

14.0 WASTE AND RESOURCE MANAGEMENT

14.1 INTRODUCTION

14.1.1 This Chapter of the Environmental Statement (ES) presents an assessment of the potential effects predicted to arise from waste generation and resource use, resulting from the construction, demolition and operational phases associated with the Proposed Development.

14.1.2 The Proposed Development comprises the following:

- An intermodal freight terminal including container storage and HGV parking, rail sidings to serve individual warehouses, and with the capability to also provide a 'rapid rail freight' facility as part of the intermodal freight terminal;
- Up to 468,000 sq m (approximately 5 million sq ft) (gross internal area) of warehousing and ancillary buildings, with additional floorspace provided in the form of mezzanines;
- New road infrastructure and works to the existing road network, including the provision of a new access and associated works to the A508, a new bypass to the village of Roade, improvements to Junction 15 and to J15A of the M1 motorway, the A45, and other highway improvements at junctions on the local highway network;
- Strategic landscaping and tree planting, including diverted public rights of way;
- Earthworks and demolition of existing structures on the SRFI site.

14.1.3 This Chapter describes the waste management policy context; the methods used to assess the potential environmental impacts; the baseline conditions at and surrounding the Site; the potential direct, indirect and wider waste management impacts; mitigation measures integral to the Proposed Development; and the significance of residual effects.

14.1.4 This Chapter presents the results of the assessment of the potential environmental effects related to construction and operational waste arising's in terms of the likely quantities of waste arising, the proposed management of the waste on Site and the regional capacity to treat or dispose of residual waste.

14.1.5 Operational waste is only of direct reference to the SRFI development containing buildings and the rail terminal (on the 'main site'), and not to the highways related elements. Construction and Demolition waste relates to the whole of the Proposed Development including the main site but also the development of the highways improvement works.

Consultation

14.1.6 Waste statistics have been requested from South Northamptonshire Council on 15.03.2017, however local data was not available at the time of the request. Therefore, county, (Northamptonshire) wide waste statistics have been used to inform this waste assessment.

14.2 LEGISLATION AND PLANNING POLICY CONTEXT

14.2.1 As a producer of waste, the Proposed Development must consider a range of waste legislation. This section details relevant national, regional and local policy.

Relevant Legislation

14.2.2 As a producer of waste, the Proposed Development will be affected by a range of waste legislation, primarily including (but not limited to):

- Control of Pollution (Amendment) Act 2012, **(Ref 14.1)**;
- Controlled Waste (England and Wales) Regulations 2012, **(Ref 14.2)**;
- Environment Act 1995, **(Ref 14.3)**;
- The Environmental Permitting (England and Wales) Regulations 2015 (as amended), **(Ref 14.4)**;
- The EU Waste Directive (2008/98/EC) and the Waste (England and Wales) Regulations 2012 (as amended), **(Ref 14.5)**;
- The Environmental Damage (Prevention and Remediation) Regulations 2015, **(Ref 14.6)**.
- National Networks National Policy Statement (NNNPS), **(Ref 14.7)**.

14.2.3 The key requirements that arise from the regulation, policy and guidance are as follows:

- Waste must be stored in such a way as to prevent it from causing damage to the environment or posing a risk to human health;
- The waste hierarchy must be applied in both the construction and operation of new developments, and waste reduction and re-use should be prioritised;
- Duty of Care obligations must be implemented, particularly in relation to waste handling and disposal;
- Waste should be managed sustainably and the environmental benefits of providing appropriate recycling facilities within new developments realised through effective waste recycling strategies;
- The impact of new development on waste management facilities should not prejudice the implementation of the waste hierarchy and/or efficient operation of such facilities;
- National waste target rates for reuse/recycling should meet the Waste Framework Directive (WFD) targets of:
 - Recovering at least 50% (by weight) of waste from household and other similar origins by 2020; and
 - Recovering at least 70% (by weight) of waste from construction and demolition by 2020; and
- To achieve a BREEAM "Very Good" rating, the development should aim for the BREEAM target of diverting 70% (by volume) and 80% (by weight) of non-hazardous construction waste from landfill, and 80% (by volume) and 90% (by weight) of demolition waste.

National Planning Policy

14.2.4 In England, waste management strategies and principles are set out in a number of documents. The most relevant document to this assessment is the waste

management section of the NNNPS (**Ref 14.7**) which stipulates the requirements of a waste assessment for a proposed development.

