

Humber Low Carbon Pipelines

Preliminary Environmental Information Report
Volume II Chapter 16 Waste and Materials
October 2022

nationalgrid

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16. Waste and Materials

16.1 Introduction

16.1.1 This Chapter reports the results of the preliminary assessment of the potential impacts and effects of the Project on Waste and Materials and describes:

- Relevant, legislation, policy and guidance;
- Engagement undertaken to date;
- The proposed assessment methodology and associated significance criteria;
- Preliminary baseline conditions;
- Potential impacts of construction, operation, and decommissioning;
- Potential design, mitigation, and enhancement measures;
- Summary of the preliminary assessment of potential significant effects; and
- Next steps.

16.1.2 This assessment considers the simultaneous construction of a dual pipeline system (one for carbon dioxide and one for hydrogen), as well as the associated Above Ground Installations (AGIs). The majority of the carbon dioxide pipeline will be up to 600 mm (24") nominal diameter and the hydrogen pipeline will be up to 900 mm (36") nominal diameter. This is referred to as the Base Case in this Preliminary Environmental Information Report (PEIR). Also under consideration is the possibility of deploying a larger carbon dioxide pipeline, with a diameter up to 750 mm (30") (with the hydrogen pipeline remaining the same diameter as within the Base Case). This is referred to in this PEIR as Sensitivity 1. Further details regarding the Base Case and Sensitivity 1, as well as the diameter and capacity of the pipelines are provided in Sections 2.3 and 2.4 of Chapter 2: Project Description (Volume II). This chapter assesses the impacts and effects associated with the Base Case. It is anticipated that the types of potential impacts for the Base Case and Sensitivity 1 will be the same, although the magnitude of impacts may differ. A full assessment of Sensitivity 1 will be undertaken and recorded within the Environmental Statement (ES) if the larger carbon dioxide pipeline diameter is taken forward into the Development Control Order (DCO) application.

16.1.3 This Chapter is intended to be read as part of the wider PEIR.

16.2 Legislation, policy and guidance

16.2.1 A summary of the international, national, and local legislation, planning policy and guidance relevant to the Waste and Materials assessment for the Project is set out below.

Legislation

Acts of Parliament:

Environmental Protection Act 1990 (Ref. 16.1)

- 16.2.2 The Environmental Protection Act 1990 deals with issues relating to waste on land, defining all aspects of waste management. The Act provides the definition of waste, establishes the statutory duty of care, lays out waste offences, sets out the duties of the relevant authorities and establishes the Waste Management Licensing System.

Environment Act 2021 (Ref. 16.2)

- 16.2.3 The Environment Act 2021 makes provision to improve and protect the natural environment, as well as make provision for waste and resource efficiency. This is achieved through the setting of targets, plans, and policies, as well as through the production of statements and reports on environmental protection.

EU Directives:

Revised EU Waste Framework Directive 2008/98/EC (Ref. 16.3)

- 16.2.4 Directive 2008/98/EC establishes a legal framework for treating waste in the European Union and is designed to protect the environment and human health by emphasising the need for proper waste management, recovery and recycling practices to reduce pressure on finite resources and improve their use. The Directive is transposed by the Waste (England and Wales) Regulations 2011 (see below).

England and Wales Regulations:

Landfill of Waste (Landfill Directive) 1999/31/EC (Ref. 16.4)

- 16.2.5 The Landfill Directive regulates waste management of landfill sites. Its aim is to reduce reliance on landfill as a disposal option and seeks to decrease the environmental impacts of landfills and reduce the risk to human health while imposing a consistent minimum standard for landfills. The Landfill Directive is implemented by the Environmental Permitting (England and Wales) Regulations 2010 (see below).

The Waste (England and Wales) Regulations 2011 (Ref. 16.5)

- 16.2.6 The Regulations transpose the Waste Framework Directive 2008/98/EC in England and Wales and require the Secretary of State (and Welsh Ministers) to establish waste prevention programmes and waste management plans that apply the waste hierarchy¹.

Environmental Permitting (England and Wales) Regulations 2016 (Ref. 16.6)

- 16.2.7 The regulations establish a system of environmental permitting for a wide range of potentially polluting activities, e.g. waste operations for recovering or disposing of waste, and also implement a number of European Directives including the Landfill Directive.

¹ The Waste Hierarchy comprises the principles of waste prevention / preparing for re-use / recycling / other recovery / disposal, in order of desirability. Further details are available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69403/pb13530-waste-hierarchy-guidance.pdf

Policy

National Policy Statement EN-1 (2011) (Ref. 16.7) and Draft National Policy Statement EN-1 (2021) (Ref. 16.8)

- 16.2.8 The National Policy Statements (adopted and draft) EN-1 both state that an applicant seeking consent for an energy infrastructure proposal should, as part of its assessment, consider the arrangements for managing any waste produced and assess the impact of the waste arising from the development proposal on the capacity of waste management facilities.

National Policy Statement EN-4 (2011) (Ref. 16.9) and Draft National Policy Statement EN-4 (2021) (Ref. 16.10)

- 16.2.9 National Policy Statement EN-4 (both adopted and draft) provide the basis for decisions by the Infrastructure Planning Commission (IPC) on applications submitted for gas supply infrastructure and gas and oil pipelines. This NPS is concerned with impacts and other matters which are specific to gas supply infrastructure and oil and gas pipelines or where, although the impact is generic and covered in EN-1, there are further specific considerations arising from the technologies covered here. There are no additional specific considerations relating to Waste and Materials in EN-4.

East Riding of Yorkshire – Local Plan (2016) (Ref. 16.11)

- 16.2.10 This plan sets out the long-term strategy to guide development across East Riding and includes policies used to make decisions on planning applications. The policy relevant to minerals is Policy EC6: Protecting mineral resources.
- 16.2.11 Policy EC6 identifies Mineral Safeguarding Areas (MSA) for sand and gravel, crushed rock, limestone, industrial chalk, clay, and silica sand. Non-minerals development proposals will be opposed in these unless they can be shown to demonstrate criteria outlined in Policy EC6.

East Riding of Yorkshire (and Kingston upon Hull) – Joint Minerals Local Plan (2019) (Ref. 16.12)

- 16.2.12 This plan addresses minerals-specific issues and aims to reconcile the objectives of safeguarding the environment and amenity of local communities whilst also meeting the need for both minerals and non-minerals development, in accordance with Policy EC6 of the Local Plan. The key policy is AGG10: Safeguarding of Mineral Infrastructure and Facilities.
- 16.2.13 Policy AGG10 safeguards existing minerals extraction and processing facilities and infrastructure from non-mineral development and states the conditions which must be met for a non-mineral development to proceed within a safeguarded area.
- 16.2.14 The East Riding of Yorkshire (and Kingston upon Hull) Joint Waste Local Plan has been reviewed and does not include any policies which restrict non-waste development via safeguarding of current or future (allocated) waste sites.

North Lincolnshire Council – Core Strategy Adopted (2011) (Ref. 16.13)

- 16.2.15 The currently adopted plan sets out the long term spatial planning framework for the development of North Lincolnshire by providing strategic policies and guidance to deliver the vision for the area. This includes strategies to protect the natural and built

environment, with a focus on sustainable development. Relevant policies within the Core Strategy include:

- CS18: Sustainable resource use and climate change;
- CS20: Sustainable waste management; and
- CS21: Minerals.

- 16.2.16 CS18 states that the council will actively promote developments that utilise natural resources as efficiently and sustainably as possible. This includes the minimisation of consumption and extraction of mineral resources through reuse and recycling of materials in construction. Notably included is the stated support for new technology and development for carbon capture and the best available clean and efficient energy technology to help reduce carbon dioxide emissions.
- 16.2.17 CS20 includes detail on how the council will promote sustainable waste management. Relevant inclusions are the requirement of Site Waste Management Plans (SWMP) for future major developments to minimise waste, as well as the requirement for facilities for waste minimisation, re-use, and composting in association with the construction of new development.
- 16.2.18 CS21 safeguards mineral resources in North Lincolnshire from development that would prejudice future mineral extraction. Also outlined are the requirements for which a non-minerals development must satisfactorily demonstrate within a Mineral Resource Assessment to be permitted within a safeguarded area.

