

# North Yorkshire Sub Region Waste Arisings and Capacity Requirements

**Waste Arisings and Capacity Requirements  
Update Report**

**September 2016**



## 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 2030 for North Yorkshire County Council, Yorkshire Dales National Park (YDNP), North York Moors National Park (NYMNP) and City of York 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 2014. The quality of data available for each waste stream varies; for LACW, accurate data is available from the local authorities and Defra WasteDataFlow. 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 four scenarios of different recycling practice, and how each would be affected by three economic growth factors, to predict a range of future waste arisings. Figures for the LACW stream were provided by the Waste Disposal Authority and are in line with their projections, therefore no further modeling has taken place for this waste stream. The scenarios considered range from 'baseline', i.e. the arisings expected if nothing changed from the current situation, to 'maximum recycling/recovery with growth', i.e. if maximum recycling levels and high levels of growth 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 projected waste arisings for each growth factor during the plan period are set out in Tables 1 – 3. They show that the total predicted waste arisings for all waste streams (except LLR waste and waste water) range:

- from a minimum of 1,646,379 tonnes in 2016 (Growth Factor: minimised growth)
- to a maximum of 1,924,065 tonnes in 2030 (Growth Factor: growth).

Under all options, the projected growth in arisings for LACW remains constant as these are in line with those provided by the Waste Disposal Authority.

Table 1 Projected Waste Arisings by Waste Stream (tonnes per annum) – Growth Factor NO GROWTH

Waste Type	Quantity 2016	Quantity 2020	Quantity 2025	Quantity 2030
LACW	442,297	452,949	468,706	483,416
AWRP <sup>1</sup> Outputs C&I		63,000	63,000	63,000
AWRP Outputs Hazardous		15,000	15,000	15,000
C&I	322,872	322,872	322,872	322,872
CD&E	820,705	820,705	820,705	820,705
Hazardous	33,143	33,143	33,143	33,143
Agricultural	33,786	33,786	33,786	33,786
LLR	<50m <sup>3</sup>	<50m <sup>3</sup>	<50m <sup>3</sup>	<50m <sup>3</sup>
Waste Water	n/a	n/a	n/a	n/a
<b>TOTAL (excluding LLR waste and waste water)</b>	<b>1,652,803</b>	<b>1,741,455</b>	<b>1,757,212</b>	<b>1,771,922</b>

Table 2 Projected Waste Arisings by Waste Stream (tonnes per annum) – Growth Factor GROWTH

Waste Type	Quantity 2016	Quantity 2020	Quantity 2025	Quantity 2030
LACW	442,297	452,949	468,706	483,416
AWRP Outputs C&I		67,346	70,233	72,977
AWRP Outputs Hazardous		16,035	16,723	17,377
C&I	327,252	336,200	347,759	359,736
CD&E	837,201	871,196	897,639	920,306
Hazardous	33,542	34,353	35,395	36,467
Agricultural	33,786	33,786	33,786	33,786
LLR	<50m <sup>3</sup>	<50m <sup>3</sup>	<50m <sup>3</sup>	<50m <sup>3</sup>
Waste Water	n/a	n/a	n/a	n/a
<b>TOTAL (excluding LLR and waste water)</b>	<b>1,674,078</b>	<b>1,811,865</b>	<b>1,870,241</b>	<b>1,924,065</b>

<sup>1</sup> AWRP: Allerton Waste Recovery Park

Table 3 Projected Waste Arisings by Waste Stream (tonnes per annum) – Growth Factor MINIMISED GROWTH

Waste Type	Quantity 2016	Quantity 2020	Quantity 2025	Quantity 2030
LACW (Primary) <sup>1</sup>	442,297	452,949	468,706	483,416
AWRP Outputs C&I		67,346	70,233	72,977
AWRP Outputs Hazardous		16,035	16,723	17,377
C&I	316,448	303,978	300,937	300,937
CD&E	820,705	820,705	820,705	820,705
Hazardous	33,143	33,143	33,143	33,143
Agricultural	33,786	33,786	33,786	33,786
LLR	<50m <sup>3</sup>	<50m <sup>3</sup>	<50m <sup>3</sup>	<50m <sup>3</sup>
Waste Water	n/a	n/a	n/a	n/a
<b>TOTAL (excluding LLR and waste water)</b>	<b>1,646,379</b>	<b>1,727,942</b>	<b>1,744,233</b>	<b>1,762,341</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 the North Yorkshire Sub-region; how much waste in tonnes each facility manages every year; and any known end dates for temporary facilities.

A summary of operational waste management capacity for different waste management methods is shown in Table 4, this shows actual operational capacity for 2016 and projected operational capacity for 2020 onwards (including Allerton Waste Recovery Park (AWRP) due to the high level of confidence that this facility will become operational in 2018). Table 4 shows that the total operational waste management capacity for the North Yorkshire Sub-region will fall:

- from 2,583,433 tonnes per annum in 2016;
- to 1,989,752 tonnes per annum in 2030.

This fall in operational capacity is due to the expected closure of landfill and other waste management facilities with time limited planning permissions during the plan period.

Table 4 Total Actual (2016) and Projected (2020 onwards) Operating Waste Management Capacity by waste stream and management method (tonnes per annum)

Waste Management Method	Capacity 2016	Capacity 2020	Capacity 2025	Capacity 2030
Recycling (C&I, LACW)	644,338	889,639	864,639	814,639
Recycling (CD&E)	279,160	204,160	151,990	151,990
Recycling (Specialist Material)	105,049	105,049	105,049	105,049
Treatment Plant	198,226	184,780	177,756	177,756
Composting	317,877	357,877	342,877	329,541
Energy from Waste	0	320,000	320,000	320,000
Landfill (C&I, LACW, CD&E)	478,822	103,822	85,075	37,140
Landfill (CD&E)	559,961	289,312	53,637	53,637
<b>TOTAL</b>	<b>2,583,433</b>	<b>2,454,639</b>	<b>2,101,023</b>	<b>1,989,752</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 5–7 show the predicted future capacity gaps/surplus for the North Yorkshire Sub-region calculated by applying the four recycling scenarios to the waste arisings projected from the 'Growth' growth factor. Figures shown in negative represent a capacity surplus, meaning no new facilities are required; positive figures represent a capacity gap, for which new facilities may be required.

The hazardous waste landfill line includes the requirement to manage the hazardous residues from the AWRP Facility post 2018. There are no facilities in the plan area permitted to take hazardous waste, and the AWRP residues are addressed in the waste contract for management outside the plan area. The capacity gap is shown here to reflect the hazardous waste arising over the plan period.

Table 5 Waste Management Capacity Requirements by waste stream and management method – Scenario 1 (BASELINE) / Growth Factor GROWTH

Waste Management Method	Gap/Surplus 2016	Gap/Surplus 2020	Gap/Surplus 2025	Gap/Surplus 2030
Recycling (C&I, LACW, Agricultural)	-233,035	-456,819	-420,482	-359,549
Recycling (CD&E)	-119,373	-38,249	18,685	22,769
Treatment Plant	52,534	90,615	111,350	124,564
Composting	-134,199	-133,483	-117,558	-103,265
Energy from Waste	43,241	-112,649	-105,438	-98,699
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632
Landfill (C&I, LACW, Agricultural)	-253,590	-40,362	-19,305	30,890
Landfill (Hazardous)	7,252	23,464	24,379	25,266
Landfill (CD&E)	32,995	318,839	529,827	544,561
<b>TOTAL</b>	<b>-590,543</b>	<b>-335,012</b>	<b>140,528</b>	<b>200,169</b>

Table 6 Waste Management Capacity Requirements by waste stream and management method – Scenario 2 (MAXIMISED RECYCLING) / Growth Factor GROWTH

