Extra MSA Group

Warrington Motorway Service Area, J11 M62

Environmental Statement

Part 2 – Waste Technical Paper 12

Revision D 22nd August 2019

Revision Record

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1. Introduction

1.1. This Technical Paper, on the impact of the Proposed Development on wastes management has been prepared by Wardell Armstrong LLP. It provides an assessment of the likely significant effects of solid waste generation associated with the construction and operational phases of the Proposed Development.

1.2. The effects are assessed in the context of relevant national, regional and local waste management policies and regional waste management treatment and disposal capacity. Mitigation measures to reduce the quantity of waste generated, increase the re-use, recycling and recovery of materials and improve waste management have been identified where feasible.

1.3. All relevant policies related to waste are considered, including:

- Waste Prevention Programme for England (2013);
- Our Waste, Our Resources: A Strategy for England (2018);
- Strategy for Sustainable Construction (2008);
- Litter Strategy for England (2017);
- Warrington Borough Council's Design and Construction Supplementary Planning Document (2010); and
- Warrington Borough Council's Environmental Protection Supplementary Planning Document (2013).

1.4. The principal objective of sustainable resource and waste management is to use material resources more efficiently and to reduce the amount of waste requiring final disposal by landfill. Where waste is generated it should be managed in accordance with the waste hierarchy as displayed in Figure 1.1. The waste hierarchy advocates an order of preference for the management of wastes.

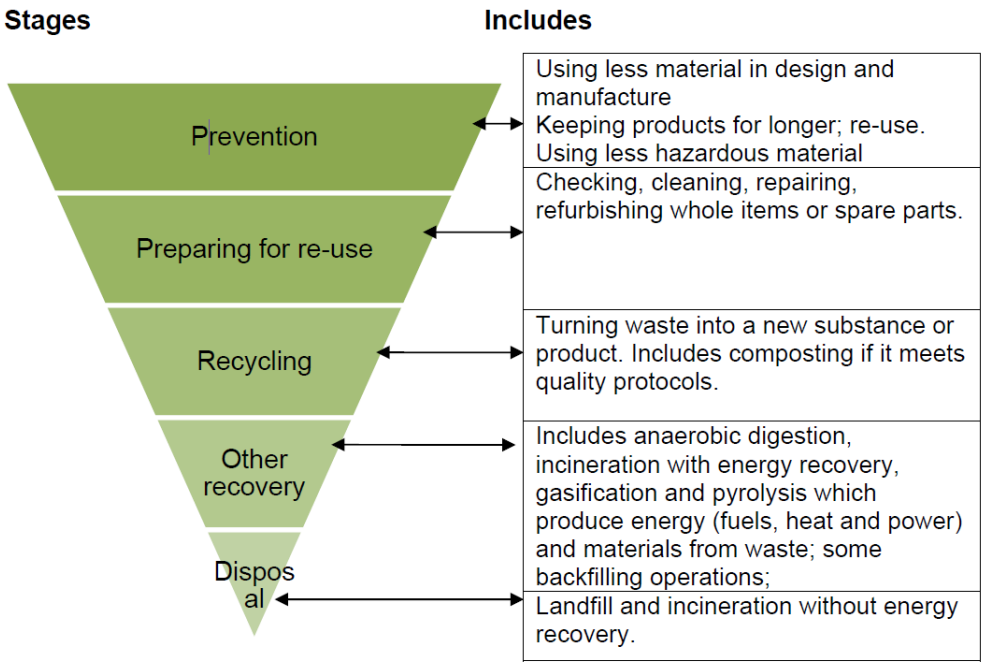

Figure 1.1: The Waste Hierarchy (Source: Defra[1])

1.5. Resource and waste management should actively contribute to the economic, social and environmental goals of sustainable development.

[1] Department for the Environment, Food and Rural Affairs (Defra) (2013), Waste Management Plan for England

2. Documents Consulted

2.1. All relevant policies relating to the management of solid wastes and the Proposed Development have been reviewed and are summarised in the following sections. In addition to the summarised policy documents the following were consulted:

- Warrington Borough Council, Draft Local Plan, March 2019
- European Commission, Thematic Strategy on the Prevention and Recycling of Waste, December 2005
- European Commission, Thematic Strategy on the Sustainable Use of Natural Resources, December 2005
- DEFRA, Waste Strategy for England, May 2007
- DEFRA, Waste Management Plan for England, December 2013
- National Planning Policy Framework (NPPF), February 2019
- National Planning Practice Guidance
- DCLG, National Planning Policy for Waste, October 2014
- Joint Local Aggregate Assessment (Greater Manchester, Merseyside and Halton, and Warrington), January 2018

Waste Prevention Programme for England (2013)

2.2. The Waste Prevention Programme for England sets out the national approach to preventing waste generation at source. It covers the benefits that can be gained through waste prevention, and the actions that can be taken by producers, businesses and the public sector. The Waste Prevention Programme fulfills the government's obligations of the 2008 revised Waste Framework Directive. The Programme's aim is to "improve the environment and protect human health by supporting a resource efficient economy, reducing the quantity and impact of waste produced whilst promoting sustainable economic growth". Key delivery messages focus on sustainable product design, innovative business practices, public sector partnership

with business and designing out waste materials. A key delivery of the Programme has been the single use carrier bag charge in England.

Our Waste, Our Resources: A Strategy for England (2018)

2.3. The latest national Waste Strategy for England provides a policy platform for industry development focusing on performance and sustainability. The Strategy outlines key objectives including the preservation of material resources by waste minimisation, resource efficiency and circular economy practices; the minimisation of environmental impacts; and, how the government will tackle waste crime in England. The circular economy vision set out in the Strategy emphasises the need to maximise the life and value out of resources used, and specific to construction and excavation wastes looks at developing off-site manufacture, use of innovative construction materials and techniques and resource efficiency by using available materials where suitable for the intended application. This includes supporting the work of the Green Construction Board.

Construction 2025: Industrial Strategy: Government and Industry in partnership (2013)

2.4. Construction 2025 sets out how the government and industry work together to develop sustainable construction practices and commitments. The Strategy commits to improving the image of the industry, investment in smart construction and digital design, investment in research and innovation, and development of the green construction board.

2.5. The Strategy sets the following targets for 2025:

- A 33% reduction in both the initial cost of construction and the whole life cost of assets;
- A 50% reduction in the overall time from inception to completion for new build and refurbished assets;
- A 50% reduction in greenhouse gas emissions in the built environment; and
- A 50% reduction in the trade gap between total exports and total imports for construction products and materials.

Industrial Strategy: Construction Sector Deal (2018)

2.6. The Construction Sector Deal sets out the government's ambitions to 2030 in regards to sustainable construction and growth. The broader Industrial Strategy focuses on 5 key productivity areas: Ideas; People; Infrastructure; Business Environments, and; Places. The Strategy builds on Construction 2025 to add three strategic goals encompassing utilisation of digital techniques in design, construction and operation, offsite manufacturing to minimise wastage and whole life asset performance. No specific waste reduction targets are set.

Litter Strategy for England (2017)

2.7. The Litter Strategy details the government's plans to tackle litter waste where it occurs. The Strategy focus' on education, enforcement and infrastructure as the three key areas where improvements can be made. Specific attention is paid to littering on the highways network including a commitment to update the Code of Practice on Litter and Refuse. The Strategy makes a commitment to work with relevant industries to tackle litter generation, and the development of guidance on "binfrastructure" to reduce litter where it occurs.

Building Regulations - H6 –Solid Waste Storage (2010)[2]

2.8. The volume and nature of the waste and the storage capacity is required to be based on the frequency of collection and the size and type of waste container. The regulations also identify the need to consult with the waste collection authority for guidance.

