

6. Waste Management

Environmental Statement

Volume I

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Introduction

- 6.1 This chapter of the Environmental Statement (ES) reports the findings of an assessment of the likely significant waste management effects as a result of the proposed Peel Centre Hybrid Planning Application (hereafter referred to as the 'Proposed Development') in the London Borough of Barnet (LBB).
- 6.2 For the purpose of the assessment, waste is defined as '*any substance or object...which the holder discards or intends or is required to discard*', as defined by the European Directive 2008/98/EC – Waste Framework Directive (Ref. 6-1).
- 6.3 In the context of this assessment, waste materials are anticipated to comprise:
- waste arising from the construction, demolition and excavation activities associated with the Proposed Development; and,
 - waste produced from the Proposed Development once occupied.
- 6.4 The assessment uses information from the existing site (Peel Centre), current Outline and Detailed designs of the Proposed Development and published information, such as benchmark construction waste figures from the Buildings Research Establishment, to assess the effects of waste management from the Proposed Development.
- 6.5 The potential for waste management effect interactions and combined effects ('Type 1' effects) and combined cumulative waste management effects ('Type 2' effects) of the Proposed Development with other development schemes are discussed **in Chapter 18: Effect Interactions and Cumulative Effects**.
- 6.6 This assessment and ES chapter has been produced by URS Infrastructure and Environment Ltd (URS) using information provided by the Applicant.

Legislation and Planning Policy Context

National Legislation

- 6.7 Most of the key UK waste related legislation has been derived from European Union (EU) directives, including, but not limited to, European Directive 2008/98/EC – Waste Framework Directive (Ref. 6-1). These EU Directives are transposed into UK law via the following legislation:
- Control of Pollution (Amendment) Act 1989 (Ref. 6-2);
 - Environmental Protection Act 1990 (EPA) (Ref. 6-3);
 - The Environment Act 1995 (Ref. 6-4);
 - The Environmental Protection (Duty of Care) (England) (Amendment) Regulations 2003 (Ref. 6-5);
 - Clean Neighbourhoods and Environment Act 2005 (Ref. 6-6);
 - The List of Wastes (England) (Amendment) Regulations 2005 (Ref. 6-7);
 - Hazardous Waste (England and Wales) Regulations 2005 (Ref. 6-8);
 - Hazardous Waste (England and Wales) (Amendment) Regulations 2009 (Ref. 6-9);
 - The Waste (England and Wales) Regulations 2011 (Ref. 6-10);
 - The Waste (England and Wales) (Amendment) Regulations 2012 (Ref. 6-11);
 - The Controlled Waste (England and Wales) Regulations 2012 (Ref. 6-12); and,
 - The Environmental Permitting (England and Wales) (Amendment) (No. 2) Regulations 2013 (Ref. 6-13).

National Planning Policy and Guidance

National Planning Policy Framework (2014)

- 6.8 The National Planning Policy Framework (NPPF) (Ref. 6-14) outlines the Government's planning policies for England and how they are expected to be applied. Paragraph 7: Achieving Sustainable Development of the NPPF identifies the need for the planning system to perform mutually dependant economic, social and environmental roles. The environmental role includes the need to minimise waste. However, the framework does not contain specific waste policies, but states that the Waste Planning Policy Statement (Planning Policy Statement 10 (PPS10) (Ref. 6-15) will remain in place until the National Waste Management Plan for England and revised waste planning policy is published.

National Planning Practice Guidance (2014)

- 6.9 The National Planning Practice Guidance (NPPG) was launched on the 6th March 2014 (Ref. 16-16) and provides a web-based resource to support the NPPF. Following its launch, a number of previously published planning guidance documents have been cancelled and are detailed within the Written Ministerial Statement titled 'Making the planning system work more efficiently and effectively', also dated 6th March 2014.
- 6.10 As discussed above, the NPPF does not contain specific waste policies pending the publication of the National Waste Management Plan for England

Waste Management Plan for England (2013)

- 6.11 The *Waste Management Plan for England 2013* (Ref. 6-17) replaces *The Waste Strategy 2007* and was published, following consultation, in December 2013. It is a "*high level, non-site specific document*" that outlines the Government's work towards a zero waste economy and fulfils the requirements of the Revised Waste Framework Directive (*ibid*).
- 6.12 The Waste Management Plan for England uses the 'Waste Hierarchy' to guide the principles of the plan stating that '*...the waste hierarchy is both a guide to sustainable waste management and a legal requirement*'. The waste hierarchy prioritises waste minimisation followed by preparing for reuse, then recycling, other types of recovery (including energy recovery), with landfill disposal the least favoured option.
- 6.13 The *Waste Management Plan for England* references Planning Policy Statement 10 (PPS10) 'Planning for sustainable Waste Management'. Recognising that national waste management planning policy is being updated and subject to public consultation with PPS10 being replaced once this is finalised, although no publication dates are provided.

Planning Policy Statement 10: Planning for Sustainable Waste Management (PPS 10)

- 6.14 PPS10 provides policy advice to help local authorities and developers prepare waste management infrastructure to manage waste more effectively. The overall objective of PPS10 is to help protect human health and the environment by producing less waste and by using waste as a resource wherever possible (Ref. 6-15). Under PPS10, local planning authorities are required to prepare strategies that deliver the following objectives:
- help deliver sustainable development through driving waste management up the waste hierarchy, addressing waste as a resource and looking to disposal as the last option;
 - help implement the key objectives and targets of the National Waste Strategy for England; and ensure consistency with obligations required under European waste legislation and other relevant guidance and legal controls; and
 - ensure the design and layout of new development supports sustainable waste management.