- 14.2.5 Other national documents are also of relevance for ensuring effective application of the waste hierarchy. These include the following.
- 14.2.6 The Waste Strategy for England 2007 (Department for Environment, Transport and the Regions (DETR), 2007) (**Ref 14.8**) and the Waste Management Plan for England 2013, (**Ref 14.9**).
- 14.2.7 The Waste Strategy for England (DETR, 2007) (**Ref 14.8**) introduced new underlying principles of sustainable waste management. Key principles are defined in **Table 14.1**.
- 14.2.8 The Waste Management Plan for England (**Ref 14.9**) provides a single document that brings all national waste policies under the same umbrella. It includes the policies originally set out by Planning Policy Statement 10 for Waste, (PPS10), (now withdrawn) (**Ref 14.10**).
- 14.2.9 The waste management principles of the waste hierarchy are now fully incorporated in the Waste Management Plan for England (**Ref 14.9**) as objectives to be delivered through waste local plans. The requirement for a Best Practicable Environmental Option (BPEO) appraisal has been replaced in PPS 10 with a requirement for Strategic Environmental Assessment (SEA)/ Sustainability Appraisal (SA) to be undertaken for planning strategies and for it to be demonstrated that planned facilities represent the Best Available Technology (BAT).

Table 14.1 Principles of Waste Management- Definitions.

Principle	Description
Waste Hierarchy	A theoretical framework used as a guide to the waste management options that should be considered when assessing the BPEO.
Waste as a Resource	Certain wastes can be directly used or separated / processed for use as a replacement for raw materials, saving resources and potentially reducing energy use or other impacts associated with virgin resource extraction and transport.
Proximity Principle	Certain wastes can be directly used or separated / processed for use as a replacement for raw materials, saving resources and potentially reducing energy use or other impacts associated with virgin resource extraction and transport.
Regional Self-sufficiency	Where practical, waste should be treated or disposed of within the region in which it is produced.
Best Practicable Environmental Option- (BPEO)	Defined by the Royal Commission on Environmental Pollution (1988) as the outcome of a systematic and consultative decision making procedure which emphasises the protection and conservation of the environment across land, air and water". The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits, as a whole, at acceptable cost, in both the short term and the long term. SA is designed to ensure compliance with SEA and as such includes for requirements on environmental decision making such as an opportunity for the public to express their opinion on draft plans (community involvement), take into account significant environmental effects including those on human health, material assets and climatic factors and a full assessment of alternative options and reasons why

alternatives have been assessed and why others have not.

Construction, Demolition and Excavation Waste

14.2.10 The EU Waste Directive (**Ref 14.5**) has set the following target for construction and demolition waste:

- Recover 70% of construction and demolition waste by 2020.

14.2.11 The Strategy for Sustainable Construction (**Ref 14.11**) detailed specific targets and policies for Construction, Demolition and Excavation waste (CD&E) waste which includes the reduction of waste to landfill by 50% by 2012 when compared to 2008 levels.

14.2.12 The construction stage assessment assesses the likely waste that will arise from building-out the development, using established national benchmarks. By quantifying the waste predicted to be generated from the development based on current practice (i.e. reported benchmarks), it is possible to then estimate the quantities of waste that could be reused and recycled, and set targets to reduce or eliminate volumes of waste entering landfill.

14.2.13 Waste volumes and tonnage arising from the construction of the development have been calculated using the floor areas provided in the Area Schedule of the Site and typical waste volumes from the Building Research Establishment (BRE) SmartWaste benchmark data and data on typical compositions (**Ref 14.12**). In the context of BRE's SmartWaste benchmark data, the proposed buildings have been categorised as 'Industrial Buildings'.

14.2.14 The information on waste is provided by volume (in cubic metres (m³) or litres). Waste volumes are converted to tonnes using conversion factors provided in WRAP's waste volume to mass conversion tool, (**Ref 14.18**).

Operational Waste

14.2.15 The waste generation amounts for the completed, occupied development are estimated using British Standard 5906:2005 Waste Management in Buildings (**Ref 14.13**). This document provides guidance on the likely waste arisings and consequent storage provision.

14.2.16 The information on waste is provided by volume (in cubic metres (m³) or litres). Waste volumes are converted to tonnes using conversion factors provided in in WRAP's waste volume to mass conversion tool, (**Ref 14.18**).

14.2.17 Operational waste at the site is likely to consist of waste categorised as commercial/industrial.

14.2.18 The Waste Management Plan for England (**Ref 14.9**) and the Review of Waste Policy in England (2011) (**Ref 14.14**) state that commercial and industrial waste should be included when considering waste management. The EU Waste Directive set targets for business waste, which includes:

- The set-up of separate collections of waste for at least paper, metal, plastic and glass where technically, environmentally and economically practicable for both household and business waste.

14.2.19 While ultimately the assessment and determination of the application will lie with the Planning Inspectorate and Secretary of State respectively, it is still important to consider the Proposed Development's waste arisings in the context of Local Policy.