North Lincolnshire Council – Local Plan (2020) (Ref. 16.14)

- 16.2.19 This emerging plan sets out objectives for the future development of the area, which includes environmental safeguarding. The policies highlighted within the plan are used to guide decisions and investment on development and regeneration. Relevant policies within the plan are:
- MIN2: Mineral Safeguarding;
 - WAS1: Waste Management Principles; and
 - WAS6: Waste Management in Development.
- 16.2.20 MIN2 safeguards nationally and locally important mineral resources (which include chalk, Lincolnshire Limestone, sand and gravel, silica sand, and brick clay), mineral sites, and minerals infrastructure from sterilisation by non-minerals development. Criteria which non-minerals developments must demonstrate in the form of a Minerals Resource Assessment in order to proceed within a safeguarded area is also outlined.
- 16.2.21 Policy WAS1 reiterates the principle that development which encourages and supports the minimisation of waste production, and the re-use and recovery of waste materials will normally be supported. The policy also outlines waste management principles that proposals for waste management facilities are encouraged to abide by. WAS6 ensures that proposals for new development support the efficient use and recovery of resources throughout its lifetime, including giving due consideration to sustainable waste management. Elements which new developments should include are also outlined.

Lincolnshire County Council (including West Lindsey District Council) – Core Strategy and Development Management Policies (2021) (Ref. 16.15)

- 16.2.22 The Core Strategy and Development Management Policies document includes the objectives, spatial strategy and development policies for minerals and waste development in Lincolnshire. Relevant policies are:
- Policy M11: Safeguarding of Mineral Resources; and
 - Policy M12: Safeguarding of Existing Mineral Sites and Associated Mineral Infrastructure.
- 16.2.23 Policy M11 safeguards mineral resources, including sand and gravel, blown sand, and limestone from permanent sterilisation by non-minerals development. The Policy states that proposals for non-minerals development within safeguarded areas must be accompanied by a Minerals Resource Assessment and outlines the criteria which must be met for the development to proceed within this area. Policy M12 safeguards existing mineral sites and associated infrastructure from development that would unnecessarily sterilise the sites or jeopardise their use and provides the criteria for where exemptions may apply.

North Yorkshire County Council / North York Moors National Park Authority / City of York Council (including Selby District Council) Minerals and Waste Joint Plan (2022) (Ref. 16.16)

- 16.2.24 This plan sets out guidance to developers, local communities, and other interested parties on where and when minerals and waste development may be expected over the next approximately 15 years, as well as how it will be managed. Relevant policies comprise:
- Policy W01 – Moving waste up the waste hierarchy;
 - Policy S01 – Safeguarded surface mineral resources;
 - Policy S02 – Developments proposed within Safeguarded Surface Mineral Resource areas;
 - Policy S04 – Waste management facility safeguarding; and
 - Policy S06 – Minerals ancillary infrastructure safeguarding
- 16.2.25 Policy W01 sets out the principles for which development proposals will be supported and enables a degree of restraint to be placed on other forms of development which do not allow waste to be dealt with at higher levels of the waste hierarchy. Policies S01 and S02 outline the County's requirements for protecting surface mineral resources which are safeguarded from non-mineral development in order to preserve them for the future, and the conditions which must be met by non-mineral development to proceed on a safeguarded surface mineral resource.
- 16.2.26 Policies S04 and S06 safeguard waste management facilities and ancillary mineral infrastructure from development which would prevent or restrict their future or ongoing use, and also set out the conditions which must be met for such development to proceed.

Guidance

The Institute of Environmental Management and Assessment (IEMA) (2020) Guide to Materials and Waste in Environmental Impact Assessment (Ref 16.17)

- 16.2.27 The IEMA (2020) Guide to Materials and Waste in Environmental Impact Assessment (Ref. 16.17) will be used to assess potential impacts from the Project for Materials and Waste. The guidance document aims to provide initial guidance on the key terms, concepts, and considerations for assessing the environmental impacts and effects of materials and waste, as part of the Environmental Impact Assessment (EIA) process. It defines standard terms used within Materials and Waste assessments as part of EIAs, as well as outlines the principles that govern the assessment process. Assessment methodologies are included to determine the significance of any environmental effect for materials and waste.
- 16.2.28 The methodologies detailed in this document will be followed as part of the Materials and Waste assessment.

The British Geological Survey (2011) Mineral Safeguarding in England: Good Practice Advice (Ref. 16.18)

- 16.2.29 The British Geological Survey (2011) Mineral Safeguarding in England: Good Practice Advice guidance document (Ref. 16.18) will be used to understand National Planning Policy Framework (NPPF) MPS1, which outlines the national approach to planning for minerals, and the need to safeguard and conserve mineral resources.
- 16.2.30 The aim of the document is to provide guidance on the implementation of national policy with respect to the safeguarding and prior extraction of minerals. It outlines that process followed in safeguarding mineral resources, which can aid developers in submitting proposals for non-minerals development within a Mineral Safeguarding Area.

The Mineral Products Association & The Planning Officers' Society (2019) Minerals Safeguarding Practice Guidance (Ref. 16.19)

- 16.2.31 Annex 1 of the Mineral Products Association & The Planning Officers' Society (2019) Minerals Safeguarding Practice Guidance (Ref. 16.19) will be used to deduce the components required as part of the Minerals Resource Assessment.
- 16.2.32 The guidance aims to provide practical advice on the implementation of policy for safeguarding mineral resources and infrastructure through plan-making and development management. Annex 1 details the necessary components that are required as part of a Minerals Resource Assessment, which must accompany development proposals within Mineral Safeguarding Areas.

16.3 EIA Scoping Opinion and engagement

- 16.3.1 A summary of the EIA Scoping Opinion from the Planning Inspectorate (PINS) and responses to this EIA Scoping Opinion are outlined below. Furthermore, all relevant engagement undertaken to date is outlined in this Section.

Response to the EIA Scoping Opinion

- 16.3.2 An EIA Scoping Opinion (Appendix 1.2: EIA Scoping Opinion (Volume III)) was received by the Applicant from PINS on 20 May 2022. Table 16.1 lists the comments that PINS and consultation bodies made in relation to Waste and Materials and shows how the Applicant is responding to these.

Table 16.1: Summary of EIA Scoping Opinion in relation to Waste and Materials

Section reference	Applicant's proposed matter	Inspectorate's / consultation bodies comments	Response
3.12.1 Table 15.4	Other materials – construction phase	<p><i>The Applicant proposes to scope out this matter on the basis that other materials (not including excavated arisings) to be utilised for construction are not anticipated to impact on regional or national supplies and therefore no likely significant effects are expected.</i></p> <p><i>The Inspectorate is content with this approach.</i></p>	<p>Agreement noted.</p> <p>This matter is not assessed further within the PEIR and will not be assessed within the ES.</p>
3.12.2 Table 15.4	Materials – operational phase	<p><i>The Applicant proposes to scope out this matter on the basis that limited quantities of materials are anticipated to be required and used during routine maintenance and repair.</i></p> <p><i>The Inspectorate is satisfied that significant effects are therefore not expected and agrees that this matter can be scoped out of further assessment.</i></p>	<p>Agreement noted.</p> <p>This matter is not assessed further within the PEIR and will not be assessed within the ES.</p>
3.12.3 Table 15.4	Materials – decommissioning phase	<p><i>The Applicant proposes to scope out this matter on the basis that limited quantities of materials are anticipated to be used during decommissioning and not on a scale that will result in significant effects.</i></p> <p><i>The Inspectorate is satisfied that significant effects are therefore not expected and agrees that this matter can be scoped out of further assessment.</i></p>	<p>Agreement noted.</p> <p>This matter is not assessed further within the PEIR and will not be assessed within the ES.</p>
3.12.4 Table 15.4	Waste – operational phase	<p><i>The Applicant proposes to scope out this matter on the basis that limited quantities of waste are anticipated to be generated during operation and not on a scale that will result in significant effects.</i></p>	<p>Agreement noted.</p>