Waste Management Method	Gap/Surplus 2016	Gap/Surplus 2020	Gap/Surplus 2025	Gap/Surplus 2030
Recycling (C&I, LACW, Agricultural)	-227,139	-438,651	-401,693	-337,528
Recycling (CD&E)	16,672	386,458	456,283	471,418
Treatment Plant	52,534	90,615	111,350	124,564
Composting	-134,199	-133,483	-117,558	-103,265
Energy from Waste	45,206	-106,594	-99,176	-94,813
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632
Landfill (C&I, LACW, Agricultural)	-261,451	-64,585	-44,356	4,983
Landfill (Hazardous)	7,252	23,464	24,379	25,266
Landfill (CD&E)	-103,050	-105,868	92,229	95,912
<b>TOTAL</b>	<b>-590,543</b>	<b>-335,012</b>	<b>32,108</b>	<b>200,169</b>

Table 7 Waste Management Capacity Requirements by waste stream and management method – Scenario 3 ('ALTERNATIVE' MEDIAN RECYCLING) / Growth Factor GROWTH

Waste Management Method	Gap/Surplus 2016	Gap/Surplus 2020	Gap/Surplus 2025	Gap/Surplus 2030
Recycling (C&I, LACW, Agricultural)	-228,319	-442,284	-405,451	-342,710
Recycling (CD&E)	-10,537	301,517	368,763	381,688
Treatment Plant	52,534	90,615	111,350	124,564
Composting	-134,199	-133,483	-117,558	-103,265
Energy from Waste	46,386	-102,961	-95,418	-89,631
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632
Landfill (C&I, LACW, Agricultural)	-261,451	-64,585	-44,356	4,983
Landfill (Hazardous)	7,252	23,464	24,379	25,266
Landfill (CD&E)	-75,841	-20,927	179,749	185,642
<b>TOTAL</b>	<b>-590,543</b>	<b>-335,012</b>	<b>35,090</b>	<b>200,169</b>

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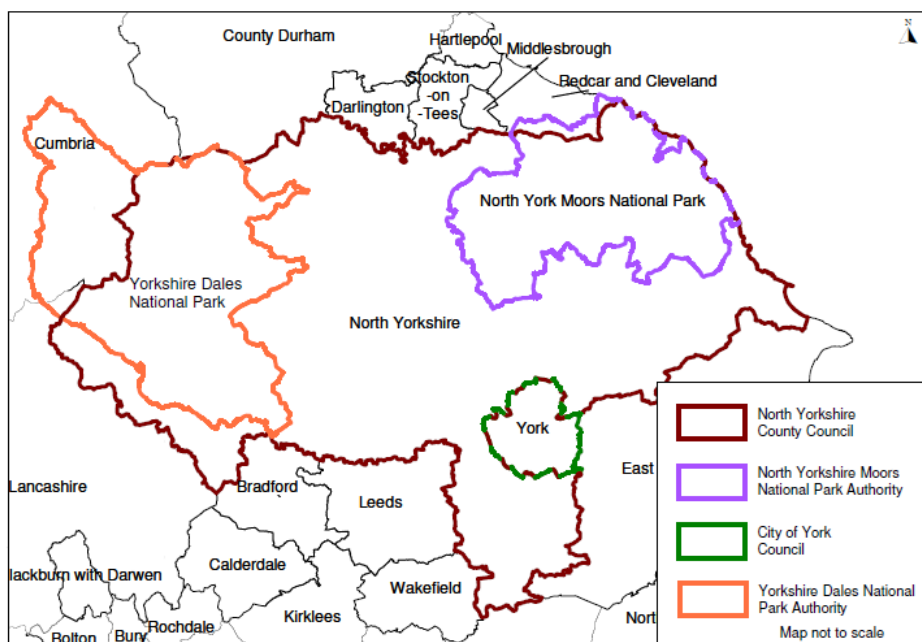
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## 1. Introduction and Context

- 1.1 In 2013 North Yorkshire County Council (in conjunction with City of York Council and the North York Moors and Yorkshire Dales National Park Authorities, hereafter referred to as ‘the Council’) commissioned Urban Vision and its partner 4Resources Ltd to prepare an assessment of waste arisings and capacity requirements for all controlled wastes arising in the North Yorkshire Sub-region.
- 1.2 The North Yorkshire Sub-region comprises: North Yorkshire County Council; The City of York Unitary Authority; the Yorkshire Dales National Park Authority; and the North York Moors National Park Authority. For the purposes of this study, the North Yorkshire Sub-region is taken to include the whole of the National Park areas including the parts of the Parks within Cumbria and Redcar and Cleveland. A map of the North Yorkshire Sub-region is shown at Figure 1.
- 1.3 Parts of the Yorkshire Dales National Park fall within the geographical boundaries of Cumbria (Waste Disposal Authority (WDA)) and South Lakeland District Council (Waste Collection Authority). On 1<sup>st</sup> August 2016, the Yorkshire Dales National Park officially grew by nearly a quarter, to include an extra 161 square miles (417 square kilometres) of land, however the change in size is unlikely to have a significant impact on waste arisings due to the population of the additional area being very small as a proportion of the whole plan area. Whilst the area is included within the North Yorkshire Sub-region for plan-making purposes, the responsibility for LACW lies with the Cumbria WDA and with South Lakeland District Council as the collection authority. Similarly, parts of the North York Moors National Park fall within the boundary of Redcar and Cleveland Borough Council which has responsibility to manage LACW as a unitary authority. LACW arisings from these parts of the National Parks have been provided for by Cumbria County Council’s Waste Management Strategy and through the Tees Valley Minerals and Waste Plan.

Figure 1: Map of North Yorkshire Sub-region



- 1.4 The findings of the study commissioned in 2013 were presented in two reports:
- Part 1 report (October 2013): assessment of waste arisings and cross-border movements
- The Interim Report provides information relating to the arisings for each of the main waste streams in the North Yorkshire Sub-Region as well as detail on the cross-border movement of waste across the North Yorkshire Sub-Region.

- Part 2 report (October 2013): summary of the earlier report, assessment of local waste capacity; presentation of forecast scenarios; capacity gap assessment and identification of gaps.

The part 2 report presents a detailed assessment of need for future waste management facilities over the plan period up to 2030 for North Yorkshire County Council, Yorkshire Dales National Park (YDNP), North York Moors National Park (NYMNP) and City of York Council.

1.5 The assessment focused on arisings in the principal 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
- Waste Water/Sewage Sludge.

1.6 The assessment was informed by the most accurate up-to-date information available at that time, in most cases referring to 2011/12.

1.7 In 2015, the Council commissioned Urban Vision to prepare a short addendum which involved the following:

- A review of the potential implications of EU and national policy developments with respect to waste and the implications of national and local evidence about future waste growth rates for the existing assessment;
- Baseline data updates as a result of changes to waste arisings and management methods for the main waste streams over the intervening period;
- Review of the consultation responses received on the original reports;
- Consideration of the implications of the above and propose, as appropriate, one or more alternative Growth and Behaviour scenarios. This task focused on changes to the C&I and CD&E waste streams as management of residual LACW continued to be based on the private procurement contract between the partner authorities in the sub-region and AmeyCespa Ltd.

1.8 The findings of this work were documented in the Addendum Report May 2015.

1.9 This latest report presents a further update covering the following points:

- Change in approach to forecasting C&I Waste Arisings following the approach set out by Defra in 2014<sup>2</sup>;
- A review of recycling capacity at existing waste transfer stations;
- Updated position on extant planning permission for new waste facilities;
- Updated position on progress with the Allerton Waste Recovery Park facility; and
- Review of recycling rates for C&I waste.

1.10 This update is presented as one complete report providing an updated baseline position for the major waste streams and forecasting capacity requirements over the plan period. The key waste streams reviewed and their data source are set out in Table 8 below.

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<sup>2</sup> DEFRA (August 2014) New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England

1.11 Future waste arisings have been projected based on four scenarios, which are explained in section four of this Report.

