A1 in Northumberland: Morpeth to Ellingham

Scheme Number: TR010041

6.2 Environmental Statement – Chapter 13 Material Resources

Part A

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

June 2020

Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

The A1 in Northumberland: Morpeth to Ellingham

Development Consent Order 20[xx]

Environmental Statement

Regulation Reference:	APFP Regulation 5(2)(a)
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Author:	A1 in Northumberland: Morpeth to Ellingham Project Team, Highways England

Version	Date	Status of Version
Rev 0	June 2020	Application Issue

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FIGURES

13 MATERIAL RESOURCES

13.1 INTRODUCTION

13.1.1. This chapter presents the assessment of likely significant environmental effects from Part A: Morpeth to Felton (Part A) in relation to material resources and waste. The assessment covers two core topics of material consumption and waste generation.

13.1.2. This chapter has been supported by data and information provided by the preliminary design of Part A and the Buildability Advisor.

13.1.3. The chapter also identifies, where appropriate, mitigation measures that would be required to prevent, minimise or control the likely adverse material resource effects arising from the construction and operation stages of Part A and the subsequent residual effects.

13.1.4. A full description of the Scheme is provided in **Chapter 2: The Scheme, Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**), while an assessment of combined effects of Part A is set out in **Chapter 15: Assessment of Combined Effects** of this ES and combined and cumulative effects of the Scheme as a whole is set out in **Chapter 16: Assessment of Cumulative Effects**, **Volume 4** of this ES (**Application Document Reference: TR010041/APP/6.4**).

13.1.5. **Section 4.3** of **Chapter 4: Environmental Assessment Methodology, Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**) identifies any differences in the assessment methodology employed for Part A and Part B: Alnwick to Ellingham (Part B). Further to this, there are other differences between the chapters for Part A and Part B. All key differences include:

a. There are differences between Part A and Part B that relate to the scoping process, for example elements that are scoped in and out of the assessment. Refer to the **Scoping Report** (**Application Document Reference: TR010041/APP/6.10**) and **Scoping Opinion** (**Application Document Reference: TR010041/APP/6.12**) for Part A, and the **Scoping Report** (**Application Document Reference: TR010041/APP/6.11**) and **Scoping Opinion** (**Application Document Reference: TR010041/APP/6.13**) for Part B.

b. The first full year of operation for Part A would be 2025, whereas for Part B it would be 2024. As a result, the landfill capacity considered in the baseline sections of Part A and Part B differ accordingly.

13.2 COMPETENT EXPERT EVIDENCE

13.2.1. **Table 13-1** below demonstrates that the professionals contributing to the production of this chapter have sufficient expertise to ensure the completeness and quality of this assessment.

Table 13-1 – Relevant Experience

Name	Role	Qualifications and Professional Membership	Experience
Sara Claxton	Author	- BSc (Hons) Environmental Earth Science - Institute of Environmental Management and Assessment (IEMA) Affiliate Member - British Occupational Hygiene Society (BOHS) Associate Member of the Faculty of Asbestos Assessment and Management	Senior Consultant - Co-author of the materials chapters of the A27 Arundel Environmental Assessment Report and Spalding Western Relief Road Environmental Statement (ES).
Tim Danson	Reviewer	- MSc (Distinction) Environmental Diagnostics - BSc (Hons) Environmental Biology and Ecology - IEMA Practitioner - Member of the Chartered Institution Water and Environmental Management - Chartered Scientist	Associate Tim has led the production of materials and waste chapters for over twenty Environmental Impact Assessments (EIA), for a variety of clients (mainly Highways England). - Lead author for (and has provided further advice on) a new Design Manual for Roads and Bridges (DMRB) Part on assessing the impact of materials and waste within EIA, for Highways England.

13.3 LEGISLATIVE AND POLICY FRAMEWORK

INTERNATIONAL LEGISLATION

Environmental Impact Assessment Directive (2014/52/EU) (Ref. 13.1)

13.3.1. The Directive provides the overarching legislative framework for assessing the significance of impacts and effects from schemes on the environment. The Directive requires assessments to take account of the "*nature and quantity of materials*" and ensure that "*resource efficiency (is) increased*".

Waste Framework Directive (2008/98/EC) (Ref. 13.2)

13.3.2. The Directive provides a comprehensive foundation for the management of waste across the European Community and provides a common definition of waste which defines waste as "*any substance or object that the holder discards or intends or is required to discard*".

13.3.3. The Waste Framework Directive sets out the Waste Hierarchy (**Figure 13.1**) against which action to reduce the production and disposal of waste shall be taken.

Figure 13.1 – Waste Hierarchy

NATIONAL LEGISLATION

The Controlled Waste (England and Wales) Regulations 2012 (Ref. 13.3)

13.3.4. The Regulation provides a definition of controlled waste and classifies waste as household, industrial or commercial waste.

The Waste (England and Wales) Regulations 2014 (Ref. 13.4)

13.3.5. Stipulates the requirement for industry and businesses to implement the Waste Hierarchy.

Clean Neighbourhoods and Environment Act 2005 (Ref. 13.5)

13.3.6. States that it is the responsibility of construction workers on site to guarantee that waste is disposed in the appropriate manner. In accordance with this, employees must undertake waste disposal activities as outlined in national law.

Hazardous Waste (England and Wales) Regulations 2005 (Ref. 13.6)

13.3.7. Introduces measures to control the storage, transport and disposal of hazardous waste. It provides a means to ensure that hazardous waste and any associated risks are appropriately managed.

The Control of Pollution Act 1974 (Ref. 13.7)

13.3.8. Makes provisions with respect to the generation and revision of 'waste disposal plans' and prohibits the unlicensed disposal of waste.

Environmental Protection Act 1990 (Ref. 13.8)

13.3.9. Outlines the requirement of the manager of a development to ensure that any excess materials or waste as a result of construction activities are recovered or disposed of without any subsequent adverse effects upon the surrounding environment.

Environmental Permitting (England and Wales) Regulations 2016 (Ref. 13.9)

13.3.10. These Regulations came into force on 1 January 2017 and replace The Environmental Permitting (England and Wales) Regulations 2010 replacing the Waste Management Licensing Regulations 1994 which dictated the licensing of persons or businesses involved in the management of waste. The Environmental Permitting Regulations and relate directly to the licensing of a site or activity to carry out the management, processing and disposal of wastes. The updated regulations provide a consolidated system of environmental permitting for England and Wales and extend the range of activities that require an environmental permit, including waste exemption.

PLANNING POLICY

National

13.3.11. **Table 13-2** sets out national policy documents and how Part A supports these policies.

Local

13.3.12. **Table 13-3** sets out local policy documents and how Part A supports these policies.

Table 13-2 - National Planning Policy Relevant to Material Resources

Policy	Relevant Policy Objectives	Significance of Part A on Policy Objective
National Policy Statement for National Networks (NPS NN) 2014 (**Ref. 13.10**)	Sets out the need for, and Government's policies to deliver, development of nationally significant infrastructure projects (NSIPs) on the national road and rail networks in England. The policy provides planning guidance for promoters of NSIPs on the road network, and the basis for the examination by the Examining Authority and decisions by the Secretary of State (paragraph 1.1). In relation to waste management, the Policy outlines the main government objectives, to protect human health and the environment and implementation of the Waste Hierarchy (paragraph 5.40). It also identifies the potential for large infrastructure projects to generate hazardous and non-hazardous waste during construction and operation, which may fall under the Environmental Permitting Regime (paragraph 5.41). The policy statement sets out the basic assessment criteria, to include information on the proposed waste recovery and disposal system for all waste generated by the development and seeks to minimise the volume of waste produced and sent for disposal (paragraph 5.42). The Policy outlines the decision-making considerations, requiring the Secretary of State to be satisfied that: - Waste will be properly managed on and off-site. - Wastes will be dealt with by available infrastructure and will not have an adverse effect on the capacity of existing waste management facilities. - Adequate measures have been taken to minimise the volume of waste arisings (paragraph 5.43).	Based on the expected best practice approach to managing materials and waste on Part A (refer to **Section 13.11** of this chapter), it is not expected that the outcomes would adversely impact achievement of or alignment with the policy objectives to: - Operate within the principles of waste hierarchy - Minimise the production of hazardous and non-hazardous waste - Minimise the volume of waste produced and sent for disposal Part A is in compliance with the Environmental Permitting regime; however, it should be noted that the main contractor would be responsible for making all suitable arrangements for waste that is not exempt. Further details can be found in the **Consents and Agreements Position Statement** (**Application Document Reference: TR010041/APP/3.3**).
National Planning Policy Framework, 2019 (**Ref. 13.11**)	Sets out the Government's planning policies for England (Chapter 1, paragraph 1). In relation to waste, the Policy makes reference to the planning policy for waste, as summarised later in this table (Chapter 1, paragraph 4). Chapter 17 of the Policy (Facilitating the sustainable use of minerals) outlines the importance of ensuring a sufficient supply of minerals to meet the countries need for infrastructure, buildings, energy and goods (paragraph 203). The chapter focus on the need to manage mineral resources through measures such as safeguarding mineral resources; enhancing contributions from secondary and recycled materials and minerals wastes (paragraph 204); preparing annual Local Aggregate Assessments and participating in an Aggregate Working Party; maintaining suitable landbanks (reserves) of mineral supply and co-operating with other Local Authorities (paragraph 207).	An **Outline Construction Environmental Management Plan (Outline CEMP)** (**Application Document Reference: TR010041/APP/7.3**) has been prepared and accompanies the application. The **Outline CEMP** would be developed into a CEMP by the main contractor. As outlined in the **Outline CEMP,** a Site Waste Management Plan (SWMP) and Materials Management Plan (MMP) would be developed. This would ensure that Part A would utilise materials obtained from site through the course of its development to minimise use of virgin resources and maximise the use of recycled materials. Based on the expected approach to managing impacts across the lifecycle of Part A (refer to **Section 13.11** of this chapter), it is not anticipated that the outcomes would adversely impact achievement of or alignment with the policy objectives.
Waste Management Plan for England, 2013 (**Ref. 13.12**)	Provides a detailed analysis of the present state of waste management at a national level and assesses how the objectives of the Waste Framework Directive will be effectively supported. It states that excavation, construction and	Part A would generate construction and demolition waste, however based on the expected approach to managing impacts across the lifecycle of Part A (refer to **Section 13.11** of this chapter), as outlined in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**), and preparation of a SWMP and MMP, it is not

Policy	Relevant Policy Objectives	Significance of Part A on Policy Objective
	demolition waste is the largest contributor to total waste generation in the UK (Waste Management Plan for England, 2013).	expected that the outcomes would adversely impact achievement of or alignment with the policy objectives.
National Planning Policy for Waste, 2014 (**Ref. 13.13**)	Outlines the ambition to promote a sustainable approach to resource use and management. It sets out waste planning policies and should be read alongside: The National Planning Policy Framework; the National Waste Management Plan for England and any relevant successor policies, guidance or documents (p.3). Policies include: - Delivery of sustainable development and resource efficiency, including provision of modern infrastructure, local employment opportunities and wider climate change benefits, by driving waste management up the waste hierarchy. - Ensuring that waste management is considered alongside other spatial planning concerns, such as housing and transport, recognising the positive contribution that waste management can make to the development of sustainable communities. - Helping to secure the reuse, recovery or disposal of waste without endangering human health and without harming the environment. - Ensuring the design and layout of new residential and commercial development and other infrastructure (such as safe and reliable transport links) complements sustainable waste management, including the provision of appropriate storage and segregation facilities to facilitate high quality collections of waste (p.3). The National Planning Policy for waste also states that 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 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. - The handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities and minimises off-site disposal (p.6).	The approach to managing potential impacts across the lifecycle of Part A is based on best practice (refer to **Section 13.11** of this chapter), as outlined in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**), which incorporates a SWMP and MMP, and is in line with a sustainable approach to resource use and management. It is therefore not expected that the outcomes would adversely impact achievement of or alignment with the policy objectives to: - Minimise the volume of waste produced and sent for disposal. - Implement a waste segregation scheme on site during construction to facilitate recycling of waste generated.
National Policy Statement for Hazardous Waste 2013 (**Ref. 13.14**)	Outlines the main objectives on Government Policy for hazardous waste (Section 2.1), including: - To protect human health and the environment: there are stringent legislative controls in place to control the management of waste with hazardous properties.	Based on the currently available information, quantities of hazardous waste from Part A are not anticipated to be substantial (refer to **Section 13.8** of this chapter). The approach to managing impacts across the lifecycle of Part A is based on good practice (refer to **Section 13.11** of this chapter), as outlined in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**), and preparation of a SWMP and MMP. It is

