEGL2_T_ES_1-3_v4_20220530

SHEET NUMBER: 2 of 3

DATE: 30/05/2022

GIS: ER Checked: TC Approved: MW



Coordinate System: British National Grid

Scale @ A3 1:75,000

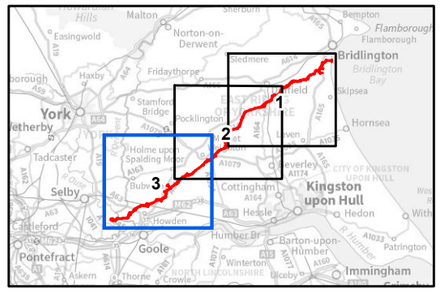
nationalgrid

PROJECT

Scotland England Green Link 2

KEY

- Planning Application Boundary
- Route Section Break
- District Borough Unitary Boundary
- HDD - Proposed
- HDD - Unless Otherwise Agreed to be Open Cut
- DC Cable Alignment – Open Cut
- DC Cable Route Working Width (40m)
- AC Cable Route Working Width (60m)
- Temporary Attenuation Pond and Outfall
- Temporary Construction Compound
- Permanent Attenuation Pond
- Converter Station Area



TITLE

Figure 16-1
Study Area

REFERENCE

SEGL2_T_ES_1-3_v4_20220530

SHEET NUMBER: 3 of 3

DATE: 30/05/2022

16.5 Baseline Environment

16.5.1 Overview

The baseline conditions will be centred on the demand for key construction materials and the national and local generation of waste, within North Yorkshire, East Riding of Yorkshire, Selby, the North East of England, and the UK. The baseline will also outline the capacity/availability of waste management infrastructure within the vicinity of the English Onshore Scheme. It will be established to ensure the most up to date information is reported. This information will be determined through a desk-based study, using the most up to date information from a range of readily available resources.

16.5.1.1 Use of material resources

Information on the demand for key construction materials within the UK and Yorkshire and Humber region has been used to provide an initial baseline for material resources. In addition, information for the UK has also been provided as a national comparison. This information has been determined through a desk-study using a number of readily available resources:

- The Minerals Products Association: The Contribution of Recycled and Secondary Materials to Total Aggregates Supply in Great Britain (Ref 16-26);
- The Minerals Products Association: Annual Cementitious 2001 onwards dataset (Ref 16-27);
- MAKE UK: UK Steel Statistics Guide 2019 (Ref 16-28); and
- Yorkshire and Humber Aggregate Working Party Annual Monitoring Report 2016, incorporating data for January – December 2016 (2017) (Ref 16-29).

A summary of mineral and mineral product sales based on these sources is shown below in **Table 16-5**.

Table 16-5: Mineral and mineral product sales in UK, 2018

Material	UK Demand (Million Tonnes)
Aggregates	
Sand and gravel	114.5 (2017)
Total Primary sources	61.8 (2017)
Recycled CD&E (Construction, Demolition, and Excavation waste) (including railway ballasts)	176.3 (2017)
Asphalt planings	58.5 (2017)
China & ball clay waste	6.1 (2017)
Incinerator Bottom Ash (IBA)	2.5 (2017)
Total Recycled sources	1.8 (2017)
Cementitious (including imports)	
Cement (including imports)	11.6 (2019)
Other cementitious materials (fly ash, Ground Granulated Blast-furnace Slag)	3.6 (2019)
Total Cementitious Material	15.2 (2019)
Other materials	
Ready-mixed concrete	56.1 (2016)
Concrete products	25.8 (2016)
Asphalt	25.2 (2016)
Dimension stone	1.0 (2016)
Steel	10.2 (2019)

At a regional level, the Yorkshire and Humber Aggregate Working Party Annual Monitoring Report 2017, incorporating data for January – December 2016 (Ref 16-29) contains the most recent data available. This has been used to outline the aggregate sales and reserved in North Yorkshire and the East Riding of Yorkshire.

Table 16-6 outlines the aggregate sales, reserves and landbank in the region as of 2016, the latest information. Raw aggregates extracted across the area include sand and gravel and crushed rock. Data on recycled and secondary aggregate is not available for North Yorkshire and the East Riding of Yorkshire.

Table 16-6: Aggregate sales, demand, reserve, and landbank in 2016 (million tonnes)

	North Yorkshire	EROY*	North Yorkshire	EROY*	North Yorkshire	EROY*	North Yorkshire	EROY*
	Sales in 2016		10-year sales average		Permitted reserve		Landbank (years)	
Sand and gravel	1.7	0.8	1.8	0.74	20.5	6.32	11.4	8.5
Crushed rock	6.67	0.23	6.2	0.13	170.7	6.59	27.5	50.7

**East Riding of Yorkshire*

As of December 2015, there were 34 active aggregate extraction sites in North Yorkshire, as well seven inactive sites, two closed sites, and one site scheduled to be closed/depleted by the end of 2015.

In the East Riding of Yorkshire, there were 14 active aggregate extraction sites as of December 2015, as well as two inactive sites, and one “dormant” site.

Data on secondary and recycled aggregate production and use is variable and incomplete. The 2017 Annual Monitoring Report from the Yorkshire and Humber Aggregate Working Party states that this is because, while some sites operate under license and can be monitored, much recycling and re-use occurs on individual construction sites, is temporary in nature and does not produce data. Insufficient data was obtained from the 2015 survey to report the returns received but it is hoped that this can be reported on in a future report. For the period 2005-2020, the use of recycled aggregate targets for North East of England is 26% and for Yorkshire and the Humber is 31% (Ref 16-22).

The Annual Monitoring Report states that minerals are imported from mainland Europe are also landed at wharfs in Kingston upon Hull, however, data quantities are not provided.

Government policy requires landbanks to be maintained for all primary aggregate minerals, with a required landbank period for sand and gravel of at least seven years. The scale and location of permitted reserves, together with the associated site production capacities across the region is sufficient to ensure the future provisions of sand and gravel and crushed rock supply at levels above the minimum requirements.

The underground DC cable route for the English Onshore Scheme would be constructed in an area identified as MSA for sand and gravel for East Riding of Yorkshire region.

16.5.1.2 Generation and management of waste

The most recent information available relating to current waste generation and operational waste facilities in the Yorkshire and Humber, and Tees Valley Unitary Authority regions, as well as the North East of England, has been gathered to provide the baseline for this assessment. Information of current waste arisings, and the waste management facilities have been determined through a desk-top study, using a number of readily available resources, in particular from the Environment Agency and Department for Environment, Food and Rural Affairs (DEFRA).

The latest data from the Environment Agency, presented in **Table 16-7**, indicated that England received 220.3 million tonnes of waste in 2020, which was managed in 6,027 permitted waste facilities. The North East of England region produced over 10.2 million tonnes of waste in 2020 which was managed in 333 sites. The Yorkshire and Humber and Tees Valley Unitary Authority regions produced more than 32 million tonnes of waste in 2020.

Table 16-7: Waste breakdown by site types in 2020

Site Type	England (tonnes)	North East of England (tonnes)	Yorks and Humber (tonnes)	Tees Valley Unitary Authority (tonnes)
Landfill	39,803,000	3,019,000	3,750,118	882,958
Transfer	42,572,000	2,472,000	5,020,150	562,825
Treatment	86,840,000	3,687,000	12,880,167	2,299,859
Metal Recovery	12,446,000	531,000	1,729,752	237,045
Incineration	16,271,000	1,360,000	2,647,529	1,282,145
Use of Waste	147,000	9,000	0	0
Land Disposal	9,859,000	398,000	1,295,756	297,820
Total	**220,333,000**	**10,224,000**	**27,323,472**	**5,562,652**

16.5.1.3 Construction and Demolition Waste

With respect to C&D waste, the Environment Agency recorded that 70,297 tonnes of C&D waste and asbestos was deposited in landfill in the North East of England region in 2020, and 75,011 tonnes was deposited in the Yorkshire and Humber region. Excavation and site clearance activities generate a significant quantity of waste arisings. The baseline target for recovery of C&D waste is 70% by weight, as set out in the EU Waste Framework Directive 2008/98/EC. However, the ENV23 – Statistics on Waste (Ref 16-30) outlines that of the 61.4 million tonnes of non-hazardous C&D waste generated in England in 2018, 57.5 million tonnes were recovered (which is 93.8% of the total generated).

Current levels of C&D inert waste (EWC chapter 17 wastes), have been estimated based on information included in the 2020 Waste Data Interrogator for England (Ref 16-31) and presented in **Table 16-8**.

Table 16-8: Tonnes of Inert C&D waste received (2020)

WPA	C&D waste received (tonnes)
East Riding of Yorkshire	1,165,722
Selby	588,165
North Yorkshire	996,435
North East England	3,629,679
Yorks and Humber	7,567,658
England	76,361,230

16.5.1.4 Hazardous Waste

In regard to hazardous C&D waste, **Table 16-9** below outlines the quantities received in 2020 in England, the North East of England, North Yorkshire, Selby, and the East Riding of Yorkshire.