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Waste Prevention Programme for England (2013)

6.15 The Waste Prevention Programme for England (Ref. 6-18) seeks to deliver a more resource efficient economy, recognising that waste prevention is the most effective economic and environmental option. The programme is also a requirement of the Waste Framework Directive. The programme specifically aims to create a culture where businesses and individuals reduce their waste arisings through more durable products, increased repair and through the reuse of products by others. The programme seeks to encourage new business models to deliver this, whilst also encouraging businesses to improve resource efficiency throughout the product lifecycle.

Regional Planning Policy

The London Plan – Spatial Development Strategy for Greater London (2011)

6.16 The London Plan (Ref. 6-19) outlines the Mayor’s commitment to making better use of waste and its management in order to support sustainable development, including mitigating and adapting to the impacts of climate change and promoting health and equality. The London Plan recognises waste as a valuable resource that can be exploited for London’s environmental, economic and social benefit. As outlined in Table 6-1, below, the London Plan emphasises the importance of four policies in relation to waste management.

Table 6-1 The London Plan 2011 Waste Management Policies

Policy	Requirements
Policy 5.3 B and C Sustainable Design and Construction	Development proposals should include sustainable design standards that are integral to the proposal and should be considered at the beginning of the design process. Major development proposals should meet minimum standards outlined in the Mayor’s Supplementary Planning Guidance including ‘...minimising the generation of waste and maximising reuse or recycling’.
Policy 5.16 Waste Self Sufficiency	The Mayor will work with various stakeholders and authorities to ensure that by 2031, 100% of London’s waste will be managed within London and zero biodegradable or recyclable waste will be sent to landfill. Sets a target for 95% recycling of construction, excavation and demolition waste by 2020.
Policy 5.17 Waste Capacity	Waste processing capacity in London needs to increase and all new developments should have suitable waste and recycling storage facilities.
Policy 5.18 Construction, Excavation and Demolition Waste	Waste should be removed from construction sites, and materials brought to the site, by water or rail based transport wherever practicable. Developers should produce Site Waste Management Plans for the efficient handling of CE&D waste and materials.

6.17 The London Plan also states that construction, excavation and demolition (CE&D) recycling rates were estimated to be around 82% in 2008 and that through “a combination of on-site mobile facilities on construction sites, effective use of existing waste processing sites and, where appropriate, safeguarded wharves, and the provision of recycling facilities at aggregate extraction sites, should be capable of meeting the anticipated future requirement within London to achieve a more beneficial re-use of this [CE&D] material”.

Revised Early Minor Alterations to the London Plan (October 2013)

6.18 No alterations in relation to waste management are outlined in the Revised Early Minor Alterations to the London Plan (October 2013) (Ref. 6-20).

Draft Further Alterations to the London Plan (2014)

6.19 The Draft Further Alterations to the London Plan (FALP) (2014) (Ref. 6-21) introduces a number of updates in response to the recalculation of national waste arisings data, which lead to a marked decrease in estimated household and commercial waste arisings.

6.20 In addition to the new waste arisings figures the Draft FALP states that the Mayor’s waste policies aim to achieve net self-sufficiency, defined as household and commercial waste managed within Greater London

for by 2026 (compared to 2031 in the *London Plan, 2011*). However the draft recognises that waste ‘may need to be exported outside London – including Europe – whilst London markets are established’.

The Business Waste Management Strategy, (2011)

6.21 In addition to the policies outlined in the over-arching London Plan, the Business Waste Management Strategy (Ref. 6-22) provides further policy guidance on the management of business waste. It sets out initiatives to help many different London businesses (including shops, restaurants and offices) save money and reduce harm to the environment through adoption of improved waste management practices. The strategy seeks to encourage waste reduction and promotes increasing re-use and recycling of waste from commercial activities. It looks to improve the efficiency of resource management and reduce the financial and environmental impact of waste by managing as much waste as is practical within the London boundaries.

The Municipal Waste Management Strategy, (2011)

6.22 The Municipal Waste Management Strategy (Ref. 6-23) provides further policy guidance on the management of municipal waste in addition to policies contained within the overarching London Plan. The strategy sets six additional targets listed in Table 6-2 which aim to reduce the amount of municipal waste generated by the capital and improve recycling and composting performance. The strategy goes on to explain that municipal waste which cannot be re-used or recycled will be used to produce energy from waste in the most environmentally sensitive way possible.

Table 6-2 The London Municipal Waste Management Strategy Targets

Target	Description
Target 1	Achieve zero municipal waste sent directly to landfill by 2025.
Target 2	Reduce the amount of household waste produced in 2008/09 from 970 kilograms (kg) per household to 790 kg per household by 2031.
Target 3	Increase London’s capacity to re-use municipal waste from approximately 6,000 tonnes each year in 2008 to: <ul style="list-style-type: none"> • 20,000 tonnes a year in 2015; and • 30,000 tonnes a year in 2031.
Target 4	With respect to municipal waste, recycle or compost at least: <ul style="list-style-type: none"> • 45% by 2015; • 50% by 2020; and • 60% by 2031.
Target 5	Cut London’s greenhouse gas emissions through the management of London’s municipal waste, achieving annual greenhouse gas emission savings of approximately: <ul style="list-style-type: none"> • 545,000 tonnes of carbon dioxide equivalent (CO₂e) in 2015; • 770,000 tonnes of CO₂e in 2020; and • 1,000,000 tonnes of CO₂e in 2031.
Target 6	To generate as much energy as practicable from London’s organic and non-recycled waste in a way that is no more polluting in carbon terms than the energy source it is replacing.

The Greater London Authority Supplementary Planning Guidance for London – Sustainable Design and Construction (2014)

6.23 The Greater London Authority (GLA) Supplementary Planning Guidance (SPG) Notes (Ref. 6-24) were produced to provide additional detail regarding certain policies of the London Plan. In relation to waste and recycling, SPG Sustainable Design and Construction promotes sustainable construction across London. Key standards are set as part of this SPG for a range of sustainability issues. Waste management is the focus of section 2.7 of this SPG with the stated aim of minimising waste arisings and the reuse and recycling of as much material as is physically practicable.