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, NYCC Waste Management team
Commercial and Industrial wastes	C&I	Wastes produced by all industry sectors	EA WDI 2014, EA, HWDI 2014, 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 2014 - <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 2014 - <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> 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	Yorkshire Water <i>Water Resources Management Plan August 2014</i> Northumbrian Water <i>Planning for the Future December 2013</i> United Utilities <i>Our revised business plan for 2015-2020</i>

## 2. Policy Development

- 2.1 This chapter briefly reviews any changes or additions to waste policy at European, national, sub-regional and local levels that have occurred since the completion of the original report. It concentrates only on changes that 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.
- 2.2 It should be noted that delays in publishing information about waste movements meant the previous reports were based on data from 2011 or 2011/12: however, other content was informed by policy and other developments affecting the waste sector in the period to autumn 2013 when the reports were published.

### European and national policy developments

Principal development	Implications
<b><i>EU Review of Waste Framework Directive Recycling Targets<sup>3</sup></i></b>	
A common EU <b>target for recycling 65% of municipal waste</b> by 2030	The implications of all these potential changes may need to be reviewed while recognising: (a) the EU has subsequently partially back-tracked on this matter and reduced proposed levels from initial proposals of 70% recycling already; (b) they may present major problems for member states locked into high rates of energy recovery; and (c) they are still subject to further consultation at which point states with high levels of energy recovery may seek further changes. One approach may be to apply two scenarios – one addressing the last two changes only (as they are potentially more realistic); the other addressing all four and representing an extreme change which, in-effect, fully implements the circular economy concept. It should also be recognised that the waste industry probably considers achieving the recycling target to be impractical unless there is continuing, significant changes affecting packaging materials and corresponding changes to householder and employee behaviour in response to waste reduction initiatives
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	
Encouragement for separate collection of biowaste (food waste) but decision to be left	

<sup>3</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.

to local authorities	waste, especially in urbanised authorities. Scale of roll-out in the North Yorkshire Sub-region 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	National average of >90% could be reflected in scenario targets though would need to be judged against apparent level of local performance <sup>4</sup>
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
<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 impact for this update but may impact need for dialogue with authorities currently receiving these wastes.

## Sub-regional and Local policy developments

<b>Leeds City Region Enterprise Partnership</b>	<b>Strategic Economic Plan 2014</b>
Focuses most of growth in urbanised south of the City Region with only York identified as a strategic investment and housing growth centre	Difficult to judge impacts on waste creation rates as the City Region only includes 4 of the local and unitary authorities
Various investment proposals for high-tech. Infrastructure and broadband connectivity to deliver growth	Possible implication that forecasting waste growth based on output may overstate the situation if the proposals lead to a decoupling of the two rates. Possibly consider alternative criteria to drive waste growth assumptions recognising, again, that the proposals will only impact part of the Plan area
Supports decentralised energy generation and promotion of biotechnology facilities that would optimise recycling, re-use and recovery of biologically based wastes	Review appropriate levels for energy recovery assumptions of C&I wastes specifically (as that for LACW will be addressed through the waste management

<sup>4</sup> The review of CD&E waste arisings later in this report notes that potentially substantial quantities of material may be being recycled at operations that lie outside the scope of the reporting submitted to the Environment Agency. Therefore it is likely that local rates will appear to be lower because this contribution cannot be identified independently.

	contract)
Recognition that the City Region under-performs as the proportion of waste managed at upper levels in the Waste Hierarchy fall below national averages.	Significant insofar as it confirms the findings of the original study (and this Update)
<b><i>North Yorkshire County Council Municipal Waste Management Strategy (MWMS) and residual waste management contracts</i></b>	
Key developments are conclusion of a Judicial Review into the proposal to develop the AWRP, planning permission for the site (September 2014), award of contract to AmeyCespa (October 2014), and breaking of ground at AWRP (March 2015) <sup>5</sup> .	This update anticipates AWRP will become operational in 2018, to reflect the revised opening date following delays caused by the Judicial Review.

<sup>5</sup> Whilst the new permission for the Allerton Waste Recovery Park is not a 'policy development', permission at this site impacts upon any future revision of the capacity assessment study and so is recorded here.



### 3 Baseline Waste Arisings

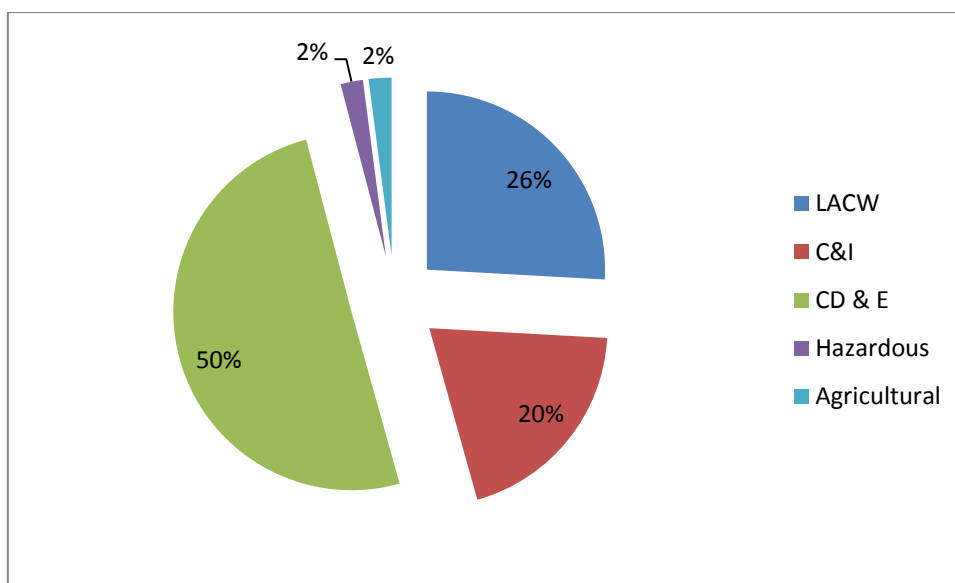
3.1 Each waste stream is discussed in detail in separate sections of this report. This section presents the overall arisings for the five key waste streams in the Plan area in 2014. In 2014, a total of **1,636,370** tonnes of waste arose in the plan area, as shown in Table 9. Table 9 does not include arisings for LLR waste or waste water as we do not have specific details on these waste streams to include here.

Table 9 Baseline waste arisings (2014) (tonnes)

Waste Type	Quantity 2014
LACW	425,864
C&I	322,872
CD&E	820,705
Hazardous	33,143
Agricultural	33,786
<b>Total</b>	<b>1,636,370</b>

3.2 Figure 2 below shows the proportions of the waste streams. This shows that just under 50% of waste arisings in 2014 consisted of construction, demolition and excavation waste. LACW made up 26%, and C&I waste 20% of the total arisings, with hazardous and agricultural sharing the remainder.

Figure 2: Total Waste Arisings 2014<sup>6</sup>



3.3 Table 10 presents operating waste management capacity within the North Yorkshire Sub-region. Capacity information has been taken from: throughputs reported via the Environment Agency WDI; planning permission data; and direct correspondence with the operators. Operating waste management capacity changes throughout the plan period as existing sites close. AWRP is included in the data from 2018 onwards due to the high level of confidence that this facility will become operational. This is the only facility included in the data that is permitted but not currently operational (as at September 2016). Table 10 shows the change in operational capacity at 5 year intervals throughout the plan period.

