7. WASTE MANAGEMENT

INTRODUCTION

7.1 The management of waste has become an increasingly important issue in the UK. The European Directives on waste, coupled with limited landfill capacity, particularly in the southeast of the UK, has obliged the Government to review waste management practices. Consequently, it is recognised that there is a need to manage waste in a more sustainable way, reducing disposal to landfill and increasing the level of recycling.

7.2 This chapter has been written by Waterman Environmental and describes the waste management practices within the administrative boundary of Westminster City Council (WCC). It outlines the estimated waste streams and associated volumes arising from the demolition and construction works of each of the four Development Scenarios and on completion and operation of each of the four Development Scenarios, together with requirements for appropriate waste management.

7.3 This chapter is supported by Technical Appendix 7a: Servicing and Waste Management Strategy. This Strategy was written by Arup and presents details and plans of the servicing and waste management arrangements for the four Development Scenarios.

LEGISLATIVE AND PLANNING POLICY CONTEXT

Legislation

7.4 Government policy on waste is primarily driven by a number of European Directives and the relevant Acts and Regulations through which they have been enacted into UK legislation. These are summarised as follows.

The Waste Framework Directive, 1991

7.5 The Waste Framework Directive 75/442/EEC (Ref. 7.1) as amended by 91/156/EEC (Ref. 7.2), requires European Union (EU) member states to establish an integrated and adequate network of waste facilities and identify these within waste management plans. It gives priority to waste prevention and encourages the reuse and recovery of waste. The Framework Directive is implemented in England by the following legislation:

- The Environmental Protection Act, 1990 (Ref 7.3);
- The Control of Pollution (Amendment) Act, 1989 (Ref 7.4);
- Waste Management (England and Wales) Regulations, 2006 (Ref 7.5);
- The Waste Management Licensing Regulations, 1994 (as amended) (Ref 7.6); and
- The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations, 1991 (Ref 7.7).

The Waste Framework Directive, 2006

7.6 The Waste Framework Directive 2006/12/EC (Ref. 7.8) replaces Directive 75/442/EC as amended by 91/156/EEC. However, it has not yet been transposed into UK law. It aims to protect human health and the environment against the negative effects of waste collection, treatment, storage and disposal of waste. It encourages EU member states to prevent the formation of waste, and to recycle and extract raw materials and energy from waste.

The Landfill Directive, 1999

7.7 The Landfill Directive 99/31/EC (Ref. 7.9) aims to harmonise the standards and use of landfill sites across Europe. It is implemented via Schedule 10 of the Environmental Permitting Regulations 2007 (EPR 2007) (Ref. 7.10) and establishes criteria and procedures for the acceptance of waste at landfills. It sets stringent requirements with regards to landfilling practices including the end of co-disposal of hazardous and non-hazardous waste, targets for landfill reduction and a new system of landfill classification. Consequently, any soil excavated from the three application sites would require Waste Acceptance Criteria (WAC) testing, followed by appropriate treatment and disposal. Further details are provided in Chapter 13: Ground Conditions and Contamination.

The Hazardous Waste Directive, 1991

7.8 The Hazardous Waste Directive 91/689/EC (Ref. 7.11) sets out the requirements for the management of Hazardous Wastes. It has been transposed into English law by the Hazardous Waste (England and Wales) Regulations, 2005 (Ref. 7.12). In summary, the Regulations:

- Require producers of hazardous waste to give notification of their premises (with some exceptions);
- Ensure safe management of hazardous wastes;
- Provide 'cradle-to-grave' documentation for the movement of hazardous waste; and
- Require people who receive hazardous waste to keep thorough records of it for the Environment Agency (EA).

The Packaging and Packaging Waste Directive, 1994

7.9 The Packaging and Packaging Waste Directive 94/62/EC (Ref. 7.13) seeks to reduce the effects of packaging and packaging waste on the environment. The Directive is implemented in England through the Producer Responsibility Obligations (Packaging Waste) Regulations, 2005 (Ref. 7.14). The Regulations apply to businesses that:

- Handle more than 50 tonnes of packaging per annum; and
- Have an annual turnover of more than £2 million.

7.10 The Regulations also set targets on recycling and recovery rates for businesses in order to comply with national targets. Businesses can recycle and recover independently, or alternatively, join a registered compliance scheme, which takes on the legal obligations for compliance on behalf of the business.

The Waste Electrical and Electronic Equipment Directive, 2002

7.11 The Waste Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) (Ref. 7.15) aims to prevent WEEE arising and to improve the environmental performance of operators dealing with WEEE. The Directive makes requirements relating to criteria for the collection, treatment, recycling and recovery of WEEE. The Directive is transposed by the Waste Electrical and Electronic Equipment Regulations (as amended), 2006 (Ref. 7.16).

Environmental Protection (Duty of Care) (England) (Amendment) Regulations, 2003

7.12 The Duty of Care Regulations (Ref. 7.17) implemented under section 34(5) of the Environmental Protection Act 1990, apply to all businesses that produce, import, carry, keep, treat or dispose of controlled waste from business or industry or act as a waste broker in this respect. Under these Regulations, all businesses are responsible for the safe and proper disposal of waste, even once it has been passed to a third party. This Duty of Care extends until the waste has either been satisfactorily disposed of, or fully recovered.

7.13 The Duty of Care Regulations stipulate that:

- All waste is stored and disposed of responsibly;
- Waste is only handled or dealt with by individuals or businesses that; are authorised to deal with it, who have a waste management licence, are a registered carrier of controlled waste, a waste collection authority or be exempt; and
- A record is kept of all waste received or transferred through the use of Waste Transfer Notes (WTN).

Site Waste Management Plans Regulations, 2008

7.14 The Site Waste Management Plans (SWMPs) Regulations came into force on 6 April 2008 (Ref. 7.18). The SWMPs Regulations require all development, where construction works are valued over £300,000, to have a SWMP prepared and implemented.

7.15 SWMPs provide a structure for systematic waste management from the early stages of design to the completion of construction. SWMPs must describe the types of waste expected to be produced during demolition and construction, and the actions proposed for the disposal of such waste, including recycling and other appropriate methods. Estimated quantities and waste management actions must be identified for each waste type likely to be produced. SWMPs must also contain declarations from the Applicant and principal contractor that they would take all reasonable steps to ensure that:

- All waste from a site is dealt with in accordance with the Duty of Care Regulations, 2003;
- Materials would be handled efficiently; and
- Waste would be managed appropriately.

National Planning Policy

The National Waste Strategy for England, 2007

7.16 The National Waste Strategy for England, 2007 (Ref. 7.19) replaces the Waste Strategy, 2000 Waste Not Want Not (Ref. 7.20). It sets out a new strategy for waste, continuing to follow the hierarchical approach to waste management incorporated in the Waste Strategy, 2000. The hierarchy prioritises, in order of the most sustainable practice:

- Waste minimisation;
- Reuse;
- Recycling / compost;
- Energy recovery; and
- Disposal.

7.17 The Strategy sets out the Government's key objectives, which are to:

- Reduce the link between economic growth and waste growth and put more emphasis on waste prevention and reuse;
- Meet and exceed the Landfill Directive diversion targets for biodegradable municipal waste;
- Increase diversion of non-municipal waste from landfill;
- Invest in infrastructure required to divert waste from landfill and for the management of hazardous waste; and
- Increase recycling and recovery of resources.

7.18 The Strategy also sets out a number of new and amended targets including:

- The recycling and composting of at least: 40% of household waste by 2010; 45% by 2015; and 50% by 2020; and
- The recovery of 53% of municipal waste by 2010; 67% by 2015 and 75% by 2020.

7.19 Consideration is also being given to setting targets within the construction industry.

Planning Policy Statement 10: Sustainable Waste Management, 2005

7.20 Planning Policy Statement 10 (PPS10) (Ref. 7.21) was adopted in July 2005 and encourages sustainable waste management through considering waste as a resource, driving waste management up the waste hierarchy and considering disposal as a last resort. PPS10 aims to break the link between economic growth and the effects of waste production. It assists in implementing the National Waste Strategy and supports the targets for recycling and recovery.

7.21 PPS10 also recommends that new developments should be supported by SWMPs. It also promotes good design and layout in new developments to secure opportunities for sustainable waste management without creating adverse effects upon the street scene.

Regional Planning Policy

The London Plan: Spatial Development Strategy of Greater London, 2008

7.22 Policy 4A.21 of the London Plan (Ref. 7.22) outlines that all new developments should incorporate the provision of suitable waste and recycling storage facilities. In addition, Policy 4A.21 identifies the following relevant waste targets:

- Recycle or compost at least 35% of municipal waste by 2010 and 45% by 2015;
- Recycle or compost at least 70% of commercial waste by 2020; and
- Recycle and reuse at least 95% of construction, excavation and demolition waste by 2020.