14.2.20 At a local level, the Northamptonshire Joint Municipal Waste Management Strategy (2012), (**Ref 14.15**) provides a commitment to increase recycling rates across the county while ensuring the waste hierarchy is utilised when considering the best options for managing Local Authority Collected Municipal Waste, (LACMW). This principle will be applied to the generated commercial industrial waste from the operational phase.

14.2.21 While the Northampton Joint Municipal Waste Strategy does not consider commercial/industrial waste arising from the operational phase of the development, the waste management plan for England referred to above will be used when determining the best practicable option for managing that specific waste stream.

Decommissioning Waste

14.2.22 The scheme is designed to be permanent. Therefore, the potential waste volume from decommissioning of the proposed development is not considered. If, at some point in the future, it is decided to decommission the development, this will be subject to a new application for which a separate waste strategy will be developed.

14.2.23 The design of buildings and supporting infrastructure, the construction methods and materials chosen will be considered throughout the detailed design stage of the proposed development to ensure 'cradle-to-grave' use of materials.

14.3 ASSESSMENT METHODOLOGY, INFORMATION SOURCES AND SIGNIFICANCE CRITERIA

Spatial Scope

- 14.3.1 The spatial scope of this waste assessment is not easily defined as issues associated with waste management are far-reaching and extend beyond the application boundary. The area in which construction and operational waste arisings are likely to occur however, is defined by the application boundary of the Proposed Development with a focus on the SRFI site ('the main site') rather than on the Highways and infrastructure related sites.

Temporal Scope

- 14.3.2 The baseline year for the assessment is 2017/2018. Waste environmental impacts have been assessed for the construction phasing from 2020, (estimated construction start date at the time of assessment), with target development completion in 2026. Operational impacts are based on whole development operation from 2026.

Technical Scope

- 14.3.3 A scoping opinion has been provided by the Planning Inspectorate (Ref- TR050006, December 2016). The Scoping Report proposes that waste be scoped into the ES on the basis that adequate information is not available to justify its exclusion. Further detail of this is provided in paragraphs 3.19 and 3.20 of the Planning Inspectorate scoping report.
- 14.3.4 Waste is defined by EC Directive 2008/98/EC (the Waste Framework Directive), as amended by EC Directive 91/156/EEC, as "*any substance or object which the holder discards or intends or is required to discard*".
- 14.3.5 The assessment includes consideration of impacts associated with construction and demolition phases as well as waste generated during the operational phase, including measures taken during the development design process to maximise the opportunities for the re-use of construction materials.
- 14.3.6 The mitigation section presented herein considers two aspects. Firstly, the extent to which measures to reduce, re-use and recycle waste, have been or would be incorporated. Secondly, it considers waste arising's that cannot be avoided, and the measures that would be taken to prevent environmental harm through the safe storage, handling and management of that waste.

Baseline Data Collection

- 14.3.7 The existing site is predominantly undeveloped agricultural land. The only buildings on site are two small clusters of farm buildings/huts in the eastern and south-central areas of the main site. The southern cluster, close to the existing woodland on site, is currently used as a base for clay pigeon shooting. Therefore, very limited volumes of waste are currently generated from the proposed site.

14.3.8 Baseline waste arising's at a regional level have been derived from the Northampton Minerals and Waste Monitoring Report 2016 (**Ref 14.16**). These arisings include Construction, Demolition & Excavation, (CD&E) waste as well as operational waste, which for the purpose of this assessment will be classified as Commercial and Industrial, (C&I) waste.

14.3.9 The waste arisings from the proposed development will be compared against this baseline regional data to determine capacity levels.

Impact Assessment and Significance Criteria

14.3.10 The significance of waste arising's is largely based on the nature of the waste, the location and capacity of local and regional waste management facilities and the sustainability of the disposal or processing method.

14.3.11 There are no specific criteria for assessing the magnitude, sensitivity of receptors and significance of effects arising from the management of waste. Each project is evaluated per individual characteristics. Overall, the purpose of a waste management assessment is to characterise development waste types and arising's and to identify existing and potential methods employed for their management, as well as the significance of change associated with a proposed development in comparison to the current and likely future situation without the development. For the purposes of this assessment, a methodology has been utilised that considers:

- The type and quantity of waste (magnitude of waste impact) when compared to the current baseline, scored 1 to 5 (1 = less than 1% current baseline (<1%), 2 = Between 1 and 2% of current baseline (1 - 2%), 3 = Between 2 and 5% of current baseline (2 - 5%), 4 = Between 5 and 10% of current baseline (5 – 10%), 5 = Above 10% of current baseline (>10%)). The score is a subjective assessment based on our understanding of local conditions and infrastructure;
- The distance waste is transported for processing or disposal (the proximity principle), scored 1 to 3 where score 1 = immediately local disposal or very high locally available capacity, score 2 = regional disposal, and score 3 = distant and or limited capacity available; and
- The method of disposal with regard to the waste hierarchy (sustainability) considering mitigation and impact avoidance measures, scored 1 to 4, where score 1 = re-use, score 2 = recycle, score 3 = recovery (e.g. energy from waste), score 4 = disposal (e.g. landfill).