<sup>6</sup> Data sources EA WDI 2014 and NYCC Waste Disposal Authority

Table 10: Total Actual (2016) and Projected (2020 onwards) Operating Waste Management Capacity by waste stream and management method (tonnes per annum)

Waste Management Method	Capacity 2016	Capacity 2020	Capacity 2025	Capacity 2030
Recycling (C&I, LACW)	644,338	889,639	864,639	814,639
Recycling (CD&E)	279,160	204,160	151,990	151,990
Recycling <sup>7</sup> (Specialist Material)	105,049	105,049	105,049	105,049
Treatment Plant <sup>8</sup>	198,226	184,780	177,756	177,756
Composting	317,877	357,877	342,877	329,541
Energy from Waste	0	320,000	320,000	320,000
Landfill (C&I, LACW, CD&E)	478,822	103,822	85,075	37,140
Landfill (CD&E)	559,961	289,312	53,637	53,637
<b>TOTAL</b>	<b>2,583,433</b>	<b>2,454,639</b>	<b>2,101,023</b>	<b>1,989,752</b>

<sup>7</sup> This relates to specialist recycling facilities handling metals and WEEE materials

<sup>8</sup> This a facility which treats waste using a variety of processes such as :Biological, chemical, or mechanical method(s) to (1) remove pollutants from industrial or municipal wastes, (2) change the character and composition of medical waste, or (3) reduce or eliminate its potential for harm to living beings and the environment.

## 4 Predicting Future Requirements

- 4.1 Three scenarios were originally used to forecast future waste requirements. The scenarios reflect a range of possibilities that could be implemented based on different recycling and recovery practices:
- Baseline, - This reflects the current status and forward planning position.
  - Maximised recycling -- This reflects the achievement of ambitious recycling and recovery targets of C&I and CD&E wastes above the EU and national levels; and
  - Median recycling – This reflects a median level of recycling and recovery of C&I and CD&E wastes. This scenario has lower recycling than the maximised option with higher levels of recovery and landfill.
- 4.2 This Report considers an additional Scenario, termed the 'Alternative' Median, and compares the outputs from modeling this scenario against the original scenarios. Reflecting the most recent EU targets<sup>9</sup> the 'Alternative' Median Scenario foresees the management of C&I waste by 2030 achieving:
- 10% maximum to landfill (Commercial) / 18% maximum to landfill (Industrial), of the remainder
  - 65% recycling; and
  - 35% to energy recovery
- 4.3 Although the EU targets relate to municipal waste, outside the UK this definition includes both household waste and that from other sources which is 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. Table 11 provides further information on the four recycling scenarios.

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<sup>9</sup> A common EU target for recycling 65% of municipal waste by 2030; A binding landfill target to reduce landfill to maximum of 10% of municipal waste by 2030

Table 11 'Change in Behaviour' Scenarios

Waste Stream	Scenario	Practice Assumption	
LACW	All scenarios	Waste is managed in accordance with existing and planned arrangements and in accordance with agreed targets in the JMWMS and delivery of AWRP facility (minimum recycling or composting of 50% of household waste by 2020 and diversion of 95% of municipal waste from landfill when AWRP facility operational)	
C&I Waste		<b>Commercial waste</b>	<b>Industrial waste</b>
	Scenario 1 Baseline Recycling Scenario	No change from baseline position	No change from baseline position
	Scenario 2 Maximised Recycling Scenario	By 2020: 10% to landfill Of the remainder: 75% recycling 25% EfW  By 2030: 10% to Landfill Of the remainder: 85% Recycling 15% EfW	By 2020: 18% to Landfill Of the remainder: 75% Recycling 25% EfW  By 2030: 18% to Landfill Of the remainder: 85% Recycling 15% EfW
	Scenario 3 Alternative Median Recycling Scenario	By 2020: 10% to landfill Of the remainder: 60% recycling 40% EfW  By 2030: 10% or below to landfill Of the remainder: 65% recycling 35% EfW	By 2020: 18% to landfill Of the remainder: 60% recycling 40% EfW  By 2030: 18% or below to landfill Of the remainder: 65% recycling 35% EfW
	Scenario 4 Median Recycling Scenario	By 2020: 10% to Landfill Of the remainder: 60% Recycling 40% EfW	By 2020: 18% to Landfill Of the remainder: 60% Recycling 40% EfW
CD&E Waste	Scenario 1 Baseline Recycling Scenario	No change from baseline position	
	Scenario 2 Maximised Recycling Scenario	By 2020 75% recycling 20% treatment 5% landfill	
	Scenario 3 Alternative Median Recycling Scenario	By 2020 60% recycling 20% treatment 20% landfill	
	Scenario 4 Median Recycling Scenario	By 2020: 60% recycling 20% treatment 20% landfill	

- 4.4 Growth factors are summarised in Table 12 and represent influences on the future quantity of waste arisings. The figures for LACW were provided by the WDA and the figures therefore align with its projections of growth for LACW. As such no further modeling has taken place on this waste stream through this update. For the other waste streams, these factors seek to reflect future economic activity (using historic trends and projections on Gross Value Added (GVA) outcomes; fiscal/financial/legislative factors, including Landfill Tax charges driving waste away from landfill; and financial incentives such as Renewable Obligations Certificates. The use of 33% estimated GVA growth projections, which is approximately 0.8% per annum, is based on an analysis of historic trends for growth in industrial, commercial waste and construction, demolition and excavation wastes. This update has also used Yorkshire Regional Econometric data growth projections as the basis for growth projections.
- 4.5 The minimised growth option was agreed by project partners to apply no growth to commercial waste, CD&E waste and Agricultural waste to reflect the implementation of effective waste growth controls such as minimisation initiatives. It also applies a reduction in growth (-1%) to industrial wastes to reflect the overall reduction in this area in recent years which could continue if the reduction in the manufacturing sector is replaced by other uses e.g. service sector.

**Table 12 Growth Factors for Growth**

<b>Growth Factor</b>	<b>Description</b>
<b>NO GROWTH</b>	All wastes no growth
<b>GROWTH</b>	Industrial waste – growth @ 33% estimated GVA Commercial waste (including LA collected commercial waste) – growth @ 33% estimated GVA <sup>10</sup> CD&E waste – growth @ 33% estimated GVA Agricultural waste – no growth LACW – growth projections as defined by the WDA
<b>MINIMISED GROWTH</b>	Industrial waste – arisings declining at 1% per annum Commercial waste – no growth CD&E waste – no growth Agricultural waste – no growth LACW – growth at projections as defined by the WDA

<sup>10</sup>.LA collected commercial waste is assumed to grow at the same rate as commercial waste rates.

## 5 Local Authority Collected Waste

- 5.1 Local Authority Collected Waste (LACW) is all waste collected by the local authority.
- 5.2 LACW across the North Yorkshire Sub-region is the joint responsibility of North Yorkshire County Council (NYCC) and City of York Council as both are designated WDA. NYCC also has the responsibility for LACW within both the National Parks, except those geographical areas falling outside of the North Yorkshire county boundary. The authorities are working together in order to treat residual waste arisings across the North Yorkshire Sub-region and meet obligations to divert waste away from landfill.

### Data Sources

- 5.3 The data sources for this waste stream are the Waste Collection Authority, the WDA, and the Defra database called 'WasteDataFlow'.

### Baseline Arisings

- 5.4 The following table provides information on LACW arisings for the North Yorkshire Sub-region in 2014/15 based on information taken from WasteDataFlow. Figures used for the National Parks are the best estimates available however the totals are only a small proportion of the total LACW managed in the North Yorkshire Sub-region. A total of 425,864 tonnes arose in the North Yorkshire Sub-region in 2014/15, see table 13 below for a detailed breakdown.

**Table 13 LACW arisings in 2014/15 for the North Yorkshire Sub-region, tonnes**

		<b>Arisings</b>	<b>Recycled, Composted or Re-Used</b>	<b>To Energy Recovery</b>	<b>To Landfill</b>
<b>North Yorkshire</b>	LACW	327,152	150,301	28,037	145,605
	Household	301,269	145,297	24,870	128,295
<b>City of York</b>	LACW	96,458	39,849	0	55,312
	Household	89,876			
<b>Yorkshire Dales National Park (Lakeland)</b>	LACW only	2,254			
<b>Total North Yorkshire Sub-region LACW arisings (estimated)</b>		425,864			
<b>National Park individual breakdown – figures included in totals above</b>					
<b>North Yorks Moors National Park</b>	LACW only	11,325	4,878	351	6,097
<b>Yorkshire Dales National Park (N Yorks)</b>	LACW only	7,272	3,132	225	3,915

Source: DEFRA WasteDataFlow. NB figures showing breakdown to management i.e. recycling, recovery etc. may not add up to the total arisings due to the provisional status of the data, the method by which data is managed through WasteDataFlow and the exclusion of process losses.