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- 6.24** During construction, the SPG's priority guidance is that "developers should maximise the use of existing resources and materials and minimise waste generated during the demolition and construction process through the implementation of the waste hierarchy." The SPG does not provide best practice guidance for construction, but provides further detail for demolition, which is summarised below.
- 6.25** If significant demolition (greater than 1000m² floor space) is required during a development, Developers are encouraged to use the Demolition Protocol (Ref 6-25) and to "demonstrate that the most significant opportunities to increase the value of materials derived from recycled and reused content have been considered". The SPG suggests that the Waste Resources Action Programme (WRAP) Quick Wins best practice guidance or equivalent is used to achieve this. The SPG also encourages the early development of a Site Waste Management Plan (SWMP) to provide a framework for the management of waste in the context of the waste hierarchy.
- 6.26** In relation to the occupation of new developments the Mayor's priority guidance is that "developers should provide sufficient internal space for the storage of recyclable and compostable materials and waste in their scheme"; and, "the design of the development should meet borough requirements for the size and location of recycling, composting and refuse storage and its removal". The SPG does not list best practice guidance for occupation.

Local Planning Policy

London Borough of Barnet Core Strategy Development Plan Document (2012)

- 6.27** LBB's Core Strategy Development Plan Document (Ref. 6-26) identifies that the borough "...need[s] to find better ways of dealing with our waste and taking more responsibility for dealing with it within London rather than burying it in landfill..." and that the Borough's recycling rates "...are above average..."
- 6.28** LBB's Local Plan outlines the Borough's joint activities through the North London Waste Authority (NLWA) and the joint development of the North London Waste Plan (NLWP), described below.
- 6.29** LBB's Local Plan also details *Core Strategy Policy CS14* in relation to waste through which the Borough "...will encourage sustainable waste management by:
- promoting waste prevention, re-use, recycling, composting and resource efficiency over landfill;
 - requiring developments to provide waste and recycling facilities which fit current and future collection practices and targets;
 - designating sites through the NLWP to meet an aggregated apportionment target across the seven North London boroughs. These sites will be the principle locations considered suitable for waste facilities; and
 - safeguarding all existing waste facilities in Barnet including a Waste Management Facility in the Brent Cross - Cricklewood Regeneration Area".

London Borough of Barnet Local Plan Development Management Policies (DPD) (2012)

- 6.30** No local plan development policies relating to waste management have been identified (Ref. 6-27).

London Borough of Barnet Unitary Development Plan Saved Policies

- 6.31** The London Borough of Barnet Unitary Development Plan (2006) 'G Waste – Waste Disposal' which has been replaced by Core Strategy Policy CS14, adopted in September 2012 (Ref. 6-28).

Other Relevant Policy, Standards and Guidance

North London Waste Plan, Proposed Submission Version, (2011)

- 6.32** The North London Waste Authority (NLWA) comprises the London Boroughs of Barnet, Camden, Enfield, Hackney, Haringey, Islington and Waltham Forest. Under this partnership, the NLWA and its seven constituent Boroughs work together to identify new waste management facilities capable of managing waste generated in North London, as per the requirement of the London Plan. To achieve this, the seven Boroughs

are developing a North London Waste Plan (NLWP) (Ref. 6-29) which will act to set out the planning framework for waste management within the NLWA through to 2027.

- 6.33** During August 2012 it was decided that the then current NLWP was not legally compliant because it did not fully meet statutory requirements; as such preparation of a new NLWP began during early 2013. Consultation on a new NLWP in mid-2013 and adoption of the draft NLWP is expected in winter 2016.

North London Joint Waste Strategy, (2009)

- 6.34** In addition to the NLWP, the North London Joint Waste Strategy (NLJWS) (Ref. 6-30) provides the strategic framework for municipal waste management in North London from 2004 through to 2020. The NLJWS sets out the targets for reducing, reusing and recovering a greater proportion of municipal waste generated within the NLWA, in addition to targets to support a reduction the amount of waste sent to landfill for disposal. The NLJWS states the following objectives in relation to waste management:

- "to minimise the amount of municipal wastes arising;
- to maximise recycling and composting rates;
- to reduce greenhouse gases by disposing of less organic waste in landfill sites;
- to co-ordinate and continuously improve municipal wastes minimisation and management policies in North London;
- to manage municipal waste in the most environmentally benign and economically efficient ways possible through the provision and co-ordination of appropriate waste management facilities and services; and,
- to ensure that services and information are fully accessible to all members of the community".

North London Waste Prevention Plan, (2012)

- 6.35** The North London Waste Prevention Plan (NLWPP) 2012-2014 (Ref. 6-31) details how waste prevention objectives outlined by the NLJWS will be met. The NLWPP provides a series of short to medium term actions aimed at minimising the amount of waste generated by North London through a sustainable and detailed programme of waste prevention activities. The NLWPP targets food waste as a priority waste stream and aims to emphasise food reduction messages. Furniture re-use is also proposed as a second focal area alongside activities to support a reduction of unwanted mail and textile re-use.

Assessment Methodology and Effect Significance Criteria

- 6.36** This section presents the following:
- Identification of the information sources that have been consulted throughout preparation this chapter;
 - Details of the consultation undertaken with respect to waste management;
 - The methodology behind the assessment of waste management effects, including the criteria for the determination of sensitivity of receptor and magnitude of change from the existing or 'baseline' condition;
 - An explanation as to how the identification and assessment of potential waste management effects has been reached; and
 - The significance criteria and terminology for assessment of the residual effects of waste management.
- 6.37** The following sources of information that define the Proposed Development have been reviewed and form the basis of the assessment of likely significant effects of waste management:
- Floor areas from design details split according to proposed end use;
 - Construction information as outlined in **Chapter 5: Demolition and Construction**; and
 - Waste Management Plan.

