Chapter O
Waste

Milton Keynes East Environmental Statement

Chapter O: Waste

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WSP UK Limited
8 First Street,
Manchester M15 4RP

www.wsp.com

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Contents

O1.0 Introduction

O1.1 This Chapter forms part of the Milton Keynes East Environmental Statement ('ES') which sets out the findings of an Environmental Impact Assessment ('EIA') of the proposed development of a sustainable urban extension to Milton Keynes. It relates to land to the east of the M1 motorway and to the south of Newport Pagnell. A description of the background to the proposal; the relationship of this chapter to the wider ES; and a description of the site and the development is provided at Chapters A to C of this ES.

O1.2 This chapter of the ES assesses the likely significant effects of the Proposed Development on the environment in respect of waste. The focus is on the generation of waste from construction of the Proposed Development, as well as from its operation and the associated increased demand on local waste treatment and disposal facilities.

O1.3 For the purpose of this Chapter, 'waste' is defined as:

'any substance or object which the owner discards, intends or is required to discard.'

O1.4 This definition is as specified under the Waste Framework Directive (European Directive 2006/12/EC), as amended by Directive 2008/98/EC [Ref 1], which came into force in December 2010.

O1.5 The chapter should be read in conjunction with the following technical appendices provided at Volume 2 to this ES:-

- Appendix O1 – Site Waste Management Plan

About the Author

O1.6 This chapter has been prepared by Michael Berney from WSP UK Limited. Michael is a Principal Consultant in the Waste and Resource Management team. Through over 16 years in consultancy, he has significant experience in providing technical planning application and architectural design support, through the development of waste management strategies and input to Environmental Impact Assessments for a broad variety of development types.

O2.0 Policy Context

Legislative Context

O2.1 A summary of legislation relevant to waste and the Proposed Development is provided below:

1 Waste Management, The Duty of Care Code of Practice (2018 update); Ref 2

2 The Waste (England and Wales) Regulations 2011 (as amended); Ref 3 and

3 Environmental Protection Act 1990. Ref 4

National Policy

National Planning Policy Framework Ref 5

O2.2 The National Planning Policy Framework sets out the government's planning policies for England and how these are expected to be applied.

O2.3 The following extracts are of relevance to waste and the Proposed Development:

'2. Achieving sustainable development

…

8. Achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways (so that opportunities can be taken to secure net gains across each of the different objectives):

…

c) an environmental objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'

National Planning Policy for Waste Ref 6

O2.4 The National Planning Policy for Waste replaced Planning Policy Statement 10: Planning for Sustainable Waste Management (PPS 10) and is to be considered alongside other national planning policy for England, such as Our Waste, Our Resources: A Strategy for England.

O2.5 The Policy includes the following which is of relevance to waste and the Proposed Development:

'8. When determining planning applications for non-waste development, local planning authorities should, to the extent appropriate to their responsibilities, ensure that:

new, non-waste development makes sufficient provision for waste management and promotes good design to secure the integration of waste management facilities with the rest of the development and, in less developed areas, with the local landscape.'

Our Waste, Our Resources: A Strategy for England Ref 7

O2.6 The strategy sets out how England will preserve the stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. At the same time, the country will minimise the damage caused to the natural environment by reducing and managing waste safely and carefully, and by tackling waste crime.

O2.7 It combines actions the country will take now, with firm commitments for the coming years and gives a clear longer-term policy direction in line with the 25 Year Environment Plan. This is the blueprint for eliminating avoidable plastic waste over the lifetime of the 25 Year Plan, doubling resource productivity, and eliminating avoidable waste of all kinds by 2050.

A Green Future: Our 25 Year Plan to Improve the Environment [Ref 8]

O2.8 The 25 Year Environment Plan sets out government action to help the natural world regain and retain good health. Its aim is to deliver cleaner air and water in cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first.

O2.9 Regarding waste, the Plan details aims that include:

1 Working towards an ambition of zero avoidable waste by 2050;

2 Working to a target of eliminating avoidable plastic waste by end of 2042;

3 Meeting all existing waste targets – including those on landfill, reuse and recycling – and developing ambitious new future targets and milestones;

4 Seeking to eliminate waste crime and illegal waste sites over the lifetime of this Plan, prioritising those of highest risk. Delivering a substantial reduction in litter and littering behaviour; and

5 Significantly reducing and where possible preventing all kinds of marine plastic pollution – in particular material that came originally from land.

Local Planning Policy

Plan:MK 2016-2031 (Adopted March 2019) [Ref 9]

O2.10 The new Local Plan for Milton Keynes was adopted by MKC on 20 March 2019. It sets out MKC's strategy for meeting the Borough's needs until 2031 and forms part of the Development Plan, replacing both the Core Strategy (2013) and saved policies of the Local Plan (2005).

O2.11 With regards to waste, Plan:MK states the following which is of relevance to the Proposed Development:

'Policy SC1

Sustainable Construction

A. Development proposals will be required to demonstrate how they have implemented the principles and requirements set out below.

…

Materials and waste

B. Reuse land and buildings wherever feasible and consistent with maintaining and enhancing local character and distinctiveness.

C. Reuse and recycle materials that arise through demolition and refurbishment, including the reuse of excavated soil and hardcore within the site.

D. Prioritise the use of materials and construction techniques that have smaller ecological and carbon footprints, help to sustain or create good air quality, and improve resilience to a changing climate where appropriate.

…

F. Consider the lifecycle of the building and public spaces, including how they can be easily adapted and modified to meet changing social and economic needs and how materials can be recycled at the end of their lifetime.

G. Space is provided and appropriately designed to foster greater levels of recycling of domestic and commercial waste.'

Milton Keynes Waste Development Plan Document 2007-2026 (Adopted February 2008) [Ref 10]

O2.12 The Milton Keynes Waste Development Plan Document provides the basis for waste planning decisions made by MKC.