Warrington Borough Council's Design and Construction Supplementary Planning Document (2010)

2.9. The Proposed Development will need to comply with Warrington Borough Council's Supplementary Planning Document on Design and Construction, as amended in 2016. The document sets out requirements pertaining to waste in the construction, design and operational phases, including:

- Limiting vehicle movements and over-ordering;
- Re-use of materials and buildings, or reclamation off site where not possible;
- Using materials with a long lifespan;

[2] HM Government (2010), *The Building Regulations 2010 Drainage and Waste Disposal*

- Designing in dedicated space for the storage, within buildings or their curtilage, of waste materials to encourage recycling and recovery; and

- For premises visited by large numbers of the public it is expected to provide community recycling facilities (for example glass or paper banks) and other waste collection facilities for re-usable items in suitable locations.

Warrington Borough Council's Environmental Protection Supplementary Planning Document (2013)

2.10. The Proposed Development will also need to comply with the Council's Environmental Protection Supplementary Planning Document. This requires consideration of the potential environmental risks and nuisances associated with waste handling and storage on site.

Warrington Borough Council's Local Plan Core Strategy (2014)

2.11. The Proposed Development will need to comply with the Council's Local Plan Core Strategy, and associated documents, adopted in 2014. The plan sets out the Council's development priorities, strategic vision and identifies key sites and land uses for strategic infrastructure. With regards to waste management, this includes:

- Changing waste management practices and infrastructure to reduce dependency on landfill sites whilst supporting the principles of regional waste management and redressing the imbalance of waste imports into the borough;

- An objective to achieve a reduction in the amount of waste produced in the borough and treat waste at as high a level of the waste hierarchy as is possible;

- Policy MP8 commits to bringing forward a Waste Local Plan to safeguard the regions waste management needs, whilst encouraging waste minimisation in new developments, the use of recycled materials, the sustainable transportation of waste and the preparation of site waste management plans.

3. Consultations

3.1. A Scoping Request Report was issued to Warrington Borough Council as part of the EIA process. The waste chapter in the Scoping Request Report featured descriptions of the baseline and key issues affecting the assessment. A response has been received from Warrington Borough Council who provided no significant comments in relation to the proposed scope of the waste technical paper.

Theme / Issue	Date	Consultee	Method	Summary of Discussion	Outcome / Output
Waste	13th February 2019	Warrington Borough Council	Scoping Request Report	The Scoping Request Report identified the methodology for the waste assessment.	Warrington Borough Council acknowledged the methodology proposed in the Scoping Request Report is considered acceptable. No specific comment to waste chapter approach.
Risley former Landfill Site	28th January 2019	Environment Agency	Scoping Opinion	Identified a potential risk to the development from landfill gas from Risley landfill site. Suggested a risk assessment conducted to ensure that the potential risk is adequately addressed. "The local authority's Environmental Health and Building Control departments would wish to ensure that any threats from landfill gas have been adequately addressed in the Proposed Development. This may include building construction techniques that minimise the possibility of landfill gas entering any enclosed structures on the site to be incorporated into the development."	Extra MSA note the need to ensure that all developments are properly safeguarded against the risk of landfill gas exposure. A risk assessment concerning potential of the neighbouring Risley landfill site will be conducted to establish if there is a real risk of landfill gas exposure. If risk is identified these will be mitigated through appropriate design of all buildings ensuring all enclosed structures do not permit the ingress of landfill gas emissions.

Table 3.1: Summary of Consultations and Discussions

3.2. Extra MSA Group has undertaken an extensive programme of pre-application consultation and has sought to engage with the Local Planning Authority, Local Councillors and MPs, key stakeholders, statutory consultees, other developers, local community interest groups, local businesses and local residents prior to the submission of this outline planning application.

3.3. This process has involved pre-application meetings with Warrington Borough Council and Statutory Consultees; briefing letters, emails and meetings for Local Councillors and MPs; meetings with key stakeholders and local interest groups; the creation of a website providing details of the development and the opportunity to comment online; and the provision of

brochures and free post return comments cards to homes and businesses in the surrounding area.

3.4. Two public consultation events were also held on 4th April 2019 at Croft Village Memorial Hall and on 6th April 2019 at Gorse Covert Primary School, Birchwod, providing the opportunity for the community to view the proposals, discuss the scheme with Extra MSA Group and their consultant team and comment on the development proposals.

3.5. In undertaking the above activities, Extra MSA Group has proactively involved the community and stakeholders in the development of the application proposals for the site at an early stage and in the formulation of the planning application proposals. The feedback received from the pre-application programme has been considered in detail and the key outcomes of this process are set out in the ES Part 1 Report.

4. Methodology and Approach

4.1. The likely significant effects of the waste generated by the construction and operation of the Proposed Development have been assessed by forecasting the future generation of key waste streams and assessing these against the current baseline that has been established as part of this assessment. Mitigation measures to reduce the quantity of waste sent to landfill, and to recover waste materials for use on-site where feasible, are provided.

4.2. Estimates of excavation waste generation produced in the preparation of the site have been calculated by the project designers.

4.3. Construction waste will be generated during construction of the Proposed Development. The quantities of construction wastes likely to be generated have been forecast from information provided by Extra MSA Group which is based on their experience of constructing other MSAs. Construction waste estimates have been calculated based on development design details and using the BRE SMARTWaste Benchmarks[3]. Floor areas of the proposed buildings have been provided by Extra MSA Group.

4.4. The volume of waste likely to be generated from constructing site infrastructure has been estimated by applying a WRAP[4] standard practice wastage rate (5%) for surface materials to the estimated volume of asphalt required to construct the car parking areas and road. Road surface areas of the proposed infrastructure have been provided by Extra MSA Group. The volume of waste has been converted to a mass using a WRAP conversion factor of 2.1 tonnes/m^3.

4.5. The approach to assessing the likely significant environmental effects of waste generation, due to the construction of the Proposed Development, has considered the likely quantities, types and management of construction waste including storage, collection, treatment and disposal. These have been considered in the context of relevant local, regional and national waste legislation and guidance.

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[3] Buildings Research Establishment (BRE) (2012), BRE Waste Benchmark Data, Online (http://www.smartwaste.co.uk/filelibrary/benchmarks%20data/Waste_Benchmarks_for_new_build_projects_by_project_type_31_May_2012.pdf - last accessed 30/11/2018)

[4] WRAP (2014) Construction, demolition and excavation waste volume to mass conversion factors and List of Waste codes used in WRAP's tools

4.6. To assess the effects of waste generated from the construction of the Proposed Development, the estimated waste values have been compared with the sub -regional recycling and recovery infrastructure, inert and non-hazardous landfill capacity for Cheshire, Merseyside and Greater Manchester has been identified by the Government[5].

4.7. To assess the effects of waste generated from the construction of the Proposed Development, the construction waste quantities have been forecast.

4.8. No demolition waste would be generated by the Proposed Development.

4.9. The project team are striving to achieve a zero cut and fill balance, and it is anticipated that net fill will be required in construction of the Proposed Development. However, in order to assess the worst scenario in terms of construction waste, excavation waste has been included in this assessment.

4.10. Extra MSA Group and Wardell Armstrong have provided initial estimations for the volume of excavated materials that would be generated through cut and fill activities as part of the Proposed Development. As earthworks design is ongoing, quantities provided are indicative only, and will be subject to change but represent a worst case basis at this stage, for environmental assessment.

4.11. It is assumed that construction waste that is removed off-site would be handled by a licensed waste management contractor and processed through a construction waste treatment facility capable of managing the construction waste.

4.12. Construction waste generated during the construction of new buildings has been forecast using BRE benchmark data. This is a reasonable assumption as the BRE guidance publishes generation rates based on large-scale projects. As earthworks design is on-going, quantities provided are indicative only, and will be subject to change.