## Forecast Arisings

- 5.5 Table 14 shows the forecast LACW arisings ranging from 442,297 tonnes in 2016 to 484,416 tonnes in 2030. These figures have been provided directly by the WDA.

Table 14 LACW Forecast arisings (tonnes)

Waste Type	Quantity 2016	Quantity 2020	Quantity 2025	Quantity 2030
LACW	442,297	452,949	468,706	484,416

Source: North Yorkshire County Council WDA

## 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. The operating capacity of facilities processing only LACW within the North Yorkshire Sub-region is 115,369 tonnes at 2016. There are numerous other waste management sites within the Plan area that have a license to take waste materials of LACW composition (962,215 tonnes at 2016) however, this capacity is also available for LACW, C&I and CD&E waste streams. Table 10 provides details of operating capacity for all waste streams over the plan period.
- 5.7 The North Yorkshire Sub-region currently relies on landfill as the primary method of disposing of waste that cannot be recycled or reused. The two main landfill sites serving the Sub-region in the next few years are expected to be Allerton Park in North Yorkshire and Harewood Whin within York's administrative boundary.
- 5.8 Both North Yorkshire County and York City Councils have entered into a contract for residual waste to be managed at a new facility, the Allerton Waste Recovery Park (AWRP). For the purposes of this Update, the permission at AWRP, which includes mechanical treatment, anaerobic digestion and energy from waste technologies, has been included as providing waste management capacity for LACW from 2018. Permission for this facility was granted in 2012. Construction of the facility is well advanced and it is expected to become fully operational in early 2018. A contract for LACW is in place for the AWRP to treat residual waste arising in North Yorkshire and York and the technology being utilised is well established. It is for these reasons that AWRP is regarded in this Report as 'operating' and therefore providing waste management capacity from 2018 onwards.
- 5.9 The AWRP includes an energy from waste plant with capacity to deal with 320,000 tonnes per annum. It is expected that it will typically treat 305,000 tonnes per annum of waste, principally LACW.
- 5.10 The energy from waste plant will result in by-products including Incinerator Bottom Ash (IBA) and Air Pollution Control (APC) residue. It is expected that 50,000 tonnes per annum of IBA will be produced. The planning consent permits the construction of an onsite IBA processing facility which will have the capacity for 50,000 tonnes per annum. It is expected that approximately 38,000 tonnes per annum will be recycled to produce secondary aggregate which can be used in construction.
- 5.11 The developer estimates that approximately 13,000 tonnes per annum IBA processing residue and 15,000 tonnes per annum APC residue would be generated. The APC is a hazardous waste and is proposed to be transported off site in sealed tankers to a hazardous landfill site which is expected to be Knostrop in Leeds. It is expected that the IBA residue will be disposed of at the adjacent non-hazardous landfill (Allerton Park) or another suitably licenced landfill.
- 5.12 IBA and APC waste produced from the AWRP are classified as C&I waste, and therefore do not count toward LACW arisings.

## Projected Capacity Gap/Capacity Surplus

- 5.13 When operational the AWRP facility is expected to enable diversion of a minimum of 95% of waste from landfill. Recycling, Energy from Waste and Landfill capacity requirements are shown jointly with the

C&I waste stream as many sites within the plan area are licensed to also take waste materials similar in composition to LACW. Table 15 below sets out the anticipated capacity gap for LACW and C&I waste over the plan period.

**Table 15 Forecast capacity requirements for LACW and C&I waste (tonnes) using Growth Factor: Growth and Behaviour Scenarios 2-4**

Waste Management Method	Year	Scenario 2	Scenario 3	Scenario 4
<b>Recycling (includes C&amp;I)</b>	2016	-227,139	-228,319	-228,319
	2020	-438,651	-442,284	-442,284
	2025	-401,693	-405,451	-405,451
	2030	-337,528	-342,710	-344,005
<b>Energy from Waste LACW (includes C&amp;I)</b>	2016	45,206	46,836	46,386
	2020	-106,594	-102,961	-102,961
	2025	-99,176	-95,418	-95,418
	2030	-94,813	-89,631	-88,336
<b>Landfill (includes C&amp;I)</b>	2016	-261,451	-261,451	-261,451
	2020	-64,585	-64,585	-64,585
	2025	-44,356	-44,356	-44,356
	2030	4,983	4,983	4,983

5.14 As table 15 shows, there is no tonnage requirement for additional capacity to manage LACW or C&I waste over the plan period. However, proposals for revisions to the network could come forward during the plan period, for example to improve the overall accessibility of the network through the provision of additional transfer capacity. There is also a small gap in landfill provision across all scenarios from 2026 onwards



## 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>11</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 the North Yorkshire Sub-region.

### Baseline Arisings

- 6.2 A total of 322,872 tonnes of C&I waste was recorded as arising in the North Yorkshire Sub-region in 2014. This total includes C&I waste arisings that were deposited in the county of North Yorkshire but which have no known origin. A detailed description of the breakdown of the unknown arisings is provided in the methodology set out in Appendix 4.

### Forecast Arisings

- 6.3 The following table provides information on forecast C&I waste arisings for the North Yorkshire Sub-region.

Table 16 Forecast C&I waste arisings in the North Yorkshire Sub-region (tonnes) (excluding output from AWRP)

	No Growth	Growth	Minimised Growth
<b>Arisings 2016</b>	322,872	327,252	316,448
<b>Arisings 2020</b>	322,872	336,200	303,978
<b>Arisings 2025</b>	322,872	347,749	300,937
<b>Arisings 2030</b>	322,872	359,736	300,937

- 6.4 In addition to applying the growth rates to C&I waste arisings, this assessment should also include the outputs from the AWRP (see chapter 5). Table 17 below identifies the additional arisings from AWRP, which for the Growth and Minimised Growth factors have been assumed to increase in line with the projections of LACW growth provided by the WDA.

Table 17 Outputs from AWRP as part of C&I Waste arisings (tonnes)

	No Growth	Growth	Minimised Growth
<b>AWRP Arisings (C&amp;I) 2016</b>	-	-	-
<b>AWRP Arisings (C&amp;I) 2020</b>	63,000	67,346	67,346
<b>AWRP Arisings (C&amp;I) 2025</b>	63,000	70,233	70,233
<b>AWRP Arisings (C&amp;I) 2030</b>	63,000	72,977	72,977

### Operating Capacity

- 6.5 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, full details of operating capacity through the plan period can be found in Table 11. It would therefore be very difficult to give a precise figure for the total available capacity for C&I waste in the North Yorkshire Sub-region.

<sup>11</sup> DEFRA (2014) *New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England*

6.6 A number of extant planning permissions (at September 2016) for new capacity have been recently granted and are listed in table 18 below. These consents have not been implemented and are not included as operational capacity for the purposes of forecasting future capacity requirements. This is because the facilities are not yet operational and there is less certainty over their future delivery than for the AWRP facility. However, if built, these facilities would provide significant additional capacity for the management of C&I waste, and if required could also provide LACW capacity, although this latter requirement is not expected to arise.

**Table 18 Waste Management Facility Sites with Planning Permission**

Site	Waste Management Capacity	Notes
North Selby Anaerobic Digestion Facility – AD Facility	60,000 tonnes per annum	Planning permission yet to be implemented.
Southmoor Energy Centre – EfW Facility	280,000 tonnes per annum	Planning permission yet to be implemented.
Former Arbre Power Station – EfW Facility	200,000 tonnes per annum	Planning permission yet to be implemented.