Policy	Relevant Policy Objectives	Significance of Part A on Policy Objective
	- Implementation of the waste hierarchy: This aids the production of less hazardous waste, promoting its reuse as a resource (where possible). Disposal of the waste is noted as a last resort. - Self-sufficiency and proximity: This ensures that sufficient disposal facilities are provided across the country to match expected arisings of all hazardous wastes, except those produced in very small quantities, and to enable hazardous waste to be disposed of in one of the nearest appropriate installations. - Climate change: To minimise greenhouse gas emissions and maximise opportunities for climate change adaptation and resilience (Section 2.1). The policy additionally outlines the key principles for the management of hazardous waste (Section 2.4), as follows: - **Principle 1:** Hazardous waste should be managed as to provide the best possible environmental outcome. This is expected to be in line with the waste hierarchy, with the exception of when life cycle analysis suggests that the best overall environmental option would require a departure from that hierarchy. - **Principle 2:** Requires a reduction in reliance upon landfill, with landfill only being used where there is no alternative recovery or disposal option available. - **Principle 3:** This principle requires that hazardous waste is not mixed with different categories of hazardous waste or with other waste substances or materials (although co-disposal of some wastes in landfill is allowed). - **Principle 4:** Stipulates that organic hazardous wastes that cannot be reused, recycled or recovered should be subject to destruction using best available techniques, with energy recovery for all appropriate treatments. No hazardous organic waste should be landfilled unless the requirements of the Landfill Directive are met. - **Principle 5:** The practice of relying on higher Landfill Directive waste acceptance criteria to enable some hazardous waste to continue to be landfilled must end (paragraph 2.4.1).	therefore not expected that the outcomes would adversely impact achievement of or alignment with the policy objectives.
Highways England Sustainable Development Strategy (**Ref. 13.15**)	The strategy sets out Highways England approach and priorities for sustainable development, defined as "*encouraging economic growth while protecting the environment and improving safety and quality of life for current and future generations*" (page 1). Key ambitions of the strategy are: - Increased responsible sourcing of materials. - A 'circular' approach to managing resources through minimising demand for primary materials and maximising reuse of resources already in use in the network. - Achieve security of supply though improving the stability and demand for 'high-sustainability-performance' products (page 4).	Based on the anticipated best practice approach to managing materials and waste on Part A (refer to **Section 13.11** of this chapter), as outlined in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**), and preparation of a SWMP and MMP, it is not expected that the outcomes would adversely impact achievement of or alignment with the policy objectives.

Policy	Relevant Policy Objectives	Significance of Part A on Policy Objective
Our Waste, Our Resources: A Strategy for England (**Ref. 13.16**)	This Strategy sets out how the Government will preserve stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. The strategy also outlines the Governments aims to minimise the damage caused to the natural environment by reducing and managing waste safely and carefully, and by tackling waste crime. It combines actions to take now with firm commitments for the coming years and gives a clear longer-term policy direction in line with the 25 Year Environment Plan (page 7).	Based on the anticipated best practice approach to managing materials and waste on Part A (refer to **Section 13.11** of this chapter), as outlined in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**), and preparation of a SWMP and MMP, it is not expected that the outcomes would adversely impact achievement of or alignment with the policy objectives.

Table 13-3 - Local Policy Relevant to Material Resources

Policy	Relevant Policy Objectives	Significance of Part A on Policy Objective
Northumberland Local Plan: Publication Draft Plan (January 2019) (**Ref. 13.17**)	The Draft Local Plan has been produced to cover proposals across the whole of Northumberland. It will replace all previous District and County Council Local Plan and Core Strategy documents. Within the Draft Local Plan, the principal aims of the to-be-adopted **Minerals Policy** (**MIN 4**) are to: - Identify, manage and safeguard mineral resources to meet current and future needs through the development of Mineral Safeguarding Area (…). - Assess proposals for non-energy mineral extraction both individually and cumulatively in terms of their contribution to national and regional guidelines and social, environmental and economic impacts. - Impose high standards of restoration and aftercare to worked land to ensure it is returned to the most appropriate and beneficial use. Within the Draft Local Plan, the principal aims of the to-be-adopted **Waste Policies** (**WAS 1, WAS 2, WAS 3 and WAS 4**) are to encourage action in the highest tiers of the Waste Hierarchy (paragraph 13.50. This will be achieved through: - Assessing proposals for waste management facilities with regard to location criteria, such as achieving on-site waste management, expansion of existing facilities, co-location of waste facilities, situated within employment areas and using previously developed land (WAS 1 and 2, page 273/274). - Ensuring the development would not have an adverse impact on the environment and human health (WAS 2/3, page 274/275). - Safeguarding existing waste management facilities from development that would prejudice or prevent the use of the site for waste management uses (WAS 4, page 276).	Whilst MSA for coal, and sand and gravel, have been identified within the Order Limits (as detailed in **paragraph 13.4.5** of this chapter), the impact on these resources, based on professional judgement, is not likely to generate a significant effect and is therefore not considered further (scoped out) within this chapter. The reasons (as reinforced in **paragraph 13.4.5**) for this are as follows: - Where the design of Part A results in changes to the highway, it does so on sections that are already online i.e. the extent to which Part A would further encroach on the MSAs is minimal; and - Where MSAs are within the Order Limits, but do not fall under either the (existing) online, or Part A designs, the proportion of MSA that is impacted (as a percentage of the available resource) is in all cases extremely small. Therefore, sterilisation of mineral resources beyond that which is already extant is not expected to occur and Part A is not anticipated to adversely impact the policy objectives. Specifically, the magnitude threshold criterion for sterilisation is not reached. Based on the anticipated good and ‘best practice’ approach to managing materials and waste on Part B (refer to Section 13.11 of this chapter), it is not expected that the outcomes would adversely impact achievement of or alignment with the policy objectives.
Northumberland Minerals Local Plan – Written Statement (March 2000) (**Ref. 13.18**)	Once adopted, the emerging Northumberland Local Plan will supersede these documents. Until the Draft Local Plan is adopted, the following saved policies are applicable to Part A in relation to the assessment of materials and waste:	Whilst MSAs for coal, and sand and gravel, have been identified within the Order Limits (as detailed in **paragraph 13.4.5** of this chapter) the impact on these receptors is not, in the professional judgement of the author, pronounced

Policy	Relevant Policy Objectives	Significance of Part A on Policy Objective
Northumberland Waste Local Plan – Written Statement (December 2001) (**Ref. 13.19**)	**Minerals Policy S1** (paragraph 2.8) – "*Land will be made available for mineral working through the planning process to provide an appropriate contribution to local, regional and national needs. The County Council*: - *Will encourage greater efficiency in the supply and use of primary mineral resources;* - *Will not grant planning permission where there would be an unduly adverse impact on local communities or the environment*". **Minerals Policy S3** (paragraph 2.11) – "*Planning permission should not be granted for development which would sterilise important economically workable mineral deposits unless*: - *There is an overriding need for the development and prior extraction of the mineral cannot reasonably be undertaken; or* - *Extraction of the mineral is unlikely to be practicable or environmentally acceptable*". **Minerals Policy S4** (paragraph 2.12) – "*The extraction of proven mineral deposits in advance of other planned development will be permitted provided that:* - *Prior extraction would not unduly prejudice the timing and viability of the proposed development;* - *A significant part of the extraction site would be sterilised by development;* - *There would not be a significant adverse effect on local communities or the environment*". **Minerals Policy S5** (paragraph 2.16) – "*The use of mineral wastes, power station ash and construction wastes as substitutes for primary aggregates will be encouraged, provided that there would not be a significant adverse effect on local communities or the environment."* **Minerals Policy A3** (page 46) **–** "Planning permission will not be granted for the extraction of aggregate minerals if: - *There are material planning objections which are not outweighed by significant benefits to the environment or the local community; and* - *The existing landbank of permitted reserves is adequate, unless there is a need for the particular nature and quality of the aggregate which cannot reasonably be met from other available sources*." **Minerals Policy A8** (paragraph 5.86) – "*Proposals for borrow pits will only be permitted if the mineral cannot practicably be supplied from existing quarries or available waste materials, there would not be a significant adverse effect on local communities or the environment, and the site would be operated and reclaimed in a satisfactory manner*." **Minerals Policy SA2** (paragraph 6.20) – "The re-use of sandstone waste will be encouraged provided that there would not be a significant adverse effect on local communities, the environment or the final restoration."	enough to warrant assessment within this chapter, and is hence scoped out. The reasons for this are twofold: - Where the design of Part A results in changes to the highway, it does so on sections that are already online i.e. the extent to which Part A would further encroach on the MSAs is minimal; and - Where MSAs are within the Order Limits, but do not fall under either the (existing) online, or Part A designs, the proportion of MSA that is impacted (as a percentage of the available resource) is in all cases extremely small. Therefore, sterilisation of mineral resources beyond that which is already extant is not expected to occur and Part A is not anticipated to adversely impact the policy objectives. Specifically, the magnitude threshold criterion for sterilisation is not reached. Based on the anticipated good and 'best practice' approach to managing materials and waste on Part B (refer to **Section 13.11** of this chapter), it is not expected that the outcomes would adversely impact achievement of or alignment with the policy objectives.

Policy	Relevant Policy Objectives	Significance of Part A on Policy Objective
	Waste Policy S3 (paragraph 2.11) **– "**Planning permission for waste management facilities will not be granted where there would be a significant adverse effect on local Communities and/or the environment." **Waste Policy RE5** (page 57) – "*Proposals for the recycling of construction/demolition waste will be permitted, provided that they are:* - *Within or adjacent to a landfill site which accepts the type of waste to be recycled, for the life of the related disposal operation; or* - *Within or adjacent to a mineral working site for the life of that mineral operation; or* - *At a demolition/construction project, for the life of that project; or* - *On industrial land used for or allocated to business uses which because of their nature require a location where they will not impact adversely on surrounding land-uses*." **Waste Policy DP1** (page 69) **– "**Proposals to provide additional landfill capacity at the strategic sites of Seghill, Ellington Road and Harecrag will be permitted, provided that there are no significant adverse effects on local communities or the environment, the proposal complies with other relevant policies in the plan and contributes to an integrated scheme or network of waste management facilities." **Waste Policy DP2** (page 70) – "*Proposals for landfill sites to dispose of biodegradable wastes outside the areas identified in policy DP 1 will not be permitted unless:* - *There is a demonstrable need for the site which cannot be met from an existing site, or the site would produce benefits for the area in which it is located; and* - *There are no significant adverse effects on local communities or the environment*." **Waste Policy DP3** (page 71) – "*Proposals for the disposal of inactive wastes will only be permitted where the waste cannot practicably be re-used or recycled, and:* - *There is a demonstrable need for the site which cannot be met from an existing site in the local area; or* - *The site would produce benefits for the area in which it is located; and* - *There are no significant adverse effects on local communities or the environment."* **Waste Policy R1** (page 96) – "*Proposals for landfill developments (including landraising) will only be permitted where proper provision has been made for the reclamation of the site as soon as practicable to a condition suitable for the identified after-use".*	

Policy	Relevant Policy Objectives	Significance of Part A on Policy Objective
	Waste Policy SM1 (page 98) – "*To secure the acceptable operation and reclamation of waste management facilities, the County Council will seek to ensure that the operation of facilities is carried out in accordance with the planning conditions and, where appropriate and subject to the circumstances of each case, the waste local plan code of practice. Where necessary, the County Council will seek to conclude planning obligations to control waste operations, their reclamation, after-use and subsequent management.*"	

13.4 ASSESSMENT METHODOLOGY

13.4.1. This section sets out the scope of the assessment which has been determined via the **Scoping Report** (**Application Document Reference: TR010041/APP/6.10**) and **Scoping Opinion** (**Application Document Reference: TR010041/APP/6.12**). **Appendix 4.1: Scoping Opinion Response Tracker**, **Volume 1** of this ES **(Application Document Reference: TR010041/APP/6.1**) provides a summary of the Scoping Opinion comments received from the Planning Inspectorate, along with the responses which have informed the scope, methodology and assessment in this chapter.

SCOPE OF ASSESSMENT

13.4.2. As presented within the **Scoping Report** (**Application Document Reference: TR010041/APP/6.10**) for Part A, the following topics have been assessed in this chapter for the currently programmed construction phase (2021 to 2024) and the first year of operation (2025):

a. The consumption of material resources (from primary, recycled or secondary, and renewable sources, including products offering sustainability benefits and in relation to the presence of mineral resources) including the generation and reuse of arisings recovered from site.
b. The production and disposal of waste to landfill.