7.23 Policy 4A.28 also states:

"…developers should be required to produce site waste management plans to arrange for efficient materials and waste handling, and require waste to be removed from the site, and materials to be brought to the site by water or rail transport, wherever that is practicable".

The Mayor's Municipal Waste Management Strategy: Rethinking Rubbish in London, 2003

7.24 In September 2003, the Mayor of London published 'Rethinking Rubbish in London' (Ref. 7.23). This Strategy promotes waste minimisation, aims to increase the proportion of waste that is recycled and seeks to ensure that all waste is handled in the most sustainable manner with minimum adverse effects to the environment. The Strategy aims to implement a long-term change in the way waste is considered, moving away from disposal into a culture where waste is considered to be a raw material which can be used as products for new industry.

The Mayor's Draft Business Waste Management Strategy: Making waste work in London, 2008

7.25 The Mayor's draft Business Waste Management Strategy (Ref. 7.24) was published in February 2008. The term 'business waste' refers to controlled waste not referred to in the Mayor's Municipal Waste Management Strategy, including:

- Commercial and industrial waste;
- Demolition, excavation and construction waste; and
- Hazardous waste produced by businesses operating in the public, private, voluntary and community sectors.

7.26 Amongst other objectives, the draft Strategy aims for London businesses to exceed the reuse, recycling and composting targets set in the London Plan by:

- Recycling and composting at least 70% of commercial and industrial waste by 2020;
- Recycling and reusing at least 95% of construction, demolition and excavation waste by 2020; and
- Generating energy from any waste that cannot be recycled using non-incineration based technologies and contributing to the Climate Change Action Plan goals.

Supplementary Planning Guidance on Sustainable Design and Construction, 2006

7.27 The Greater London Authority's (GLA's) Supplementary Planning Guidance (SPG) on Sustainable Design and Construction (Ref. 7.25) aims to achieve more sustainable construction practices and sustainable design for new developments in London. Accordingly, the SPG provides guidance on the management of waste during the demolition and construction of new developments and the nature of waste facilities to be provided as part of new developments.

7.28 The SPG outlines 'Essential' and 'Preferred' Standards that apply to major developments. The Essential Standards are minimum standards based on current Building Regulations, the targets set out in the Mayor's strategies and current good practice. The Preferred Standards include more exemplary approaches. Relevant Essential Standards include:

- Minimise, reuse and recycle demolition waste on-site where practical;
- Reduce waste during construction and demolition phases and sort waste streams on site where practical;
- Specify the use of reused or recycled construction materials;
- Provide facilities to recycle or compost at least 25% of household waste by means of separate dedicated storage space. By 2010 this should rise to 35%; and
- Recycling facilities should be as easy to access as waste facilities.

7.29 Relevant Preferred Standards include:

- Provide facilities to recycle or compost at least 35% of household waste. By 2015 this should rise to 60%; and
- Provide facilities to recycle 70% of commercial and industrial waste by 2020.

7.30 Under the planning status of the SPG, the standards are not obligatory. However, planning applications will be reviewed against the guidance.

Local Planning Policy

Westminster City Council Unitary Development Plan, 2007

7.31 Policy ENV 12 of Westminster City Council's (WCC) Replacement Unitary Development Plan (UDP) (Ref. 7.26) states:

- *"All developments must include provision for the storage of waste. Applicants are to produce a waste management plan for the proposed development.*
- *Space should be provided that is sufficient for equipment and containers to enable the processing and sorting of recyclable materials and other waste. Such storage facilities should be encased and screened from view from the street, visibly demarcated, and located so as to be convenient for users and waste and recycling collectors.*
- *Provision must be made in residential developments for the separation of recyclable materials by each household and for its continued separation at each stage in its transfer to point of collection. At least half of the storage space should be for sorting recyclables."*

7.32 The UDP states that waste management plans may be required for all developments that would generate large volumes of waste. Such plans should indicate the volumes and types of waste that would be produced by the development together with the types, sizes and locations of waste storage to be provided.

Westminster City Council Victoria Area Planning Brief, 2006

7.33 WCC's Victoria Area Planning Brief (VAPB) (Ref. 7.27) requires developers and their contractors to adhere to WCC's Code of Construction Practice (CoCP). The CoCP defines environmental standards and procedures to be undertaken in relation to construction works, including the management of waste disposal. Further details are provided below and within Chapter 6: Demolition and Construction.

Westminster City Council Code of Construction Practice (CoCP), 2003

7.34 With regards to waste management, WCC's CoCP (Ref. 7.28) stipulates that all contractors are required to explore opportunities for reusing and recycling construction and demolition waste. The CoCP notes that contractors should:

- Allocate sufficient storage space for materials which can be reused to avoid disposal;
- Avoid over-ordering of materials;
- Avoid damage on delivery by using a walled laid-out storage and off-loading area;
- Use prefabrication, if feasible;
- Avoid repetitive handling;
- Segregate materials for recycling, such as timber and cardboard wrapping;
- Salvage top soil for reuse; and
- Recycle municipal waste from temporary welfare accommodation on site.

7.35 In addition, construction site operators are required to exercise a duty of care for waste transfer. The contractor would be required to remove rubbish and food waste at regular intervals to keep the site clean and tidy. Waste would be required to be deposited at licensed sites and tips (refer to Chapter 6: Demolition and Construction).

Sustainable Buildings Supplementary Planning Guidance, 2003

7.36 The Sustainable Buildings Supplementary Planning Guidance (SPG) (Ref. 7.29) provides guidance on achieving sustainability in buildings throughout their lifecycle from the design, through to construction, operation and decommissioning. In respect of waste, it states that in designing a development consideration should be given to the following:

- The use of prefabricated components, which minimises construction waste;
- Flexible design to maximise the lifespan of the development;
- Storage and recycling facilities integrating waste sorting and recycling facilities;
- Specification of recyclable or reclaimed materials;
- Careful management to avoid waste created through over ordering; and
- Waste management systems to ensure that servicing by specialist vehicles is not required.

Other Guidance

Westminster City Council Waste and Recycling Storage Requirements, 2007

7.37 WCC has issued guidance on waste and recycling storage requirements according to the size and land use of the development (Ref. 7.30). The guidance specifies that compactors may be required for restaurants, cafés, shops, and office land works.

7.38 Table 7.1 provides an indication of likely requirements for waste storage applicable to new developments. However, the actual storage required for any new development is determined on a site-specific basis and in agreement with WCC.

7.39 In general, the waste produced by a new development would be required to be stored prior to collection. These requirements are based on a total of four days storage to facilitate twice weekly collection, with the exception of residential recyclable material, which is currently collected on a weekly basis.

Table 7.1: WCCs Waste and Recycling Storage Requirements

Land Use Class	Function	Storage Requirements
A1/A2.	Retail.	5m^3 of waste storage per 1,000m^2 of g ross floor space (50% of this capacity must be retained for segregated recyclables).
A3/A4.	Restaurants / Cafes and Bars.	1.5m^3 of waste storage per 20 dining spaces (50% of this capacity must be retained for segregated recyclables).
B1.	Offices.	2.6m^3 of waste storage per 1,000m^2 of gross floor space (50% of this capacity must be retained for segregated recyclables).
C3.	Residential.	For developments of more than 10 households, using communal waste storage containers: • 55 litres storage capacity per bedroom, plus an additional 50% storage capacity for dry recyclable material. This requirement relates to and refers to storage of waste and recyclable material provided by wheeled containers with a capacity of 660 litres or above.

Land Securities' Corporate Responsibility Report, 2007

7.40 The Land Securities' Corporate Responsibility Report 2007 (Ref 7.31) contains various targets for 2007/08, including an aspiration to:

"Reuse or recycle 80% (measured by weight) of non-hazardous demolition and construction waste on all projects undertaken during the year".

ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

Assessment Methodology

7.41 A desk-based study has been undertaken to establish the current baseline conditions in relation to waste generation and waste disposal facilities within the administrative boundaries of the GLA, WCC and at the three application sites.

7.42 The assessment has estimated current waste generation based on existing floor areas and typical waste generation rates for the existing land uses outlined in 'Planning Resource for Sustainable Communities: A Code of Practice on Waste Infrastructure and Management' (Ref. 7.32) and British Standard 5906:2005 Waste Management in Buildings (Ref. 7.33).

7.43 The typical waste arisings, management practices and recycling rates within WCC have been established from a review of Capital Waste Facts data (Ref. 7.34) and the WCC's website (Ref. 7.35).