4.13. Operational waste will be generated by the Proposed Development following completion of construction and will largely consist of commercial waste. The predictions of operational waste generation from the Proposed Development are based on existing operational data

[5] Defra (2016), Waste management 2016 in north west England: data tables (https://www.gov.uk/government/publications/waste-management-for-england-2016 - last accessed 08/04/2019)

provided by Extra MSA Group and its partners from similar development which are operational. Waste arisings in relation to the generation of commercial waste have been forecast through data available in BS 5906:2005[6]. This considers floor areas of each development part as provided by Extra MSA Group.

Receptors

4.14. The receptors which will be considered in the assessment relating to construction and operational waste are identified in Table 4.1 below.

Designation	Receptors
International	None applicable
National	None applicable
County / Regional	Recycling and recovery infrastructure in Cheshire, Merseyside and Greater Manchester Inert and recovery infrastructure in Cheshire, Merseyside and Greater Manchester
Borough/District	None applicable
Local/Neighbourhood	Residents, businesses and sites from litter dispersal.

Table 4.1: Receptors

4.15. The receptors identified reflect that the overwhelming majority of generated waste will be controlled and collected in specially designed infrastructure before processing at a suitable location in the sub-region. During the operational phase of the Proposed Development there is potential for airborne litter to leave the Site, however this will be limited by the provision of suitable litter bins throughout the Site encouraging Site users into acting responsibly.

4.16. To assess the effects of waste generated from the construction of the Proposed Development, the estimated waste values will be compared with sub-regional level recycling and recovery infrastructure, future inert and non-hazardous landfill capacity for Cheshire, Merseyside and Greater Manchester that have been identified by the Environment Agency. Please refer to the Waste Receptor Plan in Appendix 18.1 for further details of the local waste management infrastructure. It is the intention that, where possible, excavation materials will be reused on

[6] British Standard (2005) BS 5906 : 2005 Waste management in buildings – Code of practice

Site for landscaping and all other materials will be segregated and stored for onward processing and recycling as a priority.

4.17. Receptors, identified in Table 4.2, and included in Appendix 18.1 - Waste Receptor Plan, outline local waste management infrastructure. Suitable receptors will be those that accept the specified material, as permitted by the Environment Agency. Receptors will be chosen on their ability to accept the waste material, capacity available, geographic proximity to the Development Site and position in the waste hierarchy.

4.18. The most appropriate receptor facility will differ depending on the material type requiring treatment / disposal. During the construction phase the majority of waste is anticipated to be inert, non-hazardous construction waste materials. This will typically be reused on Site for landscaping, recycled as aggregate, or as a last resort, disposed of to landfill. Some construction materials will be recoverable for either recycling or energy recovery applications such as metals, plastics and wood. When this is possible waste will be separated and a suitable Materials Recycling Facility (MRF) or Energy Recovery Facility (ERF) utilised.

4.19. During the operational phase of the Proposed Development a range of commercial wastes will be generated, such as green waste from site landscaping and maintenance, food, packaging and residual wastes. Where possible waste will be separated into different material streams at the point of generation. This will enable the most appropriate treatment methods to be employed by material stream. Residual wastes will be treated by ERF or landfill, as dictated by commercial availability and geographic proximity. Recycling streams will be treated through a recycling reprocessor or MRF plant, as appropriate dependent on material characteristics.

4.20. A brief, non-exhaustive, review of available facilities in the vicinity of the Development Site has identified potential receptors for the construction phase materials, as shown in Table 4.2. These all accepted construction waste in 2017.

Site name	Permit number	Site description	Distance from Site (straight line)	Quantity of construction and excavation waste received in 2017	Operator
Woolston Deposit Ground	YP3794CN	Deposit to land for recovery (development of nature park)	4 km	~274,000 tonnes	Churchill Enviro Limited

Site name	Permit number	Site description	Distance from Site (straight line)	Quantity of construction and excavation waste received in 2017	Operator
Southworth Quarry	QP3994CH	Inert landfill	5 km	~14,000 tonnes	Gaskell Brothers (W M & C) Limited
Frank O' Gara (Irlam)	VP3298CT	Inert & excavation Waste treatment	5 km	~ 52,000 tonnes	Frank O' Gara
Whitehead Landfill	ZP3433AQ	Non-hazardous landfill	6 km	~ 416,000 tonnes	Whitehead Restoration Limited
Morleys Quarry	LP3597SR	Inert landfill / recovery	6 km	~ 179,000 tonnes (of which 30,000 recovered)	Astley Sand & Aggregates Limited
Lymeand Wood Pits Integrated Waste Management Facility	BX7886IJ	Non-hazardous landfill	10 km	~ 191,000 tonnes	Cory Environmental (Central) Limited

Table 4.2: Potential Construction Phase Receptors

4.21. A brief, non-exhaustive, review of available facilities in the vicinity of the Development Site has identified potential receptors for the operational phase materials, as shown in Table 4.3. these all accepted similar wastes in 2017 to those anticipated to the generated during the operation of the Proposed Development.

Site name	Permit number	Site description	Distance from Site (straight line)	Quantity of municipal waste in 2017	Operator
Lymeand Wood Pits Integrated Waste Management Facility	BX7886IJ	Non-hazardous landfill	10 km	~ 1,500 tonnes	Cory Environmental (Central) Limited
Harwood Landfill	BV8741IL	Non-hazardous landfill	20 km	~ 60,000 tonnes	Booth Ventures Limited
Pilsworth Landfill	BS7951IB	Non-hazardous landfill	22 km	~ 112,000 tonnes	Viridor Waste Management Limited
Bolton ERF	BS3042IM	ERF	16 km	120,000 tonnes *	Viridor Waste (Greater Manchester) Limited

Site name	Permit number	Site description	Distance from Site (straight line)	Quantity of municipal waste in 2017	Operator
Runcorn ERF	RP3638CG	ERF	21 km	890,000 tonnes *	Viridor Waste Management Limited
Irlam Material Recycling Centre	CP3093MH	MRF	4 km	~ 55,000 tonnes	Biffa Waste Services Limited
Swinton	NP3692EQ	MRF	16 km	~ 17,000 tonnes	Roydon Group PLC
Manchester (J W S)	PP3894CG	MRF	16 km	~ 57,000 tonnes	J W S Waste and Recycling Services Limited
* Permitted throughput per annum					

Table 4.3: Potential Operation Phase Receptors

4.22. It is clear that locally there is a wide range of processing/treatment/disposal provision available. Should the capacity and/or commercial viability at the time required not be suitable, additional processing/disposal capacity can be sought across a wider radius from the Development Site. Please refer to the Waste Receptor Plan at Appendix 18.1 for a map showing the location of the local facilities identified in the above tables.

Environmental Impacts

4.23. The generation of waste associated with the construction and operational phases of this Proposed Development will have an impact upon the local and sub-regional waste management infrastructure. Therefore, an assessment of the impacts of the Proposed Development on waste management infrastructure during construction and operation will be carried out.

4.24. No industry standard significance criteria have yet been established for the assessment of waste effects from new developments. The proposed assessment criteria is consistent with those adopted when waste management has been considered as part of an EIA. This relates to scheme effects and the approximate expected increase in waste generation from the Proposed Development. The assessment, detailed in Table 4.4, ranges from substantial, where the Proposed Development results in a 10% increase is construction (during the construction

phase) or commercial waste arisings (during the operational phase), to neutral, where no net waste generation is anticipated.