14.3.12 This approach broadly conforms with the standard Environmental Impact Assessment (EIA) approach of assessing significance as a function of the magnitude of impact and sensitivity of any receptors. In this case, magnitude of impact and proximity and sustainability of receptors.

14.3.13 The multiplication of scores from the three categories provides an indication of the significance of each type of waste arising. Based on various waste arising and handling scenarios, a threshold scale of significance is subsequently used as a guide for assessment (see **Table 14.2**).

Table 14.2 Magnitude of Impact

Magnitude and Significance of Impact on Receptor

1-9	10-20	21-39	40-60
Negligible Effect	Minor Effect	Moderate Effect	Major Effect
Description			
Large quantity & local disposal & recycling/ recovery/ landfill OR Small quantity & national disposal & landfill OR Medium quantity & regional disposal & recycling/ recovery	Large quantity & national disposal & recycling OR Medium quantity & regional disposal & landfill OR Quite small quantity & national disposal & landfill	Large quantity & regional disposal & landfill OR Medium - large quantity & national disposal & landfill	

Cumulative Effects

14.3.14 The study area for the consideration of cumulative effects has been developed considering the predicted extent of impacts associated with waste regarding the Proposed Development, and with the point at which the associated effects become insufficient to contribute in any meaningful way to those of another development.

14.3.15 A precautionary approach has been adopted in the definition of the study area to help to ensure that all potentially significant effects (including cumulative effects) have been effectively identified. Information on the likely extent of impacts associated with other developments in the area has also been considered. Where sufficient information exists, the study area includes all known proposed developments in the surrounding area that could potentially result in cumulative effects.

14.3.16 The developments considered as part of this assessment are:

- Northampton South SUE – allocated in the Core Strategy and subsequently approved (at planning appeal)
- Rail Central SRFI (proposed), although not currently allocated we will still consider this alongside the Northampton Gateway proposals for robustness.

14.4 BASELINE CONDITIONS

14.4.1 This section summarises the existing waste arising's of the Site and the surrounding area. These conditions are considered in the context of wider local, district, regional and national waste arising's. The information provides the baseline against which the potential impacts of the Proposed Development have been assessed.

Existing Baseline Conditions

Construction, Demolition and Excavation Waste

14.4.2 The current arising's from the Northampton region for the financial year 2014/15 are taken from the Northamptonshire Minerals and Waste Monitoring Report, 2016, (**Ref 14.16**). The report shows a total forecast amount of 1.35 Million tonnes, (Mt), for construction, excavation and demolition waste arising during 2014/15.

14.4.3 Reviewing the historic 2013/14 monitoring data alongside the 2014/15 monitoring data, the amount of CD&E waste produced was 1.35Mt in line with the current forecast amounts. Assuming these arisings are likely to remain consistent with the historic data, we can estimate the baseline, without development (2017/18), waste arisings will be in line with the 2014/15 data.

14.4.4 Estimated CD&E regional waste arisings for baseline year without development, 2017/18- 1.35Mt

Commercial and Industrial Waste

14.4.5 The current arising's from the Northampton region for the financial year 2014/15 are taken from the Northamptonshire Minerals and Waste Monitoring Report, 2016, (**Ref 14.16**). The report shows a total forecast amount of 1.065 Million tonnes, (Mt), for commercial and industrial (C&I) waste arisings during 2014/15.

14.4.6 The historic regional waste monitoring data available includes the contribution made by household waste arisings combined with C&I arisings. The split between the two categories is unknown. Therefore, it is not possible to establish a yearly increase/decrease using regional data. Therefore, national statistics on waste Published 15th December 2016 by Department for Environment, Food and Rural Affairs (**Ref 14.17**) have been used.

14.4.7 The statistics show on average a 4% decrease per year in C&I waste in England between 2010 and 2014. Therefore, this 4% decrease year on year will be applied to the 2014/15 Northampton baseline for C&I arisings.

14.4.8 The estimated C&I regional waste arisings for baseline year without development 2017/18, is 942,244.00 tonnes per annum, (tpa).

Waste Facilities and Capacity

14.4.9 The Proposed Development is located approximately 3 miles south of the Northampton town centre. Therefore, waste management/disposal facilities close to this geographical area, (capacity permitting) will be used.

14.4.10 The regional landfill and waste management capacity for the area is based on 2016 Northampton Minerals and Waste Monitoring Report, (**Ref 14.6**) As of 2014/15 there was 1.78Mtpa landfill/disposal capacity and 5.58Mtpa of waste management capacity.