O2.13 The following policy is relevant to the Proposed Development regarding waste:

'Policy WCS3 Sustainable Design, Construction and Demolition

New built development should facilitate the efficient use of resources. A waste management plan should be provided with all planning applications and should consider:

a) Designs and layouts that allow the effective sorting, recycling and composting of waste;

b) Ensuring the development can be served by appropriate waste collection methods to support recycling systems;

c) Design principles and construction methods that minimise primary aggregate use and encourage the use of high-quality building materials made from recycled and secondary sources;

d) Construction and demolition methods that minimise waste production and reuse/recycle materials, as far as practicable onsite;

e) Construction which reduces inert landfill disposal; and

f) Accommodating an appropriate proportion for waste management facilities for recycling, composting, recovery and treatment.'

Buckinghamshire Minerals and Waste Local Plan 2016-2036 [Ref 11]

O2.14 The Buckinghamshire Minerals and Waste Local Plan forms the land use planning strategy for minerals and waste development within the administrative area of Buckinghamshire County. It provides guidance regarding industry investment, the level of minerals and waste development needed to support the development of sustainable communities and infrastructure and where in the county such development should go. The Plan also addresses the design and impact of development and how it can best relate to the surrounding land use(s) and link with the wider community in order to optimise beneficial outcomes.

O2.15 The Plan is a material consideration for this assessment, as waste generated from the Proposed Development is expected to be transferred county-wide to other treatment and disposal facilities.

O2.16 The following policy is of relevance to the Proposed Development:

'Policy 10: Waste Prevention and Minimisation in New Development

Proposals for new development should support the efficient use and recovery of resources throughout the life of the development including construction and operation and/or occupation through:

Design principles and construction methods that minimise the use of primary minerals and encourage the use of building materials made from recycled and alternative materials; and

Construction and demolition methods that minimise waste production, maximise the reuse and recovery of materials (as far as practicable) on-site and minimise off-site disposal; and

Design and layout that complements sustainable waste management by providing appropriate storage and segregation facilities.

Proposals for major development should identify measures to support implementation of the waste hierarchy during construction and demolition (where applicable), including quantity and type(s) of waste expected to be generated.

Proposals for major development that seeks to deliver the housing requirement or employment land will be encouraged to incorporate neighbourhood waste management facilities (where appropriate).'

Additional Guidance

Waste Hierarchy

O2.17 The Waste Hierarchy requires avoidance of waste in the first instance and reducing waste as far as possible the volume requiring disposal once the waste has been generated. It gives an order of preference for waste management options to minimise the volume for disposal, as shown in Figure O2.1.

Figure O2.1 Waste Hierarchy

O2.18 The main principles of the Waste Hierarchy are:

1 Waste should be prevented or reduced at source as far as possible;

2 Where waste cannot be prevented, waste materials or products should be reused directly or refurbished and then reused;

3 Waste materials should be recycled or reprocessed into a form that allows them to be reclaimed as a secondary raw material;

4 Where useful secondary materials cannot be reclaimed, the energy content of the waste should be recovered and used as a substitute for non-renewable energy resources; and

5 Only if waste cannot be prevented, reclaimed or recovered, should it be disposed of into the environment and this should only be undertaken in a controlled manner.

O2.19 The Waste Hierarchy has been implemented in England and Wales by the Waste (England and Wales) Regulations 2011 (as amended). These regulations require that an establishment or undertaking that imports, produces, collects, transports, recovers or disposes of waste must take reasonable steps to apply the Waste Hierarchy when waste is transferred or disposed of. A departure from the priority order is only permitted where this is justified by lifecycle thinking on the overall effect of generation or management of waste.

O3.0 Assessment Methodology & Significance Criteria

Assessment Methodology

Scope of the Assessment

O3.1 The potential effects that require consideration in the ES relating to waste comprise:

1 Waste arisings during construction (i.e. demolition, excavation and construction waste); and

2 Waste arisings during operation (i.e. waste from households and non-residential elements).

Extent of Study Area

O3.2 The area for the desk-top study considered the Development Site and the area comprising the ceremonial county of Buckinghamshire (i.e. where it is anticipated the treatment and/or disposal of the majority of waste from the Proposed Development would take place). These sensitive receptors are collectively referred to as 'waste management infrastructure' within this Chapter.

Method of Baseline Data Collection

O3.3 In order to determine the baseline scenario with regards to current waste arisings, collection schemes, waste management facilities and disposal arrangements, a desk-top study has been undertaken using the following sources of information, in addition to the policy documents discussed in the previous section of this Chapter:

1 Highways England - LA 110 Material assets and waste (2019); [Ref 12]

2 Defra - Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2011); [Ref 13]

3 CL:AIRE - The Definition of Waste: Development Industry Code of Practice Version 2 (2011); [Ref 14]

4 Building Research Establishment (BRE) - Waste Benchmarking Data (2012); [Ref 15]

5 Defra - ENV18 - Local authority collected waste: annual results tables (2018); [Ref 16] and

6 British Standards Institution - BS5906:2005 Waste management in buildings - Code of practice (2005). [Ref 17]

Significance Criteria

O3.4 The assessment of potential effects as a result of the Proposed Development has considered both the demolition/construction and operational phases. The demolition and construction stage include enabling works, demolition, earthworks and construction activities as set out in Chapter C 'Site and Scheme Description'.

O3.5 The significance level attributed to each effect has been assessed based on the magnitude of change due to the Proposed Development and the sensitivity of the affected receptor, as well as a number of other factors that are outlined in more detail in Chapter B 'Scope and Methodology'. The magnitude of change is assessed on a scale of substantial, moderate, minor and negligible and the sensitivity of the affected receptor is assessed on a scale of high, moderate and low.

O3.6 The magnitude of change to waste management infrastructure is assessed according to the criteria set out in Table O3.1Table O3.1.

