

Chapter 18: Materials and Waste

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18. Materials and Waste

18.1 Introduction

- 18.1.1 This Preliminary Environmental Information (PEI) Report chapter presents the preliminary assessment of likely significant environmental effects arising from the Proposed Development in relation to materials and waste. This preliminary assessment follows the methodology outlined within the Environmental Impact Assessment (EIA) Scoping Report and Scoping Opinion (provided in **Appendices 5-PD-1 and 5-PD-2** in PEI Report **Volume 4**) and is based on the (preliminary) environmental information obtained to date and the description of the Proposed Development as presented in **Chapter 3: The Proposed Development** in PEI Report **Volume 2**. Further assessed will be undertaken at the Environmental Statement (ES) stage.
- 18.1.2 The materials and waste assessment presented in this PEI Report chapter follows the methodology set out in the Institute of Sustainability and Environmental Professionals¹ (ISEP) 'Guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach' (the 'ISEP Guidance') (Ref. 1).
- 18.1.3 For the purposes of this PEI Report, materials and waste comprise:
- a. The consumption of materials (key construction materials only including aggregate, asphalt, concrete, and steel); and
 - b. The generation and management of waste.
- 18.1.4 Materials are defined in the ISEP Guidance (Ref. 1) as “...*physical resources that are used across the lifecycle of a development. Examples include concrete, aggregate, asphalt, bricks, ballast, mortar, glass and timber*”.
- 18.1.5 Other material assets considered include built assets, such as landfill void capacity, waste management facilities (operation only) and safeguarded mineral and waste sites.
- 18.1.6 For the purposes of this PEI Report, safeguarded mineral sites are defined as operational sites identified in Local Plan documents, such as quarries and wharves.
- 18.1.7 Mineral Safeguarding Areas (MSA) are not deemed to be safeguarded mineral sites and are not included in the ISEP Guidance (Ref. 1). Therefore, they are not assessed in the materials and waste assessment. Instead,

¹ Formerly the Institute of Environmental Management and Assessment (IEMA).

these areas have been considered within **Chapter 14: Ground Conditions** in PEI Report **Volume 2**.

18.1.8 Waste is defined under the Waste Framework Directive (Ref. 3) as “...*any substance or object which the holder discards or intends or is required to discard*”.

18.1.9 Supporting information, including figures and appendices, is listed in **Table 18-1**.

Table 18-1: Supporting documentation

Reference	Title
<i>Figures (provided in PEI Report Volume 3)</i>	
Figure 18-PD-1	Safeguarded Mineral Waste Sites, Historic and Authorised Landfills, Permitted Waste Sites, Waste Site Applications and Waste Exemptions.
<i>Appendices (provided in PEI Report Volume 4)</i>	
Appendix 18-PD-1	Consultation
Appendix 18-PD-2	Baseline Data

18.1.10 There are interrelationships between the potential effects on materials and waste and other environmental topics. However, as outlined in **Table 18-2**, the environmental impacts associated with waste management, such as effects on water resources, air quality, noise, or traffic resulting from its generation, handling, on-site temporary storage, or off-site transport of materials and waste are outside the scope of the materials and waste assessment. These impacts are addressed in separate chapters. Therefore, this chapter should be considered in conjunction with the following chapters:

- a. **Chapter 8: Air Quality and Odour** in PEI Report **Volume 2** considers the likely significant effects arising from the Proposed Development in relation to air quality and odour;
- b. **Chapter 9: Carbon** in PEI Report **Volume 2** considers the likely significant effects arising from the Proposed Development in relation to embodied carbon, including carbon reduction measures aligned with the waste hierarchy;
- c. **Chapter 14: Ground Conditions** in PEI Report **Volume 2** considers the likely significant effects arising from the Proposed Development in relation to ground conditions, covering geology, geological designated sites, mineral resources (i.e. MSAs and Mineral Consultation Areas [MCA]), hydrogeology and land contamination;
- d. **Chapter 20: Socio-economics** in PEI Report **Volume 2** considers effects on the local economy and labour market, effects on tourism

businesses, and effects on human health arising from aspects including impacts on residential and community receptors, areas of recreation, and wider disruption to communities;

- e. **Chapter 21: Traffic and Transport** in PEI Report **Volume 2** considers changes in current traffic and transport and its effect on human receptors and may inform understanding of the change to the setting of heritage assets; and
- f. **Chapter 22: Water Environment and Flood Risk** in PEI Report **Volume 2** considers likely significant effects on the water arising from the Proposed Development, covering surface water features (such as rivers, streams, ditches, lakes and canals), groundwater assets, flood risk and demand for water resources.

18.2 Legislation, Policy and Guidance

18.2.1 Legislation, policy², standards and guidance relating to materials and waste pertinent to the Proposed Development comprises the documents listed below.

Legislative Framework

18.2.2 Legislation considered includes :

- a. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') (Ref. 2);
- b. European Waste Framework Directive 2008 (Ref. 3);
- c. Environmental Protection Act 1990 (Ref. 4);
- d. The Hazardous Waste (England and Wales) Regulations 2005 (Ref. 5);
- e. The Waste (England and Wales) Regulations 2011 (Ref. 6);
- f. The Waste (Miscellaneous Amendments) (EU Exit) Regulations 2019 (Ref. 7);
- g. The Environmental Permitting (England and Wales) Regulations 2016 (Ref. 8); and

² For the purposes of this PEI Report, an overview of relevant policy is provided to show how relevant policy has informed scope, method and in some cases mitigation. It is not the purpose of the PEI Report (or the Environmental Statement [ES]) to present a review of the compliance of the Proposed Development with the requirements of policy. The Planning Statement, to be submitted with the DCO application, will present an assessment of the extent to which the Proposed Development accords with policy.

- h. Environment Act 2021 (Ref. 9).

National Policy

18.2.3 National policy considered includes:

- a. National Policy Statement for Water Resources Infrastructure (NPSWRI) (Ref. 10);
- b. National Planning Policy Framework (NPPF) (Ref. 11);
- c. National Planning Policy for Waste (2015) (Ref. 12);
- d. The Waste Management Plan for England (2021) (Ref. 13);
- e. A Green Future: Our 25 Year Plan to Improve the Environment (2018) (Ref. 14);
- f. Our Waste, Our Resources, A Strategy for England (Resources and Waste Strategy for England) (2018) (Ref. 15);
- g. Environmental Improvement Plan (2023) (Ref. 16); and
- h. The Waste Prevention Programme for England: Maximising Resources, Minimising Waste (2023) (Ref. 17).

Local Policy

18.2.4 Local policy considered includes relevant Local Plans (both adopted and emerging) and other adopted policy documents produced by the ten local authority administrative areas within which the Proposed Development is situated (refer to Table 1-4 in **Chapter 1: Introduction** in PEI Report **Volume 2**).

National Guidance

18.2.5 National guidance considered includes:

- a. Planning Practice Guidance (PPG) for Minerals (2014) (Ref. 18) and Waste (2015) (Ref. 19);
- b. Contaminated Land: Applications in Real Environments (CL:AIRE) Definition of Waste: Development Industry Code of Practice (DoW CoP), v2 (2011) (Ref. 20);
- c. Waste and Resources Action Programme (WRAP) Designing Out Waste: A Design Team Guide for Civil Engineering (Ref. 21);
- d. Waste Duty of Care Code of Practice (Ref. 22); and
- e. Department for Environment, Food & Rural Affairs (Defra) Guidance on Applying the Waste Hierarchy (2011) (Ref. 23).

Other Guidance

- 18.2.6 Other guidance considered includes the aforementioned ISEP Guidance (Ref. 1).

18.3 Consultation

- 18.3.1 This section provides an overview of consultation undertaken to date in relation to materials and waste.

Phase One Public Consultation

- 18.3.2 There were no specific issues raised during the Phase One Public Consultation undertaken between 11 September and 25 October 2024 that relate to the scope of the materials and waste assessment³.

EIA Scoping

- 18.3.3 **Appendix 18-PD-1** in PEI Report **Volume 4** provides a summary of the key comments raised in the EIA Scoping Opinion (provided in **Appendix 5-PD-2** of PEI Report **Volume 4**), such as agreement to scope out effects. It also outlines how and where these issues have been addressed within the PEI Report or will be later addressed within the ES to ensure they are taken account of as part of the ongoing materials and waste assessment.
- 18.3.4 Where the EIA Scoping Opinion has resulted in amendment to the scope of the materials and waste assessment (or where further justification or evidence is required to confirm an effect can remain scoped out), this has been presented in section 18.4.
- 18.3.5 The scope of the waste and materials assessment is presented in **Table 18-2**.

Other Consultation

- 18.3.6 No other consultation has been undertaken to date to support the materials and waste preliminary assessment of likely effects.

³ A Phase One Public Consultation Report has been made available at Phase Two Public Consultation. A consultation report will also be submitted with the DCO application, which will set out activities undertaken to deliver the consultation (including the technical bodies consultation at this stage). It will provide a summary of the key themes and issues raised, and how the project has considered these.

18.4 Scope of Assessment

18.4.1 This section identifies the scope of the materials and waste assessment following EIA Scoping and subsequent consultation, design refinement, surveys / studies and assessment.

18.4.2 **Table 18-2** below provides a summary of all matters scoped in and out of the materials and waste assessment on the basis of whether they were considered to have the potential to result in significant effects during the EIA Scoping process. The table uses the following coding:

- a. In = refers to likely effects that are considered potentially significant and therefore require further assessment in the EIA;
- a. Out = refers to likely effects that are not considered potentially significant and therefore do not require further assessment in the EIA; and
- b. n/a = indicates that there is no prospect of an effect from a particular Proposed Development Part(s), either due to its specific nature or location and/or the absence of a receptor within the study area for that part.