7.44 An estimate of the amount of waste generated by type, throughout the demolition and construction works for each of the Development Scenarios has been calculated in consultation with the project construction advisor (Mace) and quantity surveyors (EC Harris and Gardiner and Theobald). Reference has been made to data on similar large scale construction projects published by the Building Research Establishment (BRE) (Ref. 7.36). Consideration has been given to extent of demolition and excavation required and the potential for on-site reuse of materials.

7.45 For each of the four Development Scenarios, waste generation arising from the completed Development Scenario has also been estimated on the basis of data contained in Planning Resource for Sustainable Communities (Ref. 7.37) and British Standard 5906:2005 Waste Management in Buildings. During the design of each of the proposed buildings comprising the four Development Scenarios, the relevant waste storage requirements were determined by Arup with reference to the aforementioned WCC waste storage guidance, in consultation with WCC's Waste Management Officer, and with input from the project transport consultants, Steer Davies Gleave (SDG).

7.46 It is important to note that 'flexible floorspace' provision as proposed by Development Scenarios 1 and 2 (refer to Chapter 5: The Proposed Development Scenarios) has been assessed as comprising 127m^2 of food-related retail (A3-A5 Use Classes) and 1,525m^2 of library space (D1 Use Class). This is considered to represent a worst-case precautionary assessment in terms of waste generation and management. Furthermore, for consistency with Arup's Servicing and Waste Management Strategy (refer to Technical Appendix 7a), it has been assumed that 30% of all retail units provided under each of the four Development Scenarios would comprise food-related retail (A3-A5 Use Classes) with the remainder providing non-food retail (A1 and A2 Use Classes). (NB. it is noted that certain A1 Use Classes, e.g. internet cafes, could technically be food related; however, for the purposes of this assessment, A1 Use Classes have been assumed to be non-food related.

7.47 The assessment of effects has compared the existing waste generation of the four Development Scenario sites against the likely waste arising from each of the four possible Development Scenarios. The assessment then goes on to consider whether the design and proposed Waste Management Strategy for all buildings contained within each of the four Development Scenarios (refer to Technical Appendix 7a) contributes to the achievement of national and regional waste targets and accords with WCC requirements and the general principles of sustainable waste management. Where appropriate, mitigation measures have also been identified.

Significance Criteria

7.48 In accordance with Chapter 2: EIA Methodology, the assessment uses the following significance criteria:

- **Substantial adverse**: Increase in waste generation with no reuse, recycling or composting undertaken;
- **Moderate adverse**: Increase in waste generation with limited potential for recycling, reuse or composting;
- **Minor adverse**: Increase in waste generation with potential for recycling, reuse or composting below existing recycling rate;
- **Negligible**: No significant change in waste generation, or a significant proportion of waste generated would be reused, recycled or composted in accordance with relevant guidelines;
- **Minor beneficial**: A minor reduction in waste generation or meeting 2010 targets for the reuse, recycling or composting of at least 40% of household waste and 50% of commercial waste;
- **Moderate beneficial**: A moderate reduction in waste generation or meeting 2015 targets for the reuse, recycling or composting of at least 45% of household waste and 60% of commercial waste;
- **Substantial beneficial**: A substantial reduction in waste generation or meeting 2020 targets for the reuse, recycling or composting of at least 50% of household waste and 70% of commercial waste.

BASELINE CONDITIONS

Existing Waste Generation

Greater London

7.49 During the year 2006/2007 Greater London produced 4.218 million tonnes of Municipal Solid Waste (MSW) of which 2.404 million tonnes (57%) was disposed of to landfill; 0.929 million tonnes (22%) incinerated with energy recovery; and 0.844 million tonnes (20%) recycled. Of this MSW, 3.390 million tonnes (80%) was household waste, of which 0.776 million tonnes (22.9%) was recycled (Ref. 7.34).

7.50 In addition, the most recent data available shows that approximately 6.6 million tonnes of waste was created by businesses and industry in the Greater London area during the 2003/2004 period (Ref. 7.24). A further 7.2 million tonnes was estimated to be generated from demolition and construction sites during 2003/2004 (Ref. 7.24).

Administrative Boundary of Westminster City Council

7.51 WCC's waste and recycling services reflect the unique nature of central London. Approximately two-thirds of the waste collected by WCC is produced by local businesses and one-third of 'household waste' is actually street litter (Ref. 7.35).

7.52 In 2005/2006 approximately 188,959 tonnes of MSW was generated within WCC (Ref. 7.34). This comprised approximately 74,862 tonnes of household waste. The administrative boundary of WCC has a population of approximately 185,110 within 113,759 households. This approximates to 0.7 tonnes of household waste per household per year (approximately 0.44 tonnes per person). This is slightly lower than the average household waste produced per person in Greater London of 0.46 tonnes per year.

7.53 Of WCC's household waste, 19.57% was recycled and 0.81% was composted in 2006/2007 (Ref. 7.34). Approximately 62% of the remaining waste was incinerated with energy recovery, with the remaining 18% disposed of to landfill.

7.54 Household waste is composed of a wide variety of materials. A survey of 88 households located within flats in London undertaken by Waste Research Ltd in 2004 (Ref. 7.38) showed that household waste arising from London flats typically consists of:

- Paper and Card (26.2%);
- Organic Waste (24.7%);
- Glass (19%);
- Miscellaneous Waste (10.8%);
- Dense Plastics (7.3%);
- Potentially Hazardous Waste (6.4%);
- Textiles (4.9%);
- Plastic Film (4.3%);
- Ferrous Metal (2.8%);
- Non Ferrous Metal (1.2%); and
- Waste Electronic and Electrical Equipment (0.6%).

Sites of Each of the Four Development Scenarios

7.55 As described in Chapter 3: Existing Land Uses and Activities, the sites of the Development Scenarios (which comprise combinations of the three application sites) currently include a variety of land uses. Table 7.2 presents the typical waste generation rates for each land use class and Tables 7.3 and 7.4 present estimated volumes of waste produced at the existing sites of the four Development Scenarios.

7.56 As noted in the methodology section of this chapter, the estimated volumes of waste are based on average generation rates specified in Planning Resource for Sustainable Communities: A Code of Practice on Waste Infrastructure and Management and British Standard 5906:2005 Waste Management in Buildings.

Table 7.2: Typical Waste Generation Rates per Land Use Class

Land Use Class	Typical Waste Generation Rates
Office (B1)	0.01 to 0.03m^3 per 100m^2 floor space per day*.
Non-Food Retail (A1/A2)	0.05m^3 per 100m^2 of floor space per day.
Food-related Retail (A3/A4/A5)	0.1 to 0.2m^3 per 100m^2 of floor space per day.
Residential (C3)	0.084m^3 per unit per week**
Hotel (C1) (luxury 4 star)	0.35m^3 per bedroom per week*** (4/5 star hotel)
Library (D1)	0.01 to 0.03m^3 per 100m^2 floor space per day****.
Leisure (D1/D2 and sui generis)	0.005m^3 per m^2 of floor space per week***

Notes: * *A 5-day working week has been assumed for office uses.*
** *Based on estimated average 0.658 tonnes per household per year in WCC and 6.67m^3 per tonne.*
*** *Based on British Standard 5906:2005.*
**** *Based on the office waste generation rate and a six day working week.*

Table 7.3: Estimated Existing Waste Generation for Sites of Development Scenarios 1 and 2

Land Use Class	Gross External Area (GEA) / Number of Units / Bedrooms	Waste Generation (m^3)		
		Per Day	Per Week*	Per Annum
Office (B1)	34,949m^2	3.49 – 10.48	17.47 – 52.42	909 – 2,726
Non-Food Retail (A1/A2)	4,864m^2	2.43	17.02	885
Food-related Retail (A3/ A4/ A5)	5,836m^2	5.84 – 11.67	40.85 – 81.70	2,124 – 4,249
Residential (C3)	62 units	0.74	5.21	271
Hotel (C1) (luxury 4 star)	134 bedrooms	6.7	46.9	2,439
Leisure (D1/D2 and sui generis)	822m^2	0.59	4.11	214
Total		**19.79 – 32.61**	**131.56 – 207.36**	**6,842 – 10,783**

Table 7.4: Estimated Existing Waste Generation for Sites of Development Scenarios 3 and 4

Land Use Class	Gross External Area (GEA) / Number of Units / Bedrooms	Waste Generation (m^3)		
		Per Day	Per Week*	Per Annum
Office (B1)	33,903m^2	3.39 – 10.17	16.95 – 50.85	881 – 2,644
Non-Food Retail (A1/A2)	4,397m^2	2.20	15.39	800
Food-related Retail (A3/A4/A5)	4,075m^2	4.08 – 8.15	28.53 – 57.05	1,483 – 2,967
Residential (C3)	62 units	0.74	5.21	271
Hotel (C1) (luxury 4 star)	134 bedrooms	6.7	46.9	2,439
Leisure (D1/D2 and sui generis)	822m^2	0.59	4.11	214
Total		**17.70 – 28.54**	**117.09 – 179.51**	**6,088 – 9,335**

7.57 As identified in Tables 7.3 and 7.4, existing office uses represent approximately 25% (Development Scenarios 1 and 2) and 28% (Development Scenarios 3 and 4) of existing maximum annual waste generation. In addition, the hotel use represents approximately 23% (Development Scenarios 1 and 2) and 26% (Development Scenarios 3 and 4) of existing waste generation.