Magnitude	Environmental Impact
Substantial	*>10% increase in waste generation and treatment relative to sub-regional baseline* Severe or irreversible adverse environmental or human health effects (e.g. pollution of controlled waters and terrestrial habitats, and/or uncontrolled landfill gas emissions), or major detrimental effects to local amenities from dust, litter, odour or pests. Severe permanent reduction in landfill void space capacity on a local and regional scale. Need for large-scale waste treatment facilities to protect against adverse environmental effects. During construction this is a short-term effect. When operational this is a long-term effect.
High	*5-10% increase in waste generation and treatment relative to sub-regional baseline.* Major environmental or human health effects or major effects to local amenities. Major, local-scale reduction in landfill void space capacity. Need for appropriate waste treatment facilities to protect against adverse environmental effects.
Moderate	*2-5% increase in waste generation and treatment relative to sub-regional baseline.* Moderate environmental or human health effects or moderate adverse effects to local amenities. Moderate, local-scale reduction in landfill void space capacity. Need for medium-scale waste treatment facilities to protect against adverse environmental effects.
Minor	*1-2% increase in waste generation and treatment relative to sub-regional baseline.* Minor environmental or human health effects or insignificant detrimental effects to local amenities. Slight local scale reduction in landfill void space capacity reversible with time. Need for small-scale waste treatment facilities to protect against adverse environmental effects.
Negligible	*<1% increase in waste generation and treatment relative to sub-regional baseline.* No appreciable adverse environmental or human health effects or detrimental effects to local amenities.
Neutral	*No change in net waste generation.* No impact is predicted.

Table 4.4: Environmental Impacts

4.25. Construction phase and operational phases effects will differ by timescale as well as magnitude. Construction phase effects will be short-term in impact, and operational phase effects are likely to have more long-term impacts. The specifics of the Effects and Impacts are discussed in detail in Section 7.

Significance of Effects

4.26. The significance of effect is determined using the significance matrix in Section 6 of the Environmental Statement Part 1 Report. This identifies the receptor level across the top of the matrix and the magnitude of environmental impact down the side and where they meet within the matrix identifies the significance of the effect.

4.27. For the purposes of this assessment, consistent with typical environmental assessment methodologies, impacts which have a magnitude of either neutral or negligible are considered non-significant. Minor and moderate impacts are considered slight but non-significant, and substantial and high impacts will be considered as having significant environmental effects.

Impact Prediction Confidence

4.28. It is also of value to attribute a level of confidence by which the predicted impact has been assessed. The criteria for these definitions are set out below:

Confidence Level	Description
High	The predicted impact is either certain i.e. a direct impact, or believed to be very likely to occur, based on reliable information or previous experience.
Low	The predicted impact and its levels are best estimates, generally derived from first principles of relevant theory and experience of the assessor. More information may be needed to improve confidence levels.

Table 4.5: Confidence Levels

5. Baseline Information

Construction, Demolition and Excavation Waste

5.1. Table 5.1 sets out the different management methods for the 3.74 million tonnes of Construction, Demolition and Excavation Waste (CD&E) generated within Cheshire and Merseyside in 2005. Of all CD&E waste generated, 0.86 million tonnes (23%) was disposed of at landfill with the largest proportion (1.71 million tonnes, 46%) being recovered and used as recycled aggregate or soil.

	Recycled Aggregates and Soils (million tonnes)	Used for Landfill Engineering or Restoration (million tonnes)	Spread on Registered Exempt Sites (million tonnes)	Disposal at Landfill (million tonnes)	Total Arisings (million tonnes)
Cheshire & Merseyside	1.71	0.2	0.97	0.86	3.74
%	46%	5%	26%	23%	100%

Table 5.1: Construction, Demolition and Excavation (CD&E) Waste Generated within Cheshire and Merseyside in 2005[7]

5.2. There is limited information available relating to CD&E waste generation, therefore, the information contained in Table 5.1 is the most recent and accurate available on a regional level. It has not been possible to calculate future waste arisings in the counties as there are no figures available on the estimated increase of CD&E waste arisings in Cheshire and Merseyside. In the absence of more recent data, the data from 2005 has been adopted as the baseline.

5.3. In the absence of reliable and comparable annual releases of data regarding CD&E waste arisings it is not possible to determine the evolution of the environmental baseline. However, long-term generation of this waste material is considered to be relatively stable and closely linked with regional development levels and economic activity. With improvements in sustainable design of developments and waste management processes a long-term move from disposal at landfill to reduction, recycling and restoration is anticipated, however there is no data of the requisite standards to substantiate this. Given that the requirement for, and availability of, processing and disposal capacity is closely linked to development and economic

[7] Department of Communities and Local Government (2005) Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005 - Construction, Demolition and Excavation Waste

activity it can be assumed that the environmental baseline will reflect wider development activity regardless of the specific development at this site.

Commercial and Industrial Waste

5.4. Baseline Commercial and Industrial Waste (C&I) data has been gathered to assess the operational impact of the Proposed Development on available regional waste management infrastructure, capacity and generation. These are used to assess the likely significance of the development relative to the available treatment infrastructure and similar waste generation from existing commercial and industrial activities.

5.5. As with C,D&E waste generation figures, the information available for C&I arisings and treatment is not routinely collected to the same detail as Municipal waste. Therefore, the information gathered here is the most recently available and reliable data available in relation to C&I waste arisings in the region.

5.6. Warrington Borough Council's Waste Arisings and Capacity Requirements Report (2017) identified 165,234 tonnes of C&I waste arising in the borough in 2015. The latest available data on a regional level, covering the North West region, is from 2009[8], as set out in Table 5.2, below. An annual C&I waste generation of 7,527,000 tonnes was recorded in this survey, which closely corresponds to the Environment Agency's North West of England Commercial and Industrial Waste Survey 2009 that records C&I waste arisings of 7,631,158 for 2009.

Business Type	**Business Sector**	**Waste Arisings (tonnes) Defra 2009**	**Waste Arisings (tonnes) Environment Agency 2009**
Industrial	Food, drink & tobacco	616,000	656,395
	Textiles / wood / paper / publishing	637,000	620,481
	Power & utilities	289,000	408,486
	Chemicals / non-metallic minerals manufacture	605,000	598,894
	Metal manufacturing	440,000	461,366
	Machinery & Equipment	509,000	501,913
	Sub-total	*3,096,000*	*3,247,535*

[8] Defra (2011), Commercial and Industrial Waste Survey 2009: Final Report

Business Type	Business Sector	Waste Arisings (tonnes) Defra 2009	Waste Arisings (tonnes) Environment Agency 2009
Commercial	Retails & wholesale	1,931,000	1,972,570
	Hotels & catering	859,000	-
	Public administration & social work	376,000	755,539
	Education	305,000	
	Transport & storage	606,000	-
	Other services	354,000	1,655,515
	Sub-total	*4,431,000*	*4,383,624*
TOTAL		7,527,000	7,631,158

Table 5.2: Commercial and Industrial (C&I) Waste Generated within the North West in 2009

5.7. As with C,D&E waste generation figures, reliable and comparable annual releases of data for C&I arisings and treatment is not routinely collected to the same detail as Municipal waste. Therefore, the information gathered here is the most recently available and reliable data available in relation to C&I waste arisings in the region.

5.8. In the absence of C&I waste arisings it is not possible to determine the evolution of the environmental baseline. However, long-term generation of this waste material is considered to be relatively stable and closely linked with local economic activity. With improvements in waste management practices a long-term move from disposal at landfill to reduction, recycling and recovery is anticipated, however there is no data of the requisite standards to substantiate this as treatment of these materials often utilises the same facilities as those used for municipal waste. Given that the requirement for, and availability of, treatment and disposal capacity is closely linked economic activity it can be assumed that the environmental baseline will reflect economic activity regardless of the development at this site.

Evolution of the environment

5.9. Without the development in place the site would likely continue in its current agricultural use. The site does not currently impact on waste management receptors and this would continue to be the case if the development were not to go ahead.

6. Alternatives Considered

6.1. The following waste related actions have been undertaken in the design of the Proposed Development, and will be implemented during construction and operation:

- As the development design has evolved the cut and fill balance has moved from a zero balance to the development requiring import of material to achieve the desired ground levels and development platform. This means that the vast majority of extracted materials will be re-used on site. Design evolution has identified opportunities to minimise material extraction, and opportunities to use material for landscaping and to form spatial barriers where suitable.

