



# Warrington Borough Council Waste Arisings and Capacity Requirements Report 2017



**Waste Arisings and Capacity Requirements  
Report  
May 2017**

## Executive Summary

This report presents a detailed assessment of need for future waste management capacity over the plan period up to 31<sup>st</sup> December 2037 for Warrington Council. The report addresses the following waste streams:

- Local Authority Collected Waste (LACW)
- Commercial and Industrial (C&I) Waste;
- Construction, Demolition and Excavation (CD&E) Waste;
- Hazardous Waste;
- Agricultural Waste;
- Low Level (Non-Nuclear) Radioactive (LLR) Waste; and
- Water Waste/Sewage Sludge.

Figures are based on the best available data sources in line with current accepted methodologies. These include the Waste Data Interrogator (WDI) and Hazardous Waste Data Interrogator (HWDI), which are maintained by the Environment Agency and updated annually, the latest available data being for 2015. The quality of data available for each waste stream varies; for LACW, accurate data is available from the local authorities and Defra Waste Dataflow. However, data for other waste streams is not recorded as accurately. This study uses a methodology developed for Defra to calculate C&I waste arisings, and takes information for CD&E waste from the EA's WDI.

This Waste Needs Assessment looks at two scenarios of different recycling practice, and how this would be affected by economic growth factors, to predict future waste arisings. Figures for the LACW stream are based on actual figures provided by the Waste Disposal Authority for 2015/16 and projected forward using two different levels of household growth provided by Warrington Council, recycling rates are assumed to stay at the existing levels therefore no changes have been made to recycling /recovery for LACW. The scenarios considered include a 'baseline', i.e. the arisings expected if nothing changed from the current situation, and 'maximum recycling/recovery with growth', i.e. if national and local recycling levels identified levels of growth in line with local modeling were achieved. In this way, future waste arisings and any corresponding gap in future waste management capacity can be considered in terms of the minimum to maximum expected requirement.

The requirements for each waste stream, based on the different growth options are shown in Tables 1 to 3 below. Baseline arisings will be the same figure as shown for 2015.

**Table 1: Projected Waste Arisings by Waste Stream (tonnes per annum) –based on OAN projections for LACW and Oxford Economics growth projections for other waste streams.**

Waste Type	Quantity 2015	Quantity 2020	Quantity 2025	Quantity 2030	Quantity 2037
LACW	97,795	106,219	111,405	116,591	123,850
C&I	165,234	163,880	162,541	162,015	161,457
CD&E	241,682	244,892	246,374	247,352	248,453
Hazardous	10,865	11,181	11,519	11,859	12,394
Agricultural	92,200	92,200	92,200	92,200	92,200
<b>TOTAL</b>	<b>607,776</b>	<b>618,372</b>	<b>624,039</b>	<b>630,017</b>	<b>638,354</b>

**Table 2: Projected Waste Arisings by Waste Stream (tonnes per annum) –based on OAN projections for LACW with economic uplift and Oxford Economics growth projections for other waste streams**

Waste Type	Quantity 2015	Quantity 2020	Quantity 2025	Quantity 2030	Quantity 2037
LACW	97,795	107,079	113,340	119,601	128,366
C&I	165,234	163,880	162,541	162,015	161,457
CD&E	241,682	244,892	246,374	247,352	248,453
Hazardous	10,865	11,181	11,519	11,859	12,394
Agricultural	92,200	92,200	92,200	92,200	92,200
<b>TOTAL</b>	<b>607,776</b>	<b>619,232</b>	<b>625,974</b>	<b>633,027</b>	<b>642,870</b>

**Table 3: Projected Waste Arisings by Waste Stream (tonnes per annum) –based on OAN projections for LACW with higher economic uplift and Oxford Economics growth projections for other waste streams**

Waste Type	Quantity 2015	Quantity 2020	Quantity 2025	Quantity 2030	Quantity 2037
LACW	97,795	108,053	115,598	123,113	133,634
C&I	165,234	163,880	162,541	162,015	161,457
CD&E	241,682	244,892	246,374	247,352	248,453
Hazardous	10,865	11,181	11,519	11,859	12,394
Agricultural	92,200	92,200	92,200	92,200	92,200
<b>TOTAL</b>	<b>607,776</b>	<b>620,236</b>	<b>628,232</b>	<b>636,539</b>	<b>648,138</b>

In order to determine whether additional waste management facilities will be required in the future to manage the predicted waste arisings, it is necessary to establish how much waste can be managed by existing waste management facilities. This Waste Needs Assessment has looked at information relating to waste permits from the Environment Agency, as well as planning permissions and the WDI, to establish

- how many waste management facilities there are in Warrington;
- how much waste in tonnes each facility manages every year; and
- any known end dates for facilities.

A summary of operational waste management capacity for different waste management methods is shown in Table 4; this shows actual operational capacity for 2015 and projected capacity to the end of the plan period as a result of loss of existing facilities.

Table 4: Available licensed capacity (tonnes) showing changes throughout plan period

Waste Type	Facility Type	2015	2018	2022	2023	2031
LACW only	Household Waste Recycling Site	25,429	25,429	25,429	25,429	25,429
LACW, C&I	Composting	72,000	72,000	72,000	72,000	72,000
LACW, C&I, CDE	Transfer stations (non-hazardous)	38,864	38,864	38,864	38,864	38,864
Haz	Transfer stations	6,373	6,373	5,000	5,000	5,000
LACW, C&I, CDE	Treatment facility	99,148	99,148	99,148	99,148	99,148
CDE only	Restricted Landfill	1,025,691	1,025,691	1,025,691	1,025,691	1,025,691
LACW, C&I, CD&E	Non-Haz Landfill	854,828	0	0	0	0
LACW, C&I	Non-Haz Landfill (restricted)	93,083	93,083	93,083	0	0
CDE only	Inert LF	473,350	473,350	473,350	473,350	0
CDE only	Reclamation	213,620	213,620	213,620	213,620	0
C&I, CD&E, Haz	Metal recycling	20,472	20,472	20,472	20,472	20,472
LACW, C&I	Biological Treatment (WWT)	313,284	313,284	313,284	313,284	313,284
C&I, Haz	Car Breaker	480	480	480	480	480
CD&E	Recycling	100,000	100,000	100,000	100,000	100,000
LACW, C&I, CD&E, Haz	Recycling	38,239	38,239	38,239	38,239	38,239
<b>Total</b>		<b>3,374,861</b>	<b>2,520,033</b>	<b>2,518,660</b>	<b>2,425,577</b>	<b>1,738,607</b>

A key element of this Waste Needs Assessment is to predict whether there is likely to be any gap in future waste management provision and consequently any need for additional waste management capacity during the Plan period. This can be understood by comparing the predicted waste arisings with operational waste management capacity. Where waste arisings are greater than waste management capacity, this is identified as a 'capacity gap'. Where there is sufficient waste management capacity to deal with predicted waste arisings, this is identified as a 'capacity surplus'. Tables 5 to 7 below show the capacity requirements assuming growth for the baseline recycling (scenario 1) and increased recycling (scenario 2) scenarios..



**Table 5: Waste Management Capacity Requirements by waste stream and management method – Growth/ Scenario 1 Baseline recycling**

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2037
Landfill (C&I and LACW)	780,317	-75,091	-74,490	-73,954	-73,848
Landfill (Hazardous)	-1,954	-2,013	-2,067	-2,119	-2,199
Landfill (CD&E)	437,762	437,762	437,762	437,762	-35,588
Energy from waste (C&I)	-237	-238	-235	-233	-232
Energy from waste (Hazardous)	-8,015	-8,248	-8,497	-8,748	-9,143
Thermal Treatment (Hazardous - no energy recovery)	-95	-98	-101	-104	-109
Recycling (Hhold, C&I , haz)	13,998	11,529	10,306	9,055	7,097
Recycling Metals	3,789	3,731	3,927	4,100	4,178
Treatment (Hazardous)	-1,226	-1,261	-1,300	-1,338	-1,398
Composting	44,373	41,993	40,528	39,063	37,012
Treatment plant LACW, C&I, C&D)	6,291	3,403	2,486	1,960	1,151
Treatment Plant CD &E	42,620	42,620	42,620	42,620	42,620
Land recovery	140,208	406,040	405,952	405,893	-67,522
Recovery LACW	-40,671	-44,174	-46,331	-48,488	-51,507
Transfer LACW, C&I, CD&E	15,262	15,011	15,082	15,165	15,161
<b>Total</b>	<b>1,432,422</b>	<b>830,965</b>	<b>825,642</b>	<b>820,635</b>	<b>-134,327</b>
<b>LACW Requirements with OAN uplift</b>					
Landfill (C&I and LACW)	780,317	-75,107	-74,527	-74,012	-73,934
Recycling (Hhold, C& , haz)	13,998	11,286	9,759	8,205	5,821
Composting	44,373	41,750	39,981	38,212	35,736
Recovery LACW	-40,671	-44,532	-47,136	-49,740	-53,385
<b>LACW Requirements with OAN Higher uplift (Historic Employment)</b>					

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2037
Landfill (C&I and LACW)	780,317	-75,127	-74,570	-74,079	-74,035
Recycling (Hhold, C& , haz)	13,998	11,002	9,121	7,213	4,333
Composting	44,373	41,466	39,343	37,220	34,248
Recovery LACW	-40,671	-44,949	-48,075	-51,200	-55,576

Table 6 Waste Management Capacity Requirements by waste stream and management method –Growth/ Scenario 2

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2037
Landfill (C+I and LACW)	780,317	-57,816	-37,748	-22,988	-23,118
Landfill (Hazardous)	-1,954	-2,013	-2,067	-2,119	-2,199
Landfill (CD&E)	437,762	437,762	437,762	437,762	-35,588
Energy from waste (C&I)	-237	-24,868	-32,776	-40,552	-40,364
Energy from waste (Hazardous)	-8,015	-8,248	-8,497	-8,748	-9,143
Thermal Treatment (Hazardous - no energy recovery)	-95	-98	-101	-104	-109
Recycling (Hhold, C+I , haz)	13,998	11,529	10,306	9,055	7,097
Recycling Metals	3,789	3,731	3,927	4,100	4,178
Treatment (Hazardous)	-1,226	-1,261	-1,300	-1,338	-1,398
Composting	44,373	41,993	40,528	39,063	37,012
Treatment plant LACW, C&I, C&D)	6,291	533	-3,630	-5,715	-6,488
Treatment Plant CD &E	42,620	42,620	42,620	42,620	42,620
Land recovery	140,208	140,207	140,207	140,207	-73,413
Recovery LACW	-40,671	-44,174	-46,331	-48,488	-51,507
Transfer LACW C&I, CDE	15,262	29,403	29,309	29,247	29,178
<b>Total</b>	<b>1,432,422</b>	<b>569,300</b>	<b>572,211</b>	<b>572,003</b>	<b>-123,244</b>
<b>LACW Requirements with OAN uplift</b>					

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	Landfill (C+I and LACW)	780,317	-57,832	-37,785	-23,046
Recycling (Hhold, C+I , haz)	13,998	6,508	-3,157	-9,446	-11,748
Composting	44,373	41,750	39,981	38,212	35,736
Recovery LACW	-40,671	-44,532	-47,136	-49,740	-53,385
<b>LACW Requirements with OAN Higher uplift (Historic Employment)</b>					
Landfill (C+I and LACW)	780,317	-57,851	-37,828	-23,113	-23,305
Recycling (Hhold, C+I , haz)	13,998	6,225	-3,795	-10,093	-13,236
Composting	44,373	41,466	39,343	37,220	34,248
Recovery LACW	-40,671	-44,949	-48,075	-51,200	-55,576

**Table 7: Waste Management Capacity Requirements by management method No Growth/ Scenario 2 Recycling**

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2037
Landfill (C+I and LACW)	780,317	-57,293	-37,465	-22,594	-22,594
Landfill (Hazardous)	-1,954	-1,954	-1,954	-1,954	-1,954
Landfill (C,D&E)	437,762	437,762	437,762	437,762	-35,588
Energy from waste (C&I)	-237	-24,785	-33,047	-41,309	-41,309
Energy from waste (Hazardous)	-8,015	-8,015	-8,015	-8,015	-8,015
Thermal Treatment (Hazardous - no energy recovery)	-95	-95	-95	-95	-95
Recycling (Hhold, C+I , haz)	13,998	9,236	974	-3,983	-3,983
Recycling Metals	3,789	4,396	34,396	4,396	4,396
Treatment (Hazardous)	-1,226	-1,226	-1,226	-1,226	-1,226
Composting	44,373	44,373	44,373	44,373	44,373
Treatment plant LACW, C&I, C&D)	6,291	3,430	125	-1,527	-1,527
Treatment Plant C,D &E	42,620	42,620	42,620	42,620	42,620



Waste Management Method	Gap/Surplus capacity by year (tonnes)				
Land recovery	140,208	140,208	140,208	140,208	-73,412
Recovery LACW	-40,671	-40,671	-40,671	-40,671	-40,671
Transfer LACW C&I, CDE	15,262	29,606	29,606	29,606	29,606
<b>Total</b>	<b>1,432,422</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>-109,377</b>

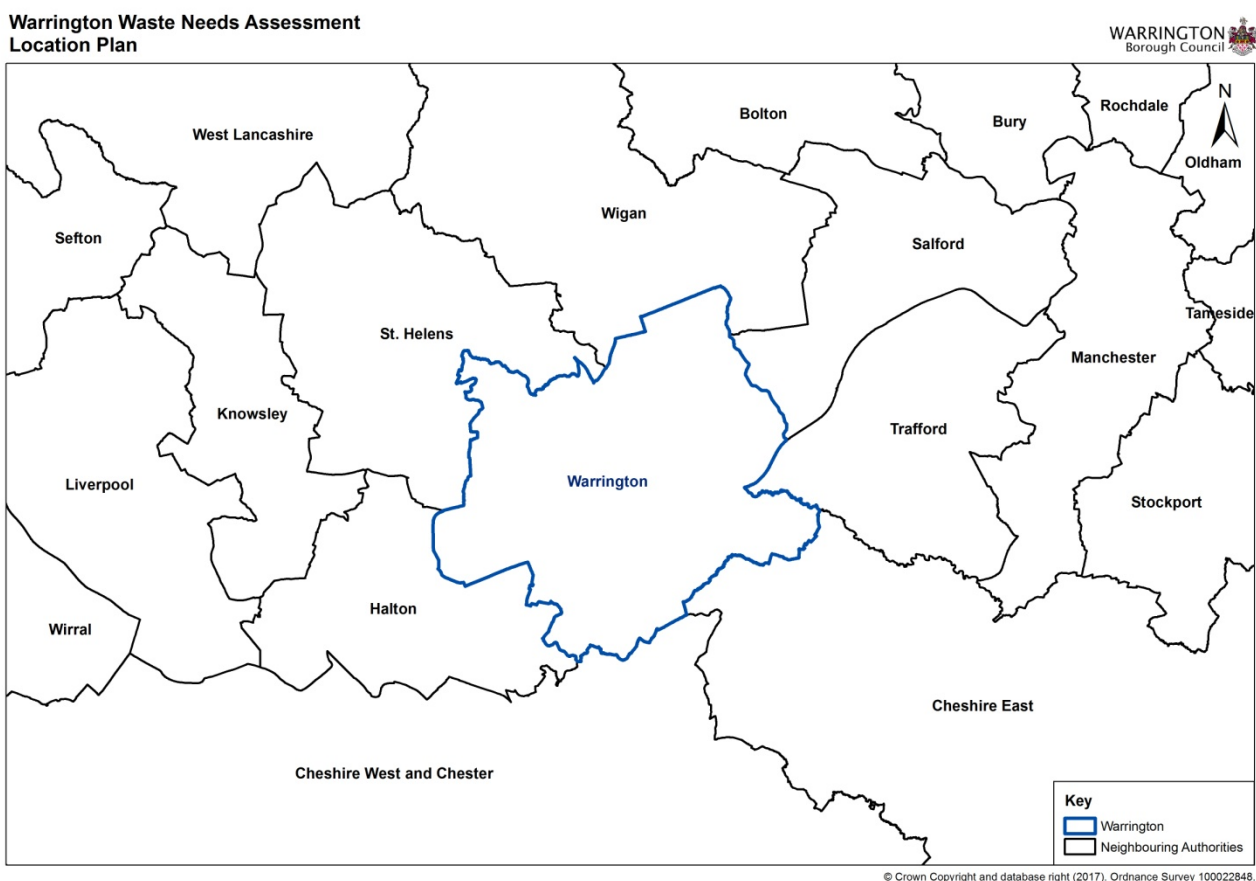
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## 1. Introduction and Context

- 1.1 Warrington Borough Council has commissioned Urban Vision to prepare an assessment of waste arisings and capacity requirements for all controlled wastes arising within Warrington.
- 1.2 Warrington Borough is the most northerly of the local authorities in the Cheshire area. It shares boundaries with Halton, Cheshire West and Chester, Cheshire East, and the four metropolitan boroughs of St Helens, Wigan, Salford and Trafford. The borough covers some 181square kilometres and at midyear 2015 was estimated to have a population of approximately 207,700.
- 1.3 Warrington lies at the hub of the region's communications network. The M6, M56 and M62 motorways intersect within the borough, providing good access to all parts of the region and beyond. Warrington also lies on the region's main North-South (West Coast Main Line) and East-West (Trans-Pennine) rail routes.