Table 18-2: Summary of materials and waste assessment scope

Likely significant effect	Receptor(s)	Part of the Proposed Development					
		1a	1b	2	3	4a	4b
Construction phase							
Changes in demand for materials	Construction material demand – The quantities and types of construction materials to be used are not yet known at this stage. Therefore, on a precautionary basis, changes in demand for materials have been scoped into the assessment.	In	In	In	In	In	In
Waste arising from extraction, processing and manufacture of construction components and products	Waste – Products and materials are developed in manufacturing environments with their own waste management plans, facilities, and supply chains, which may be located in different regions of the UK or globally and are therefore outside the geographical scope of this study.	Out	Out	Out	Out	Out	Out
Other environmental impacts associated with the management of waste from the Proposed Development, e.g. on water resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste	Waste – These are addressed separately in other relevant chapters of this PEI Report (refer to Chapter 8: Air Quality and Odour, Chapter 9: Carbon, Chapter 14: Ground Conditions, Chapter 19: Noise and Vibration, Chapter 21: Traffic and Transport and Chapter 22: Water Environment and Flood Risk in PEI Report Volume 2).	Out	Out	Out	Out	Out	Out

Likely significant effect	Receptor(s)	Part of the Proposed Development					
		1a	1b	2	3	4a	4b
Changes in available landfill void capacity (for both hazardous and non-hazardous waste)	Waste (landfill capacity) – The exact quantities and types of waste to be generated during construction are not yet known for some parts. Therefore, on a precautionary basis, changes in available landfill void capacity have been scoped into the assessment.	In	In	In	In	In	In
Changes to safeguarded mineral and waste sites	Safeguarded mineral and waste sites – Impacts on safeguarded waste sites are not included in the ISEP Guidance (Ref. 1); however, they are included for completeness and an assessment of impacts on such sites are considered in the assessment for Parts 1b, 2 and 3.	Out	In	In	In	Out	Out
Operational phase							
Changes in availability of materials	Construction material demand – Forecast effects (using professional judgement on the likely quantities and types of materials) are considered negligible in relation to the scale and nature of the Proposed Development.	Out	Out	Out	Out	Out	Out
Other environmental impacts associated with the management of waste from the Proposed Development (e.g. on water	Waste – These are addressed separately in other relevant chapters of this PEI Report (refer to Chapter 8: Air Quality and Odour , Chapter 9: Carbon , Chapter 14: Ground	Out	Out	Out	Out	Out	Out

Likely significant effect	Receptor(s)	Part of the Proposed Development					
		1a	1b	2	3	4a	4b
resources, air quality, noise or traffic resulting from the generation, handling, on-site temporary storage or off-site transport of materials and waste)	Conditions, Chapter 19: Noise and Vibration, Chapter 21: Traffic and Transport and Chapter 22: Water Environment and Flood Risk in PEI Report Volume 2).						
Changes in available landfill void capacity	Waste (landfill capacity) – The pipelines, canal network and reservoirs will require minimal maintenance during operation and will generate negligible volumes of waste relative to the scale and nature of the Proposed Development. Waste will be managed in accordance with operational procedures already in place for the canal network and reservoirs. During operation, Parts 1a and 4a of the Proposed Development will generate waste. The quantities and types of waste to be generated during operation are not yet known; therefore, operational waste has been scoped in for further assessment.	In	Out	Out	Out	In	Out
Changes to safeguarded mineral and waste sites	Safeguarded mineral and waste sites – Changes to safeguarded minerals and waste sites are not anticipated during operation and	Out	Out	Out	Out	Out	Out

Likely significant effect	Receptor(s)	Part of the Proposed Development					
		1a	1b	2	3	4a	4b
	are considered during the construction phase only.						

18.5 Assessment Methodology

18.5.1 This section presents the methodology used to assess the potential effects on materials and waste during the construction and operational phases of the Proposed Development.

Defining the Study Area

18.5.2 This section sets out the study areas adopted for the Proposed Development.

18.5.3 The study areas for the assessment of impacts related to materials and waste have been defined in line with the ISEP Guidance (Ref. 1), as summarised within **Table 18-3**. Further details of the study areas are set out within the sections below.

Table 18-3: Study areas for materials and waste impacts

Materials and waste impacts	Study area extent
Waste generation	Preliminary Order Limits
Use of construction and operational materials (key materials only)	
Impact on safeguarded mineral and waste sites	
Non-hazardous and inert waste landfill capacity	Expansive Study Area (regional)
Hazardous waste landfill capacity	Expansive Study Area (national, England)
Hazardous waste	
Availability of key construction materials	Expansive Study Area (regional [aggregates, asphalt, and concrete], national, UK [steel])

Preliminary Order Limits Study Area

18.5.4 The study area for waste generation and the use of construction and operational materials (key materials only) comprises the Preliminary Order Limits. The Preliminary Order Limits have been adopted for the purposes of this PEI Report to define the potential extent of land currently assumed to be necessary to construct, operate and maintain the Proposed Development.

18.5.5 The study area for the impacts on safeguarded mineral and waste sites is also defined by the Preliminary Order Limits. Impacts on safeguarded waste sites are not included in the ISEP Guidance (Ref. 1); however, they are included for completeness and an assessment of impacts on such sites is considered in the assessment, as appropriate.

Expansive Study Area

- 18.5.6 Study areas are defined based on professional judgement and informed by consideration of the proximity principle. As outlined in the PPG for Waste (Ref. 19): *“The principles of self-sufficiency and proximity (commonly referred to as the ‘proximity principle’) are set out in Article 16 of the Waste Framework Directive [Ref. 3], Local planning authorities are required, under regulation 18 of the Waste (England and Wales) Regulations 2011 [Ref. 6] which transposed the Directive, to have regard to these requirements when exercising their planning functions relating to waste management”*. The proximity principle means that wastes should generally be managed as close as possible to the place of generation due the environmental impacts associated with transportation.
- 18.5.7 In addition, *“...though this should be the aim, there is no expectation that each local planning authority should deal solely with its own waste to meet the requirements of the self-sufficiency and proximity principles. Nor does the proximity principle require using the absolute closest facility to the exclusion of all other considerations. There are clearly some wastes which are produced in small quantities for which it would be uneconomic to have a facility in each local authority. Furthermore, there could also be significant economies of scale for local authorities working together to assist with the development of a network of waste management facilities to enable waste to be handled effectively”*.
- 18.5.8 Non-hazardous and inert waste management impacts are assessed at a regional level. The regional study area for non-hazardous and inert waste management is defined by the Environment Agency and includes the following sub-regions as outlined in the Environment Agency’s ‘2024 Waste Summary Tables for England – Version 1’ (Ref. 25) which the Proposed Development crosses:
- East Midlands (Derbyshire, Leicestershire, Lincolnshire, Northamptonshire and Nottinghamshire);
 - West Midlands (Herefordshire, Shropshire, Staffordshire, Warwickshire, West Midlands Metropolitan Districts (includes Birmingham, Coventry, Dudley, Sandwell, Solihull, Walsall and Wolverhampton) and Worcestershire);
 - South East (Berkshire, Buckinghamshire, East Sussex, Hampshire, Isle of Wight, Kent, Oxfordshire, Surrey and West Sussex); and
 - East of England (Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk).
- 18.5.9 **Table 18-4** presents a summary of the local and county context and subsequent regional study areas for non-hazardous and inert waste for the Proposed Development.

Table 18-4: Summary of study areas – materials and waste

Proposed Development Part	Local administrative area	Sub region defined in the Environment Agency Waste Summary Tables for England	Regional area defined in the Environment Agency Waste Summary Tables for England
Part 1a	• Birmingham City Council	• West Midlands Metropolitan Districts	• West Midlands
Part 1b	• North Warwickshire Borough Council	• Warwickshire	• West Midlands
Part 2	• North Warwickshire Borough Council • Nuneaton and Bedworth Borough Council • Rugby Borough Council	• Warwickshire	• West Midlands
	• Coventry City Council	• West Midlands Metropolitan Districts	• West Midlands
	• West Northamptonshire Council	• Northamptonshire	• East Midlands
	• Milton Keynes City Council • Buckinghamshire Council	• Buckinghamshire	• South East
Part 3	• West Northamptonshire Council	• Northamptonshire	• East Midlands
Part 4a	• Buckinghamshire	• Buckinghamshire	• South East
Part 4b	• Milton Keynes City Council • Buckinghamshire	• Buckinghamshire	• South East
	• Central Bedfordshire	• Bedfordshire	• South East

18.5.10 The study area for hazardous waste management (landfill capacity and other waste management infrastructure) is England. This is defined based on professional judgement and informed by consideration of the proximity principle, outlined in 'Principle 2 – Infrastructure Provision in the Strategy for Hazardous Waste Management in England' (Ref. 26):

“We look to the market for the development of hazardous waste infrastructure, which implements the hierarchy for the management of hazardous waste and meets the needs of the UK to ensure that the country as a whole is self-sufficient in hazardous waste disposal, facilities are put in place for hazardous waste recovery in England, and the proximity principle is met.”

18.5.11 Planning for hazardous waste management is also undertaken at a national level.

18.5.12 The study area for the availability of key construction materials (aggregates, asphalt, and concrete) is regional (East Midlands, West Midlands, South East, and the East of England) while for steel it is national (UK).

18.5.13 **Table 18-5** provides a summary of the study areas by Proposed Development Part.

Table 18-5: Summary of study areas for the materials and waste assessment

Proposed Development Part	Study area
1a: Minworth AWTP	Preliminary Order Limits, regional, and National. Local and county level context is for the review of safeguarded mineral and waste sites only and not considered to be study areas.
1b: Minworth to Atherstone Pipeline	
2: Works to the Coventry, Oxford and Grand Union canals	
3: Works to Daventry and Drayton Reservoirs	
4a: Abstraction, storage and treatment	
4b: Pipeline to an existing underground reservoir near Luton	

Determining Baseline Conditions

18.5.14 This section sets out how baseline conditions were determined for the Proposed Development. All baseline conditions will be checked and updated for the ES.

18.5.15 **Table 18-6** below provides an overview of the baseline studies and surveys undertaken to inform the materials and waste assessment. The table uses the following coding:

- a. ✓ = Completed;

- b. O = To be completed for the ES; and
- c. n/a = Baseline study / survey is not applicable for that Part of the Proposed Development.