Table 16-9: Tonnes of C&D hazardous waste received (2020)

WPA	C&D hazardous waste received (tonnes)
East Riding of Yorkshire	264
Selby	3,792
North Yorkshire	7,301
North East England	75,709
Yorks and Humber	58,185
England	1,070,182

16.5.1.5 Potential contaminated wastes

To identify potential sources of contamination present in land, an initial review of the landfill sites, both authorised and historic, in close proximity of the underground Direct Current (DC) cable route and converter station was undertaken with the help of National Designations web map was undertaken. There are 19 historic landfill sites within 500 m of the route. There are no authorised landfill sites within

500 m of the route. Potential sources of contamination that are greater than 500 m away from the route have not been considered, as these are considered unlikely to affect the English Onshore Scheme.

16.5.1.6 Waste Management facilities

The Environment Agency reported that in 2020, 333 sites accepted waste in the North East of England and at the end of 2020, 531 sites in the North East of England had environmental permits to accept waste (**Table 16-10**). 809 facilities in the Yorkshire and the Humber Region accepted waste in 2020 and 1,225 sites had an environmental permit at the end of 2020.

Table 16-10: Permitted waste facilities 2020

Site Type	England		North East England		Yorkshire and Humber	
	No. of sites with an environmental permit at the end of 2020	No. of sites that accepted waste in 2020	No. of sites with an environmental permit at the end of 2020	No. of sites that accepted waste in 2020	No. of sites with an environmental permit at the end of 2020	No. of sites that accepted waste in 2020
Landfill	531	295	23	20	92	33
Transfer	2,708	2,177	159	126	359	281
Treatment	2,941	2,142	197	111	357	283
Metal Recovery	2,063	1,114	123	61	342	174
Incineration	183	104	14	7	27	18
Use of Waste	20	9	1	1	-	-
Land Disposal	409	185	14	7	48	20
Total	**8,855**	**6,026**	**531**	**333**	**1,225**	**809**

16.5.1.7 Remaining landfill capacity

Remaining landfill void has been determined using the Environment Agency 2020 remaining landfill capacity dataset (Ref 16-31). Annual quantities landfilled have been based on the 2020 Waste Data Interrogator (Ref 16-32). **Table 16-11** outlines the capacity of landfill within North Yorkshire, Selby, the East Riding of Yorkshire, the North East of England, the Yorkshire and Humber region, and England at the end of 2020.

Table 16-11: Remaining landfill void (2020)

Landfill type	East Riding of Yorkshire (m^3)	Selby (m^3)	North Yorkshire (m^3)	North East England (m^3)	Yorkshire and Humber (m^3)	England (m^3)
Number of active landfill sites	10	8	18	26	68	534
Number of landfills with remaining capacities	6	4	7	20	40	Not provided.
Hazardous Merchant	0	0	0	4,634,903	2,386,614	15,571,171
Hazardous Restricted	0	0	0	0	0	809,640
Non-Hazardous with SNRHW* cell	1,243,333	0	0	2,027,147	1,243,333	66,969,897
Non-Hazardous	2,631,389	14,823,111	17,584,583	7,840,530	42,063,124	164,824,065

Landfill type	East Riding of Yorkshire (m^3)	Selby (m^3)	North Yorkshire (m^3)	North East England (m^3)	Yorkshire and Humber (m^3)	England (m^3)
Inert	3,079,657	961,600	1,104,653	8,681,586	25,040,150	140,191,731
Total	**6, 954,379**	**15,784,711**	**18,689,236**	**23,193,166**	**70,73,221**	**388,366,504**

**SNRHW is Stable Non-Reactive Hazardous Waste*

Note that some active landfills noted above have been listed as having no remaining landfill void at the end of 2020. Remaining hazardous capacity includes merchant landfills which may not be suitable to accept wastes generated by the English Onshore Scheme.

16.5.1.8 Surrounding waste management infrastructure

Surrounding waste management infrastructure, presented in **Table 16-12** to **Table 16-15,** have been identified within 10 km of the landfall over four sections of the English Onshore Scheme, using the Environment Agency public register (Ref 16-33). Sites which do not process relevant waste streams (such as End-of-Life Vehicle processing facilities) have been excluded from this list.

Section 1 – Landfall to Bainton

Landfall postcode: YO15 3QL

Bainton postcode: YO25 9EG

Section length: approximately 25.1 km

Central point: YO25 8NN

Table 16-12: Permitted waste operation sites within 10km (Section 1 – Landfall to Bainton)

Site Name	Treatment Facility Type	Distance from central point (km)
Lowthorpe Quarry	SR/12: Treatment of waste to produce soil <75,000 tpy	3.16
Gransmoor Quarry (site B)	SR/12: Treatment of waste to produce soil <75,000 tpy	5.14
Gransmoor Quarry	A05: Landfill taking Non-biodegradable Wastes	5.29
Unit 2 Danes Grave Industrial Estate	A11: Household, Commercial & Industrial Waste T Stn	6.49

Section 2 – Bainton to Market Weighton

Bainton postcode: YO25 9EG

Market Weighton postcode: YO43 4RF

Section length: approximately 17.4 km

Central point: YO43 3NA

Table 16-13: Permitted waste operation sites within 10km (Section 2 – Bainton to Market Weighton)

Site Name	Treatment Facility Type	Distance from central point (km)
D J Cleaning Limited	S0809: Asbestos Waste Transfer Station	6.87
Middleton Quarry	SR/12: Treatment of waste to produce soil <75,000 tpy	7.04
Station Road Site	A25: Deposit of waste to land as a recovery operation	7.06

Site Name	Treatment Facility Type	Distance from central point (km)
R N H Skiphire	S0803: HCI Waste TS + treatment	7.61
Gallymoor Landfill Site	A04: Household, Commercial & Industrial Waste Landfill	8.97
Beechwood Services	A20: Metal Recycling Site (mixed MRS's)	9.68

Section 3 – Market Weighton to River Ouse

Market Weighton postcode: YO43 4RF

River Ouse postcode: DN14 7HX

Section length: approximately 24.7 km

Central point: YO43 4BX

Table 16-14: Permitted waste operation sites within 10km (Section 3 – Market Weighton to River Ouse)

Site Name	Treatment Facility Type	Distance from central point (km)
Bursea Lane Farm	S1506: 75kte household, commercial and industrial waste transfer station with treatment	0.83
Allensway Recycling Ltd	A23: Biological Treatment Facility	2.52
Chrispin's	SR/21: 75kte metal recycling site (existing permits)	3.59
Mallard Grange	S1506: 75kte household, commercial and industrial waste transfer station with treatment	5.25
Changing Waste	A16: Physical Treatment Facility	5.43
Beechwood Services	A20: Metal Recycling Site (mixed MRS's)	6.12
Gilberdyke Landfill Site	A06: Landfill taking other wastes	6.22
Gallymoor Landfill Site	A04: Household, Commercial & Industrial Waste Landfill	6.82
Breighton Airfield	SR/12: Treatment of waste to produce soil <75,000 tpy	6.89
Breighton Airfield	A22: Composting Facility	7.25
Breighton Airfield	A16: Physical Treatment Facility	7.31
G B P Skips & Waste Ltd	S1506: 75kte household, commercial and industrial waste transfer station with treatment	7.53
North Cave Wetlands	A25: Deposit of waste to land as a recovery operation	8.68
North Cave Quarry	S0908: Management of inert or extractive waste at mine	8.76
Ryedale Farm Organics Recycling Facility	A22: Composting Facility	8.89
North Cave Fame Plant	A17: Physico-Chemical Treatment Facility	9.03
R N H Skiphire	S0803: HCI Waste TS + treatment	9.12
Anytime Waste Transfer Station	S0803: HCI Waste TS + treatment	9.53

Section 4 – River Ouse to Drax Substation

River Ouse postcode: DN14 7HX

Drax Substation postcode: YO8 8PH

Section length: approximately 1.7 km

Central point: YO8 8NQ

Table 16-15: Permitted waste operation sites within 10km (Section 4 – River Ouse to Drax Substation)

Site Name	Treatment Facility Type	Distance from central point (km)
Lightweight Aggregate Manufacturing Plant	A15: Material Recycling Treatment Facility	1.62
Catcon UK	A16: Physical Treatment Facility	6.51
Goole Transfer Station	S0803: HCI Waste TS + treatment	6.71
Station Road Business Centre	SR21: 75kte metal recycling site (existing permits)	7.38
Taperell Environmental	A11: Household, Commercial & Industrial Waste T Stn	7.43
Commons Farm	A22: Composting Facility	7.86
Van Werven UK Ltd	A11: Household, Commercial & Industrial Waste T Stn	7.92
Whitemoor Business Park	A11: Household, Commercial & Industrial Waste T Stn	7.97
Strong Skips Waste Recycling Ltd	S1506: 75kte household, commercial and industrial waste transfer station with treatment	8.13
Changing Waste	A16: Physical Treatment Facility	8.17
Goole Recycling Facility	A09: Special Waste Transfer Station	8.21
Breighton Airfield	A16: Physical Treatment Facility	8.46
Anytime Waste Transfer Station	S0803: HCI Waste TS + treatment	8.47
Breighton Airfield	SR/12: Treatment of waste to produce soil <75,000 tpy	8.70
Breighton Airfield	A22: Composting Facility	8.71
Park Lodge Shooting School	A25: Deposit of waste to land as a recovery operation	9.58
Hensall Quarry	A05: Landfill taking Non-Biodegradeable Wastes	9.96
Lightweight Aggregate Manufacturing Plant	A15: Material Recycling Treatment Facility	1.62

16.5.1.9 Exempt sites

In addition to permitted CD&E waste management sites, inert material is also managed on sites that have an Environment Agency waste management license exemption. These exempt sites generally comprise land restoration activities such as restoring mineral voids, engineering/landscaping schemes and for agricultural improvements on farmland; therefore, they should not technically be seen as disposal 'landfilling' activity as they are a re-use of the material. These sites are an important part of the provision of the capacity for managing inert materials. Although small tonnages of waste from other waste streams (e.g. biodegradable waste) may be managed at locations with an exemption, the largest tonnage of exempt activities is likely to involve construction and demolition material.