Table O3.1 Magnitude of Change to Waste Management Infrastructure

Magnitude	Criteria
Substantial	The Proposed Development generates more than 50,000 tonnes of waste per year
Moderate	The Proposed Development generates more than 5,000 tonnes but less than 50,000 tonnes of waste per year
Minor	The Proposed Development generates more than 1,000 tonnes but less than 5,000 tonnes of waste per year
Negligible	The Proposed Development generates less than 1,000 tonnes of waste per year

O3.7 The current and forecast capacities of local waste management infrastructure is commercially sensitive information and therefore not publicly available on the Environment Agency's registers.

O3.8 The magnitude of change from the Proposed Development is dependent on the extent of the effect and would consider the volumes of waste arisings generated, the nature of the waste material, (e.g. whether it is hazardous, non-hazardous or inert), the ease of handling and the implications for treatment and disposal (e.g. whether facilities are easily available or whether treatment or disposal capacity is restricted).

O3.9 The magnitude of change has therefore been established from WSP's professional judgement on waste facilities' likely ability to manage the volumes of waste expected over the duration of the construction project and during operation.

O3.10 The criteria for assessing the sensitivity of the waste management infrastructure in this Chapter are set out in Table O3.2.

Table O3.2 Criteria for Assessing the Sensitivity of Waste Management Infrastructure

Sensitivity	Criteria
High	The waste generated comprises large volumes of hazardous, non-hazardous or inert waste and local waste facilities are severely restricted (i.e. there are less than five facilities in the Study Area).
Moderate	The waste generated comprises medium volumes of hazardous, non-hazardous or inert waste and local waste facilities are restricted (i.e. there are more than five but less than 10 facilities in the Study Area).
Low	The waste generated comprises small volumes of hazardous waste, or medium volumes of non-hazardous waste or inert waste and local waste facilities are less restricted (i.e. there are more than 10 facilities but less than 30 facilities in the Study Area).

Significance of Effects

O3.11 No standard publicly available criteria exist for assessing the significance of the potential effects that may arise from the generation of waste from new development. Therefore, criteria have been derived for this assessment based on several factors, including:

1 The ability to treat the waste generated by the Proposed Development, which is determined by its physical and chemical characteristics, (i.e. whether the waste can be easily treated with minimal residual waste, such as recycled waste, or whether the waste requires a specialised treatment with potentially toxic residual waste);

2 The availability of suitable facilities within the region to treat the waste generated;

3 Compatibility of the Best Practicable Environmental Option for the waste within the context of the Waste Hierarchy, i.e. whether generation of the waste can be minimised, the waste can be recycled, landfilled etc.; and

4 Potential environmental effects or human health risks associated with the waste e.g. if it is hazardous etc.

O3.12 The following terms have been used to define the significance of the effects identified:

1 Substantial effect: where the Proposed Development could be expected to have a considerable effect (either beneficial or adverse) on the quantity of waste generated compared to existing levels;

2 Moderate effect: where the Proposed Development could be expected to have a limited effect, which may be considered significant (either beneficial or adverse) on the quantity of waste generated compared to existing levels;

3 Minor effect: where the Proposed Development could be expected to result in a small, barely noticeable effect (either beneficial or adverse) on the quantity of waste generated; and

4 Negligible: where no discernible effect on the quantity of waste generated is expected as a result of the Proposed Development.

O3.13 The significance of effects has been assessed according to the following scale shown in Table O3.3.

Table O3.3 Matrix for Determining Significance of Effect

		Magnitude			
		Substantial	**Moderate**	**Minor**	**Negligible**
Sensitivity	**High**	Substantial	Moderate	Minor	Negligible
	Moderate	Moderate	Moderate / Minor	Minor	Negligible
	Low	Minor	Minor	Negligible	Negligible

O3.14 An effect of moderate or above is considered to be significant in this assessment.

O3.15 With regard to the duration of the effects, in the context of this assessment 'short-term' is defined as less than two years, 'medium-term' as more than two years but less than 10 years and ‘long term’ as more than 10 years.

Consultation

O3.16 No consultation with statutory bodies was deemed necessary for the development of this ES Chapter.

Assumptions and Limitations

O3.17 Information obtained from the BRE regarding construction waste benchmarks is dependent on the accuracy of input data which is from numerous external sources.

O3.18 The calculation of estimated construction waste from the residential element has been made using Net Internal Areas (NIA) for the houses, as Gross Internal Areas (GIA) information was not available for the assessment.

O3.19 The *Milton Keynes Waste Development Plan Document 2007-2026* includes a list of operational waste management facilities which are expected to continue to operate up to at least 2026. There is no available forecast beyond that year.

O3.20 The *Buckinghamshire Minerals and Waste Local Plan 2016-2036* includes a list of operational waste management facilities which are expected to continue to operate up to at least 2036. There is no available forecast beyond that year.

O3.21 Estimates of likely waste generation during operation of the Proposed Development have been obtained from the most credible published sources available, however, the accuracy and currency of the baseline data must be considered when forecasting waste arisings.

04.0 Baseline Conditions

Existing Conditions

04.1 The site currently comprises arable field parcels with boundary hedgerows, therefore, waste arisings would mainly comprise organic materials which is assumed would either be composted or used as a soil-improver on-site, with other waste materials being sent off-site for treatment and/or disposal.