Table 18-6: Summary of baseline materials and waste studies and surveys

Study / survey	Overview	Date completed	Part of the Proposed Development					
			1a	1b	2	3	4a	4b
Availability of key construction materials*	UK and regional data have been used to establish a quantitative national baseline of the consumption for key construction materials using UK Steel's Key Statistics Guide (Ref. 27) and Mineral Products Association's Profile of the UK Mineral Product Industry (Ref. 28).	November 2025	✓	✓	✓	✓	✓	✓
Safeguarded mineral and waste sites*	The locations of safeguarded mineral and waste sites have been identified for each part of the Proposed Development within (and adjacent to) the Preliminary Order Limits, using Local Plans and policy maps.	November 2025	✓	✓	✓	✓	✓	✓
Permitted waste sites and waste site applications*	The locations of permitted waste sites within the Preliminary Order Limits were identified for each part of the Proposed Development using the Environment Agency's Environmental Permitted Regulations – Waste Sites and Waste Site Applications (Ref. 29).	July 2025	✓	✓	✓	✓	✓	✓
Waste exemptions*	The locations of waste exemptions within the Preliminary Order Limits were identified for each part of the Proposed Development using the Environment Agency's Environmental Waste Exemptions (Ref. 30).	August 2025	✓	✓	✓	✓	✓	✓

Study / survey	Overview	Date completed	Part of the Proposed Development					
			1a	1b	2	3	4a	4b
Historic and authorised landfills*	Authorised landfills which sit within the Preliminary Order Limits of each part of the Proposed Development have been summarised from the Environment Agency's Permitted Waste Sites – Authorised Landfill Site Boundaries spatial data (Ref. 31). Historic landfills which sit within the Preliminary Order Limits of each part of the Proposed Development have been identified from the Environment Agency's Historic Landfill Sites spatial data (Ref. 32).	August 2025	✓	✓	✓	✓	✓	✓
Capacity of waste management facilities*	Landfill capacity in the East Midlands, West Midlands, South East, and the East of England for non-hazardous waste and England for hazardous waste has been obtained from the Environment Agency's Waste Data Interrogator (Ref. 24) and the Environment Agency's 2024 Waste Summary Tables for England – Version 1 (Ref. 25). Capacity of other waste management infrastructure has also been obtained from the Environment Agency's Waste Data Interrogator 2024– Waste Received (Excel) – Version 1 (Ref. 24).	November 2025	✓	✓	✓	✓	✓	✓

* To be refreshed in the ES

Assessment of Effects

18.5.16 This section sets out how the scoped in effects have been assessed.

18.5.17 Definitions of magnitude of impact, sensitivity or importance of the receptor and significance of effect that is used as part of the assessment are reported in the following section.

18.5.18 This section outlines the methodology that is employed for assessing the likely significant effects associated with materials and waste. The ISEP Guidance (Ref. 1) offers two methods for the assessment of waste.

18.5.19 Method W1 (void capacity) is a more detailed methodology and is appropriate for larger and more complex projects. The magnitude of impact from waste is assessed by determining the percentage of the remaining landfill void capacity that will be depleted by waste produced during the construction and operation phases.

18.5.20 Method W2 (landfill diversion) is a simpler approach and deemed to be less robust than Method W1. Developments are compared to a good practice landfill diversion rate of 90% (as achieved and exceeded by major UK developments and organisations).

18.5.21 Method W1 has been selected for this assessment because the Proposed Development is larger and more complex.

18.5.22 The sensitive receptors for the assessment of materials and waste impacts are:

- a. Materials, national and regional demand of key construction materials, as outlined in the ISEP Guidance (Ref. 1):

“Materials are, in their own right, sensitive receptors. Consuming materials impacts upon their immediate and (in the case of primary material) long-term availability; this results in the depletion of natural resources and adversely impacts the environment.”;

- b. Landfill void capacity in the expansive study area of the East Midlands, West Midlands, South East, and East of England (non-hazardous landfill void capacity) and England (hazardous landfill void capacity) as defined in the ISEP Guidance (Ref. 1):

“Landfill is a finite resource, and hence, through the ongoing disposal of waste, there is a continued need to expand existing and develop new facilities. This requires the depletion of natural and other resources which, in turn, adversely impacts the environment.”; and

- c. Safeguarded mineral and waste sites. As stated in the ISEP Guidance (Ref. 1):

“...does not consider waste processing and recovery facilities as sensitive receptors, rather: they are part of a system that has the

potential to reduce the magnitude of adverse impacts associated with waste generation and disposal. Waste processing and recovery facilities are, hence, different to landfills, in that the latter are finite resources.”

18.5.23 The assessment of materials and waste considers the following:

- a. Waste producers have a legal duty of care to manage their waste in accordance with regulations and to ensure that any waste leaving the site where it is generated is transferred to a suitably licensed facility for further treatment or disposal;
- b. Facilities transferring, treating or disposing of waste must be either licensed or apply for an exemption from a licence;
- c. As part of their planning function, Waste Planning Authorities (WPA) are required to ensure that sufficient land is available to accommodate facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas; and
- d. Minerals Planning Authorities (MPA) are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs.

Methodology for Determining Effects

18.5.24 The effects on materials and waste, and safeguarding of material and waste receptors, are assessed through the following:

- a. Materials (construction only, all Parts):
 - i. Establishing the baseline for national and regional consumption of key construction materials by weight;
 - ii. Assessing the sensitivity of materials as related to the availability and types of materials to be consumed by the Proposed Development during construction;
 - iii. Establishing the quantities of key construction materials required for the construction of the Proposed Development; and
 - iv. Comparing the total quantities of key construction materials with the most recent national demand (utilising a percentage approach).
- b. Waste construction (all Parts) and operation (Part 1a and Part 4a only):
 - i. Establishing the baseline landfill void capacity in the expansive study areas;
 - ii. Assessing the sensitivity of landfill void capacity;
 - iii. Establishing the quantities of waste to be generated across the life-cycle of the Proposed Development; and

- iv. Comparing the total waste arising from the Proposed Development against the landfill void capacity (using a percentage approach) assuming a worst case that waste goes to landfill.
- c. Safeguarded mineral and waste sites (construction only, all Parts):
 - i. Considering whether there is the potential to adversely and substantially impact access to one or more allocated mineral and waste site (in their entity), or become substantially sterilised, placing their future use at risk.

Sensitivity of Receptors

Materials

18.5.25 The sensitivity of materials relates to the availability and type of construction material to be consumed by the Proposed Development. The ISEP Guidance (Ref. 1) criteria described within **Table 18-7** has been used to determine the sensitivity of materials.

Table 18-7: Materials Receptor Sensitivity

Sensitivity level	Criteria for materials receptor sensitivity
Negligible	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be free from known issues regarding supply and stock. And/or, are available comprising a very high proportion of sustainable features and benefits compared to industry-standard materials*
Low	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. And/or, are available comprising a high proportion of sustainable features and benefits compared to industry-standard materials.
Medium	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from some potential issues regarding supply and stock. And/or, are available comprising some sustainable features and benefits compared to industry-standard materials.
High	On balance, the key materials required for the construction of the Proposed Development are forecast (through trend analysis and other information) to suffer from known issues regarding supply and stock. And/or, comprise little or no sustainable features and benefits compared to industry-standard materials.

Sensitivity level	Criteria for materials receptor sensitivity
Very High	On balance, the key materials required for the construction of the Proposed Development are forecast are known to be insufficient in terms of production, supply and/or stock. And/or, comprise no sustainable features and benefits compared to industry-standard materials.

** Subject to supporting evidence, sustainable features and benefits could include, for example, materials or products that: comprise reused, secondary or recycled content (including excavated and other arisings); support the drive to a circular economy; or in some other way reduce lifetime environmental impacts.*

18.5.26 Material receptor sensitivity is determined as 'low' for all parts in accordance with **Table 18-7**. This is because, on balance, the key construction materials required for the Proposed Development's construction are forecast (through trend analysis and other information) to be generally free from known issues regarding supply and stock. Key materials required for construction are likely to be available comprising a high proportion of sustainable features and benefits (e.g. recycled content) as demonstrated by the potential recycled content for the main construction materials outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Waste

18.5.27 The sensitivity of waste relates to availability of landfill capacity in the absence of the Proposed Development. As outlined in the ISEP Guidance (Ref. 1) "...landfill capacity is recognised as an unsustainable and increasingly scarce option for managing waste". The sensitivity of landfill capacity is assessed based on a review of historic landfill void capacity trends where available and information from relevant policy documents.

18.5.28 Waste receptor sensitivity is determined as 'very high' (**Table 18-8** and **Table 18-9**). Since there is no publicly available information on any potential changes to landfill void capacity at the time of the Proposed Development's construction and operation, a worst-case scenario is considered. Landfill capacity is assumed to remain the same for the baseline; however, a very considerable reduction in capacity cannot be excluded and a very high sensitivity is selected. The high sensitivity takes into account that there may be a >10% for non-hazardous and inert landfill and >1% for hazardous landfill). However, the current baseline is not reduced.

18.5.29 The criteria described within **Table 18-8** and **Table 18-9** are used to determine the sensitivity of landfill capacity.

Table 18-8: Inert and non-hazardous landfill capacity sensitivity

Sensitivity level	Criteria for inert and non-hazardous landfill capacity
Negligible	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity expected to remain unchanged, or is expected to increase through a committed change in capacity.
Low	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce minimally by <1% as a result of wastes forecast.
Medium	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce noticeably by 1-5% as a result of wastes forecast.
High	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity is expected to reduce considerably by 6-10% as a result of wastes forecast.
Very High	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of regional inert and non-hazardous landfill capacity: • is expected to reduce very considerably (by >10%); • is expected to end during construction or operation; • is already known to be unavailable; or, • would require new capacity or infrastructure to be put in place to meet forecast demand.

Table 18-9: Hazardous landfill capacity sensitivity

Sensitivity level	Criteria for hazardous landfill capacity sensitivity
Negligible	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity is expected to remain unchanged or is expected to increase through a committed change in capacity.
Low	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity is expected to reduce minimally by <0.1% as a result of wastes forecast.

Sensitivity level	Criteria for hazardous landfill capacity sensitivity
Medium	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity is expected to reduce noticeably by 0.1-0.5% as a result of wastes forecast.
High	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity is expected to reduce considerably by 0.5-1% as a result of wastes forecast.
Very High	Across the relevant phase of the Proposed Development, the baseline / future baseline (i.e. without the Proposed Development) of national hazardous landfill capacity: • is expected to reduce very considerably (by >1%); • is expected to end during construction or operation; • is already known to be unavailable, or; • would require new capacity or infrastructure to be put in place to meet forecast demand.

Magnitude of Impact

18.5.30 The magnitude of impact describes the degree of variation from the baseline conditions as result of the Proposed Development.

Materials

18.5.31 The methodology for assessing the magnitude of impact from materials comprises a percentage-based approach that determines the influence of construction materials use on the baseline national demand from the construction of the Proposed Development. The criteria used to assess the magnitude of impact for materials are provided within **Table 18-10**.

Table 18-10: Materials magnitude of impact

Magnitude level	Criteria for materials magnitude of impacts
No change	Consumption of no materials is required.
Negligible	Consumption of no individual material type is equal to or greater than 1% by volume of the national* baseline availability.
Minor	Consumption of one or more materials is between 1-5% by volume of the national* baseline availability. And/or The development has the potential to adversely and substantially impact access to one or more allocated mineral site (in their entirety), placing their future use at risk.

Magnitude level	Criteria for materials magnitude of impacts
Moderate	Consumption of one or more materials is between 6-10% by volume of the national* baseline availability. And/or One allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.
Major	Consumption of one or more materials is >10% by volume of the national* baseline availability. And/or More than one allocated mineral site is substantially sterilised by the development rendering it inaccessible for future use.