Figure 1: Map of Warrington



- 1.4 This assessment focuses on establishing arisings of the principal waste streams as set out below:
- Local Authority Collected Waste (LACW);
  - Commercial and Industrial (C&I) Waste;
  - Construction, Demolition and Excavation (CD&E) Waste;

- Hazardous Waste;
- Agricultural Waste;
- Low Level (Non-Nuclear) Radioactive (LLR) Waste; and
- Waste Water/Sewage Sludge.

1.5 The assessment has been informed by the most accurate up-to-date information available at that time, in most cases referring to 2015 or 2015/16 data.

1.6 The key waste streams reviewed and the data sources used are set out in Table 8 below.

**Table 8: Waste Streams Reviewed and Data Sources**

Waste Stream	Acronym	Description	Data Source
Local Authority Collected Waste	LACW	All waste collected by local authorities. This is primarily waste produced by householders but can include small amounts of waste generated by businesses ('trade waste') and other sources such as street sweepings;	Defra Waste Data Flow, Warrington Waste Management team
Commercial and Industrial wastes	C&I	Wastes produced by all industry sectors	EA WDI 2015, EA, HWDI 2015, EA records of exempt sites, EA records of incinerators
Construction, Demolition and Excavation wastes	CD&E	Waste produced through the undertaking of infrastructure, regeneration and new development projects	Environment Agency WDI 2015 - <a href="http://www.geostore.com/environment-agency/WebStore">http://www.geostore.com/environment-agency/WebStore</a>
Hazardous waste	-	A sub category of all the above waste streams, where the material presents a threat to human health and/or the environment and which requires specialised management as a result	Environment Agency HWDI 2015 - <a href="http://www.geostore.com/environment-agency/WebStore">http://www.geostore.com/environment-agency/WebStore</a>
Agricultural Waste	-	Waste produced by farming and forestry activity	Defra Annual Agricultural Census 2015 - <a href="https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june">https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june</a>

Waste Stream	Acronym	Description	Data Source
			Environment Agency. 2003. <i>Agricultural Waste Survey 2003: A Study of the Management of Non-Agricultural Waste on Farms</i> . Environment Agency. Environment Agency 2001. <i>Towards Sustainable Agricultural Waste Management</i> , Environment Agency.
Low Level (Non-Nuclear) LLR Waste	LLR Waste	Waste produced by activities such as x-ray photography, clinical and laboratory testing, oil and gas industry	Environment Agency
Waste Water / Sewage Sludge	-	Waste produced from washing, cleaning, and hygienic activities applied to waste water and sewage effluents	United Utilities <i>Our revised business plan for 2015-2020</i>

## 2. Policy Development

2.1 This chapter briefly reviews waste policy at European, national, sub-regional and local levels. It concentrates only on changes that may directly affect the assumptions about future growth and management priorities for waste that can have a direct impact on the capacity assessment and its results – i.e. general developments in planning policy and practice do not necessarily impact this study.

### European and national policy developments

Principal development	Implications
<b><i>EU Review of Waste Framework Directive Recycling Targets<sup>1</sup></i></b>	
A common EU <b>target for recycling 65% of municipal waste</b> by 2030	The EU has proposed the targets indicated for all Member states to adopt. Following the BREXIT vote, it is unclear if the UK will look to adopt these targets going forward; however it is likely that these targets will be kept and as such modeling work has assumed these targets will be achieved.
A common EU <b>target for recycling 75% of packaging waste</b> by 2030	
A binding landfill target to <b>reduce landfill to maximum of 10% of municipal waste</b> by 2030	
A ban on landfilling of separately collected waste	
<b><i>Waste Management Plan for England</i></b>	
Promotes high-quality recycling to support the development of a circular economy	Not necessarily a direct impact but could justify assumptions about further improvement in LACW and C&I waste recycling rates though improvement in householder and employee buy-in to recycling initiatives will be essential. PRNs expected to have an extremely indirect impact
Paves way for regulations to improve quality of recyclates produced by MRFs	
Support for Packaging Recovery Notes (PRNs) as a mechanism for improving recycling rates for business wastes	
	Regarded as a vital means of pushing up recycling and composting of household waste, especially in urbanised authorities. Scale of roll-out in Warrington may indicate whether it has the potential to boost the recycling rate to the 2020 EU/national target and possibly higher, and which may be reflected in recycling assumptions for these streams
Acknowledges UK already out-performing EU target for recycling CD&E waste by a significant margin	Warrington already exceeding C&D recycling/recovery/reuse target of 70%
Reiteration of the Proximity Principle (removed on revision of PPS10)	Indirect encouragement for authorities to seek net self-sufficiency in planning for waste and not to continue relying on external capacity indefinitely

<sup>1</sup> Following the referendum in June 2016, the UK is preparing plans to withdraw from the EU. Until the UK formally leaves the EU, there is no change to the current legal framework. Following withdrawal, the EU Directives will no longer be relevant. However, there is nothing at this stage to suggest that directives already transposed into UK legislation would not be saved, nor that recycling targets would not be saved.



Principal development	Implications
<b>National Planning Policy for Waste (and Technical Guidance)</b>	
In spite of its wider significance, the NPPW has few implications for the matters addressed by this study in that it defines the process of establishing and monitoring policies and makes limited reference to the external influences that may need to be taken into account when assessing appropriate growth and performance assumptions.	
<b>National Infrastructure Plan</b>	
The relevant chapter is essentially a commentary on achievement of targets in line with the Waste Framework and Landfill Directives, and progress on bringing forward new infrastructure to achieve them both through public and private funding. Relevant developments on targets reflect the emerging EU proposals referred to above.	
<b>Low Level Radioactive Waste Management Plan for England</b>	
Encourage planning authorities to provide more support for local storage / disposal to relieve pressure on limited national infrastructure	No impacts for this update but may impact need for dialogue with authorities currently receiving these wastes.

## Sub-regional and Local policy developments

<b>Northern Powerhouse Strategy</b>	
A Government strategy for the north of England which aims to increase productivity in the north. New projects in the north which have successfully bid for funding within the Local Majors Fund include the Warrington Waterfront Western Link, which will provide a new road connection to the south-west of Warrington.	Difficult to predict the impact on waste creation particularly from improvements to enterprise and innovation, trade and investment. In addition, much of the predicted growth is likely to occur beyond the plan period. Work to infrastructure could impact on waste creation.
<b>Warrington Means Business – January 2017</b>	
Warrington forms part of the Atlantic Gateway which stretches from the Wirral in the West to Manchester in the East along the motorway and waterway corridors. Aspirations by 2030 include: 250,000 new jobs, 400,000 new homes and £6billion GVA growth.	Difficult to judge the impact on waste creation because it is not clear what will happen in Warrington itself.
Warrington is part of the Cheshire and Warrington sub-region and a member of the Cheshire & Warrington Local Enterprise Partnership (LEP). By 2040, aim to grow the Cheshire and Warrington economy by £27bn to £50bn; increase GVA per head to 120% of the national average; create 112,000 jobs; and build 115,000 new homes.	Potential future increase in waste produced from manufacturing industry which would be reflected in future data and incorporated into future waste work.
There are 5 components for reinforcing the heart of the town: delivering Warrington Waters; Delivering Warrington North: Hinterland Employment Areas; enabling the critical access and transportation schemes to enable the economic growth of the town; and creating sustainable, new mixed use communities and supporting economic growth.	Difficult to predict the impact on waste creation but any increase in waste will be reflected in future data.

Warrington Waste Management Strategy	
No up-to-date strategy in place.	n/a

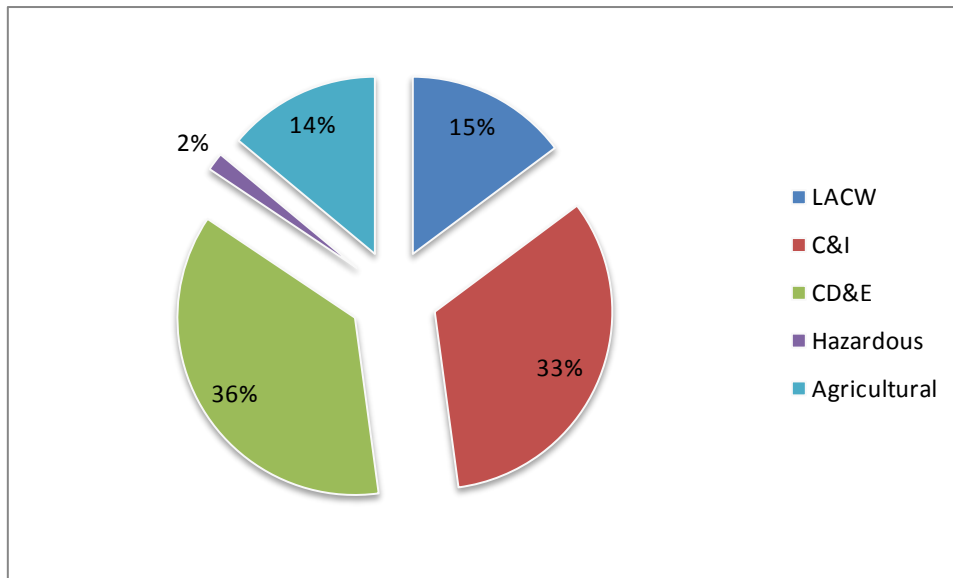
### 3 Baseline Waste Arisings

- 3.1 Each waste stream is discussed in detail in separate sections of this report. This section presents the overall arisings for the five key waste streams in the Plan area in 2015. In 2015, a total of **661,307** tonnes of waste arose in the plan area, as shown in Table 9. Table 9 does not include arisings for LLR waste or waste water as we do not have specific details on these waste streams to include here.
- 3.2 In preparing the baseline data for Warrington, some anomalies were identified in the WDI figures for commercial and local authority waste. The total combined figures for EWC 20, which is the principle route for recording this waste stream, was lower than the total LACW figures provided by the council. This issue was discussed with the EA; however, even when considering the historic context of this waste stream within Cheshire and including the unknown Cheshire waste managed in Warrington, the figure was still too low. Following further review with WDA colleagues, information on the use of a transfer station outside of Warrington was provided. This facility in Halton was reviewed and the source of the data for this site was only recorded at the regional North West level, as such the waste was not attributed as originating in Warrington. Therefore, for establishing baseline arisings, the LACW data has been taken from that provided by WDA colleagues and Commercial waste data is assumed to be the total recorded in the WDI under EWC 20.

Table 9: Baseline waste arisings (2015) (tonnes)

Waste Type	Quantity 2015	%Split
LACW	97,795	15
C&I	218,752	33
CD&E	241,682	36
Hazardous	10,865	2
Agricultural	92,213	14
<b>Total</b>	<b>661,307</b>	

- 3.3 Figure 2 below shows the proportions of the waste streams. This shows that 36% of waste arisings in 2015 consisted of CD&E waste. LACW made up 15%, and C&I waste 33% of the total arisings, agricultural waste made up 14% although only 770 tonnes of this waste stream left farms for management elsewhere, with hazardous just 2% of the total.

Figure 2: Total Waste Arisings 2015<sup>2</sup>

3.4 Table 10 presents operating waste management capacity within Warrington and how this changes over the plan period. Capacity information has been taken from: throughputs reported via the Environment Agency WDI and planning permission data. Operating waste management capacity changes throughout the plan period as existing sites close or new sites come on stream. Table 10 shows the operational capacity as at 2015 and at key dates following closure of existing sites. This table also includes details on restricted landfill in Warrington and biological treatment facilities. Whilst these facilities are located within the borough, they do not count towards the available capacity for managing Warrington's waste. This is because they are dealing with waste water from other locations not just from Warrington; power station waste from Fiddlers Ferry Power Station; and inert waste which is imported by a business solely for deposit of its own waste from a site elsewhere in the North West. A summary of operational waste management capacity for different waste management methods is shown in Table 10; this shows actual operational capacity for 2015 and projected capacity to the end of the plan period as a result of loss of existing facilities.

<sup>2</sup> Data sources EA WDI 2015 and NYCC Waste Disposal Authority

**Table 10: Total Actual (2016) and Projected (2023 onwards) Operating Waste Management Capacity by waste stream and management method (tonnes per annum)**

Waste Type	Facility Type	2015	2018	2022	2023	2031
LACW only	Household Waste Recycling Site	25,429	25,429	25,429	25,429	25,429
LACW, C&I	Composting	72,000	72,000	72,000	72,000	72,000
LACW, C&I, CDE	Transfer stations (non-hazardous)	38,864	38,864	38,864	38,864	38,864
Haz	Transfer stations	6,373	6,373	5,000	5,000	5,000
LACW, C&I, CDE	Treatment facility	99,148	99,148	99,148	99,148	99,148
CDE only	Restricted Landfill	1,025,691	1,025,691	1,025,691	1,025,691	1,025,691
LACW, C&I, CD&E	Non-Haz Landfill	854,828	0	0	0	0
LACW, C&I	Non-Haz Landfill (restricted)	93,083	93,083	93,083	0	0
CDE only	Inert LF	473,350	473,350	473,350	473,350	0
CDE only	Reclamation	213,620	213,620	213,620	213,620	0
C&I, CD&E, Haz	Metal recycling	20,472	20,472	20,472	20,472	20,472
LACW, C&I	Biological Treatment (WWT)	313,284	313,284	313,284	313,284	313,284
C&I, Haz	Car Breaker	480	480	480	480	480
CD&E	Recycling	100,000	100,000	100,000	100,000	100,000
LACW, C&I, CD&E, Haz	Recycling	38,239	38,239	38,239	38,239	38,239
<b>Total</b>		<b>3,374,861</b>	<b>2,520,033</b>	<b>2,518,660</b>	<b>2,425,577</b>	<b>1,738,607</b>

## 4 Predicting Future Requirements

- 4.1 This needs assessment has considered different recycling levels for each of the three main waste streams. For LACW, the targets are those set by the Council in regards to recycling rates only. For C&I and CD&E the targets proposed are those set as part of the circular economy. For each recycling scenario considered, growth has been modeled in line with the Oxford Economics model data for Warrington and assumes that this level of growth will occur. For LACW, growth has been modeled in line with growth in Household numbers using the OAN figures with and without economic uplift.
- Baseline - This reflects the current status and forward planning position.
  - Increased recycling – This reflects the achievement of recycling targets proposed by Europe for C&I and C&D waste.
  - No change from baseline is proposed for excavation waste, hazardous waste and agricultural waste.
- 4.2 The EU proposed recycling targets are set out below:
- 10% maximum to landfill of municipal waste by 2030 (C&I and LACW)
  - 50% recycling C&I by 2020 and 65% by 2030; and
  - 70% (by weight) recycling, recovery or reuse of C&D waste (excludes E waste) by 2020.
- 4.3 For Commercial and industrial waste a further target of 25% of waste to energy recovery by 2030 has also been proposed. The Plan will be looking at providing facilities to process/treat waste to produce a fuel substitute such a Refuse Derived Fuel (RDF) or Solid Recovered Fuel (SRF). This is to reflect the high amount of waste currently dealt with through either disposal to landfill or via transfer facilities which is managed outside of Warrington. The aim is to look to manage this waste further up the hierarchy over the Plan period to achieve the landfill diversion targets.
- 4.4 For all waste streams, targets have been based on the total waste stream for each waste type.
- 4.5 Although the EU targets relate to municipal waste, outside the UK this definition includes both household waste and that from other sources which are similar in nature and composition, which will include a significant proportion of waste generated by businesses and not collected by local authorities. Consequently, this update applies these municipal waste targets to the C&I waste stream. The term LACW was introduced in the UK to include all waste collected by a local authority.
- 4.6 Table 11 provides further information on the two recycling scenarios.

**Table 11: 'Change in Behaviour' Scenarios**

Waste Stream	Scenario	Practice Assumption
<b>LACW</b>	All scenarios	<p>Waste is managed in accordance with existing and planned arrangements and in accordance with agreed targets in the JMWMS (minimum recycling or composting of 50% of household waste by 2020). A significant proportion is converted in to RDF as this option is proposed to continue to ensure diversion from landfill. Therefore the recycling, recovery and landfill targets remain at the current levels throughout.</p> <p>Current levels for LACW            57% Recycling/composting            42% Incineration with Energy Recovery            2% Landfill</p>
<b>C&amp;I Waste</b>	Scenario 1 Baseline Recycling	<p>Baseline position as set out below:</p> <p>50% Recycling/treatment            41% Landfill            0% Recovery</p>
	Scenario 2 Increased Recycling	<p>By 2020:</p> <p>50% Recycling /Treatment            15% RDF/SRF            35% landfill</p> <p>By 2030:</p> <p>10% to Landfill            65% Recycling/Treatment            25% RDF/SRF</p>
<b>CD&amp;E Waste</b>	Scenario 1 Baseline Recycling	<p>C&amp;D Baseline position:</p> <p>Recycling and treatment currently in excess of 87%            Landfill less than 6.5%</p> <p>E waste Baseline position:</p> <p>33.5% Recycling/Re-use            &gt;21% Landfill            43% Recovery</p>



	<p>Scenario 2 Increased Recycling</p>	<p>EU Targets:                  By 2020                  70% recycling                  30% landfill/reclamation                  Above targets already exceeded for C&amp;D waste therefore no change proposed                   No change from baseline for Excavation waste</p>
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4.7 Growth factors for CD&E and C&I are based on the number of FTE employees as indicated by forecasts produced by Oxford Economics<sup>3</sup>. This data has been used for both baseline and increased recycling scenarios. For agricultural waste, no growth is assumed to take place. For LACW, this has been based on 3 different household number projections both using OAN figures, but with one also taking account of employment uplift and one using historic employment showing higher levels of employment. The OAN figures are 955 households per year, 1153 households per year with employment uplift projections and of 1384 households per year when looking at OAN higher (historic employment) .