Current Waste Management Arrangements

04.2 A number of waste management facilities are currently permitted within Milton Keynes. These facilities are expected to continue to operate up to at least 2026 [Ref 10]:

1 Non-hazardous and inert landfill
   a Bletchley Landfill site
2 Composting facilities
   a Home Farm, Castlethorpe
   b Crossroads Farm, Haversham
3 Materials Recovery Facility (MRF)
   a Colts Holm Road, Old Wolverton
4 Inert landraising (to form Acoustic Ridge)
   a Brooklands Ridge, Eastern Expansion
5 Community Recycling Centres (Civic Amenity Sites)
   a Bleak Hall
   b New Bradwell
   c Newport Pagnell
   d Eastern Expansion
6 Waste transfer
   a Old Wolverton Road
   b Bleak Hall
   c Home Farm, Bletchley (road sweepings)
7 Inert/aggregate recycling
   a Broughton Barn Quarry
8 Metal Recyclers/Vehicle Dismantlers
   a New Bradwell
   b Bletchley
   c Bleak Hall

04.3 MKC consider that much of the waste capacity requirements are already in place. There is enough non-hazardous landfill void to meet the needs of Milton Keynes and where appropriate provide for an element of waste from London and other adjoining sub-regions. The Plan states that there is currently enough capacity for recycling, however, further facilities for the treatment of waste to reduce the need for landfill are required. Further composting facilities will be

required, such as in-vessel composting of food waste. To increase recycling, two further Community Recycling Centres will be required and an allowance is needed for an increase in the recycling of commercial and industrial and construction and demolition waste. Specialist facilities and agricultural waste requirements may be required. It was concluded that the wording within the development control policies should allow for such sites to be considered through the life of the Plan.

O4.4 In addition, a number of waste management facilities are currently permitted within Buckinghamshire. These facilities are expected to continue to operate up to at least 2036 [Ref 11]. The existing capacity (as of 1 January 2016) comprises a variety of facilities located throughout Buckinghamshire, including:

1 Numerous local scale facilities for preparing for reuse and/or recycling and reprocessing materials:
   a Household Recycling Centres (HRCs) (10);
   b MRF (1);
   c Inert transfer stations (6);
   d Inert recycling facilities (4);
   e Incinerator Bottom Ash (IBA) processing facility (1);
   f Composting facilities (6);
   g Waste transfer stations (20);
   h Metal recycling and End of Life Vehicles (ELV) facilities (12); and
   i Waste Electrical and Electronic Equipment (WEEE) facility (1).
2 Anaerobic Digestion (AD) facilities (2);
3 Thermal Energy from Waste (EfW) facility (1);
4 Soil treatment facility (1);
5 Inert recovery and/or landfill sites (6);
6 Non-hazardous landfill sites (3); and
7 Sites permitted to dispose of hazardous wastes (to landfill) (2).

O4.5 The County Council state that net self-sufficiency will be achieved through the provision of the waste management capacity needs of Buckinghamshire. The capacity will be delivered through existing commitments, extensions to existing commitments and new facilities.

Construction and Demolition Waste

O4.6 Approximately 1.13 million tonnes of Construction, Demolition and Excavation (CD&E) waste was produced within Buckinghamshire in 2016 and it is anticipated that annual arisings will remain the same up to 2033 [Ref 9]. This figure includes a portion of CD&E waste exported from London.

O4.7 Recent national studies suggest that over three quarters of CD&E waste is currently recycled or otherwise recovered, with less than a quarter disposed of to landfill. A significant proportion (around a third) of inert waste is reused, with over half of this thought to be reused on exempt sites. This 'unseen capacity' is assumed to continue to be available, however, it is anticipated that the amount of waste captured under exempt categories will decrease in line with revision of the Environmental Permitting system providing a more rounded view of management of this

waste in the future. In addition, some inert waste is utilised at non-hazardous landfill for engineering purposes.

O4.8 Based on current working methods, a significant opportunity exists for segregating non-inert CD&E waste streams for reuse/recycling at the Development Site. It is likely that the key waste streams generated by the construction of the Proposed Development that have the potential to be reused/recycled will predominantly comprise soils, concrete, bricks, metal, glass, plastic and timber.

O4.9 It is anticipated that waste treatment and recycling facilities, inert, non-hazardous and hazardous landfill sites would be the main sensitive receptors during the Development Site preparation and construction of the Proposed Development. These sensitive receptors are collectively referred to as waste management infrastructure within this chapter.

Household Waste

O4.10 Table O4.1 outlines the household waste figures and percentage of waste recycled/composted for Milton Keynes, in comparison to England, between 2014-15 and 2018-19 (the most recent year for which data is available)[Ref 16].

Table O4.1 Household waste figures from Milton Keynes, in comparison to England

Period	Household Waste		
	Total collected in Milton Keynes (tonnes)	% recycled / composted in Milton Keynes	% recycled / composted in England
2018-19	117,272	59.1%	45.1%
2017-18	123,639	51.7%	45.2%
2016-17	124,984	50.6%	44.9%
2015-16	124,438	49.0%	43.9%
2014-15	119,408	51.8%	44.8%

O4.11 According to the data, from 2014-145 to 2018-19, the recycling rate in Milton Keynes has been higher than the rate for England. It was the 14th best performing local authority in 2018-19.

O4.12 Table O4.2 outlines how the average annual household waste generation rate per residential unit was established using Milton Keynes waste data for 2018-19.

Table O4.2 Average household waste generation for Milton Keynes

Total household waste generated within Milton Keynes in 2018-19 (tonnes) [Ref 16]	117,272
Total number of households within MKC boundary (September 2020) [Ref 18]	116,510
Estimated average waste generation per household per year (tonnes)	1.01

O4.13 The average household waste generation rate per household per year was therefore 1.01 tonnes.

O4.14 Table O4.3 outlines the waste management services that MKC currently provides within the Borough.

Table O4.3 Waste Management services provided by MKC

Refuse collection	Black sacks
Recycling collection	Clear sacks for paper, card, cartons, cans, tins, foil trays, aerosols, plastic bottles, plastic trays and pots Blue box for glass bottles and jars Battery bag for household batteries
Garden and food waste collection	Green wheeled bin
Bulky waste collection	Chargeable service
Household Waste Recycling Centres	Bleak Hall, Chesney Wold, MK6 1NE New Bradwell, Newport Road, MK13 0AH Newport Pagnell, North Crawley Road, MK16 9HG

Commercial and Industrial Waste

O4.15 A 2009 national survey [Ref 19] of commercial and industrial (C&I) waste arisings and management methods was the most comprehensive set of national and regional data available, however, this publication was withdrawn by the Government in 2015 and current information on C&I waste is provided in DEFRA's UK Statistics on Waste, 2020 edition [Ref 20].