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Assessment Methodology

Methodology for Determining Baseline Conditions and Sensitive Receptors

- 6.38** Waste is expected to be generated by activities during the demolition, excavation, construction and operation / occupation of the Proposed Development and considered to occur within the red line boundary. However, the infrastructure for managing waste mainly occurs outside with the Proposed Development in the local and regional area.
- 6.39** *The London Plan* identifies that CE&D waste generated by development activity in London is primarily dealt with by the private sector (Ref. 6-19) and it is therefore assumed to be managed regionally beyond the local administrative boundaries within Greater London. The baseline for Construction, Excavation and Demolition (CE&D) Waste has therefore been established through a desktop review of 2011 waste data from *The London Plan*.
- 6.40** Local Authority Collected Waste (LACW) in LBB is managed through facilities in the NLWA partnership. Baseline waste arisings for the NLWA have been established through desktop review of 2014 published waste data – “*North London Waste Plan Waste Data Study – Part 1 Waste Arisings in North London*” (Ref 6-36).
- 6.41** The baseline for operational waste within the Proposed Development has been established by estimating the waste arisings from the current use of the Site using floor areas/ average occupancy rates and applying the waste arising figures from *BS5906:2005 Waste management in buildings – Code of practice* (Ref. 6-32).
- 6.42** Potential receptors are considered to be either local/regional waste recycling/reprocessing/recovery facilities or landfill sites.

Methodology for Determining Demolition and Construction Effects

- 6.43** Waste arisings from the demolition and construction activities have been estimated using the floor areas and building dimensions of the Proposed Development, in combination with published figures derived from similar projects as documented by the Waste Resources Action Programme (WRAP) and the Buildings Research Establishment (Ref. 6-33). The estimated waste arisings and their subsequent management are then assessed against the regional CE&D waste arisings baseline for Greater London.
- 6.44** Excavated waste arisings have been estimated from site plans and include a bulking factor to allow for expansion. Bulked, excavated waste is assumed to have a density of 1.25 tonnes/m³ (Ref. 6-34).

Methodology for Determining Operational Effects

- 6.45** Operational waste management effects have been determined using a similar methodology to that used to estimate the effects from demolition and construction. Floor areas for the Proposed Development, categorised by intended use, are multiplied by the relevant waste generation figures in litres / year from guidance contained in BS5906:2005. The use classes considered in the assessment are Residential (class C3) and Town Centre (classes A1-A4, D1, D2). In order to convert the volume figures derived from BS5906:2005, the waste is assumed to comprise of uncompacted mixed municipal waste with a density of 0.21 tonnes/m³ (Ref. 6-34).
- 6.46** The baseline operational waste arisings from existing site activities are subtracted from the predicted arisings from the Proposed Development to provide the net difference and therefore magnitude of change, which is used to estimate the effects of operational waste.

Significance Criteria

- 6.47** As described in **Chapter 2: EIA Methodology** of this ES, the significance of environmental effects is determined by considering the magnitude of impacts within the context of the sensitivity and proximity of receptors affected, i.e.:

- The magnitude (very low-high) of forecasted waste arisings for the Proposed Development assessed against the current local and regional waste arisings baseline; and,
 - The sensitivity of receptors where landfill is considered to be a high sensitivity receptor, due to its finite capacity; and local/regional waste recycling/reprocessing is considered to be a low sensitivity receptor, on the basis of an assumption that such activity has a beneficial impact and demand for recycled/recovered materials exceeds supply.
- 6.48** Assessment of the residual effects following mitigation will include consideration of:
- management of the waste within the context of the waste hierarchy, i.e. whether generation of the waste can be minimised, the waste can be reused or recycled etc.;
 - management of waste in accordance with the proximity principal, i.e. the proximity of the waste management infrastructure used and whether the waste is transported out of the region for management;
 - the ease of management of the waste generated, as determined by its physical and chemical characteristics, i.e. whether the waste can be easily treated with minimal residual waste, or whether the waste requires specialised treatment in the case of potentially hazardous residual waste; and
 - the potential environmental effects or human health risks associated with the waste e.g. if it is hazardous, infectious, etc.
- 6.49** As such the following criteria have been adopted to assess the potential effect associated to waste arisings and management techniques.
- **Major Adverse** - Large net increase in waste generation compared to the national or regional average, resulting in the need for the expansion of collection or waste disposal sites on a long-term basis. Noncompliance with legislation. No attempt to reduce, reuse or recycle. Resulting in irreversible environmental effects or human health risks associated to untreatable hazardous or infectious waste arisings.
 - **Moderate Adverse** - Noticeable increased need for waste disposal activity in comparison to the national or regional average. Non-achievement of recycling targets on a medium-term basis. Insufficient attempt to reduce, reuse or recycle. Resulting in detrimental environmental effects or human health risks associated to hazardous or infectious waste arisings.
 - **Minor Adverse** - Barely perceptible adverse effect, e.g. minor increase in disposal activity comparative to the ‘national or regional average’ or a small decrease in recycling and re-use on a short-term basis. Potential to cause environmental effects or human health risks associated to hazardous or infectious waste arisings however can be treated to reduce the risk.
 - **Negligible** - Neutral effect on waste disposal capacity and recycling.
 - **Minor Beneficial** - Barely perceptible improvement e.g. small decrease in disposal activity comparative to ‘national or regional average’ or a minor increase in recycling and re-use on a short term basis.
 - **Moderate Beneficial** - Perceptible improvement, e.g. noticeable increase in recycling and re-use comparative to the ‘national or regional average’ in accordance with waste policy objectives or targets on a medium-term basis.
 - **Major Beneficial** - Large net positive benefit such as a large decrease in the need for waste disposal sites or a major increase in reduction, re-use and recycling beyond waste policy objectives or targets on a long-term basis.
- 6.50** In the context of the Proposed Development, short to medium-term effects are considered to be those associated with the demolition and construction activities, and long-term effects are those associated with the completed, operational development. Local effects are those affecting neighbouring receptors, while

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effects upon receptors within the LBB/ NLWA area are considered to be at a local/district level. Effects affecting Greater London are considered to be at a regional level, whilst effects that affect different parts of the county, or England as a whole, are considered to be at a national level.