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<sup>3</sup> Oxford Economics, May 2015

## 5 Local Authority Collected Waste

- 5.1 Local Authority Collected Waste (LACW) is all waste collected by the Local Authority.
- 5.2 LACW across Warrington is the responsibility of the Local Authority and is currently managed through a short term contract with FCC. LACW residual waste is currently bulked up and sent for treatment at Ferry Bridge power station where it is burnt as a fuel. This contract is currently in place until January 2018, with the option for a 2 year extension. The WDA are currently preparing a new Waste Management Strategy looking at the long term management of waste arising across the borough.

### Data Sources

- 5.3 The data sources for this waste stream are the Waste Collection Authority, the WDA, and the Defra database called 'Waste Dataflow'. The Council has not undertaken any long term projections of waste arisings across the borough, so future arisings will be calculated in line with household increases predicted over the Plan period. The household projection based on OAN (Objectively Assessed Needs) data is 955 households per year. The council has also asked us to model a further two options using OAN data. The first option includes employment uplift, this increases household projections to a figure of 1153 households per year, whilst the second presents a higher level using historic employment and increases household projections to 1384 households per yer.

### Baseline Arisings

- 5.4 The following table provides information on LACW arisings for Warrington in 2015/16 based on information taken from Waste Dataflow. A total of 97,795 tonnes arose in Warrington in 2015/16, see table 12 below for a detailed breakdown of how this was managed. As there are currently no waste transfer stations for LACW in Warrington, waste is first taken to a facility in Halton for bulking up and moved on to recovery, recycling or disposal.

Table 12: LACW arisings in 2015/16 for Warrington, tonnes

		Recycled, Composted or Re-Used	To Energy Recovery	To Landfill	Total arisings
<b>Warrington</b>	LACW	55,255	40,671	1,869	97,795

Source: Warrington WDA

## Forecast Arisings

5.5 Table 13 shows the forecast LACW arisings ranging from 97,795 tonnes in 2015 to 133,634 tonnes in 2037 using OAN higher (historic employment) figures. These figures have been based on the 3 different options for household growth supplied by Warrington as detailed in paragraph 5.3 above.

Table 13: LACW Forecast arisings (tonnes)

Waste Type	Quantity 2015	Quantity 2020	Quantity 2025	Quantity 2030	Quantity 2037
LACW Baseline	97795	102,071	102,071	102,071	102,071
LACW OAN	97,795	106,219	111,405	116,591	123,850
LACW OAN plus employment uplift	97,795	107,079	113,340	119,601	128,366
LACW OAN Higher (Historic Employment)	97,795	108,083	115,598	123,113	133,634

Source: Warrington waste model 2017

## Operating Capacity

5.6 Many of the facilities permitted to accept LACW will also accept other waste streams such as C&I and CD&E. It is therefore difficult to provide a figure for the total operating capacity for LACW. There are currently no facilities which purely take LACW in Warrington, and there is no local waste transfer station for managing this waste. There are numerous waste management sites within the Plan area that have a license to take waste materials of LACW composition however, this capacity is also available for C&I and CD&E waste streams. Table 9 above provides details of operating capacity for all waste streams over the Plan period.

## Projected Capacity Gap/Capacity Surplus

5.7 Recycling and Landfill capacity requirements are shown jointly with the C&I waste stream as most sites within the Plan area are licensed to also take waste materials similar in composition to LACW. Table 14 sets out the anticipated capacity gap for LACW and C&I waste over the Plan period, excluding Energy from Waste, RDF requirements for LACW only are shown. Figures with a minus show a capacity gap and positive figure indicate a surplus.

5.8 Energy recovery requirements from Warrington's LACW are currently dealt with under contract until 2018, with an option to extend this for a further 2 years. The residual waste is currently exported out of the area for management and it is expected that this option will continue under any new arrangements. However, should this not happen, there will be a capacity gap for dealing with this waste which is in the region of 41,000-55,000 tonnes/year by 2037.

Table 14: Forecast capacity requirements for LACW and C&I waste (tonnes) for baseline and increased recycling options.

Waste Management Method	Year	Baseline Growth and Scenario 1: Baseline Recycling	OAN Growth and Scenario 2 Increased Recycling	OAN Uplift Growth and Scenario 2 Increased Recycling	OAN Higher and Scenario 2 Increased Recycling
<b>Recycling (includes C&amp;I)</b>	2015	13,998	13,998	13,998	13,998
	2020	13,998	11,529	6,508	6,225
	2025	13,998	10,306	-3,157	-3,795
	2030	13,998	9,055	-9,446	-10,438
	2037	13,998	7,097	-11,748	-13,236
<b>RDF from LACW only</b>	2016	-40,671	-40,671	-40,671	-40,671
	2020	-40,671	-44,174	-44,532	-44,949
	2025	-40,671	-46,331	-47,136	-48,075
	2030	-40,671	-48,488	-49,740	-51,200
	2037	-40,671	-51,507	-53,385	-55,576
<b>Landfill</b>	2015	780,317	780,317	780,317	780,317
	2020	-74,511	-57,816	-57,832	-57,851
	2025	-74,511	-37,748	-37,785	-37,828
	2030	-74,511	-22,988	-23,046	-23,113
	2037	-74,511	-23,118	-23,204	-23,305

5.9 Table 14 shows that following the closure of existing landfill sites during the Plan period, there is a capacity requirement for non-hazardous landfill from 2018 throughout the Plan period under all recycling and growth options. For LACW, the requirements for landfill are assumed to stay in line with existing levels with less than 2 % of waste going to landfill, as such the requirement would not exceed 2,600tpa under the highest growth option. There is also a requirement for recycling facilities for LACW. The current capacity for all waste streams includes the Local Authority Household Waste Recycling Centre's, however the recycling from doorstep collections would not be managed at such sites and a localized recycling facility to handle this waste stream could be required. The current contract for dry recyclables ends in April 2017, with the option to extend for a further 2 years.

5.10 The WDA team has also indicated a need for a local Waste Transfer Station to remove the reliance on the facility in Halton. Currently waste is sent out of the borough for bulking up and then sent on for processing as recyclate etc; however a local facility could also include a MRF and meet two requirements in one.

5.11 The current contract for managing residual waste is to produce an RDF which is then sent to Ferry Bridge Power Station, however this contract is due to expire in January 2018, although there is the potential for a 2 year extension. This Needs Assessment identifies a capacity gap locally for managing this material within Warrington. To ascertain the level of provision in the North West for RDF processing, a review of existing and planned facilities was undertaken. Table 15 below provides details of facilities in the North West which have been identified as either having planning permission or

awaiting a decision and some already operating which could potentially manage this waste going forward. This work identifies that there are a number of facilities which could manage this waste going forward once the existing contract ends. However, Warrington would still need a facility to process LACW into RDF, again this could be through a similar facility to that currently used in Halton and combined with a transfer MRF facility.

**Table 15: Energy Recovery facilities with Planning Permission and /or built in the North West**

Facility Name	Location	Operational	Capacity
Kingsmoor Park EfW	Carlisle	No, PP granted Oct 2016	225,000tpa
Bolton EfW	Bolton	Yes	120,000tpa
Barton Combined Heat and Power Plant	Trafford	No. PP granted Apr 2014 majority capacity wood waste with small element of RDF	200,000tpa (biomass will account for at least 90% of capacity)
Runcorn EfW	INOVYN site, Runcorn	Yes – uses RDF to produce CHP	850,000tpa
Knowsley Gasification Plant	Knowsley	PP granted but Energos have gone in to liquidation and unclear on sites future	80,000tpa
Greengate ERF	St Helens	Awaiting Planning decision	150,000tpa
Ince resource Recovery Park	Cheshire West & Chester	Amended existing consent and construction expected in 2017	350,000tpa
Fleetwood Energy Recovery Plan	Fleetwood	PP granted and expected to become operational in 2017	80,000tpa

## 6 Commercial and Industrial Waste

### Data Sources

- 6.1 The method for calculating Commercial and Industrial (C&I) waste arisings is based on the approach set out in *New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England* (DEFRA, published August 2014)<sup>4</sup>. A summary of the approach used is provided in Appendix 4. This approach uses data from the Environment Agency WDI as the basis for calculating C&I waste arisings in Warrington.

### Baseline Arisings

- 6.2 A total of 165,234 tonnes of C&I waste was recorded as arising in Warrington in 2015. This total includes C&I waste arisings that were managed in Warrington but which have the origin of the arisings as not codeable beyond Cheshire. The Cheshire option has been chosen due to the historical setting of Warrington within Cheshire. A detailed description of the breakdown of the unknown arisings is provided in the methodology set out in Appendix 4. Waste arisings associated with waste water treatment and Fiddlers Ferry power station have been excluded from the Warrington totals as this waste cannot be solely attributed to Warrington.

### Forecast Arisings

- 6.3 Table 16 below provides information on forecast C&I waste arisings for Warrington. The forecasts have used information supplied by Warrington. This information was based on employment forecasts prepared by Oxford Economics. The Oxford Economic data shows a predicted increase in the number of employees in the commercial sector alongside a reduction in those in the industrial sector, as such overall, the number of employees drops below that of the baseline which results in a reduction in overall waste arisings.

Table 16: Forecast C&I waste arisings in Warrington (tonnes)

Year	Baseline	Growth
2015	165,234	165,234
2020	165,234	165,785
2025	165,234	165,785
2030	165,234	163,881
2037	165,234	161,457

### Operating Capacity

- 6.4 There are very few waste management facilities that are permitted only to receive C&I waste. Most facilities will accept C&I waste alongside CD&E waste and LACW. It would therefore be very difficult to give a precise figure for the total available capacity for C&I waste in Warrington. Full details of operating capacity through the plan period can be found in Table 10.

<sup>4</sup> DEFRA (2014) *New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England*



### Projected Capacity Gap/Capacity Surplus

- 6.5 Table 14 shows that under baseline growth and Scenario 2 recycling and growth with OAN uplift and Scenario 2 Recycling, there is a requirement for recycling facilities within Warrington. There is only one recycling facility and 3 Household Waste Recycling Sites currently handling this waste stream and as such a local recycling facility could provide for Warrington's recycling needs. Table 14 also identifies a requirement for landfill from 2018 as existing sites close. This requirement reduces under Scenario 2 Recycling as EU diversion targets of 10% to landfill are achieved.
- 6.6 Table 17 below identifies energy recovery requirements for C&I waste. As with LACW, it is assumed a local facility will be developed to produce RDF and that this will be processed elsewhere. Warrington is not seeking to provide additional energy recovery capacity above that already built or permitted within the NW region.
- 6.7 Table 17 also identifies a small treatment requirement from 2021. This requirement is for C&I, LACW and C&D. It is hard to say what the specific requirements will be, however this small gap could be met by the surplus treatment capacity available for CD&E waste, should the capacity available be capable of meeting this need. However, it may be useful to plan for a requirement of one small treatment facility for C&I waste which includes anaerobic digestion, specialized treatment of biodegradable liquids and wastes and organic waste treatment by distillation.

Table 17: C&I waste management requirements 2015-2037 assuming growth (tonnes)

Waste Management Method	Year	Baseline	Increased recycling
Energy Recovery (C&I only)	2015	-237	-237
	2020	-238	-24,868
	2025	-235	-32,766
	2030	-233	-40,552
	2037	-232	-40,364
Treatment Plant LACW< C&I and C&D	2015	6,291	6,291
	2020	3,403	533
	2025	2,486	-3,630
	2030	1,960	-5,715
	2037	1,151	-6,488

Source Warrington Waste Model 2017.

## 7 Construction, Demolition and Excavation Waste

7.1 Waste materials generated from Construction, Demolition and Excavation (CD&E) operations include a wide range of surplus waste construction materials as well as materials generated by the demolition of old buildings and soils and sub-soils from excavation. Most of these materials are inert with respect to their pollution potential. However, materials such as wood are biodegradable, plasterboard produces a polluting leachate, and asbestos is classified as hazardous.

### Data Sources

7.2 An estimate of how much CD&E waste is produced in Warrington can be made by looking at how much CD&E is managed through permitted sites. Data has been published by the Environment Agency for 2015 (EA WDI) and this gives the quantities of CD&E waste deposited at sites which are subject to an Environmental Permit. This data provides some information on origin and waste movements; but it is incomplete as not all details are fully recorded. However, it remains the most appropriate data set available and is considered the best approach.

7.3 The EA provided details of current waste exemptions in Warrington, following a review of this information, there are 196 registered waste exemptions in Warrington. Of these, 27 were identified as using materials which would be classed as CD&E, however there is no corresponding data on the tonnages these sites will be handling. As such no estimates can be made on the levels of waste coming from these sources to alter the arisings levels for this waste stream.

### Baseline Arisings

7.4 Table 18 shows that there was in the order of **549,356 tonnes** of CD&E waste deposited in 2015 in Warrington. However not all of this waste arose within Warrington; a total of 227,867<sup>5</sup> tonnes arose within the Plan area. Table 19 shows the types of facilities where CD&E waste is managed in Warrington.

**Table 18: CD&E waste deposits by management method in Warrington in 2015 (tonnes)**

Management Method	Construction and Demolition Waste	Excavation Waste	Total
CA site	337		337
Haz Waste Transfer/Treatment	56,449	52,023	108,471
Inert Landfill	16,495	130,255	146,750
Non Hazardous Landfill	5,657	82,367	88,024
Non Hazardous Transfer	4,447	3,451	7,898
Non Hazardous Transfer/Treatment	4,679	5,041	9,720
Deposit of waste to land (recovery)		166,113	166,113
Restricted Landfill		22,042	22,042
<b>Totals</b>	<b>88,063</b>	<b>461,293</b>	<b>549,356</b>

Source: EA WDI 2015

<sup>5</sup> This figure includes waste classed as WPA not codeable Cheshire which was deposited in Warrington as this is assumed to have originated here.

7.5 Table 19 shows that only 6 % of Construction and Demolition waste arisings in Warrington are exported.

**Table 19: Management of Construction and Demolition Wastes Arising in Warrington in 2015 (tonnes)**

<b>Construction &amp; Demolition Waste</b>			
Site type	Managed Locally	Exported	Total Arisings
CA Site	337	-	337
Deposit of waste to land (recovery)	-	16	16
Haz Waste Transfer/Treatment	56,449	518	56,967
Haz Waste Transfer	-	43	43
Hazardous Merchant LF	-	747	747
Inert LF	6,250	-	6,250
Inert Transfer	-	16	16
Inert Transfer/Treatment	-	63	63
Material Recycling Facility	-	35	35
Metal Recycling	-	33	33
Non Hazardous LF	1,225	3,029	4,254
Non-Haz Waste Transfer	4,447	5	4,452
Non-Haz Waste Transfer / Treatment	4,679	62	4,741
Non Haz (SNRHW) LF	-	321	321
Physical Treatment	-	16	16
Physical-Chemical Treatment	-	1	1
<b>TOTAL</b>	<b>73,387</b>	<b>4,905</b>	<b>78,291</b>
% of waste managed	94%	6%	

Source: EA WDI 2015

7.6 Table 20 shows that only 11 % of excavation waste is exported.

**Table 20: Management of Excavation Wastes Arising in Warrington in 2015 (tonnes)**

Excavation Waste			
Site type	Managed Locally	Exported	Total Arisings
Chemical Treatment	-	272.72	272.72
Deposit of waste to land (recovery)	64,337	-	64337
Haz Waste Transfer/Treatment	52,023	-	52022.901
Haz Waste Transfer	-	11	10.8
Hazardous Merchant LF	-	136	135.88
Inert LF	29,595		29595
Inert Transfer	-	428	428
Non Hazardous LF	33	5,611	5643.92
Non-Haz Waste Transfer	3,451	1,000	4451.45
Non-Haz Waste Transfer / Treatment	5,041	-	5041.16
Non Haz (SNRHW) LF	-	109	108.72
Physical Treatment	-	1,054	1054
Physical-Chemical Treatment	-	100	100.45
Reclamation	-	10,480	10480
<b>TOTAL</b>	154,481	19,201	173,682
% of waste managed	89%	11%	

Source: EA WDI 2015

7.7 Table 21 provides detail on the movement of wastes into and out of transfer stations.

**Table 21: Movements of CD&E Wastes through Transfer Stations in Warrington in 2015 (tonnes)**

Nature of movement	Construction & Demolition (tonnes)	Excavation (tonnes)
Locally arising wastes managed at local WTSs	4784	3451
Wastes imported	3154	-
Wastes removed from local WTSs	7883	3451

### Forecast Arisings

7.8 Table 22 shows the forecast arisings for CD&E waste at five-year intervals throughout the Plan period under agreed growth levels in line with the Oxford Economics data. The forecast is based on arisings from 2015 and includes waste deposited within Warrington known to arise in Warrington and waste managed in Warrington which is known to arise within the North West.