7.58 As each application site comprises a number of different properties, tenants and land uses, waste management is currently dictated and controlled by the individual tenant of each property. There is no central waste storage or collection facility for the existing properties, with bin storage and collection points contained within each individual property. This limits current opportunities to maximise the reuse and recycling of waste.

Waste Treatment and Disposal Facilities

Waste Transfer Station and Materials Recovery Facilities

7.59 There are no waste transfer sites in WCC. The closest transfer stations that accept municipal waste are the Cringle Dock Transfer Station, Battersea, located approximately 4km to the south of the application sites, and Western Riverside Transfer Station, Wandsworth, approximately 7km to the south of the application sites.

7.60 Similarly, there are no material recovery facilities in WCC. Recyclable material generated witin the administrative boundary of WCC is sent via the waste transfer centre operated by Cory Environmental at Smugglers Way, approximately 6.4km southwest of the application sites, in the London Borough of Wandsworth (LBW), and then to Grosvenor Waste Management's Materials Recycling Facility (MRF) at Crayford in Bexley, located approximately 22km to the southeast of the application sites. Here, waste is segregated by magnets and infrared sensors prior to being transported to waste reprocessors.

Landfills

7.61 There are no landfills within the administrative boundary of WCC. As such, waste is transferred to a landfill site at Rainham, approximately 29km east of the application sites in Essex, or to Beaconsfield, approximately 44km northwest of the application sites, in Buckinghamshire (Ref. 7.34).

Energy Recovery

7.62 There are no incinerators or energy recovery plants within the administrative boundary of WCC. However, waste is sent to the SELCHP Energy-from-Waste plant in Deptford, approximately 10km to the south-east of the application sites (Ref. 7.34). Metals are mechanically extracted from the incinerated waste and the bottom ash is used in road building projects.

Composting

7.63 There is no centralised composting scheme within the administrative boundary of WCC. However, residents are offered subsidised composters for domestic use (Ref. 7.35).

Civic Amenity Sites

7.64 There are no Civic Amenity Sites within the administrative boundary of WCC. However, residents can use Western Riverside Waste Authority's facilities located at Smugglers Way and Cringle Dock in LBW. These facilities accept a mixture of waste including aerosols, car batteries, cardboard, televisions and monitors, reusable furniture, glass bottles and jars, green waste, household batteries, mixed cans, mobile phones, motor oil, paint, paper, plastic bottles, records, CDs and tapes, scrap metal, textiles, shoes, books, plastic bags, aluminium foil, white goods and wood (Ref. 7.34).

Bring Sites

7.65 There are 127 micro-recycling centres located throughout the administrative area of WCC for aerosols, cardboard, glass bottles and jars, mixed cans, paper and plastic bottles. Textile bins are provided at 24 of these sites, where residents can also dispose of shoes, videos, DVDs and CDs (Ref. 7.34).

Waste and Recycling Collection

Commercial Waste and Recycling Collection

7.66 WCC offers a waste and recycling collection service for commercial uses using sacks or Eurobins. Approximately 370 businesses are served, with the frequency of collection dependant on the nature of the business (Ref. 7.24). Recycling collection is available for cardboard, glass bottles and jars, mixed cans and paper.

Residential Waste and Recycling Collection

7.67 All residential properties within WCC receive twice weekly general waste collections as a minimum.

7.68 WCC provides a weekly door-to-door residential collection of recyclable waste. Residents of houses (approximately 40% of total population of WCC) are provided with a recycling box or blue recycling bags, and residents of blocks of flats are generally provided with polypropylene bags with handles, which they can empty into central co-mingled recycling bins.

7.69 Recycling collection is available for:

- Aerosols;
- Cardboard;
- Glass bottles and jars;
- Mixed cans;
- Paper; and
- Plastic bottles.

Green Waste

7.70 A fortnightly green waste collection service operates to 3,000 households in selected streets in St. John's Wood and Maida Vale, approximately 6.5km to the north of the application sites. Residents are provided with a reusable garden waste bag for prunings, twigs and leaves, old flowers and house plants, weeds, grass cuttings, and thin logs and branches.

Food Waste

7.71 Food waste for composting is currently not collected by WCC.

Bulky Items

7.72 WCC provide a special collection service for bulky items such as white goods and furniture. Given prior notice, free service for the collection of three items of bulky waste is provided per household, such as washing machines, mattresses and wardrobes. Residents are also encouraged to reuse old furniture by donating to charity organisations.

POTENTIAL EFFECTS

Demolition and Construction

Development Scenarios 1, 2, 3 and 4

Overview

7.73 For all four Development Scenarios, all demolition and construction waste (refer to later in this chapter) would be stored on-site in accordance with the relevant legislation, in particular the Duty of Care Regulations, 2003 (as amended). No burning of waste would be undertaken at the sites of the Development Scenarios.

7.74 A commitment has been made by the Applicant to ensure that a minimum 80% of the demolition material by mass would be reused or recycled, although a greater amount would be strived for. Areas where recycled aggregate would be considered for use would include the building structures, floor slabs, road surfaces, car parking areas and as hardcore under ground floor slabs. Additional information would also be sought from organisations such as the BRE and Waste and Resources Action Plan (WRAP). Consideration would also be given towards adopting the recommendations of the 'ICE Demolition Protocol' (Ref. 7.39). This sets out methodologies to achieve resource efficiency in demolition and construction.

7.75 Any waste from the demolition and construction processes associated with the four Development Scenarios that cannot be reused or recycled would be disposed of in accordance with the requirements of the EA and other relevant legislation, in particular the Environmental Protection Act 1990 and the Duty of Care Regulation 2003 (as amended). Waste would only be deposited at authorised waste treatment and disposal sites, and transported by licensed waste carriers (refer to Chapter 13: Ground Conditions and Contamination). In addition, to ensure that construction waste arising from any of the four Development Scenarios would be managed in a sustainable manner, a SWMP for the consented Development Scenarios would be compiled and implemented in accordance with current requirements. Details on the typical content of a SWMP are provided later in this chapter.

Demolition of Existing Buildings and Structures

7.76 The four Development Scenarios would require the demolition of all existing buildings and structures within their specific site areas. As a consequence, the overall volume of demolition material expected would vary for each Development Scenario. Table 7.5 provides the overall volume of expected demolition material for each of the four Development Scenarios.

Table 7.5: Expected Volume of Demolition Material for Each Development Scenario

Development Scenario	Volumes of Demolition Waste (m^3)
1	37,055
2	37,055
3	34,639
4	34,639

7.77 At this point in a design process, it is not possible to precisely quantify the type and amount of materials arising from the demolition works. However, Table 7.6 provides an indication of the major types of materials expected to arise from the demolition associated with each of the Development Scenarios.

Table 7.6: Indicative Material Types Arising from Demolition

Material	Material Sources
Concrete	Superstructures, floor slabs, retained walls, columns
Brick	External and internal walls
Glass and cladding	Cladding
Metal components	Windows, plant, superstructure, sub-assemblies
Timber and plasterboard	Partitions and ceilings
Hard-standing/tarmac	Streets, pavements, car parks
Hazardous materials	Services, plan, walls, ceilings, linings

7.78 The implementation of a SWMP would ensure that waste from all four Development Scenarios be managed in accordance with relevant legislation. Furthermore, where feasible, it would be ensured that waste be reused or recycled and opportunities for using recycled and reused materials be identified. As such, the effect of demolition waste for each Development Scenario is considered to be **negligible**.

7.79 In addition to the above, a Level 3 asbestos survey would be undertaken and asbestos would be removed from all buildings scheduled to be demolished on each application site (refer to Chapter 6: Demolition and Construction). Since asbestos is classified as a hazardous waste, any asbestos or other hazardous waste identified during demolition would be removed and disposed by specialist waste contractors in accordance with the Hazardous Waste Regulations, 2005 and any other applicable legislation. As noted in Chapter 13: Ground Conditions and Contamination, adherence to the above legislative requirements would significantly reduce the health and safety risk posed to construction site workers from any hazardous waste to **negligible** for each Development Scenario.