Section reference	Applicant's proposed matter	Inspectorate's / consultation bodies comments	Response
		<i>The Inspectorate agrees that, on this basis, significant effects are unlikely and is therefore content that this matter can be scoped out of further assessment.</i>	This matter is not assessed further within the PEIR and will not be assessed within the ES.
3.12.5 Table 15.4	Waste – decommissioning phase	<p><i>The Applicant proposes to scope out this matter on the basis that waste generation will be limited to removal of AGIs (for example concrete, metals, asphalts), the majority of which can be reused, recycled or recovered. In addition, the pipelines will be left in situ and no waste will be generated from their decommissioning.</i></p> <p><i>The Inspectorate agrees that, on this basis, the potential for significant effects would be unlikely and is therefore content that this matter can be scoped out of further assessment.</i></p>	<p>Agreement noted.</p> <p>This matter is not assessed further within the PEIR and will not be assessed within the ES.</p>
Scoping Report Section 15	The proposed assessment approach was outlined. Matters proposed to be scoped in / out of further assessment were also summarised.	<i>North Yorkshire County Council commented that the recently adopted Minerals and Waste Joint Plan has not been taken into account and should be as the scheme covers a small area of Selby where mineral safeguarding is in place.</i>	The PEIR and ES will take in to account the Minerals and Waste Joint Plan (2022) (see Paragraph 16.2.24) and assess the impact on the safeguarded mineral deposits in the form of a Minerals Resource Assessment.

Engagement undertaken to date

16.3.3 Table 16.2 provides a summary of the engagement undertaken to inform the assessment to date.

Table 16.2: Summary of engagement undertaken

Consultee	Date and method of engagement	Summary of issues raised	Response
North Yorkshire County Council (with Selby District Council copied in)	03 March 2022 (via email)	A letter was sent for comment – this included a summary of the proposed methodology and a list of matters to be scoped in or out of the materials and waste assessment summarised in Table 15.4 of the EIA Scoping Report.	No comments received.
East Riding of Yorkshire Council			Responded 06 March 2022, agreeing with scoping and methodology for Materials and Waste.
North Lincolnshire Council			No comments received.
Lincolnshire County Council			No comments received.
North Yorkshire County Council	10 August 2022 / 2 September 2022 (via email)	Digital mapping layers of individual mineral safeguarding areas were requested, for addition to the project Geographic Information System (GIS).	Receipt of email noted 23 September 2022. No comments yet received.
East Riding of Yorkshire Council		An email was sent providing details of the proposed scope and methodology for preparation of the Mineral Resource Assessment. The email provided background geological information and our intended approach to assessing the	No comments received.
North Lincolnshire Council			Responded on 05 September 2022. It was highlighted that whilst the Local Plan is emerging, the Core Strategy should be referred to as the adopted policies surrounding mineral safeguarding.

Consultee	Date and method of engagement	Summary of issues raised	Response
		potential for mineral resource sterilisation in Mineral Safeguarding Areas in the light of relevant planning policies.	However, the Policies Map within the Local Plan should be used to direct where MSAs are located. It was also highlighted that the Proposed Order Limits intersect an allocated mineral site, and an active mineral site.
Lincolnshire County Council			Responded 14 September 2022. Confirmation that the scope of the mineral resource assessment is acceptable was given. It was highlighted that consideration should be given to the allocated mineral site intersected by the Proposed Order Limits, as well as the surrounding land. Additional guidance was also provided on relevant policies and the production of the mineral resource assessment.
North Yorkshire County Council		An email was sent to request additional information (if available) and seek agreement of our approach to identification of current and allocated waste sites.	Receipt of email noted 23 September 2022. No comments yet received.
East Riding of Yorkshire Council	2 September 2022 (via email)	Confirmation re. treatment of infilled drains as Made Ground rather than landfill was also sought. Additional data on remaining landfill capacity and current (baseline) material usage volumes, e.g. aggregate, concrete, timber, asphalt, within each County was also requested.	Responded 03 September 2022. Confirmation that infilled drains are to be treated as Made Ground was received. It was stated that there was no awareness of any recent data relating to waste, landfill capacity and materials availability outside of what had already been utilised. It was confirmed that the Proposed Order Limits do not interact with any allocated / active sites.

Consultee	Date and method of engagement	Summary of issues raised	Response
North Lincolnshire Council			No comments received.
Lincolnshire County Council			Responded 14 September 2022. Confirmation that infilled drains can be treated as infill rather than landfill was given. Data sources surrounding waste, landfill capacity, and materials availability which may be relevant were provided. It was highlighted that the Proposed Order Limits intersect an allocated mineral site.

16.4 Assessment methodology and significance criteria

Study Area

- 16.4.1 The Study Areas that are applicable to the Project (as defined in IEMA's 2020 Guide to Materials and Waste in Environmental Impact Assessment (Ref. 16.17), (herein referred to as the 'IEMA Guidance') are:
- The development Study Area – the extent of works within the Proposed Order Limits, including areas required for construction of the pipelines infrastructure, AGI and temporary access during construction including site compounds, working platforms and other enabling activities; and
 - The expansive Study Area extends to the availability of construction materials and the capacity of waste management facilities within the UK and the regions where the Project is located. The expansive Study Area encompasses the local authority areas of North Yorkshire County Council (NYCC), Selby District Council (SDC), East Riding of Yorkshire Council (EroY), North Lincolnshire County Council (NLCC), West Lincolnshire District Council (WLDC) and Lincolnshire County Council (LCC).
- 16.4.2 The Proposed Order Limits intercept a number of Mineral Safeguarding Areas throughout the local authority areas of NYCC, EroY, NLCC, and LCC. Much of this land is agricultural, and as such, the majority of potential mineral resources are currently unsterilised. The Proposed Order Limit intercepts a number of known waste sites or former landfills, plus numerous infilled drains. These are shown in Figure 9.8 (Volume IV) and listed below:
- In Section 1 – Drax to Keadby:
 - An active landfill operated by Drax Power Limited adjacent north of Drax Power Station, with >25,000 tonne capacity (excluding inert waste);
 - An inert historic landfill adjacent north of Drax Power Station;
 - An inert/industrial historic landfill associated with Keadby Power Station adjacent northwest of Keadby Power Station;
 - A historic landfill associated with Keadby Power Station 850m west of Keadby Power Station;
 - A historic landfill (Pulverised Fuel Ash (PFA) settlement lagoon) associated with Keadby Power Station 650 m west of Keadby Power Station;
 - A historic landfill (comprising inert, industrial, and liquid sludge waste) associated with John Brown Engineering 730 m west of Keadby Power Station;
 - A historic landfill (comprising inert, commercial, and household waste) associated with Keadby Power Station 740 m west of Keadby Power Station;
 - A historic landfill (comprising inert, industrial, commercial, and household waste) associated with Transtore Industries 900 m west of Keadby Power Station; and
 - A historic landfill (comprising industrial, commercial, household, and special waste) associated with Keadby Power Station 1,100 m west of Keadby Power Station.

- In Section 3 Scunthorpe to Killingholme:
 - A historical landfill (comprising inert, industrial, commercial, and household waste) associated with Humberside County Council 1,600 m east of Messingham;
 - A historical landfill (comprising inert, industrial, commercial, and household waste) associated with Humberside County Council 1,650 m east of Messingham;
 - An inert waste recycling facility (Kettleby Quarry Plant Site) 1,450 m west of Bigby;
 - A historical landfill (comprising industrial waste) 750 m southeast of Kirmington;
 - An active/recent (license expired) landfill site operated by Quibell & Son Holdings Ltd accepting non-biodegradable wastes 2,350 m southwest of Thorngumbald;
 - A historical landfill (comprising inert waste) associated with W J Johnson Esquire 2,300 m southwest of Thorngumbald; and
 - A historical landfill (comprising inert waste) associated with Humberside Excavations Limited 100 m southwest of Hedon.