13.4.3. The following elements have been scoped out in accordance with the **Scoping Report** (**Application Document Reference: TR010041/APP/6.10**):

a. Lifecycle assessment (including embodied carbon and water) of materials and site arisings, and waste. The effort and resources required to undertake a full lifecycle assessment of these elements are deemed disproportionate to the benefit they would offer the assessment of the significance of effect.
b. The consumption of material resources, and site arisings and waste production beyond the first year of the operation of Part A has been scoped out, as their impacts and associated effects are deemed to be not significant.
c. Potential effects resulting from the transportation of material resources and waste to and from the site are considered within **Chapter 5: Air Quality**, **Chapter 6: Noise and Vibration** and **Chapter 14: Climate** of this ES.
d. The risk of contamination affecting controlled waters is discussed within **Chapter 10: Road Drainage and the Water Environment** and adverse impacts on agricultural soils are discussed in **Chapter 11: Geology and Soils** of this ES.

13.4.4. The assessment of potential effects upon MSAs has been scoped out of this chapter, as the result of review and assessment subsequent to the production of the **Scoping Report** (**Application Document Reference: TR010041/APP/6.10**) for Part A. Justification for scoping this element out of this chapter is as follows.

13.4.5. Whilst (as stated in **Table 13-3**) MSAs have been identified within the Order Limits, the impact on these resources, based on professional judgement, is not expected to generate a significant adverse effect. Specifically, therefore, the magnitude threshold criterion for sterilisation of MSAs is not reached as a result of Part A, because:

a. Where the design results in changes to the highway, it does so on sections that are already online i.e. the extent to which Part A would further encroach on the MSAs is minimal.

b. Where MSAs are within the Order Limits, but do not fall under either the (existing) online, or design, the proportion of MSA that is impacted (as a percentage of the available resource) is in all cases extremely small.

13.4.6. It should be noted that this chapter considers MSA in relation to their value as a potentially consumable resource based upon the sterilisation of the resource, whereas **Chapter 11: Geology and Soils** of this ES considers MSA based upon their geological value.

CONSULTATION

13.4.7. No consultation specific to materials resources for Part A has taken place in the preparation of this chapter as it was not necessary for obtaining the data and information required for this environmental assessment. However, the Environment Agency confirmed in the scoping opinion current landfill capacity for the region.

13.4.8. It was originally proposed that consultation with Northumberland County Council would be undertaken to determine whether there are recovered materials from treatment / processing facilities, or donor sites, which could be used to minimise potential impacts as a result of Part A. Further to receiving the detailed information from the Buildability Advisor, this has been deemed not to be required, particularly as no earthwork's material would be imported to Part A.

METHODOLOGY

Guidance

13.4.9. The assessment has been carried out in line with IAN 153/11 Guidance on the Environmental Assessment of Material Resources (**Ref. 13.20**) and internal guidance from the Applicant.

13.4.10. IAN 153/11 states in section 3.3.3, that a detailed assessment of impacts and effects is "most likely to be used for complex capital maintenance, improvement and large new construction projects." Part A comprises online (6.5 km) and offline highway (6.1 km) sections, a new bridge over the River Coquet, an overbridge and an underbridge, three grade separated junctions, new accesses and local roads to new junctions, diversion of minor roads, and a new parallel road linking the existing A1 with West Moor junction. To facilitate the construction of Part A statutory utilities would need to be diverted, in particular the diversion of sections of a high-pressure gas main, a gas pipeline and an overhead electricity line. Part A also includes new drainage features, new and extended culverts, and temporary and permanent Public Right of Way (PRoW) diversions. Part A meets the IAN 153/11 guidance definition of 'complex improvement and large new construction works' (**Ref. 13.20**). Accordingly, a detailed assessment of material resources has been undertaken. Refer to **Chapter 2: The Scheme**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**) for a detailed description of the Scheme.

13.4.11. As part of the detailed assessment, the following assessment tasks were carried out:

a. Relevant waste legislation, policies and guidance has been reviewed to identify material use and waste management objectives, commitments and targets (refer to **Table 13-2** and **Table 13-3**).
b. The likely types of material resources (including site arisings) and waste (inert and non-inert) have been identified, and quantities estimated for Part A.
c. Details of the source of materials including site-won arisings and recycled content have been identified where available. This also includes the cut and fill balance for Part A.
d. The types and quantities of forecast waste arisings including hazardous wastes have been identified.
e. Surplus materials and waste falling under regulatory controls have been identified.
f. Details on the management of waste arisings, (for example on-site storage, pre-treatment or treatment prior to recovery, or disposal) have been identified where information is available.
g. The impacts that would arise from materials and waste from Part A have been evaluated against the regional and national materials markets and the capacity of regional (or if appropriate, national) waste infrastructure.
h. Measures to mitigate impacts - opportunities to eliminate, reduce, reuse, recycle or recover material resources, site arisings and (potential) waste, have been identified through a review of Part A (including proposed building materials, construction methods and design, where available) and in accordance with industry best practice.
i. Viable circular economy opportunities in design have been identified, where appropriate.

13.4.12. This chapter considers the nature of impacts (adverse/beneficial, permanent/temporary, direct/indirect) from:

a. Material resources consumption (from primary, recycled or secondary, and renewable sources, and including products offering sustainability benefits).
b. The generation and reuse of arisings recovered from site.
c. The production and disposal of waste to landfill.

13.4.13. The main outputs from the detailed assessment are:

a. The identification of the environmental impacts and the significance of effects associated with material resources (including site arisings) and waste.
b. The measures which will be implemented to eliminate or mitigate impacts, and to fulfil resource efficiency and circular economy opportunities.

13.4.14. Assessment results are presented in a format that meets the requirements of Table C of Annex 2 (Detailed Assessment Reporting Matrix) as set out in IAN 153/11 (**Ref. 13.20**).

Method of Baseline Data Collection

13.4.15. The baseline data collected and presented in this chapter were obtained by desk study.

13.4.16. The data acquired during the desk study describe the regional and national availability of materials that would be required for Part A, and the capacity of regional facilities to recover and dispose of waste generated.

13.4.17. Data relating to the volumes of materials (their source and recycled content) and waste (including their management and disposal method) have been obtained from design estimates and information provided by the Buildability Advisor for Part A.

Materials

13.4.18. An assessment of the impacts of the consumption of materials required during site construction (from 2021 to 2024) and the first year of operation (2025), has been undertaken by considering the origins and sources of materials, including their general availability (production, stock, sales) and the proportion of recovered (reused or recycled) materials they contain.

13.4.19. The reuse of excavated and other arisings has been evaluated as part of the assessment of materials, to determine whether the adverse effects associated with the consumption of primary resources can be reduced.

13.4.20. The assessment takes into account the forecast volumes of materials that need to be consumed. Thresholds for sensitivity and magnitude of impact from materials are presented in **Table 13-4** and **Table 13-5**. In addition to those set out by internal guidance from the Applicant, industry-recognised best practice criteria have been added to **Tables 13-4** and **13-5** to help refine and make more robust the thresholds and assessment process. Each new criterion has been marked with an asterisk (*). The assessment considers the nature of impacts (adverse and beneficial, permanent and temporary, direct and indirect) from materials, and uses professional judgement based on experience of assessment of similar schemes to determine the significance of effect.

Landfill Capacity

13.4.21. An assessment of the remaining landfill capacity in north east England has been used to determine the impacts and effects of waste generated during site construction of Part A.

13.4.22. The assessment considers the volume of waste (inert, non-hazardous and hazardous) anticipated to be generated by the construction of Part A and determines the potential impact of each on remaining landfill capacity in the region. Wherever waste is recovered (diverted from landfill) the influence of this has been taken into account in the assessment of significance of effect.

13.4.23. Thresholds for sensitivity and magnitude of impact from waste are presented in **Table 13-4** and **Table 13-5**. In addition to those set out by internal guidance from the Applicant, industry-recognised best practice criteria have been added to **Table 13-4** and **Table 13-5** to help refine and make more robust the thresholds and assessment process. Each new criterion has been marked with an asterisk (*). The assessment considers the nature of impacts (adverse and beneficial, permanent and temporary, direct and indirect) from waste generated and disposed of, and uses professional judgement based on knowledge and experience of similar schemes to determine the significance of effect.

Updated DMRB Guidance

13.4.24. Since the assessments reported in this ES were completed, a number of DMRB guidance documents have been superseded and updated with revised guidance. The updated DMRB document relevant to material assets and waste is:

a. DMRB LA 110 Material Assets and Waste Revision 0 (LA 110) (**Ref. 13.21**), August 2019, which supersedes Interim Advice Note 153/11 (IAN 153/11).

13.4.25. To determine the implications of the updated guidance to the conclusions of the ES, a sensitivity test has been undertaken to identify key changes in the assessment methodology and determine whether there would be changes to the significant effects reported in this ES if the updated guidance had been used for the assessment.

13.4.26. The findings of the sensitivity test are presented in **Appendix 4.5: DMRB Sensitivity Test**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**), and in **Section 13.10** of this chapter.

SENSITIVITY AND MAGNITUDE CRITERIA FOR MATERIAL RESOURCES

13.4.27. The sensitivity and magnitude of affected receptors has been assessed in this chapter, using the criteria set out in **Table 13-4** and **Table 13-5**. The assessment has been based on best practice, professional judgement and internal guidance from the Applicant. Where one or more of the following criteria in each category is met, the corresponding sensitivity criteria has been applied.

Table 13-4 - Sensitivity Criteria

Sensitivity	Materials	Waste
Very High	Comprises no re-used or recycled aggregate (alternative materials) Are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock or are known to be insufficient regarding supply and stock* Offer little or no sustainable features and benefits compared to traditional materials *	The scheme would require new (permanent) waste infrastructure to be constructed to accommodate waste
High		>50% of the scheme waste requires disposal outside of the region
Medium	Comprises re-used/recycled aggregate (alternative materials) below the lower of the relevant regional or national percentage target (refer to Notes below) Are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock *	1-50% of the scheme waste requires disposal outside of the region

<table>
<tr><th>Sensitivity</th><th>Materials</th><th>Waste</th></tr>
<tr><td></td><td>Offer some sustainable features and benefits compared to traditional materials*</td><td></td></tr>
<tr><td>Low</td><td>Comprises re-used or recycled aggregate (alternative materials) above the higher of the relevant regional or national percentage target (refer to Notes below)
Are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock *
Offer sustainable features and benefits compared to traditional materials*</td><td>Waste infrastructure has sufficient capacity to accommodate waste from the scheme, without compromising integrity of the receiving infrastructure (design life or capacity) within the region</td></tr>
<tr><td>Negligible</td><td>No reduction or alteration in the availability of material assets at a regional scale in relation to the resources the scheme would use</td><td>No reduction or alteration in the capacity of waste infrastructure at a regional scale</td></tr>
<tr><td>Notes</td><td colspan="2">*Denotes where industry-recognised best practice criteria have been added to those set out by the Applicant’s internal guidance, to help refine and make more robust the thresholds and assessment process.
Recycled aggregate targets 2005 – 2020 (Ref. 13.22)
The higher target for recycled aggregate between the national average or region shall apply. Where a project is located in more than one region, the regions target where the majority of the materials are to be sourced shall apply.

<table>
<tr><th>Region</th><th>Recycled content target (alternative materials)</th><th>Total aggregate provision (million tonnes)</th></tr>
<tr><td>North East</td><td>26%</td><td>193</td></tr>
<tr><td>England Average</td><td>25%</td><td>434</td></tr>
</table>
</td></tr>
</table>

13.4.28. The magnitude of impact has been assigned as described in **Table 13-5**.

Table 13-5 - Magnitude criteria

Magnitude	Materials*	Waste
Major	- >50% of primary materials to be sourced internationally - Sterilises ≥1 mineral safeguarding site and/or peat resource	- >1% reduction or alteration in national capacity of waste infrastructure, as a result of accommodating waste from a project
Moderate		- >1% reduction or alteration in the regional capacity of waste infrastructure as a result of accommodating waste from a project
Minor	- >50% of primary materials to be sourced nationally (with other primary materials sourced at a lower geographic scale)	- >1% reduction or alteration in the regional capacity of waste infrastructure as a result of accommodating waste from a project
Negligible	- Requires ≤50% of primary materials to be sourced nationally (with other primary materials sourced at a lower geographic scale)	- ≤1% reduction or alteration in the regional capacity of waste infrastructure
No change	- No reduction or alteration in the availability of material assets at a regional scale in relation to the resources the project will use	- No reduction or alteration in the capacity of waste infrastructure at a regional scale
Notes	* For materials: magnitude of impact may be reduced wherever non-renewable, virgin, primary material consumption is reduced e.g. through use of recycled, secondary content, or materials with sustainable features	

SIGNIFICANCE OF EFFECTS

13.4.29. The outputs of comparing sensitivity against magnitude are assessed against the significance of effects matrix provided in **Table 13-6**, as reproduced from Table 2.4 of DMRB Part 5 HA 205/08 (**Ref. 13.23**).