**Table 22: Forecast Arisings for CD&E in Warrington in 2015 (tonnes)**

Year	Baseline	Growth
2015	241,682	241,682
2020	241,682	244,892
2025	241,682	246,374
2030	241,682	247,352
2037	241,682	248,453

### Operating Capacity

7.9 It is not possible to identify the total existing capacity available to manage CD&E waste. This is because a number of facilities will accept these wastes alongside other waste streams. Operational exclusive CD&E waste management capacity at all types of facilities within Warrington is 1,912,660 tonnes as at 2015; however this includes 100,000 tonnes at Port Warrington which is now assumed to be complete and over 1 million tonnes of capacity at restricted landfill sites.

### Projected Capacity Gap/Capacity Surplus

7.10 As explained above, it is not possible to identify a projected separate capacity gap for CD&E with a high degree of certainty. However, the capacity gap for inert waste landfill can be identified due to the specifics of the waste that can be taken at these sites. As the recycling and recovery targets for CD&E waste have been met already, there is no change under any of the scenarios as there is assumed no growth in the waste stream even when applying the Oxford Economics data. Therefore there is a gap in provision of 35,588 tonnes of inert landfill from 2032 throughout the remainder of the Plan period due to the closure of Southworth Quarry in 2031.

- 7.11 There is a small shortfall of treatment capacity for LACW, C&I and C&D from 2021 when recycling increases are applied, ranging from a modest;
- 1,527 tonnes per annum by 2037 under Scenario: Baseline growth recycling ; to
  - 6,488 tonnes in 2037 under Scenario: Recycling and Growth.
- 7.12 There is excess treatment capacity solely for the use of CD&E and it is likely that C&D waste will be treated at these sites and would meet this shortfall; as such there is no anticipated need for additional treatment capacity for CD&E waste.
- 7.13 There are currently 2 sites accepting inert C&D waste as recovery. These sites are:
- Woolston Deposit Ground ; and
  - Port Warrington Facility
- 7.14 The Port Warrington facility was expected to have closed in 2016 and as such is not assumed to provide any further capacity going forward. The Woolston Depot Ground, operated by Churchill Enviro Ltd is due to close in 2031. Following closure of this site, there will be a gap in provision of recovery of C&D waste in the order of 73,412 tonnes per annum from 2032 onwards.

## 8 Hazardous Waste

- 8.1 The 2005 Hazardous Waste (England and Wales) Regulations and the List of Wastes (England and Wales) Regulations set out what is defined as hazardous waste. Waste is classified as “Hazardous Waste” if it has characteristics that make it harmful to human health, or to the environment, either immediately or over an extended period of time.
- 8.2 Hazardous waste is a sub category of LACW, C&I and CD&E wastes. Estimated totals for LACW, C&I waste and CD&E waste are inclusive of waste in the sub-category of hazardous.

### Data Sources

- 8.3 Data on hazardous waste is sourced from the 2015 Hazardous Waste Environment Agency Interrogator.

### Baseline Arisings

- 8.4 A total of 10,908.39 tonnes of hazardous waste was recorded as arising in Warrington in 2015. Of this, only 33 tonnes was actually managed in Warrington, the rest was exported out of the area for management. The largest proportion of waste, 60%, was sent on for recovery with 8% to landfill.

### Forecast Arisings

- 8.5 Table 23 provides information on forecast hazardous waste arisings for Warrington.

**Table 23: Forecast Hazardous waste arisings in Warrington (tonnes)**

Arisings	Baseline	Growth
2015	10,865	10,865
2020	10,865	11,181
2025	10,865	11,519
2030	10,865	11,932
2037	10,865	12,394

### Operating Capacity

- 8.6 There is very limited capacity in Warrington for the management of Hazardous waste, most of which is confined to transfer facilities or metal recycling sites. The majority of hazardous waste is sent out of the area for management elsewhere.

### Projected Capacity Gap/Capacity Surplus and Required Facilities

- 8.7 There is a forecast gap in capacity for hazardous landfill throughout the Plan period under all scenarios, see table 24 below. The requirement ranges from 1,954 tonnes under baseline growth up to 2,199 tonnes under growth. However, as there are no sites able to take this material it is expected that this will continue to be exported out of the area and Warrington will need to undertake DtC with the receiving authorities.

Table 24 Hazardous waste capacity requirements

Waste Management Method	Year	Baseline Growth and Scenario 1: Baseline Recycling	OAN Growth and Scenario 2 Recycling
<b>Landfill (Hazardous)</b>	2015	-1,954	-1,954
	2020	-1,954	-2,013
	2025	-1,954	-2,078
	2030	-1,954	-2,119
	2037	-1,954	-2,199
<b>Energy from Waste (Hazardous)</b>	2016	-237	-8,015
	2020	-237	-8,248
	2025	-237	-8,497
	2030	-237	-8,748
	2037	-237	-9,143
<b>Thermal treatment (hazardous – no energy recovery)</b>	2015	-95	-95
	2020	-95	-98
	2025	-95	-101
	2030	-95	-104
	2037	-95	-109
<b>Treatment (Hazardous)</b>	2015	-1,226	-1,226
	2020	-1,226	-1,261
	2025	-1,226	-1,300
	2030	-1,226	-1,338
	2037	-1,226	-1,398

- 8.8 At the end of 2015, there was 4,682,000m<sup>3</sup> of hazardous merchant capacity in the northwest and a further 9,404,000m<sup>3</sup> of capacity within the Non Hazardous SNRHW cell. In addition to hazardous waste requirements, this Needs Assessment has also identified a requirement for up to 500 tonnes per annum of Non hazardous SNRHW capacity for CD&E waste.
- 8.9 Table 24 also identifies a requirement of 8,015 tonnes in 2015 increasing to 9,143 tonnes in 2037 for energy recovery of hazardous waste and up to 109 tonnes in 2037 of thermal treatment of hazardous waste (without thermal recovery).
- 8.10 There is also a requirement of between 1,226 tonnes in 2015 and 1,398 tonnes in 2037 for treatment of hazardous waste regardless of the growth scenario
- 8.11 Hazardous waste facilities for most forms of treatment, incineration and for landfill are located outside the Plan area and it is anticipated that this provision will continue and remain available throughout the Plan period. It should be noted that hazardous waste facilities require economies of scale so that



provision of facilities within the plan area for the small quantities of arisings would be unlikely to be viable, unless a new facility were to import significant quantities from outside the area.

## 9 Agricultural Waste

9.1 Agricultural premises are defined in the Agriculture Act 1947 as land used for: horticulture, fruit growing, seed growing, dairy farming, livestock breeding and keeping, grazing land, meadow land, osier land (growing willow), market gardens and nursery grounds. It also includes woodlands where that use is ancillary to the use of land for other agricultural purposes. This definition includes all arable farming.

9.2 This waste is made up of the following substances:

- Compostable and digestible materials (farm yard manure, slurry, vegetables);
- Combustible materials (straw, silage wrap (plastic), bale twine and net (plastic), fertiliser and seed bags (plastic), animal feed bags (plastic), animal feed bags (paper & card), horticulture (plastic), tree guards (plastic), paper seed bags (paper & card), and oil);
- Hazardous and Difficult Waste; chemical materials (silage effluent), agrochemical (plastic), agrochemical (paper & card), animal health (plastics), animal health (paper & card), animal health (glass), animal health (rubber/metal), pesticide washings, sheep dip (organic phosphates) and sheep dip (synthetic pyrethroids); and
- Other (waste milk).

9.3 However some of the above materials can also be defined as agricultural by-products and not necessarily wastes due to the fact they contain important nutrient resources and they are not defined as wastes when applied to the land as fertiliser for agricultural improvement or put to some other beneficial use on-farm.

### Data Sources

9.4 In order to estimate agricultural waste arisings for Warrington, data has been extrapolated using the relationship between the number of farm holdings and associated waste generation. This work is based on the Defra annual agricultural census by region and farm type (particularly the dataset called *Local Authority breakdown for key crops areas and livestock numbers on agricultural holdings for 2013*<sup>6</sup> which provided a local authority breakdown for the number of farm holdings) and the report *Towards Sustainable Agricultural Waste Management* (Environment Agency, 2001).

9.5 The principal source on agricultural waste arisings and management methods are well over a decade old, however, this approach assumes that the on-farm activities that generate wastes will not have changed significantly over the intervening period. The estimate given below has been derived from published regional information and scaled down to provide a representative figure for the Warrington area alone, which will introduce some inaccuracy. Furthermore, for the purposes of the Defra Agricultural Census, Warrington is grouped together with Halton and therefore the data on agricultural

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<sup>6</sup> <https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june>

arisings overestimates the amount of waste produced in Warrington but will provide a 'worst case' scenario.

## Baseline Arisings

9.6 There are 135 commercial farm holdings in Warrington (and Halton) (Defra, 2013). Data on estimated agricultural waste arisings at the regional level from 1998 has been used to extrapolate an agricultural waste arising for Warrington of approximately 92,200 tonnes of waste per annum, the majority being managed within the generating farm holding.

**Table 25: Estimates of Agricultural Waste Arisings in the North West (1998)**

Waste type	Quantity Arising in the North West per annum (tonnes)
Plastic Packaging	2,079
Cardboard and paper packaging	681
Metal, glass, wood and rubber packaging	2,891
Other non-packaging plastics	14,497
Agrochemicals	3,084
Animal Health Products	11,215
Machinery Waste (oils, batteries, tyres, redundant machinery)	6,086
CD&E Waste (Asbestos Cement Bonded Roof Sheeting)	1,768
Organic by-products waste (slurry, waste milk, straw)	8,261,467
Animal By-products	28,201

Source: Environment Agency (2001) *Towards sustainable agricultural waste management*, Appendix C

**Table 26: Extrapolated Agricultural waste Arisings (rounded) for Warrington based on 135 Farm Holdings<sup>7</sup>**

Waste Type	Potential Waste Management Treatment Route	Quantity Arising in Warrington per annum (tonnes) (rounded)
Plastic Packaging	Recycling/Landfill	23
Cardboard and paper packaging	Composting on site/recycling/ landfill	8
Metal, glass, wood and rubber packaging	Recycling/landfill	32
Other non-packaging plastics	Recycling/landfill	160
Agrochemicals	Treatment/incineration	34
Animal Health Products	Incineration	124
Machinery Waste (oils, batteries, tyres, redundant machinery)	Recycling/treatment	67
CD&E Waste (Asbestos Cement Bonded Roof Sheeting)	Hazardous Landfill	20
Organic by-products waste	Composting/land recovery/ treatment on	91,433

<sup>7</sup> For reference, the total number of farm holdings in the North West in 2013 was 12,198.

(slurry, waste milk, straw)	site	
Animal By-products	Specialised Treatment	312
<b>TOTAL ARISINGS</b>		<b>92,213</b>

Sources: Environment Agency (2001) *Towards sustainable agricultural waste management*, Appendix C; Defra (2013) *June Census Local Authority breakdown for key crops areas and livestock numbers on agricultural holdings*

9.7 Table 27 summarises the waste arisings by treatment route. In each case it is assumed that the current management method represents the optimal management route with respect to the Waste Hierarchy – e.g. all material suitable for recycling is managed in that way and is not disposed to landfill. Table 27 also distinguishes between waste that is currently managed on site and that which should be managed off site. Only the latter material would require management capacity that is currently available or that would be delivered by policies and allocations in the Local Plan.

9.8 Table 27 shows that the majority of agricultural waste arisings (91,441 tonnes, or 99% are managed on the farm. Therefore approximately **770 tonnes** are managed off site. For the purposes of planning for this waste stream, it is the 770 tonnes of waste requiring off-site management that should be considered.

**Table 27: Potential Treatment Routes for Extrapolated Agricultural Waste Arisings for Warrington**

Waste Management Route	Tonnage
<i>Management within the farm holding</i>	
Composting on site/ land recover/ treatment on site	91,441
<i>Management outside of the farm holding</i>	
Recycling	282
Treatment plant/ incineration	158
Animal by-products incineration	312
Landfill	0
Hazardous Landfill	20
<b>Total Management off site</b>	<b>772</b>
<b>Total Arisings</b>	<b>92,213</b>

## Forecast Arisings

9.9 It will be necessary to provide for management of waste leaving the farm holdings amounting to approximately 770 tonnes per annum (assuming no growth in the volume of agricultural waste arisings).

9.10 New legislation came into force in April 2010 amending the existing system of waste exemptions including agricultural waste exemptions currently undertaken by farmers. All farmers had to re-register their agricultural exemptions covering such practices as land spreading and depositing dredgings cleared from farm ditches along banks from 1st October 2013. In addition to re-registration some of the exemptions are also changing. There are approximately 30 exemptions covering agricultural activities and nearly all exemption activities covered at present will still be covered in the new system. However,

in some cases there may be slight changes to the limits and conditions within the waste exemption. There are also a number of new exemptions that could be applied to farming.

- 9.11 In addition to any effect of the new exemption regulations, it is likely that in the future more waste could be diverted from landfill to recycling (due to the increasing awareness of the potential to recycle). It is likely that the majority of agricultural waste will still be managed within the farm holdings via land treatment/spreading and composting. The quantities involved for management off-site from farm holdings are likely to be so small they will be of low significance in the overall waste arisings for Warrington.

### **Operating Capacity**

- 9.12 The majority of arisings are managed on the farm holdings via land treatment/spreading, composting and, increasingly, by on-site aerobic digestion.

### **Projected Capacity Gap/Capacity Surplus**

- 9.13 Data sources for agricultural waste are based upon extrapolations of data from past survey information carried out in 2001 and 2003. These original surveys also noted that an assessment of the likely accuracy of the estimates has been undertaken and this was defined as 'Medium'.
- 9.14 It is likely that the majority of agricultural waste will still be managed within the farm holdings via land treatment/spreading and composting.
- 9.15 The future arisings that will require management off site are likely to be small, less than 770 tonnes per annum. There is no immediate need to provide any new facilities solely to cover agricultural wastes. Waste generated that requires specialist treatment is likely to continue to be treated at appropriate facilities over the plan period.

## 10 Low Level Radioactive Waste

### Data Sources

- 10.1 Most (98%) of Low Level Radioactive (LLR) Waste in the UK arises from operation of nuclear power stations, nuclear fuel reprocessing facilities, and also from the decommissioning and clean-up of nuclear sites. The remaining 2% is produced by non-nuclear industry users of radioactivity. No nuclear sites are located in Warrington. Non-nuclear industries are the sole producers of LLR Waste in Warrington for which capacity will need to be planned. Therefore, when compared to the total LLR Waste produced in the UK, the amount produced in Warrington is very small.
- 10.2 The EA regulate how users of radioactive substances dispose of their LLR waste. They do this by granting permits that place limits on disposal of solid waste to land and on discharges to water and air.
- 10.3 In February 2016, the UK Government published an updated UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry<sup>8</sup>. The strategy was prepared by the Nuclear Decommissioning Authority (NDA) and sets out the need to apply the waste hierarchy, make best use of existing LLR Waste management assets and the need for new fit-for-purpose waste management routes for LLR Waste.

### Baseline Arisings

- 10.4 There is only one site in Warrington which produces LLR waste; this is Amec Foster Wheeler as confirmed by the EA. Table 28 below details the levels of waste produced in 2015. The amount of waste produced is low in quantity.

Table 28:LLR producers and quantity 2015

OPERATOR NAME	SUBSTANCE NAME	ROUTE NAME	QUANTITY RELEASED	UNIT OF MEASURE ID
AMEC NUCLEAR UK LTD	Carbon 14	Wastewater	4.4	KBq
AMEC NUCLEAR UK LTD	Total Alpha	Wastewater	114	KBq
AMEC NUCLEAR UK LTD	Tritium	Wastewater	1.6	MBq
AMEC NUCLEAR UK LTD	Total Beta/Gamma (Excl Tritium)	Wastewater	4.6	MBq

- 10.5 Some waste is also produced by Warrington and Halton Hospital, see table 29 below.

<sup>8</sup> DECC et al *UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry* February 2016  
[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/497114/NI\\_LLW\\_Strategy\\_Final.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/497114/NI_LLW_Strategy_Final.pdf)

Table 29: LLR produced by Warrington and Halton Hospital

OPERATOR NAME	SUBSTANCE NAME	ROUTE NAME	QUANTITY RELEASED	UNIT OF MEASURE ID
WARRINGTON AND HALTON HOSPITALS NHS FOUNDATION TRUST	Technetium 99m	Wastewater	181,924	MBq

### Forecast Arisings

- 10.6 There is no likelihood of a nuclear facility being located in Warrington over the Plan period, which means it is highly unlikely that LLR Waste will increase significantly above current levels.
- 10.7 It is recognised that future volumes of LLR Waste could be influenced by the scale of any future shale gas development in the Warrington, but the overall extent of potential arisings from this source cannot be quantified at this time.

### Operating Capacity

- 10.8 There are no permitted premises in Warrington that receive LLR waste. The permitted premises in the Warrington that do generate LLR waste, dispose of that waste either under exemption as Very Low Level Waste, or to sewer, or by transfer facilities in the North West.