O4.16 This report does not provide a regional breakdown of C&I arisings as the 2009 survey did, but instead states that approximately 37.2 million tonnes of C&I waste was generated in England in 2018.

O4.17 For context, the 2009 survey stated that the South-East region generated approximately 6.3 million tonnes of C&I waste in 2009 (13% of the national total), with recycling and land disposal being the main waste management methods used.

O4.18 C&I waste is currently collected within the Study Area by a large number of private waste companies and the commercial waste services provided by Milton Keynes Council's contractor (Serco). There is a network of waste facilities that are used to bulk, transfer, treat and dispose of C&I waste.

Future Baseline

O4.19 If the Proposed Development was not to proceed, it would be expected that waste generation levels and management methods would be unlikely to change significantly compared to the existing conditions. However, any population increase in the region would contribute to an increase in waste arisings which would require subsequent management.

O5.0 Potential Effects

During Construction

Demolition, Site Clearance and Earthworks

O5.1 Waste will be generated during the demolition phase of the Proposed Development. For further details on the proposed demolition , see the Construction Methodology in Chapter C of this ES.

O5.2 Demolition of the following buildings within the Development Site (Table O5.1) will be carried out in accordance with best practice and to ground level. On site crushing and screening is not assumed to be carried out in association with the demolition works.

Table O5.1 Planned Demolition Works

Buildings	Approximate Area	Waste Materials
All existing buildings at Hermitage Farm, Newport Road	2,500 sqm	Concrete hardstanding, metal frame, metal cladding, brick/timber buildings
All existing buildings (house + farm sheds) at Moulsoe Farm, London Road	2,000 sqm	Concrete hardstanding, metal frame, metal cladding, brick/timber buildings
All existing buildings (house + adjacent farm sheds + farm shed on opposite side of road) at 27-29 London Road	2,000 sqm	

O5.3 The specific quantities and types of demolition waste materials have not been determined at this stage, as a full pre-demolition audit will not be carried out until the buildings are unoccupied; certain elements of the audit are intrusive and could potentially put occupants at risk. Therefore, it is not possible at this stage to generate a quantitative assessment of the effects of waste arising from the demolition phases of the Proposed Development, however, it is not expected to be significant.

O5.4 Detailed ground investigations will be conducted for each phase, as required, prior to the start of the construction works and will identify the presence or absence of contamination within shallow soils and groundwater. Any contamination will be subject to remediation as required.

O5.5 For the purposes of assessment, it is assumed that no earth will be removed from site with surplus material (approximately 580,000m^3 of material) to be used in the creation of noise bunds and embankments for routes across the floodplain. A consolidation centre may be required which would be located within the south-west corner of the Development Site. Further details are provided in Chapter I 'Ground Conditions' of this ES. The effects of waste from site clearance and earthworks are therefore not expected to be significant.

Construction

O5.6 It must be allowed for that construction of the Proposed Development could take approximately 26 years from commencement to completion. For the purposes of this assessment, it is assumed that construction will commence in 2022, subject to gaining planning permission, and could therefore be completed in 2048 at the latest.

O5.7 The BRE has developed indicators to aid in the calculation of construction waste arisings at the design stage of a variety of development types [Ref 15]. These indicators do not include demolition, excavation or groundworks waste, however, the Environmental Performance Indicators (EPIs)

measure the tonnes of construction waste per 100m2 of Gross Internal Area (GIA) floorspace. These are outlined in Table O5.2.

Table O5.2 BRE Waste Benchmarks for New Build Construction

Development Type	Tonnes or construction waste per 100 m^2 of GIA
Residential	16.8
Public Buildings	22.4
Leisure	21.6
Industrial Buildings	12.6
Healthcare	12.0
Education	23.3
Commercial Offices	23.8
Commercial Retail	27.5
Commercial Other	7.0

O5.8 The indicators applicable to the Proposed Development have been used to measure construction waste generation and relate to rates where no minimisation, reuse or recycling of materials has taken place. This will provide the baseline figure against which a reduction in waste arisings would then be planned.

O5.9 Table O5.3 and Table O5.4 show the estimated construction waste arisings for the residential and non-residential elements of the Proposed Development respectively, based on the indicative average floor areas per residential unit type and indicative floor areas of non-residential buildings, together with the relevant EPI from the BRE.

Table O5.3 Estimated Construction Waste Arisings (Residential)

Description	Type	No Units. (Baseline)	No. Units (Max.)	Indicative Floor Area per Unit (sqft)	Indicative Floor Area per Unit (sqm)	Indicative Total Floor Area (sqm) (Baseline)	Indicative Total Floor Area (sqm) (Max.)	Tonnes / 100sqm Floor Area (BRE)	Estimated Construction Waste (Tonnes) (Baseline)	Estimated Construction Waste (Tonnes) (Max.)
Apartments	1 bed	224	507	557	52	11,591	26,236	16.8	1,947	4,408
	2 beds	320	976	735	68	21,839	66,609	16.8	3,669	11,190
Houses	2 beds	544	600	818	76	41,328	45,583	16.8	6,943	7,658
	3 beds	1,102	941	1,055	98	108,010	92,230	16.8	18,146	15,495
	4 beds	1,102	903	1,439	134	147,283	120,686	16.8	24,743	20,275
	5 beds	548	489	2,004	186	102,013	91,029	16.8	17,138	15,293
Extra Care Apartments	1 bed	128	147	557	52	6,624	7,607	16.8	1,113	1,278
	2 beds	32	37	976	91	2,902	3,355	16.8	487	564
Total		**4,000**	**4,600**	-	-	**441,589**	**453,335**	-	**74,187**	**76,160**

Table O5.4 Estimated Construction Waste Arisings (Non-Residential)

Description	Assumed BRE Project Type	Estimated Max. Total Floor Area Sought (sqm)	Tonnes / 100sqm of Floor Area (BRE)	Estimated Max. Construction Waste (Tonnes)
Employment	Industrial Buildings	403,650	12.6	50,860
Secondary School	Education	35,400 *	23.3	8,248
Primary Schools (x3)	Education	40,500 **	23.3	9,437
Commercial	Commercial Retail	10,500	27.5	2,888
Community Space	Public Buildings	1,000	22.4	224
Total	-	-	-	**71,656**

Notes: * Assumption that 30% of total area sought for the Secondary School (11.8 ha, 118,000 sqm) is built on.
** Assumption that 50% of total area sought for the Primary Schools (8.1 ha, 81,000 sqm) is built on.