There are 1,722 waste exempt sites listed by the Environmental Agency within 10 km of the English Onshore Scheme, 421 of which are U1 exempt sites (allowed to use suitable waste material in construction, in place of virgin materials). These sites have been identified using the same method as active waste management sites, and are located as follows:

- Section 1 – Landfall to Bainton (YO25 8NN): 217 waste exemptions, of which 69 are U1 exemptions;

- Section 2 – Bainton to Market Weighton (YO43 3NA) 190 waste exemptions, of which 68 are U1 exemptions;
- Section 3 – Market Weighton to River Ouse (YO43 4BX) 309 waste exemptions, of which 103 are U1 exemptions; and
- Section 4 – River Ouse to Drax Substation (YO8 8NQ) 435 waste exemptions, of which 72 are U1 exemptions.

These U1 exemption sites were used to manage waste produced onsite only as a one-off event. These sites are often short-lived, and therefore, should be identified upon commencement of construction.

16.6 Potential Impacts

16.6.1 Introduction

This section presents the findings of the assessment of the potential impacts of material resources use and waste generation as a result from the construction of the English Onshore Scheme.

No significant effects relating to the operation of the English Onshore Scheme are anticipated for the use of material resources, and generation and management of waste, as operational activities will include maintenance which is unlikely to use large volumes of materials or generate large volumes of waste. The waste hierarchy would be implemented to reduce waste generation. Hence, as per the Scoping Report, the material resource use and generation of waste during the operation of the English Onshore Scheme has been scoped out.

Cable manufacturing industries and the manufacturing of component parts of the converter station are subject to their own regulated controls and would require recycling of the waste arising from cable works and, so has been scoped out of the assessment. Steel waste that may be generated from construction works will be minimal, is likely to be recycled by waste processing infrastructure (**Table 16-12** to **Table 16-15)** and unlikely to be landfilled and so has also been scoped out of the assessment. The generation and management of waste that cannot be re-used on-site will require transport off-site. Impact assessment for material resources use.

The route of the underground DC cable passes through the MSA identified for sand and gravel in the East of Riding Yorkshire region. Based on professional judgement, it is unlikely to sterilise >1% of the MSA for East Riding of Yorkshire, so scoped out for further assessment.

All the effects identified are considered to be adverse, unless stated otherwise. During the construction of the English Onshore Scheme, materials will be required for construction and waste will be generated by the English Onshore Scheme. The assessment will consider:

- The provision and use of material resources, including primary, secondary, recycled and manufactured materials; and
- The management of waste by implementing the waste hierarchy, availability of waste management infrastructure and landfill capacity.

The scale and nature of activities undertaken during decommissioning would be similar to those described for construction, and they would be temporary during the period of decommissioning activities on site. Following the removal of the structures and the reinstatement of the land there would be no further potential effects from waste and material use. The potential effects from decommissioning should therefore be regarded as the same as construction as described in greater detail below.

The likely impacts on material resources and waste generation as a result of the English Onshore Scheme are described below.

16.6.2 Mitigation by Design

Where possible embedded mitigation measures, or mitigation by design, have been incorporated into the English Onshore Scheme such that they inform its design and/or how it shall be constructed. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as much as possible. The approach provides the opportunity to prevent or reduce adverse effects from the outset.

This mitigation by design has been taken into account when evaluating the significance of the potential impacts. Residual impacts described in Section 16.8 are those which remain taking into account any further proposed project specific mitigation. See Section 5.6 for further information on the approach to mitigation taken in this document.

Mitigation by design applicable to waste and materials is intrinsically linked to the development of a design that is as direct as possible between the landfall and connection at Drax Substation. By limiting the extent of the English Onshore Scheme where practicable the quantum of material required is reduced.

Standard good practice measures have also been embedded within the way in which the English Onshore Scheme will be installed and constructed. This includes the way in which materials and waste are managed on site, and will be incorporated within a Site Waste Management Plan (SWMP) for each of the components of the English Onshore Scheme. The SWMP will be developed by the Contractor and agreed with ERYC and SDC in advance of construction. Typical measures that will be incorporated within the SWMP include:

- Implementing the principles of the waste hierarchy.
- Providing information on how the construction waste is managed, stored and disposed of in an appropriate manner, by approved contractors, in accordance with the waste hierarchy and all relevant legislation.
- Managing the volume and types of hazardous waste generated.

An outline Soil Management Plan (SMP) has been included within this ES (see **Chapter 12: Agriculture and Soils**, **Appendix 12B**) which sets out how excavated soils are to be managed. This will ensure that the quality of soil resources, won from the site, is maintained during construction so that they remain suitable for re-use, do not become contaminated and ultimately do not become waste. This outline SMP will be developed into a full SMP by the appointed contractor.

The preparation of detailed versions of the SWMP, and SMP will ensure that any adverse effects associated with material resource use and waste generation are managed.

Mitigation measures that will be implemented on-site to ensure efficient use of material resources and reduction of waste arisings, and to reduce the potential impacts identified are as follows:

- The waste hierarchy will be implemented throughout the construction to minimise disposal and maximise re-use and recycling of waste arisings. Opportunities for re-use and recycling of waste include (but are not limited to):
  - Re-using excavated soils for back filling the cable trench and reinstating temporary accesses (where excavation is necessary).
  - Options for use of surplus excavated soil that may be generated in the converter station site include:
    - Visual bunds;
    - Retain soil for reuse elsewhere within the English Onshore Scheme if additional soil is required for restoration;
    - Increase topsoil depths (<5cm assuming topsoil depths will not become much greater than 30 cm) in the converter station site or nearby fields of the English Onshore Scheme;
    - Sell/export for re-use on another project (pending testing and certification);
    - a wider search locally to identify potential areas requiring restoration – where the soil could be re-used off-site; and
    - topsoil could be bunded in a suitable fashion for storage over the medium term for resale off-site. This would facilitate storing and selling in batches as and when there is a demand, subject to the topsoil being managed by a local topsoil trader.
  - Recycling of inert material by crushing, blending and subsequent re-use, as an aggregate.

- Opportunities to reduce the amount of imported material required for temporary works (for e.g. haul roads) through the use of alternative construction methods will be considered by the appointed Contractor.
- Where site-won material is not available or suitable for re-use, secondary or recycled materials will be procured where available and practicable.
- Materials will be delivered on an 'as required' basis to avoid damage or contamination and therefore limit the likelihood of waste.
- Temporary stockpiling of fill materials prior to incorporation into the English Onshore Scheme will be avoided where possible, to ensure double handling and damage are minimised, therefore avoiding waste. However, where required, materials will be stockpiled in accordance with best practice and managed appropriately to limit the likelihood of damage or contamination.
- Locally sourced materials and suppliers will be identified and used where practicable.
- Pre-cast elements will be used where practicable to ensure efficient use of materials and avoid the generation of waste arisings from off-cuts.
- Re-use/ recycle of all aggregate in other projects that have been used for temporary construction works.
- Where waste must be taken to a recycling or disposal site, the appointed Contractor will ensure that the sites have the appropriate permits. In addition, the suitable facility will be located as close to the works as possible to minimise the impacts of transportation, in particular the release of carbon emissions. The appointed contractor will identify the closest and relevant treatment and disposal sites.
- A non-exhaustive list of waste infrastructure sites within 10 km of the English Onshore Scheme are provided in **Table 16-12, Table 16-13, Table 16-14** and **Table 16-15**. The ability for waste arisings to be deposited at these sites will be dependent on the conditions imposed on the sites by the relevant licence or permit. There may be other facilities in the vicinity of the English Onshore Scheme that may be used.

No project-specific mitigation will be applied beyond the measures identified in the mitigation by design section.

16.6.3 Assessment of Potential Impacts: Construction Phase

16.6.3.1 Material resources use

16.6.3.1.1 Overview

Resources required to construct the English Onshore Scheme include raw material such as cables, stone for haul road, cement bound sand (CBS) or other thermostable backfill material, construction mats from primary, secondary and recycled sources, and manufactured construction products. Many material resources may originate off-site, purchased as manufactured construction products and include electrical equipment like transformers for the converter station. However, some materials may arise on-site, for example excavated soils and sub-strata.