### Projected Capacity Gap/Capacity Surplus

- 10.9 Arisings of LLR Waste from existing sources are not expected to change over the plan period. It is unlikely that the management routes of the small amount of LLR Waste produced in Warrington will change over this period. However, as discussed above, if shale gas extraction develops in Warrington, this could impact on the level of future arisings but the overall extent of potential arisings from this source cannot be quantified at this time.
- 10.10 It is recommended that Warrington make contact, under the Duty to Cooperate, with relevant authorities in order to establish whether they are aware of any foreseeable changes which may affect the position for LLR Waste over the plan period.

## 11 Waste Water/Sewage Sludge

### Data Sources

- 11.1 Waste Water Treatment Works in Warrington are operated by United Utilities. United Utilities are required to produce plans under the Water Act 2003.

### Baseline Arisings

- 11.2 Water companies plan operations in 5-year cycles, known as an Asset Management Period (AMP). The current AMP is known as AMP6 – the sixth period – which runs from 2015-2020. During AMP6, UK water companies will come under increased pressure to improve their relative efficiency whilst achieving improved wastewater effluent quality. In 2016 the water companies will start preparing for AMP7 – the seventh period – including assessing what new waste water infrastructure will be required post-2020.
- 11.3 In 2015, United Utilities published a Water Resources Management Plan covering the period from 2016 to 2040. The plan describes in detail an assessment of the available water supplies and the demand for water by customers over the 2015 – 2040 period. The plan also sets out the proposed strategy for water resources and demand management to ensure adequate water supplies to serve customers.

### Forecast Arisings

- 11.4 United Utilities are involved in consultations on the Local Plan Review which would help inform growth requirements.

### Operating Capacity

- 11.5 The Business Plan 2015 – 2020 explains that, over the 5-year period, United Utilities intend to invest in sewer infrastructure so it can meet demand from the region's growing population and business sector. They will also work closely with local authorities and developers to make sure there is adequate sewer capacity to support the development and economy of the North West.

### Projected Capacity Gap/Capacity Surplus and Required Facilities

- 11.6 As a general principle, when greater capacity is required, WWTW operators would try and place new plant on existing treatment works or, failing that, acquire land from an adjacent land owner. Therefore, it is unlikely that new sites will be required within the plan area to handle waste water/sewage sludge. However, in some circumstances it may be beneficial to do so, for example if there are site sensitive receptors near to an existing works making expansion unfeasible. The precise location would be dependent on engineering and environmental feasibility studies.
- 11.7 United Utilities should be kept informed of Plan preparation and invited to comment at relevant stages.



## 12 Movement of Waste across Authority Boundaries

12.1 A summary of Imports and Exports of waste into and out of Warrington is shown in Table 30. Further details of movements of waste are shown in Appendix 7. The table is a snapshot in time and shows that, in 2015, a high proportion of inert CD&E waste arising in Warrington were also managed in Warrington. However, a considerable proportion of the hazardous waste arising in Warrington is exported and managed elsewhere.

**Table 30 Imports and Exports Summary for Warrington (2015)**

	<b>Hazardous</b>	<b>Household Industrial &amp;Commercial</b>	<b>Inert CD&amp;E</b>	<b>Total (tonnes)</b>
Waste originating in Warrington and managed in Warrington	33	579,749 <sup>9</sup>	227,867	807,649
Waste arising elsewhere and managed in Warrington (imports)	266	680,394	322,923	1,003,583
Waste arising in Warrington and exported for management elsewhere (exports)	10,875	65,811	25,149	101,835

Source: EA WDI 2015

12.2 Table 31 shows activity at transfer stations within Warrington. The difference between waste deposited and waste removed is -1,446, therefore indicating that in 2015 slightly more waste was removed than managed in Warrington.

**Table 31 Waste Deposited at Transfer Stations and subsequently removed for onward Waste Treatment, Warrington (2015)**

	<b>Household Industrial &amp; Commercial</b>	<b>Inert</b>	<b>Hazardous</b>	<b>Total</b>
Waste deposited at Waste Management Sites in Warrington	198,310	11,389	0	209,700
Waste removed from Waste Management Sites in Warrington	188,937	11,334	10,875	211,146

\*Data taken from EA HWDI looking at waste exports from Warrington. As there are no hazardous facilities, all waste is exported

12.3 A list of planning authorities for which there have been cross border waste movements for the various waste types are shown in Appendices 5, 6 and 7.

<sup>9</sup> This figure includes 166,531 tonnes of thermal process waste from Ferry bridge power station

## 13 Summary of future waste management requirements and overall conclusions

13.1 Tables 32, 33 and 34 show the predicted future capacity gaps/surplus for Warrington for each of the recycling scenarios for the 'Growth' rate option. Figures shown in negative represent a capacity gap, meaning new facilities are required; positive figures represent a capacity surplus, for which no new facilities have been identified as being required.

### Recycling and Treatment Requirements

10.1 There is a capacity surplus for recycling facilities for LACW and C&I waste throughout the Plan period under all options, therefore no additional facilities are required.

10.2 The WDA team has indicated a need for a local Waste Transfer Station to remove the reliance on the facility in Halton. Currently waste is sent out of the borough for bulking up and then sent on for processing as recycle etc. It is not currently proposed to include a recycling element as part of the development of a localised WTS, as such there is a need for provision of recycling facilities to manage LACW.

13.2 There is a requirement for additional treatment capacity for LACW, C&I, and C&D waste during the Plan period. The requirement varies between the different growth options under Scenario 2. However, there is no gap under Scenario 1. There is a requirement for capacity of 1,527 tonnes under the baseline growth option from 2031 and from 2021 under the growth option where the requirement increases from 1,395 tonnes to 6,488 tonnes by 2037.

13.3 Existing treatment facilities accept C&I, C&D and LACW, with additional treatment capacity also available purely for CD&E waste. It is hard to say what the specific requirements will be, however this small gap could be met by the surplus treatment capacity available for CD&E waste, should the capacity available be capable of meeting this need. However, it may be useful to plan for a requirement of one small treatment facility for C&I waste which includes anaerobic digestion, specialized treatment of biodegradable liquids and wastes and organic waste treatment by distillation for C&I waste.

### Energy and Treatment requirements

13.4 A requirement for facilities to produce RDF has been identified throughout the plan period under all options for both LACW and C&I. As there is currently no localized facility to produce RDF/SRF, it is proposed that a local facility is required to process and treat LACW and C&I waste to produce RDF/SRF for use in energy recovery. There are already a number of facilities with planning permission in the North West (see Table 14 earlier for site specific details) which would go some way to meeting this gap should they all be developed. This requirement is currently met through export outside the plan area. This requirement should be kept under review to assess to what extent existing permitted sites may be able to meet this need.

13.5 There are no specialist high temperature incinerators within the Plan area and a capacity gap is identified for this waste management route throughout the Plan period under all scenarios. This waste

is currently exported for treatment elsewhere within the region. Due to the fairly low levels of waste requiring management via this route, it is not likely to be economically viable for a facility to be built solely to manage waste arising within the plan area, and therefore it is likely that this waste will continue to be exported or a larger scale facility developed to take waste from surrounding areas.

### Landfill requirements

- 13.6 Under both recycling scenarios, there is a requirement for hazardous waste landfill. The requirement ranges from 1,954 tonnes under baseline growth up to 2,199 tonnes under growth. However, as there are no sites able to take this material it is expected that this will continue to be exported out of the area and Warrington will need to undertake DtC with the receiving authorities.
- 13.7 Following the closure of existing landfill sites during the plan period, there is a capacity requirement for non-hazardous landfill from 2018 throughout the Plan period under all recycling and growth options. For LACW, the requirements for landfill are assumed to stay in line with existing levels with less than 2 % of waste going to landfill, as such the requirement would not exceed 2,600tpa under the highest growth option and for C&I are projected to fall to around 23,000 tonnes in order to meet the EU Target of 10% to landfill by 2030.
- 13.8 The capacity gap for inert waste landfill can be identified due to the specifics of the waste that can be taken at these sites. As the recycling and recovery targets for CD&E waste have been met already, there is no change under any of the scenarios as there is assumed no growth in the waste stream even when applying the Oxford Economics data, therefore there is a gap in provision of 35,588 tonnes from 2032 throughout the remainder of the plan period due to the closure of Southworth Quarry in 2031.

**Table 32: Waste Management Capacity Requirements by waste stream and management method – Growth/ Scenario 1: Baseline recycling**

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2037
Landfill (C&I and LACW)	780,317	-75,091	-74,490	-73,954	-73,848
Landfill (Hazardous)	-1,954	-2,013	-2,067	-2,119	-2,199
Landfill (CD&E)	437,762	437,762	437,762	437,762	-35,588
Energy from waste (C&I)	-237	-238	-235	-233	-232
Energy from waste (Hazardous)	-8,015	-8,248	-8,497	-8,748	-9,143
Thermal Treatment (Hazardous - no energy recovery)	-95	-98	-101	-104	-109
Recycling (Hhold, C&I , haz)	13,998	11,529	10,306	9,055	7,097

Recycling Metals	3,789	3,731	3,927	4,100	4,178
Treatment (Hazardous)	-1,226	-1,261	-1,300	-1,338	-1,398
Composting	44,373	41,993	40,528	39,063	37,012
Treatment plant LACW, C&I, C&D)	6,291	3,403	2,486	1,960	1,151
Treatment Plant CD&E	42,620	42,620	42,620	42,620	42,620
Land recovery	140,208	406,040	405,952	405,893	-67,522
Recovery LACW	-40,671	-44,174	-46,331	-48,488	-51,507
Transfer LACW, C&I, CD&E	15,262	15,011	15,082	15,165	15,161
<b>Total</b>	<b>1,432,422</b>	<b>830,965</b>	<b>825,642</b>	<b>820,635</b>	<b>-134,327</b>
<b>LACW Requirements with OAN uplift</b>					
Landfill (C&I and LACW)	780,317	-75,107	-74,527	-74,012	-73,934
Recycling (Hhold, C& I , haz)	13,998	11,286	9,759	8,205	5,821
Composting	44,373	41,750	39,981	38,212	35,736
Recovery LACW	-40,671	-44,532	-47,136	-49,740	-53,385
<b>LACW Requirements with OAN Higher (Historic Employment)</b>					
Landfill (C&I and LACW)	780,317	-75,127	-74,570	-74,079	-74,035
Recycling (Hhold, C& I , haz)	13,998	11,002	9,121	7,213	4,333
Composting	44,373	41,466	39,343	37,220	34,248
Recovery LACW	-40,671	-44,949	-48,075	-51,200	-55,576

Table 33: Waste Management Capacity Requirements by waste stream and management method – Growth/ Scenario 2: Recycling

Waste Management Method	Gap/Surplus capacity by year (tonnes)				
	2015	2020	2025	2030	2037
Landfill (C+I and LACW)	780,317	-57,816	-37,748	-22,988	-23,118
Landfill (Hazardous)	-1,954	-2,013	-2,067	-2,119	-2,199
Landfill (CD&E)	437,762	437,762	437,762	437,762	-35,588

Energy from waste (C&I)	-237	-24,868	-32,776	-40,552	-40,364
Energy from waste (Hazardous)	-8,015	-8,248	-8,497	-8,748	-9,143
Thermal Treatment (Hazardous - no energy recovery)	-95	-98	-101	-104	-109
Recycling (Hhold, C+I , haz)	13,998	11,529	10,306	9,055	7,097
Recycling Metals	3,789	3,731	3,927	4,100	4,178
Treatment (Hazardous)	-1,226	-1,261	-1,300	-1,338	-1,398
Composting	44,373	41,993	40,528	39,063	37,012
Treatment plant LACW, C&I, C&D)	6,291	533	-3,630	-5,715	-6,488
Treatment Plant CD &E	42,620	42,620	42,620	42,620	42,620
Land recovery	140,208	140,207	140,207	140,207	-73,413
Recovery LACW	-40,671	-44,174	-46,331	-48,488	-51,507
Transfer LACW C&I, CDE	15,262	29,403	29,309	29,247	29,178
<b>Total</b>	<b>1,432,422</b>	<b>569,300</b>	<b>572,211</b>	<b>572,003</b>	<b>-123,244</b>
<b>LACW Requirements with OAN uplift</b>					
Landfill (C+I and LACW)	780,317	-57,832	-37,785	-23,046	-23,204
Recycling (Hhold, C+I , haz)	14,032	6,544	-3,121	-9,409	-11,710
Composting	44,373	41,750	39,981	38,212	35,736
Recovery LACW	-40,671	-44,532	-47,136	-49,740	-53,385
<b>LACW Requirements with OAN Higher (Historic Employment)</b>					
Landfill (C&I and LACW)	780,317	-57,851	-37,828	-23,113	-23,305
Recycling (Hhold, C+I , haz)	13,998	6,225	-3,795	-10,438	-13,236
Composting	44,373	41,466	39,343	37,220	34,248
Recovery LACW	-40,671	-44,949	-48,075	-51,200	-55,576

Table 34: Waste Management Capacity Requirements by waste stream and management method – NO Growth /Scenario2: Recycling

Waste Management Method	Gap/Surplus capacity by year (tonnes)
-------------------------	---------------------------------------

	2015	2020	2025	2030	2037
Landfill (C+I and LACW)	780,317	-57,293	-37,465	-22,594	-22,594
Landfill (Hazardous)	-1,954	-1,954	-1,954	-1,954	-1,954
Landfill (C,D&E)	437,762	437,762	437,762	437,762	-35,588
Energy from waste (C&I)	-237	-24,785	-33,047	-41,309	-41,309
Energy from waste (Hazardous)	-8,015	-8,015	-8,015	-8,015	-8,015
Thermal Treatment (Hazardous - no energy recovery)	-95	-95	-95	-95	-95
Recycling (Hhold, C+I , haz)	13,998	9,236	974	-3,983	-3,983
Recycling Metals	3,789	3,731	3,927	4,100	4,178
Treatment (Hazardous)	-1,226	-1,226	-1,226	-1,226	-1,226
Composting	44,373	44,373	44,373	44,373	44,373
Treatment plant LACW, C&I, C&D)	6,291	3,430	125	-1,527	-1,527
Treatment Plant C,D &E	42,620	42,620	42,620	42,620	42,620
Land recovery	140,208	140,208	140,208	140,208	-73,412
Recovery LACW	-40,671	-40,671	-40,671	-40,671	-40,671
Transfer LACW C&I, CDE	15,262	29,606	29,606	29,606	29,606
<b>Total</b>	<b>1,431,942</b>	<b>577,113</b>	<b>577,113</b>	<b>577,113</b>	<b>-109,857</b>

## APPENDIX 1: Waste Management Capacity Gap/Surplus for Warrington 2015-2036

The tables below show the predicted future capacity gaps/surplus for Warrington for each of the recycling scenarios for the growth option. Figures shown in negative represent a capacity surplus, meaning no new facilities required and positive figures represent a capacity gap for which new facilities may be required.

The capacity gap/surplus is identified by comparing the predicted waste arisings (Detailed in Appendix 3) with known waste management capacity (Appendix 2). Where waste arisings are greater than waste management capacity, this is identified as a 'capacity gap'. Where there is sufficient waste management capacity to deal with predicted waste arisings, this is identified as a 'capacity surplus'.