**National baseline is used in the absence of regional construction material consumption data.*

Waste

18.5.32 The methodology for assessing the magnitude of impact for waste comprises a percentage-based approach that determines the influence of waste generation from the construction of the Proposed Development on the baseline landfill capacity. The criteria used to assess the magnitude of impact for waste are provided within **Table 18-11** and **Table 18-12**.

Table 18-11: Inert and non-hazardous waste magnitude of impact

Magnitude level	Criteria for waste magnitude of impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by <1%.
Minor	Waste generated by the Proposed Development will reduce expansive study area landfill capacity* baseline by 1-5%.
Moderate	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by 6-10%.
Major	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by >10%.

**Forecast as the 'worst-case' scenario, during a defined construction and/or operational phase.*

Table 18-12: Hazardous waste management magnitude of impact

Magnitude level	Criteria for waste magnitude of impacts
No change	Zero waste generation and disposal from the Proposed Development.
Negligible	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by <0.1%.
Minor	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by <0.1-0.5%.
Moderate	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline* by 0.5-1%.
Major	Waste generated by the Proposed Development will reduce expansive study area landfill capacity baseline by >1%.

**Forecast as the 'worst-case' scenario, during a defined construction and/or operational phase.*

Significance of Effects

18.5.33 **Table 18-13** summarises the effect thresholds used in determining the effects.

Table 18-13: Effect thresholds

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

18.5.34 Neutral and slight effects are considered to be 'not significant' and moderate, large or very large effects are considered to be 'significant'.

Assumptions, Limitations and Uncertainties

18.5.35 The following assumptions and limitations have been identified in relation to material and waste:

- a. Waste arising and material use from extraction, processing and manufacture of construction components and products has been scoped out of this assessment. This assumes that these products and materials are being produced in manufacturing facilities including quarries with their own waste management plans, planning and permitting permissions, facilities, and supply chains, which are potentially in different regions of England, the UK or the world, and therefore outside of the geographical scope of this assessment;
- b. Data on the bulk density of materials has been used to convert quantities between volume (m³) and weight (tonnes [t]) where required;
- c. It is not possible to reliably forecast the future availability of construction materials; therefore, national (UK) and regional data has been used to establish a quantitative baseline of the consumption of key construction materials which is used as a proxy for availability;
- d. It is not possible to reliably forecast any potential changes to landfill void capacity by the time of the Proposed Development's construction and operation. Therefore, landfill void capacity is assumed to remain the same as the current baseline;
- e. The material and waste assessment has been undertaken on the basis of information available at the time of writing;
- f. Historic and authorised landfills are considered in the assessment since excavations within these sites can generate waste that may require off-site management;
- g. Only the Indicative Work Areas for Parts 2 and 3 are considered for their respective assessments as no physical works will occur outside of these areas. Therefore, there will be no impact on safeguarded mineral and waste sites, permitted waste sites, waste site applications or exemptions in the Indicative Non-Work Areas;
- h. It is assumed in the assessment that all hazardous waste is disposed of to landfill as an absolute worst-case;
- i. It is assumed in the assessment that excess excavated material (e.g. from pipeline construction) is disposed of to landfill as an absolute worst-case; and
- j. The assessment presented in this chapter is a pre-additional mitigation scenario.

18.6 Project-Wide Environmental Design, Standards and Management

18.6.1 This section outlines embedded environmental design, standards and/or management measures in relation to materials and waste that are relevant for the whole Proposed Development.

18.6.2 The Proposed Development will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy (see **Plate 18-1**).



Plate 18-1: The Waste Hierarchy

[Recreated by AECOM using Defra's 'Guidance on Applying the Waste Hierarchy' (Ref. 23)]

18.6.3 The following mitigation measures will be considered and implemented where applicable during the design phases and subsequent construction work:

- a. Design for reuse and recovery: identifying, securing and using materials that already exist on-site, or can be sourced from other projects;
- b. Design for materials optimisation: simplifying layout and form to minimise material use, using standard design parameters, balancing cut and fill, maximising the use of renewable materials and materials with recycled content;
- c. Design for off-site construction: maximising the use of pre-fabricated structure and components, encouraging a process of assembly rather than construction;
- d. Design for the future (deconstruction and flexibility): identify how materials can be designed to be more easily adapted over an asset lifetime and how deconstructability and demountability of elements can be maximised at end of first life;

- e. Design for waste and material asset efficient procurement: identify and specify materials that can be acquired responsibly, in accordance with a recognised industry standard; and
 - f. Engineering plan configurations and layouts that show how the most effective use of materials and arisings can be achieved.
- 18.6.4 A Preliminary Outline Construction Environmental Management Plan (CEMP) has been prepared for this PEI Report (provided in **Appendix 24-PD-2** in PEI Report **Volume 4**). An Outline CEMP will accompany the DCO application and will set out the key measures to be employed during the Proposed Development's construction phase to control and minimise the impacts on the environment.
- 18.6.5 An Outline Site Waste Management Plan (SWMP) will accompany the DCO application. This will set out how waste would be managed during construction, and opportunities to prevent, reuse and recycle waste would be explored in accordance with the waste hierarchy.
- 18.6.6 A Detailed CEMP(s) and Detailed SWMP(s) would be prepared by the construction contractor in accordance with the Outline CEMP and Outline SWMP and agreed with the relevant consenting authority prior to commencing the construction works.
- 18.6.7 A Materials Management Plan (MMP) if required will be developed by the contractor under the 'CL:AIRE Definition of Waste: Development Industry Code of Practice' (Ref. 20) by the construction contractor, and agreed with the relevant consenting authority prior to commencing the construction works. It will support the reuse of excavated materials, minimise off-site disposal; and to demonstrate the necessary lines of evidence to support the proper reuse / off-site disposal of materials and ensure compliance with regulatory guidance.
- 18.6.8 Embedded measures are considered before assessing effects to avoid scenarios that would be unrealistic in practice, such as those that ignore measures likely to be standard practice (also known as 'tertiary mitigation') or integral to the design of the Proposed Development (mitigation by design). These measures are carried through the assessment to ensure that realistic likely environmental effects are identified. Where significant adverse effects remain after considering these embedded measures, additional mitigation will be developed and proposed where possible.
- 18.6.9 All mitigation measures will be described within the ES with the rationale for their inclusion clearly stated.

Part 1a: Minworth AWTP

18.7 Part 1a: Minworth Advanced Water Treatment Plant

- 18.7.1 This section provides a focused description of the environmental baseline, embedded environmental design, standards and management measures (if in addition to the aforementioned) and presents the preliminary assessment of likely significant effects in relation to materials and waste for Part 1a (Minworth AWTP) of the Proposed Development.

Baseline Conditions

- 18.7.2 This section describes the baseline environmental characteristics with specific reference to materials and waste.

Existing Baseline

- 18.7.3 Part 1a of the Proposed Development lies within Birmingham City Council's administrative boundary in the West Midlands. **Table 18-3** defines the study area extents for baseline topics, including landfill capacity (hazardous and non-hazardous), availability of key construction materials, and other relevant considerations such as safeguarded mineral and waste sites, historic and authorised landfills, permitted waste sites and waste exemptions. Detailed information regarding existing baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Future Baseline

- 18.7.4 The future baseline is assumed to be the same as the existing baseline. Detailed information regarding future baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Environmental Design, Standards and Management

- 18.7.5 There are no further embedded environmental design, standards and/or management in relation to materials and waste that are specific to Part 1a of the Proposed Development.

Assessment of Effects and Significance

- 18.7.6 This section provides the preliminary assessment of likely significant effects, including determining the level of significance, for Part 1a (Minworth AWTP) of the Proposed Development. Where applicable, the requirement for additional mitigation measures and/or monitoring is identified to avoid, prevent, reduce, or if possible, offset, any identified significant adverse effects on the environment.

Construction Phase

Materials

Changes in Demand for Materials

- 18.7.7 Part 1a of the Proposed Development is anticipated to require approximately 6,381 t of aggregate. This equates to 0.06% of West Midlands' total aggregate availability (11.4 million tonnes [Mt]).
- 18.7.8 For aggregates, sensitivity of the receptor is classified as 'low' and magnitude of impact is considered to be 'negligible'.
- 18.7.9 Therefore, this results in a neutral or slight effect, which is not significant. This is a direct and permanent effect.
- 18.7.10 Material estimates for other construction materials such as asphalt, concrete, and steel have not been confirmed for Part 1a at this stage. Where possible an assessment will be undertaken and reported in the ES. However, it is anticipated that the Proposed Development's material requirements will remain below the significance threshold (10% of availability) for regional availability of asphalt (>170,000 t) and concrete (>430,000 t), as well as national availability of steel (>1,600,000 t).

Additional Mitigation, Enhancement and Monitoring

- 18.7.11 No additional mitigation, enhancement or monitoring is have been identified.

Residual Effect

- 18.7.12 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Waste

Changes in Available Landfill Void Capacity (for Both Hazardous and Non-Hazardous Waste)

- 18.7.13 Estimated quantities of excavation material and construction and demolition waste are outlined in **Table 18-14**. Waste quantities are based on available information at the time of writing this PEI Report and will be further refined for the ES.
- 18.7.14 Hazardous excavated material is anticipated to arise from below ground excavations for Part 1a structures / buildings.
- 18.7.15 Non-hazardous construction waste estimates for Part 1a include waste arisings from the construction of the Filter Building and Floc-Sed Area (160 m³). Construction waste quantities have been derived using WRAP's SMARTWaste Tool (Ref. 33) and a 'best' practice benchmark for waste volume (m³) per 100 m².

Table 18-14: Estimated construction, demolition and excavation waste quantities (m³) – Part 1a

Waste type	Estimated waste quantity (m³)
Excavated material (hazardous)	53,500
Excavated material (inert and non-hazardous)	3,300
Demolition waste (hazardous)	No demolition anticipated. Further details to be confirmed in the ES if available.
Demolition waste (inert and non-hazardous)	
Construction waste (hazardous)	8
Construction waste (inert and non-hazardous)	5,030
Total hazardous waste	53,508
Total hazardous landfill capacity	9,167,000
% hazardous landfill capacity	0.58% Sensitivity of receptor is classified as 'very high', and the magnitude is 'moderate', resulting in a large or very large adverse effect, which is significant.
Total inert & non-hazardous waste	8,330
Total inert & non-hazardous landfill capacity	34,897,000
% inert & non-hazardous landfill capacity	0.02% Sensitivity of receptor is classified as 'very high', and the magnitude is 'negligible' resulting in a slight effect, which is not significant.

Additional Mitigation, Enhancement and Monitoring

18.7.16 A potential significant effect has been identified for the construction phase of Part 1a in relation to hazardous excavation waste requiring disposal. No additional mitigation is proposed at this time and will be reviewed further as part of the ongoing assessment. Waste management routes would be confirmed by the construction contractor.