Table 13-6 - Matrix to Assign Significance of Effect Category

		Magnitude of Impact				
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
Sensitivity	**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

13.4.30. The assessment of potential effects as a result of Part A considers the construction and operational phases. The construction phase includes demolition, site remediation and preparation, and construction activities, as set out in **Chapter 2: The Scheme**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**). The operational phase commences following the construction of Part A and subsequent opening.

13.4.31. The significance level attributed to each effect has been assessed based on the magnitude of impact due to Part B and the sensitivity of identified receptors.

13.4.32. The significance of effect has been determined in this chapter by using the thresholds presented in **Table 13-7**, which are based on internal guidance provided by the Applicant. Professional judgement based on knowledge and experience of similar schemes has been used to define the resultant significance of effects.

Table 13-7 – Effect Threshold

Effect Threshold	Materials Significance of Effect	Waste Significance of Effect
Neutral	Not Significant	Not Significant
Slight	Not Significant	Not Significant
Moderate	Not Significant	**Significant**
Large	**Significant**	**Significant**
Very Large	**Significant**	**Significant**

DATA SOURCES

13.4.33. The following data sources have been used to inform this assessment:

a. Northumberland Local Plan: Publication Draft Plan (Regulation 19) for Consultation (January 2019) and Policies Map (**Ref. 13.17**)
b. Department for Business Innovation & Skills, Monthly Bulletin of Building Materials and Components - January 2018 (**Ref. 13.24**)
c. North East Aggregates Working Party Annual Aggregates Monitoring Report (2017) (**Ref. 13.25**)
d. House of Commons Library UK Steel Industry: Statistics and Policy (2018) (**Ref. 13.26**)
e. British Geological Society, Minerals Produced in the UK (2014) (**Ref. 13.27**)
f. Mineral Products Association, Profile of the UK Mineral Products Industry (2018) (**Ref. 13.28**)
g. Natural England MAGIC mapping website (**Ref. 13.29**)
h. The Department of the Environment, Food and Rural Affairs (Defra), Basis of the UK BAP target for the reduction in use of peat in horticulture – SP0573 (2009) (**Ref. 13.30**)
i. Defra (2019) UK Statistics on Waste (**Ref. 13.31**)
j. Environment Agency, Waste Management Information 2018: England (**Ref. 13.32**)
k. Environment Agency, Remaining landfill capacity, England (2018) (**Ref. 13.33**)
l. Material and waste data provided by the Buildability Advisor

13.5 ASSESSMENT ASSUMPTIONS AND LIMITATIONS

13.5.1. The assessment of materials is based upon the validity of the collated third-party information, regarding the anticipated materials to be used and waste generated and disposed of.

13.5.2. Material and waste types and quantities provided at this stage are indicative only (as provided by the Buildability Advisor) and would be verified through more accurate modelling undertaken during detailed design, and through the application of a SWMP and MMP by the main contractor as Part A progresses into construction.

13.5.3. It is assumed that the foot and mouth burial site located near Highlaws Junction would not be disturbed by ensuring that any works required for Part A do not disturb or penetrate the encapsulated pits. Where there is a risk of disturbance or damage to the pits, the Highlaws Junction would be relocated at detailed design (as considered by Part A Assessment Parameter 2 within **Chapter 2: The Scheme**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**).

13.5.4. The presence of Ash Dieback disease in the location of Part A may adversely impact the re-use of site-won earthworks, whereby the diseased vegetation (including root structures) must be retained in-situ, due to the legal restrictions on the movement of plants infected with ash dieback. However, as the diseased vegetation cannot be removed from site and taken to landfill (due to the risk of spreading the disease) this would not alter the significance of effect from waste disposed. Further details on ash dieback is available in the **Arboricultural Report** in **Appendix 7.5**, **Volume 7** of this ES (**Application Document Reference: TR010041/APP/6.7**).

13.5.5. During the demolition and site preparation phases of Part A, there is a risk that asbestos may be present within North Gate House and its associated outbuildings and within made ground on Part A. This has been identified as potential hazardous and contaminated waste in the assessment. The volume of asbestos waste from the demolition of the property is not known at this stage, however this is not expected to alter the significance of effect from waste disposed as there is sufficient capacity for hazardous waste in the region.

13.5.6. Information on the source and recycled content of materials, and the intended destination for any waste, has not been provided at this stage. Instead, it would be determined by the main contractor responsible for the construction of Part B, once further information is made available during detailed design. As such, a worst case scenario of 0% use of recycled aggregates has been applied to the assessment of Part A.

13.5.7. Baseline data and information for the assessment are (unless otherwise stated) only available to 2018. Data for material resource availability, landfill capacity and waste recovery are only updated periodically. The most up to date sources of available information has been used at the time of writing. The absence of any data in this context is not anticipated to materially affect the overall findings of the assessment.

13.5.8. UK landfill operators can claim commercial confidentiality for their data at the time of submission to the Environment Agency; data for sites with a commercial confidentiality in place are therefore unavailable for the analyses presented in this chapter.

13.5.9. Defra has been consulted 'in general' (i.e. not specific to Part A) to determine whether generation and recovery rates for Construction, Demolition and Excavation (CDE) arisings were available by region.

13.5.10. Defra confirmed that it does not publish CDE figures at a regional level, and only national (England) data are accessible through the publicly available Waste Data Interrogator Database; the database is held and operated by the Environment Agency. During this consultation their response stated that *'the methodology used to generate these figures is complex, in order to take into account, the inherent double-counting and data gaps that are present within waste system data, and it would not be feasible to reproduce these on a regional basis.'*

13.5.11. Until such a time that CDE generation and recovery rates by region are available, transfer (non-civic), recovery and metal recycling data (available through the Waste Data Interrogator Database) will be used as the closest possible proxy.

13.6 STUDY AREA

13.6.1. The primary Study Area comprises the Order Limits, as described in **Chapter 2: The Scheme**, **Volume 1** and as illustrated on **Figure 1.1: Location Plan: Part A**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**). Within this area, construction materials would be consumed (used, reused and recycled) and waste would be generated.

13.6.2. The secondary Study Area extends to the availability of construction and recovered material resources within the North East of England (Northumberland, Tyne and Wear, Durham and the Tees Valley) and the UK, and the capacity of waste management facilities in the North East of England.

13.7 BASELINE CONDITIONS

13.7.1. The operation and maintenance of the existing A1, within the Order Limits, requires the consumption of some materials and generates some arisings that may need to be disposed of as waste. Currently, neither the construction materials consumed, nor the types or volume of waste generated and disposed of from the agricultural land (fields) upon which the online widening of the carriageway is to be constructed, are known. Therefore, professional judgement has been used to determine that no bulk quantities of construction materials would be used on the fields and no significant waste is likely to be generated from the fields.

13.7.2. The following section describes baseline material consumption and waste disposal for the current assets and provides regional and national information and data in the context of which the assessment has been undertaken.

MATERIAL RESOURCES

Materials Currently Required

13.7.3. The current operation and maintenance of the existing A1, within the Order Limits, requires a small number of specialist components (for example, signage, steelwork for replacement barriers) as well as some bulk material (asphalt for minor re-surfacing) for routine works and repairs of the highway and ancillary infrastructure. The current consumption of construction and other material resources within the Order Limits is, however, deemed minimal as resources required for day to day maintenance and operation of the current asset would be very limited in scale.

UK and Regional Perspective of Construction Materials

13.7.4. **Table 13-8** (**Refs. 13.25**, **13.26**, **13.27**, **13.28** and **13.29**) provides a summary of the availability of the main construction materials available in North East England and the UK, as required to deliver typical highways schemes. The overview provides a context in which the assessment of impacts and significant effects from material consumption on Part A can be undertaken.

Table 13-8 - Construction materials availability in the North East of England and the UK

Material Type	Availability (2018 unless otherwise stated)	
	North East	UK
Sand and gravel [+]	2.0 Mt	58.3 Mt

Material Type	Availability (2018 unless otherwise stated)	
	North East	**UK**
Permitted crushed rock *	5.1 Mt (2017)	144.5 Mt (2017)
Concrete blocks #	2.2 Mm^2 (North)	6.8 Mm^2
Primary aggregate *	6.3 Mt (2016)	203 Mt (2017)
Recycled and secondary aggregate *	1.3 Mt (2016)	74 Mt (2017)
Ready-mix concrete +	0.7 Mm^3 (2017)	25.9 Mm^3 (2017)
Steel +	(no data)	8 Mt (2016)
Asphalt *	0.8 Mt (2017)	27.3 Mt (2017)
# stocks + production * sales	Mt – Million tones Mm^3 – Million cubic metres Mm^2 – Million square metres	

Data based on the following sources

- Department for Business Innovation & Skills, Monthly Bulletin of Building Materials and Components - January 2018 (**Ref. 13.24**)
- North-East Aggregates Working Party Annual Aggregates Monitoring Report (2017) (**Ref. 13.25**)
- House of Commons Library UK Steel Industry: Statistics and Policy (2018) (**Ref. 13.26**)
- British Geological Society, Minerals Produced in the UK (2014) (**Ref. 13.27**)
- Mineral Products Association, Profile of the UK Mineral Products Industry (2018) (**Ref. 13.28**)

13.7.5. The availability of construction materials typically required for highways construction schemes in the North East of England and across the UK, indicates that stocks, production and sales remain buoyant.

13.7.6. The North East of England has, in general, a lower availability of construction materials by comparison with other regions in England. This has the potential to increase sensitivity, particularly where adverse cumulative impacts are realised, which has been considered accordingly in **Chapter 16: Assessment of Cumulative Effects**, **Volume 4** of this ES (**Application Document Reference: TR010041/APP/6.4**).

13.7.7. Taking into account the above information and data, the sensitivity of materials for Part A is considered to be **medium** as the availability of construction materials may suffer from some

potential issues regarding stock and supply due to the lower availability within the region, and the fact that quantity of recycled aggregate to be used on Part A is currently not known.

13.7.8. There are no known peat resources (**Ref. 13.29**) or active peat extractions (**Ref. 13.30**) within the Order Limits.

SITE ARISINGS

Site Arisings Currently Generated

13.7.9. Current routine operation and maintenance works on the existing assets within the section of the A1 within the Order Limits generate small volumes of site arisings as day to day operation and maintenance of the current asset would be very limited in scale.

UK and Regional Perspective: Transfer, Recovery and Recycling

13.7.10. Defra data (**Table 13-9**) shows that in England, the recovery rate for non-hazardous construction and demolition arisings have remained above 90% since 2010. This exceeds the EU target of 70%, which (subject to future changes in national legislation) the UK must meet by 2020 (**Ref. 13.31**).

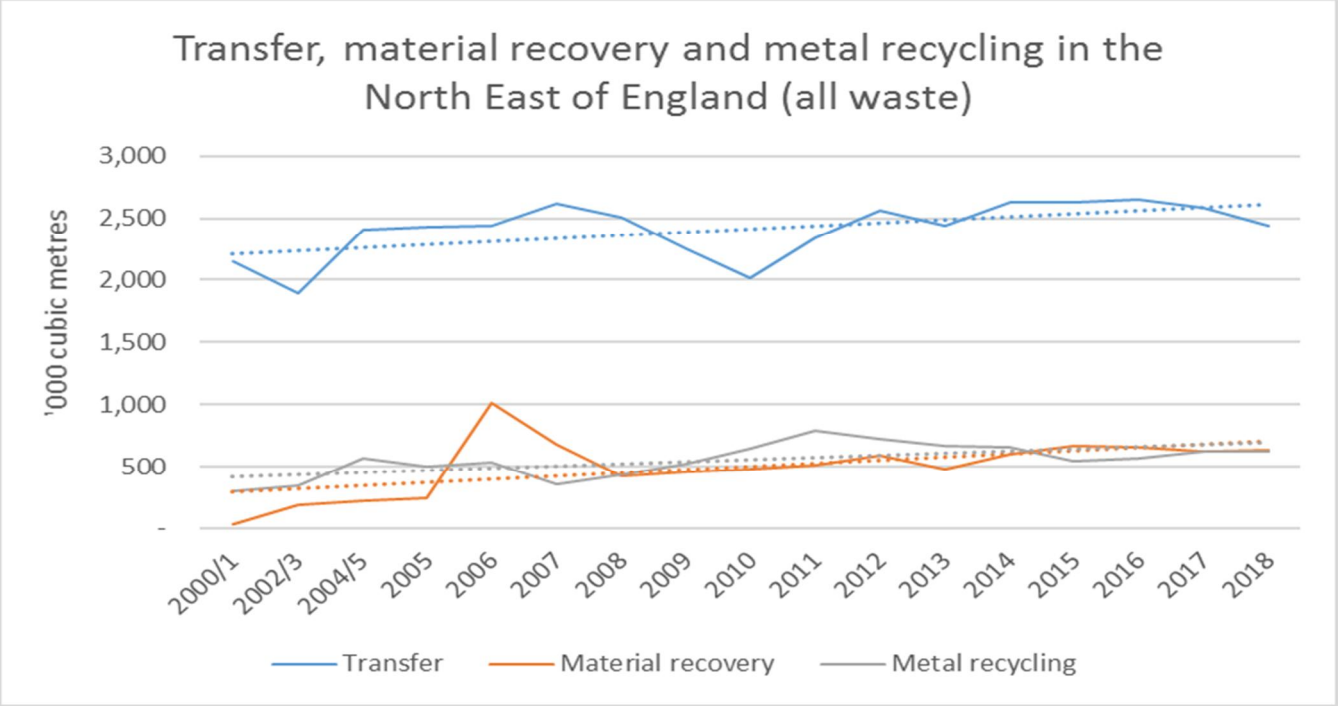
Table 13-9 - Non-Hazardous Construction and Demolition Waste Recovery in England

Year	Generation (Mt)	Recovery (Mt)	Recovery rate (%)
2010	53.6	49.4	92.2%
2011	54.9	50.8	92.5%
2012	50.5	46.4	92.0%
2013	51.7	47.6	92.0%
2014	55.9	51.7	92.4%
2015	57.7	53.3	92.3%
2016	59.6	55.0	92.1%

The 2019 update of the data in this table by Defra did not extend the data range beyond 2016 https://www.gov.uk/government/statistical-data-sets/env23-uk-waste-data-and-management).