Baseline data collection

Desk study

16.4.3 Baseline conditions of the Project were established during a desk study using the following sources:

- British Geological Society (BGS) Onshore Geoindex (Ref. 16.20);
- East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan 2016 – 2033, Adopted 2019 (Ref. 16.12);
- East Riding of Yorkshire Local Plan, Adopted 2016 (Ref. 16.11);
- North Lincolnshire Council – Core Strategy Adopted (2011) (Ref. 16.13);
- North Lincolnshire Council Local Plan (2020 – 2038), October 2021 (Ref. 16.14);
- Lincolnshire County Council Core Strategy and Development Management Policies June 2016 (Ref. 16.15);
- North Yorkshire County Council, North York Moors National Park, City of York Council Minerals and Waste Joint Plan, 2022 (Ref. 16.16);
- Environment Agency 2020 Waste Data Interrogator – Wastes Received, published January 2022 (Ref. 16.21);
- Environment Agency 2020 Waste Data Interrogator – Wastes Removed, published January 2022 (Ref. 16.22);
- Environment Agency 2020 Waste Summary Tables, published January 2022 (Ref. 16.23); and
- Yorkshire and Humber Aggregates Working Party – Annual Monitoring Report 2018 (Ref. 16.24).

Site visits and surveys

- 16.4.4 The information required to complete a robust assessment of waste and materials can be obtained via a desk-based approach. Resultantly, no site visits or surveys have been or will be undertaken.

Impact assessment methodology

- 16.4.5 A standard EIA methodology is set out in Chapter 3: EIA Methodology (Volume II). The IEMA guidance on Materials and Waste (Ref. 16.17) will be used to assess potential impacts from the Project for Materials and Waste, using Method W1 (Void capacity). The assessment will be qualitative, in accordance with the IEMA guidance and identify the following:

- Type and volume of materials proposed for use during the Project;
- Potential percentage recycled content of materials used;
- Type and volume of waste to be generated; and
- Details of proposed reuse, recovery, recycling, or disposal of waste generated.

- 16.4.6 Impacts and effects will be evaluated against data for the regional and national materials markets, where information is available. The likely types and estimated quantities of material resources required (including site arisings generated) for the scoped in phases of the Project will be assessed against regional, and if required, national availability. The assessment will also consider the reuse of excavated material in the Project construction.

- 16.4.7 The likely types and estimated quantities of waste to be generated by the Project will be assessed and the impacts reviewed against regional (or national) void capacity.

Significance criteria

- 16.4.8 For the purposes of the assessment, IEMA Method W1 (void capacity) will be used when assessing the magnitude of waste. Table 16.3 contains the materials and waste magnitude criteria, whilst Table 16.4 contains the criteria for assessing sensitivity (Ref. 16.17). The outputs of comparing sensitivity against magnitude will be assessed against the effect thresholds (Table 16.5) and significance of effects matrix (Table 16.6) provided within the IEMA Guide (Ref. 16.17).

Table 16.3: Materials and Waste Magnitude Criteria replicated from the IEMA 2020 Guide (Ref. 16.17)

Magnitude	Materials Criteria Assessment of the Project is made by determining whether the consumption of...	Inert and non-hazardous waste criteria Percentage depletion of remaining landfill void capacity	Hazardous waste criteria The percentage depletion of remaining landfill void capacity
<i>No change</i>	<i>...no materials required</i>	<i>Zero waste generation and disposal from the development.</i>	<i>Zero waste generated and disposal from the development.</i>
<i>Negligible</i>	<i>...no individual material type is equal to or greater than 1% by volume of the regional* baseline availability</i>	<i>Waste generated by the development will reduce the regional* landfill void capacity baseline^{\$} by <1%.</i>	<i>Waste generated by the development will reduce the national landfill void capacity baseline^{\$} by <0.1%.</i>
<i>Minor</i>	<i>...one or more materials is between 1-5% by volume of the regional* baseline availability; and/or the development has the potential to adversely and substantially[#] impact access to one or more allocated mineral sites (in their entirety), placing their future at risk.</i>	<i>Waste generated by the development will reduce the regional* landfill void capacity baseline^{\$} by 1-5%.</i>	<i>Waste generated by the development will reduce national landfill void capacity baseline^{\$} by 0.1-0.5%.</i>
<i>Moderate</i>	<i>...one or more materials is between 6-10% by volume of the regional* baseline availability; and/or one allocated mineral site is substantially[#] sterilised by the development rendering it inaccessible for future use.</i>	<i>Waste generated by the development will reduce the regional* landfill void capacity baseline^{\$} by 6-10%.</i>	<i>Waste generated by the development will reduce the national landfill void capacity baseline^{\$} by 0.5-1%.</i>
<i>Major</i>	<i>...one or more materials is >10% by volume of the regional* baseline availability; and/or more than one allocated mineral site is substantially[#] sterilised by the development rendering it inaccessible for future use.</i>	<i>Waste generated by the development will reduce the regional* landfill void capacity baseline^{\$} by >10%.</i>	<i>Waste generated by the development will reduce national landfill void capacity baseline^{\$} by >1%.</i>

Magnitude	Materials Criteria Assessment of the Project is made by determining whether the consumption of...	Inert and non-hazardous waste criteria Percentage depletion of remaining landfill void capacity	Hazardous waste criteria The percentage depletion of remaining landfill void capacity
Notes	* or where justified, national. # justified using professional judgement, based on the scale and nature of the allocated mineral site being assessed. \$ forecast as the worst-case scenario, during a defined Construction Phase.		

Table 16.4: Materials and Waste Sensitivity Criteria replicated from the IEMA 2020 Guide (Ref. 16.17)

Sensitivity	Materials Criteria Key materials required for the construction of the Project...	Inert and non-hazardous waste criteria Landfill void capacity is expected to ...	Hazardous waste criteria Landfill void capacity is expected to ...
Negligible	<p>...are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock; and/or</p> <p>...are available comprising a very high proportion of sustainable features and benefits compared to industry standard materials*</p>	<p>...remain unchanged, or is expected to increase through a committed change in capacity.</p>	<p>...remain unchanged, or is expected to increase through a committed change in capacity.</p>
Low	<p>...are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock; and/or</p>	<p>...reduce minimally: by <1% as a result of wastes forecast.</p>	<p>...reduce minimally: by <0.1% as a result of wastes forecast.</p>

Sensitivity	Materials Criteria Key materials required for the construction of the Project...	Inert and non-hazardous waste criteria Landfill void capacity is expected to ...	Hazardous waste criteria Landfill void capacity is expected to ...
	<i>...are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.</i>		
Medium	<i>...are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock; and/or ...are available comprising some sustainable features and benefits compared to industry standard materials.</i>	<i>...reduce notably: by 1-5% as a result of wastes forecast.</i>	<i>...reduce noticeably: by 0.1-0.5% as a result of wastes forecast.</i>
High	<i>...are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock; and/or ...comprise little or no sustainable features and benefits compared to industry standard materials.</i>	<i>...reduce considerably: by 6-10% as a result of wastes forecast.</i>	<i>...reduce considerably: by 0.1-1% as a result of wastes forecast.</i>
Very High	<i>...are known to be insufficient in terms of production, supply and/or stock; and/or</i>	<i>...reduce very considerably (by >10%); and during construction or operation; is already known to be unavailable; or, would require new capacity or</i>	<i>...reduce very considerably (by >1%); end during construction or operation; is already known to be unavailable; or, would require new capacity or</i>

Sensitivity	Materials Criteria Key materials required for the construction of the Project...	Inert and non-hazardous waste criteria Landfill void capacity is expected to ...	Hazardous waste criteria Landfill void capacity is expected to ...
	<i>...comprise no sustainable features and benefits compared to industry-standard materials.</i>	<i>infrastructure to be put in place to meet forecast demand.</i>	<i>infrastructure to be put in place to meet forecast demand.</i>
Notes	<i>* Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.</i>		

Table 16.5: Materials and waste effect thresholds replicated from the IEMA 2020 Guide (Ref. 16.17)

		Magnitude of Impact				
		No change	Negligible	Minor	Moderate	Major
Sensitivity (or value) of receptor	Very high	Neutral	Slight	Moderate or large	Large or very large	Very large
	High	Neutral	Slight	Slight or moderate	Moderate or large	Large or very large
	Medium	Neutral	Neutral or slight	Slight	Moderate	Moderate or large
	Low	Neutral	Neutral or slight	Neutral or slight	Slight	Slight or moderate
	Negligible	Neutral	Neutral	Neutral or slight	Neutral or slight	Slight

Table 16.6: Materials and waste significance criteria replicated from the IEMA 2020 Guide (Ref. 16.17)

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

Assumptions and limitations

- 16.4.9 To ensure transparency within the EIA process, the following limitations and assumptions have been identified
- The most recent publicly available data has been used to collate baseline information (2019 – 2021 unless otherwise stated), and assessments made are based on information available at the time (any lag between time of writing and publishing date will be stated);
 - Some waste facility operators may not release data for reasons of commercial confidentiality. The resulting data gaps may reduce the value of information that is publicly available;
 - It is assumed that materials required for current land uses within the Proposed Order Limits is minimal in comparison to the regional and national availability of materials resources;
 - It is assumed that material excavated during construction would be reused on site, wherever practicable; and
 - There is no published or formalised methodology for assessing the impact upon waste treatment site capacity. Professional judgement has, therefore, been applied.