14.4.11 The permitted landfill capacity void (approximately 1.78 Mt) shows the landfill capacity requirement for inert and hazardous landfill in Northamptonshire is being met, however, there is currently a shortage of non-inert capacity.

14.4.12 Therefore, while most waste types can be disposed of locally, there may be a requirement to transport non-inert waste arisings off site where required, to a facility with adequate capacity.

14.4.13 A review of the local waste facilities will be completed by the site operator prior to waste disposal. This would establish the most appropriate waste management options for the given waste stream. The review should comprise the following factors when selecting appropriate facilities.

- A geographical review of waste facility locations to ensure distance to the facility is accounted for in the decision-making process; and
- Available capacity (m3) for the specific waste streams arising from the Proposed Development.

Future Baseline Conditions

14.4.14 The future baseline is the predicted site condition if the Proposed Development did not go ahead. The date for the future baseline assessed for the Proposed Development is 2026, in line with the targeted development completion date.

14.4.15 Based on information available for review at the time of writing this Chapter, it is assumed that the Site will continue to be used as per its existing agricultural use. Therefore, it is considered there will be no significant waste arising's resulting from the Site in the future baseline year of 2026, as the uses on site are not anticipated to change significantly.

14.5 ASSESSMENT OF EFFECTS

14.5.1 The construction and operational arising's of the Proposed Development have been estimated using industry benchmark figures as detailed below.

14.5.2 Construction waste volumes have been estimated using Building Research Establishment (BRE) SMARTWaste Benchmark Values (**Ref 14.12**). Proposed floor areas are multiplied by the relevant benchmark values. The results of which are subsequently converted to tonnage.

14.5.3 The rail freight terminal and warehousing facilities will comprise up to 468,324 sqm (approximately 5 million sq ft), (gross internal area) of warehousing and ancillary buildings, with additional floor space provided in the form of mezzanine floor space (155,000 sq.m.).

- 14.5.4 Demolition waste has been calculated using the volumes of the existing farm buildings/huts, located in the eastern-central area of the site as well as the buildings adjacent to the existing woodland. These will be demolished to accommodate the proposed development. The following assumptions have been made in order to provide a worst-case scenario.
- 14.5.5 The heights of the buildings have been calculated using an approximate 4m height from floor to eaves. All buildings have been assumed to have level rooves. We have also assumed a constant density throughout the structures, and based our conversion factor on 0.42 tonnes per m³ as specified for metals within WRAPs building materials to mass conversion factors, **(Ref 14.18)**. A single heavy dense material type is assumed throughout the building structure. Therefore, the figures provided are a conservative worst case scenario of demolition waste arising's.
- 14.5.6 Excavation waste has been calculated using cut and fill calculations completed for the site.
- 14.5.7 Operational waste for both commercial and industrial facilities have been calculated using guidance given in BS 5906:2005 **(Ref 14.13)**.

Construction Phase

- 14.5.8 The construction phase for the purpose of this assessment includes wastes arising during the demolition and excavation phases.

Impact

- 14.5.9 The construction, demolition and excavation waste that will arise from the Proposed Development has the potential to increase the burden on local landfill sites and result in the depletion of natural resources. This potential impact has been considered as part of this waste assessment. It is anticipated that a large proportion of the CD&E waste arising's would be beneficially reused / recycled, negating the need to send such wastes to be landfilled. For this assessment, we have used a predicted 85% re-use and recycling rate **(Ref 14.9)**.

Construction of Warehousing, Offices and Mezzanine

- 14.5.10 The extent of buildings for the development has been based on the up to 468,324 sqm (approximately 5 million sqft) (gross internal area (GIA)) of warehousing and ancillary buildings, with up to 155,000 sqm of additional floorspace provided in the form of mezzanine floorspace. For this assessment, a combined total of 623,000.00 GIA has been used to approximate the amount of waste arisings from this aspect of the development. A conversion factor of 12.6 tonnes of waste arisings per 100m² has been used, **(Ref 14.13)**.

Construction and Excavation of By-Pass and Highways Improvement Works

- 14.5.11 Construction materials regarding the highways construction would be ordered to measure and quantities specified once detailed designs have been formalised. This will allow waste to be prevented where possible. The material amounts would then be added into the detailed Site Waste Management Plan. At this stage material amounts are not able to be specified. Therefore, waste arisings, from the construction

phase of the highways will confirmed once the designs of the road have been formalised.

14.5.12 Initial cut and fill calculations show that there will be no requirement for the disposal of excavated material off site. Any excavated material from this element of the proposals will be incorporated into those areas which require additional material for levelling purposes.