18.7.17 No other significant effects have been identified; therefore, additional mitigation or monitoring is not proposed.

Residual Effect

18.7.18 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario in **Table 18-14**.

Changes to Safeguarded Mineral and Waste Sites, Permitted Waste Sites, Waste Applications, Waste Exemptions, Historic Landfills and Authorised Landfills

18.7.19 Part 1a does not intersect any safeguarded mineral and waste sites, historic landfills, waste site applications or waste exemptions.

18.7.20 Sensitivity is not applied for safeguarded mineral and waste sites, but the magnitude is 'no change' resulting in a neutral effect, which is not significant.

18.7.21 One permitted waste site and authorised landfill (Minworth – Hazardous Waste Landfill Site) was identified intersecting Part 1a. However, the Proposed Development is unlikely to adversely and substantially impact its access and/or substantially sterilise it.

Additional Mitigation, Enhancement and Monitoring

18.7.22 No additional mitigation, enhancement or monitoring is has been identified.

Residual Effect

18.7.23 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Operational Phase

Waste

Changes in Available Landfill Void Capacity

18.7.24 Operational waste from Part 1a of the Proposed Development would comprise of waste from site offices and the proposed AWTP.

18.7.25 Quantities have not yet been confirmed. However, in the event that non-hazardous and inert wastes from the Proposed Development are disposed of to landfill, the annual quantity is likely to result in a reduction of <1% of West Midlands' inert and non-hazardous waste landfill void capacity (i.e. less than 37,897 m³) and <0.1% of England hazardous waste landfill void capacity (i.e. less than 9,167 m³). The sensitivity of receptor is classified as 'very high' and the magnitude of impact is considered to be 'negligible' resulting in a slight adverse effect which is not significant. This is a direct and permanent effect.

18.7.26 Since some of the operational wastes likely to be generated by the AWTP may not be suitable for landfill disposal (e.g. liquid or sludge), operational waste has been considered in the context of England waste management

facility inputs. In the event that wastes are sent to a waste management facility rather than landfill, the annual quantity is likely to be small in the context of national capacity.

Additional Mitigation, Enhancement and Monitoring

18.7.27 No additional mitigation, enhancement or monitoring has been identified.

Residual Effect

18.7.28 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Summary

18.7.29 **Table 18-15** below summarises the residual materials and waste effects of Part 1a of the Proposed Development.

Table 18-15: Summary of Residual Effects – Part 1a

Description of impact	Sensitivity of receptor	Nature of effect / geographic scale	Magnitude of impact	Initial classification of effect (with embedded control)	Additional mitigation, enhancement and / or monitoring	Residual effect significance
<i>Construction Phase</i>						
Changes in demand for materials	Low	Regional (aggregates only assessed to date)	Negligible	Slight	None	Slight effect (Not Significant)
Changes in available landfill void capacity (hazardous)	Very high	National	Moderate	Large or very large adverse	To be reviewed for the ES as part of the ongoing assessment.	Large or very large adverse (Significant)
Changes in available landfill void capacity (non-hazardous)	Very high	Regional	Negligible	Slight	None	Slight (Not Significant)
Changes to safeguarded mineral and waste sites	Not applicable sensitivity not applied.	Local	No change	Neutral	None	Neutral effect (Not Significant)
<i>Operational Phase</i>						
Changes in available landfill void capacity (hazardous)	Very high	Regional and national	Negligible	Slight	None	Slight effect (Not Significant)

Description of impact	Sensitivity of receptor	Nature of effect / geographic scale	Magnitude of impact	Initial classification of effect (with embedded control)	Additional mitigation, enhancement and / or monitoring	Residual effect significance
Changes in available landfill void capacity (non-hazardous)	Very high	Regional & national	Negligible	Slight	None	Slight effect (Not Significant)

Part 1b: Minworth to Atherstone Pipeline

18.8 Part 1b: Minworth to Atherstone Pipeline

- 18.8.1 This section provides a focussed description of the environmental baseline, embedded environmental design, standards and management measures (if in addition to the aforementioned) and presents the preliminary assessment of likely significant effects in relation to materials and waste for Part 1b (Minworth to Atherstone Pipeline) of the Proposed Development.

Baseline Conditions

- 18.8.2 This section describes the baseline environmental characteristics with specific reference to materials and waste.

Existing Baseline

- 18.8.3 Part 1b of the Proposed Development lies within North Warwickshire Borough Council administrative boundary in the West Midlands. **Table 18-3** defines the study area extents for baseline topics, including landfill capacity (hazardous and non-hazardous), availability of key construction materials, and other relevant considerations such as safeguarded waste and mineral sites, historic and authorised landfills, permitted waste sites and waste exemptions. Detailed information regarding existing baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Future Baseline

- 18.8.4 Future baseline is assumed to be the same as the existing baseline for the baseline topics considered. Detailed information regarding future baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Environmental Design, Standards and Management

- 18.8.5 There are no further embedded environmental design, standards and/or management in relation to materials and waste that are specific to Part 1b of the Proposed Development.

Assessment of Effects and Significance

- 18.8.6 This section provides the preliminary assessment of likely significant effects, including determining the level of significance, for Part 1b (Minworth to Atherstone Pipeline) of the Proposed Development. Where applicable, the requirement for additional mitigation measures and/or monitoring is identified to avoid, prevent, reduce, or if possible offset, any identified significant adverse effects on the environment.

Construction Phase

Materials

Changes in Demand for Materials

- 18.8.7 Part 1b is anticipated to require approximately 53,061 t of aggregate. This equates to 0.5% of West Midlands' total aggregate availability (11.4 Mt).
- 18.8.8 For aggregates, sensitivity of the receptor is classified as 'low' and magnitude of impact is considered to be 'negligible'. This, therefore, results in a slight effect, which is not significant. This is a direct and permanent effect.
- 18.8.9 Material estimates for other construction materials such as asphalt, concrete and steel have not been confirmed for Part 1b of the Proposed Development at this stage. Where possible an assessment will be undertaken and reported in the ES. However, it is anticipated that the Proposed Development's material requirements will remain below the significance threshold (10% of availability) for regional availability of asphalt (>170,000 t) and concrete (>430,000 t), as well as national availability of steel (>1,600,000 t).

Additional Mitigation, Enhancement and Monitoring

- 18.8.10 No additional mitigation, enhancement or monitoring have been identified.

Residual Effect

- 18.8.11 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Waste

Changes in Available Landfill Void Capacity (for Both Hazardous and Non-Hazardous Waste)

- 18.8.12 Estimated quantities of excavation material and construction and demolition waste are outlined in **Table 18-16**. Waste quantities are based on available information at the time of writing this PEI Report and will be further refined where possible for the ES.
- 18.8.13 Hazardous excavated material is anticipated to arise from the excavation activities associated with the trenchless crossings.
- 18.8.14 Non-hazardous and inert excavated material is anticipated to arise from the excavation activities associated with the Break Pressure Tank (BPT) and Outfall.

Table 18-16: Estimated construction, demolition, and excavation waste quantities (m³) – Part 1b

Waste type	Estimated waste quantity (m ³)
Excavated material (hazardous)	263
Excavated material (inert and non-hazardous)	43,802
Demolition waste (hazardous)	No demolition anticipated. Further details to be confirmed for the ES.
Demolition waste (inert and non-hazardous)	
Construction waste (hazardous)	Further details to be confirmed for the ES.
Construction waste (inert and non-hazardous)	23,688
Total hazardous waste	263
Total hazardous landfill capacity	9,167,000
% hazardous landfill capacity	0.003% Sensitivity of receptor is classified as 'very high', and magnitude is 'negligible', resulting in a slight effect, which is not significant.
Total inert & non-hazardous waste	67,490
Total inert & non-hazardous landfill capacity	34,897,000
% inert & non-hazardous landfill capacity	0.19% Sensitivity of receptor is classified as 'very high', and magnitude is 'negligible' resulting in a slight effect, which is not significant.

Additional Mitigation, Enhancement and Monitoring

18.8.15 No additional mitigation, enhancement or monitoring is have been identified.

Residual Effect

18.8.16 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Changes to Safeguarded Mineral and Waste Sites, Permitted Waste Sites, Waste Applications, Waste Exemptions, Historic Landfills and Authorised Landfills

18.8.17 Part 1b does not intersect any safeguarded waste sites, permitted waste applications, and authorised landfills.

18.8.18 One safeguarded mineral site (Hams Lane, Lea Marston, site reference HL9), one permitted waste site (Woodhouse Farm, Church Lane, Lea Marston), one waste exemption and five historic landfills have been identified intersecting Part 1b of the Proposed Development.

18.8.19 The Proposed Development is unlikely to adversely or substantially impact the access to these sites and/or substantially sterilise them. The waste exemption is also associated with a built asset and is therefore unlikely to be impacted by the Proposed Development.

18.8.20 Sensitivity is not applied for safeguarded mineral and waste sites, but the magnitude is 'negligible' resulting in a slight effect, which is not significant. This is a direct and permanent effect.

Additional Mitigation, Enhancement and Monitoring

18.8.21 No additional mitigation, enhancement or monitoring have been identified.

Residual Effect

18.8.22 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Summary

18.8.23 **Table 18-17** below summarises the residual materials and waste effects of Part 1b of the Proposed Development.

Table 18-17: Summary of Residual Effects – Part 1b

Description of impact	Sensitivity of receptor	Nature of effect / geographic scale	Magnitude of impact	Initial classification of effect (with embedded control)	Additional mitigation, enhancement and/or monitoring	Residual effect significance
<i>Construction Phase</i>						
Changes in demand for materials	Low	Regional (aggregates only assessed to date)	Negligible	Slight	None	Slight effect (Not Significant)
Changes in available landfill void capacity (hazardous)	Very high	Regional & national	Negligible	Slight	None	Slight (Not Significant)
Changes in available landfill void capacity (non-hazardous waste)	Very high	Regional & national	Negligible	Slight	None	Slight (Not Significant)
Changes to safeguarded mineral and waste sites	Not applicable sensitivity not applied.	Local	Negligible	Slight	None	Slight effect (Not Significant)

Part 2: Works to the Coventry, Oxford and Grand Union canals

18.9 Part 2: Works to the Coventry, Oxford and Grand Union canals

18.9.1 This section provides a focussed description of the environmental baseline, embedded environmental design, standards and management measures (if in addition to the aforementioned) and presents the preliminary assessment of likely significant effects in relation to materials and waste for Part 2 (Works to the Coventry, Oxford and Grand Union canals) of the Proposed Development.