13.7.11. No regional data for construction, demolition and excavation production or recovery rates are currently available for the North East of England. Instead, data in **Figure 13.2** has been collated from the Environment Agency (**Ref. 13.32**) to show that rates of material transfer (non-civic) and recovery in the region have risen steadily over the past 18 years. Metal recycling shows a steady, overall increase. Data obtained reflect the recovery of all potential waste types in the North East of England and hence includes, but are not specific to, construction, demolition and excavation arisings.

Figure 13.2 - Transfer, Material Recovery and Metal Recycling in North East England



13.7.12. Construction and demolition recovery trends across England (**Figure 13.2**) and data in **Table 13-10** (**Ref. 13.32**) confirm that whilst trends for transfer, recovery and metal recycling in the North East of England display different characteristics, data indicate that there is likely to be regional infrastructure and capacity for the transfer and recovery for construction, demolition and excavation wastes from Part A.

Table 13-10 - Permitted Waste Recovery Management Sites in North East England (2018)

Waste Recovery Facility Type	Number of Sites
Incineration	11
Transfer	170
Treatment	152
Metal recovery	147
Use of waste	1
Total	**481**

13.7.13. The availability of materials recovery infrastructure in the North East, and across England, suggests that there is strong potential to divert from landfill site arisings generated by Part

A. Both the importance of this infrastructure and (hence) the potential to maximise the re-use and recycling value of site arisings, have been taken into account during the assessment process.

WASTE GENERATION AND DISPOSAL

Waste Currently Generated and Disposed Of

13.7.14. The current operation and maintenance of the existing A1 assets currently generates small volumes of waste from routine maintenance, in combination with littering, signage replacement, replacement of reflective road studs (cats' eyes), vegetation from verge clearance and minor barrier refurbishments.

13.7.15. The impact associated with disposing of this waste is, however, deemed minimal in the context of available regional capacity.

Regional Perspective: Remaining Landfill Capacity

13.7.16. At the end of 2018, the landfill sites in the North East of England (as presented in **Table 13-11**) were recorded as having remaining capacity (**Ref. 13.33**).

Table 13-11 - Landfill Sites in the North East of England

Facility Name	Local Authority	Landfill Site Type	Remaining Capacity 2018 (m^3)
Port Clarence landfill Site (Haz)	Stockton on Tees	Hazardous Merchant Landfill	4,937,920
Bishop Middleham Quarry 2	County Durham	Inert Landfill	4,315,999
ICI No 3 Teesport	Redcar and Cleveland	Hazardous Merchant Landfill	2,011,796
Aycliffe Quarry Landfill	Sedgefield	Non Hazardous Landfill with Stable Non-Reactive Hazardous Waste (SNRHW) cell	1,883,401
Crime Rigg Quarry	County Durham	Inert Landfill	1,780,000
Joint Stocks Landfill Phase 2	Durham City	Non Hazardous	1,594,094

Facility Name	Local Authority	Landfill Site Type	Remaining Capacity 2018 (m^3)
Old Quarrington Quarry Landfill	County Durham	Inert Landfill	1,527,914
ICI No 2 Teesport	Redcar and Cleveland	Non Hazardous	1,328,890
Cowpen Bewley Landfill	Stockton on Tees	Non Hazardous	1,285,769
Ellington Road Landfill Site	Wansbeck	Non Hazardous Landfill With SNRHW cell	1,113,284
Marsden Quarry Landfill	South Tyneside	Inert Landfill	964,898
Blaydon Quarry Landfill Site	Gateshead	Non Hazardous	950,000
Hollings Hill Quarry Landfill	County Durham	Inert Landfill	572,627
Seaton Meadows	Hartlepool	Non Hazardous Landfill With SNRHW cell	550,332
Port Clarence Non-Hazardous Landfill Site	Stockton on Tees	Non Hazardous	542,950
Field House Quarry	Sunderland	Inert Landfill	370,869
Houghton-Le-Spring Landfill Site	Sunderland	Non Hazardous	217,952
Merryshields Quarry	Northumberland	Inert Landfill	190,908
Coatham Stob Quarry (Area 6)	Stockton on Tees	Non Hazardous	164,096

Facility Name	Local Authority	Landfill Site Type	Remaining Capacity 2018 (m^3)
Alcan Ash Lagoons 1-4	Wansbeck	Non Hazardous	7,442
Springwell Quarry	Sunderland	Non Hazardous	6,455
Total Capacity			**26,456,539**

13.7.17. Environment Agency data (**Ref. 13.33**) confirms that at the end of 2018, 21 landfill sites in the North East of England had 26.4 million cubic meters (Mm^3) of remaining capacity. Since production of the **Scoping Report** (**Application Document Reference: TR010041/APP/6.10**) for Part A (based on 2016 data), the Environment Agency noted that the following landfill sites were no longer operational:

a. CLE 3/8 Landfill Site – this has been removed from the figures in **Table 13-11** and **Table 13-12** below.
b. Path Head Landfill – this was not included in the 2018 data.

13.7.18. **Table 13-12** provides the split of capacities by waste type. The change in capacity from 2017 to 2018 is also shown.

Table 13-12 - Remaining Landfill Capacity in North East England

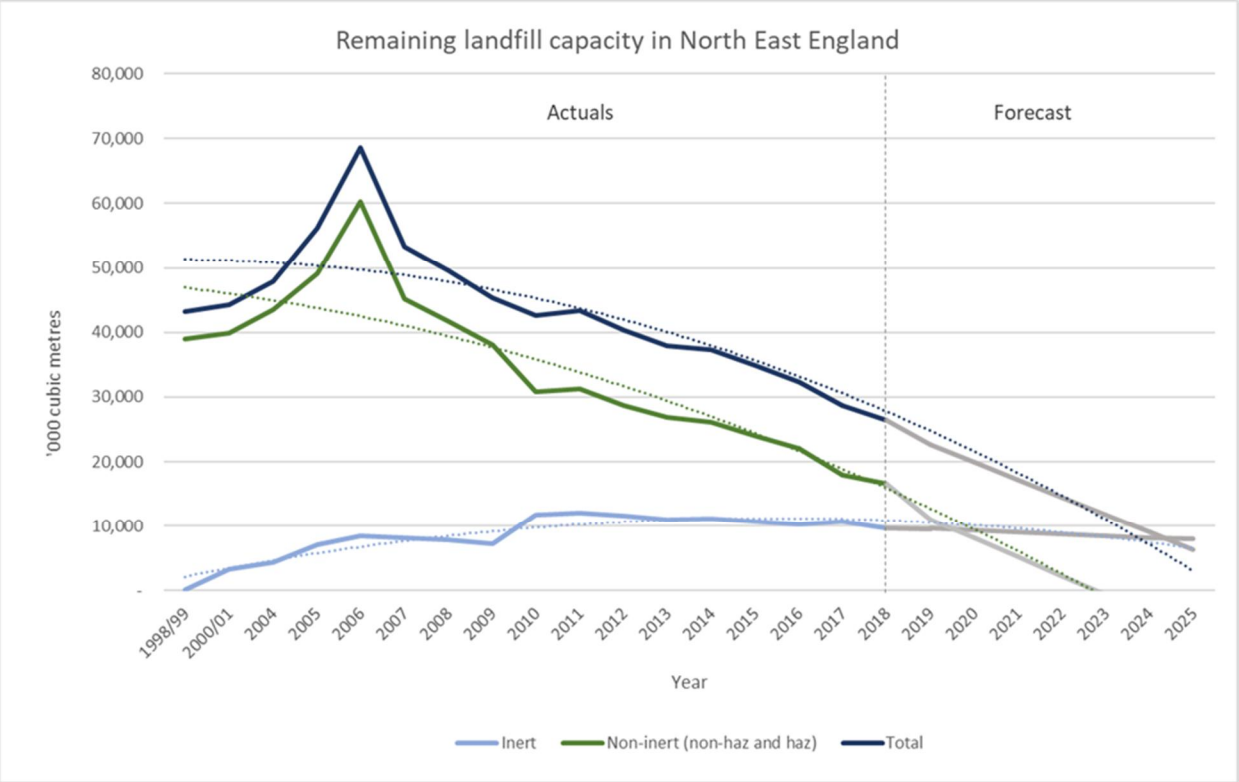
Landfill type	Capacity in 2017(m^3)	Remaining capacity m^3 (2018)	2017 to 2018 Capacity Comparison (Mm^3)
Hazardous (merchant and restricted)	7,058,902	6,949,716	0.1 Mm^3 decrease
Inert	10,736,556	9,862,158	0.8 Mm^3 decrease
Non-hazardous (including stable hazardous waste cells)	10,951,343	9,644,665	1.3 Mm^3 decrease
Total	**28,746,801**	**26,456,539**	**2.3 Mm^3 decrease**

13.7.19. The Northumberland Local Plan: Publication Draft Plan 2019 (Waste Policies WAS1 and WAS3) (**Ref.13.17**) does not specify any proposals for the development of additional landfill

sites, although utilising former mineral sites for inert construction and demolition waste is noted as a future option, if required.

13.7.20. **Figure 13.3** shows the remaining landfill capacity in the North East of England (**Ref. 13.33**) and uses simple MS Excel forecasting calculations based on existing trends to demonstrate long term void capacity to the year 2025 in the absence of future provision.

Figure 13.3 – Remaining Landfill Capacity in North East England (2000/1-2025)



13.7.21. Baseline data indicates that total and non-inert landfill capacity is likely to become an increasingly sensitive receptor over the life of Part A to the first full year of operation. Remaining capacity for non-inert wastes (hazards and non-hazardous wastes) are forecast to expire in 2022, in the absence of future provision. **Figure 13.3** shows that waste capacity in the North East is forecast from 2018 to 2025 to reduce by:

a. 18% for inert waste
b. 100% for non-inert wastes (including hazardous and non-hazardous wastes)
c. 76% (total)

13.7.22. Individually, the sensitivity of different landfill capacity types over the lifetime of Part A are assessed to be:

a. Inert waste (**low**) as existing waste infrastructure is deemed to have sufficient capacity to accommodate waste from Part A.

b. Non-inert waste (**high**) as over 50% of project waste is expected to require disposal outside of the region but no new (permanent) waste infrastructure is considered necessary to accommodate the waste.

c. Total waste (**high**) as over 50% of project waste is expected to require disposal outside of the region but no new (permanent) waste infrastructure is considered necessary to accommodate the waste.

13.7.23. Overall (assuming worst case scenario), the sensitivity of landfill capacity is assessed to be **high**.

FUTURE BASELINE

13.7.24. The future baseline describes the conditions that are expected to develop and evolve over an approximate ten-year period if Part A was not to proceed ('do minimum').

Materials

13.7.25. In the future baseline, it is not anticipated that there would be any change to the scale and nature of repair and maintenance works currently required in the 'do minimum' scenario. Materials consumption is expected to include small quantities of materials such as specialist components (for example, signage and steelwork for replacement barriers) as well as some bulk products (asphalt for minor re-surfacing). The do-minimum future baseline scenario would therefore be unlikely to change the current consumption of materials, which would remain minimal.