14.5.13 It is therefore considered that the environmental impact resulting from excavation waste associated with the highways element of the development will not be significant and can be considered **negligible**.

Demolition Waste

14.5.14 Demolition waste wold consist of the removal of three buildings/huts, located in the eastern-central area of the site, as well as the wooded area in the central portion of the site. These total a square meterage of approximately 830m². Assuming a uniform 4m height this gives a total volume of 3,320.00m³. As these building's will be removed completely from the site, this is also the total amount of demolition waste arisings.

Excavation Waste Arising from the SRFI Construction

14.5.15 Regarding Excavation waste, it is considered that there will not be any waste arising's from on-site excavation activities, due to the waste either being re-used on-site or exported off site for re-use. It is therefore considered that the environmental impact resulting from excavation waste will not be significant and can be considered **negligible**.

Table 14.3 Estimated Construction, Demolition and Excavation Waste Arising's

Type	Building GIA (m ²) or Waste Amount (m ³)	Conversion Factor	Waste (Tonnes)	Waste after 85% Reuse/ Recycling (Tonnes)
Construction of Warehouses, and Mezzanine	598,889.00m ²	12.6 tonnes per 100m ² (ref 14.12)	81,275.00	11,775.00
Construction of Offices	24,435.00 m ²	23.8 tonnes per m ² (ref 14.12)		
Construction and Excavation of Bypass and Highways Improvement	0	0	0	0
Demolition Waste	3,320.00 m ³	0.42 tonnes per m ³ for Metal (Ref 14.18)	1,395.00	209.00
Excavation Waste Arising from SRFI Construction	0	0	0	0
Total CD&E Waste	-	-	82,670.00	11,984.00

Effect

14.5.16 As shown in **Table 14.2** CD&E waste arising's would account for approximately 82,670.00 tonnes of waste arising's from the Proposed Development. It is anticipated that a large proportion of the CD&E waste arising's would be beneficially reused/ recycled, negating the need to send such wastes to be landfilled.

14.5.17 As illustrated in **Table 14.2**, if 85% of the waste arising's are reused / recycled, this would reduce the volume of waste from 82,670.00 tonnes to approximately 11,984.00 tonnes which equates to approximately 0.8% of the current baseline, (1.35 MT), (**score 1** for type and quantity of waste as detailed in paragraph 14.3.11).

14.5.18 Baseline conditions indicate that local and regional landfill capacity is adequate and can accommodate the predicted CD&E waste arising's from the Proposed Development (**score 2** for regional capacity).

14.5.19 Whilst it is anticipated that a large proportion of waste arising's would be beneficially reused / recycled, there would still be a need to send some such wastes to landfill. Therefore, a **score of 4** for landfill is given as this represents the worst case (although this is not representative of the whole waste stream). On this basis, construction phase waste management effects would not be significant (**total score 8**) and can be considered negligible, (see **Table 14.5**).

Operational Phase

Impact

14.5.20 Operational waste from the development would comprise commercial and industrial waste. This has the potential to increase the levels of commercial and industrial waste generated in the region beyond the capacity of the local waste management facilities. Figures relating to the development proposals have been calculated as per Appendix 14.1. A recycling rate has been assumed based on data from 2009. In 2009 approximately 52% of commercial and industrial waste in the UK was recycled. (**Ref 14.14**).

Commercial

14.5.21 Commercial waste would comprise waste generated from the proposed commercial uses on the Site.

14.5.22 The estimated volume of operational commercial waste from the Proposed Development is detailed in **Table 14.5** below. Calculations are detailed in Appendix 14.1.

Table 14.4 Estimated Operational Commercial Arising's Per Annum

Waste	Waste (Tonnes Per Annum)
Office Use	13,832.00 (Refer to Appendix 14.1)
Total Arising's	13,832.00
Total Arising's assuming a 52% recycling rate	6,639.00

Industrial

14.5.23 Industrial waste is likely to arise from the warehouse and rail freight aspect of the development.

14.5.24 The estimated volume of operational commercial waste from the Proposed Development is detailed in **Table 14.6** below.

Table 14.5 Estimated Operational Industrial Arising's Per Annum

Waste	Waste (Tonnes Per Annum)
Office	5,720.00
Warehousing and Rail Freight, (Industrial)	155,688.00
Total Industrial Arising's	161,408.00
Total Arising's assuming a 52% recycling rate	83,932.00
Total Commercial and Industrial Arisings	175,240.00

Table 14.6 Estimated Operational Commercial & Industrial Arising's Per Annum

Waste	Waste (Tonnes Per Annum)
Total C&I Arisings	175,240.00
Total Arising's assuming a 52% recycling rate	91,125.00

Effect

14.5.25 The total estimated commercial and industrial waste arising's from the Proposed Development's operational phase are estimated to be approximately 175,240.00 tonnes per annum. These figures are based on conservative estimates and data available at the time of undertaking the impact assessment. For example, these figures assume no recycling of waste. Using such conservative estimates help ensure a robust, or worst-case assessment.