Excavation

7.80 The overall volume of material required to be excavated would vary slightly for each Development Scenario. Table 7.7 provides details on the extent of the basement(s) proposed and the overall volume of expected excavation material for each of the four Development Scenarios.

Table 7.7: Expected Volume of Excavated Material for Each Development Scenario

Development Scenario	Extent of Basement	Volumes of Excavation Material (m^3)
1	Two-level basement across the western two-thirds of the site of Development Scenario 1 to a maximum depth of -8.25m Above Ordnance Datum (AOD), together with a one-level basement under Building 7b/c to a maximum depth of 0.8m AOD.	177,068
2	Two-level basement across the western two-thirds of the site of Development Scenario 2 to a maximum depth of -8.25m AOD, together with a one-level basement under Building 7b/c to a maximum depth of 0.8m AOD.	177,068
3	Two-level basement across most of the site of Development Scenario 3 to a maximum depth of -8.25m AOD.	175,300
4	Two-level basement across the site of Development Scenario 4 to a maximum depth of -8.25m AOD.	175,300

7.81 Where necessary, waste arising from excavation works would be disposed of in line with the relevant legislation outlined above.

7.82 As outlined in Chapter 13: Ground Conditions and Contamination, the application sites are considered to pose a low to medium environmental risk with respect to ground contamination and contaminative liabilities. Due to the previous history of the application sites, there is potential for contamination to exist beneath them. As such, during excavation, waste arising would be carefully controlled and managed so as to prevent the uncontrolled release of potential contaminants. Excavated material would be tested against Waste Acceptance Criteria (WAC) to determine any hazardous properties. Inert waste (anticipated to be uncontaminated soils) would be reused off-site. Hazardous material (anticipated to be some made ground and contaminated soils) would be treated or disposed of in accordance with the Landfill Regulations 2002 and Hazardous Waste Regulations 2005 at authorised waste treatment and disposal sites.

7.83 From the above, it can be concluded that the waste management practices to be employed during excavation are in line with the relevant legislation and the waste hierarchy. As such, the effect of waste generation during excavation is considered to be **negligible** for all Development Scenarios.

Construction

7.84 Waste material would be generated at all stages of the construction process, from structural and foundation works to the fit-out of the new buildings. Following a number of audits, the BRE have determined that, as a broad guide, approximately $18m^3$ of waste is generated in the construction of $100m^2$ of floor space. Table 7.8 indicates that there would be relatively small differences in the estimated gross volumes of waste generated during the construction of each of the four possible Development Scenarios.

Table 7.8: Estimation of Waste Arising During Construction for Each Development Scenario

Development Scenario	GEA (m^2)	Waste Arising (m^3)
1	131,946	23,750
2	117,800	21,204
3	122,302	22,014
4	108,156	19,468

7.85 Based on the proposed construction materials, the following waste streams are likely to be generated from all Development Scenarios:

- Stone and brick;
- Concrete, plaster and cement;
- Steel and other metals including copper and zinc;
- Glass and glass cladding; and
- Packaging waste comprising plastic, cardboard and paper.

7.86 The types and quantity of waste generated would vary throughout the construction programme for each Development Scenario, with a large proportion of the waste in the early stages being concrete and steel. In the later stages a higher proportion of packaging is anticipated.

7.87 Where possible, consideration would be given to the use of recycled materials, particularly in respect of the proposed highway and building structure sub-bases. Each of the Development Scenarios would also make use of prefabricated building components wherever possible. This would significantly reduce material wastage for each Development Scenario and would minimise installation time. Recycled aggregate would also be used in the construction where feasible in order to reduce the amount of virgin material used.

7.88 As with demolition waste, any waste that cannot be reused would be recycled as far as is practically possible. Where recycling is not possible, the waste would be disposed of in accordance with relevant legislation as outlined above.

7.89 In addition to the above, the SWMP for the consented Development Scenario would assist in reducing waste and would ensure the reuse and recycling of waste where feasible. It is considered that the effects of waste generated during the construction works would, therefore, be **negligible** for each Development Scenario.

Completed Development

7.90 The following section assesses the potential effects on waste management of each of the four Development Scenarios.

Development Scenario 1

7.91 On completion, Development Scenario 1 would comprise 205 residential units and 96,712m^2 GEA of commercial floorspace comprising retail units including shops, cafes and restaurants, office and potentially library accommodation. These uses would be provided within proposed Buildings 5, 6a, 6b, 7a and 7b/c. Development Scenario 1 represents the greatest floor space provision out of all four Development Scenarios.

7.92 A range of waste types would be generated by the occupation and operation of the proposed buildings within Development Scenario 1. An estimate of the volumes of waste expected for each of the proposed land uses has been calculated on the basis of data contained in Planning Resource for Sustainable Communities and British Standard 5906:2005 Waste Management in Buildings, as summarised in Table 7.2. Table 7.9 presents an estimation of waste generation for the completed and operational Development Scenario 1.

Table 7.9: Estimation of Waste Generation from Development Scenario 1

Land Use Class	GEA / Number of Units	Estimated Waste Generation (m^3)		
		Per Day	Per Week	Per Annum
Office (B1).	82,326m^2	8.23 – 24.70	41.16 – 123.49	2,140 – 6,421
Non-Food Retail (A1/A2).	8,914m^2	4.46	31.2	1,622
Food-related Retail (A3/ A4/A5).	3,947m^2	3.95 – 7.89	27.63 – 55.26	1,437 – 2,873
Residential (C3).	205 units	2.46	17.22	895
Library (D1).	1,525m^2	0.15 – 0.46	0.90 – 2.76	47 – 144
Total		**19.25 – 39.97**	**118.11 – 229.93**	**6,141 – 11,955**

7.93 As presented in Table 7.9, Development Scenario 1 is expected to generate between 6,141m^3 and 11,955m^3 of waste per annum. Based on the maximum waste generation, this would equate to an increase of approximately 1,172m^3 from the existing estimated annual waste generation. The proposed office use would contribute to approximately 54% of maximum total waste generation resulting from Development Scenario 1.

7.94 The waste generated from Development Scenario 1 can be separated into two main categories. These are household waste produced by residential dwellings and commercial waste produced by offices, non-food retail and food retail, which include bars and restaurants. A library may also be provided as part of Development Scenario 1 (refer to Chapter 5: The Proposed Development Scenarios).

7.95 The waste generation rates and storage areas presented in Table 7.10 for household and commercial waste have been allocated according to the Waste and Servicing Strategy produced by Arup contained within Technical Appendix 7a. This has been based on the WCC Waste and Recycling Storage Requirements, presented in Table 7.1, and is envisaged to adequately cope with the amount of waste that would be generated by the completed and operational Development Scenario 1. The design storage allocated by Arup allows for two days storage of commercial waste. This has been agreed in consultation with WCC.

Table 7.10: Waste Storage and Recycling Strategy for Development Scenario 1

Buildings / Uses	Design Storage (m^3)	Waste Storage and Recycling
Building 5, 6a, 6b and 7a		
Residential (C3).	28 (10 for recyclables).	$28m^3$ of waste storage would be provided within the central waste rooms for refuse and recyclable materials. Each room would be of approximately $45m^2$. An additional $15m^2$ storage space would be provided for the storage of bulky household waste items.
Commercial (B1, A1-5).	144 (72 for recyclables).	Provision for a total of 2 x $10m^3$ compactors. Commercial segregated waste would be stored in a dedicated waste room approximately $190m^3$ in size, equipped with a twin-chamber baler for paper, cardboard and plastics. The bales would be double-stacked. Temporary waste rooms would also be provided for each of the commercial buildings, located in the basement near building cores.
Building 7b/c		
Residential (C3).	6 (3 for recyclables).	$6m^3$ of waste storage would be provided within a separate $30m^3$ waste room located adjacent to the core of Building 7b/c. It is anticipated that all bulk waste would also be stored in this room.
Commercial (B1, A1/A2, D1).	9.2 (4.6 for recyclables).	$6m^3$ of waste storage would be provided within the commercial waste storage room within Building 7c for the office and all retail units on the northern part of Allington Street and on Bressenden Place. Another retail unit (on the eastern section of Allington Street) and the library would be provided with separate waste storage within Building 7b. This commercial waste room would accommodate up to $6m^3$ of waste storage.

Commercial Waste

7.96 It is anticipated that all commercial uses would contract out activities relating to the collection, handling, treatment and disposal of waste to a private waste management company. To maximise recycling, commercial waste would be segregated at source.