### Projected Capacity Gap/Capacity Surplus

- 6.7 Table 15 shows a surplus capacity for the recycling of C&I and LACW across all potential scenarios. However, there may still be a benefit in extra provision in order to provide an adequate geographic network as well as providing for material specific capacity
- 6.8 This Report shows a capacity gap across all scenarios for ‘treatment’, which includes Anaerobic digestion, specialized treatment of biodegradable liquids and wastes and organic waste treatment by distillation. This need for treatment capacity is not specific to C&I waste, and facilities may treat a number of waste streams. This need for treatment capacity should be kept under review as a facility has been permitted (North Selby Anaerobic Digestion Facility) which would go some way to meeting this gap should it be developed. In addition, ‘treatment’ incorporates recycling technologies; it is not unreasonable to expect the availability of surplus recycling capacity to help manage much of these forecast arisings.
- 6.9 From 2018 onwards there is no projected capacity gap for the management of residual LACW and C&I waste via energy from waste.
- 6.10 There is a surplus of landfill across the plan period for both LACW and C&I combined under all management scenarios until 2025. However, from 2026, there will be a small gap in the region of between 5,000 - 7,000 tonnes towards the end of the plan period, the lower gap is realised if the higher recycling rates are achieved.

## 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 the North Yorkshire Sub-region can be made by looking at how much CD&E is managed through permitted sites. Data has been published by the Environment Agency for 2014 (EA WDI). This gives 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 There is no available data covering “Registered Exemptions” for CD&E waste, which would include burning practices on land, spreading waste on land, for reclamation/improvement; and/or sites used for the storage of CD&E materials.
- 7.4 No separate data on CD&E waste is available for the National Parks. There are no operational sites in the Yorkshire Dales National Park. Whilst there are permitted sites in the North York Moors National Park, only two transfer facilities record CD&E waste deposits and it cannot be ascertained if these arisings are from within the North York Moors National Park. However construction activity within both the National Parks is very low and thus CD&E arisings will be low and consequently included within the totals for the North Yorkshire sub-region and principally North Yorkshire as set out below.

### Baseline Arisings

7.5 Table 19 shows that there was in the order of **931,819 tonnes** of CD&E deposited in 2014 in the North Yorkshire Sub-region. However not all of this waste arose within the North Yorkshire Sub-region; a total of 820,705 tonnes arose within the plan area. There is likely to be an uneven geographical distribution of CD&E waste arisings across the North Yorkshire Sub-region with most arisings concentrated in urban areas. Table 19 shows the types of facilities where CD&E waste is managed in the North Yorkshire Sub-region.

Table 19 CD&E waste deposits by management method in the North Yorkshire Sub-region in 2014 (tonnes)

Management Method	Construction and Demolition Waste	Excavation Waste	Total
CA site	9,417		9,417
Car Breaker	3,409		3,409
Composting	10,795		10,795
Deposit of Waste on Land	5,776	56,080	61,856
Hazardous Waste Transfer	13,024	3,989	17,013
Inert Landfill	23,420	343,182	366,602
Inert Transfer Station	18,104	6,249	24,353
Inert Transfer/Treatment	1,946	2,205	4,151
MRF	15,127	30,085	45,212
Metals Recycling	18,427		18,427
Non Hazardous Landfill	31,965	79,100	111,065

Non Hazardous Transfer	70,408	18,883	89,291
Non Hazardous Transfer/Treatment	24,051	14,366	38,417
Physical Treatment	32,280	99,524	131,804
Timber Manufacturing	7		7
Totals	278,156	653,663	931,819

Source: EA WDI 2014

7.6 Table 20 provides a simplified summary of the fate of these materials.

**Table 20 CD&E Waste Deposits by fate in the North Yorkshire Sub-region in 2014 (tonnes)**

Fate	Construction & Demolition	Excavation	Total
<b>Transfer</b>	114,362	29,121	143,483
<b>Recycling</b>	33,561	30,085	63,646
<b>Composting</b>	10,795		10,795
<b>Treatment</b>	58,277	116,095	174,372
<b>To land</b>	61,161	478,362	539,523
<b>Total</b>			

Source: EA WDI 2014

7.7 Table 21 shows that only 15% of Construction and Demolition waste arisings in the North Yorkshire Sub-region are exported.

**Table 21 Management of Construction and Demolition Wastes Arising in the North Yorkshire Sub-region in 2014 (tonnes)**

<b>Construction &amp; Demolition Waste</b>			
Site type	Managed Locally	Exported	Total Arisings
<b>CA Site</b>	9,256		9,256
<b>Car Breaker</b>	3,124		3,124
<b>Composting</b>	9,850		9,850
<b>Deposit of waste to land (recovery)</b>	353		353
<b>Haz Waste Transfer</b>	12,855		12,855
<b>Inert LF</b>	25,914		25,914
<b>Inert Waste Transfer</b>	10,000		10,000

<b>Construction &amp; Demolition Waste</b>			
<b>Site type</b>	<b>Managed Locally</b>	<b>Exported</b>	<b>Total Arisings</b>
<b>Inert Waste Transfer / Treatment</b>	1,946		1,946
<b>Material Recycling Facility</b>	15,091	1,739	16,830
<b>Metal Recycling</b>	18,175		18,175
<b>Non Hazardous LF</b>	27,881	17,666	45,547
<b>Non-Haz Waste Transfer</b>	68,063	12,060	80,123
<b>Inert Waste Transfer / Treatment</b>	24,322		24,322
<b>Physical Treatment</b>	32,247	14,306	46,553
<b>Timber Manufacturing</b>	8		8
<b>TOTAL</b>	<b>259,083</b>	<b>45,771</b>	<b>304,855</b>

Source: EA WDI 2014

7.8 Table 22 shows that less than 5% of excavation waste is exported.

Table 22 Management of Excavation Wastes Arising in the North Yorkshire Sub-region in 2014 (tonnes)

<b>Excavation Waste</b>			
<b>Site type</b>	<b>Managed Locally</b>	<b>Exported</b>	<b>Total</b>
<b>Deposit of waste to land (recovery)</b>	61,503		61,503
<b>Haz Waste Transfer</b>	3,998		3,998
<b>Inert LF</b>	240,107		240,107
<b>Inert Waste Transfer</b>	900		900
<b>Inert Waste Transfer / Treatment</b>	2,205		2,205
<b>Material Recycling Facility</b>	30,084	212	30,297
<b>Metal Recycling</b>			
<b>Non Hazardous LF</b>	73,061	17,345	90,406

<b>Non-Haz Waste Transfer</b>	18,883	3,185	22,068
<b>Inert Waste Transfer / Treatment</b>	13,659		13,659
<b>Physical Treatment</b>	85,171	5,182	90,353
<b>Timber Manufacturing</b>			
<b>TOTAL</b>	<b>529,571</b>	<b>25,924</b>	<b>555,496</b>

Source: EA WDI 2014

7.9 Table 23 provides detail on the movement of wastes into and out of transfer stations.

**Table 23 Movements of CD&E Wastes through Transfer Stations in the North Yorkshire Sub-region in 2014 (tonnes)**

<b>Nature of movement</b>	<b>Construction &amp; Demolition tonnes</b>	<b>Excavation tonnes</b>
<b>Locally arising wastes managed at local WTSs</b>	103,298	23,781
<b>Wastes imported</b>	7,654	5,340
<b>Wastes removed from local WTSs</b>	88,838	34,114

### Forecast Arisings

7.10 Table 24 shows the forecast arisings for CD&E waste at five-year intervals throughout the plan period under all forecast growth rates. The forecast is based on arisings from 2014/15 and includes waste deposited within the North Yorkshire Sub-region for which the origin is unknown. This has resulted in an increase in the amount of waste recorded as requiring management in the North Yorkshire Sub-region over the plan period.