Large quantities of material resources is likely to be required for the construction of the underground DC cable route and the converter station. For the assessment of material resource requires the following information (where available) was used to estimate the percentage of site-won material used on-site and the percentage of recycled and/or secondary material used for the project:

- The types and quantities of materials required to construct the English Onshore Scheme;
- Any information on materials that contain secondary/recycled content;
- Any 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 English Onshore Scheme;
- The estimated cut and fill balance (converter station only); and
- The details of on-site storage and stockpiling arrangements, and any supporting logistical details.

This will help to establish if the English Onshore Scheme is likely to:

- Recover/re-use little on-site material thereby requiring materials to be imported to site; and
- Use little/no recycled or secondary materials thereby requiring the majority of materials used on the English Onshore Scheme to comprise of primary materials.

The receptors likely to be subjected to impacts as a result of material resources used include quarries and other sources of minerals, and other finite raw material resources. The potential impacts associated with the use of material resources include:

- Impacts on the availability of material resources, and subsequent impacts on the demand for key construction materials as materials will need to be imported on-site as the English Onshore Scheme is unlikely to recover/re-use all the site won material and available site won material may not be adequate for all the construction works; and
- Depletion of non-renewable (primary) resources as the majority of materials needed on the English Onshore Scheme comprise primary material (e.g. aggregates) as the English Onshore Scheme is unlikely to be able to source all requirement materials from recycled/secondary materials.

16.6.3.1.2 Material resource use for underground DC cable route

During the construction of the underground DC cable route, materials would require to be imported to the site to establish temporary construction requirements (haul roads, access points, construction compounds etc.)

The likely materials required are listed below (although the list is not exhaustive):

- Steel,
- Cables (DC and Alternating Current (AC) cables),
- Stone for haul road (underground DC cable route only), and
- Construction mats,

Materials used to produce finished products like cables, have not been included in the EIA assessment as these are subject to their own, separate consenting and regulatory controls at the place of production.

Information is available for the estimate of aggregates required and is given in **Table 16-17.** For the purpose of the EIA, it is assumed that all excavated material won from the construction of the cable trench will be re-used on site and utilised for reinstatement works.

Table 16-16: Import material required for the underground DC cable route earthworks

Aggregate Use	Description	Volume
Fill for Construction compound	Aggregates, Ministry of Transport (MOT) type 1 fill,	109,510.5m^3
Bellmouths	Bitumen	10,571.44m^3
Fill for Bellmouths	MOT, type 1	13,214.3m^3
Fill for haul roads	MOT, type 1	163,983.9m^3
Drainage	MOT, type 1	20,762.7m^3
Total		**318,042.84**m^3

Source: Initial design information, provided by design team

It can be seen from **Table 16-17** that a large quantity of raw material will be required for the temporary construction works. 318,043 m^3 of aggregate/aggregate based products equates to 3.97% of the regional 10 years sales average in the North Yorkshire region for sand, gravel and rocks. Most of the aggregate used for the underground DC cable route would be for temporary construction works and is likely to be recovered for re-use by other projects after the completion of the underground DC cable route.

The recycled content of the material that could be used in the construction of the underground DC cable route is unknown at this stage. However, it is assumed this will meet the regional target Plan for the recycled and secondary aggregate where technically appropriate and economically feasible.

The use of material resources will require its transport to site and the effects of this activity have been assessed with in **Chapter 14: Traffic and Transport** (and subsequently in **Chapter 7: Ecology and Nature Conservation** and **Chapter 15: Socio-economics, Recreation and Tourism**).

16.6.3.1.3 Material resource use for converter station

The construction works for the convertor station area would require fill material to raise the level of the converter station by approximately 3 m. The stripping of the topsoil would be required. There is no requirement for a substantial cut volume to build up the platform of the converter station.

The likely materials required are listed below (although the list is not exhaustive):

- Steel,
- Bitumen for bellmouth
- Cement
- Concrete
- Construction mats, and
- Electrical equipment

Information is available for the estimate of aggregates and is given in **Table 16-17.** For the purpose of the EIA, it is assumed that all excavated material won from the converter station site will be re-used on site and utilised for building-up the site level..

Table 16-17: Import material required for Converter Station earthworks

Aggregate Use	Description	Volume
Converter station	MOT, type 1	212,007m^3

Source: Initial design information, provided by design team

For access and site establishment of the converter station, a permanent road will be constructed of approximately 145 m long and 6 m wide. Information is unavailable for the quantity of aggregate that would be required for the construction of the road within the site, and is unlikely to be of a comparable volume when compared to the large quantities of aggregate that would be required to construct the converter station.

The estimated quantities of aggregate, or aggregate based materials, required for the construction of the convertor station is 212,007 m^3 (**Table 16-17**). Materials used to produce finished products like pre-fabricated elements for the converter station have not been included in the assessment as these are subject to their own, separate consenting and regulatory controls at the place of production.

It can be seen from **Table 16-17,** that a large quantity of raw material (aggregates) will be required to raise the level of the converter station. 212,007 m^3 of aggregate/aggregate-based products equates to 2.65% of the regional 10 years sales average in the North Yorkshire region for sand, gravel and rocks (**Table 16-6**).

The recycled content of the material that could be used in the construction of the convertor station is unknown at this stage, but it is assumed this will meet the regional target Plan for the recycled and secondary aggregate where technically appropriate and economically feasible.

The use of material resources will require its transport to site and the effects of this activity have been assessed with in **Chapter 14: Traffic and Transport** (and subsequently in **Chapter 7: Ecology and Nature Conservation** and **Chapter 15: Socio-economics, Recreation and Tourism**).

16.6.3.2 Generation and management of waste

16.6.3.2.1 Overview

Waste likely to be generated from the access and site establishment (e.g. bellmouth creation, haul road establishment, and creation of construction compounds), where works may include:

- Debris and rubbish lying on the ground;
- Soil which may be contaminated or unsuitable for re-use without treatment;
- Green waste from vegetation clearance and small quantities of unsorted non-hazardous waste like timber; and
- Surplus material from site preparation (including any remediation) and excavation works.

Waste arising from these activities is anticipated to be minimal based on professional judgement. Final waste arising will be subject to contractor design.

Waste from construction activities is likely to be generated from surplus site-won materials (from excavations of natural and made ground) which cannot be used for construction, materials imported to site that is a by-product of construction works (packaging materials) and materials brought to site which are not used for their original purpose.

Without mitigation measures, the generation of waste may result in significant adverse effects as it can cause direct effects on waste infrastructure locally, through temporary occupation of sites or indirect effects if disposal in landfill is required, which could result in a permanent reduction in landfill void capacity.

It is possible that, if appropriate mitigation measures are applied, the potential effect could be reduced. Any hazardous waste identified during the excavation works will be dealt with in accordance with the SWMP.

Based on the design information, the English Onshore Scheme is unlikely to generate large quantities of excavated materials that will require disposal off-site.

16.6.3.2.2 Assessment of potential impacts: generation and management of waste for underground DC cable route

Construction activities for underground DC cable route is not likely to generate large quantities of waste. Excavated material are unlikely to be generated as all of the material excavated in establishing the working width/cable trench is likely to be reused in reinstatement works. The aggregate used for construction of the haul roads would be removed from site and would be likely to be re-used or recycled. The waste arising is likely to be from:

- Vegetation clearance,
- Offcuts from cables; and
- Cable reels.

The materials (aggregates and/or stones) required for temporary construction (e.g. haul roads and construction compounds) is likely to be re-used by other projects after the completion of the construction works. However, as a worst-case scenario, based on professional judgement, it is assumed that 10% of the aggregates (31,804 m^3) used for the temporary construction works is identified to be landfilled. This will reduce the non-hazardous landfill void space of North Yorkshire by 0.18% (**Table 16-11**).

16.6.3.2.3 Assessment of potential impacts: generation and management of waste for converter station

Topsoil removed from the converter station area is likely to be re-used for landscaping purposes, however this is subject to testing and analysis of the material excavated. It is estimated that 35,000 m^3 of topsoil will be stripped from the converter station site. The quantity of topsoil that can be re-used on site for landscaping works is unknown, but it can be assumed that topsoil identified for disposal can be offered to nearby schemes/farmers for utilisation and thus avoid it being landfilled. However, to assess the worst-case scenario, all topsoil is assumed to be landfilled.

Information is unavailable regarding the volume of non-hazardous waste that may be generated by the construction works at the converter station. Based on a worst-case scenario, it is assumed that some excavated material will generate non-hazardous waste and would require disposal to landfill. In the absence of information of the volume of non-hazardous waste that is likely to arise from this English Onshore Scheme, guidance provided by DMRB and professional judgement has been utilised to estimate the arising of waste, if deposited in landfill that can lead to 1% reduction in the non-hazardous landfill void space and given in **Table 16-18**.

Table 16-18: Calculated 1% non hazadous landfill void space.

Landfill type	East Riding of Yorkshire (m^3)		Selby (m^3)		North Yorkshire (m^3)	
	Remaining landfill void space, m^3	Volume of waste required to cause 1% reduction in void space, m^3	Remaining landfill void space, m^3	Volume of waste required to cause 1% reduction in void space, m^3	Remaining landfill void space, m^3	Volume of waste required to cause 1% reduction in void space, m^3
Non-Hazardous	2,631,389	26,313	14,823,111	148,231	17,584,583	175,845

It can be seen from **Table 16-18**, that to cause a 1% reduction in the non-hazardous landfill space, 26,000 m^3 of waste will require to be generated by the construction work for the converter station in the EROY region and 148,230 m^3 of waste will require to be generated by the construction work for the converter station in the Selby region.