Non-Food Retail (A1 and A2 Use Class)l

7.97 For Development Scenario 1, $4.46m^3$ of waste per day would be produced by non-food retail shops. These would be located in Buildings 5, 6a, 6b, 7a and 7b/c. The type of waste would be dependent on the type of retail. Since A1 retail encompasses a wide range of businesses, it is difficult to predict the waste composition at this stage. Nonetheless, it is estimated that paper, card, packaging and plastic would account for the majority of waste, alongside small quantities of food waste. All retail units would be provided with sufficient space for separate receptacles for general waste and key recyclable waste streams. At the end of each day waste would be moved to central waste storage areas.

Food Related Retail (A3, A4 and A5 Use Class)

7.98 For Development Scenario 1, between 3.95 and $7.89m^3$ of waste per day would be generated by the proposed food related retail establishments. These would be located in Buildings 5, 6a, 6b, 7a and 7b/c. These Use Classes are likely to give rise to a higher proportion of food waste including cooking oil, glass and aluminium and steel cans as well as cardboard and paper. Consideration would also be given to the segregated collection of organic waste for composting.

7.99 At the end of each day, waste would be moved to a central waste storage area. Secure bunded areas would also be provided for waste oils from café, restaurant and bar facilities. It is envisaged that the site management team would be responsible for moving bins to service areas for collection.

Offices (B1 Use Class) and Library (D1 Use Class)

7.100 For Development Scenario 1, between 8.38 and 25.16m^3 of waste per day would be generated by the offices and library. With the exception of Building 5, office uses would be located in all buildings. The library would be located within Building 7b/c.

7.101 Audits undertaken by Waste Watch, an environmental organisation which promotes the reduction and reuse of waste, have identified that approximately:

- 60% of office waste comprises paper and cardboard, of which approximately 20% is high quality white paper (the most sought after for recycling);
- 6% consists of glass and drinks cans; and
- 20% comprises food waste (Ref. 7.40).

7.102 Recycling and general waste bins would be provided on each office floor and within the library in strategic locations. It is anticipated that office waste would be moved by cleaners to the temporary waste storage areas described in Table 7.10 above. The facilities management team would then transfer bins from these rooms to either the balers, compactor, or to the main segregated waste store on a daily basis. Based on the likely composition of office waste, the provision of balers could facilitate the recycling of up to 60% of office waste generated per day.

7.103 With regards to the proposed library, waste would be moved by cleaners to the separate commercial waste room provided within Building 7b/c.

Residential

7.104 For Development Scenario 1 approximately 2.46m^3 of household waste would be generated per day. In accordance with 2006/2007 WCC household recycling rates, approximately 20.38% of this waste is expected to comprise recyclables (Ref. 7.34). Whilst this composition of waste varies in each household, based on an analysis undertaken by Waste Research Ltd in 2004 (Ref. 7.38), it is envisaged that 56% of waste could be recycled through the collection service provided by WCC.

7.105 Sufficient storage space would be provided within each unit for household waste and recyclable materials, and within communal waste storage areas to facilitate recycling. Each unit would be designed to include sufficient storage space to allow for a bin for general waste, and a separate bin for at least three types of mixed recyclables (for example, paper, plastic, glass, cans or cardboard).

7.106 Based on the facilities provided and the anticipated composition of waste, it is envisaged that up to 50% of waste could be recycled. The actual rate of recycling (and potentially composting) would, however, be dependent on the participation of future occupants.

7.107 The proposed residential units would be located within Buildings 5 and 7b/c. For the convenience of residents, temporary waste rooms would be provided at each residential level within Building 5 adjacent to each core. Residents of Building 5 would dispose of their waste into the temporary waste rooms. Residents of Building 7b/c would make use of the ground floor central residential waste room. In accordance with British Standard requirements, the location of all waste rooms contained within Buildings 5 and 7b/c would ensure that residents would not be required to carry waste more than 30m.

7.108 The site management team would empty bins contained within waste rooms of Buildings 5 and 7b/c on a daily basis and transport the waste into the central waste storage facilities.

7.109 As described in Table 7.10, residential waste generated from Building 5 would be stored in two dedicated waste rooms; one for refuse and one for segregated recyclables. Both would be located in the service basement. The waste in both residential rooms would be stored in 1100L Eurobins. Residential waste generated from Building 7b/c would be stored within a central waste room located adjacent to the core of Building 7b/c. In accordance with WCC requirements, both buildings would be provided with bulky household waste storage areas.

7.110 Residential waste and recyclables would be collected by WCC or a private contractor by agreement in accordance with the Duty of Care Regulations.

Summary of the Potential Effects of Development Scenario 1 on Waste Management

7.111 The overall management of commercial and residential waste within Development Scenario 1 is anticipated to accord with the waste hierarchy, and minimise the volume of waste being disposed of to landfill.

7.112 With regards to commercial waste, sufficient storage space has been provided to allow for a daily collection (total of 2 days storage) of all commercial waste, including retail, restaurants and offices. The bunding of hazardous waste including cooking oils also accords with legislation.

7.113 Sufficient storage space would also be provided to allow for a once weekly collection of residential recyclable material and a twice weekly collection (total of 4 days storage) of residential general waste.

7.114 Due to the fact that the responsibility for waste management would lie with the occupants of the site of Development Scenario 1, it is difficult to accurately estimate the quantity that would be recycled and recovered. However, based on typical office waste composition, Development Scenario 1 provides the opportunity to recycle approximately 60% of office waste and a significant proportion of retail waste including cardboard and paper. It is envisaged that a minimum of 50% of commercial waste could be recycled.

7.115 In addition, it is envisaged that up to 50% of household waste generated could be recycled. Should recycling rates increase above 50%, additional recycling storage would be provided place of general waste provision, or if agreed, the frequency of recycling collection could be increased. The provision of facilities to enable the recycling of up to 50% of household waste would exceed WCC and London Plan requirements, and meet 2020 National Waste Strategy targets for the reuse, recycling and composting of household waste.

7.116 Furthermore, it is anticipated that the completed Development Scenario 1 would only result in slight increase of a maximum of 9.8% in the volume of waste currently produced at the site of this Development Scenario. Although the completed Development Scenario 1 would result in a greater quantum of floor space in comparison to the exiting situation, the removal of the hotel use (Thistle Westminster Hotel) from the site of Development Scenario 1 (representing approximately 23% of the maximum existing waste generation) would result in significant waste reduction. As such, commercial waste generated from the completed Development Scenario 1 is considered to have a **negligible** effect.

Development Scenario 2

7.117 On completion, Development Scenario 2 would comprise 205 residential units and 82,566m^2 of commercial floorspace comprising retail units including shops, cafes and restaurants, office and potentially library accommodation. These uses would be provided within proposed Buildings 5, 6b, 7a and 7b/c.

7.118 A range of waste types would be generated by the occupation and operation of the proposed buildings within Development Scenario 2. Table 7.11 presents an estimation of waste generation from the completed and operational Development Scenario 2.

Table 7.11: Estimation of Waste Generation from Development Scenario 2

Land Use Class	GEA / Number of Units	Estimated Waste Generation (m^3)		
		Per Day	Per Week	Per Annum
Office (B1)	68,482m^2	6.85 – 20.54	34.24 – 102.72	1,781 – 5,342
Non-Food Retail (A1/A2)	8,702m^2	4.35	30.46	1,584
Food-related Retail (A3/ A4/A5)	3,857m^2	3.86 – 7.71	27.00 – 54.00	1,404 – 2,808
Residential (C3)	205 units	2.46	17.22	895
Library (D1)	1,525m^2	0.15 – 0.46	0.90 – 2.76	47 – 144
Total		**17.67 – 35.52**	**109.82 – 207.06**	**5,711 – 10,773**

7.119 As presented in Table 7.11, Development Scenario 2 is expected to generate between 5,711m^3 and 10,773m^3 of waste per annum. Based on the maximum waste generation, this would equate to a reduction of approximately 10m^3 from the existing estimated annual waste generation. The proposed office land uses would contribute to approximately 50% of maximum total waste generation resulting from Development Scenario 2.

7.120 As for Development Scenario 1, the waste generated from Development Scenario 2 can be separated into household waste and commercial waste.

7.121 The waste generation rates and storage areas presented in Table 7.12 for household and commercial waste have been allocated according to the aforementioned Waste and Servicing Strategy produced by Arup (refer to Technical Appendix 7a). In agreement with WCC, the design storage allocated by Arup allows for two days storage of commercial waste and is envisaged to adequately cope with the amount of waste that would be generated by the completed and operational Development Scenario 2. This has been agreed in consultation with WCC.