Baseline Conditions

18.9.2 This section describes the baseline environmental characteristics with specific reference to materials and waste.

Existing Baseline

18.9.3 Part 2 of the Proposed Development lies within the following administrative boundaries in the West Midlands, East Midlands, South East, and East of England regions:

- a. North Warwickshire Borough Council;
- b. Nuneaton and Bedworth Borough Council;
- c. Coventry City Council.
- d. Rugby Borough Council;
- e. West Northamptonshire Council;
- f. Milton Keynes City Council; and
- g. Buckinghamshire Council.

18.9.4 **Table 18-3** defines the study area extents for baseline topics, including landfill capacity (hazardous and non-hazardous), availability of key construction materials, and other relevant considerations such as safeguarded waste and mineral sites, historic and authorised landfills, permitted waste sites and waste exemptions. Detailed information regarding existing baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Future Baseline

18.9.5 Future baseline is assumed to be the same as the existing baseline for the baseline topics considered. Detailed information regarding future baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Environmental Design, Standards and Management

- 18.9.6 There are no further embedded environmental design, standards and/or management in relation to materials and waste that are specific to Part 2 of the Proposed Development.

Assessment of Effects and Significance

- 18.9.7 This section provides the preliminary assessment of likely significant effects, including determining the level of significance, for Part 2 (Works to the Coventry, Oxford and Grand Union canals) of the Proposed Development. Where applicable, the requirement for additional mitigation measures and/or monitoring is identified to avoid, prevent, reduce, or if possible offset, any identified significant adverse effects on the environment.
- 18.9.8 Only Indicative Work Areas are considered in Part 2 of the assessment, as no works will occur outside of these areas.

Construction Phase

Materials

Changes in Demand for Materials

- 18.9.9 Given that Part 2 spans four regions (West Midlands, East Midlands, South East, and East of England), a worst-case scenario is adopted by comparing against the region with the lowest material availability for each key construction material. For aggregates this will be the South East, the East Midlands for concrete and either the West Midlands or South East for asphalt.
- 18.9.10 Key construction materials (aggregate, asphalt, concrete, and steel) have not been confirmed for Part 2 of the Proposed Development at this stage. Where possible an assessment will be undertaken and reported in the ES. However, it is anticipated that the Proposed Development's material requirements will remain below the significance threshold (10% of availability) for regional availability of aggregate (>920,000 t), asphalt (>170,000 t) and concrete (>310,000 t), as well as national availability of steel (>1,600,000 t).

Waste

Changes in Available Landfill Void Capacity (for Both Hazardous and Non-Hazardous Waste)

- 18.9.11 Estimated quantities for demolition waste and excavated material for Part 2 of the Proposed Development are not yet confirmed at this stage. However, it is anticipated that waste being sent to landfill will remain below the significance threshold (<1% of West Midlands' inert and non-hazardous

landfill void capacity (34,897,000 m³) and <0.1% of national hazardous waste landfill capacity (9,167 m³). Where possible an assessment will be undertaken and reported in the ES.

- 18.9.12 The construction of eight pumping stations is expected to generate approximately 20 m³ of inert and non-hazardous construction waste. Construction waste quantities have been derived using WRAP's SMARTWaste Tool (Ref. 33) and a 'best' practice benchmark for waste volume (m³) per 100 m² (square metres).
- 18.9.13 The sensitivity of inert and non-hazardous landfill capacity is classified as 'very high'. Given that Part 2 spans four regions (West Midlands, East Midlands, South East, and East of England), a worst-case scenario has been adopted by comparing against the region with the lowest landfill void capacity (i.e. West Midlands). The magnitude is therefore considered to be 'negligible' as it is anticipated that waste being sent to landfill would be <1% of West Midlands' inert and non-hazardous landfill void capacity (34,897,000 m³). This results in a slight effect, which is not significant. This is a direct and permanent effect.
- 18.9.14 The sensitivity of hazardous landfill capacity is classified as 'very high'. The magnitude is therefore considered to be 'negligible' as it is anticipated that waste being sent to landfill would be <0.1% of the national hazardous landfill void capacity (9,167 m³). This results in a slight effect, which is not significant. This is a direct and permanent effect.

Additional Mitigation, Enhancement and Monitoring

- 18.9.15 No additional mitigation, enhancement or monitoring have been identified.

Residual Effect

- 18.9.16 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Changes to Safeguarded Mineral and Waste Sites, Permitted Waste Sites, Waste Applications, Waste Exemptions, Historic Landfills and Authorised Landfills

- 18.9.17 Part 2 does not intersect any waste site applications.
- 18.9.18 One safeguarded mineral site (Jees and Boon, site reference J&B_HR), one "Preventing land use conflict consultation buffer" around waste location WL1, one permitted waste site (Judkins Landfill Site, Tuttle Hill, Nuneaton, Warwickshire, CV10 0HR), six waste exemptions, ten historic landfills and two authorised landfills have been identified intersecting Part 2 of the Proposed Development. The Proposed Development is unlikely to adversely or substantially impact the access to these sites and/or substantially sterilise

them. The waste exemptions are also associated with built assets and are therefore unlikely to be impacted by the Proposed Development.

18.9.19 Sensitivity is not applied for safeguarded mineral and waste sites, the magnitude is negligible since the Proposed Development does not have the potential to adversely and substantially impact access to one or more allocated site (in their entity), placing their future use at risk or substantially sterilise a site rendering it inaccessible for future use (**Table 18-10**) resulting in a slight effect, which is not significant. This is a direct and permanent effect.

Additional Mitigation, Enhancement and Monitoring

18.9.20 No additional mitigation, enhancement or monitoring have been identified.

Residual Effect

18.9.21 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Summary

18.9.22 **Table 18-18** below summarises the residual materials and waste effects of Part 2 of the Proposed Development.

Table 18-18: Summary of Residual Effects – Part 2

Description of impact	Sensitivity of receptor	Nature of effect / geographic scale	Magnitude of impact	Initial classification of effect (with embedded control)	Additional mitigation, enhancement and/or monitoring	Residual effect significance
<i>Construction phase</i>						
Changes in demand for materials	Low	Regional and National	Likely to be negligible	Likely to be not significant	None	Likely to be Slight (Not Significant)
Changes in available landfill void capacity (hazardous)	Very high	National	No change	Slight	None	Slight (Not Significant)
Changes in available landfill void capacity (non-hazardous)	Very high	Regional	Negligible	Slight	None	Slight (Not Significant)
Changes to safeguarded mineral and waste sites	Not applicable; sensitivity not applied	Local	Negligible	Slight	None	Slight effect (Not Significant)

Part 3: Works to Daventry and Drayton Reservoirs

18.10 Part 3: Works to Daventry and Drayton Reservoirs

18.10.1 This section provides a focussed description of the environmental baseline, embedded environmental design, standards and management measures (if in addition to the aforementioned) and presents the preliminary assessment of likely significant effects in relation to materials and waste for Part 3 (Works to Daventry and Drayton Reservoirs) of the Proposed Development.

Baseline Conditions

18.10.2 This section describes the baseline environmental characteristics with specific reference to materials and waste.

Existing Baseline

18.10.3 Part 3 of the Proposed Development lies within West Northamptonshire administrative boundary in the East Midlands. **Table 18-3** defines the study area extents for baseline topics, including landfill capacity (hazardous and non-hazardous), availability of key construction materials, and other relevant considerations such as safeguarded waste and mineral sites, historic and authorised landfills. Detailed information regarding existing baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Future Baseline

18.10.4 Future baseline is assumed to be the same as the existing baseline for the baseline topics considered. Detailed information regarding future baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Environmental Design, Standards and Management

18.10.5 There are no further embedded environmental design, standards and/or management in relation to materials and waste that are specific to Part 3 of the Proposed Development.

Assessment of Effects and Significance

18.10.6 This section provides the preliminary assessment of likely significant effects, including determining the level of significance, for Part 3 (Works to Daventry and Drayton Reservoirs) of the Proposed Development. Where applicable, the requirement for additional mitigation measures and/or monitoring is identified to avoid, prevent, reduce, or if possible offset, any identified significant adverse effects on the environment.

18.10.7 Only Indicative Work Areas are considered in Part 3 of the assessment, as no works will occur outside of these areas.

Construction Phase

Materials

Changes in Demand for Materials

- 18.10.8 Key construction materials (aggregate, asphalt, concrete, and steel) have not been confirmed for Part 3 of the Proposed Development at this stage. Where possible an assessment will be undertaken and reported in the ES. However, it is anticipated that the Proposed Development's material requirements will remain below the significance threshold (10% of availability) for regional availability of aggregate (>3,670,000 t), asphalt (>330,000 t) and concrete (>310,000 t), as well as national availability of steel (>1,600,000 t).

Waste

Changes in Available Landfill Void Capacity (for Both Hazardous and Non-Hazardous Waste)

- 18.10.9 Estimated quantities for construction and demolition waste for Part 3 of the Proposed Development have not yet been confirmed. Where possible an assessment will be undertaken and reported in the ES. Pipeline excavation is estimated to generate approximately 9,400 m³ of non-hazardous excavation waste based on pipeline dimensions. The sensitivity of inert and non-hazardous landfill capacity is classified as 'very high', and the magnitude is considered to be 'negligible' as it is <1% of East Midlands' inert and non-hazardous landfill void capacity (49,850,000 m³). This results in a slight effect, which is not significant. This is a direct and permanent effect.

Additional Mitigation, Enhancement and Monitoring

- 18.10.10 No additional mitigation, enhancement or monitoring have been identified.

Residual Effect

- 18.10.11 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Changes to Safeguarded Mineral and Waste Sites, Permitted Waste Sites, Waste Applications, Waste Exemptions, Historic Landfills and Authorised Landfills

- 18.10.12 No safeguarded mineral and waste sites, permitted waste sites, waste applications, waste exemptions, or authorised landfills intersect Part 3 of the Proposed Development.
- 18.10.13 One historic landfill and a "Preventing land use conflict consultation buffer" around waste location WL1 were identified intersecting Part 3. The Proposed

Development is unlikely to adversely or substantially impact the access to these sites and/or substantially sterilise them.

- 18.10.14 Sensitivity is not applied for safeguarded mineral and waste sites, but the magnitude is 'no change' (since there are no safeguarded mineral and waste sites in Part 3) resulting in a neutral effect, which is not significant.

Additional Mitigation, Enhancement and Monitoring

- 18.10.15 No additional mitigation, enhancement or monitoring has been identified.

Residual Effect

- 18.10.16 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Summary

- 18.10.17 **Table 18-19** below summarises the residual materials and waste effects of Part 3 of the Proposed Development.