16.5 Baseline conditions

- 16.5.1 Baseline material consumption and waste disposal is described in this Chapter for the current land use. Regional and national information/data is provided in the context of which environmental assessment will be undertaken.
- 16.5.2 The most recent sources of information have been utilised to collate data for material resource availability, landfill capacity and waste recovery. Baseline data obtained and displayed in this chapter was obtained through desk study and acquired from publicly available data sources.

Existing baseline: Materials

Materials currently required

- 16.5.3 The land use within the Proposed Order Limits is predominantly agricultural, with some residential, commercial and industrial areas. Other assets include highways, rail, canals and existing pipeline infrastructure, along with environmental attributes such as rivers, wooded and agricultural areas.
- 16.5.4 Materials required for current land uses are anticipated to comprise aggregate, concrete, steel, timber and asphalt for use in general maintenance and repair works. Regional material volume data for current requirements is not readily available; additional information on material availability / usage has been requested as part of the consultation process (see Table 16.2). These requirements are assumed to be minimal when compared with the regional and national availability of resources.

Availability of Materials

- 16.5.5 A summary of the availability of the primary construction materials in the Yorkshire and Humber region is provided in Table 16.7, as well as for the UK. These materials are thought relevant to the bulk construction materials required as part of the Project. Although technological products are excluded from this table, a proportionate context for the assessment of impact and significant effects resulting from materials consumption can be undertaken. Both within the Yorkshire and Humber region, as well as within the UK as a whole, the availability of primary construction materials remains resilient.

Table 16.7: Construction materials availability in the Yorkshire and Humber region and the UK

Material Type	Yorkshire and the Humber	UK
Sand & Gravel * (Ref. 16.25)	2.3 Mt	Refer to primary aggregate
Permitted crushed rock * (Ref. 16.25)	11.5 Mt	
Primary aggregate * (Ref. 16.25)	13.8 Mt	198.8 Mt
Concrete blocks (2020) # (Ref. 16.26)	1.958 Mm ² (North)	5.295 Mm ² (GB)
Recycled and secondary aggregate + *	13.17 Mt/annum (2016)	71 Mt
Ready mix concrete * (Ref. 16.25)	1.2 Mm ³	24.7 Mm ³
Steel + (Ref. 16.27)	No data	7.2 Mt
Asphalt * (Ref. 16.25)	2.1 Mt	27.4 Mt
# Stocks + Production * Sales Data availability: 2019 unless otherwise stated GB: Great Britain (England, Wales, Scotland) figures used where UK (including Northern Ireland) figures are unavailable.		

- 16.5.6 From the data available, the Yorkshire and Humber region appears to be in line with the average availability of most primary construction materials when compared with other UK regions. Sales of sand and gravel however appear to be below the UK average,

although on assessment of the most recent Aggregate Working Party reports (Ref. 16.24) for the counties intersected by the Proposed Order Limits, sand and gravel landbanks were stocked above the seven-year supply required as part of the NPPF (Table 16.8). Similarly, crushed rock landbanks were stocked well above the ten-year supply required as part of the NPPF. Comparatively, stocks of concrete blocks for the North are the highest within Great Britain.

Table 16.8: Aggregate landbank information from the Council areas intersected by the Proposed Order Limits within the Yorkshire and Humber region plus Central Lincolnshire

Council Body	Sand & Gravel Landbank (years)	Crushed Rock Landbank (years)
East Riding of Yorkshire Council (Ref. 16.12)	8.5	50.7
North Lincolnshire County Council (Ref. 16.13)	Insufficient data	32.5
Lincolnshire County Council (Ref. 16.14)	9.55	21.73
North Yorkshire County Council (Ref. 16.16)	11.4	28.6

Mineral Safeguarding Areas

- 16.5.7 Mineral resources are essential to the production of primary aggregates essential to the UK construction and civil engineering sections. Mineral deposits, including sand and gravel, limestone, chalk, and brick clay are safeguarded by Mineral Planning Authorities (County Councils) to ensure a sufficient aggregate supply is maintained.
- 16.5.8 The Proposed Order Limits of the Project intersect several Mineral Safeguarding Areas, including:
- Brick clay deposits surrounding Drax, as well as sand & gravel deposits east of Drax safeguarded by North Yorkshire County Council (Ref. 16.16);
 - Sand and gravel and brick clay deposits to the west and south of Goole, as well as sand and gravel deposits south of Hedon safeguarded by East Riding of Yorkshire County Council (Ref. 16.12);
 - Sand and gravel, limestone, chalk, and brick clay deposits throughout the entirety of the Proposed Order Limits within North Lincolnshire, safeguarded by North Lincolnshire County Council. This includes allocated site MIN 6-16 (land at Holme Lane) and active site MIN 6-13 (land North of Brigg Road) (Ref. 16.13, 16.14); and
 - A safeguarded allocated site for sand & gravel deposits east of Brigg (MS 07/08 – Extension to Kettleby Quarry), safeguarded by Central Lincolnshire County Council (Ref. 16.15).
- 16.5.9 The Proposed Order Limits is potentially underlain by a small area of peat, recorded in the BGS Onshore Geoindex superficial deposits map at 1:50,000 scale to the south of Kettleby (Ref. 16.20, 16.28). This will be reviewed during the environmental

assessment. However, there are no known active peat extractions within the Proposed Order Limits.

Local Policy Context: Material Resources

16.5.10 Local policies relevant to material resources are summarised in Section 16.2.

Existing Baseline: Site Arisings and Waste Recovery

Site arisings currently generated

16.5.11 Current arisings within the Proposed Order Limits are anticipated to be predominantly from earthworks and vegetation due to agricultural activities, and surplus materials from existing infrastructure repairs and maintenance. No specific data is available for waste or material arisings generated within the Proposed Order Limits, however given the current development levels in the region the generation of site arisings within the Proposed Order Limits is not anticipated to be significant.

Waste Transfer, Recovery, and Recycling

16.5.12 Table 16.9 displays data obtained from DEFRA (Ref. 16.29) on the recovery rate for non-hazardous construction and demolition wastes in England². A recovery rate exceeding 90% has been maintained from 2010 and exceeds the target of 70% (by weight) set to the UK within the EU Waste Framework Directive (Ref. 16.3)³.