The converter station will be constructed in the Selby region. Initial design information indicates that there is no requirement for a substantial cut volume to build up the platform of the Converter station and would require importing of approximately 212,007 m^3 of aggregate or aggregate based products. As a worst-case scenario, based on professional judgement, it is highly unlikely that 148,230 m^3 of the aggregate, equating to 69.9% of the imported material to the converter station site, would be unsuitable for use and thus would be identified for disposal to non-hazardous landfill, causing 1% reduction in Selby's non-hazardous landfill void space.

As a worst-case scenario, it is assumed that all topsoil stripped from the converter station area (35,000 m^3) would be landfilled, occupying 0.23% of Selby's non-hazardous landfill void space and 0.2% of the North Yorkshire's non-hazardous landfill void space.

16.6.3.3 Impact assessment of material resource use during construction

16.6.3.3.1 Overview

Using design information and professional judgement, the material resources likely to be needed for the construction phase of the underground DC cable route and the converter station have been forecast. These forecasts are likely to be refined and subject to change as the English Onshore Scheme design is confirmed by the appointed Contractor. For that reason, the forecasts have been made on a reasonable worst-case scenario basis, informed by professional judgement and experience on similar projects.

16.6.3.3.2 Impact Assessment of material resource use: underground DC cable route

As can be seen from **Table 16-16**, the majority of the raw material required for the construction works of the underground DC cable route are aggregate and aggregate-based materials. The materials used for the construction of the temporary construction works (primarily haul roads and construction compounds) is likely to be recycled or/and secondary aggregates.

Estimated quantification for manufactured elements such as cables will be determined at detailed design stage and will require importing to site. Assessment for manufactured materials has not been undertaken as they will be subject to their own separate consenting and regulatory controls at the place of production.

Table 16-19 provides the detailed assessment of the effects of materials used during the construction of underground DC cable route.

Table 16-19: Detailed assessment of material resources use, for underground DC cable route

Scheme activity	Potential impacts associated with material resource use	Description of the effects
Temporary construction works	Impacts on the availability of material resources, and subsequent impacts on the demand for key construction materials.	Materials are imported on-site for the construction of the underground DC cable route as site won material may not be adequate for all temporary construction works. The implementation of the mitigation measures as outlined in Section 16.6.2 will ensure the efficient use of material resources on-site. All excavated site-won material will be re-used on site for reinstatement works. It has been assumed that the construction works for the underground DC cable route is likely to achieve more than 70-99% overall material recovery/recycling of non-hazardous C&D waste (to substitute use of primary materials, if used as fill material). Aggregates required to be imported to site are likely to comprise re-used/recycled content in line with the relevant regional percentage target where technically appropriate and economically feasible. This is classed as minor adverse impact based on **Table 16-3**. Effects would be direct, permanent and adverse. **Effect category: Minor** **Significance: Not Significant**
	Depletion of non-renewable (primary) resources.	Large quantities of aggregate (318,043 m^3) will be required for the temporary construction works for the underground DC cable route. The baseline has indicated an adequate supply of aggregates within the North Yorkshire region, therefore where further supplies of aggregates are required the majority of these can be procured within the region (**Table 16-6**). It is assumed that the aggregates and stones supply will consist of recycled and secondary aggregates, in line with regional adopted Plan target (31%) where technically appropriate and economically feasible. Therefore, there is potential that ≥69% of the aggregates is sourced from non- renewable (primary) resources. Professional judgement and guidance from IEMA have been used to assess the large quantities of aggregates required for the temporary construction works of the underground DC cable route and would require 3.97% of primary aggregate supply available within North Yorkshire. This is classed as Minor adverse impact based on **Table 16-3**. Effects would be direct, permanent and adverse. **Effect category: Minor** **Significance: Not Significant**

Source: Based on information provided in Table 16-3 and professional judgement.

16.6.3.3.3 Impact Assessment of material resource use: converter station

As can be seen from **Table 16-17**, the majority of the raw material required for the construction works of the converter station are aggregate and aggregate-based materials.

In terms of the forecast levels of fill required for the construction of the converter station, the total excavated earthworks volume is dependent on the detailed foundations design which will determine the earthworks requirements. Topsoil will be stripped around the converter station area and it is expected that all excavated material will be re-used on site and will require an additional 212,007 m^3 of aggregate or aggregate-based material to be imported for fill in the converter station site.

Backfill to structures will be imported to the converter station site only, as material meeting the required specification is assumed not be won from the site. The volumes of imported material will depend greatly on the characteristics of the existing ground and the Contractor's detailed design but are anticipated to be approximately 212,007 m^3 (**Table 16-17**) equating to 2.65% by volume of the regional (North Yorkshire) supply of aggregates. Baseline data indicates that the future provisions of sand and gravel and crushed rock supply are at levels above the minimum requirements.

Some quantities of aggregate and aggregate based material will be required to establish access and site establishment. Based on professional judgement, it is, unlikely to require ≤1% of the regional aggregate supply available within North Yorkshire.

Estimated quantification for elements such as steel for converter station structures will be determined at detailed design stage and will require importing to site.

Table 16-20 provides the detailed assessment of the effects of materials used during construction of the English Onshore Scheme.

Table 16-20: Detailed assessment of material resources use for converter station

Scheme activity	Potential impacts associated with material resource use	Description of the effects
Access and site establishment	Impacts on the availability of material resources, and subsequent impacts on the demand for key construction materials.	Some quantity of aggregates would be required for construction of permanent access road. The implementation of the mitigation measures as outlined in Section 16.6.2 will ensure the efficient use of material resources on-site. Professional judgement and guidance from IEMA have been used to assess the quantities of aggregates required and would require ≤1% of aggregate supply available within North Yorkshire. This is classed as Negligible adverse impact based on **Table 16-3**. Effects would be direct, permanent and adverse. **Effect category: Negligible** **Significance: Not Significant**
	Depletion of non-renewable (primary) resources.	
Permanent construction of converter station	Impacts on the availability of material resources, and subsequent impacts on the demand for key construction materials.	Materials are imported to the converter station site for permanent construction works as, site won material may not be adequate for all construction works. The implementation of the mitigation measures as outlined in Section 16.6.2 will ensure the efficient use of material resources on-site. Some excavated topsoil will be re-used on site for landscaping purposes. It has been assumed that the construction works for the converter station is likely to achieve more than 70-99% overall material recovery/recycling of non-hazardous C&D waste (to substitute use of primary materials, if used as fill material). Aggregates required to be imported to site are likely to comprise re-used/recycled content in line with the relevant regional percentage target where technically appropriate and economically feasible. This is classed as minor adverse impact based on **Table 16-3**. Effects would be direct, permanent and adverse. **Effect category: Minor** **Significance: Not Significant**
	Depletion of non-renewable (primary) resources.	Majority of materials used for the construction of the converter station comprise of primary material as the construction of the converter station is unlikely to use construction materials all sourced from recycled/secondary materials resulting in depletion of

		non-renewable resources. Large quantities of aggregate (212,007 m^3) will be required. The baseline has indicated an adequate supply of aggregates within the North Yorkshire region, therefore where further supplies of aggregates are required the majority of these can be procured within the region (**Table 16-6**). It is assumed that the aggregates and stones supply will consist of recycled and secondary aggregates, in line with regional adopted Plan target (31%) where technically appropriate and economically feasible. Therefore, there is potential that ≥69% of the aggregates is sourced from non- renewable (primary) resources. Professional judgement and guidance from IEMA have been used to assess the large quantities of aggregates required and the construction of the converter station would require 2.65% of aggregate supply available within North Yorkshire. This is classed as Minor adverse impact based on **Table 16-3**. Effects would be direct, permanent and adverse. **Effect category: Minor** **Significance: Not Significant**

Source: Based on information provided in Table 16-3 and professional judgement.

16.6.3.4 Impact assessment of waste generated during construction

16.6.3.4.1 Overview

The amount of waste that will arise during the construction phase of the of the underground DC cable route and the converter station will be subject to change as the construction phase progresses and, on the efficiency achieved by the appointed Contractor. Forecasts have been made for this assessment on a reasonable worst-case scenario basis, informed by experience on similar projects.

Some waste may be generated during the access creation and site establishment activities and has not been quantified. It is not anticipated that significant quantities of hazardous waste will arise from the access creation and site establishment activities.

16.6.3.4.2 Impact Assessment of waste generated: underground DC cable route

Quantification of organic waste that would require removal while construction of the underground trench for laying DC cables has not been undertaken at this stage. It is assumed that all vegetation waste will be composted.

Estimated quantification for waste arising from elements such as cables will be determined at detailed design stage and is likely to be recycled and not landfilled and hence scoped out of the assessment.