**Table 24 Forecast Arisings for CD&E in the North Yorkshire Sub-region in 2014 (tonnes)**

<b>Year</b>	<b>No Growth</b>	<b>Growth</b>	<b>Minimised Growth</b>
<b>2016</b>	820,705	837,201	820,750
<b>2020</b>	820,705	871,196	820,750
<b>2025</b>	820,705	897,639	820,750
<b>2030</b>	820,705	920,306	820,750

### Operating Capacity

7.11 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 the North Yorkshire Sub-region is 767,691 tonnes as at 2016. This capacity excludes sites within the plan area that can accept, by license, CD&E waste alongside C&I waste and is therefore not a true reflection of the total available

capacity for this waste stream. If sites which accept CD&E alongside other waste streams are included, there is an additional 876,772 tonnes of capacity available for both CD&E and C&I waste management.

### Projected Capacity Gap/Capacity Surplus

- 7.12 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, and ranges, from;
- 79,728 tonnes in 2030 under Scenario: Maximum recycling; No Growth; to
  - 479,821 tonnes per annum in 2001 under Scenario: baseline; No Growth.
- 7.13 There is a shortfall of recycling capacity for CD&E waste (principally C&D materials) under all the growth rates and management scenarios over the plan period. The gap ranges from a modest;
- 4,826 tonnes per annum by 2030 under Scenario: Baseline; No growth; to
  - 471,418 tonnes in 2030 under Scenario: Maximum recycling; Growth.
- 7.14 It may be concluded that additional capacity will be required to support higher levels of CD&E recycling. Recycling of CD&E waste is economically more viable at more localised facilities due to the lower value and costs of transporting lower value, higher density wastes. Therefore the recycling facilities for this waste stream are more likely to be required within the Plan area. CD&E recycling can be achieved by mobile plant working at demolitions sites as well as at fixed facilities
- 7.15 Sites capable of accepting inert CD&E waste for landfill show significant closures from 2020/21 (c.169,000 tonnes per annum) and in year 2020 annual capacity is reduced by a further 67,000 tonnes. New capacity will therefore be required from the start of the Plan period if there is no increase in recycling and from 2022 with maximised recycling. However, it is important to note that there are two sites with planning permission extending beyond the plan period that are not operating, with a combined potential capacity of 150,000 tonnes per annum, which would meet a significant amount of the inert landfill capacity gap post 2020. The sites are:
- Barnsdale Bar Quarry; and
  - Long Lane Quarry
- 7.16 In addition, non-hazardous landfill sites are also able to take inert waste (CD&E waste), and this is common practice for use as daily cover and in final restoration of sites. The EA estimates that 25% of the total capacity of non-hazardous landfill could be taken up by CD&E waste for this use. At the end of 2014, there was 4,257,096 cm<sup>3</sup> of void space available in non-hazardous landfill sites across the plan area. Applying the 25% capacity to each site identifies just over 1million cm<sup>3</sup> of void space for inert material, whilst still allowing for non-hazardous requirements to be met. However, like many of the existing inert landfill sites, the permission for the non-hazardous sites expire within the next 10 years, leaving only one site available post 2025.
- 7.17 The Yorkshire and Humber Waste Planning Authorities produced a Waste Position Statement in February 2016. That paper looks at the total waste managed within the region, including the level of landfill required and existing void space. That paper identifies that the Yorkshire and Humber Region has in overall terms sufficient landfill capacity to meet its own needs; this is an important consideration for future landfill needs of the plan area over the plan period. This paper reflects the expected continued need for internal movement of waste across the region for disposal to landfill; a position accepted by the constituent WPAs.

## 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 2014 Hazardous Waste Environment Agency Interrogator. It is not possible to separate hazardous waste data for the two National Park areas from the Environment Agency data, nor is there any reasonable method to apportion hazardous waste arisings for the two National Parks (for example, there is no explicit relationship in hazardous waste arisings per head of population). Therefore, the figures used are based on data covering North Yorkshire and York. Arisings in the National Parks will be low due to the low number of businesses generating such hazardous wastes and it can be assumed that any arisings will continue to be dealt with through the current means throughout the life of the Minerals and Waste Local Plan. A potential exception to this is if shale gas development takes place in the area in future, but the extent to which this may occur is not presently known.

### Baseline Arisings

- 8.4 A total of 33,143 tonnes of hazardous waste was recorded as arising in the North Yorkshire Sub-region in 2014.

### Forecast Arisings

- 8.5 Table 25 provides information on forecast hazardous waste arisings for the North Yorkshire Sub-region. The tonnage presented in this table also includes the APC residue (approximately 15,000 tonnes per annum) that results from the processing of LACW through the AWRP from 2018. The APC is a hazardous waste and is proposed to be transported off site in sealed tankers to a hazardous landfill site expected to be Knostrop in Leeds.

Table 25 Forecast Hazardous waste arisings in the North Yorkshire Sub-region (tonnes) including AWRP hazardous outputs

	No Growth	Growth	Minimised Growth
<b>Arisings 2016</b>	33,143	33,542	33,143
<b>Arisings 2020</b>	48,143	50,388	49,178
<b>Arisings 2025</b>	48,143	52,118	49,866
<b>Arisings 2030</b>	48,143	53,844	50,520

### Operating Capacity

- 8.6 Hazardous waste management within the North Yorkshire Sub-region is confined to waste taken to Waste Electrical and Electronic Equipment (WEEE) treatment facilities. Remaining arisings are deposited at transfer stations for onward movement (for treatment and disposal) or are exported directly from the area.

### 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. The future capacity requirement for hazardous waste management has been taken into account under the main classes of waste materials for which hazardous waste is a sub-set. However, hazardous waste facilities for most forms of treatment, incineration and for landfill are located outside the plan area



and it is anticipated that 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.

- 8.8 As discussed above, it is likely that the AWRP facility, in particular, the energy recovery facility, will generate APC residues that will be classed as hazardous. There are no waste management facilities for these wastes within the North Yorkshire Sub-region, consequently it is expected to be exported for management and disposal.

## 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 the North Yorkshire Sub-region, data has been extrapolated using the relationship of agricultural land size and number of farm holdings and associated waste generation. This work is based on the Defra annual agricultural census by region and farm type (published in 2013 for 2010); `Environment Agency Agricultural Waste and By-Products Survey 2003 and Towards Sustainable Agricultural Waste Management, Environment Agency 2001.

### Baseline Arisings

- 9.5 The figures presented in Table 26 are estimates at the regional level. In the Environment Agency Agricultural Waste and By-Products Survey 2003 an assessment of the likely accuracy of the estimates was undertaken which were defined as 'High', 'Medium' or 'Low'. Agricultural Waste arisings figures shown at regional level were estimated at predominantly 'Medium' accuracy level. All the waste volumes were calculated against surveyed farm holdings and practice of waste management within that farming unit, allowing an extrapolation against the number of farm holdings within the North Yorkshire Sub-region to be calculated. Due to the methodology applied in this Report for looking at calculating figures for the national park as discussed below, the numbers are likely to be slightly lower.
- 9.6 Farm holding figures are published by DEFRA separately for National Parks and for each of the English Local Authorities. In calculating the figure for North Yorkshire Sub-region the total figure of 6,500 farm holdings has been reduced to 3,458 to subtract the farms within the two National Parks<sup>12</sup>. There are
- 1,369 farm holdings in Yorkshire Dales National Park;
  - 1,673 in North York Moors National Park (Defra June 2009 Agricultural and Horticultural Survey);
  - 3,458 farm holdings in North Yorkshire; and

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<sup>12</sup> Using this assumption it should be highlighted that this figure may be slightly lower than is actually the case, as the National Park farm holdings numbers include farms within the Redcar and Cleveland and Cumbrian parts of the National Parks.

- 248 farm holdings in York (Defra Local Authority breakdown for key crops areas and livestock numbers on agricultural holdings last update 2012).