Table 7.12: Waste Storage and Recycling Strategy for Development Scenario 2

Buildings / Uses	Design Storage (m^3)	Waste Storage and Recycling
Building 5, 6b and 7a		
Residential (C3).	28 (10 for recyclables).	28m^3 of waste storage would be provided within the central waste rooms for refuse and recyclable materials. Each room would be of approximately 45m^2. An additional 15m^2 storage space would be provided for the storage of bulky household waste items.
Commercial (B1, A1-A5).	144 (72 for recyclables).	Provision for a total of 2 x 10m^3 compactors. Commercial segregated waste would be stored in a dedicated waste room approximately 190m^3 in size, equipped with a twin-chamber baler for paper, cardboard and plastics. The bales would be double-stacked. Temporary waste rooms would also be provided for each of the commercial buildings, located in the basement near building cores.
Building 7b/c		
Residential (C3).	6 (3 for recyclables).	6m^3 of waste storage would be provided within a separate 30m^3 waste room located adjacent to the core of Building 7b/c. It is anticipated that all bulk waste would also be stored in this room.
Commercial (B1, A1/A2, D1).	9.2 (4.6 for recyclables).	6m^3 of waste storage would be provided within the commercial waste storage room within Building 7c for the office and all retail units on the northern part of Allington Street and on Bressenden Place. Another retail unit (on the eastern section of Allington Street) and the library would be provided with separate waste storage within Building 7b. This commercial waste room would accommodate up to 6m^3 of waste storage.

7.122 Table 7.12 illustrates that the waste storage and recycling strategy for commercial and residential waste would remain identical to that proposed for Development Scenario 1.

7.123 Consequently, the overall waste management of Development Scenario 2 is also anticipated to accord with the waste hierarchy, and minimise the volume of waste being disposed of to landfill. As identified for Development Scenario 1, sufficient storage space would be provided to allow for:

- A daily collection (total of 2 days storage) of all commercial waste, including retail, restaurants and offices;
- The bunding of hazardous waste including cooking oils in accordance with legislation;
- A once weekly collection of residential recyclable material; and
- A twice weekly collection (total of 4 days storage) of residential general waste.

7.124 Based on typical waste compositions and the facilities to be provided, the predicted recycling rates for both commercial and residential uses under Development Scenario 2 would be the same as those rates identified for Development Scenario 1. This includes the recycling of a minimum of 50% commercial waste and up to 50% of residential waste.

7.125 In addition, it is anticipated that the completed and operational Development Scenario 2 would result in a virtually identical amount of waste being produced, compared to the volume of waste currently produced at the existing site of Development Scenario 2. Although the completed Development Scenario 2 would result in a greater quantum of floor space in comparison to the exiting situation, the removal of the hotel use from site (represented approximately 23% of the maximum existing waste generation) would result in significant waste reduction. As such, waste generated from both the commercial and residential uses of completed Development Scenario 2 is considered to be **negligible**.

Development Scenario 3

7.126 On completion, Development Scenario 3 would comprise 170 residential units and 91,296m^2 of commercial floorspace comprising retail units including shops, cafes and restaurants, and office accommodation. These uses would be provided within proposed Buildings 5, 6a, 6b and 7a.

7.127 Table 7.13 presents an estimation of waste generation from the completed and operational Development Scenario 3.

Table 7.13: Estimation of Waste Generation from Development Scenario 3

Land Use Class	GEA / Number of Units	Estimated Waste Generation (m^3)		
		Per Day	Per Week	Per Annum
Office (B1).	79,497m^2	7.95 – 23.85	39.75 – 119.25	2,067 – 6,201
Non-Food Retail (A1/A2).	8,259m^2	4.13	28.91	1,503
Food-related Retail (A3/ A4/A5).	3,540m^2	3.54 – 7.08	24.78 – 49.56	1,289 – 2,577
Residential (C3).	170 units.	2.04	14.28	743
Total		**17.66 – 37.10**	**107.72 – 212.00**	**5,602 – 11,024**

7.128 As presented in Table 7.13, Development Scenario 3 is expected to generate between 5,602m^3 and 11,024m^3 of waste per annum. Based on the maximum waste generation, this would equate to an increase of approximately 1,689m^3 from the existing estimated annual waste generation currently occurring within the site of Development Scenario 3. The proposed office land uses would contribute to approximately 56% of maximum total waste generation resulting from Development Scenario 3.

7.129 As for Development Scenario 1, the waste generated from Development Scenario 3 can be separated into household waste and commercial waste.

7.130 The waste generation rates and storage areas presented in Table 7.14 for household and commercial waste have been allocated according to the aforementioned Waste and Servicing Strategy produced by Arup (refer to Technical Appendix 7a). In agreement with WCC, the design storage allocated by Arup allows for two days storage of commercial waste and is envisaged to adequately cope with the amount of waste that would be generated by the completed and operational Development Scenario 3. This has been agreed in consultation with WCC.

Table 7.14: Waste Storage and Recycling Strategy for Development Scenario 3

Buildings / Uses	Design Storage (m^3)	Waste Storage and Recycling
Building 5, 6a, 6b and 7a		
Residential (C3).	28 (10 for recyclables).	$28m^3$ of waste storage would be provided within the central waste rooms for refuse and recyclable materials. Each room would be approximately $45m^2$; an additional $15m^2$ of storage space would be provided for the storage of bulky household waste items.
Commercial (B1, A1-5).	144 (72 for recyclables).	Provision for a total of 2 x $10m^3$ compactors. Commercial segregated waste would be stored in a dedicated waste room approximately $190m^2$ in size, equipped with a twin-chamber baler for paper, cardboard and plastics. The bales would be double-stacked. Temporary waste rooms would also be provided for each of the commercial buildings, located in the basement near building cores.

7.131 Table 7.14 illustrates that the waste storage and recycling strategy for commercial and residential waste would remain as per Development Scenario 1 with the exception of waste provision for Building 7b/c (which is not proposed as part of Development Scenario 3).

7.132 Consequently, the overall waste management of Development Scenario 3 is anticipated to accord with the waste hierarchy, and minimise the volume of waste being disposed of to landfill. In particular, sufficient storage space has been provided to allow for:

- A daily collection (total of 2 days storage) of all commercial waste, including retail, restaurants and offices;
- The bunding of hazardous waste including cooking oils in accordance with legislation;
- A once weekly collection of residential recyclable material; and
- A twice weekly collection (total of 4 days storage) of residential general waste.

7.133 Based on typical waste compositions and the facilities to be provided, the predicted recycling rates for both commercial and residential uses under Development Scenario 3 would be the same as those rates identified for Development Scenario 1. This includes the recycling of a minimum of 50% commercial waste and up to 50% of residential waste.

7.134 As with Development Scenario 1, it is anticipated that the completed Development Scenario 3 would result in an increase of waste generation. However, this increase would equate to approximately 18.1% of the volume of waste currently produced at the site of Development Scenario 3. As such, waste generated from both the commercial and residential uses of completed Development Scenario 3 would result in a **long-term, local** effect of **minor adverse** significance.

Development Scenario 4

7.135 On completion, Development Scenario 4 would comprise 170 residential units and $77,150m^2$ of commercial floorspace comprising retail units including shops, cafes and restaurants, and office accommodation. These uses would be provided within proposed Buildings 5, 6b and 7a.

7.136 Table 7.15 presents an estimation of waste generation from the completed and operational Development Scenario 4.

Table 7.15: Estimation of Waste Generation from Development Scenario 4

Land Use Class	GEA / Number of Units	Estimated Waste Generation (m^3)		
		Per Day	Per Week	Per Annum
Office (B1).	65,653m^2	6.57 – 19.70	32.83 – 98.48	1,707 – 5,121
Non-Food Retail (A1/A2).	8,048m^2	4.02	28.17	1,465
Food-related Retail (A3/ A4/A5).	3,449m^2	3.45 – 6.90	24.14 – 48.29	1,255 – 2,511
Residential (C3).	170 units	2.04	14.28	743
Total		**16.08 – 32.66**	**99.72 – 189.52**	**5,170 – 9,840**

7.137 As presented in Table 7.15, Development Scenario 4 is expected to generate between 5,170m^3 and 9,840m^3 of waste per annum. Based on the maximum waste generation, this would equate to an increase of approximately 505m^3 from the existing estimated maximum waste generation within the site of Development Scenario 4. The proposed office land uses would contribute to approximately 52% of maximum total waste generation resulting from Development Scenario 4.

7.138 As for Development Scenario 1, the waste generated from Development Scenario 4 can be separated into household waste and commercial waste.

7.139 The waste generation rates and storage areas presented in Table 7.16 for household and commercial waste have been allocated according to the aforementioned Waste and Servicing Strategy produced by Arup (refer to Technical Appendix 7a). In agreement with WCC, the design storage allocated by Arup allows for two days storage of commercial waste and is envisaged to adequately cope with the amount of waste that would be generated by the completed and operational Development Scenario 4. This has been agreed in consultation with WCC.