O5.10 It is estimated that approximately 74,187 to 76,160 tonnes of construction waste from the residential elements and an estimated maximum of 71,656 tonnes from the non-residential elements will be generated. The total construction waste arisings from the Proposed Development are therefore estimated to be 145,843 to 147,816 tonnes. Over the duration of the construction works (26 years), this equates to an average of approximately 5,609 to 5,685 tonnes per year, although this is likely to vary significantly according to the construction programme and phasing. Effective mitigation will be essential to divert waste from landfill and ensure that any peaks in waste generation which may occur do not give rise to short-term impacts. Mitigation measures are described further in Section O6.0.

O5.11 The information based in Table O5.3 and Table O5.4 above is based on standard waste management practices in the UK and the estimated volumes identified have significant potential to be reduced through best practice on-site waste minimisation and management. The estimated waste arisings data can be used as an indicator for measuring and monitoring waste generated. This will enable the setting of realistic and attainable waste minimisation and management targets.

O5.12 From the assessment criteria outlined previously, the predominance of treatment (e.g. segregation of recyclable materials) of significant quantities of construction waste on-site (for both environmental and economic reasons), is operated on the clear majority of sites in the UK, thus reducing the need to send waste to landfill. Adherence to the Waste Hierarchy by reusing and/or recycling waste materials will reduce the significance of the effect. It is likely that the key waste streams generated by the construction of the Proposed Development that have the potential to be reused/recycled will predominantly comprise soils, concrete, bricks, metal, glass, plastic and timber.

O5.13 Based on the estimated waste arisings, the sensitivity of the waste management infrastructure is anticipated to be low and the magnitude of effect, prior to mitigation is **moderate**.

O5.14 The construction is therefore anticipated to result in a direct, temporary, long-term effect on waste management infrastructure of **moderate/minor adverse** significance prior to the implementation of mitigation measures. This reflects that there will be periods of intensive construction activity, followed by periods of inactivity (due to the phasing, market conditions etc.), so although the effect is expected to be long-term (due to the duration of construction) it is not going to be permanent.

During Operation

Household Waste

O5.15 The calculation of future household waste generation has been estimated using MKC waste statistics. The figures can only be considered indicative as a variety of factors, such as the on-going national and local promotion of waste minimisation and recycling, consumer habits and population changes, will affect waste generation rates in future years.

O5.16 The average household waste generation rate calculated in Table O4.2 above was used to provide an estimate of the waste arisings from the future residents of the Proposed Development. This is outlined in Table O5.5.

Table O5.5 Estimated Household Waste Arising

Description	No. Units	Estimated average waste generation per household per year (tonnes)	Tonnes / year	Tonnes / week *
Baseline	4,000	1.01	4,040	78
Maximum	4,600		4,646	90

Notes: * Figure has been rounded

O5.17 At this stage it is estimated that if current waste generation levels remained constant, the Proposed Development could potentially generate 4,040-4,646 tonnes of household waste per year (78-90 tonnes per week) from the residential units. This would be equivalent to an additional 3.4-4% on Milton Keynes' household waste generation from 2018-19 (117,272 tonnes).

O5.18 The sensitivity of the waste management infrastructure is anticipated to be low and the magnitude of effect, prior to mitigation is **minor**. There is likely to be a direct, permanent, long-term effect on waste management infrastructure of **minor** adverse significance prior to the implementation of mitigation measures.

Commercial Waste

O5.19 Table O5.6 identifies the estimated waste generation from the non-residential elements of the Proposed Development, based on floor area and appropriate benchmarks from British Standard *BS5906:2005 Waste management in buildings - Code of practice*, unless otherwise stated.

Table O5.6 Estimated Commercial Waste Arising

Description	Estimated Max. Total Floor Area Sought (sqm)	Weekly waste arising (Tonnes)	Annual waste arising (Tonnes)	Comments on methodology and assumptions
Employment	403,650	92	4,770	Volume per m^2 of floor area [5 l] × floor area [a]
Commercial	10,500	4	186	Volume per m^2 of sales area [10 l] × sales area
Community Space	1,000	0.2	12	Volume per m^2 of floor area [5 l] × floor area
Description	No. Pupils	-	-	-
Secondary School	1,500 [b]	1	33	Volume arising per pupil: secondary school (22kg) [c]
Primary Schools (x3)	1,680 [d]	1	76	Volume arising per pupil: primary school (45kg) [c]
Total	**-**	**98**	**5,077**	**-**

Assumptions: a 75% of the total floor area is sales area.
b The Secondary School is 10FE, has 30 pupils per form and five year groups (i.e. no Sixth Form)
c Source: Recycle Now - How Much Does Your School Waste? [Ref 21]
d Two Primary Schools are 3FE and one Primary School is 2FE, they have 30 pupils per form and seven year groups

O5.20 It has been estimated that the Proposed Development could therefore generate up to 5,077 tonnes of commercial waste per annum (up to approximately 98 tonnes per week), assuming that the maximum gross floorspace will be constructed and occupied. It should be noted that these figures should be considered as indicative as the application is at the outline stage and so to determine the worst-case effect, maximum numbers have been considered.