Waste

13.7.26. In the future baseline, it is anticipated that there would be no change to the scale and nature of the repair and maintenance works currently required in the 'do minimum' scenario. Small volumes of waste are expected to be generated from routine bridge maintenance, littering, signage replacement, replacement of reflective road studs (cat's eyes), vegetation from verge clearance and minor barrier refurbishments. The do-minimum scenario would be unlikely to change the current generation of waste, which would remain minimal in the context of available regional capacity.

13.8 POTENTIAL IMPACTS

13.8.1. Part A has the potential to consume material resources (including those recovered from site arisings) and produce and dispose of waste during the demolition, site preparation and construction phases of the carriageways and associated infrastructure.

13.8.2. The associated potential impacts (both direct and indirect) would occur principally during construction, and potentially in the first year of operation.

13.8.3. Potential impacts would be associated with the production, processing, consumption and disposal of material resources.

13.8.4. The potential impacts of Part A as a result of the consumption of material resources (including recovered site arisings) and waste generation and disposal, are likely to occur on-

site, off-site within the UK and, potentially, internationally. **Table13-13** summarises the likely potential impacts on materials consumption, and waste generation and disposal.

Table 13-13 - Potential Impacts Associated with Materials and Waste

Element	Direct Impacts	Indirect Impacts
Materials	Consumption and depletion of natural and non-renewable resources	Release of greenhouse gas emissions Water consumption and scarcity Nuisance to communities (visual, noise) Detriments to health and wellbeing
Waste	Reduction in landfill capacity	Release of greenhouse gas emissions Nuisance to communities (visual, noise) Detriments to health and wellbeing

CONSTRUCTION

Detailed Assessment Reporting Matrix

13.8.5. The potential impacts associated with material resource consumption and waste generation and disposal during the construction of Part A are reported in **Table 13-14**. These take into account design measures described in **Section 13.9**.

13.8.6. The subsequent tables, Table 13-15 to **Table 13-17** present the supporting data available upon which the detailed assessment reporting matrix was generated. The data describes the quantities and likely source of materials required for the construction of Part A and the expected recovery action or disposal routes for arisings and waste generated during construction.

Table 13-14 - Detailed Assessment Reporting Matrix: Construction

Activity	Potential Impacts Associated with Material Resources and Waste	Description and Magnitude of the Impacts
Site remediation and preparation	Materials Consumption of resources (such as timber and aggregate) during site remediation and preparation is likely to impact primary materials stocks, supplies and production. The main impacts would be the consumption of natural and non-renewable resources. Impacts would result in the depletion of natural resources and local/regional stocks; and degradation of the natural environment. The following material resources are expected to be consumed as part of the site remediation and preparation (refer to **Table 13-15** for further details): - Timber and other products required for the erection of perimeter fencing and temporary barriers; - Aggregate and stone for ground improvement at site, prior to use by heavy plant.	It is anticipated that in line with good practice, materials would be sourced from local supplies, as far as reasonably practicable. Any impacts associated with material resource consumption would be **adverse, permanent and direct**. The magnitude of impact, taking into account embedded mitigation measures, is considered **minor**, as over 50% of primary materials are anticipated to be sourced nationally or at a lower geographic scale.
	Waste Generation and disposal of waste during site remediation and preparation would adversely impact regional landfill capacity. **Table 13-16** details where site arisings would be diverted from landfill. Arisings and wastes likely to be generated during site preparation include: - Hazardous or contaminated material found on or beneath Part A (e.g. asbestos and coal tar[1]) - Cut material unsuitable for re-use. It has been estimated that 315,000 t of unacceptable earthworks material would require disposal to landfill. Other arisings generated during site remediation and preparation which would be diverted from landfill include: - Vegetation and other above ground materials produced by site clearance (potentially, including invasive weeds) - Surplus topsoil or subsoil materials	It is anticipated that wastes would, where possible, be diverted from landfill with a beneficial effect through recovery, reuse and recycling action. However, this may not be possible for certain waste types or volumes, resulting in **adverse, permanent and direct** impacts. The magnitude of impact is considered **negligible** for inert waste and non-inert waste. Specifically, the anticipated disposal of unacceptable earthworks material is considered to have ≤1% reduction or alteration in the regional capacity of waste infrastructure (approximately 26.5 Mm^3 or 47.7 Mt).
Demolition of existing structures	Materials No adverse impacts are anticipated associated with demolition.	No adverse impacts anticipated. The magnitude of impact is considered as **no change**.
	Waste	As far as possible, arisings from demolition would be reused or recycled on or off site, to reduce the impact on landfill. Where diverting site arisings from landfill is not

[1] The presence of coal tar has not been confirmed at the time of writing, but it has been included as a possible demolition arising as part of a worst-case scenario.

Activity	Potential Impacts Associated with Material Resources and Waste	Description and Magnitude of the Impacts
	Waste generation and disposal is expected to adversely impact on regional landfill capacity and cause degradation to the natural environment. Wastes generated during demolition are anticipated to include: - Broken out concrete, cut steel and road surface planings - Hazardous or contaminated material found on or beneath Part A (e.g. asbestos from buildings and coal tar from road planings) - Other demolition wastes Waste in this phase of the works would, for example, be produced during the following: - Demolition of one residential property - Demolition of two existing culverts - Partial demolition (small sections) of some existing culverts to facilitate their extension - Breaking out of the existing highway to facilitate the online widening - Closure of the Bywell Shooting Grounds and Low Epsley access roads. Refer to **Table 13-16**, **Table 13-17** and **Chapter 2: The Scheme**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**) for further details.	possible, the impacts associated with disposing of waste would be adverse, permanent and direct. The magnitude of impact is considered **negligible** for inert waste and non-inert waste. Specifically, due to the anticipated re-use of site arisings, the low volume of demolition waste disposed of to landfill would result in ≤1% reduction or alteration in the regional capacity of waste infrastructure.
Construction	Materials Construction would require the greatest use of primary and secondary materials (non-renewable and natural), incorporating aggregates, metals, concrete asphalt and plastics (refer to **Table 13-15** for further details). Material resources would be required for the construction of Part A including: - The 6.5 km online and 6.1 km offline sections - The River Coquet bridge - An underbridge (at Burgham Park) and an overbridge (at Causey Park) - New subway at Parkwood - The provision of parking lay-bys and detention basins - New culverts and extension to existing culverts - Three grade separated junctions - New accesses and local roads to new junctions - Diversion of minor roads - A new parallel road linking the existing A1 with West Moor junction - Diversion of existing utilities Construction materials to be consumed would include: - Bulk materials for earthworks (obtained from site-won arisings) - Road paving materials, including sub-base and bituminous materials - Steel – for structures, reinforcement and signage - Concrete including pre-cast or prefabricated elements - Aggregate - Timber for fencing and formwork	The construction phase for materials has been assessed to have an adverse, permanent and direct impact on the consumption of construction materials. The magnitude of impact is considered to be **minor**, as over 50% of the materials are anticipated to be sourced nationally or at a lower geographic scale.

Activity	Potential Impacts Associated with Material Resources and Waste	Description and Magnitude of the Impacts
	- Aluminium street furniture and signage - Other general construction materials - Oils/fuel for construction plant and machinery - Copper cabling The main potential impact from the use of construction material is the consumption of natural resources resulting in depletion of natural resources and local/regional stocks, and degradation of the natural environment.	
	Waste The majority of waste is expected to be generated during the construction of new carriageways, structures and associated assets. It is anticipated that the following wastes would be generated: - Bulk earthworks - Timber from formwork and fencing - Concrete, bricks and aggregate waste - Road paving materials including sub-base and bituminous materials - Hazardous or contaminated material found or generated on Site - Surplus cabling - Redundant street furniture and signage - Steel waste e.g. safety barriers - General construction waste e.g. plastic packaging and wrapping, ducting, damaged goods. It is anticipated that the majority of arisings (such as earthworks, road planings, concrete, bricks and aggregate – refer to **Table 13-16** for further details), would be diverted from landfill in line with best practice. Where waste cannot be recovered, the potential impact would comprise a reduction in landfill void capacity (refer to **Table 13-7**).	In accordance with the development and application of a SWMP and MMP, it is anticipated that wastes would, where possible, be diverted from landfill with impacts being reduced through recovery, reuse and recycling action. Where site arisings cannot be diverted from landfill in line with best practice, impacts would be adverse and direct, and are generally accepted to be permanent in nature. The magnitude of impact is considered **negligible** for inert and non-inert waste. This is based on the anticipated volume of waste being disposed of to landfill (315,000 tonnes of earthworks), resulting in ≤1% reduction or alteration in the regional capacity of waste infrastructure. The diversion of any (currently) unsuitable cut material, through treatment and/ or reuse on Part A, would be expected to further reduce the magnitude of impact on landfill.

13.8.7. The materials set out in **Table 13-15** are those which are likely to be consumed during the site remediation, preparation and construction phase of Part A as appropriate. Primary and secondary materials would be required for construction elements of Part A.

13.8.8. The information in **Table 13-15** has been gathered from the Design Team and the Buildability Advisor and is consolidated to show the main materials types required.

Table 13-15 - Material Assets Imported to site during the Construction Phase

Material Assets	Quantity (tonnes unless otherwise stated)	Likely Source and Approximate Distance from Part A (km)
Earthworks and topsoil fill	None	Earthworks from excavations are to be reused on Part A, though a surplus is expected to be generated. There is, therefore, no requirement to import earthworks to site. Additionally, as set out in **Table 13-15** of **Chapter 13: Material Resources**, **Volume 3** of this ES (**Application Document Reference: TR010041/APP/6.3**) for Part B, the surplus would be used in the construction of Part B, should it be suitable.
Asphalt	60,702	This would likely be sourced from an asphalt plant in Northumberland (to be confirmed at detailed design). Options include: Howick (25 km); CEMEX Divet Hill (25 km); Tarmac Barrasford (35 km)
Aggregate	240,000	The likely source of these materials would be Howick quarry in Northumberland (25 km).
Concrete	8,450	It is expected that concrete for reinforced concrete structures, drainage and kerbing materials would be sourced from CEMEX, Bedlington in Northumberland (15 km). Pre-cast concrete products are likely to be sourced from regional, national and international locations including Ilkeston (260 km), Maltby (180 km), Telford (290 km) and Co Offaly in Ireland (470 km).
Steel	1,944	Sources of reinforcement, safety fencing, bridge beams and parapets are likely to be sourced from Sheffield (210 km), West Midlands (300 km), Darlington (85 km) and Birmingham (310 km) respectively.

Material Assets	Quantity (tonnes unless otherwise stated)	Likely Source and Approximate Distance from Part A (km)
Plastic	200	Drainage pipework is likely to be sourced from Doncaster (195 km).
Timber	1,900	The likely source for timber fencing is Goole (180 km) and temporary formwork is likely to be sourced from Jarrow in the North East (35 km).
Other general construction materials (including reflective road studs, signage etc.)	No data available	Source not known

13.8.9. Forecasts for waste recovery (diverted from landfill) from Part A are given in **Table 13-16**. The information has been gathered from data provided by the Buildability Advisor and consolidated to show the key waste types. The use of arisings would be subject to their classification under re-use criteria through the implementation of an MMP. This would be completed during the construction phase by the main contractor. On site storage arrangements for arisings has been considered in the design of Part A to allow stockpiling of materials for on-site reuse, or prior to off-site recovery or disposal.

Table 13-16 - Forecast Site Arisings that can be Recovered and Hence Diverted from Landfill

Excavated and Other Materials	Quantity (Tonnes Unless Otherwise Stated)	Reuse Process and Approximate Distance from Part A (km) Where Applicable
Topsoil	160,000	Surplus topsoil would be reused on site in thickened topsoil spread.
Suitable earthworks cut	260,000	These would be reused and retained where possible and placed in landscape bunds within the Order Limits. In particular, these would be reused on site in landscape bunds (specifically within proposed bunds 1, 2, 7, 8, 9, 10, 11, 12 & 13).

Excavated and Other Materials	Quantity (Tonnes Unless Otherwise Stated)	Reuse Process and Approximate Distance from Part A (km) Where Applicable
Road planings and sub base	22,000	These planings would be reused on site for a variety of purposes including haul road construction, compound laydown areas, crane pads and capping layer, reducing the requirement for import to Part A[2].
Concrete	3,500	The concrete removed during site clearance and demolition (kerbing elements, concrete fencing and signage foundations, concrete culverts) would be crushed on site for re-use in hardstandings or removed off site to a recycling/ crushing facility.
Drainage arisings (mixed material, potentially including aggregate)	31,000	These would be retained on Part A if possible and placed in landscape bunds within the Order Limits.
Steel	Approximately 150	Existing safety fencing would be removed during site clearance and taken to a recycling facility in Wooler (40 km).
Other excavated materials (for drainage)	6,200	Excavation for structural foundations for bridges and culverts would generate arisings that would be sustainably placed within landscape mound, through a defined need within the Order Limits.
Vegetation	Approximately 500	Vegetation would be mulched and spread on site or removed off site for mulching/logging. Ash trees with ash dieback disease would be disposed of in-situ as there are legal restrictions on the movement of plants infected with the disease. For further information, refer to **Appendix C.3**, **Section 4.3** of **Appendix 7.5: Arboricultural Report**, **Volume 7** of this ES

[2] The presence of coal tar has not been confirmed or otherwise at the time of writing, but it has been included as a possible demolition arising as part of a worst-case scenario.