Table 16-21: Detailed assessment of generation and management of waste for construction works of the underground DC cable route

Scheme activity	Potential impacts associated with generation and management of waste	Description of the effects
Access and site establishment	Production of non-hazardous (organic and topsoil) waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	The implementation of the mitigation measures as outlined in section 16.6.2 would reduce the effects through the re-use and recycling of waste. It is unlikely that vegetation waste will be landfilled. No reduction or alteration in the capacity of waste infrastructure within the region is anticipated. As a worst-case scenario, it is assumed that some waste will be generated and will be landfilled to non-hazardous landfill. This is classed as Minor adverse impact based on **Table 16-3** **Effect category: Minor** **Significance: Not Significant**

Construction works for underground DC cable route	Production of non-hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity	The implementation of the mitigation measures as outlined in 16.6.2 will likely reduce the effects through the re-use and recycling of waste. However, the worst-case scenario would be that this non-hazardous waste requires disposal to landfill. If it is assumed that all waste arising from temporary construction works (10% of aggregate used) identified for disposal is landfilled, it will occupy 0.18% of the regional non-hazardous landfill space and this is classed as Minor adverse impact based on **Table 16-3.** Waste arising from cables etc. will be treated by available waste infrastructure. The baseline has identified that the waste infrastructure in North East of England and Yorkshire and Humber has sufficient capacity to accommodate non-hazardous waste from the construction of the converter station without compromising the integrity of the receiving infrastructure within the region, if disposal to landfill is required. Effects would be direct, permanent and adverse. **Effect category: Minor** **Significance: Not Significant**
	Production and treatment of hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	It is unlikely that hazardous waste would be generated. Therefore, no reduction or alteration in the capacity of waste infrastructure at the regional scale. However, the baseline has identified that the waste infrastructure in North Yorkshire does not have capacity to accommodate hazardous waste without compromising the integrity of the receiving infrastructure within the region, if disposal to landfill is required. If hazardous waste is generated and requires to be landfilled, it would be landfilled within the Humber and Yorkshire region. This is classed as Minor adverse impact based on **Table 16-3**. **Effect category: Minor** **Significance: Not Significant**
	Production of inert waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	No inert waste has been identified, therefore, no reduction or alteration in the capacity of waste infrastructure at the regional scale is expected and this is classed as neutral impact based on **Table 16-3**. The baseline has identified that the waste infrastructure has sufficient capacity to accommodate inert waste without compromising the integrity of the receiving infrastructure within the region, if disposal to landfill is required. If inert waste is generated and requires to be landfilled, it would be classed as Minor adverse impact based on **Table 16-3**. **Effect category: Minor** **Significance: Not Significant**

Source: Based on information provided in Table 16-3 and professional judgement

16.6.3.4.3 Impact Assessment of waste generated: converter station

As stated in section 16.6.3.2, in the absence of information available regarding the likely waste arising from the construction of the converter station, as a worst-case scenario, it is assumed that all topsoil excavated from converter station will require landfilling, equating to 0.23% of Selby's non-hazardous landfill space and 0.2% of North Yorkshire's non-hazardous landfill void space.

Due to the absence of information for waste arising, based on professional judgement and initial design information, it is estimated that non-hazardous waste arising in the converter station site will be less than 148,230 m^3 (section 16.6.3.2).

Hazardous waste is unlikely to be generated by the construction of the converter station. If hazardous material and contaminated excavated materials arise during construction, the SWMP procedures for handling and storing of this waste will be followed to ensure cross-contamination does not occur. In addition, soil investigation will be undertaken to determine whether the soils can be re-used directly on-site, will require treatment prior to re-use on-site, or will require disposal off-site.

East Riding of Yorkshire, Selby and North Yorkshire region do not have capacity to accommodate hazardous waste and thus if hazardous waste is generated, it would be required to be landfilled in the North East of England or Yorkshire and Humber region (**Table 16-11**).

Table 16-22 provides the detailed assessment of the effects of generation and management of waste during construction of the English Onshore Scheme.

Table 16-22: Detailed assessment of generation and management of waste for construction of the converter station

Scheme activity	Potential impacts associated with generation and management of waste	Description of the effects
Access and site establishment	Production of non-hazardous (organic and topsoil) waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	The implementation of the mitigation measures as outlined in section 16.6.2 would reduce the effects through the re-use and recycling of waste. It is unlikely that vegetation waste will be landfilled. No reduction or alteration in the capacity of waste infrastructure within the region is anticipated. As a worst-case scenario, it is assumed that some waste will be generated and will be landfilled to non-hazardous landfill and reduce the Selby non-hazardous landfill void space by 0.2%. This is classed as Minor adverse impact based on **Table 16-3** **Effect category: Minor** **Significance: Not Significant**
Construction of the converter station	Production of non-hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity	The implementation of the mitigation measures as outlined in 16.6.2 will likely reduce the effects through the re-use and recycling of waste. However, the worst-case scenario would be that this non-hazardous waste requires disposal to landfill. If it is assumed that all excavated non-hazardous waste and waste arising from importing of materials identified for disposal is landfilled, it will occupy ≤1% of the regional landfill space and this is classed as Minor adverse impact based on **Table 16-3.** Metal waste arising (steel, cables etc.) will be treated by available waste infrastructure. The baseline has identified that the waste infrastructure in North East of England and Yorkshire and Humber has sufficient capacity to accommodate non-hazardous waste from the construction of the converter station without compromising the integrity of the receiving infrastructure within the region, if disposal to landfill is required. Effects would be direct, permanent and adverse. **Effect category: Minor** **Significance: Not Significant**

	Production and treatment of hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	It is unlikely that hazardous waste would be generated. Therefore, no reduction or alteration in the capacity of waste infrastructure at the regional scale. However, the baseline has identified that the waste infrastructure in North Yorkshire does not have capacity to accommodate hazardous waste without compromising the integrity of the receiving infrastructure within the region, if disposal to landfill is required. If hazardous waste is generated and requires to be landfilled, it would be landfilled within the Humber and Yorkshire region. This is classed as Minor adverse impact based on **Table 16-3**. **Effect category: Minor** **Significance: Not Significant**
	Production of inert waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.	No inert waste has been identified, therefore, no reduction or alteration in the capacity of waste infrastructure at the regional scale is expected and this is classed as neutral impact based on **Table 16-3**. The baseline has identified that the waste infrastructure has sufficient capacity to accommodate inert waste without compromising the integrity of the receiving infrastructure within the region, if disposal to landfill is required. If inert waste is generated and requires to be landfilled, it would be classed as Minor adverse impact based on **Table 16-3**. **Effect category: Minor Adverse** **Significance: Not Significant**

Source: Based on information provided in Table 16-3 and professional judgement.

16.6.1 Assessment of Potential Impacts: Operational Phase

Use of material resources and generation and management of waste for the operational phase has been scoped out of the assessment.

16.7 Project Specific Mitigation

16.7.1 Construction Phase Mitigation

Good working practices have been adopted to mitigate impacts. No project-specific mitigation will be applied beyond the measures identified in the mitigation by design section.

16.7.2 Operational Phase Mitigation

Use of material resources and generation and management of waste for the operational phase has been scoped out of the assessment. Operational practices will be implemented as per the waste hierarchy to help with the management of waste and minimise waste generation.

16.8 Residual Effects

Due to the embedding of design mitigation and construction mitigation into the English Onshore Scheme the residual effects of the English Onshore Scheme remain unchanged from the potential effects outlined in Section 6 above, and no project-specific mitigation has been identified as necessary.

16.8.1 Assessment of Residual Effects: Construction Phase

Resources will be required for the construction of the English Onshore Scheme. Based on the assumptions stated in Section 0, the English Onshore Scheme has the potential to recover the majority of its site won material and utilise recycled and/or secondary aggregate (RSA) in line with the regional target Plan resulting in less impact on the use of natural resources. Large quantities of aggregate will

be required for temporary construction works (bellmouths, haul roads and site compounds) and it is likely that RSA will be utilised for such construction activities. Some excavated material may not be suitable for re-use on-site.

Following the implementation of appropriate mitigation plans as outlined within the assessment that includes a SMP and SWMP to be developed by the appointed Contractor, the residual effect for use of material resources and generation and management of waste will remain the same as assessed in the detailed assessments (**Table 16-20** and **Table 16-22**). **Table 16-23** outlines the residual effects assessed as likely to occur as a result of the English Onshore Scheme.