O5.21 The sensitivity of the waste management infrastructure is anticipated to be low and the magnitude of effect, prior to mitigation is **moderate**. There is likely to be a direct, permanent, long-term effect on waste management infrastructure of **minor** adverse significance prior to the implementation of mitigation measures.

O6.0 Mitigation and Monitoring

During Construction

O6.1 The Government revoked the requirement for Site Waste Management Plans (SWMPs) for construction projects costing over £300,000 as of 1 December 2013 and as such, SWMPs are no longer mandatory. However, they remain good practice and a SWMP would be developed by the Principal Contractors for the Proposed Scheme.

O6.2 SWMPs are typically 'live' documents which are regularly updated to record how waste is managed during construction.

O6.3 The Materials Management Plan (MMP) would further include a specific soils management plan developed under the following voluntary and industry regulated Codes of Practice including:

1 The Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [Ref 13]. This provides best practice guidance for the excavation, handling, storage and final placement of soils.

2 The Definition of Waste. Development Industry Code of Practice Version 2 [Ref 14]. This provides a process whereby contaminated soils can be reused on the site of origin (i.e. they do not become a waste) if they are proven through appropriate risk assessment to be suitable for use. It also provides for soils with naturally elevated contamination to be used directly on another site provided that they are suitable for use at that site.

O6.4 The consideration of a programme of realistic waste management targets and subsequent monitoring arrangements at an early stage during construction will assist in reducing the amount of waste disposed off-site.

O6.5 Implementation of good practice measures in terms of on-site storage will assist in reducing unnecessary wastage of material and ensure that high standards are maintained throughout the development process.

O6.6 Best practice measures and recommendations for the minimisation and management of waste will be incorporated into a CEMP prior to commencement of works on-site, which will be secured by planning condition. The Framework CEMP is outlined in Chapter C 'Site and Scheme Description'.

O6.7 To ensure that the system of waste minimisation, reuse and recycling is effective, consideration will be given to the setting of on-site waste targets for the Proposed Development and a suitable programme of monitoring at regular intervals to focus upon:

1 Quantifying raw material wastage;

2 Quantifying the generation of each waste stream;

3 Any improvements in any working practices;

4 Methods by which the waste streams are being handled and stored; and

5 The available waste disposal routes used, e.g. landfill, waste transfer stations.

O6.8 The Principal Contractors will be responsible for the setting and review of waste targets from the outset to ensure that high standards are maintained with the emphasis being on continual improvement.

O6.9 Specific waste quantification and monitoring will assist in determining the success of waste management initiatives employed and progress against these targets should be relayed back to the Project Team.

O6.10 As outlined in Chapter C 'Site and Scheme Description', all construction works on the Site will be undertaken in accordance with the Considerate Constructors Scheme, secured as part of the CEMP or through planning condition. This is a national initiative set up by the construction industry. Sites that register with the Scheme sign up to and are monitored against a Code of Considerate Practice designed to encourage best practice beyond statutory requirements. The Scheme is concerned about any area of construction activity that may have a direct or indirect effect on the image of the industry as a whole. The main areas of concern fall into three main categories: the environment, the workforce and the general public. Waste management is a key area of focus and on-site considerations may include:

1 How waste is avoided, reduced, reused and/or recycled;

2 Whether there is a SWMP and how this is monitored; and

3 The type of feedback received (if any) as to how much waste on-site is diverted from landfill.

O6.11 As part of the encouragement of on-site best practice, there will also be a need to ensure that suppliers during construction of the Proposed Development are committed to reducing surplus packaging associated with the supply of any raw materials. This includes the reduction of plastics (i.e. shrink wrap and bubble wrap), cardboard and wooden pallets. This may involve improved procurement and consultation with selected suppliers regarding commitments to waste minimisation, recycling and the emphasis on continual improvement in environmental performance. Where practicable, the off-site manufacture/pre-fabrication of building components will be undertaken to help minimise the generation of on-site construction waste.

O6.12 Table O6.2 summarises the most important mitigation measures to reduce the potential waste of on-site materials during the construction of the Proposed Development.

Table O6.1 Measures to Reduce the Wastage of Raw Materials

Ordering	**Delivery**
Avoid: Over-ordering (i.e. order 'just in time'); Ordering standard lengths rather than lengths required; and Ordering for delivery at the wrong time (update programme regularly).	Avoid: Damage during unloading; Delivery to inappropriate areas of the Site; and Accepting incorrect deliveries, specification or quantity.
Storage	**Handling**
Avoid: Damage to materials from incorrect storage; and Loss, theft or vandalism through secure storage and on-site security.	Avoid: Damage or spillage through incorrect or repetitive handling.

O6.13 Where practicable, waste streams that have the potential to be reused on-site or transported off-site for recycling will need to be segregated. Although every effort will be made to retain all suitable materials on-site, it is possible that some of these materials cannot be reused or recycled during the construction of the Proposed Development. In these situations, the Site Managers will work to identify suitably licensed waste facilities in order for material to be redistributed to other suitable sites. This represents the most sustainable alternative to landfill disposal.

During Operation

Household Waste

O6.14 Design measures for the Proposed Development will ensure that all residents have access to both internal and external waste and recycling storage facilities, to be secured as part of the detailed design works.

O6.15 A summary of the containers provided by MKC for the kerbside collection of waste and recycling can be found in Table O4.3 above.

O6.16 These containers will be located within the curtilage of each house and in suitably designed enclosures on ground level for apartments. These containers will be easily accessible for both residents and collection crews.

O6.17 Waste segregation and storage facilities will be designed to be convenient and simple to use, to encourage residents to recycle and to maximise recycling rates.

O6.18 Taking Milton Keynes' household waste recycling rate from 2018-19 (59.1%), this would equate to 2,388-2,746 tonnes of household waste being diverted from waste disposal facilities.