Excavated and Other Materials	Quantity (Tonnes Unless Otherwise Stated)	Reuse Process and Approximate Distance from Part A (km) Where Applicable
		(**Application Document Reference: TR010041/APP/6.7**).
Timber (from formwork and fencing)	350	The timber elements of the fencing would be taken off site to a recycling facility in Bedlington (15 km).
Masonry	100	The masonry recovered during demolition of the culverts would be taken off site to a recycling facility in Wooler (40 km).
General construction waste (packaging, surplus materials and off-cuts)	Approximately 800	Waste would include in situ concrete, pre-cast concrete products including (for example) kerbs and manholes, timber from formwork, and plastic waste from pipes and packaging. A waste regime to segregate construction waste would be implemented and (where practicable) arisings taken for recycling to a facility in Bedlington (15 km).

13.8.10. Forecasts for waste which cannot be diverted from landfill, or which have been identified for disposal to landfill, are listed in **Table 13-17**. The information has been gathered from data provided by the Buildability Advisor and had been consolidated to show the key waste types.

Table 13-17 - Forecast Site Arisings that have been Identified for Disposal to Landfill

Waste	Quantity (tonnes)	Disposal Process
Unsuitable Earthworks cut	315,000	Disposal to licensed landfill
Hazardous and contaminated waste (e.g. asbestos and coal tar)	Quantity unknown at this stage	Disposal to suitable licenced hazardous waste landfill. Coal tar planings would only be sent to landfill if it was not possible to treat these arisings for reuse on Part A.
General construction waste (packaging, surplus materials / off-cuts)	< 800	Any general construction waste that cannot be recycled, reused or otherwise

Waste	Quantity (tonnes)	Disposal Process
		recovered, would be disposed of to landfill

OPERATION

Detailed Assessment Reporting Matrix

13.8.11. The potential impacts associated with material resource consumption and waste generation and disposal during the first year of operation of Part A are reported in **Table 13-13**. Data to forecast the quantity and type of material resources required or the quantity and type of arisings and waste generated during this phase is not available due to the unknown type, extent and frequency of maintenance or repair activity. Therefore, the information described in the table is based on professional judgement and experience of similar road schemes.

Table 13-18 - Detailed Assessment Reporting Matrix: Operation

Activity	Potential Impacts Associated with Material Assets and Waste	Description and Magnitude of the Impacts
Operation and maintenance (during the first year of operation only)	**Materials** Minimal quantities of materials are anticipated to be required during the first year of operation and maintenance. Types of materials resources required are anticipated to be similar to the existing A1 between Morpeth to Felton assets, such as: - Signage - Steelwork for replacement barriers - Asphalt for minor re-surfacing / routine works and repairs of the highway and ancillary infrastructure. Any materials required would impact on the consumption of natural and non-renewable resources resulting in the depletion of natural resources and local and regional stocks.	It is anticipated that, materials would be sourced locally where practicable. The operation and maintenance phase for materials has been assessed to have an adverse, permanent and direct impact on the consumption of construction materials. The magnitude of impact is considered **negligible** as ≤50% of primary materials are anticipated to be sourced nationally or at a lower geographical scale.

Activity	Potential Impacts Associated with Material Assets and Waste	Description and Magnitude of the Impacts
	Waste Waste generation is anticipated to be minimal during the first year of operation and associated only with arisings from final modifications to Part A, in combination with routine maintenance and replacement, littering and vegetation clearance. Waste generated is anticipated to be comparable to that generated by the existing A1 between Morpeth and Felton, which typically comprise: - Waste from routine bridge maintenance - Littering - Signage replacement - Replacement of reflective road studs (cat's eyes) - Vegetation from verge clearance - Minor barrier refurbishments. It is considered that in line with best practice, the majority of wastes would be diverted from landfill. However, any which cannot be diverted would impact on landfill capacity and cause degradation to the natural environment.	It is anticipated that waste would be diverted from landfill where practicable. During the first year of the operation and maintenance, any site arisings which cannot be diverted from landfill in line with best practice, would result in adverse, permanent and direct impacts. The magnitude of impact is considered to be **negligible** as whilst there is a potential for some reduction or alteration in the capacity of waste infrastructure at a regional scale, this is not anticipated to exceed ≤1%.

13.9 DESIGN, MITIGATION AND ENHANCEMENT MEASURES

13.9.1. Specific design, mitigation measures and circular economy opportunities to avoid and mitigate adverse impacts from material resources consumption and site arisings, and the generation and disposal of waste are presented below.

DESIGN MEASURES

13.9.2. Measures that would be implemented during detailed design to avoid and mitigate adverse impacts from material resources consumption, and the generation and disposal of waste, include (embedded mitigation):

a. Designing for resource optimisation by:

i. Simplifying layout and form and using standard sizes
ii. Balancing cut and fill
iii. Setting net importation as a goal for Part A. For example, the production of a net surplus of earthworks on Part A, has removed the requirement to import earthworks to Part A.
iv. Maximising the use of renewable material resources, and materials with recycled or secondary content. For example, the central reserve design would comprise slow viscoelastic recycled materials (up to 80%) for a hardened design.

b. Designing for off-site construction by maximising the use of prefabricated structures and components, encouraging a process of assembly rather than construction, as detailed below:

i. The construction method for the River Coquet bridge would comprise prefabricated elements which would reduce waste production on site.
ii. The Burgham Park Underbridge, Causey Park Overbridge and bridges at Highlaws, Fenrother and West Moor Junctions, would each comprise an integral single span bridge with a prestressed precast concrete beam deck, which would be constructed in a controlled environment off site, along with precast parapets.
iii. Precast elements of the new culvert structures would also be constructed off site, reducing waste production on site.
iv. Retention of an existing culvert (Burgham Culvert) and extensions to existing culverts have been proposed under Part A (e.g. Bockenfield, Glenshotton and Parkwood Culverts).

c. Designing for recovery and reuse by identifying, securing and using material resources at their highest value, whether they already exist on site, or are sourced from other schemes. For example, the re-use of suitable cut material on Part A as fill has been already been incorporated within the design to minimise adverse impacts on virgin material consumption and landfill capacity. In addition, Polished Stone Values (PSVs) would be varied across the carriageway to reduce the demand on premium high PSV aggregate and use more local aggregate. (PSVs are used for estimating the skid resistance of the road surface).

d. Considering how material resources can be designed to be more easily adapted over an asset lifetime. For example, the design of the proposed Burgham Park Underbridge would specifically exclude the use of construction and expansion joints to ensure only minimal maintenance would be required in the future and there would be no need for bearing replacement.

e. Design for the future by seeking to specify materials with low environmental impact (as determined through lifecycle assessment, Green Guide ratings (**Ref: 13.36**) or other industry recognised methods) to minimise lifetime environmental impact.

f. A Construction Environmental Management Plan (CEMP), incorporating a Site Waste Management Plan (SWMP) and CL:AIRE compliant Materials Management Plan (MMP) (**Ref. 13.32**) would be implemented by the main contractor and would set out mitigation measures in order to identify, monitor and manage materials and arisings on site. These commitments are included in the **Outline CEMP** for the Scheme (**Application Document Reference: TR010041/APP/7.3**).

MITIGATION MEASURES

Construction

13.9.3. Measures that would be implemented during construction to avoid and mitigate adverse impacts from material resources consumption and site arisings, and the generation and disposal of waste, include:

a. As far as possible, material resources from demolition would be re-used in the construction of the new road.

b. The following options for re-using materials are being explored and would be agreed at detailed design:

i. The use of site arisings (earthworks cut) unsuitable for re-use on Part A as fill, would be used on site in specified environmental landscape bunds. Approximately 145,000 m^3 would be reused for essential mitigation in landscape bunds (for screening or protected species mitigation, refer to **Figure 7.8: Landscape Mitigation Masterplan**, **Volume 5** of this ES (**Application Document Reference: TR010041/APP/6.5**)). There is an opportunity for material to be re-used on Part B, and/or exported for use to the Applicant's other schemes in the North East. This material would be stored temporarily within Part A until the start of construction of these other schemes. This approach is discussed further in **Section 2.12** of **Chapter 2: The Scheme**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**), as addressed by Assessment Parameters 4, 5 and 9. Should other schemes not be available to use the surplus material, additional bunds and slackened earthworks slopes are proposed within Part A, which would accommodate the surplus material except for a quantity of topsoil, some of which would be temporarily stored within topsoil storage areas. The surplus would then either be reused within proposed environmental bunds or sold locally. The viability of this approach will be determined following the results of ground investigations to determine whether the soil is chemically and geotechnically suitable.

ii. Earthworks material classified as unacceptable for reuse, would be treated and reused on the Scheme in order to divert these arisings from landfill.

c. In order to increase resource efficiency, use of secondary and recycled materials (e.g. steel, concrete or aggregate) would minimise the consumption of primary materials, in line with the regional target of 26% indicated in **Table 13-4** and as detailed in the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**).

Operation

13.9.4. During the first year of operation, the consumption of materials and generation of waste is forecast (using professional judgement based on assessment of similar schemes) to be minimal and hence no significant adverse environmental effects are forecast. This assessment relies upon implementation of best practice measures such as recycling or reuse. Accordingly, any good practice operational measures implemented to increase:

a. The quantity of recycled materials over the use of primary materials would mitigate further the impact of material consumption.
b. Recycling or recovery of any waste generated during the first year of operation would similarly mitigate the impact on landfill capacity.

ENHANCEMENT MEASURES

13.9.5. No further opportunities for enhancement have been identified.

13.10 ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

CONSTRUCTION

13.10.1. **Table 13-19** provides a summary of the likely significant effects during construction. The assessment uses available material and waste data provided by the Buildability Advisor based on the design of Part A and applies the professional judgement of the author to make the assessment.

13.10.2. In summary, the post-mitigation construction phase of Part A is considered **not significant** in relation to material resource consumption and disposal of waste to landfill.

Table 13-19 - Assessment of Likely Significant Effects: Construction

Topic	Potential Impacts	Embedded Mitigation	Other Committed Measures	Justification following Mitigation		Significance of Effect	How Measures would be Implemented, Measured and Monitored
				Sensitivity	**Magnitude**		
Materials	Consumption of natural, non-renewable resources. The total estimated volume of imported material is approximately 313,196 t for Part A. At this time, no information is available on recycled content.	Designing out Waste principles Balancing cut and fill Use of site-won arisings Use of pre-fabricated structures	Maximise sourcing and use of recycled materials Simplifying layout and form	**Medium** Due to a lower than UK average availability of construction materials within the north east region, some potential issues regarding stock and supply may be experienced. Furthermore, the quantity of recycled aggregate to be used on Part A is currently unknown.	**Minor** Over 50% of primary materials would be sourced nationally or at a lower geographic scale.	**Slight** (**not significant**)	Implementation of **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**) incorporating a CL:AIRE-compliant MMP (**Ref. 13.34**)
Waste	Generation and disposal of waste. The total estimated volume of forecast site arisings that can be recovered and diverted from landfill is 484,500 t. The total volume of forecast site arisings that have been identified for disposal to landfill is estimated at 315,800 t.	Re-use of site won arisings Diversion of waste from landfill through implementation action in the highest tiers of the Waste Hierarchy	Consideration of end of life reuse and recovery Treatment of unacceptable arisings to divert from landfill	**Low** (inert waste) Waste infrastructure is considered to have sufficient capacity to accommodate waste from Part A. **High** (non-inert waste) Over 50% of the waste is considered to require disposal outside of the region, but no new (permanent) waste infrastructure would be required.	**Negligible** (inert waste) As ≤1% reduction or alteration in the regional capacity of waste infrastructure is anticipated. **Negligible** (non-inert waste) As ≤1% reduction or alteration in the regional capacity of waste infrastructure is anticipated.	**Neutral** (**not significant**) (inert waste) **Slight** (**not significant**) (non-inert waste)	Implementation of **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**) incorporating a SWMP and CL:AIRE compliant MMP (**Ref. 13.34**)

Materials

13.10.3. The consumption of materials during demolition works is considered minimal and therefore no adverse impacts or effects are anticipated.