14.5.26 The scale of commercial waste arising's is considered within the context of regional estimated baseline commercial and industrial waste arising's of 942,244.00 tonnes per year in the Northampton area. Arising's from the Proposed Development equates to approximately 18.5% of the current baseline.

14.5.27 Calculations have also been provided based on a 52% recycling rate, (Ref 14.4) If this were achieved at the Proposed Development, the volume of commercial and industrial waste would be further reduced from 18.5% of the current baseline arising's to 9.7%, approximately 91,125.00 tonnes per annum, providing a **score of 4** for % contribution to baseline.

14.5.28 Baseline conditions indicate that local and regional landfill capacity is adequate and can accommodate the predicted commercial and industrial waste arising's from the Proposed Development. Disposal will be local so, therefore, a **score of 1** for disposal location is given.

14.5.29 Whilst it is anticipated that a large proportion of waste arising's would be beneficially reused / recycled, there would still be a need to send some such wastes to landfill. Therefore, a **score of 4** for landfill is given as this represents the worst case (although this is not representative of the whole waste stream). On this basis, operational phase waste management effects would be **minor, (total score 16)** (see **Table 14.6**).

14.5.30 The operational waste impact from the proposed development would not lead to any new adverse or additional impacts and is therefore not considered significant.

14.6 MITIGATION AND ENHANCEMENT

Construction Phase

- 14.6.1 To minimise impacts associated with construction waste, the developers assigned contractor will implement a Site Waste Management Plan (SWMP) – this is expected to form part of the Construction Environmental Management Plan (CEMP). As part of the SWMP, the construction contractor would reduce, re-use and recycle waste, where possible. This would, if necessary, include the use of on-site re-processing equipment such as screens and crushers, where appropriate and practical.
- 14.6.2 Materials arising from site clearance and excavations would be integrated with the future works programme onsite or be considered for appropriate off site building projects, or off site treatment.
- 14.6.3 The demolition of on-site buildings will also result in the potential generation of associated waste arising's.
- 14.6.4 Opportunities for the re-use of onsite structures such as walls, hardstanding and structures would be considered. Where this is not possible, the contractor would consider the use of a crusher to allow for the reuse of recycled aggregates on-site.
- 14.6.5 Waste segregation would be implemented during building demolition works to ensure waste containing potential Asbestos Containing Materials (ACM) is minimised and therefore minimising the volume of waste requiring disposal to a suitably licensed hazardous waste facility. Waste segregation would also allow for materials to be reused and recycled therefore reducing the volume of waste material requiring disposal.
- 14.6.6 Where practicable the construction off-site of components for the construction of buildings would be undertaken i.e. prefabrication. This would reduce the requirement for raw materials to be brought to site and reduce the potential for construction waste generation.
- 14.6.7 Where possible, further reductions in construction waste would be achieved through the reduction of packaging used in the transport of both raw materials and fabricated construction components.
- 14.6.8 It is also important to consider broader sustainability issues such as resource consumption. The contractor, where possible, would minimise the consumption of virgin raw materials by specifying products and materials with recycled content and which are durable with a long life.
- 14.6.9 All construction staff would be trained in the appropriate use of materials on site through inductions, tool box talks and at regular intervals.

Operational Phase

Commercial & Industrial

- 14.6.10 Waste from commercial activities would be controlled and monitored through the specific operators and occupants. At this stage the arisings are based on estimations and more specific operational waste volumes will be calculated once full detailed planning applications are brought forward and the tenants of the units are confirmed.
- 14.6.11 In accordance with good practice, waste obligations would be specified in Tenancy Agreements by the developer. Occupants would be required to separate recyclable items for collection and waste minimisation would be encouraged.
- 14.6.12 In addition, all occupants would be educated on the potential various types of hazardous wastes that may be generated and appropriate storage and handling procedures.
- 14.6.13 All commercial wastes would need to be stored separately and in appropriate containers and a commercial contract entered into, with an appropriate waste carrier.
- 14.6.14 There would be adequate storage facilities for the various types of wastes within the proposed commercial areas.

14.7 RESIDUAL EFFECTS

- 14.7.1 This section of the report reviews the significance of impacts resulting from both the construction and operational phases of the development while taking into account the presence of mitigation measures.

Construction Phase

- 14.7.2 **Table 14.3** has indicated the impacts of the construction waste arising's at the Proposed Development. The assessment prior to mitigation measures considers the significance of any environmental impact to be negligible, the residual effects are therefore considered negligible and will not result in any adverse significant environmental impacts.