Commercial Waste

O6.19 The commercial elements of the Proposed Development will be provided with dedicated or shared waste storage areas to facilitate the segregation of recyclable materials.

O6.20 All waste storage areas will be clearly labelled to ensure that cross contamination of refuse and recycling is minimised.

O6.21 Retailers and commercial tenants will be encouraged to undertake their own waste audit and create an Action Plan to set targets for reducing, reusing and recycling their waste streams.

O6.22 It is assumed that collection of commercial waste will be undertaken via external waste management contractors. It will be the responsibility of the occupiers to arrange for refuse and recycling to be collected from their premises.

O6.23 The frequency of waste collection will be dependent upon several factors including the volume of waste generated; the storage method (i.e. whether balers and waste compactors are used); and the schedule of the appointed waste contractor.

O6.24 The opportunity for the segregation and off-site composting of organic waste generated from any landscaping and grounds maintenance activities will be provided by the external company contracted to undertake this work.

O7.0 Residual Effects

During Construction

O7.1 It is considered that, if the majority of the construction waste is appropriately reused on-site or reused/recycled off-site, due to its scale and nature the Proposed Development will still have a noticeable effect on the volume of construction waste generated. The sensitivity of waste management infrastructure is **moderate** and the magnitude of change, following mitigation is **minor**. Therefore, considering all stages of construction, there is likely to be direct, temporary and long-term effect on waste management infrastructure of **minor adverse** significance following the implementation of mitigation measures.

O7.2 This is based on professional judgement, given the current level of landfill diversion for CD&E waste nationally and the propensity to treat these materials as a resource rather than send them for disposal.

During Operation

O7.3 The mitigation measures outlined above will ensure that a significant proportion of household and commercial waste can be separated for recycling by occupiers and users, thereby maximising recycling opportunities and reducing the waste contributions for disposal. The sensitivity of the waste management infrastructure is low and the magnitude of effect, following mitigation is **negligible**. Therefore, there is likely to be a direct, permanent, long-term effect on waste infrastructure from commercial waste of **negligible** significance following the implementation of mitigation measures.

O8.0 Summary & Conclusions

Summary

O8.1 The most significant effects of the Proposed Development from a waste management perspective include the generation of waste materials during demolition/site clearance and earthworks; during construction activities; and its operation. The proposed construction approach and strategy has sought to minimise waste generation. The effects on waste management will be mitigated by the following initiatives:

1 Adherence to the Waste Hierarchy;

2 Reuse of earthworks/construction materials on-site or reuse/recycling off-site;

3 Registration of the Proposed Development with the Considerate Constructors Scheme;

4 Management of supply chains and good on-site storage of materials to prevent wastage; and

5 Segregation of recyclable and compostable materials by residents.

O8.2 The Proposed Development is not expected to result in a significant quantity of excavation waste being generated from excavation, as the majority of this material would be reused on-site wherever possible. This will result in a **negligible** negative long-term residual effect due to the timescale for the construction of the Proposed Development.

O8.3 The Proposed Development will result in the generation of a considerable quantity of construction waste, however, even following implementation of measures to minimise the generation of waste, including the initiatives listed above.

O8.4 It is considered that, if the majority of the construction waste is appropriately reused on-site or reused/recycled off-site, the Proposed Development will result in a residual long-term effect of **minor adverse** significance.

O8.5 Following the implementation of mitigation measures the generation of waste during operation of the Proposed Development is likely to comprise a **negligible** effect on off-site waste management infrastructure in the long-term for commercial and household waste.

O8.6 Table O8.1 contains a summary of the likely significant effects of the Proposed Development.

Table O8.1 Summary of Significant Effects - Waste

Description of Potential Effect	Significance of Effects					Summary of Mitigation Measures	Significance of Effects				
	Substantial, Moderate, Minor, Negligible	Beneficial / Adverse	P / T	D / I	ST / MT / LT		Substantial, Moderate, Minor, Negligible	Beneficial / Adverse	P / T	D / I	ST / MT / LT
During Construction											
Waste arisings during construction (i.e. demolition, excavation and construction waste)	Moderate / Minor	Adverse	T	D	LT	SWMPs and CEMPs Adherence to Waste Hierarchy Considerate Constructors Scheme Implementation of waste monitoring Segregation of recyclables at source Reuse of materials on-site or reuse/recycling off-site Management of supply chains and good on-site waste storage and segregation	Minor	Adverse	T	D	LT
During Operation											
Waste arisings during operation (i.e. waste from households)	Minor	Adverse	P	D	LT	Segregation of recyclables at source Provision of appropriate waste storage areas Sufficient external space in private gardens for home composting	Negligible	Adverse	P	D	LT
Waste arisings during operation (i.e. waste from non-residential elements)	Minor	Adverse	P	D	LT	Segregation of recyclables at source Provision of appropriate waste storage areas Waste audits and Action Plans by commercial tenants Segregation and off-site composting of organic waste generated from any landscaping and grounds maintenance activities	Negligible	Adverse	P	D	LT

Key: P / T = Permanent or Temporary, D / I = Direct or Indirect, ST / MT / LT = Short-Term, Medium-Term or Long-Term, N/A = Not Applicable

09.0 Abbreviations

- AD - Anaerobic Digestion
- BRE - Building Research Establishment
- CL:AIRE - Contaminated Land: Applications in Real Environments
- Defra - Department for Environment, Food and Rural Affairs
- ELV - End of Life Vehicles
- EfW - Energy from Waste
- EIA – Environmental Impact Assessment
- ES – Environmental Statement
- HRC - Household Recycling Centre
- IBA - Incinerator Bottom Ash
- MRF - Materials Recovery Facility
- MKC - Milton Keynes Council
- MHCLG - Ministry of Housing, Communities & Local Government
- OPSI - Office of Public Sector Information
- WEEE - Waste Electrical and Electronic Equipment

O10.0 References

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