Consultation

- 6.51 Consultation with LBB on the approach of the Waste Management assessment has been undertaken through issue of the EIA Scoping Report in March 2014 and through LBB's EIA Scoping Opinion issued June 2014.
- 6.52 A meeting was held on 3rd June 2014 with the LBB to discuss the operational waste strategy and the servicing requirements for the Proposed Development..

Limitations and Assumptions

- 6.53 The consideration of landfill as a high sensitivity receptor and of waste recycling/ reprocessing infrastructure as low sensitivity is to some extent an arbitrary rating. However, this allows consideration of waste management using a familiar environmental assessment methodology to assess impact significance and considers waste management in the context of the waste hierarchy and local policy/ guidance.
- 6.54 The estimation of waste arisings from both the construction and operational activities of the Proposed Development requires the conversion of arisings from volumes to tonnages using published densities for the type of waste, which requires the assumption of the type of waste generated. In the case of operational waste from the town centre uses, it is assumed that the waste will be similar in composition to municipal waste, from the broad use class (A1-A4, D1, D2) and therefore of a similar density.
- 6.55 The use of floor areas, average occupancy data and other benchmark data and guidance to estimate CE&D and operational waste arisings provides indicative rather than absolute estimations of future waste arisings. Whilst this potential inaccuracy is acknowledged, the benchmarks are considered suitable for application to the type of development proposed and adequate to assess the significance of likely waste arisings.
- 6.56 Inflationary waste growth predictions have not been applied to the waste production estimates for the proposed development. Estimates of waste inflation vary widely. Previous statistics for municipal waste growth predicted year-on-year increases in waste production, although recent Defra figures suggest that household waste arisings have decreased by 12% since 2006/07 (Ref. 6-35). It is likely that the latter situation is most appropriate to the Proposed Development. This is because the long-term population of the building is unlikely to change significantly, and widespread initiatives to reduce waste and improve materials reuse and recycling are likely to reduce long-term production of waste from the Site. Therefore, it is likely that the current waste production and storage requirements will represent a reasonable worst-case scenario, and as such should form the basis for long-term waste management provisions.

Baseline Conditions

Construction, Excavation & Demolition Waste Arisings

- 6.57 *The London Plan* states that CE&D waste generated by development activity in London is primarily dealt with by the private sector and amounted to approximately 10.4 million tonnes in 2008. The London Plan also states that reuse and recycling rates for CE&D waste in London are already high - estimated at 82% for 2008 (Ref. 6-19).

Operational Waste Arisings

North London Waste Arisings

- 6.58 In 2012/2013 NLWA reported it managed a total of 809,699 tonnes of LACW (including trade waste), of which 75% was reused, recycled, composted or sent to an energy recovery facility. The remaining 199,813 tonnes, or 25%, was sent to landfill (Ref. 6-36).

Current Operational Waste Arisings

- 6.59 The 16 houses and Peel Centre buildings are assumed to generate municipal and commercial waste. It is not known how this waste is currently managed, therefore for the purposes of the assessment it is assumed that the houses generate LACW, processed by NLWA on behalf of LBB, and the Peel Centre buildings generate commercial waste, collected by a private contractor.
- 6.60 The 16 houses are assumed to contain 3 bedrooms on average and generate approximately 240 litres of waste each per week, equating to an estimated annual volume of 200m³ or 42 tonnes per year, assuming a density of 0.21t / m³ (Ref. 6-34).
- 6.61 The buildings comprising the existing Peel Centre have approximately 1,090 staff on site taking into account shift work and other operational requirements. It is assumed that these activities are mainly office-based for the purposes of comparison with BS5906:2005 and therefore generate 50 litres of waste per person per week. This equates to approximately 2,834m³ per year or 595 tonnes per year, assuming a density of 0.21t / m³ (Ref. 6-34).

Assessment of Effects and Significance

Incorporated Mitigation during Construction

- 6.62 The Site Waste Management Plans Regulations 2008 were repealed in 2013; however the Proposed Development will require a Site Waste Management Plan (SWMP) to be produced recognising the benefits of this approach. A SWMP identifies the types and quantities of waste that will be produced during every stage of a project. A draft early stage SWMP has been produced for the Proposed Development and is available in **ES Volume III: Appendix C**. The Principal Contractor will have responsibility for updating and implementing the SWMP throughout the development process. The SWMP will identify all waste streams and will discuss the potential to reduce, reuse and recycle all materials wherever possible.
- 6.63 As part of the SWMP, the Principal Contractor will provide proof that all site waste has been deposited or transferred to the correct place and by appropriately licensed contractors. Records will also be kept and updated regularly ensuring that all waste transferred or disposed has been correctly processed with evidence of signed Waste Transfer Notes (WTNs) that will be kept on-site for inspection whenever requested.
- 6.64 An 85% recovery rate is targeted within the SWMP and demolition and construction contractors will be constantly monitored to ensure that the proportion of materials being recycled is maximised wherever possible. The Principal Contractor will ensure that the disposal of all waste or other materials removed from the Site is in accordance with the requirements of the Environment Agency and legislation and planning policy documents as listed above.
- 6.65 A demolition asbestos survey will be carried out prior to the demolition works to determine the location of asbestos based materials in the buildings and to verify whether any fly tipping of contaminated materials has occurred. All notifiable asbestos materials will be removed by a specialist licensed contractor and transported by a licenced carrier to an appropriately licenced site. Other hazardous materials identified will be removed, appropriately segregated and disposed at appropriately licenced sites.
- 6.66 Prior to demolition commencing, a demolition audit in accordance with the Demolition Protocol will be conducted. Demolition will commence with a soft strip of the building will be conducted allowing the removal, segregation of materials expected to comprising: flooring, walls (including partitions), ceilings, fixtures and fittings, kitchens and other electrical and mechanical services.
- 6.67 All demolition materials will be segregated into separate waste streams, including; hardcore (concrete, bricks, stones etc.), timber and metal products. Concrete and hardcore will either be crushed, graded and reused on site or taken to an offsite facility for recycling, timber will be sent off site for reuse or pulping and metal products will be taken off site to be recycled.
- 6.68 Waste will be minimised through:
- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme;