- Earthwork profiles will be designed to minimise the degree of importation and exportation of materials. This will evolve through project design, however where opportunities exist to re-use materials on site these will be prioritised other imports of material. All exports of material will be undertaken only following consideration of potential on site uses. Where on-site use is not possible material will be exported for re-use applications wherever possible. All material imports will be assessed against suitable alternatives to ensure that the most appropriate materials for that function are selected.

- A Site Waste Management Plan (SWMP) will be developed to provide a framework for managing waste in a sustainable manner. This will cover construction and operation stages of the development. The SWMP will identify management techniques for all waste materials and will prioritise sustainable practices which have the best environmental outcome. The SWMP will consider options for waste collection on site and inform the collection containers and service adopted.

7. Potential Environmental Effects

7.1. The potential environmental impacts of waste have been assessed during the construction and operational phases of the Proposed Development.

Construction Phase

7.2. Construction waste, including possibly hazardous materials, will be generated during the excavation and construction stage of the Proposed Development.

7.3. In order to assess the likely significant effects of the construction phase of the Proposed Development, the total construction waste likely to be generated has been forecast and assessed against the baseline.

7.4. Construction waste materials will comprise direct waste streams from the construction process, including inert materials, masonry, steel, wood, metals, earth, plasterboard, and glass; and non-construction waste including general waste, canteen waste, plastics and packaging.

Forecast of Construction Waste Quantities

7.5. The forecast of the total quantity of construction waste likely to be generated by the Proposed Development has been calculated using the following information (and following the proposed methodology):

- BRE SMARTWaste benchmarks;
- The land use area schedule; and
- Published waste density values.

7.6. The quantities of construction, and associated, wastes likely to be generated by the Proposed Development are summarised in Table 7.1. These are worst case scenarios assuming maximum floor space for each part of the Site.

7.7. The volume of waste likely to be generated from the access roads and car parking has been estimated by applying a WRAP[9] standard practice wastage rate (5%) for surface materials to the volume of asphalt required for constructing the road. Road surface areas of the proposed infrastructure have been provided by Extra MSA Group. It has been assumed the thickness of the roads and car park surfaces will be 50mm. The volume of waste has been converted to a mass using a WRAP conversion factor of 2.1 tonnes/m^3.

Summary	**Floor Area (max. m^2)**	**BRE Project Type**	**Average m^3 / 100m^2**	**Waste Arisings (m^3)**	**Average tonnes / 100m^2**	**Waste Arisings (tonnes)**
Facility Building	5,000	Commercial / Retail	20.9	1,045	27.5	1,375
Hotel Building	1,240	Leisure	14.4	179	21.6	268
Fuel Filling Stations	500	Industrial Buildings	13	65	12.6	63
Sub-total				*1,289*		*1,706*
Summary	**Area (m^2)**	**Volume (m3)**	**Standard Practice Wastage (%)**	**Waste Arisings (m3)**	**Conversion Factor**	**Waste Arisings (tonnes)**
Parking / Access Road / Service Areas	97,700	4,885	5	244	2.1	513
Sub-total				*244*		*513*
TOTAL				***1,533***		***2,219***

Table 7.1: Summary of estimated Proposed Development construction waste generation

7.8. In addition to construction waste, excavation waste will be generated by the proposed site development. In order to build up levels of site to support the Proposed Development it is projected that a net requirement of fill materials, ~25,000^3 to ~75,000m^3 will be required. It is therefore anticipated that the majority of excavated materials will be utilised on site and therefore requirements to export excavation waste will be minimal.

7.9. There are a range of local waste management facilities within close proximity of the Proposed Development, as identified in Table 4.2. These include recycling and recovery, reclaim and re-

[9] WRAP (2008), Net Waste Tool Guide to reference data.

use and private waste contractors. The Proposed Development will have an impact on sub-regional waste management infrastructure.

7.10. Construction of the Proposed Development would result in the removal of waste materials from site during this phase. The significance of the likely environmental effects of the additional waste arisings has been considered in the context of the available treatment capacity within Warrington, Merseyside and Greater Manchester and assessed against the criteria in Table 4.2.

Construction Waste Treatment and Disposal Capacity

7.11. Recycling and recovery of this waste is anticipated to account for 77% of the material generated, or 1,709 tonnes. If it assumed all construction waste is generated in one calendar year this represents 0.015% of the 11,775,000 tonnes per annum of sub-regional waste treatment capacity. In terms of the identified recovery and treatment sites, as set out in Table 4.2), this equates to 0.48% of the 356,000 tonnes per annum of local waste treatment and recovery capacity. In terms of the existing management of C,D&E waste in Cheshire and Merseyside, as set out in Table 5.1, 1,709 tonnes of material represents 0.059% of the annual quantity of C,D&E waste generated and treated in the sub-region.

7.12. Material requiring non-hazardous or inert landfill disposal will constitute the remaining 23% of material generated, or 510 tonnes. If it assumed all construction waste is generated in one calendar year this represents 0.002% of the 25,261,000 tonnes per annum of sub-regional appropriate landfill capacity. In terms of the identified landfill sites, as set out in Table 4.2), this equates to 0.066% of the 770,000 tonnes per annum of local waste treatment and recovery capacity. In terms of the existing management of C,D&E waste in Cheshire and Merseyside, as set out in Table 5.1, 510 tonnes of material represents 0.059% of the annual quantity of C,D&E waste generated and disposed of to landfill in the sub-region.

7.13. It is assessed that the construction waste requiring removal off-site for recycling, recovery or disposal represents an insignificant proportion of the predicted treatment capacity in Warrington and surrounding areas, with a maximum of 0.66% calculated.

Summary of Construction Waste Impacts and Significance

7.14. The results of this assessment indicate that there is likely to be:

- Adequate treatment and recovery capacity for construction waste in Warrington and the wider sub-region; and
- Adequate landfill capacity for construction waste in Warrington and the wider sub-region.

7.15. Therefore, significance of the predicted effects of construction waste generation by the Proposed Development is assessed to be negligible, and therefore not significant.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level
Construction waste requiring removal off-site for recycling and recovery	County / Regional	Negligible	Negligible	High
Construction waste requiring disposal at landfill	County / Regional	Negligible	Negligible	High

Table 7.2: Significance of Effect - Construction Phase

Operational Phase

7.16. Commercial waste will be generated during the operational phase of the Proposed Development.

Forecast of Operational Waste Quantities

7.17. The Proposed Development will comprise commercial, leisure and retail properties. Operational commercial wastes would comprise of non-hazardous waste and small quantities of hazardous waste. The estimated quantities of operational wastes from the Proposed Development are summarised in Table 7.3. These are calculated using BS 5906 values and the maximum floor areas / number of hotel rooms provided by Extra MSA.

7.18. The volume of waste generation derived from the BS 5906 figures has been converted to tonnage using a conversion factor of 0.26 kg / litre derived from the Environment Agency's Generic Operator Returns system guidance[10].

Summary	Anticipated Commercial Waste Arisings (litres per annum)[11]	Anticipated Commercial Waste Arisings (tonnes per annum)	Recycling Rate (%)	Materials sent for Recycling (tonnes)	Residual Waste sent for Treatment of Disposal (tonnes)
Hotel	1.3m	338	50%	169	169
Facility Building	2.6m	676	50%	338	338
Fuel Filling Station	0.26m	68	50%	34	34
TOTAL	***4.16m***	***1,082***		***541***	***541***

Table 7.3: Annual Operational Waste Generated by the Proposed Development

7.19. In absence of any local commercial waste recycling targets it has been assumed that the site will recycle 50% of waste generated, in line with the 2020 municipal waste target from the revised Waste Framework Directive (2008). This equates to waste generation of 541 tonnes per annum of residual waste, and 541 tonnes per annum of recyclable materials.