Table 16.9: Non-hazardous Construction and Demolition waste recovery in England and the UK

Year	Generation (Mt)		Recovery (Mt)		Recovery rate (%)	
	UK	England	UK	England	UK	England
2010	59.2	53.6	53.1	49.4	89.7	92.2
2011	60.2	54.9	55.0	50.8	91.4	92.5
2012	55.8	50.5	50.8	46.4	91.1	92.0
2013	57.1	51.7	52.0	47.6	91.2	92.0
2014	61.5	55.9	56.3	51.7	91.5	92.4
2015	63.8	57.7	58.0	53.3	91.0	92.3
2016	66.2	59.6	60.0	55.0	90.7	92.1
2017	68.7	62.2	62.9	57.9	91.5	93.1
2018	67.8	61.4	62.6	57.5	92.3	93.8
2019	No data	62.3	No data	58.3	No data	93.6

² Construction and Demolition wastes as per European Waste Catalogue, Chapter 17

³ This target excludes naturally occurring materials (specifically category 17 05 04 in the list of waste defined as non-hazardous soils and stones)

Year	Generation (Mt)		Recovery (Mt)		Recovery rate (%)	
	UK	England	UK	England	UK	England
2020	No data	53.6	No data	50.0	No data	93.2

16.5.13 Trends for waste recovery⁴ in the Yorkshire and Humber region displayed in Insert 16.1, based on data obtained for the Environment Agency Waste Interrogator (Ref. 16.21), demonstrate that materials recovery has steadily risen, whilst the amount of metal recycling has remained constant. The rise in the amount of waste transferred is also positive, and together these trends indicate that there is regional infrastructure and capacity for managing Construction, Demolition, and Excavation (CDE) wastes from the Project, and for this to be reused in a sustainable manner. This is supported by the number of permitted waste recovery sites in the Yorkshire and Humber Region, as detailed in

⁴ Data utilised includes all waste types in the Yorkshire and Humber region and is not specific to (although does include) construction, demolition, and excavation wastes.

Insert 16.1: Transfer, material recovery, and recycling in the Yorkshire and Humber region (2000/1-2020)

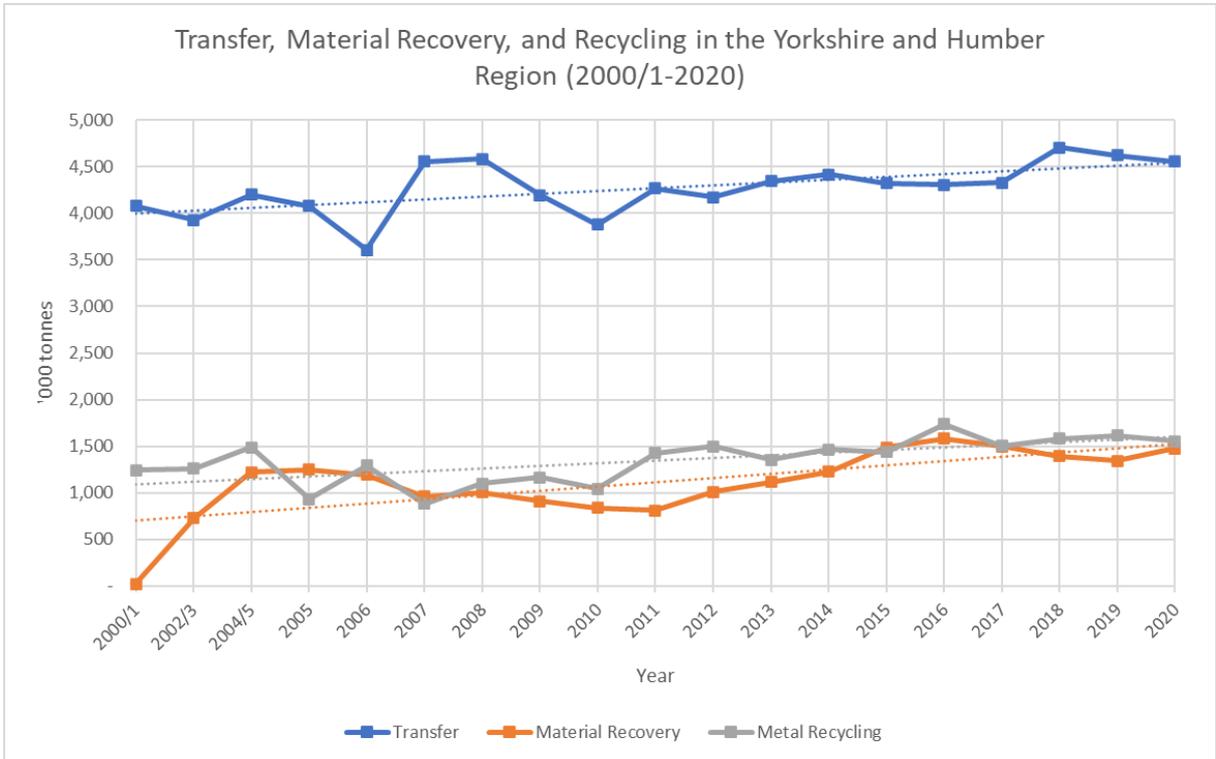


Table 16.10: Permitted waste facilities in Yorkshire and Humber region (2020)

Waste facility type		Number of permitted sites	Sites accepting waste in 2020
Waste Recovery	Incineration	27	18
	Transfer	359	281
	Treatment	357	283
	Metal recovery	342	174
	Use of waste	0	0
	Total	1,085	756
Waste Disposal	Landfill	92	33
	Land disposal	48	20
	Total	140	53

16.5.15 Further information sourced from the Environment Agency Waste Data Interrogator (Ref. 16.22) in Table 16.11 displays that of the total Construction and Demolition Waste (European Waste Catalogue, Chapter 17) received in the Yorkshire and Humber region, 76% was recovered through waste management methods.

Table 16.11: Waste management routes for waste received in the Yorkshire and Humber region (2020)

Waste Management Route	Inert and non-hazardous waste (tonnes)	Hazardous wastes (tonnes)	Total waste (tonnes)	Recovery / Landfill rate
Recovery	5,783,024	17,770	5,800,794	76%
Landfill	1,748,621	40,199	1,788,819	24%
Total	7,531,645	57,968	7,589,613	100%

Recovery comprises treatment, reprocessing, transfer, use of waste in or on land (e.g. composting), incineration, and long-term storage.

16.5.16 From the data presented and analysed through this section, it is evident that waste management facilities and materials recovery infrastructure is available throughout the Yorkshire and Humber region. As a result, there is strong potential to divert site arisings from landfill, and for their reuse and recycling. This could materially influence the findings of the assessment of impacts and effects from materials and waste.

Local Policy Context: Waste Management

16.5.17 Local policies relevant to Waste Management are summarised in Section 16.2.

Existing Baseline: Waste Generation and Disposal to Landfill

Waste Currently Generated and Disposed of

16.5.18 Within the Proposed Order Limits, land uses are anticipated to generate minimal quantities of waste associated with agricultural activities and routine maintenance of infrastructure assets (highways, rail, canals and existing pipeline infrastructure). Likely waste products associated with these activities include:

- Asphalt associated with road repairs;
- Steel and aggregate associated with rail repairs;
- Litter associated with light and signage replacement;
- Material dredged and cleared from canals and rivers; and
- Vegetation associated with vegetation clearance.

16.5.19 The magnitude of impact associated with disposal of the above waste is anticipated to be negligible in the context of available regional capacity.

Remaining Landfill Capacity

16.5.20 Remaining landfill capacity within the Yorkshire and Humber region (Ref. 16.23) is detailed in Table 16.12, summarised by landfill type. The change in capacity from 2019 to 2020 is also included.

Table 16.12: Remaining Landfill capacity in Yorkshire and the Humber (2020)

Landfill type	Capacity in 2019 (m ³)	Capacity in 2020 (m ³)	Change in capacity (Mm ³ and %)
Hazardous (restricted and merchant)	2,650,000	2,387,000	-0.263 (-9.92%)
Non-hazardous (including Stable Non-Reactive Hazardous Waste Cell)	44,567,000	43,306,000	-1.261 (-2.82%%)
Inert	25,473,000	25,040,000	-0.433 (-1.69%)
Total	72,690,000	70,733,000	-1.957 (-2.69%)

16.5.21 In addition to the regional landfill capacity data presented above, Table 16.13 provides detail on the remaining hazardous waste landfill capacity in England (Ref. 16.23). Both sources of data are considered in the assessment of magnitude, as outlined in the IEMA Guide.