### No Growth /Scenario 1 Baseline Recycling

Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Landfill (C+I and LACW)	780,317	780,317	780,317	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511	-74,511
Landfill (Hazardous)	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954
Landfill (C,D&E)	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	-35,588	-35,588	-35,588	-35,588
Energy from waste (C&I)	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237	-237
Energy from waste (Hazardous)	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015
Thermal Treatment (Hazardous - no energy recovery)	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95
Recycling (Hhold, C+I , haz)	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998	13,998
Recycling Metals	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789	3,789
Treatment (Hazardous)	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226
Composting	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373
Treatment plant LACW, C&I, C&D)	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291	6,291
Treatment Plant C,D &E	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620
Land recovery	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	-73,412	-73,412	-73,412	-73,412
Recovery LACW	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671
Transfer LACW, C&I, CDE	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262	15,262
<b>Total</b>	<b>1,432,422</b>	<b>1,432,422</b>	<b>1,432,422</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>577,594</b>	<b>-109,376</b>	<b>-109,376</b>	<b>-109,376</b>	<b>-109,376</b>

### No Growth/Scenario 2 Recycling

Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Landfill (C+I and LACW)	780,317	782,664	787,621	-62,250	-57,293	-57,293	-52,336	-47,379	-44,074	-39,117	-37,465	-34,160	-30,855	-27,551	-25,898	-22,594	-22,594	-22,594	-22,594	-22,594	-22,594	-22,594	-22,594
Landfill (Hazardous)	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954	-1,954
Landfill (C,D&E)	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	-35,588	-35,588	-35,588	-35,588
Energy from waste (C&I)	-237	-237	-8,262	-13,219	-19,828	-24,785	-26,437	-28,090	-29,742	-33,047	-33,047	-34,699	-36,352	-38,004	-39,656	-41,309	-41,309	-41,309	-41,309	-41,309	-41,309	-41,309	-41,309
Energy from waste (Hazardous)	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015	-8,015
Thermal Treatment (Hazardous - no energy recovery)	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95	-95
Recycling (Hhold, C+I , haz)	13,998	10,888	7,584	4,279	5,931	9,236	7,584	4,279	2,627	2,627	974	-678	-2,330	-3,983	-3,983	-3,983	-3,983	-3,983	-3,983	-3,983	-3,983	-3,983	-3,983
Recycling Metals	3,789	3,789	3,789	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396	4,396
Treatment (Hazardous)	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226	-1,226
Composting	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373	44,373
Treatment plant LACW, C&I, C&D)	6,291	6,291	6,734	5,082	5,082	3,430	1,777	1,777	1,777	125	125	125	125	125	125	-1,527	-1,527	-1,527	-1,527	-1,527	-1,527	-1,527	-1,527
Treatment Plant C,D &E	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620
Land recovery	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	140,208	-73,412	-73,412	-73,412	-73,412
Recovery LACW	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671	-40,671
Transfer LACW, C&I, CDE	15,262	16,024	21,956	26,302	26,302	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606	29,606
<b>Total</b>	<b>1,432,422</b>	<b>1,432,421</b>	<b>1,432,425</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>577,593</b>	<b>-109,377</b>	<b>-109,377</b>	<b>-109,377</b>	<b>-109,377</b>

**Growth/Scenario 1 Baseline Recycling**

LACW OAN Growth																								
Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Landfill (C+I and LACW)	780,317	779,875	779,684	-75,179	-75,107	-75,091	-75,018	-74,919	-74,794	-74,657	-74,490	-74,491	-74,349	-74,195	-74,060	-73,954	-73,906	-73,849	-73,808	-73,788	-73,788	-73,807	-73,848	
Landfill (Hazardous)	-1,954	-1,972	-1,983	-1,992	-2,001	-2,013	-2,023	-2,034	-2,045	-2,056	-2,067	-2,078	-2,088	-2,098	-2,108	-2,119	-2,130	-2,141	-2,153	-2,164	-2,176	-2,188	-2,199	
Landfill (C,D&E)	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	-35,588	-35,588	-35,588	-35,588	-35,588
Energy from waste (C&I)	-237	-238	-239	-239	-238	-238	-238	-237	-237	-236	-235	-235	-235	-234	-233	-233	-233	-232	-232	-232	-232	-232	-232	
Energy from waste (Hazardous)	-8,015	-8,076	-8,121	-8,163	-8,202	-8,248	-8,292	-8,341	-8,392	-8,446	-8,497	-8,550	-8,601	-8,647	-8,696	-8,748	-8,802	-8,855	-8,910	-8,966	-9,024	-9,082	-9,143	
Thermal Treatment (Hazardous - no energy recovery)	-95	-96	-96	-97	-97	-98	-98	-99	-100	-100	-101	-101	-102	-103	-103	-104	-104	-105	-106	-106	-107	-108	-109	
Recycling (Hhold, C+I, haz)	13,998	12,694	12,355	12,061	11,803	11,529	11,271	11,020	10,778	10,538	10,306	10,022	9,782	9,547	9,306	9,055	8,787	8,521	8,250	7,972	7,688	7,398	7,097	
Recycling Metals	3,789	3,719	3,684	3,685	3,714	3,731	3,760	3,795	3,836	3,878	3,927	3,936	3,978	4,025	4,066	4,100	4,120	4,142	4,160	4,173	4,181	4,184	4,178	
Treatment (Hazardous)	-1,226	-1,235	-1,242	-1,248	-1,254	-1,261	-1,268	-1,276	-1,283	-1,292	-1,300	-1,308	-1,316	-1,323	-1,330	-1,338	-1,346	-1,354	-1,363	-1,371	-1,380	-1,389	-1,398	
Composting	44,373	43,165	42,872	42,579	42,286	41,993	41,700	41,407	41,114	40,821	40,528	40,235	39,942	39,649	39,356	39,063	38,770	38,477	38,184	37,891	37,598	37,305	37,012	
Treatment plant LACW, C&I, C&D)	6,291	4,982	4,415	4,145	3,829	3,403	3,126	2,874	2,646	2,527	2,486	2,276	2,249	2,157	2,088	1,960	1,825	1,701	1,562	1,421	1,257	1,090	1,151	
Treatment Plant C, D & E	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	
Land recovery	140,208	406,151	406,116	406,097	406,072	406,040	406,017	405,995	405,975	405,961	405,952	405,936	405,929	405,917	405,907	405,893	405,882	-67,480	-67,492	-67,503	-67,515	-67,527	-67,522	
Recovery LACW	-40,671	-42,449	-42,880	-43,312	-43,743	-44,174	-44,606	-45,037	-45,468	-45,900	-46,331	-46,762	-47,194	-47,625	-48,056	-48,488	-48,919	-49,350	-49,782	-50,213	-50,644	-51,076	-51,507	
Transfer LACW, C&I, CDE	15,262	15,117	15,051	15,032	15,030	15,011	15,011	15,017	15,029	15,051	15,082	15,073	15,100	15,126	15,150	15,165	15,169	15,176	15,179	15,177	15,171	15,161	15,161	
<b>Total</b>	<b>1,432,422</b>	<b>1,692,019</b>	<b>1,689,997</b>	<b>833,751</b>	<b>832,473</b>	<b>830,965</b>	<b>829,724</b>	<b>828,546</b>	<b>827,442</b>	<b>826,469</b>	<b>825,642</b>	<b>824,333</b>	<b>823,478</b>	<b>822,577</b>	<b>821,668</b>	<b>820,635</b>	<b>819,494</b>	<b>-128,320</b>	<b>-129,478</b>	<b>-130,679</b>	<b>-131,941</b>	<b>-133,240</b>	<b>-134,327</b>	
LACW OAN plus Uplift																								
Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Landfill (C+I and LACW)	780,317	779,875	779,679	-75,188	-75,119	-75,107	-75,038	-74,944	-74,822	-74,690	-74,527	-74,532	-74,394	-74,244	-74,113	-74,012	-73,968	-73,915	-73,878	-73,862	-73,866	-73,890	-73,934	
Recycling (Hhold, C+I, haz)	13,998	12,694	12,294	11,940	11,621	11,286	10,967	10,656	10,353	10,052	9,759	9,415	9,114	8,818	8,516	8,205	7,875	7,549	7,217	6,878	6,534	6,183	5,821	
Composting	44,373	43,165	42,811	42,457	42,103	41,750	41,396	41,042	40,688	40,335	39,981	39,627	39,273	38,920	38,566	38,212	37,858	37,505	37,151	36,797	36,444	36,090	35,736	
Recovery LACW	-40,671	-42,449	-42,970	-43,491	-44,011	-44,532	-45,053	-45,574	-46,094	-46,615	-47,136	-47,657	-48,177	-48,698	-49,219	-49,740	-50,260	-50,781	-51,302	-51,823	-52,343	-52,864	-53,385	
LACW OAN higher (historic employment)																								
Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Landfill (C+I and LACW)	780,317	779,875	779,675	-75,197	-75,134	-75,127	-75,062	-74,972	-74,856	-74,728	-74,570	-74,580	-74,447	-74,302	-74,175	-74,079	-74,040	-73,992	-73,959	-73,948	-73,957	-73,986	-74,035	
Recycling (Hhold, C+I, haz)	13,998	12,694	12,223	11,798	11,408	11,002	10,613	10,230	9,857	9,485	9,121	8,706	8,335	7,968	7,595	7,213	6,812	6,415	6,012	5,603	5,187	4,765	4,333	
Composting	44,373	43,165	42,740	42,315	41,891	41,466	41,042	40,617	40,192	39,768	39,343	38,918	38,494	38,069	37,645	37,220	36,795	36,371	35,946	35,522	35,097	34,672	34,248	
Recovery LACW	-40,671	-42,449	-43,074	-43,699	-44,324	-44,949	-45,575	-46,200	-46,825	-47,450	-48,075	-48,700	-49,325	-49,950	-50,575	-51,200	-51,825	-52,450	-53,076	-53,701	-54,326	-54,951	-55,576	



Growth/Scenario 2 Recycling

LACW OAN Growth																								
Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Landfill (C+I and LACW)	780,317	782,232	787,032	-62,845	-57,815	-57,816	-52,807	-47,798	-44,444	-39,452	-37,748	-34,491	-31,181	-27,887	-26,240	-22,988	-23,001	-23,011	-23,025	-23,044	-23,068	-23,097	-23,118	
Landfill (Hazardous)	-1,954	-1,972	-1,983	-1,992	-2,001	-2,013	-2,023	-2,034	-2,045	-2,056	-2,067	-2,078	-2,088	-2,098	-2,108	-2,119	-2,130	-2,141	-2,153	-2,164	-2,176	-2,188	-2,199	
Landfill (C,D&E)	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	437,762	-35,588	-35,588	-35,588	-35,588	-35,588	-35,588
Energy from waste (C&I)	-237	-238	-8,312	-13,298	-19,914	-24,868	-26,481	-28,078	-29,658	-32,871	-32,776	-34,398	-35,946	-37,476	-39,010	-40,552	-40,504	-40,450	-40,406	-40,376	-40,356	-40,349	-40,364	
Energy from waste (Hazardous)	-8,015	-8,076	-8,121	-8,163	-8,202	-8,248	-8,292	-8,341	-8,392	-8,446	-8,497	-8,550	-8,601	-8,647	-8,696	-8,748	-8,802	-8,855	-8,910	-8,966	-9,024	-9,082	-9,143	
Thermal Treatment (Hazardous - no energy recovery)	-95	-96	-96	-97	-97	-98	-98	-99	-100	-100	-101	-101	-102	-103	-103	-104	-104	-105	-106	-106	-107	-108	-109	
Recycling (Hhold, C+I , haz)	13,998	12,694	12,355	12,061	11,803	11,529	11,271	11,020	10,778	10,538	10,306	10,022	9,782	9,547	9,306	9,055	8,787	8,521	8,250	7,972	7,688	7,398	7,097	
Recycling Metals	3,789	3,719	3,684	3,685	3,714	3,731	3,760	3,795	3,836	3,878	3,927	3,936	3,978	4,025	4,066	4,100	4,120	4,142	4,160	4,173	4,181	4,184	4,178	
Treatment (Hazardous)	-1,226	-1,235	-1,242	-1,248	-1,254	-1,261	-1,268	-1,276	-1,283	-1,292	-1,300	-1,308	-1,316	-1,323	-1,330	-1,338	-1,346	-1,354	-1,363	-1,371	-1,380	-1,389	-1,398	
Composting	44,373	43,165	42,872	42,579	42,286	41,993	41,700	41,407	41,114	40,821	40,528	40,235	39,942	39,649	39,356	39,063	38,770	38,477	38,184	37,891	37,598	37,305	37,012	
Treatment plant LACW, C&I, C&D)	6,291	4,982	4,861	2,929	2,615	533	-1,395	-1,638	-1,854	-3,607	-3,630	-3,836	-3,848	-3,924	-3,978	-5,715	-5,841	-5,955	-6,085	-6,221	-6,381	-6,546	-6,488	
Treatment Plant C,D &E	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	42,620	
Land recovery	140,208	140,208	140,208	140,208	140,207	140,207	140,207	140,207	140,207	140,207	140,207	140,207	140,207	140,207	140,207	140,207	140,207	140,207	-73,413	-73,413	-73,413	-73,413	-73,413	
Recovery LACW	-40,671	-42,449	-42,880	-43,312	-43,743	-44,174	-44,606	-45,037	-45,468	-45,900	-46,331	-46,762	-47,194	-47,625	-48,056	-48,488	-48,919	-49,350	-49,782	-50,213	-50,644	-51,076	-51,507	
Transfer LACW C&I, CDE	15,262	15,883	21,787	26,139	26,118	29,403	29,379	29,356	29,333	29,319	29,309	29,293	29,285	29,272	29,261	29,247	29,235	29,223	29,210	29,198	29,185	29,172	29,178	
<b>Total</b>	<b>1,432,422</b>	<b>1,429,198</b>	<b>1,430,545</b>	<b>577,027</b>	<b>574,099</b>	<b>569,300</b>	<b>569,729</b>	<b>571,865</b>	<b>572,407</b>	<b>571,421</b>	<b>572,211</b>	<b>572,549</b>	<b>573,300</b>	<b>573,999</b>	<b>573,057</b>	<b>572,003</b>	<b>570,853</b>	<b>-117,242</b>	<b>-118,407</b>	<b>-119,609</b>	<b>-120,867</b>	<b>-122,158</b>	<b>-123,244</b>	
LACW OAN plus Uplift																								
Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Landfill (C+I and LACW)	780,317	782,232	787,028	-62,853	-57,827	-57,832	-52,827	-47,823	-44,472	-39,485	-37,785	-34,532	-31,226	-27,936	-26,293	-23,046	-23,062	-23,076	-23,095	-23,118	-23,146	-23,179	-23,204	
Recycling (Hhold, C+I , haz)	13,998	9,572	5,841	2,162	3,520	6,508	4,542	941	-986	-1,259	-3,157	-5,133	-7,032	-8,913	-9,171	-9,446	-9,755	-10,058	-10,371	-10,696	-11,032	-11,380	-11,748	
Composting	44,373	43,165	42,811	42,457	42,103	41,750	41,396	41,042	40,688	40,335	39,981	39,627	39,273	38,920	38,566	38,212	37,858	37,505	37,151	36,797	36,444	36,090	35,736	
Recovery LACW	-40,671	-42,449	-42,970	-43,491	-44,011	-44,532	-45,053	-45,574	-46,094	-46,615	-47,136	-47,657	-48,177	-48,698	-49,219	-49,740	-50,260	-50,781	-51,302	-51,823	-52,343	-52,864	-53,385	
LACW OAN higher (historic employment)																								
Facility Type	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Landfill (C+I and LACW)	780,317	782,232	787,023	-62,862	-57,842	-57,851	-52,851	-47,852	-44,506	-39,523	-37,828	-34,580	-31,279	-27,994	-26,355	-23,113	-23,134	-23,153	-23,176	-23,204	-23,237	-23,275	-23,305	
Recycling (Hhold, C+I , haz)	13,998	9,572	5,770	2,021	3,307	6,225	4,188	516	-1,482	-1,826	-3,795	-5,842	-7,811	-9,763	-10,093	-10,438	-10,818	-11,192	-11,576	-11,972	-12,379	-12,797	-13,236	
Composting	44,373	43,165	42,740	42,315	41,891	41,466	41,042	40,617	40,192	39,768	39,343	38,918	38,494	38,069	37,645	37,220	36,795	36,371	35,946	35,522	35,097	34,672	34,248	
Recovery LACW	-40,671	-42,449	-43,074	-43,699	-44,324	-44,949	-45,575	-46,200	-46,825	-47,450	-48,075	-48,700	-49,325	-49,950	-50,575	-51,200	-51,825	-52,450	-53,076	-53,701	-54,326	-54,951	-55,576	



### APPENDIX 3: Waste Management Capacity Requirements by waste stream and management method 2016 – 2036- Increased Recycling/Growth

The following tables present the findings of work to assess the future amount of waste that will require management (i.e. future waste arisings), shown by waste stream and management method, within Warrington.