Operational Waste Treatment and Disposal Capacity

7.20. 541 tonnes of waste generated at the Proposed Development each year is suitable for treatment at recycling infrastructure in the region. There is a sub-regional material recycling capacity of 1,369,000 tonnes per annum across Cheshire, Merseyside and Greater Manchester, meaning that the sites waste generation represents 0.04% of the available capacity. In terms of the identified treatment sites, as set out in Table 4.3, this equates to 0.419% of the available 129,000 local capacity. In terms of the existing management of C&I waste in North West England, as set out in Table 5.2, 541 tonnes of material represents 0.007% of the annual quantity of C&I waste generated and treated in the region.

[10] Environment Agency (2018), Waste Conversion Factors (https://www.gov.uk/government/publications/waste-returns-spreadsheet-and-supporting-information - last accessed 08/04/2019)

7.21. 541 tonnes of waste generated at the Proposed Development each year is suitable for treatment via EfW or disposal to Landfill at available infrastructure in the region. There is a sub-regional EfW capacity of 954,000 tonnes per annum, and a non-hazardous landfill capacity of 25,261,000 tonnes per annum, across Cheshire, Merseyside and Greater Manchester, meaning that the sites waste generation represents 0.002% of the total available 26,215,000 tonnes per annum capacity. In terms of the identified treatment sites, as set out in Table 4.3, this equates to 0.046% of the available 1,183,500 local capacity. In terms of the existing management of C&I waste in North West England, as set out in Table 5.2, 541 tonnes of material represents 0.007% of the annual quantity of C&I waste generated and treated in the region.

7.22. It is assessed that the operational waste requiring removal off-site for recycling, recovery or disposal represents an insignificant proportion of the predicted treatment capacity in Warrington and surrounding areas, with a maximum of 0.419% calculated.

Summary of Operational Waste Impacts and Significance

7.23. The results of this assessment indicate that there is likely to be:

- Adequate non-EfW treatment capacity for non-hazardous commercial waste in Warrington and the wider sub-region; and
- Adequate EfW and landfill capacity for non-hazardous commercial waste in Warrington and the wider sub-region.

7.24. Therefore, significance of the predicted effects of operational waste generation by the Proposed Development is assessed to be negligible, and therefore not significant.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level
Operational waste requiring removal off-site for recycling	County / Regional	Negligible	Negligible	High
Operational waste requiring removal off-site for EfW or disposal to landfill	County / Regional	Negligible	Negligible	High

Table 7.4: Significance of Effect - Operation Phase

8. Proposed Mitigation

8.1. Mitigation has been proposed for the construction and operational phases of the Proposed Development, as detailed in the following sections.

Construction Phase

8.2. Where construction waste cannot not be reduced, re-used, recycled or recovered, the proximity principle will be applied to residual waste to ensure it is disposed of close to the Proposed Development where it is generated, with the aim of treating the waste within the district if available.

8.3. On-site investigation is required to determine the levels of any contaminated land, identify the appropriate remediation options and agree the preferred approach with the regulatory authorities. Handling, treatment and re-use of this material onsite will be included in a Materials Management Plan that will be developed as and when necessary.

8.4. A Site Waste Management Plan (SWMP) will be prepared during the detailed design phase in order to develop methods to reduce construction waste and promote the recovery of site-gained materials from an early stage in the Proposed Development. The SWMP will include a number of actions to achieve sustainable resource and waste management on the project, including:

- Consideration of waste generation during detailed design stage of development to ensure that the minimum amount of material is wasted, and if possible where waste is inevitable materials are selected which can be re-used on site or readily recycled;
- Recovery of excavated materials will be optimised with a focus on re-using materials on site, with alternative recovery routes as an alternative management method. It is anticipated that there will be a significant requirement for fill materials at the site and therefore not expected that substantial quantities of excavation materials will be removed from site; and,
- The preferred construction contractor will strive to reduce waste generation and material sent for disposal to landfill during the constructing phase of the

project. This will be achieved through effective waste management practices. Where waste generated by the project cannot be avoided this will be recovered through re-use and recycling where feasible.

8.5. In order to reduce negative environmental effects of construction materials will be used efficiently, therefore reducing the demand for landfill and the depletion of finite, natural resources through:

- Minimising the overall creation of waste resulting from, for example, over ordering or inefficient design;
- Reducing the quantity of material sent to landfill during the construction process through effective waste management;
- Recycling materials already on-site into the new construction project; and,
- Using more recycled materials and mainstream products with higher recycled content.

8.6. This materials management will drive the implementation of good practice and sustainable procurement on the project. Table 8.1 demonstrates the sustainable practices which will be undertaken to reduce, re-use and recycle waste during construction, maintenance and deconstruction.

Good Practice	Description
Avoid wasteful working practices	Staff will be given appropriate training both as part of site induction and at intervals throughout the life of the project such as Toolbox Talks.
Designing out waste	Waste management will be considered at the design stage of the development to ensure that the minimum amount of material is wasted
Effective material management	Materials will be appropriately handled and stored throughout their lifecycle from delivery to inclusion, e.g. return surplus materials to storage. Materials will be delivered to the site 'just-on-time', this would limit the need for excess on-site storage and would limit the chance of wastage through damage of the stored materials. There will be a designated area for the storage of materials. Will develop a Materials Management Plan to provide guidance on the handling, segregation and re-use of waste on-site
Hazardous waste management	Hazardous waste will be correctly labelled, shall not be mixed with non-hazardous waste, securely contained and disposed of by a certified waste carrier for hazardous waste. The Duty of Care (DoC) applies to hazardous wastes.

Good Practice	Description
Modern construction methods	The introduction of Modern Methods of Construction (MMC) shall be investigated during the construction phase of the Proposed Development. MMC entails improvements in the products or processes employed in construction, ranging from innovative components to be used on-site through to whole building systems manufactured off-site shall be investigated. Opportunities to introduce MMC on the project will be investigated.
Site Waste Management Plan	A project specific SWMP will be developed based on an over-arching Waste Strategy that is easy to communicate and disseminate. The SWMP includes procedures for monitoring, measuring and reporting hazardous and non-hazardous waste.
Sustainable procurement	Materials selected will be durable to ensure long life and reduced need for replacement. Over-ordering of materials will be avoided and suppliers that minimise packaging shall be used. Any packaging will be returned for recycling. Construction material specifications will prioritise the procurement and use of recycled/secondary aggregates and other recycled materials e.g. wood for formwork.
Utilise supply chain partners	All members of the supply chain will be aware of the SWMP. The Project Manager will ensure that someone is responsible for the implementation of the SWMP. Workshops will be held throughout the construction period to help reinforce the SWMP and ensure that all partners are kept up to date with developments. Targets will be established for the recycling of materials. These targets would then be communicated to the workforce and performance against them would be measured and used to promote positive PR.
Waste management	Whilst reduction of waste will remain the highest priority, waste produced shall be segregated wherever possible. This will allow materials to be re-used/recycled and ultimately reduce the amount of waste that has to be finally disposed of. The waste stream colour-coding developed by the Institute of Civil Engineers to raise waste awareness will be considered, as will WRAP branding styles.

Table 8.1: Sustainable Resource Management for the Construction Phase of the Proposed Development

Operational Phase

8.7. Commercial waste will be managed by the Proposed Development's operator, occupants and an appropriate waste management contractor. Occupants will be specifically expected to separate recyclable items for collection by the Proposed Development's operator. Occupants will also need to comply with the Council's Sustainable Design and Construction Supplementary Planning Document. Aspirational residential recycling rates shall be applied therefore provision must be made for storing a minimum of 50% of commercial waste for recycling or composting. Investigations shall be undertaken to understand the feasibility for recycling metals, plastic, paper and cardboard, glass and food waste.