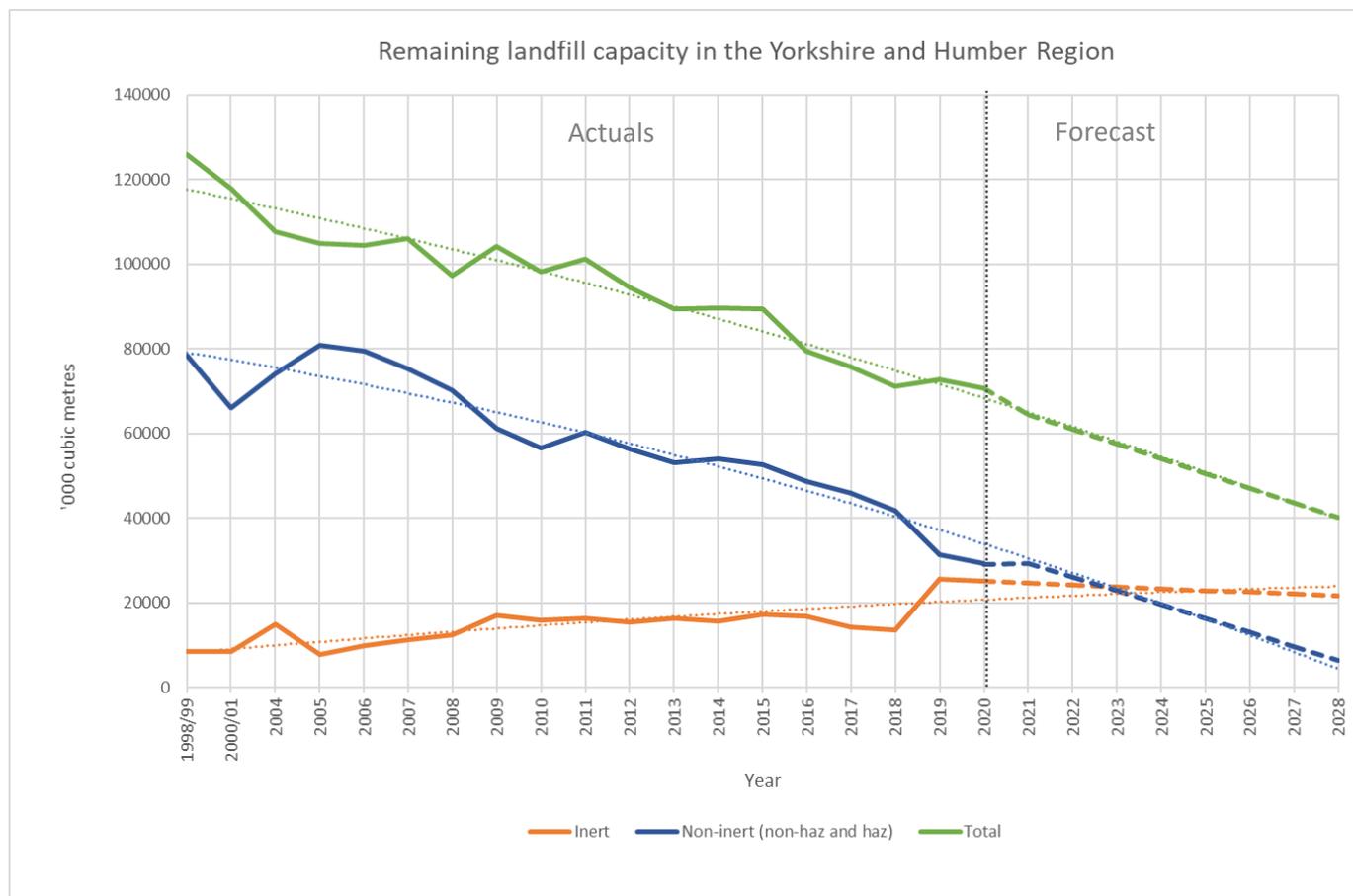
Table 16.13: Remaining hazardous landfill capacity in England

Landfill type	Remaining capacity in 2020 (m ³)
Hazardous (restricted)	809,640
Hazardous (merchant)	15,571,171
Total	16,380,811

Hazardous landfill sites in England are separated into merchant and restricted sites. Restricted landfill sites only accept waste from restricted sources and producers, e.g. site operator / managing site. As such, only merchant sites are considered in this assessment.

16.5.22 Further analysis of baseline data is provided by Insert 16.2, showing forecasted long term void capacity to the year of Project completion (2028). Baseline data indicates that in the absence of future provision, non-hazardous and total landfill capacity is likely to become an increasingly sensitive receptor throughout the duration of the construction phase, and during operation. Remaining landfill capacity for hazardous waste is included as 'non-inert' landfill capacity.

Insert 16.2: Remaining landfill capacity in the Yorkshire and Humber region up to 2020, with forecast trends to 2028 (Project completion)



16.5.23 The forecasts shown in Insert 16.2 and Table 16.14 suggest that in the absence for future provision, total landfill capacity in the Yorkshire and Humber region could reduce by 33% by 2028. Non-inert waste landfill capacity could reduce as much as 56% by 2028 with no future provision. It should be noted that due to the increased provisions made in recent years to the inert landfill capacity in the Yorkshire and Humber region, the forecast in landfill capacity is based only on the changes observed between 2019 and 2020.

Table 16.14: Forecast waste capacity in the Yorkshire and Humber region

Waste Type	Forecast reduction of capacity (2028)	Forecast remaining capacity (2028)
Inert waste	14%	21.5 Mm ³
Non-inert waste	78%	6.4 Mm ³
Total waste	43%	40.2 Mm³

Local Policy Context: Landfill Capacity

16.5.24 Local policies relevant to Landfill Capacity are summarised in Section 16.2.

Future baseline

16.5.25 In the absence of the Project, it is considered that the current land use within the Proposed Order Limits would remain predominantly agricultural. However, it should be noted that increased maintenance of nearby ageing infrastructure (highways, rail, canals etc.) may be required, which could potentially result in changes to material consumption, site arisings and waste generation. Given the scale of the current infrastructure within the Proposed Order Limits, the consumption of materials, generation of waste and the recovery of site arisings within the Proposed Order Limits is expected to remain minimal.

16.5.26 The presence of several MSAs suggests that future surface mineral extraction could occur at various points within the Proposed Order Limits. In conjunction with mineral extraction there could also be establishment of new, or extension of existing, mineral processing facilities within the Proposed Order Limits to meet regional / national resource requirements. Resultantly, engagement with relevant Mineral Planning Authorities will be undertaken to ensure that safeguarded mineral resources are not needlessly sterilised by the Project and / or regional and national resource requirements are met.

16.6 Design development, impact avoidance and embedded mitigation

16.6.1 The assessment of the Project’s impacts on material resource availability and generation, as well as disposal of waste to landfill, is based on the design stage at present.

- 16.6.2 Construction methods that may have the potential to reduce adverse impacts have been considered as part of the Project’s current design. These include:
- Backfilling of earthworks through trenching activities, subject to the materials suitability; and
 - The utilisation of trenchless crossing technology (including horizontal directional drilling, or auger boring) in areas where the Project crosses infrastructure (roads, rail lines, waterways) would prevent the consumption of additional material resources, as well as reduce the waste generation and disposal, though the avoidance of infrastructure removal/replacement.
- 16.6.3 The inclusion of confirmed embedded mitigation will be captured and reported in the ES.

16.7 Preliminary assessment of potential impacts

- 16.7.1 This Section details the preliminary assessment of potential impacts for the Project during construction, operation and decommissioning phases. The findings of the assessment within the PEIR have the potential to change as design of the Proposed Development progresses. The materials and waste types and quantities will be reviewed for assessment within the ES. The preliminary assessment of potential impacts considers only the simultaneous construction of dual pipelines (one carbon dioxide and one hydrogen), as well as the associated AGIs, as this is considered the worst-case scenario in relation to waste and materials.

Construction Phase

- 16.7.2 The potential impacts for Waste and Materials associated with the construction phase are provided in Table 16.15.