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- Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste;
 - Attention to material quantity requirements to avoid over-ordering and generation of waste materials;
 - Re-use of materials will be considered (e.g. re-use of crushed concrete from the demolition process for fill; re-use of excavated soil for landscaping).
 - Segregation of waste at source where practical; and
 - Re-use and recycling of materials off-site and where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing).
- 6.69** Site waste will be regularly collected on site at allocated positions and cleared from the Site. Certain waste material will be separated into recyclable bins on site taken from site by specialised recycling companies. Generally waste will be taken to waste separation centres where the contractor will recycle as much as is practical with an objective to minimise the use of landfill sites, ensure hazardous material are correctly disposed of and to maximise the recycling of materials.
- 6.70** It is considered likely that if, following the implementation of a SWMP, the majority of construction waste will be appropriately segregated (either on or off-site) for recycling
- Incorporated Mitigation during Occupation**
- 6.71** A Waste Management Plan (WMP) with the following aims has been developed for the Proposed Development(see *ES Volume III: Appendix C*):
- To contribute towards achieving current and long-term Government, GLA and the LBL targets for waste minimisation, recycling and re-use;
 - To ensure that all legal requirements for handling operational waste management are complied with;
 - To achieve high standards of environmental performance and, due consideration has and will continue to be given to the waste generated by the operation of the Proposed Development; and
 - To provide residents with convenient, clean and efficient waste systems that enhances the operation of the buildings and promote high levels of recycling,
- 6.72** The WMP outlines the optimum recycling and waste management areas for each component of the development and draws upon the current guidance and policy to specify areas and equipment which will further facilitate the source segregation of waste and recyclables. It also includes information received during a meeting with LBB on 3rd June 2014.
- 6.73** Residential waste will be segregated, stored and collected in three waste streams: organic, residual and mixed recycling. Waste storage will be through the use of communal bin stores located throughout the Site on the ground floor of each apartment block. Dwelling houses (including Duplexes) will have individual bins storage for each stream of waste. All residential waste will be collected by the LBB..Collection will take place weekly for all three streams of waste. In a number of individual dwelling houses a fourth stream (green waste) will be segregated and will be collected on a fortnightly basis.
- 6.74** Non-residential waste will be managed through the use of 1100L bins in dedicated bin storage rooms. It is assumed that compactors will not be utilised for commercial or retail waste management. Commercial and retail waste will be broken into three streams: organic, residual and mixed recycling. This waste can be collected by either the London Borough of Barnet or via a private waste collection service. The WMP has considered that all waste is collected by the borough to allow the plan be future proofed.

Effects during Demolition and Construction

Detailed Components of the Proposed Development

- 6.75** According to the demolition and construction programme set out *within Chapter 5: Demolition and Construction* of this ES, construction of the Detailed Components will be a staged process taking place over the Development Stage 1 construction period of approximately 5 years between 2015 and 2019. During the construction of Detailed Components, no excavation activities are scheduled, so the assessment considers waste arisings from demolition and construction.
- 6.76** Demolition of the existing buildings within Development Stage 1 are anticipated to take place over a 3.5-year period between April 2015 and September 2018. Construction activities are expected to take place over a 4-year period beginning in April 2015 and ending in April 2019.
- 6.77** The total waste arisings from the construction of Development Stage 1 are presented in table 6-3.

Table 6-3 Construction Waste Arisings from the Detailed Components

Activity	Calculation Method	Total Waste Arisings (tonnes)	Average Annual Waste Arisings (tonnes)
Demolition	Demolition of 62,249m ² of existing floor space is estimated to yield 87,253 m ³ of demolition arisings. A density factor of 0.87 tonnes/m ³ (Ref 6-34) is used to convert volume to tonnages	75,910	30,364 (2.5 years)
Excavation	No excavation activities are expected during Development Stage 1	0	0
Construction	85,260m ² of residential and 179 m ² of town centre uses floor space are expected to be built in the Detailed Components. BRE benchmarks suggest 16.8 tonnes of construction waste are generated for every 100m ² of residential floorspace constructed and 27.5 tonnes of construction waste are generated for every 100m ² of commercial retail floorspace	15,092	3,773 (4 years)
Total		91,002	34,137

- 6.78** Table 6-4 below presents a split of the likely excavation and construction waste material types.