8.8. A commercial contract will need to be drawn up and storage container requirements will be specific to the contract. However, space will need to be provided with sufficient capacity to

enable the segregation and recycling of wastes generated from the commercial units in order to limit the quantity of waste sent for disposal. These storage areas must also be easily accessible from the commercial property and by waste collection vehicles.

8.9. There will also be adequate space for the storage of bulky waste and the small amounts of hazardous waste produced.

9. Potential Residual Effects

9.1. The proposed residual effects have been assessed for the construction and operational phases of the Proposed Development.

Potential Residual Effects – Construction Phase

9.2. The overall impact of the proposal in terms of construction waste issues during the construction phase is highlighted in the table below. The residual effects for the construction phase are assessed as negligible, and therefore not significant.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Construction waste requiring removal off-site for recycling and recovery	County / Regional	Negligible	Negligible	High	Implement opportunities to minimise construction waste generation. Strive to reuse/recycle excavation and construction materials on-site. Where this is not feasible reuse/recycle on other local construction projects.	Negligible
Construction waste requiring disposal at landfill	County / Regional	Negligible	Negligible	High	Employ measures to recycle and recover construction wastes.	Negligible

Table 9.1: Residual Significance of Effect - Construction Phase

Potential Residual Effects – Operational Phase

9.3. The overall impact of the proposal in terms of commercial operational waste issues during the operational phase is highlighted in the table below. The residual effects for the construction phases are assessed as negligible, and therefore not significant.

Nature of Impact	Receptor	Environmental Impact	Significance of Effect	Confidence Level	Mitigation	Residual Significance of Effect
Operational waste requiring removal off-site for recycling	County / Regional	Negligible	Negligible	High	Minimisation of operational waste arisings	Negligible
Operational waste requiring removal off-site for EfW or disposal to landfill	County / Regional	Negligible	Negligible	High	Segregation of commercial waste arisings for recycling. Appropriate internal and external storage provision to achieve 50% recycling rate.	Negligible

Table 9.2: Residual Significance of Effect - Operation Phase

10. Additive Impacts (Cumulative Impacts and their Effects)

10.1. For the purposes of this ES we define the additive cumulative effects as:

> ***'Those that result from additive impacts (cumulative) caused by other existing and/or approved projects together with the project itself***

10.2. The developments that are likely to have a cumulative impact when considered with the Proposed Development have been scoped with the Local Authority and Key Consultees during the preparation of this ES (a full list is included within Section 9 of the ES Part One Report). The following table includes the agreed list of cumulative developments that have been assessed in respect of waste management. These are also shown geographically on the plan included at **Appendix** ***## [confirm appendix no.]*** of the ES Part One Report.

No.	Cumulative Development	Details	Status	Justification for Inclusion in Cumulative Assessment
1	The Quadrant, Cavendish Avenue, Birchwood Park, Warrington, WA3 6AE Application Ref: 2014/23358	Seven units for general industry and/or warehouse/distribution (Use Class B2 and/or B8). Area 7 of 3.64ha site area 12,225m^2 of development Within area 7 of original outline permission.	Planning Permission Granted 12-08-2014	Potential to increase demand on local waste management infrastructure.

No.	Cumulative Development	Details	Status	Justification for Inclusion in Cumulative Assessment
2	Eastern Edge of Birchwood Park Plots 107, 300, 501-502, 611-612, 701-702 and Quadrant, Birchwood Park, Warrington, WA3 6AE Application Ref: 2015/26044	Demolition of existing buildings and erection of new buildings for a combination of offices (B1); light and general industrial (B1/B2); warehousing development (B8) and ancillary retail/ financial & professional services/ non-residential institutions/ assembly and leisure (A1/A2/D1/D2) floor space.	Part developed. Outline Planning Permission Granted 29-10-2015 (10-year permission).	Potential to increase demand on local waste management infrastructure.

Table 10.1: Cumulative Development

10.3. Both Construction and Operational phases will be considered and the short, medium and long term impacts assessed.

10.4. In order to assess the likely additive impacts of waste generation on local waste management infrastructure, construction and operational waste generation values have been estimated for the planned developments detailed above.

Construction Waste Additive Impacts

10.5. The mass of waste likely to be generated from the construction of these sites has been assessed using Building Research Establishment (BRE) Benchmarks. Floor areas used in this calculation are taken from the relevant planning applications. It is not possible to forecast the quantities of potential excavation or demolition wastes from the planned developments.

10.6. The quantities of waste estimated to be generated from the construction phases from the proposed and planned developments are summarised in the table below.

Project	Floor Area (max. m^2)	BRE Project Type	Average waste generation (m^3 / $100m^2$)	Estimated Construction Waste (m^3)	Average waste generation (tonnes / $100m^2$)	Estimated Construction Waste (tonnes)
Warrington MSA	-	-	-	1,533	-	2,219
The Quadrant	12,225	Industrial Buildings	13	1,589	12.6	1,540
Eastern Edge of Birchwood Park Plots 107, 300, 501-502, 611-612, 701-702 and Quadrant	91,235 Office 40,215 Industrial 1,000 mixed	Commercial offices, Industrial and Commercial other respectively	19.8 13 17.4	23,467	11 24 2	19,708
TOTAL				*26,589*		*23,467*

Table 10.2: Cumulative Development Construction Waste quantities

10.7. Construction works associated with the proposed and planned developments would directly increase the quantity of waste generated. The significance of the likely environmental effects of the cumulative construction waste arisings has been considered in the context of the available treatment capacity within Warrington and surrounding areas, and assessed against the criteria in Table 4.2.

10.8. Recycling and recovery of this waste is anticipated to account for 77% of the material generated, or 18,070 tonnes. If it assumed all construction waste is generated in one calendar year this represents 0.153% of the 11,775,000 tonnes per annum of sub-regional waste treatment capacity. In terms of the identified recovery and treatment sites, as set out in Table 4.2), this equates to 5.08% of the 356,000 tonnes per annum of local waste treatment and recovery capacity. In terms of the existing management of C,D&E waste in Cheshire and Merseyside, as set out in Table 5.1, 18,070 tonnes of material represents 0.627% of the annual quantity of C,D&E waste generated and treated in the sub-region.

10.9. Material requiring non-hazardous or inert landfill disposal will constitute the remaining 23% of material generated, or 5,397 tonnes. If it assumed all construction waste is generated in one calendar year this represents 0.021% of the 25,261,000 tonnes per annum of sub-regional appropriate landfill capacity. In terms of the identified landfill sites, as set out in Table 4.2, this equates to 0.701% of the 770,000 tonnes per annum of local waste treatment and recovery capacity. In terms of the existing management of C,D&E waste in Cheshire and Merseyside, as set out in Table 5.1, 5,397 tonnes of material represents 0.628% of the annual quantity of C,D&E waste generated and disposed of to landfill in the sub-region.

10.10. It is assessed that the cumulative construction waste requiring removal off-site for recycling and recovery represents a high proportion of the predicted treatment capacity in Warrington and surrounding areas (a maximum of 5.1%) when assessed against local facilities only. On a sub-regional level this represents a negligible proportion of available capacity. It is assessed that the cumulative construction waste requiring disposal off-site in landfill represents an insignificant proportion of the predicted inert landfill capacity in Warrington and surrounding areas (a maximum of 0.56%).

10.11. The results of this assessment indicate that there is likely to be:

- Adequate suitable treatment and recovery capacity for construction waste in Warrington and the wider sub-region; and
- Adequate landfill capacity for construction waste in Warrington and the wider sub-region.

10.12. Many of the planned developments will be constructed over a period of years (some decades). Therefore, in reality the quantities of cumulative construction waste that will be generated by the planned developments during the construction period of the Proposed Development will be significantly lower. Therefore, significance of the predicted cumulative effects of construction waste generation by the proposed and planned development are assessed to be minor adverse.