Table 18-19: Summary of Residual Effects – Part 3

Description of impact	Sensitivity of receptor	Nature of effect / geographic scale	Magnitude of impact	Initial classification of effect (with embedded control)	Additional mitigation, enhancement and/or monitoring	Residual effect significance
<i>Construction phase</i>						
Changes in demand for materials	Low	Regional and National	Likely to be negligible)	Likely to be not significant)	Likely none)	Likely to be Not Significant)
Changes in available landfill void capacity (hazardous)	Very high	National	Likely to be negligible)	Likely to be not significant)	Likely none)	Likely to be Not Significant)
Changes in available landfill void capacity (non-hazardous)	Very high	Regional	Negligible	Slight	None	Slight (Not significant)
Changes to safeguarded mineral and waste sites	Not applicable; sensitivity not applied.	Local	No change	Neutral	None	Neutral effect (Not Significant)

Part 4a: Abstraction, storage and treatment

18.11 Part 4a: Abstraction, storage and treatment

18.11.1 This section provides a focussed description of the environmental baseline, embedded environmental design, standards and management measures (if in addition to the aforementioned) and presents the preliminary assessment of likely significant effects in relation to materials and waste for Part 4a (Abstraction, storage and treatment) of the Proposed Development.

Baseline Conditions

18.11.2 This section describes the baseline environmental characteristics with specific reference to materials and waste.

Existing Baseline

18.11.3 The Part 4a Preliminary Order Limits are located near Great Brickhill, south-east of Milton Keynes, within the local authority area of Buckinghamshire Council. However, the north-western access point to Part 4a on A4146, attributed with the abstraction element, is located within the local authority area of Milton Keynes City Council.

18.11.4 **Table 18-3** defines the study area extents for baseline topics, including landfill capacity (hazardous and non-hazardous), availability of key construction materials, and other relevant considerations such as safeguarded waste and mineral sites, historic and authorised landfills, permitted waste sites and waste exemptions. Detailed information regarding existing baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Future Baseline

18.11.5 Future baseline is assumed to be the same as the existing baseline for the baseline topics considered. Detailed information regarding future baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Environmental Design, Standards and Management

18.11.6 There are no further embedded environmental design, standards and/or management in relation to materials and waste that are specific to Part 4a of the Proposed Development.

Assessment of Effects and Significance

18.11.7 This section provides the preliminary assessment of likely significant effects, including determining the level of significance, for Part 4a (Abstraction, storage and treatment) of the Proposed Development. Where applicable, the requirement for additional mitigation measures and/or monitoring is identified to avoid, prevent, reduce, or if possible offset, any identified significant adverse effects on the environment.

Construction Phase

Materials

Changes in Demand for Materials

18.11.8 Key construction materials (aggregate, asphalt, concrete, and steel) have not been confirmed for Part 4a of the Proposed Development at this stage. Where possible an assessment will be undertaken and reported in the ES. However, it is anticipated that the Proposed Development's material requirements will remain below the significance threshold (10% of availability) for regional availability of aggregate (>920,000 t), asphalt (>170,000 t) and concrete (>550,000 t), as well as national availability of steel (>1,600,000 t).

Waste

Changes in Available Landfill Void Capacity (for Both Hazardous and Non-Hazardous Waste)

18.11.9 Estimated quantities of excavation material and construction and demolition waste and their significance are outlined in **Table 18-20**. Waste quantities are based on available information at the time of writing this PEI Report and where possible, will be further refined for the ES.

18.11.10 Non-hazardous construction waste estimates for Part 4a include waste arisings from a pumping station and the proposed Water Treatment Works (WTW) site. Construction waste quantities have been derived using WRAP's SMARTWaste Tool (Ref. 33) and a 'best' practice benchmark for waste volume (m³) per 100 m².

18.11.11 Excavation waste from the raw water treatment storage area has been based on a 10% cut-and-fill imbalance, resulting in approximately 57,500 m³ of surplus material from a total excavation volume of 575,000 m³.

Table 18-20: Estimated construction, demolition, and excavation waste quantities (m³) – Part 4a

Waste type	Estimated waste quantity (m ³)
Excavated material (hazardous)	Further details to be confirmed in the ES.
Excavated material (inert and non-hazardous)	57,500
Demolition waste (hazardous)	No demolition anticipated. Further details to be confirmed in the ES.
Demolition waste (inert and non-hazardous)	
Construction waste (hazardous)	Further details to be confirmed in the ES.
Construction waste (inert and non-hazardous)	993

Waste type	Estimated waste quantity (m ³)
Total hazardous waste	Further details to be confirmed in the ES.
Total hazardous landfill capacity	9,167,000
% hazardous landfill capacity	Further details to be confirmed in the ES.
Total inert & non-hazardous waste	58,493
Total inert & non-hazardous landfill capacity	41,342,000
% inert & non-hazardous landfill capacity	0.14% Sensitivity of receptor is classified as 'very high', and magnitude is 'negligible' resulting in a slight effect, which is not significant.

Additional Mitigation, Enhancement and Monitoring

18.11.12 No additional mitigation, enhancement or monitoring has been identified.

Residual Effect

18.11.13 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Changes to Safeguarded Mineral and Waste Sites, Permitted Waste Sites, Waste Applications, Waste Exemptions, Historic Landfills and Authorised Landfills

18.11.14 Part 4a does not intersect any safeguarded mineral and waste sites, permitted waste sites, waste applications, waste exemptions, historic landfills and authorised landfills.

18.11.15 Sensitivity is not applied for safeguarded mineral and waste sites, but the magnitude is 'no change' resulting in a neutral effect, which is not significant.

Additional Mitigation, Enhancement and Monitoring

18.11.16 No additional mitigation, enhancement or monitoring have been identified.

Residual Effect

18.11.17 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Operational Phase

Waste

Changes in available landfill void capacity

- 18.11.18 Operational waste from Part 4a of the Proposed Development would comprise waste generated from the site offices and the WTW site.
- 18.11.19 Quantities have not yet been confirmed. However, in the event that non-hazardous and inert wastes from the Proposed Development are disposed of to landfill, the annual quantity is likely to result in a reduction of <1% of the South East's inert and non-hazardous waste landfill void capacity (i.e. less than 41,342 m³) and <0.1% of England hazardous waste landfill void capacity (i.e. less than 9,167 m³). The sensitivity of receptor is classified as 'very high' and the magnitude of impact is considered to be 'negligible' resulting in a slight adverse effect which is not significant. This is a direct and permanent effect.
- 18.11.20 Since some of the operational wastes likely to be generated by the WTW may not be suitable for landfill disposal (e.g. liquid or sludge), operational waste has been considered in the context of England waste management facility inputs. In the event that wastes are sent to a waste management facility rather than landfill, the annual quantity is likely to be small in the context of national capacity.

Additional Mitigation, Enhancement and Monitoring

- 18.11.21 No additional mitigation, enhancement or monitoring have been identified.

Residual Effect

- 18.11.22 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Summary

- 18.11.23 **Table 18-21** below summarises the residual materials and waste effects of Part 4a of the Proposed Development.

Table 18-21: Summary of Residual Effects – Part 4a

Description of impact	Sensitivity of receptor	Nature of effect / geographic scale	Magnitude of impact	Initial classification of effect (with embedded control)	Additional mitigation, enhancement and/or monitoring	Residual effect significance
<i>Construction phase</i>						
Changes in demand for materials	Low	Regional & National	Likely to be negligible)	Likely to be not significant)	Likely none)	Likely to be Not Significant)
Changes in available landfill void capacity (hazardous)	Very high	National	Likely to be negligible)	Likely to be not significant)	To be determined (likely none)	Likely to be Not Significant)
Changes in available landfill void capacity (non-hazardous)	Very high	Regional	Negligible	Slight effect	None	Slight effect (Not Significant)
Changes to safeguarded mineral and waste sites	Not applicable sensitivity not applied.	Local	No change	Neutral	None	Neutral effect (Not Significant)
<i>Operational phase</i>						
Changes in available landfill void capacity (non-hazardous and hazardous)	Very high	Regional and National	Negligible	Slight	None	Slight effect (Not Significant)

Part 4b: Pipeline to an existing underground reservoir near Luton

18.12 Part 4b: Pipeline to an Existing Underground Reservoir near Luton

18.12.1 This section provides a focussed description of the environmental baseline, embedded environmental design, standards and management measures (if in addition to the aforementioned) and presents the preliminary assessment of likely significant effects in relation to materials and waste for Part 4b (Pipeline to an Existing Underground Reservoir near Luton) of the Proposed Development.

Baseline Conditions

18.12.2 This section describes the baseline environmental characteristics with specific reference to materials and waste.

Existing Baseline

18.12.3 Part 4b of the Proposed Development lies within Buckinghamshire, Central Bedfordshire and Milton Keynes City Council administrative boundaries in the South East. **Table 18-3** defines the study area extents for baseline topics, including landfill capacity (hazardous and non-hazardous), availability of key construction materials, and other relevant considerations such as safeguarded waste and mineral sites, historic and authorised landfills, permitted waste sites and waste exemptions. Detailed information regarding existing baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Future Baseline

18.12.4 Future baseline is assumed to be the same as the existing baseline for the baseline topics considered. Detailed information regarding future baseline is outlined in **Appendix 18-PD-2** in PEI Report **Volume 4**.

Environmental Design, Standards and Management

18.12.5 There are no further embedded environmental design, standards and/or management in relation to materials and waste that are specific to Part 4b of the Proposed Development.

Assessment of Effects and Significance

18.12.6 This section provides the preliminary assessment of likely significant effects, including determining the level of significance, for Part 4b (Pipeline to an existing underground reservoir near Luton) of the Proposed Development. Where applicable, the requirement for additional mitigation measures and/or monitoring is identified to avoid, prevent, reduce, or if possible offset, any identified significant adverse effects on the environment.

Construction Phase

Materials

Changes in Demand for Materials

- 18.12.7 Key construction materials (aggregate, asphalt, concrete, and steel) have not been confirmed for Part 4b of the Proposed Development at this stage. Where possible an assessment will be undertaken and reported in the ES. However, it is anticipated that the Proposed Development's material requirements will remain below the significance threshold (10% of availability) for regional availability of aggregate (>920,000 t), asphalt (>170,000 t) and concrete (>550,000 t), as well as national availability of steel (>1,600,000 t).

Waste

Changes in Available Landfill Void Capacity (for Both Hazardous and Non-Hazardous Waste)

- 18.12.8 Estimated quantities for construction waste for Part 4b of the Proposed Development are not yet confirmed. No demolition is anticipated. Where possible an assessment will be undertaken and reported in the ES
- 18.12.9 Pipeline excavation is estimated to generate 88,279 m³ of non-hazardous excavation waste, based on pipeline dimensions of 1,000 mm and a total length of 28 km. The sensitivity of inert and non-hazardous landfill capacity is classified as 'very high', and the magnitude is considered 'negligible' as it is <1% of the South East's inert and non-hazardous landfill void capacity (41,342,000 m³). This results in a slight effect, which is not significant. This is a direct and permanent effect.