Table 7.16: Waste Storage and Recycling Strategy for Development Scenario 4

Buildings / Uses	Design Storage (m^3)	Waste Storage and Recycling
Building 5, 6b and 7a		
Residential (C3)	28 (10 for recyclables)	28m^3 of waste storage would be provided within the central waste rooms for refuse and recyclable materials. Each room would be approximately 45m^2; an additional 15m^2 of storage space would be provided for the storage of bulky household waste items.
Commercial (B1, A1-5)	144 (72 for recyclables)	Provision for a total of 2 x 10m^3 compactors. Commercial segregated waste would be stored in a dedicated waste room approximately 190m^2 in size, equipped with a twin-chamber baler for paper, cardboard and plastics. The bales would be double-stacked. Temporary waste rooms would also be provided for each of the commercial buildings, located in the basement near building cores.

7.140 Table 7.16 illustrates that the waste storage and recycling strategy for commercial and residential waste would remain as per Development Scenario 1 with the exception of waste provision for Building 7b/c (which is not proposed as part of Development Scenario 4).

7.141 Consequently, the overall waste management of Development Scenario 4 is anticipated to accord with the waste hierarchy, and minimise the volume of waste being disposed of to landfill. As such, sufficient storage space would be provided to allow for:

- A daily collection (total of 2 days storage) of all commercial waste, including retail, restaurants and offices;
- The bunding of hazardous waste including cooking oils in accordance with legislation;
- A once weekly collection of residential recyclable material; and
- A twice weekly collection (total of 4 days storage) of residential general waste.

7.142 Based on typical waste compositions and the facilities to be provided, the predicted recycling rates for both commercial and residential uses under Development Scenario 4 would be the same as those rates identified for Development Scenario 1. This includes the recycling of a minimum of 50% commercial waste and up to 50% of residential waste.

7.143 It is anticipated that the completed Development Scenario 4 would result in small increase of approximately 5.4% in the maximum annual volume of waste currently produced at the site of Development Scenario 4. Although the completed and operational Development Scenario 4 would result in a greater quantum of floor space in comparison to the exiting situation, the removal of the hotel use from site (represented approximately 26% of the maximum existing waste generation) would result in significant waste reduction. As such, waste generated from both the commercial and residential uses of completed Development Scenario 4 is considered to be **negligible**.

MITIGATION

Demolition and Construction

Development Scenarios 1, 2, 3 and 4

7.144 As stated earlier in this chapter, it would be mandatory to implement a SWMP during the construction stages of the four Development Scenarios. The SWMP would include measures to ensure the reduction, reuse, recycling and appropriate disposal of waste in accordance with the Site Waste Management Plan Regulations. A named individual would be made responsible for its implementation and all demolition and construction contractors and sub-contractors would be trained to understand the requirements of the SWMP.

7.145 In addition, the Applicant is committed to reusing or recycling at least 80% of all demolition waste with an aspiration to exceed this amount. To ensure this target is carried forward, this commitment would be included in the contract documents of the appointed contractor.

7.146 To reduce waste, contractors would be required to:

- Order materials that are cut to size, rather than standard cuts;
- Reduce over-ordering and ensuring the careful storage of materials to prevent damage;
- Return of damaged goods to the manufacturer;
- Specify materials to be delivered with minimum packaging; and
- Reuse of waste material within the site of the relevant Development Scenario.

7.147 To maximise reuse and recycling, waste would be segregated at source within the site of the relevant Development Scenario using colour coded skips. Inert waste would be reused as far as practicable within the site of the relevant Development Scenario and options for using additional waste at other construction projects would be investigated. Research would also be undertaken into appropriate recycling companies that provide facilities to recycle site waste arisings that cannot be reused.

7.148 In order to monitor the amount and type of waste generated and to refine reuse or recycling targets, the SWMP would also require Waste Audits to be undertaken at intervals throughout the construction works. The results of audits would be communicated to all staff involved in the project. Following these audits, targets would be reviewed and, where necessary, amended to enable continuous improvement.

Completed Development

Development Scenarios 1, 2, 3 and 4

7.149 Provided waste is managed in accordance with relevant legislation, no significant adverse effects are anticipated. Nevertheless, future occupants of any of the Development Scenarios would be provided with information on reducing, reusing and recycling waste. This information would highlight to office users and retailers the potential cost savings of waste management services and encourage the:

- Use of recycled paper;
- Reuse of packaging, envelopes and scrap paper;
- Segregation of paper, card and where appropriate cans and glass to maximise recycling;
- Maximise the use of email and CDs rather than distributing hard copies;
- Return of all ink cartridges to suppliers for refilling rather than disposal;
- Recycling of office furniture; and
- Use of rechargeable batteries.

7.150 Future residents would also be provided with information on the waste management system and the acceptable materials to be placed in each bin as part of an information pack for residential occupiers. All communal bins would be clearly colour coded to minimise any contamination of segregated waste.

RESIDUAL EFFECTS

Demolition and Construction

Development Scenarios 1, 2, 3 and 4

7.151 For all four Development Scenarios, a commitment has been made by the Applicant to reuse or recycle at least 80% of demolition material. The commitment would be included within the appointment documents of the contractor and would be achieved through the implementation of a SWMP. The SWMP would also ensure that waste is managed in accordance with legislation such as the Duty of Care Regulations.

7.152 The implementation of a SWMP would ensure that waste generated during construction of each of the Development Scenarios would be reused or recycled where feasible, failing which, it would be disposed of in accordance with relevant legislation. It is, therefore, considered that the demolition and construction phases of all four of the Development Scenarios would give rise to **negligible** effects.

Completed Development

Development Scenarios 1, 2, 3 and 4

7.153 Recycling rates achieved within the various uses of the four Development Scenarios would be dependent on the procedures implemented by future occupants. However, it is considered that all four Development Scenarios would incorporate sufficient recycling storage in suitable, accessible locations to facilitate recycling in accordance with the waste hierarchy and best practice requirements. Information would also be provided to future occupants in order to promote recycling and waste reduction and outline the cost savings associated with it.

7.154 Consequently, each of the four Development Scenarios would be designed to facilitate the reuse or recycling of approximately 50% of waste generated in the proposed commercial and residential uses. This would be in line with all aforementioned legislation and guidance.

7.155 For Development Scenarios 1, 2 and 4, there would be no significant change in waste generation in comparison to the existing waste currently generated at the respective sites of the Development Scenarios (i.e. 9.8% and 5.4% increases for Development Scenarios 1 and 4 respectively and virtually no change for Development Scenario 2). Although the completed and operational Development Scenarios 1, 2 and 4 would result in a greater quantum of floor space in comparison to the existing situation, the removal of the existing hotel use from the site of Development Scenarios 1, 2 and 4 (representing approximately 23% of the maximum existing waste generation for Development Scenarios 1 and 2 and 26% for Development Scenario 4) would result in a significant reduction in waste generation. As such, the waste generated from both the commercial and residential uses of completed Development Scenarios 1, 2 and 4 is considered to be **negligible**.

7.156 Notwithstanding this, it has been estimated that the completed and operational Development Scenario 3 would result in an approximate 18.1% increase in the volume of waste currently produced at the existing site of Development Scenario 3. This is due to the completed Development Scenario 3 resulting in a greater quantum of floor space in comparison to the exiting situation, even with the removal of the hotel use from site. As such, waste generated from both the commercial and residential uses of the completed and operational Development Scenario 3 would result in a **long-term, local** effect of **minor adverse** significance.

SUMMARY AND CONCLUSIONS

7.157 Overall, due to the mitigation measures imposed by the SWMP and a commitment by the Applicant to reuse or recycle at least 80% of demolition material, it is considered that each of the proposed Development Scenarios would have **negligible** effects with respect to waste generated during the demolition and construction phase.

7.158 With regards to the completed Development Scenarios, adequate storage space and information about the most sustainable methods of dealing with waste would be provided for each of the four Development Scenarios. This would encourage high levels of recycling.

7.159 The assessment has shown that, for Development Scenarios 1, 2 and 4, the completed Development would result in no significant change in waste generation. As such, waste generated from both the commercial and residential uses of completed Development Scenarios 1, 2 and 4 would be **negligible**.

7.160 For the completed and operational Development Scenario 3, it has been estimated that an approximate 18.1% increase in the volume of waste would occur when compared to the exiting waste generation volumes of the site of Development Scenario 3. As such, waste generated from both the commercial and residential uses of completed Development Scenario 3 would result in a **long-term, local** effect of **minor adverse** significance.