Table 16-23: Residual effects for material resource use and generation and management of waste during construction

Scheme Activity	Receptor Description	Value/ Sensitivity	Description of Potential Impact	Magnitude	Significance	Mitigation Measure(s)	Residual Effect	
							Magnitude	Significance
Underground DC Cable Route	Mineral and quarries sites	Adverse	Impacts on the availability of material resources, and subsequent impacts on the demand for key construction materials.	Minor Adverse	Not Significant	Soil Management Plan	Minor Adverse	Not Significant
			Depletion of non-renewable (primary) resources	Minor Adverse	Not Significant	Soil Management Plan	Minor Adverse	Not Significant
Converter Station	Mineral and quarries sites	Adverse	Impacts on the availability of material resources, and subsequent impacts on the demand for key construction materials for access and site establishment.	Adverse Negligible	Not Significant	Soil Management Plan	Adverse Negligible	Not Significant
			Depletion of non-renewable (primary) resources for access and site establishment.	Adverse Negligible	Not Significant	Soil Management Plan	Adverse Negligible	Not Significant
			Impacts on the availability of material resources, and subsequent impacts on the demand for key construction materials.	Minor Adverse	Not Significant	Soil Management Plan	Minor Adverse	Not Significant
			Depletion of non-renewable (primary) resources	Minor Adverse	Not Significant	Soil Management Plan	Minor Adverse	Not Significant
Underground DC Cable Route	Waste infrastructures and landfill sites	Adverse	Production of non-hazardous (organic and topsoil) waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity for access and site establishment.	Minor Adverse	Not Significant	Site Waste Management Plan	Minor Adverse	Not Significant
			Production of non-hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity for construction activities.	Minor Adverse	Not Significant	Site Waste Management Plan	Minor Adverse	Not Significant
			Production of hazardous waste resulting in the temporary occupation of waste management	Minor Adverse	Not Significant	Site Waste Management Plan	Minor Adverse	Not Significant

Scheme Activity	Receptor Description	Value/ Sensitivity	Description of Potential Impact	Magnitude	Significance	Mitigation Measure(s)	Residual Effect	
							Magnitude	Significance
			infrastructure capacity or permanent reduction to landfill capacity for construction activities.					
			Production of inert waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity for construction activities.	Minor Adverse	Not Significant	Site Waste Management Plan	Minor Adverse	Not Significant
Converter Station	Waste infrastructures and landfill sites	Adverse	Production of non-hazardous (organic and topsoil) waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity for access and site establishment	Minor Adverse	Not Significant	Site Waste Management Plan	Minor Adverse	Not Significant
			Production of non-hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity for construction activities	Minor Adverse	Not Significant	Site Waste Management Plan	Minor Adverse	Not Significant
			Production of hazardous waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity for construction activities	Minor Adverse	Not Significant	Site Waste Management Plan	Minor Adverse	Not Significant
			Production of inert waste resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity for construction activities.	Minor Adverse	Not Significant	Site Waste Management Plan	Minor Adverse	Not Significant

16.8.2 Assessment of Residual Effects: Operational Phase

Use of material resources and generation and management of waste for the operational phase has been scoped out of the assessment. Operational practices will be implemented as per the waste hierarchy to help with the management of waste and minimise waste generation.

16.9 Combined and Cumulative Effects

As outlined in **Chapter 1: Introduction**, the English Onshore Scheme forms one element of the wider Project, along with the Marine Scheme and Scottish Onshore Scheme. Due to the distances of separation between the English Onshore Scheme and the Scottish Onshore Scheme, intra-Project cumulative effects to individual receptors will not occur, for example no property or ecological site would experience effects from both the English Onshore Scheme and Scottish Onshore Scheme.

Similarly, although there is a slight overlap of the English Onshore Scheme and Marine Scheme in the intertidal area between Mean High Water Springs and Mean Low Water Springs (as shown in **Figure 1-2**), as the HVDC cable reaches the landfall site (part of the English Onshore Scheme) via HDD, the works which could give rise to environmental impacts are physically separated and hence no significant intra-Project cumulative effects to individual receptors are predicted to occur.

For receptors such as agricultural land or protected species where the resource or population could be considered as a whole across the entire Project, it is considered that there would be no significant cumulative effects due to the mitigation measures proposed by each element of the Project.

The separate EIA/EA reports produced for the English Onshore Scheme, Marine Scheme and Scottish Onshore Scheme provide an environmental assessment of each topic area for which potential environmental effects could arise from that element. Once the assessment of the other elements of the Project is complete, a Bridging Document will be prepared which summarises the main interactions of these three individual environmental assessments. The Bridging Document will be made available as soon as it is available, but as highlighted above, there are no significant in-combination impacts between the English Onshore Scheme, Marine Scheme or Scottish Onshore Scheme. This section, therefore, provides an assessment of the combined and cumulative effects on material use and waste generation relating to the English Onshore Scheme only. For full definitions of terminology and details of other projects considered in this assessment see **Chapter 17: Cumulative Assessment**.

16.9.1 Assessment of Combined Effects

The English Onshore Scheme has been assessed in its entirety, so there are no combined effects. Material and waste will need to be transported to and from site, respectively.

16.9.2 Assessment of Cumulative Effects

During the creation of accesses, site establishment and construction activities, 26 non-English Onshore Schemes have the potential to result in cumulative effects with the proposed English Onshore Scheme. These are:

- Hornsea Project Four Offshore Windfarm (EN010098);
- Drax BECCS (pre-application);
- Dogger Bank Creyke (EN10021);
- Thorpe Marsh Gas Pipeline;
- Continental link multipurpose interconnector;
- Dogger bank south offshore wind farms;
- Humber Low Carbon Pipelines by National Grid Carbon;
- Gransmoor Quarry and remediation works (20/00300/CME);
- South Shore holiday Village (20/03551/PLF);
- Carnaby Farm Shop, Moore Lane (20/02567/PLF);

- Land south-east of Wansford (21/00216/STPLF);
- Warren House Farm (18/02787/PLF);
- Land north of Houghton Close (20/02502/REM);
- Yoke Gate Farm, Holme Road, Spaldington (19/04161/STPLF);
- Horn Hill Poultry Farm Middleton Road Kilnwick East Riding of Yorkshire (21/01568/PLF);
- Land West Of 2 Wood Lane Cottages Station Road Howden East Riding Of Yorkshire (17/03759/STPLF);
- Field At Grid Reference 504139 456454 Back Lane Skerne East Riding Of Yorkshire (20/01962/STPLF);
- Land Off New Road Drax Selby North Yorkshire (2020/1357/FULM);
- Demolition of Drax Power Ltd Flue Gas Desulphurisation (FGD) plant and associated restoration works, Selby (2020/0994/FUL);
- Construction of battery energy storage system to provide energy balancing services to the National Grid including bund and landscaping (2021/0601/FUL);
- Development of ground-mounted solar farm including associated infrastructure (2021/0788/EIA);
- Retail unit at Land Adjacent Duddings Farm High Street Carlton Goole East Yorkshire (2019/1020/FUL);
- Development of a battery storage facility, associated infrastructure, access and grid connection at Land Off Hales Lane Drax Selby North Yorkshire (2021/1089/FULM);
- Erection of 45 dwellings at Street Record Selby Road Camblesforth North Yorkshire (2021/0512/FULM);
- Development of existing horticultural facility at P3P Energy Management Brigg Lane Camblesforth Selby North Yorkshire (2021/0120/FULM); and
- Erection of Five wind turbines at Newlands Farm Turnham Lane Cliffe Selby North Yorkshire (2021/0348/SCN).

Due to the proximity of these other schemes to the English Onshore Scheme the potential to cause construction related cumulative impacts have been identified. These will however be dependent upon the timescales of their construction and overlap with the construction programme of the English Onshore Scheme.

It could be assumed that some of these other schemes will have been constructed prior to start of the English Onshore Scheme in Q4 2024. However, due to the unknown proposed dates for these schemes to commence they remain a consideration in this assessment.

The sensitive receptors which could potentially experience cumulative effects as a result of the use of material resources include quarries and other sources of minerals, and other finite raw material resources. The potential cumulative impacts these receptors may experience include:

- Depletion of non-renewable (primary) resources;
- Impact on the national or local demand for materials; and
- Sterilisation of larger areas of land from future mineral extraction either above or below ground.

The sensitive receptors which could potentially experience cumulative effects as a result of waste generation and management, are landfills and other waste management infrastructure. The potential cumulative impacts these receptors may experience include:

- Utilisation and depletion of the remaining local landfill capacity; and
- Occupation of available waste management infrastructure capacity.

There is the potential that most of the short-listed non-English Onshore Schemes could have an adverse impact on the capacity of receiving waste management facilities within the two study areas. It is anticipated that the non-English Onshore Schemes would all generate waste and require materials

during construction phase and that such waste would require treatment and/or disposal at third party waste management facilities.

It should be noted that most of the above listed non-English Onshore Schemes would require primary materials such as aggregate during the construction of each of the schemes whereas the English Onshore Scheme would utilise the majority of the site won materials for filling. The English Onshore Scheme would require significant quantities of primary materials such as aggregate or aggregate based materials including cement, concrete etc.

The use of materials and the waste anticipated to be generated by these short-listed English Onshore Schemes or the timescales over which waste would be generated and materials required are not known at this time. Thus, it has not been possible to accurately quantify the cumulative effects due to the lack of waste and materials arisings information. However, it is recognised that the cumulative effects are likely to be greater than the individual effects, although good practice would seek to re-use material on the development sites where possible to reduce waste arisings as far as practicable. This will be indicated in the planning applications for some of the non-English Onshore Schemes. Based on professional judgement it is likely that the Scheme will generate some non-hazardous waste that may require to be landfilled. As the baseline study indicated that the North Yorkshire, North East of England and Yorkshire and Humber regions have sufficient landfill void capacities, it is likely that the cumulative effects is estimated to be Minor Adverse for waste.

Mitigation measures will be implemented as part of the construction of the English Onshore Scheme. The non-English Onshore Schemes themselves will also be subject to the National Planning Policy Framework and will require mitigation and control measures to be adopted during their construction through management plans to reduce impacts to the environment, including dust generation and potential mobilisation of contaminants. The detailed design for the English Onshore Scheme will also take into consideration any impacts and recommended mitigation measures associated with material resource use and waste generation during construction of the English Onshore Scheme.