Table 6-4 Estimated Quantities of Construction and Excavation Waste from the Detailed Components by Material Type

Materials	Approximate Quantity for Detailed Components (tonnes)
Excavation	
Soils and Stones	0
Construction	
Packaging	2,432
Timber	1,699
Plaster/ Cement	1,677
Concrete	1,702
Canteen/ Office/ Ad Hoc	1,552
Mixed	1,375
Ceramics/ Bricks	1,290
Insulation	978
Plastics	941
Inert	610
Metals	531

6 Waste Management

Materials	Approximate Quantity for Detailed Components (tonnes)
Electrical Equipment	135
Furniture	72
Hazardous	54
Liquids and Oils	45

Effects from CE&D Waste in the Detailed Components

- 6.79** Table 6-3 states that 91,002 tonnes of CE&D Waste is estimated to arise overall during the construction of the Detailed Components. Assuming a reasonable worst case that demolition and construction activities occur in the same year, which is likely to occur between Q3 2015 and end of Q2 2017, it is estimated that annual waste arisings could peak at 34,137 tonnes. This accounts for less than 0.3% of CE&D waste arisings generated in Greater London as identified in the baseline. The magnitude of impact is therefore very low.
- 6.80** From the incorporated mitigation measures identified above for managing CE&D waste, it is reasonable to assume that at least 85% of the CE&D waste will either be reused or recycled on or off-site or sent for energy recovery at low sensitivity receptors within Greater London.
- 6.81** CE&D waste arisings from the construction of the Detailed Components are therefore considered to have a **negligible** effect both locally and regionally and over the construction period.

Outline Components of the Proposed Development

- 6.82** According to the demolition and construction programme set out within **Chapter 5: Demolition and Construction** of this ES, construction of the Outline Components will be a staged process taking place over approximately 11 years, between the start of 2015 and the end of 2025.
- 6.83** The construction of the Outline Components involves demolition, excavation and construction activities. Demolition of the existing buildings is expected to take place over a 3.25-year period commencing in quarter 1 2015 and ending in quarter 1 2018. Excavation and earthworks occur in two 0.75-year periods in quarter 1 2017 to quarter 3 2017 and quarter 3 2020 to quarter 1 2021. Construction activities occur throughout over a 9.75-year period starting in quarter 2 2015 and ending in quarter 1 2025.
- 6.84** Demolition, Excavation and Construction activities all overlap in 2017 and therefore when the peak construction waste arisings are expected to occur. 2017 is therefore considered as a 'worst case scenario' for the purposes of the assessment
- 6.85** The total waste arisings from all construction related activities relating to the Outline Components are presented in table 6-5.

Table 6-5 Construction Waste Arisings from the Outline Components

Activity	Calculation Method	Total Waste Arisings (tonnes)	Average Annual Waste Arisings (tonnes)
Demolition	Demolition of 77,438m ² of existing floor space is estimated to yield 102,450 m ³ of demolition arisings. A density factor of 0.87 tonnes/m ³ (Ref 6-34) is used to convert volume to tonnages	89,132	27,425 (3.25 years)
Excavation (Development Stage 2)	112,411m ³ of bulked excavated material is expected during quarter 1 2017 to quarter 3 2017. A density of 1.25t/m ³ (Ref 6-34) has been applied to give tonnages. This activity occurs concurrently with the demolition and construction activities and is therefore considered by the assessment	140,514	140,514 (1 year)
Excavation (Development Stage 3)	101,790m ³ of bulked excavated material is expected during quarter 3 2020 to quarter 1 2021. A density of 1.25t/m ³ (Ref 6-34) has been applied to give tonnages.	127,238	-

Activity	Calculation Method	Total Waste Arisings (tonnes)	Average Annual Waste Arisings (tonnes)
	This activity does not overlap with demolition activities and is listed to provide a total volume of waste arising, but is not considered by the 'worst case' scenario		
Construction	270,604 m ² of residential floor space and 10,000 m ² of town centre uses floor space are expected to be built in the Outline Components. BRE benchmarks suggest 16.8 tonnes of construction waste are generated for every 100m ² of residential floorspace constructed and 27.5 tonnes of construction waste are generated for every 100m ² of commercial retail floorspace constructed (Ref. 6-33).	51,680	5,301 (9.75 years)
Total		408,564	173,240

- 6.86** Table 6-6 below presents a split of the likely excavation and construction waste material types.

Table 6-6 Estimated Quantities of Construction and Excavation Waste from the Outline Components by Material Type

Materials	Approximate Quantity for Outline Components (tonnes)
Excavation	
Soils and Stones	267,751
Construction	
Packaging	8,214
Timber	5,577
Plaster/ Cement	5,864
Concrete	5,600
Canteen/ Office/ Ad Hoc	5,230
Mixed	5,187
Ceramics/ Bricks	4,221
Insulation	3,276
Plastics	3,110
Inert	2,505
Metals	1,861
Electrical Equipment	467
Furniture	245
Hazardous	177
Liquids and Oils	145

Effects from CE&D Waste in the Outline Components

- 6.87** Table 6-5 states that 408,564 tonnes of CE&D Waste is estimated to arise overall during construction of the Outline Components. Assuming a reasonable worst case that demolition, excavation and construction activities occur in the same year, which is likely to occur in 2017, it is estimated that annual CE&D waste arisings could peak at 173,240 tonnes. This accounts for approximately 1.7% of CE&D waste arisings generated in Greater London as identified in the baseline. The magnitude of impact is therefore low.
- 6.88** From the incorporated mitigation measures identified above for managing CE&D waste, it is reasonable to assume that at least 85% of the CE&D waste will either be reused or recycled on or off-site or sent for energy recovery at low sensitivity receptors within Greater London.
- 6.89** CE&D waste arisings from the construction of the Detailed Components are therefore considered to have a **negligible** effect both locally and regionally and over the construction period.

6 Waste Management

Effects Once the Proposed Development is Completed and Occupied

The Proposed Development comprises of both residential and town centre units and therefore consideration is given to both household and commercial waste during operation.

Detailed Components of the Proposed Development

6.90 The assessment considers full occupation of Detailed Components from the start of 2019 for the duration that the Proposed Development is occupied.