Operational Phase

- 14.7.3 **Tables 14.4 & 5** have indicated the impacts of the construction waste arising's at the Proposed Development. The assessment prior to mitigation measures considers the significance of any environmental impact to be minor. With the presence of mitigation the residual effects are therefore considered negligible and will not result in any adverse significant environmental impacts.

Table 14.6 Summary of Effects

Waste Type	Approx. waste Forecast (Tpa)	Magnitude of waste arising: score based on waste type and quantity (1 = Low, 5 =	Proximity/capa -city of disposal facility: Local/regional/national (1 = Local/high capacity available, 3 =	Sustainability of disposal method: (Position of disposal route on the waste hierarchy)	Score: <10 Negligible Significant Effect 10 - 20 Minor 21 - 45

		High)	Distant/Limited Capacity)	(1 = Re-use to 4 = Disposal)	Moderate 46 - 60 Major Effect
CD&E waste (including soil strip)	11,984	1	2	4	7 (negligible effect)
Commercial & Industrial waste	91,125	4	1	4	16 (minor adverse effect)

14.8 CUMULATIVE EFFECTS

14.8.1 If the listed developments are taken forward for construction, it is likely that collectively they would generate a construction waste volume that is >1% of the current baseline arising's (score 2 for type and quantity of waste). Given that such wastes would be disposed of locally / regionally (score 2) and that some residual waste arising would be subject to landfilling (score 4 - although this is not representative of the whole waste stream), indicates that there would be a potential minor cumulative waste management effect (total score 16).

14.8.2 Cumulative operational phase waste management effects are anticipated to be of minor significance given the volumes of waste expected to be collectively generated in relation to existing capacity. However, assuming mitigation measures and recycling will be implemented at the two assessed developments the cumulative impacts during the operational phase can be considered negligible.

14.9 SUMMARY AND CONCLUSIONS

14.9.1 Based on the information available as detailed herein, the construction and operation of the Proposed Development is assessed as not significant and can be considered negligible. Following the implementation of applicable impact avoidance and mitigation measures, all potential residual waste management effects associated with the Proposed Development are assessed as being negligible (i.e. not significant).

REFERENCES

- Ref 14.1** Control of Pollution (Amendment) Act 2012 – UK Government
- Ref 14.2** Controlled Waste (England and Wales) Regulations 2012 – UK Government
- Ref 14.3** Environment Act 1995 – UK Government
- Ref 14.4** The Environmental Permitting (England and Wales) Regulations 2015 (as amended) – UK Government
- Ref 14.5** EU Waste Directive (2008/98/EC) and the Waste (England and Wales) Regulations
- Ref 14.6** The Environmental Damage (Prevention and Remediation) Regulations 2015 – UK Government
- Ref 14.7** National Networks National Policy Statement (NN NPS- Department for Transport
- Ref 14.8** Waste Strategy for England 2007- DEFRA
- Ref 14.9** Waste Management for England 2013- DEFRA
- Ref 14.10** Planning Policy Statement 10: Planning for Sustainable Waste Management (PPS10) (Department for Communities and Local Government (DCLG), 2011) (Withdrawn).
- Ref 14.11** Strategy for Sustainable Construction 2008- UK Government
- Ref 14.12** SmartWaste BRE Waste Benchmark Data Issued 26th June 2012.
- Ref 14.13** BS 5906:2005 Waste Management in Buildings – Code of Practice
- Ref 14.14** Government Review of Waste Policy in England 2011- DEFRA
- Ref 14.15** Northamptonshire Joint Municipal Waste Management Strategy- 2012
- Ref 14.16** Northamptonshire Minerals and Waste Local Plan, Minerals and Waste Monitoring Report 2015- January 2016
- Ref 14.17** UK Stats on Waste- Table 4.1: Total waste generation from the commercial and industrial sectors, UK and England, 2010-14
- Ref 14.18** WRAP Waste Volume to Mass Conversion Factors- July 2014

Table 14.7 Summary of Significant Effects and Mitigation

Development Phase	Potential Effect of Development pre-mitigation	Significance of Effect pre-mitigation	Mitigation Measures	Significance of effect following mitigation (Residual)	Nature of effect
Construction	Depletion of resources and strain on local waste management facilities. Excess waste levels being diverted to landfill.	Negligible	Production of a SWMP, use of prefabricated construction techniques, use of recycled materials, appropriate training.	Negligible	T & I
Operational	High levels of waste arising's due to no recycling provision. Environmental impact due to waste being diverted to landfill.	Minor	Appropriate on site recycling facilities, appropriate training (commercial).	Negligible	P & I

T – Temporary, P-Permanent, I – Indirect, D – Direct

APPENDICES

APPENDIX 1-OPERATIONAL PHASE WASTE CALCULATIONS