16.10 Summary of Assessment

The baseline study for material resources indicated that there is sufficient supply of primary raw materials such as steel, aggregates, and cementitious products available for the English Onshore Scheme. The English Onshore Scheme lies within the Yorkshire and the Humber region, approximately 60 km south of the southern border of the North East region. The scale and location of permitted reserves, together with the associated site production capacities, across the region indicates that there are sufficient reserves to ensure the future provisions of sand and gravel and crushed rock supply at levels above the minimum requirements.

The baseline study for generation and management of waste indicates that there are sufficient waste infrastructure in North Yorkshire region to accommodate waste from the region. There are 19 historical landfill sites along the underground DC cable route and converter station. The baseline study for remaining landfill capacity indicates that the North Yorkshire region has capacity to accommodate inert and non-hazardous waste.

The receptors for the use of material resources are raw minerals and quarries site and the adverse impacts on these receptors include:

- Impacts on the availability of material resources, and subsequent impacts on the demand for key construction materials as materials will need to be imported on-site as the English Onshore Scheme is unlikely to recover/re-use all the site won material and site-won materials may not be adequate for the construction; and
- Depletion of non-renewable resources as majority of materials needed on the project comprise primary material as the English Onshore Scheme is unlikely to be able to source all requirement materials from recycled/secondary materials.

It is assumed that the construction works of the underground DC cable route and the converter station will re-use the majority of the site won material. It has also been assumed that the aggregates and stones supply will consist of recycled and secondary aggregates, in line with regional adopted Plan target, where technically appropriate and economically feasible. The effect of the magnitude impact

from the construction of the underground DC cable route and the converter station on the raw minerals and quarries site will be Not Significant.

The receptors for the generation and management of waste are the waste infrastructure and landfill sites. The adverse impacts on these receptors include:

- Production of waste (inert/hazardous/non-hazardous) resulting in the temporary occupation of waste management infrastructure capacity or permanent reduction to landfill capacity.

The construction works of the underground DC cable route and the converter station is not expected to generate inert waste. Hazardous waste, if generated, will not be of significant quantity and would be landfilled within the same regional landfills of Humber and Yorkshire region. The English Onshore Scheme will generate some non-hazardous waste, however if landfilled this will occupy less than 1% of the non-hazardous landfill capacity of the North Yorkshire region. Hence, the impacts on the generation and management of waste will be **Minor adverse** and **Not Significant**.

The following mitigation plans will be implemented for material resource use and generation and management of waste:

- The waste hierarchy will be implemented throughout the construction to minimise disposal and maximise re-use and recycling of waste arisings;
- A SWMP will be produced by the appointed Contractor to support the English Onshore Scheme application; and
- A SMP will be produced by the appointed Contractor, which will set out how excavated soils are to be managed. As a minimum this will include the measures included in the outline SMP included in **Appendix 12B**.

The residual significant effects after implementation of the relevant mitigation, for use of material resources and generation and management of waste will remain the same as stated in the assessment and is given below:

- Material resource use: **Minor Adverse** and **Not Significant;** and
- Generation and management of waste: **Minor Adverse** and **Not Significant.**

16.11 References

Ref 16-1 HM Government (2021) Environment Act 2021. Available at: Environment Act 2021 (legislation.gov.uk).

Ref 16-2 European Union (2008). Waste Framework Directive (2008/98/EC). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098

Ref 16-3 HM Government (1990). The Environmental Protection Act (1990). Available at: https://www.legislation.gov.uk/ukpga/1990/43/contents

Ref 16-4 HM Government (2005). The Hazardous Waste (England and Wales) Regulations (2005). Available at: https://www.legislation.gov.uk/uksi/2005/894/contents/made

Ref 16-5 HM Government (2011). The Waste (England and Wales) Regulations (2011). Available at: https://www.legislation.gov.uk/uksi/2011/988/contents/made

Ref 16-6 HM Government (2016). The Environmental Permitting (England and Wales). Available at: https://www.legislation.gov.uk/uksi/2016/1154/contents/made

Ref 16-7 HM Government (2020) The Waste and Environmental Permitting etc (Legislative Functions and Amendment etc) (EU Exit) Regulations 2020. Available at: https://www.legislation.gov.uk/ukdsi/2020/9780348213294/contents

Ref 16-8 HM Government (2020) Waste (Circular Economy) (Amendment) Regulations 2020. Available at: https://www.legislation.gov.uk/uksi/2020/904/contents/made

Ref 16-9 HM Government (2014). National Planning Policy for Waste (2014). Available at: https://www.gov.uk/government/publications/national-planning-policy-for-waste

Ref 16-10 HM Government (2019). National Planning Policy Framework (2019) Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

Ref 16-11 HM Government (2018). 'A Green Future: Our 25 Year Plan to Improve the Environment'. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

Ref 16-12 HM Government (2018). 'Our Waste, Our Resources: A Strategy for England'. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf

Ref 16-13 HM Government (2020). The Waste Management Plan for England (2020). Available at: https://www.gov.uk/government/consultations/waste-management-plan-for-england

Ref 16-14 HM Government (2013). The Waste Prevention Programme for England (2013). Available at: https://www.gov.uk/government/publications/waste-prevention-programme-for-england

Ref 16-15 Department for Energy and Climate Change (2011). Overarching National Policy Statement for Energy (EN-1). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf

Ref 16-16 Department for Energy and Climate Change (2011). National Policy Statement for Electricity Networks Infrastructure (EN-5). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/37050/1942-national-policy-statement-electricity-networks.pdf

Ref 16-17 Kingston-Upon-Hull City Council & East Riding of Yorkshire Council (2004). Joint Waste Local Plan for Kingston-Upon-Hull and the East Riding of Yorkshire. Available at: https://www.eastriding.gov.uk/EasySiteWeb/GatewayLink.aspx?alId=98194

Ref 16-18 Selby District Council (2021). New Local Plan. Available at: https://www.selby.gov.uk/localplan

Ref 16-19 North Yorkshire County Council (2009); Saved policies: waste local plan post-May 2009. Available at: https://www.northyorks.gov.uk/local-plan-waste

Ref 16-20 DEFRA (2009). Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/716510/pb13298-code-of-practice-090910.pdf

Ref 16-21 CL:AIRE (2011). Definition of Waste: Development Industry Code of Practice, v2. Available at: https://www.claire.co.uk/projects-and-initiatives/dow-cop

Ref 16-22 Highways England (2019). Design Manual for Roads and Bridges (DMRB) LA110 'Sustainability and Environment Appraisal - Material Assets and Waste. Available at: https://www.thenbs.com/PublicationIndex/documents/details?Pub=HA&DocID=327435

Ref 16-23 Highways England (2020). Design Manual for Roads and Bridges (DMRB) LA104 Revision 1 Environmental assessment and monitoring (formerly HA 205/08, HD 48/08, IAN 125/15, and IAN 133/10). Available at: https://www.thenbs.com/PublicationIndex/documents/details?Pub=HA&DocID=330238

Ref 16-24 Department of Trade and Industry (2004). Site Waste Management Plans – Guidance for Construction Contractors and Clients Voluntary Code of Practice. Available at: https://www.thenbs.com/PublicationIndex/documents/details?Pub=DTI&DocId=267008

Ref 16-25 Institute of Environmental Management and Assessment (2020); IEMA guide to: Materials and Waste in Environmental Impact Assessment. Available at: https://www.iema.net/resources/news/2020/03/30/iema-launches-guide-to-materials-and-waste-in-environmental-impact-assessment

Ref 16-26 Mineral Products Association (2020). Profile of the UK Mineral Products Industry. Available at: https://www.mineralproducts.org/Homepage-Promotions/Profile-of-the-UK-Mineral-Products-Industry.aspx

Ref 16-27 Mineral Products Association (2018). The Minerals Products Association: Annual Cementitious 2001 onwards dataset. Available at: https://cement.mineralproducts.org/downloads/industry_statistics.php

Ref 16-28 MAKE UK (2019). UK Steel Statistics Guide 2019. Available at: https://www.makeuk.org/insights/publications/uk-steel-key-statistics-guide-2019

Ref 16-29 Yorkshire and Humber Aggregates Working Party / UrbanVision (2017). Yorkshire and Humber Aggregate Working Party Annual Monitoring Report 2017, incorporating data for January – December 2016. Available at: https://www.kirklees.gov.uk/beta/planning-policy/pdf/examination/city-region-evidence/CR28-Yorkshire-and-Humber-Aggregate-Working-Party-Annual-Monitoring-Report-2017.pdf

Ref 16-30 DEFRA (2020). ENV23 – Statistics on Waste. Available at: https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management

Ref 16-31 Environment Agency (2021). Remaining Landfill Capacity dataset. Available at: https://data.gov.uk/dataset/237825cb-dc10-4c53-8446-1bcd35614c12/remaining-landfill-capacity

Ref 16-32 Environment Agency (2021). Waste Data Interrogator 2020. Available at: 2020 Waste Data Interrogator - data.gov.uk

Ref 16-33 Environment Agency (2021). Public Registers. Available at: https://environment.data.gov.uk/public-register/view/index