13.10.4. Primary materials required for Part A are a finite resource and whilst they are generally available through local and regional supply, some national or wider sourcing may be required. However, based on information provided by the Buildability Advisor it is anticipated that >50% of the primary materials would be sourced nationally, with other primary materials sourced at a lower geographical scale, (e.g. from quarried or other sources local to Part A as presented in **Table 13-15**) as set out in **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**).

13.10.5. At the time of writing, no information was available on the percentage of reused or recycled content that would be used in Part A. Whilst it is anticipated that all efforts would be made to maximise sourcing and use of sustainable resources during detailed design, a worst case scenario for recycled content has been applied to this assessment.

Waste

13.10.6. During site preparation, construction and demolition it is expected that a proportion of the waste generated would be suitable for recovery (processing, reuse and recycling) both on-site and at off-site facilities (and therefore diverted from landfill). Excavated and other materials that comply with an appropriate waste exemption, or reuse criteria set out in the CL:AIRE Definition of Waste Code of Practice (**Ref. 13.34**), are expected to be utilised on Part A.

13.10.7. The majority of site arisings are anticipated from earthworks activities, the breaking out of concrete from the demolition of existing structures and buildings, and for the tie-in of new structures and from road planings. As described in **Table 13-16** available information suggests that the majority of waste from earthworks would be reused on-site in specified landscape mitigation bunds. Waste to landfill is currently expected to comprise only unsuitable and contaminated earthworks and hazardous waste, e.g. asbestos.

OPERATION

13.10.8. **Table 13-20** provides a summary of the likely significant effects during the first year of operation. The assessment applies the professional judgement of the author.

13.10.9. In summary, the operational phase of Part A is considered **not significant** in relation to material resource consumption and disposal of waste to landfill.

Table 13-20 - Assessment of Likely Significant Effects: Operation

Topic	Potential Impacts	Embedded Mitigation	Other Committed Measures	Justification following Mitigation		Significance of Effect	How Measures would be Implemented, Measured and Monitored
				Sensitivity	**Magnitude**		
Materials	Consumption of natural, non-renewable resources. Minor amendments, changes and maintenance of Part A assets would be required. The potential to consume material resources is expected to be minimal, and the impact extremely limited.	None identified	Good and best practice measures to increase the quantity of reused / recycled / sustainable materials used over the operational phase	**Medium** Due to a lower than UK average availability of construction materials within the region, some potential issues regarding stock and supply may be experienced. Furthermore, the quantity of recycled aggregate to be used is currently unknown.	**Negligible** As ≤50% of primary materials are anticipated to be sourced nationally or at a lower geographic scale.	**Slight** (**not significant**)	Not applicable
Waste	Generation and disposal of waste resulting in a reduction of landfill capacity. Minor amendments, changes and maintenance of Part A would be required. The extent of these requirements is expected to be minimal, and the potential to produce and dispose of waste to landfill, extremely limited.	None identified	Good and best practice measures to increase recovery of any waste generated during operation, and to divert it from landfill	**Low** (inert waste) Regional inert waste infrastructure has sufficient capacity to accommodate the forecast waste from Part A. **High** (non-inert waste) Over 50% of the waste would require disposal outside of the region, but no new (permanent) waste infrastructure would be required.	**Negligible** (inert waste) As ≤1% reduction or alteration in the regional capacity of waste infrastructure is anticipated. **Negligible** (non-inert waste) As ≤1% reduction or alteration in the regional capacity of waste infrastructure is anticipated.	**Neutral** (**not significant**) (inert waste) **Slight** (**not significant**) (non-inert waste)	Not applicable

Materials

13.10.10. As stated in **Table 13-18**, during the first year of operation, minor amendments, changes and maintenance of Part A would be expected. The extent of these changes is expected to be minimal, and the potential to consume material resources extremely limited.

Waste

13.10.11. As stated in **Table 13-18**, during the first year of operation, minor amendments, changes and maintenance of Part A would be required. The extent of these changes is expected to be minimal, and the potential to produce and dispose of waste to landfill, limited.

UPDATED DMRB GUIDANCE

13.10.12. As noted in **Section 13.4**, updated DMRB guidance has been published since the original assessment, which forms the basis of this ES, was completed. The following sections set out the implications to the conclusions of this ES if the new DMRB LA 110 (**Ref. 13.21**) methodology had been used for the assessment.

LA 110 - Material Assets and Waste

13.10.13. The sensitivity test (**Appendix 4.5: DMRB Sensitivity Test**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**)), which comprises a high-level evaluation of the differences between the assessment processes of IAN 153/11 (**Ref. 13.20**) and LA 110 (**Ref. 13.21**), identified that should the updated guidance be applied, updates to the original assessment methodology (specifically, to reflect the updated significance criteria in LA 110) would be required.

13.10.14. In contrast to LA 110, IAN 153/11 does not provide any criteria or thresholds for significance of effect. However, it does set out separate processes for simple and detailed assessments of impacts and effects from materials and waste. LA 110 does not provide a separate assessment process for materials and waste (it combines them in a single table). However, the data requirements for a detailed assessment (as set out in IAN 153/11, and as used in this ES) are comparable to those required in LA 110. Therefore, the approach followed in this ES is compatible with LA 110. In addition, while there is an increased focus in LA 110 on action in accordance with the Waste Hierarchy and the circular economy, this would not affect the conclusions of this chapter because they do not directly alter the significance of effect criteria.

Materials

13.10.15. Significance criteria for materials in LA 110 have been updated in that the previous (IAN 153/11) requirement to assess the geographical source of materials has been removed and replaced with the need to assess the overall percentage of material recovery and recycling of non-hazardous construction and demolition wastes.

13.10.16. The sensitivity test has identified that, with the application of LA 110, a change to the significance of effect from materials consumption would likely occur. This finding is based on the change in the way that anticipated forecasts for 'recovery of arisings' for Part A

(outlined in **Tables 13-16** and **13-17**) would be assessed. The change in methodology (from IAN 153/11 to LA 110) would mean that the assessment of materials would reach a '**moderate**' threshold, which would in turn trigger a significant adverse effect (previously assessed as 'not significant'). The reason for this change is that Part A would achieve less than 70% overall material recovery/recycling (by weight) of non-hazardous construction and demolition waste (to substitute use of primary materials); a high-level estimate indicates 61% recovery would be achieved.

13.10.17. With the application of LA 110, a significant effect is triggered. However, with mitigation as set out immediately below (refer to the **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**)) the effect would reduce to slight adverse (not significant) and therefore the conclusions of the assessment would remain unchanged:

a. Ensure the sourcing of a percentage of recycled aggregate commensurate with regional good practice.

b. Identification of how the reuse of general construction and demolition waste arisings (in this case, particularly the earthworks where approximately 315,000 tonnes unsuitable earthworks cut is currently forecast to be disposed of to landfill) could be recovered and deployed in high value applications.

Waste

13.10.18. There is no difference between significance criteria for waste used in this assessment (based on internal guidance from the Applicant) and LA 110. Accordingly, the application of the updated guidance would not change the conclusions of the original assessment.

ASSESSMENT PARAMETERS

13.10.19. **Table 13-21** summarises the Assessment Parameters, as presented **in Section 2.12** of **Chapter 2: The Scheme**, **Volume 1** of this ES (**Application Document Reference: TR010041/APP/6.1**) and provides a justification of the extent to which each has the potential to change the assessment of likely significant effects in this chapter.

Table 13-21 - Consideration of Assessment Parameters

Assessment Parameters	Brief Description	Justification
Parameter 1	Change in permanent boundary around Highlaws Junction	This parameter relates to horizontal increases to land boundaries around Part A. This is not likely to change the outcome of assessment of effects in this chapter as it is not anticipated to increase the volume of materials required or waste generated.
Parameter 2	Relocation of Highlaws Junction approximately 47 m north to avoid the existing foot and mouth burial pit	Whilst there is the potential that the design in this parameter could preclude disturbance of hazardous waste, the change in location of the junction is not likely to change the outcome of assessment of effects in this chapter as it is not anticipated to increase the volume of materials required or waste generated.
Parameter 3	1 m increase in height and 4 m increase in width of Fenrother Junction	The increase in height and width to the proposed junction would slightly increase the requirement for construction materials, however this is not likely to change the outcome of assessment of effects in this chapter.
Parameter 4	Slackening of slopes	The bunds could provide a benefit through the re-use of surplus earthworks; in turn, this has the potential to reduce both the total volume of primary materials required, and the volume of disposal to landfill. Overall, the slackening of the slopes to the bunds is not likely to change the outcome of assessment of effects in this chapter.
Parameter 5	Additional environmental earth bunds (2 m maximum height).	Additional earth bunds would provide a benefit in terms of re-use of surplus earthworks which would reduce the amount of potential disposal to landfill. However, they are not expected to significantly alter the conclusions of this chapter.
Parameter 6	1.5 m off-set to proposed Priest's Bridge Culvert	The change in location of the culvert is not expected to change the assessment outcomes as it is not anticipated to increase the volume of materials required or waste generated.
Parameter 7	20 m horizontal parameter to the north for the proposed Drainage Basin 9	The change in location of the drainage basin is not expected to change the assessment outcomes presented in this chapter as it is not anticipated to increase the volume of materials required or waste generated.
Parameter 8	Movement of underground gas pipe near Burgham Park Underbridge	The change in location of the underground gas pipe is not expected to change the overall assessment of effects presented in this chapter. Some excavation works may be required, but it is anticipated than any arisings generated could be used to re-fill any cut, resulting in an overall neutral effect in this location.
Parameter 9	Additional earth bund to western edge of the Main Compound at West Moor Junction to temporarily stockpile surplus material	An additional earth bund would provide a benefit in terms of re-use of surplus earthworks which would reduce the amount of potential disposal to landfill. However, it would not change the conclusions of this chapter.
Parameter 10	Horizontal parameter around the proposed River Coquet bridge piers and abutments	The change in location of the River Coquet bridge piers and abutments would not change the outcomes of the assessment in this chapter as it is not anticipated to increase the volume of materials required or waste generated.
Parameter 11	Vertical parameter of up to 0.8 m to the parapet height of overbridges	An increase in the parapet height of overbridges may lead to a slight increase in construction materials required for Part A. However, this is unlikely to alter the findings of the assessment in this chapter.

Assessment Parameters	Brief Description	Justification
Parameter 12	Horizontal parameter of 10 m to the permanent boundary at Parkwood embankment to allow for a potential berm on the embankment	This parameter relates to horizontal increases to land boundaries around Part A. This is not likely to change the outcome of assessment of effects in this chapter as it is not anticipated to increase the volume of materials required or waste generated.

13.11 MONITORING

13.11.1. An **Outline CEMP** (**Application Document Reference: TR010041/APP/7.3**) incorporating a SWMP and MMP has been prepared to describe the measures to be implemented to manage potential environmental impacts from Part A during construction. An **Outline CEMP** accompanies the Development Consent Order application and would be developed by the main contractor prior to construction commencing, with the content of these documents updated and monitored at an agreed frequency.

13.11.2. The SWMP would manage and monitor site waste. The SWMP would be deployed to reduce waste disposal to landfill, and (therein) potential harm to the environment. The SWMP would set out the person(s) responsible for resource management on site and monitor:

a. Types and volumes of waste reused, recycled and landfilled.
b. Where the materials and waste have been reused, recycled and landfilled, both on and off site.
c. Waste recovery and disposal facilities that would be used and their details of their permits, licences and exemptions, both on and off site.
d. Waste recovery and disposal contractors that would be used and details of waste carriers' licence.
e. Any waste exemptions that are in place in order to enable waste to be reused.
f. Waste transfer notes (WTNs) and waste consignments notes to ensure that all waste movements are accompanied by a WTN and that all requisite information is provided.
g. Scheme performance objectives and targets to ensure they are met.

13.11.3. An MMP would be used to monitor the maximum reuse of both natural soils and made ground (contaminated or otherwise). The MMP forms part of the CL:AIRE code of practice (**Ref. 13.34**) to determine that the materials will not harm human health or pollute the environment and are no longer considered a waste. The MMP requires answers to a series of questions including:

a. The parties involved.
b. Suitability for use criteria.
c. Certainty of use.
d. Quantity of use.
e. Contingency arrangements.
f. Tracking and document control.
g. Verification plan.

13.11.4. The Highways England Carbon Tool, used to calculate, monitor and reduce the embodied impact of materials would also be used during construction to support the drive for leaner and less carbon intensive (and more resource efficient) design. Further details are provided in **Chapter 14: Climate** of this ES.

13.11.5. As the detailed design stage of Part A progresses, the potential to refine materials specifications to incorporate greater recycled content, reuse on-site material resources from demolition, and reuse structures would be investigated and documented through the SWMP and MMP.

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