6.91 Tables 6-7 and 6-8, below, present the estimated residential and commercial waste arisings from occupation of the Detailed Components. The tables draw upon information presented in BS5906:2005 (Ref. 6-32) and are converted into an annual arisings figure, assuming a density of 0.21t/m³ provided by WRAP (Ref. 6-34)

Table 6-7 Operational Waste Arisings from the Residential Areas of the Detailed Components

Unit Type	Number of Units	Volume of waste/week/unit (L) from BS5906:2005	Volume of waste/week/unit type(L)	Volume of waste/year/unit type (tonnes)
Studios and 1 bedroom	273	100	27,300	298
2 bedroom	376	170	63,920	698
3 bedroom	207	240	49,680	543
4 bedroom	32	310	9,920	108
Total	888			1,647

Table 6-8 Operational Waste Arisings from the Non Residential Areas of the Detailed Components

Use	Floor Area (m ²)	Volume of waste/week/m ² (L) from BS5906:2005	Volume of waste/week/unit type(L)	Volume of waste/year/use (tonnes)
Town Centre Uses (A1-A4, D2)	179	10	1,790	20
Total	179			20

Effects from Operational Waste in the Detailed Components

6.92 Tables 6-7 and 6-8 state that approximately 1,667 tonnes of household and commercial waste could arise each year from the units making up the Detailed Components for as long as the Proposed Development is occupied. The baseline indicates that there is no operational waste currently arising from this part of the Proposed Development, as there are no buildings located here and therefore all can be considered as net arisings.

6.93 The arisings account for a net increase of less than 0.3% of the total LACW arisings in the NLWA area. The overall magnitude of impact is therefore very low.

6.94 Waste materials produced during the operation of the Proposed Development will be managed in accordance with LBB and NLWA's requirements along with statutory regulations. The effects of operational waste from the Detailed Components are therefore considered to have a **negligible** effect.

Outline Components of the Proposed Development

6.95 The assessment considers a scenario of full occupation of all stages of the development from the start of 2026 and beyond for the duration of occupation of the Proposed Development.

6.96 Table 6-9 and 6-10, below, present the estimated residential and commercial waste arisings from occupation of the Detailed Components. The tables draw upon information presented in BS5906:2005 (Ref. 6-32) and are converted into an annual arisings figure, assuming a density of 0.21t/m³ provided by WRAP (Ref. 6-34)

Table 6-9 Operational Waste Arisings from the Residential areas of the Outline Components

Unit Type	Number of Units	Volume of waste/week/unit (L) from BS5906:2005	Volume of waste/week/unit type(L)	Volume of waste/year/unit type (tonnes)
Studio, 1 bedroom	1,020	100	102,000	1,114
2 bedroom	1311	170	222,870	2,434
3 bedroom	522	240	125,280	1,368
4 bedroom	47	310	14,570	159
Total	2,900			5,075

Table 6-10 Operational Waste Arisings from the Non Residential Areas of the Outline Components

Use	Floor Area (m ²)	Volume of waste/week/m ² (L) from BS5906:2005	Volume of waste/week/unit type(L)	Volume of waste/year/use (tonnes)
Town Centre Uses (A1-A4, D1, D2)	10,000	10	100,000	1,092
Total	10,000			1,092

Effects from Operational Waste in the Outline Components

6.97 Tables 6-9 and 6-10 state that approximately 6,167 tonnes of household and commercial waste could be generated each year from the Outline Components for as long as the Proposed Development is occupied.

6.98 The baseline indicates that approximately 595 tonnes of waste per year is generated at the site, which provides a net increase of approximately 5,572 tonnes per year

6.99 The arisings account for a net increase of less than 0.7% of the total LACW arisings in the NLWA area. The overall magnitude of impact is therefore expected to be very low. In addition, it is expected that a significant proportion of the commercial waste will be managed independently by private waste contractors.

6.100 Waste materials produced during the operation of the Proposed Development will be managed in accordance with LBB and NLWA's requirements along with statutory regulations. The effects of operational waste from the Detailed Components are therefore considered to be **negligible**.

Additional Mitigation

6.101 The assessment has demonstrated that both construction and operational waste arisings are likely to have negligible effect over the baseline and result in no significant impacts.

Additional Mitigation during Demolition and Construction

6.102 No further mitigation measures are proposed over and above those already discussed. Waste materials arising from the construction activities associated with the Proposed Development will be managed through the use of a SWMP and in accordance with construction waste policy and legislation.

Additional Mitigation Once the Proposed Development is Completed and Occupied

6.103 No further mitigation measures are proposed over those discussed in the waste management plan. Waste materials during occupation of the Proposed Development will be managed in accordance with policy and LBB requirements.

6 Waste Management

Residual Effects and Conclusions

Detailed Components of the Proposed Development

6.104 As the effects arising from the demolition and construction activities are considered to be of negligible significance, no further mitigation measures are proposed and therefore the likely residual effects are also considered to be of negligible significance.

Outline Components of the Proposed Development

6.105 As the effects during the demolition and construction phases are considered to be of negligible significance, no further mitigation measures are proposed and therefore the likely residual effects are also considered to be of negligible significance.

Overall Hybrid Planning Application Residual Effects Summary and Conclusions

6.106 The assessment has demonstrated that waste arising during both construction and occupation will be managed at processing sites within Greater London by private contractors with negligible effect when compared to current waste arisings on the regional scale.

6.107 Effective waste management to meet current policy requirements will be achieved through the existing infrastructure combined with site wide mitigation measures during construction and the implementation of a masterplan operational waste strategy which will facilitate the minimisation of waste and segregation of materials for recycling.

6.108 The Mayor of London has committed to London boroughs achieving zero municipal waste to landfill in 2025, meaning that longer term, reliance on landfill will decrease as processing capacity in London increases to meet demand. The NLWA and the seven North London boroughs it represents have drafted the North London Waste Plan which addresses the waste processing needs for the NLWA area out to 2027 (Ref. 6-29).

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