Additional Mitigation, Enhancement and Monitoring

- 18.12.10 No additional mitigation, enhancement or monitoring has been identified.

Residual Effect

- 18.12.11 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Changes to Safeguarded Mineral and Waste Sites, Permitted Waste Sites, Waste Applications, Waste Exemptions, Historic Landfills and Authorised Landfills

- 18.12.12 No safeguarded waste and mineral sites, permitted waste sites, waste site applications, or authorised landfills intersect Part 4b of the Proposed Development.

18.12.13 Sensitivity is not applied for safeguarded mineral and waste sites, but the magnitude is 'no change' resulting in a neutral effect, which is not significant.

18.12.14 One historic landfill and two waste exemptions were identified intersecting Part 4b. The waste exemptions are associated with a built asset so are therefore unlikely to be impacted by the Proposed Development.

Additional Mitigation, Enhancement and Monitoring

18.12.15 No additional mitigation, enhancement or monitoring have been identified.

Residual Effect

18.12.16 As there is no additional mitigation, enhancement or monitoring identified, the residual effect remains the same as that reported for the pre-additional mitigation scenario.

Summary

18.12.17 **Table 18-22** below summarises the residual materials and waste effects of Part 4b of the Proposed Development.

Table 18-22: Summary of Residual Effects – Part 4b

Description of impact	Sensitivity of receptor	Nature of effect / geographic scale	Magnitude of impact	Initial classification of effect (with embedded control)	Additional mitigation, enhancement and/or monitoring	Residual effect significance
<i>Construction phase</i>						
Changes in demand for materials	Low	Regional and National	Likely to be negligible	Likely to be Not Significant	None anticipated	Likely to be Slight (Not Significant)
Changes in available landfill void capacity (hazardous)	Very high	National	Likely to be negligible	Likely to be Not Significant	None anticipated	Likely to be Slight (Not Significant)
Changes in available landfill void capacity (non-hazardous)	Very high	Regional	Negligible	Slight	None	Slight (Not Significant)
Changes to safeguarded mineral and waste sites	Not applicable sensitivity not applied	Local	No change	Neutral	None	Neutral effect (Not Significant)

18.13 Combined Effects between Proposed Development Parts

18.13.1 This section reviews the findings from the individual Parts of the Proposed Development, to identify potential combined effects on a shared receptor(s), which may be of greater significance than the effects arising from any single Part. Where combined effects are identified, they are assessed additively and qualitatively using professional judgement. The shared receptor for combined effects on materials and waste is the region in which the Part sits. Some parts fall into more than one region and are therefore considered in the context of each region.

18.13.2 As further explained in **Chapter 6: Environmental Impact Assessment Methodology** in PEI Report **Volume 2**, the approach undertaken for this assessment is summarised in the following steps:

- a. **Step 1:** Review and identification of shared receptors from assessments undertaken for each technical chapter for interfacing Parts of the Proposed Development; and
- b. **Step 2:** Assessment of combined effects for any shared receptors identified under Step 1.

18.13.3 Given that Part 2 spans four regions (West Midlands, East Midlands, South East, and East of England), a worst-case scenario has been adopted by comparing against the region with the lowest material availability for each key construction material and lowest non-hazardous and inert landfill capacity.

Part 1a, Part 1b, Part 2 Combined Effects

18.13.4 Parts 1a, 1b, and 2 of the Proposed Development are all located within the West Midlands region and have therefore been combined.

Step 1: Screening, Review and Identification of Shared Receptors

18.13.5 **Table 18-23** reviews the relevant receptor groups to consider the potential for a combined effect to occur across Parts 1a, 1b and 2 of the Proposed Development.

Table 18-23: Potential for Combined Effects Between Parts 1a, 1b and 2

Receptor groups	Potential for combined effects
Demand for materials	Each part is expected to require key construction materials, including aggregate, asphalt, concrete, and steel. This creates a potential combined impact on this receptor. To ensure a comprehensive assessment, total material volumes from all parts should be combined and evaluated

Receptor groups	Potential for combined effects
	against regional availability for aggregate, asphalt, and concrete and national availability for steel.
Landfill void capacity (non-hazardous and hazardous)	The inert and non-hazardous waste generated by each Part will reduce regional landfill void capacity, while any hazardous waste will impact national landfill capacity. This creates a potential combined impact on this receptor. To ensure a comprehensive assessment, total waste volumes from all parts should be combined and evaluated against both regional and national landfill void capacities.

Step 2: Source-pathway-receptors Identification

18.13.6 The assessment of combined effects described in this section considers the embedded, control and management measures, and mitigation measures identified earlier within this PEI Report chapter.

Summary of Potential Combined Effects on Part 1a, Part 1b and Part 2

18.13.7 **Table 18-24** provides a summary of the potential combined effects review for Parts 1a and 1b of the Proposed Development.

Table 18-24: Summary of Potential Combined Effects Between Parts 1a, 1b and 2

Receptor groups	Potential combined effect?	Significance of combined effects
Demand for materials	Yes	Material quantities have been provided for Parts 1a and 1b; however, they are not yet confirmed for Part 2 at this stage. However, the significance of effect is unlikely to be worse than that reported for each individual Part of the Proposed Development.
Landfill void capacity (non-hazardous and hazardous)	Yes	Construction, demolition and excavation quantities have been confirmed for Part 1a and Part 1b, while some quantities for Part 2 are not yet confirmed. However, the significance of effect is unlikely to be worse than that reported for each individual Part of the Proposed Development (Significant for hazardous waste for Part 1a, not significant for non-

Receptor groups	Potential combined effect?	Significance of combined effects
		hazardous waste for Part 1a, Part 1b and Part 2).

Part 2 and Part 3 Combined Effects

18.13.8 Parts 2 and 3 of the Proposed Development are both located in the East Midlands region and have therefore been combined.

Step 1: Screening, Review and Identification of Shared Receptors

18.13.9 **Table 18-25** reviews the relevant receptor groups to consider the potential for a combined effect to occur across Part 2 and Part 3 of the Proposed Development.

Table 18-25 Potential for Combined Effects Between Parts 2 and 3

Receptor groups	Potential for combined effects
Demand for materials	Each part is expected to require key construction materials such as aggregate, asphalt, concrete, and steel. This creates a potential combined impact on this receptor. To ensure a comprehensive assessment, total material volumes from both Parts should be combined and evaluated against regional availability for aggregate, asphalt, and concrete, and national availability for steel.
Landfill void capacity (non-hazardous and hazardous)	The inert and non-hazardous waste generated by each part will reduce regional landfill void capacity, while any hazardous waste will impact national landfill capacity. This creates a potential combined impact on this receptor. To ensure a comprehensive assessment, total waste volumes from both Parts should be combined and evaluated against both regional and national landfill void capacities.

Step 2: Source-pathway-receptors Identification

18.13.10 The assessment of combined effects described in this section considers the embedded, control and management measures, and mitigation measures identified earlier within this PEI Report chapter.

Summary of potential combined effects on Part 2 and Part 3

18.13.11 **Table 18-26** provides a summary of the potential combined effects review for Parts 2 and 3 of the Proposed Development.

Table 18-26: Summary of Potential Combined Effects Between Parts 2 and 3

Receptor groups	Potential combined effect?	Significance of combined effects
Demand for materials	Yes	Material quantities are not yet confirmed for Parts 2 and 3. Significance of combined effects will be assessed and reported in the ES where possible, however it is unlikely to be significant.
Landfill void capacity (non-hazardous and hazardous)	Yes	Some waste quantities are not yet confirmed for Part 2 and Part 3. Significance of combined effects will be assessed and reported in the ES, where possible, however it is unlikely to be significant.

Part 2, Part 4a and Part 4b Combined Effects

18.13.12 Parts 2, 4a, and 4b of the Proposed Development are all located in the South East region and have therefore been combined.

Step 1: Screening, Review and Identification of Shared Receptors

18.13.13 **Table 18-27** below reviews the relevant receptor groups to consider the potential for a combined effect to occur across Parts 2, 4a and 4b of the Proposed Development.

Table 18-27 Potential for Combined Effects Between Parts 2, 4a and 4b

Receptor groups	Potential for combined effects
Demand for materials	Each part is expected to require key construction materials, including aggregate, asphalt, concrete, and steel. This creates a potential combined impact on this receptor. To ensure a comprehensive assessment, total material volumes from all Parts should be combined and evaluated against regional availability for aggregate, asphalt, and concrete, and national availability for steel.
Landfill void capacity (non-hazardous and hazardous)	The inert and non-hazardous waste generated by each part will reduce regional landfill void capacity, while any hazardous waste will impact national landfill capacity. This creates a potential combined impact on this receptor. To ensure a comprehensive assessment, total waste volumes from all Parts should be combined and evaluated against both regional and national landfill void capacities.

Step 2: Source-pathway-receptors Identification

18.13.14 The assessment of combined effects described in this section considers the embedded, control and management measures, and mitigation measures identified earlier within this PEI Report chapter.

Summary of Potential Combined Effects on Part 2, Part 4a and Part 4b

18.13.15 **Table 18-28** provides a summary of the potential combined effects review for Part 2, Part 4a, and Part 4b of the Proposed Development.

Table 18-28: Summary of Potential Combined Effects between Part 2, Part 4a, and Part 4b

Receptor groups	Potential combined effect?	Significance of combined effects
Demand for materials	Yes	Material quantities are not yet confirmed for Part 2, Part 4a and Part 4b. Significance of combined effects will be assessed and reported in the ES, where possible, however it is unlikely to be significant.
Landfill void capacity (non-hazardous and hazardous)	Yes	Some waste quantities are not yet confirmed for Part 2, Part 4a and Part 4b. Significance of combined effects will be assessed and reported in the ES, where possible, however it is unlikely to be significant.

18.14 Summary and Next Steps

18.14.1 The preliminary assessment of effects has identified one significant effect on a precautionary basis in Part 1a of the Proposed Development in relation to hazardous excavation waste requiring disposal. No additional mitigation is proposed at this time due to the ongoing design process and further refinement of design and will be reviewed further as part of the ongoing assessment in the ES.

18.14.2 Further information including Ground Investigations will be developed as part of the ongoing design development to inform the ES assessment.

18.14.3 The information provided in this PEI Report is preliminary, with the final assessment of likely significant effects to be reported in the ES when more information about materials and waste estimates is likely to be available.

18.15 References

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