Table 16.15: Potential impacts for Waste and Materials associated with the construction phase of the Project

Resource/receptor	Sensitivity of resource/receptor	Description of potential impact/change
Material Resources	Low	<p>Baseline data for material resource availability in the Yorkshire and Humber region display there are currently no known significant issues regarding supply and stock of material resources, and reserves remain resilient.</p> <p>At the current stage of design maturity, detailed quantitative information on the anticipated material types and quantities required for the Project is not available. More accurate information will be obtained as the design progresses. Information on material resource availability is also being requested through the consultation process.</p>

Resource/receptor	Sensitivity of resource/receptor	Description of potential impact/change
		A qualitative assessment has been made based on current Project understanding and existing resource availability / demands. A moderate magnitude of impact is anticipated due to the potential for mineral sterilisation / interface with allocated mineral sites.
Mineral Resources (Safeguarded Areas)	Low	The Proposed Order Limits pass through multiple Mineral Safeguarding Areas. These areas comprise mineral resources that are considered generally free from known issues regarding supply and stock. The Project has the potential to sterilise safeguarded mineral resources (not in their entirety) throughout the Proposed Order Limits. It also has the potential to adversely impact access to an allocated sand and gravel mineral site in Central Lincolnshire (Kettleby Quarry, Bigby, site reference MS07/08-CL).
Landfill Void Capacity: Inert / non-hazardous	Very high ⁵	Detailed quantitative information relating to the amount of inert/non-hazardous waste produced by the Project is not available, but it is considered likely that the waste generated would be of negligible magnitude in comparison to landfill void capacity. If more detailed information is provided, this will be reassessed in the ES.
Landfill Void Capacity: non-inert / hazardous	Very high ⁶	Detailed quantitative information relating to the amount of non-inert/hazardous waste produced by the Project is not available, but it is considered likely that the waste generated will be of negligible magnitude in comparison to landfill void capacity. Should more detailed information be provided, this will be reassessed in the ES.

Operation

16.7.3 As outlined in the EIA Scoping Report, materials used and waste generated during operation are anticipated to be minimal and limited to the ongoing maintenance and repair of the AGIs, including the Pump Facility. Resultantly the operational impacts in relation to waste and materials has been scoped out of further assessment (Section reference 3.12.4, Table 16.1).

⁵ Inert / non-hazardous landfill void capacity is forecast to reduce by 14% from 2.5 Mt in 2020, to 2.15 Mt in 2028 (Project completion) in the absence of any further provision being made. As a result, the sensitivity is considered very high.

⁶ Non-inert / hazardous landfill void capacity is forecast to reduce by 78% from 29.23 Mt in 2020, to 6.44 Mt in 2028 (Project completion) in the absence of any further provision being made. As a result, the sensitivity is considered very high.

Decommissioning

16.7.4 As outlined in the EIA Scoping Report, the consumption of materials and generation of waste during the decommissioning phase are anticipated to be minimal. Resultantly, the decommissioning impacts in relation to waste and materials has been scoped out of further assessment (Section reference 3.12.5, Table 16.1).

16.8 Mitigation and enhancement measures

16.8.1 This Section sets out the preliminary avoidance, mitigation and compensation measures which are likely to be required to address the potential impacts as assessed in Section 16.7. The assessment of significant effects in this document will be reviewed and updated during the preparation of the ES, in response to the ongoing development of design information.

Construction

16.8.2 Potential impacts of the Project have been identified in relation to the consumption of material resources, the sterilisation of safeguarded mineral resources, and the generation and disposal of waste to landfill. Mitigation/enhancement measures considered likely to reduce the potential impact the Project may have on these aspects are detailed in Table 16.16. The inclusion of construction measures will be incorporated into the Construction Environmental Management Plan (CEMP) and would be implemented by the Main Works Contractor (and others).

Table 16.16: Potential design, mitigation, and enhancement measures considered likely to reduce the potential impacts the Project may have during the Construction phase

Element	Measure
Material resources	Identification and specification of material resources that can be acquired responsibly, in accordance with BES 6001 Responsible Sourcing of Construction Products (Ref. 16.29).
	Implementation of a SWMP as part of the CEMP. This would set out the framework for the management of wastes generated during the construction of the Project, which may have the potential to be reused with the Project.

Element	Measure
	<p>Identification of opportunities for the reuse of excavated soils and other arisings on-site or as part of other developments in compliance with a SWMP, a Materials Management Plan (MMP), and CL:AIRE Definition of Waste Code of Practice (Ref. 16.30) requirements.</p> <p>A MMP would be produced in accordance with the CL:AIRE Definition of Waste: Code of Practice (Ref. 16.30) and included in the CEMP. Measures would include:</p> <ul style="list-style-type: none"> • Implementation of the waste hierarchy; • Working to a proximity principle, ensuring arisings generated are handled, stored, managed and reused or recycled as close as possible to the point of origin; • Principles of circular economy, reuse and recycling of waste arisings on site; • Embedded design – e.g., reuse of excavated materials within construction (trench backfill); and • Designing out waste.
Waste generation	Implementation of a SWMP as part of the CEMP. This well set out the framework for the management of wastes generated during the construction of the Project.

Operation

16.8.3 The operation phase of the Project has been scoped out and is therefore not considered.

Decommissioning

16.8.4 The decommissioning phase of the Project has been scoped out and is therefore not considered.

16.9 Summary of the preliminary assessment of potential significant effects

16.9.1 Table 16.17 below lists the preliminary assessment of potential significant effects associated with the Project.

Table 16.17: Summary of the preliminary assessment of potential significant effects

Resource/receptor	Stage	Sensitivity of resource/receptor	Description of potential impact/change	Mitigation	Potential significant effects
Material resources	Construction	Low	Material resources required by the Project could potentially reduce regional material stocks minimally.	Implementation of a SWMP. Preparation of an MMP	Not significant Long term
Mineral resources (Safeguarded Areas)	Construction	Low	Safeguarded mineral resources intersected by the Proposed Order Limits have the potential to be sterilised, and allocated sites intersected by the Proposed Order Limits may be adversely impacted.	Preparation of an MMP	Not significant Long term
Landfill void capacity: inert/non-hazardous	Construction	Very high	Inert waste generated by the Project through to completion is considered to be negligible when compared to current landfill void capacity and forecast trends.	Preparation of an MMP Implementation of a SWMP	Not significant Long-term
Landfill void capacity: non-inert/hazardous	Construction	Very high	Non-inert waste generated by the Project through to completion is considered to be negligible when	Preparation of an MMP	Not significant Long-term

Resource/receptor	Stage	Sensitivity of resource/receptor	Description of potential impact/change	Mitigation	Potential significant effects
			compared to current landfill void capacity and forecast trends.	Implementation of a SWMP.	

16.10 Next steps

Engagement

- 16.10.1 As multiple MSAs are encroached upon by the Proposed Order Limits, an MRA will be prepared to support the ES once additional design information is available to further inform calculations of mineral resource volumes, identify safeguarded areas potentially affected by the Project, and similar pertinent information. The MRA will be provided to the Mineral Planning Authorities (MPA) listed in Section 16.2 for review and comment.

Surveys

- 16.10.2 No surveys are required to support the Waste and Materials assessment (see Paragraph 16.4.4).

Assessment

- 16.10.3 As the design progresses, further data to more effectively assess Waste and Materials associated with the Project will be made available. Emerging data will be used to assess the impact of the Project against the baseline information at ES stage, using the methodology set out within this chapter.
- 16.10.4 Baseline data will also be reviewed at ES stage to ensure that the most current data and information is presented.

16.11 References

- Ref. 16.1 HM Government (1990) *Environmental Protection Act 1990*. Available online: <https://www.legislation.gov.uk/ukpga/1990/43/contents>
- Ref. 16.2 HM Government (2021) *Environment Act 2021*. Available online: <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>
- Ref. 16.3 EU Parliament (2008) *Waste Framework Directive 2008/98/EC*. Available online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098>
- Ref. 16.4 EU Council Directive (1999) *Landfill of Waste (Landfill Directive) 1999/31/EC EU*. Available online: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999L0031&from=EN>
- Ref. 16.5 HM Government (2011) *The Waste (England and Wales) Regulations 2011*. Available online: <https://www.legislation.gov.uk/uksi/2011/988/contents>
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