10.13. Waste requiring off-take from site will be managed to limit potential direct and cumulative impacts. This will be done through on-site storage, bulking material so it is only removed when a full load is available and management of collections to avoid material movements at peak traffic times.

Operational Waste Additive Impacts

10.14. In order to assess the likely cumulative effects of waste generation on waste management infrastructure in Warrington and surrounding areas, operational commercial waste generation values have been calculated for the planned developments plus the Proposed Development itself.

10.15. The estimated quantities of commercial waste estimated to be generated from the operational phases from the proposed and planned developments are summarised in the table below.

Summary	Anticipated Commercial Waste Arisings (litres per annum)	Anticipated Commercial Waste Arisings (tonnes per annum) [12]	Recycling Rate (%)	Materials sent for Recycling (tonnes)	Residual Waste sent for Treatment of Disposal (tonnes)
Warrington MSA	4.16m	1,082	50%	541	541
The Quadrant	3.1785m[13]	826	50%	413	413
Eastern Edge of Birchwood Park Plots 107, 300, 501-502, 611-612, 701-702 and Quadrant	8.9518m[14]	2,327	50%	1,164	1,164
TOTAL	*16.2903m*	*4,235*	*50%*	*2,118*	*2,118*

Table 10.3: Annual Operational Waste Generated by the Proposed Development

10.16. 2,118 tonnes of waste generated at the proposed and planned developments is suitable for treatment at recycling infrastructure in the region. There is a sub-regional material recycling capacity of 1,369,000 tonnes per annum across Cheshire, Merseyside and Greater Manchester, meaning that the sites' waste generation represents 0.155% of the available capacity. In terms of the identified treatment sites, as set out in Table 4.3, this equates to

[12] Assumes 0.26kg/litre as per Environment Agency (2018), Waste Conversion Factors (https://www.gov.uk/government/publications/waste-returns-spreadsheet-and-supporting-information - last accessed 08/04/2019)
[13] Assumes 5l/m^2/week, as per BS 5906.
[14] Assumes 50l/employee/week, as per BS 5906 for office workers (offices comprising majority of development). Planning statement indicates anticipate 3,443 FTE jobs generated by development.

1.64% of the available 129,000 local capacity. In terms of the existing management of C&I waste in North West England, as set out in Table 5.2, 2,118 tonnes of material represents 0.028% of the annual quantity of C&I waste generated and treated in the region.

10.17. 2,118 tonnes of waste generated at the proposed and planned developments is suitable for treatment via EfW or disposal to Landfill at available infrastructure in the region. There is a sub-regional EfW capacity of 954,000 tonnes per annum, and a non-hazardous landfill capacity of 25,261,000 tonnes per annum, across Cheshire, Merseyside and Greater Manchester, meaning that the sites' waste generation represents 0.008% of the total available 26,215,000 tonnes per annum capacity. In terms of the identified treatment sites, as set out in Table 4.3, this equates to 0.179% of the available 1,183,500 local capacity. In terms of the existing management of C&I waste in North West England, as set out in Table 5.2, 2,118 tonnes of material represents 0.028% of the annual quantity of C&I waste generated and treated in the region.

10.18. It is assessed that the cumulative operational waste requiring removal off-site for recycling and recovery represents a moderate proportion of the predicted treatment capacity in Warrington and surrounding areas (a maximum of 1.64% at a local level). It is assessed that the cumulative operational waste requiring off-site treatment by EfW or disposal in landfill represents an insignificant proportion of the predicted inert landfill capacity in Warrington and surrounding areas (a maximum of 0.18%).

10.19. The results of this assessment indicate that there is likely to be:

- Adequate non-EfW treatment capacity for non-hazardous commercial waste in Warrington and the wider sub-region; and
- Adequate EfW and landfill capacity for non-hazardous commercial waste in Warrington and the wider sub-region.

10.20. Therefore, significance of the predicted cumulative effects of operational waste generation by the proposed and planned developments are assessed to be minor adverse at worst.

Short Term

10.21. The cumulative construction waste generated by the proposed and planned developments will occur in the short term.

Medium Term

10.22. The cumulative operational waste generated by the proposed and planned developments will occur in the medium and long term.

Long Term

10.23. The cumulative operational waste generated by the proposed and planned developments will occur in the long term.

Summary

10.24. The significance of the predicted cumulative effects of construction waste generation by the proposed and planned developments are assessed to be minor and temporary.

10.25. The significance of the predicted environmental effects of commercial waste generation by the proposed planned developments are to be minor and permanent.

11. Conclusion

11.1. This Technical Report provides an assessment of the likely effects of waste generation during construction and operation of the Proposed Development.

11.2. A Scoping Report was issued to the Warrington Borough Council Planning and Waste departments as part of the EIA process. The Council acknowledged the methodology proposed in the Scoping Report is considered acceptable.

11.3. The approach to assessing the likely significant environmental effects of waste generation, due to the construction of the Proposed Development, has considered the likely quantities, types and management of construction waste including storage, collection, treatment and disposal.

11.4. It is assessed that the construction waste requiring removal off-site for recycling and recovery represents an insignificant proportion of the predicted treatment capacity in Warrington and its environs (a maximum of 0.6%).

11.5. It is assessed that the construction inert waste requiring disposal off-site in landfill represents an insignificant proportion of the predicted landfill capacity in Warrington and its environs (a maximum of 0.7%).

11.6. Therefore, the significance of the predicted effects of construction waste generation by the Proposed Development are assessed to be negligible, and therefore not significant.

11.7. Mitigation measures have been identified to reduce the predicted effects from construction waste generation including:

- Avoid wasteful working practices;
- Designing out waste;
- Effective material management;
- Hazardous waste management;
- Modern construction methods;
- Site Waste Management Plan;

- Sustainable procurement; and
- Utilising supply chain partners.

11.8. The approach to assessing the likely significant environmental effects of waste generation, due to the operation of the Proposed Development, has considered the likely quantities, types and management of operational waste including storage, collection, treatment and disposal. Operational waste will consist of commercial wastes associated with the running of hotel, food, shop and petrol station facilities.

11.9. It is assessed that the commercial waste sent for recycling and recovery represents an insignificant proportion of the predicted treatment capacity in Warrington and its environs (a maximum of 0.4%).

11.10. It is assessed that the commercial waste requiring off-site treatment by EfW or disposal to landfill represents an insignificant proportion of the predicted treatment capacity in Warrington and its environs (a maximum of 0.04%).

11.11. Therefore, the significance of the predicted environmental effects of operational waste generation by the Proposed Development is considered to be negligible, and therefore not significant.

11.12. Mitigation measures have been identified to reduce the predicted effects from operational waste generation including:

- Occupants will be specifically expected to separate recyclable items for collection by the Proposed Development's operator;
- Occupants will also need to comply with the Council's Sustainable Design and Construction Supplementary Planning Document;
- Aspirational residential recycling rates of 50% of commercial waste for recycling or composting; and
- Investigations shall be undertaken to understand the feasibility for recycling metals, plastic, paper and cardboard, glass and food waste.

11.13. There are a number of other planned developments located close to the Proposed Development, which could potentially produce cumulative impacts during construction, if constructed concurrently, and during operation. In order to assess the likely cumulative effects of waste generation on local waste management infrastructure, construction and operational waste generation has been estimated for the planned developments plus the Proposed Development itself based on worst case generation estimates.

11.14. The significance of the predicted cumulative effects of construction waste generation by the proposed and planned developments are assessed to be minor and temporary, and therefore not significant.

11.15. The significance of the predicted environmental effects of operational waste generation by the proposed planned developments are to be minor and permanent, and therefore not significant.

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13. Appendices

Appendix 12.1 – Waste Receptor Plan