#### Waste Management Capacity Requirements (tonnes) by waste stream and management method 2015 – 2037 Baseline Recycling / No Growth

Commerical & Industrial waste management	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Transfer	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78	14,344.78
Treatment	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85	31,837.85
metal recycling	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57	17,130.57
composting	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33	11,507.33
Non haz landfill	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32	68,440.32
MRF	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47	3,111.47
Recovery	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25	237.25
CA Site	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33	18,564.33
Haz landfill	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20	60.20
<b>Total</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>	<b>165,234.09</b>
<b>Management route C&amp;D</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>
Transfer	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86	4,459.86
Treatment	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68	61,019.68
CA Site	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77	332.77
metal recycling	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46	32.46
Non haz landfill	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18	4,201.18
Deposit of waste to land (recovery)	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80	15.80
Non Haz (SNRHW) LF	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45	317.45
MRF	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54	34.54
<b>Total</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>	<b>70,413.74</b>
<b>Management route E waste</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>
Transfer	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38
Treatment	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41
Reclamation	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97
Non haz landfill	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73
Deposit of waste to land (recovery)	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16
Non Haz (SNRHW) LF	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66
Inert landfill	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81
<b>Total</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>
<b>Management Route Hazardous waste</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>
Incineration without energy recovery	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14	95.14
Landfill	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82	843.82
Recovery	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99	6,515.99
Transfer (D)	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73	685.73
Transfer (R)	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82	1,498.82
Treatment	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78	1,225.78
<b>Total</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>	<b>10,865.29</b>
<b>Management Route LACW</b>	<b>2015</b> </																						

**Waste Management Capacity Requirements (tonnes) by waste stream and management method 2015 – 2037 Baseline Recycling / Growth**

Commerical & Industrial waste management	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Transfer	14,344.78	14,403.25	14,432.03	14,431.33	14,406.66	14,392.56	14,368.24	14,338.82	14,304.01	14,268.41	14,227.26	14,220.17	14,184.62	14,145.64	14,110.99	14,082.03	14,065.28	14,046.76	14,031.51	14,020.81	14,014.09	14,011.48	14,016.85
Treatment	31,837.85	31,967.61	32,031.49	32,029.94	31,975.19	31,943.90	31,889.92	31,824.61	31,747.35	31,668.35	31,577.01	31,561.28	31,482.36	31,395.86	31,318.96	31,254.67	31,217.51	31,176.40	31,142.56	31,118.81	31,103.88	31,098.10	31,110.01
metal recycling	17,130.57	17,200.39	17,234.76	17,233.92	17,204.47	17,187.63	17,158.58	17,123.45	17,081.87	17,039.37	16,990.22	16,981.76	16,939.30	16,892.75	16,851.38	16,816.78	16,796.79	16,774.67	16,756.46	16,743.68	16,735.65	16,732.54	16,738.95
composting	11,507.33	11,554.23	11,577.32	11,576.76	11,556.97	11,545.66	11,526.15	11,502.55	11,474.62	11,446.07	11,413.06	11,407.37	11,378.85	11,347.58	11,319.79	11,296.55	11,283.12	11,268.26	11,256.03	11,247.45	11,242.05	11,239.96	11,244.27
Non haz landfill	68,440.32	68,719.27	68,856.59	68,853.25	68,735.57	68,668.29	68,552.26	68,411.88	68,245.78	68,075.96	67,879.62	67,845.81	67,676.16	67,490.21	67,324.89	67,186.70	67,106.82	67,018.44	66,945.69	66,894.64	66,862.56	66,850.13	66,875.73
MRF	3,111.47	3,124.15	3,130.39	3,130.24	3,124.89	3,121.83	3,116.56	3,110.17	3,102.62	3,094.90	3,085.98	3,084.44	3,076.73	3,068.27	3,060.76	3,054.48	3,050.84	3,046.83	3,043.52	3,041.20	3,039.74	3,039.17	3,040.34
Recovery	237.25	238.22	238.70	238.68	238.28	238.04	237.64	237.15	236.58	235.99	235.31	235.19	234.60	233.96	233.39	232.91	232.63	232.32	232.07	231.89	231.78	231.74	231.83
CA Site	18,564.33	18,639.99	18,677.24	18,676.33	18,644.41	18,626.16	18,594.69	18,556.61	18,511.56	18,465.50	18,412.24	18,403.07	18,357.05	18,306.61	18,261.77	18,224.28	18,202.62	18,178.64	18,158.91	18,145.06	18,136.36	18,132.99	18,139.94
Haz landfill	60.20	60.44	60.56	60.56	60.46	60.40	60.30	60.17	60.03	59.88	59.70	59.67	59.52	59.36	59.22	59.09	59.02	58.95	58.88	58.84	58.81	58.80	58.82
<b>Total</b>	<b>165,234.09</b>	<b>165,907.55</b>	<b>166,239.07</b>	<b>166,231.01</b>	<b>165,946.91</b>	<b>165,784.48</b>	<b>165,504.34</b>	<b>165,165.41</b>	<b>164,764.42</b>	<b>164,354.42</b>	<b>163,880.41</b>	<b>163,798.77</b>	<b>163,389.19</b>	<b>162,940.25</b>	<b>162,541.13</b>	<b>162,207.48</b>	<b>161,801.65</b>	<b>161,801.27</b>	<b>161,625.63</b>	<b>161,502.38</b>	<b>161,424.93</b>	<b>161,394.93</b>	
<b>Management route C&amp;D</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>
Transfer	4,459.86	4,546.02	4,582.81	4,602.65	4,629.76	4,663.16	4,687.36	4,710.59	4,732.86	4,747.38	4,757.06	4,773.51	4,781.26	4,794.33	4,804.98	4,819.01	4,831.60	4,843.70	4,856.28	4,868.38	4,881.45	4,894.04	4,888.71
Treatment	61,019.68	62,198.49	62,701.80	62,973.32	63,344.18	63,801.13	64,132.26	64,450.14	64,754.77	64,953.45	65,085.90	65,311.06	65,417.02	65,595.83	65,741.52	65,933.58	66,105.76	66,271.32	66,443.51	66,609.07	66,787.88	66,960.06	66,887.21
CA Site	332.77	339.19	341.94	343.42	345.44	347.93	349.74	351.47	353.13	354.22	354.94	356.17	356.75	357.72	358.52	359.56	360.50	361.41	362.34	363.25	364.22	365.16	364.76
metal recycling	32.46	33.08	33.35	33.50	33.69	33.94	34.11	34.28	34.44	34.55	34.62	34.74	34.80	34.89	34.97	35.07	35.16	35.25	35.34	35.43	35.53	35.62	35.58
Non haz landfill	4,201.18	4,282.34	4,317.00	4,335.69	4,361.22	4,392.68	4,415.48	4,437.37	4,458.34	4,472.02	4,481.14	4,496.64	4,503.94	4,516.25	4,526.28	4,539.50	4,551.36	4,562.76	4,574.61	4,586.01	4,598.32	4,610.18	4,605.16
Deposit of waste to land (recovery)	15.80	16.11	16.24	16.31	16.40	16.52	16.61	16.69	16.77	16.82	16.85	16.91	16.94	16.99	17.02	17.07	17.12	17.16	17.21	17.25	17.29	17.34	17.32
Non Haz (SNRHW) LF	317.45	323.58	326.20	327.61	329.54	331.92	333.64	335.29	336.88	337.91	338.60	339.77	340.32	341.25	342.01	343.01	343.91	344.77	345.66	346.53	347.46	348.35	347.97
MRF	34.54	35.20	35.49	35.64	35.85	36.11	36.30	36.48	36.65	36.76	36.84	36.96	37.02	37.13	37.21	37.32	37.41	37.51	37.61	37.70	37.80	37.90	37.86
<b>Total</b>	<b>70,413.74</b>	<b>71,774.02</b>	<b>72,354.81</b>	<b>72,668.14</b>	<b>73,096.09</b>	<b>73,623.39</b>	<b>74,005.49</b>	<b>74,372.31</b>	<b>74,723.85</b>	<b>74,953.11</b>	<b>75,105.95</b>	<b>75,365.78</b>	<b>75,488.05</b>	<b>75,694.38</b>	<b>75,862.51</b>	<b>76,084.13</b>	<b>76,282.82</b>	<b>76,473.87</b>	<b>76,672.56</b>	<b>76,863.62</b>	<b>77,069.95</b>	<b>77,268.64</b>	<b>77,184.58</b>
<b>Management route E waste</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>
Transfer	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38
Treatment	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41
Reclamation	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97
Non haz landfill	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73
Deposit of waste to land (recovery)	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16
Non Haz (SNRHW) LF	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66
Inert landfill	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81
<b>Total</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>
<b>Management Route Hazardous waste</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>	<b>2032</b>	<b>2033</b>	<b>2034</b>	<b>2035</b>	<b>2036</b>	<b>2037</b>
Incineration without energy recovery	95.14	95.87	96.41	96.90	97.36	97.91	98.43	99.02	99.61	100.26	100.86	101.50	102.11	102.65	103.22	103.84	104.48	105.12	105.77	106.43	107.12	107.81	108.53
Landfill	843.82	850.29	855.06	859.45	863.49	868.36	873.01	878.20	883.48	889.20	894.58	900.19	905.59	910.43	915.50	921.01	926.65	932.33	938.06	943.97	950.04	956.22	962.57
Recovery	6,515.99	6,565.91	6,602.73	6,636.67	6,667.83	6,705.43	6,741.38	6,781.47	6,822.25	6,866.40	6,907.91	6,951.23	6,992.93	7,030.34	7,069.46	7,112.00	7,155.61	7,199.46	7,243.71	7,289.32	7,336.21	7,383.92	7,432.95
Transfer (D)	685.73	690.98	694.86	698.43	701.71	705.66	709.45	713.67	717.96	722.60	726.97	731.53	735.92	739.86	743.97	748.45	753.04	757.65	762.31	767.11	772.05	777.07	782.23
Transfer (R)	1,498.82	1,510.30	1,518.77	1,526.58	1,533.74	1,542.39	1,550.66	1,559.88	1,569.26	1,579.42	1,588.97	1,598.93	1,608.53	1,617.13	1,626.13	1,635.91	1,645.94	1,656.03	1,666.21	1,676.70	1,687.49	1,698.46	1,709.74
Treatment	1,225.78	1,235.17	1,242.10	1,248.48	1,254.34	1,261.42	1,268.18	1,275.72	1,283.39	1,291.70	1,299.51	1,307.66	1,315.50	1,322.54	1,329.90	1,337.90	1,346.10	1,354.35	1,362.68	1,371.26	1,380.08	1,389.05	1,398.28
<b>Total</b>	<b>10,865.29</b>	<b>10,948.51</b>	<b>11,009.91</b>	<b>11,066.51</b>	<b>11,118.47</b>	<b>11,181.17</b>	<b>11,241.11</b>	<b>11,307.96</b>	<b>11,375.96</b>	<b>11,449.58</b>	<b>11,518.80</b>	<b>11,591.03</b>	<b>11,660.57</b>	<b>11,722.95</b>	<b>11,788.18</b>	<b>11,859.11</b>	<b>11,931.83</b>	<b>12,004.96</b>	<b>12,078.74</b>	<b>12,154.80</b>	<b>12,232.98</b>	<b>12,312.54</b>	<b>12,394.30</b>
<b>Management Route LACW OAN</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2023</b>	<b>2024</b>	<b>2025</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>	<b>2031</b>						



**Waste Management Capacity Requirements (tonnes) by waste stream and management method 2015 – 2037 Recycling / Growth**

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
<b>Commerical &amp; Industrial waste management</b>																							
Transfer	14,344.78	13,637.60	7,696.87	3,324.62	3,318.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Treatment	31,837.85	31,967.61	31,585.42	33,246.20	33,189.38	34,814.74	36,410.95	36,336.39	36,248.17	37,801.52	37,692.49	37,673.72	37,579.51	37,476.26	37,384.46	38,929.80	38,883.52	38,832.30	38,790.15	38,760.57	38,741.98	38,734.78	38,749.62
metal recycling	17,130.57	17,200.39	17,234.76	16,623.10	16,594.69	16,578.45	16,550.43	16,516.54	16,476.44	16,435.44	16,388.04	16,379.88	16,338.92	16,294.03	16,254.11	16,220.75	16,201.46	16,180.13	16,162.56	16,150.24	16,142.49	16,139.49	16,145.67
composting	11,507.33	11,554.23	11,577.32	11,576.76	11,556.97	11,545.66	11,526.15	11,502.55	11,474.62	11,446.07	11,413.06	11,407.37	11,378.85	11,347.58	11,319.79	11,296.55	11,283.12	11,268.26	11,256.03	11,247.45	11,242.05	11,239.96	11,244.27
Non haz landfill	68,440.32	66,363.02	61,508.46	56,518.54	51,443.54	51,393.19	46,341.21	41,291.35	37,895.82	32,870.88	31,137.28	27,845.79	24,508.38	21,182.23	19,504.94	16,220.75	16,201.46	16,180.13	16,162.56	16,150.24	16,142.49	16,139.49	16,145.67
MRF	3,111.47	8,295.38	11,636.73	14,960.79	19,913.63	19,894.14	23,170.61	26,426.47	28,009.95	29,583.80	31,137.28	32,759.75	34,311.73	35,846.86	37,384.46	38,929.80	38,883.52	38,832.30	38,790.15	38,760.57	38,741.98	38,734.78	38,749.62
Recovery	237.25	238.22	8,311.95	13,298.48	19,913.63	24,867.67	26,480.69	28,078.12	29,657.59	32,870.88	32,776.08	34,397.74	35,945.62	37,476.26	39,009.87	40,551.87	40,503.66	40,450.32	40,406.41	40,375.60	40,356.23	40,348.73	40,364.18
CA Site	18,564.33	16,590.76	16,623.91	16,623.10	9,956.81	6,631.38	4,965.13	4,954.96	4,942.93	3,287.09	3,277.61	3,275.98	3,267.78	3,258.81	1,625.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Haz landfill	60.20	60.44	60.56	60.56	60.46	60.40	60.30	60.17	60.03	59.88	59.70	59.67	59.52	59.36	59.22	59.09	59.02	58.95	58.88	58.84	58.81	58.80	58.82
<b>Total</b>	<b>165,234.09</b>	<b>165,907.64</b>	<b>166,235.98</b>	<b>166,232.16</b>	<b>165,948.05</b>	<b>165,785.62</b>	<b>165,505.48</b>	<b>165,166.55</b>	<b>164,765.55</b>	<b>164,355.55</b>	<b>163,881.54</b>	<b>163,799.91</b>	<b>163,390.32</b>	<b>162,941.38</b>	<b>162,542.26</b>	<b>162,208.61</b>	<b>162,015.77</b>	<b>161,802.39</b>	<b>161,626.75</b>	<b>161,503.50</b>	<b>161,426.04</b>	<b>161,396.05</b>	<b>161,457.85</b>
<b>Management route C&amp;D</b>																							
Transfer	4,459.86	4,546.02	4,582.81	4,602.65	4,629.76	4,663.16	4,687.36	4,710.59	4,732.86	4,747.38	4,757.06	4,773.51	4,781.26	4,794.33	4,804.98	4,819.01	4,831.60	4,843.70	4,856.28	4,868.38	4,881.45	4,894.04	4,888.71
Treatment	61,019.68	62,198.49	62,701.80	62,973.32	63,344.18	63,801.13	64,132.26	64,450.14	64,754.77	64,953.45	65,085.90	65,311.06	65,417.02	65,595.83	65,741.52	65,933.58	66,105.76	66,271.32	66,443.51	66,609.07	66,787.88	66,960.06	66,887.21
CA Site	332.77	339.19	341.94	343.42	345.44	347.93	349.74	351.47	353.13	354.22	354.94	356.17	357.52	358.52	359.56	360.50	361.41	362.34	363.25	364.22	365.16	366.16	364.76
metal recycling	32.46	33.08	33.35	33.50	33.69	33.94	34.11	34.28	34.44	34.55	34.62	34.74	34.80	34.89	34.97	35.07	35.16	35.25	35.34	35.43	35.53	35.62	35.58
Non haz landfill	4,201.18	4,282.34	4,317.00	4,335.69	4,361.22	4,392.68	4,415.48	4,437.37	4,458.34	4,472.02	4,481.14	4,496.64	4,503.94	4,516.25	4,526.28	4,539.50	4,551.36	4,562.76	4,574.61	4,586.01	4,598.32	4,610.18	4,605.16
Deposit of waste to land (recovery)	15.80	16.11	16.24	16.31	16.40	16.52	16.61	16.69	16.77	16.82	16.85	16.91	16.94	16.99	17.02	17.07	17.12	17.16	17.21	17.25	17.29	17.34	17.32
Non Haz (SNRHW) LF	317.45	323.58	326.20	327.61	329.54	331.92	333.64	335.29	336.88	337.91	338.60	339.77	340.32	341.25	342.01	343.01	343.91	344.77	345.66	346.53	347.46	348.35	347.97
MRF	34.54	35.20	35.49	35.64	35.85	36.11	36.30	36.48	36.65	36.76	36.84	36.96	37.02	37.13	37.21	37.32	37.41	37.51	37.61	37.70	37.80	37.90	37.86
<b>Total</b>	<b>70,413.74</b>	<b>71,774.02</b>	<b>72,354.81</b>	<b>72,668.14</b>	<b>73,096.09</b>	<b>73,623.39</b>	<b>74,005.49</b>	<b>74,372.31</b>	<b>74,723.85</b>	<b>74,953.11</b>	<b>75,105.95</b>	<b>75,365.78</b>	<b>75,488.05</b>	<b>75,694.38</b>	<b>75,862.51</b>	<b>76,084.13</b>	<b>76,282.82</b>	<b>76,473.87</b>	<b>76,672.56</b>	<b>76,863.62</b>	<b>77,069.95</b>	<b>77,268.64</b>	<b>77,184.58</b>
<b>Management route E waste</b>																							
Transfer	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38	4,797.38
Treatment	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41	57,380.41
Reclamation	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97	10,280.97
Non haz landfill	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73	5,536.73
Deposit of waste to land (recovery)	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16	63,115.16
Non Haz (SNRHW) LF	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66	106.66
Inert landfill	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81	30,050.81
<b>Total</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>	<b>171,268.11</b>
<b>Management Route Hazardous waste</b>																							
Incineration without energy recovery	95.14	95.87	96.41	96.90	97.36	97.91	98.43	99.02	99.61	100.26	100.86	101.50	102.11	102.65	103.22	103.84	104.48	105.12	105.77	106.43	107.12	107.81	108.53
Landfill	843.82	850.29	855.06	859.45	863.49	868.36	873.01	878.20	883.48	889.20	894.58	900.19	905.59	910.43	915.50	921.01	926.65	932.33	938.06	943.97	950.04	956.22	962.57
Recovery	6,515.99	6,565.91	6,602.73	6,636.67	6,667.83	6,705.43	6,741.38	6,781.47	6,822.25	6,866.40	6,907.91	6,951.23	6,992.93	7,030.34	7,069.46	7,112.00	7,155.61	7,199.46	7,243.71	7,289.32	7,336.21	7,383.92	7,432.95
Transfer (D)	685.73	690.98	694.86	698.43	701.71	705.66	709.45	713.67	717.96	722.60	726.97	731.53	735.92	739.86	743.97	748.45	753.04	757.65	762.31	767.11	772.05	777.07	782.23
Transfer (R)	1,498.82	1,510.30	1,518.77	1,526.58	1,533.74	1,542.39	1,550.66	1,559.88	1,569.26	1,579.42	1,589.97	1,608.93	1,626.13	1,641.13	1,656.13	1,671.13	1,686.13	1,701.13	1,716.13	1,731.13	1,746.13	1,761.13	1,776.13
Treatment	1,225.78	1,235.17	1,242.10	1,248.48	1,254.34	1,261.42	1,268.18	1,275.72	1,283.39	1,291.70	1,299.51	1,307.66	1,315.50	1,322.54	1,329.90	1,337.90	1,346.10	1,354.35	1,362.68	1,371.26	1,380.08	1,389.05	1,398.28
<b>Total</b>	<b>10,865.29</b>	<b>10,948.51</b>	<b>11,009.91</b>	<b>11,066.51</b>	<b>11,118.47</b>	<b>11,181.17</b>	<b>11,241.11</b>	<b>11,307.96</b>	<b>11,375.96</b>	<b>11,449.58</b>	<b>11,518.80</b>	<b>11,591.03</b>	<b>11,</b>										



## APPENDIX 4: Methodology for Calculating Commercial and Industrial Waste Arisings

This appendix presents the proposed approach to assessing levels of C&I waste over the plan period for Warrington.

In 2014, Defra employed consultants Jacobs to prepare a methodology for calculating arisings of C&I waste. The Defra report<sup>10</sup> sets out a 5-step approach to calculating arisings:

- 1) Calculate waste arisings sent to permitted facilities;
- 2) Calculate waste arisings received at incineration facilities;
- 3) Estimate waste arisings handled at exempt facilities;
- 4) Calculate waste arisings exported directly from the UK; and
- 5) Map waste to the sector that generated it and validate.

The method proposed for Warrington does not include carrying out step 4. This is because it is not considered relevant to the arisings currently managed by the authorities (as waste is not known to be exported from Warrington to countries abroad) and is therefore not a dataset which will impact on the arisings calculations.

Defra step 5 involves mapping waste to sector. However, in order to better understand what is happening to waste and to identify future requirements, the proposed approach for Warrington maps arisings to waste management route rather than sector.

Therefore, the proposed approach is based on steps 1-3 of the Defra method, as well as step 5 which is tailored to suit the requirements of Warrington. The principle raw data sources for estimating C&I waste arisings are:

- Environment Agency (EA) Waste Data Interrogator (WDI)
- EA Hazardous Waste Data Interrogator (WDI)
- EA list of exempt sites ( not provided b y the EA)
- EA data waste received at Incineration facilities ( NO facilities identified in Warrington)

### **Step 1 Calculation of waste arisings sent to permitted facilities**

There are two parts to Step 1:

Calculate known C&I waste arisings managed at facilities within Warrington; and estimate the amount of 'unknown' waste arisings that are likely to be C&I waste arisings managed at facilities within Warrington.

#### ***Calculating 'Known' Arisings***

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<sup>10</sup> New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England, DEFRA, Project Report, Final, EV0804, August 2014

Information used to calculate arisings sent to permitted facilities within Warrington is taken from the EA waste data Interrogator (WDI). This is done by assessing data for the whole of England by *origin*. The WDI has been used to extract information on all waste managed in England in 2014, including the details of the site (e.g. address, operator and management type) and the authority where the waste was managed, as well as information on the origin of the waste. The latter enables information to be gathered on the waste managed with Warrington that also arose in the Warrington, as well as how much waste arose in the Warrington and was managed elsewhere. This gives a total figure for the amount of waste produced in Warrington.

### **'Unknown' Arisings**

Within the WDI dataset there is a level of 'unknown' waste arisings managed in Warrington which arose within the North West Region. However, the dataset does not reveal how much of this waste actually originated in Warrington. There is also an 'unknown' amount of waste arisings managed outside the North West Region but which originate from within the Region. It is likely that some of these 'unknown' arisings are from Warrington and therefore a methodology for attributing some aspects of the arisings to Warrington is required.

The proposed approach to calculating these unknown arisings is to look first at the makeup of the unknown arisings to match it back to the waste stream it originated from i.e. LACW, CD&E, C&I. This can be broken down to the constituent waste streams. This then allows for each waste stream to be looked at separately and conclusions made about that arising and for the removal of any waste which has already been accounted for elsewhere i.e. LACW.

The following points about each waste stream should be noted:

The waste coded as 'municipal waste' is already accounted for as part of the arisings for LACW obtained from Warrington's WDA team. LACW waste arisings will need to be removed from this figure to prevent double counting of this waste stream.

Any waste identified as CD&E waste does not need to be included in the estimation for C&I waste and is therefore excluded further from calculation of this waste stream and included as part of the CD&E stream<sup>11</sup>.

For Warrington the waste arising in the North West that was managed in Warrington has been assumed to arise in Warrington, and these figures have subsequently been added to the total for the waste stream.

### **Adjustments**

The Defra report looked at 4 years worth of data from 2009 to 2012 by individual EWC code and waste management method. Waste passing through a waste transfer station will be recorded more than once in the WDI, for example at a transfer facility and then again at a processing facility. Therefore, to remove double counting of such arisings, information on waste managed at transfer facilities is removed from calculations except where they have a destination outside of England, as waste going to these sites would not be picked up at other facilities recorded within the WDI.

The Defra report also removes tonnages of waste with an origin outside of England, however, as mentioned previously, this study looks at only Warrington and its arisings and therefore this is not an issue for this assessment.



## **Step 2 Calculation of waste arisings received at incineration facilities**

Information used to calculate arisings received at incineration facilities has been obtained on request from the Environment Agency because this information is not publically available. Information is provided on the quantities managed by European Waste Classification (EWC) and this is used to identify what waste streams the material come from.

This dataset includes information on waste received at the following types of facility:

- Animal By-Products;
- Animal Carcasses;
- Clinical;
- Co-Incineration of hazardous waste;
- Co-Incineration of non-hazardous waste;
- Hazardous;
- Municipal and/or Industrial & Commercial; and
- Sewage Sludge.

The tonnages received are recorded against EWC codes which allows for removal of waste attributed to household waste. The data received from the EA indicated that there are no such facilities in Warrington.

## **Step 3 Estimates of waste arisings handled at exempt facilities**

A waste exemption is a waste operation that is exempt from requiring an environmental permit. Exemptions can involve the use, treatment, disposal and storage of waste. Since 2010 there has been a significant change to the waste exemptions system with exemptions being redefined with greater clarity over the types and quantities of waste that can be used under each exemption. Each exemption now lasts for a period of 3 years, after which, if an operator wishes to continue, they need to reapply. However, there is no requirement for an exemption which is completed within the 3 years to be removed from the register.

There are 4 groups of exemptions:

- Using waste (U codes);
- Treating waste (T codes);
- Disposing of waste (D codes); and
- Storing waste (S codes).

The EA hold records on exempt facilities and, like the data on incineration facilities, this is not publicly available and is obtained on request. This information contains a list of exempt sites operating in the sub-region and the level of waste covered by the exemption (i.e. the maximum amount of waste permitted to be handled at an exempt site each year). However, because this is an exemption, there are no detailed records to say how much waste has been received at the site as input records are not required.

The Defra report suggests the following approach be used when estimating the amount of C&I waste managed through exempt sites. The exemptions should be reviewed to identify those exempt sites which:

- are likely to be handling waste that is not captured through other facilities/datasets;
- are likely to relate to non-C&I waste generation activities (e.g. construction and demolition waste);
- result in low volumes of waste being handled; or
- have low numbers of relevant exemptions.

The Defra approach identifies 21 exemption paragraphs from a potential total of 57 which are considered to contribute to C&I waste arisings. Of these, T4 - preparatory treatments (bailing, sorting, shredding etc) - is considered the most important and likely to handle the most waste. The Defra approach is to estimate a throughput figure per facility as this dataset was done for England, however as this is Warrington, the actual throughputs can be used. There are 8 such exemptions in Warrington, but we have no data on the level of waste handled through these exemptions.

The Defra report also includes an approach to removing any waste from the exemptions information which would be identified as being household waste from estimates of arisings. Information received from the EA identified a total of 196 exemptions in Warrington, of these 68 are identified as handling C&I waste and 22 of those are just for storage before moving on for treatment elsewhere. However the information provided did not indicate the level of tonnage these sites can handle, as such no assumptions have been made to increase the arisings for C&I based on the exemptions data received and it is assumed that these sites or similar will continue to manage C&I waste outside the permit system.

#### **Step 4 Calculate waste arisings exported directly from the UK**

As set out above, Step 4 of the Defra approach is not considered relevant to Warrington.

#### **Step 5 Mapping waste to the sector that generated it and validate.**

This aspect of the assessment is carried out as the data is being assessed. As stated above, the Defra approach is to map waste arisings to the EWC. This allows the data to be mapped back to the business sector which produced the waste and does not look at how the waste is managed.

To allow the data to be used to assist in the calculation of waste arisings and to identify how this was managed the proposed approach matches the waste arisings to the waste management route. This is more appropriate for Warrington because the Defra approach does not allow for any estimate of how waste was managed at permitted facilities. This means, using just the Defra approach, no assessment can be made on how much was recycled, reused, disposed or incinerated. Using the waste management route, an assessment can be made and is considered more useful in waste planning and for future monitoring.

#### **Total C&I arisings.**

The total arisings are obtained by summing up the totals from steps 1-3. Step 4, as discussed above, was not undertaken for this study as it was not considered relevant in the context of Warrington.

## APPENDIX 5: Movement of Household, Commercial and Industrial Wastes

Imports exceeding 1,000 tonnes –Source EA WDI 2015

Authority	Household, Industrial and Commercial Waste
Bolton	5,083
Halton	9,272
Knowsley	42,121
Lancashire	7,694
Leeds	7,269
Liverpool	149,772
Manchester	64,669
Sefton	30,568
St Helens	129,692
Staffordshire	5,330
Wigan	1,001
Wirral	18,792

Exports exceeding 1,000 tonnes Source EA WDI 2015

Authority	Household, Industrial and Commercial Waste
Calderdale	1,053
Derbyshire	4,811
Knowsley	3,482
Leeds	1,155
Liverpool	1,961
Salford	1,068
St Helens	40,401
Stockport	1,194

## APPENDIX 6: Movement of Construction and Demolition Wastes

Imports exceeding 1,000 tonnes – Source EA WDI 2015

Authority	CONSTRUCTION AND DEMOLITION WASTES
Cheshire East	2,945
Cheshire West	4,865
Halton	15,710
Knowsley	3,476
Lancashire	3,697
Manchester	76,746
Salford	53,250
Trafford	37,493

Exports exceeding 1,000 tonnes Source EA WDI 2015

Authority	CONSTRUCTION AND DEMOLITION WASTES
Wigan	1,038
Manchester	2,054
St. Helens	18,763

## APPENDIX 7: Movement of Hazardous Wastes for

Imports exceeding 100 tonnes

There are no imports above 100 tonnes

Exports exceeding 100 tonnes (Total 9,721.25 tonnes)

Authority	Hazardous Waste
Bolton	586.38
Bury	244.15
Dudley	324.37
Kirklees	317.21
Knowsley	848.73
Lancashire	3,322.92
Nottinghamshire	295.52
Redcar and Cleveland	143.80
Rotherham	557.72
Salford	993.39
Sefton	346.78
St. Helens	158.39
Staffordshire	1,438.77
Stoke on Trent	143.13

## APPENDIX 8: Glossary

Acronym	Term	Definition
AD	Anaerobic Digestion	A process where biodegradable material is encouraged to break down in the absence of oxygen. Material is placed into a closed vessel and in controlled conditions the waste breaks down to produce a mixture of carbon dioxide, methane and solids/liquids known as digestate which can be used for fertiliser, compost or Solid Recovered Fuel (SRF)
APCRs	Air Pollution Control Residues	Bi-product produced from treatment of wastes through an energy from waste plant
C&I	Commercial and Industrial Waste	Waste generated by shops, offices, factories and other businesses and industry
-	Composting	A biological process which takes place in the presence of oxygen in which organic wastes, such as garden and kitchen waste, are converted into a stable, granular material. This can be applied to land to improve soil structure and enrich nutrient content.
C&D	Construction and Demolition Waste	Controlled waste arising from the construction, repair, maintenance and demolition of buildings and structures.
CD&E	Construction Demolition and Excavation Waste	Controlled waste arising from the construction, repair, maintenance and demolition of buildings and structures and excavated materials such as soils.
CHP	Combined Heat & Power	Combined heat and power (CHP) is the use of a heat engine or power station to generate electricity and useful heat at the same time.
EfW	Energy from Waste	The controlled high temperature burning of waste. Energy recovery is achieved by utilising the calorific value of the materials burnt. The most efficient facilities combine the production of heat (usually in the form of steam) with power (electricity) which is usually referred to as combined heat and power (CHP).
ELV	End of Life Vehicle	Motor vehicles that fall into the category of 'waste' as defined by the EU Waste Directive.
EA	Environment Agency	Agency which regulates waste management activities by issuing waste management licenses and other permits and exemptions. The EA also conducts national surveys of waste arising and waste facilities.
GVA	Gross Value Added	A measure of the value of the goods and services produced in the economy.
-	Hazardous waste	A sub category of all waste streams, where the material produced is hazardous and requires specialist treatment

Acronym	Term	Definition
-	Inert waste	Inert waste is waste that does not undergo significant physical, chemical or biological changes following disposal and does not adversely affect other matters that it may come into contact with, and does not endanger surface or groundwater.
-	Landfill	Restoration of land (for example, a former quarry) using waste.
-	Land recovery	The restoration of land using inert waste to enable the land to be used for a new purpose.
LACW	Local Authority Collected Waste	Previously known as municipal waste, LACW refers to all waste collected by a Local Authority.
LACW(H)	Local Authority Collected Waste Household	Household waste collected by a Local Authority
LACW (Other)	Local Authority Collected Waste other	Non-household waste collected by a Local Authority (such as street cleaning collection, rubble from household waste recycling sites).
LLW	Low level Radioactive Waste	Radioactive waste having a radioactive content not exceeding four GBq/te of alpha or 12 GBq/te of beta/gamma activity.
MRF	Materials Recovery/Recycling Facility	A MRF is a specialised plant that receives, separates and prepares recyclable materials for marketing to end-user manufacturers.
OAN	Objectively Assessed Needs	An assessment of housing need for a local authority.
PP	Planning Permission	Termed used when an application has been granted by the Local Planning Authority
	Recycling	Turning waste into a new substance or product includes composting if it meets quality protocols.
ROCs	Renewable Obligations Certificates	Green certificates issued to operators of accredited renewable generating stations for the eligible renewable electricity they generate.
RDF/SRF	Refuse Derived Fuel/Solid Recovered Fuel	Solid recovered fuel is a high quality alternative to fossil fuel produced from commercial waste including paper, card, wood, textiles and plastic. Refuse derived fuel is made from domestic waste which includes biodegradable material as well as plastics, and has a lower calorific value than solid recovered fuel
SSTW	Sewage Sludge Treatment Works	Infrastructure providing initial treatment of material delivered by foul sewer from homes, businesses and the network draining the wider public realm.

Acronym	Term	Definition
	Thermal Treatment without energy recovery	Management of waste by incineration without use of facilities to capture heat given off for the purposes of energy recovery. Some facilities using this technology to manage LACW still exist while others involve very high temperature incineration due to the properties of specific wastes (i.e. clinical, animal by-products and other hazardous wastes)
	Transfer/Transfer Station	Facility for receiving and 'bulking up' waste before its onward journey for treatment, recycling or disposal elsewhere.
	Treatment	Physical, chemical, biological or thermal waste management processes which change the characteristics of waste.
-	Waste facilities	Waste facilities include: Transfer stations Energy from Waste (Incineration with energy recovery) Recycling facility Treatment facility (e.g. mechanical biological or mechanical heat treatment) Household waste recycling centre Landfill/landraise Materials recovery facility
-	Waste streams	Waste streams include: LACW C&I CD&E Hazardous Agricultural LLW Waste Water/Sewage Sludge
-	Waste management routes	Waste management routes include: Recycling Composting (in vessel or open windrow) Treatment (recovery via thermal, physical, chemical or biological treatment) Landfill/landraise Transfer onwards to other waste management facility
WDI/HWDI	Waste Data Interrogator / Hazardous Waste Data Interrogator	Data tool prepared by the EA based on information provided by waste operators. It allows for assessments of strategic waste and general waste flow.



Acronym	Term	Definition
WEEE	Waste Electrical and Electronic Equipment	Term used to describe old, end-of-life or discarded appliances using electricity.
WWTW	Waste Water Treatment Works	Infrastructure providing initial treatment of material delivered by foul sewer from homes, businesses and the network draining the wider public realm.

## APPENDIX 9: Data Source References

### Commercial and Industrial Waste

Environment Agency Waste Data Interrogator 2014 <https://data.gov.uk/dataset/waste-data-interrogator-2014>

### Local Authority Collected Waste

Waste Data Flow - [www.wastedataflow.org](http://www.wastedataflow.org)

Information on waste arisings and growth forecasts – [www.northyorks.gov.uk](http://www.northyorks.gov.uk)

### Hazardous Waste

Environment Agency Hazardous Waste Data Interrogator 2014 - <https://data.gov.uk/dataset/hazardous-waste-interrogator-2014>

### Construction, Demolition and Excavation Waste

Environment Agency Waste Data Interrogator 2014 <https://data.gov.uk/dataset/waste-data-interrogator-2014>

### Agricultural Waste

Defra Annual Agricultural Census - <https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june>

Environment Agency. 2003. Agricultural Waste Survey 2003: A Study of the Management of Non-Agricultural Waste on Farms. Environment Agency.