- 9.7 Together these generate over 4.7 million tonnes of waste, the majority of which is managed within the generating farm holding.
- 9.8 Table 26 assumes that the most sustainable waste management route has been chosen for the waste, with consequently no waste managed by landfill. However, in reality some of these wastes (plastic packaging, cardboard and paper packaging, metal, glass, wood and rubber packaging and other non-packaging plastics) could continue to go to landfill. As the quantities are very small (if all these materials continued to go to landfill it would involve an additional 7,767 tonnes) and can practically be recycled (the waste materials are very similar to “mixed household waste”) the assumption has been made in favour of diversion from landfill.

Table 26 Extrapolated Agricultural waste arisings and waste management route for the North Yorkshire Sub-region<sup>13</sup>

Waste Management Route	Tonnes
Composting on site/ Land recovery/treatment on site	4,668,670
<b>Management off site</b>	
Recycling	7,767
Treatment plant/Incineration	12,387
Animal By-Products incineration	13,633
Landfill	0
Hazardous Landfill	0
Sub-total (Management off site)	33,787
<b>Total</b>	<b>4,702,457</b>

### Forecast Arisings

- 9.9 It will be necessary to provide for management of waste leaving the farm holdings amounting to approximately just over 33,700 tonnes per annum (assuming no growth in the volume of agricultural waste arisings). It is likely that in the future more waste may be diverted from landfill for recycling, fulfilling the aspirations of waste management moving up the waste hierarchy, these optimum routes are shown in Table 26.
- 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,

<sup>13</sup> based on the Towards Sustainable Agricultural Waste Management, Environment Agency 2001 and 2003 Environment Agency Agricultural Waste and By-products Survey. Assuming that the highest level of management in line with the waste hierarchy is chosen (zero landfill)

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 the Sub-region.

### **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 The future arisings are small (in the order of 33,787 tonnes per annum assuming no growth in agricultural activity or significant change in agricultural practice). In practice, additional waste materials would be likely to be required to make any new facility viable. The capacity requirement should be noted for specialised treatment of certain types of agricultural waste such as animal by-products incineration and hazardous landfill. The figures reflect the optimum level of treatment according to the waste hierarchy and in reality some of the waste may not be able to be practically or cost effectively recycled and therefore require treatment by other methods such as landfill.
- 9.14 There is no immediate need to provide any new facilities solely to cover agricultural wastes. The small capacity requirements for agricultural waste recycling are combined with C&I waste, with any new capacity requirements included within Section 6 considering C&I waste. Waste generated that requires specialist treatment is likely to continue to be treated at appropriate facilities over the plan period. It is noted that there are specialist storage plants, processing (rendering) plants, incineration, co-incineration plants and combustion plants all licensed and registered specifically for animal by-products treatment only, located across the Sub-region (such as at Knaresborough, Northallerton, York and Thirsk).

## 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 the North Yorkshire Sub-region. Non-nuclear industries are the sole producers of LLR Waste in the North Yorkshire Sub-region for which capacity will need to be planned. Therefore, when compared to the total LLR Waste produced in the UK, the amount produced in North Yorkshire 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>14</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 are few permitted premises in North Yorkshire Sub-region that generate LLR waste. A survey of producers of LLR Waste was undertaken by Urban Vision in 2013. Although the response rate was poor, it was clear from those organisations that did respond that the levels of LLR Waste produced in the Sub-region are low.
- 10.5 This is confirmed by the EA in correspondence with officers at the North Yorkshire Sub-region<sup>15</sup> who estimate that the LLR Waste arisings in the North Yorkshire Sub-region are less than 50m<sup>3</sup>.
- 10.6 This is likely to be waste arising at medical facilities and labs and could include general items such as tissues which are disposed of as general laboratory waste, as well as glassware and sharps that are contained in sharpsafes and assigned as radioactive and disposed of as LLR.

### Forecast Arisings

- 10.7 There is no likelihood of a nuclear facility being located in the North Yorkshire Sub-region in the next 20 years, which means it is highly unlikely that LLR Waste will increase significantly above current levels (less than 50m<sup>3</sup> per annum) as a result of the introduction of this source.
- 10.8 It is recognised that future volumes of LLR Waste could be influenced by the scale of any shale gas development in the North Yorkshire Sub-region, but the overall extent of potential arisings from this source cannot be quantified at this time.

### Operating Capacity

- 10.9 There are no permitted premises in the North Yorkshire Sub-region that receive LLR waste. The permitted premises in the North Yorkshire Sub-region that do generate LLR waste, dispose of that waste either under exemption as Very Low Level Waste, or to sewer, or by transfer to permitted clinical waste incinerators in West Yorkshire.

### Projected Capacity Gap/Capacity Surplus

- 10.10 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 the North Yorkshire

<sup>14</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)

<sup>15</sup> Email correspondence from EA to NYCC dated 24<sup>th</sup> August 2016.

Sub-region will change over this period. However, as discussed above, if shale gas extraction develops in the Sub-region, 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.

- 10.11 It is recommended that the North Yorkshire Sub-region partners 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 period to 2030.

## 11 Waste Water/Sewage Sludge

### Data Sources

- 11.1 There are three companies operating Waste Water Treatment Works (WWTW) within the North Yorkshire Sub-region: United Utilities; Yorkshire Water; and Northumbrian Water.

### 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 Yorkshire Water has produced a Water Resources Management Plan<sup>16</sup> covering the period from 2015/16 to 2039/40. The purpose of this document is to ensure Yorkshire Water has sufficient water to both supply the public and maintain adequate water in the environment over a 25-year period.

### Forecast Arisings

- 11.4 The three companies have been contacted in order to gain a broad overview of their future capacity requirements as far into the future as possible. The responses indicated that at this stage they cannot give any indication of what future requirements are likely to be with regard to waste water, especially not for the entire period up to 2030. However, water companies are involved in consultations on Local Plans which would help inform growth requirements. Companies did not anticipate building new WWTW in the Sub-region but would almost certainly be undertaking works at various existing WWTW over the period. Correspondence with Yorkshire Water in 2016<sup>17</sup> confirmed that this position had not changed.

### Operating Capacity

- 11.5 AMP6 has seen a shift in focus from short term investment, replacing ageing infrastructure and systems, to looking towards improvements and upgrades of systems for long term benefits.

### 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 There currently no known requirements for additional waste water treatment facilities. The three WWTW companies should be kept informed of Plan preparation and invited to comment at relevant stages.
- 11.8 Should the shale gas industry develop in the North Yorkshire Sub-region, there will be a need to safely dispose of flowback fluid. There are three routes identified for the disposal of flowback fluid:
- on-site treatment with re-use of water and disposal of remaining liquids and solids to a suitable licensed waste treatment and disposal facility;
  - removal off site to a suitable licensed waste treatment and disposal facility; or
  - disposal to a special sewer with the permission of the relevant waste water utility company

<sup>16</sup> Yorkshire Water *Water Resources Management Plan* August 2014

<sup>17</sup> Email correspondence from Yorkshire Water to Urban Vision dated 26<sup>th</sup> August 2016

11.9 The latter option could affect the capacity of the existing WWTW if demand was high, however the overall extent of potential demand on WWTW from this source cannot be quantified at this time.



## 12 Movement of Waste across Authority Boundaries

12.1 A summary of Imports and Exports of waste into and out of the North Yorkshire Sub-region is shown in Table 27. Further details of movements of waste are shown in Appendix 7. The table is a snapshot in time and shows that, in 2014, a high proportion of inert CD&E waste arising in the North Yorkshire Sub-region were also managed in the North Yorkshire Sub-region. However, a considerable proportion of the hazardous waste arising in the North Yorkshire Sub-Region is exported and managed elsewhere.

**Table 27 Imports and Exports Summary for the North Yorkshire Sub-region (2014) (percentages compared to the total managed in the North Yorkshire Sub-region)**

	Hazardous	Household Industrial & Commercial	Inert CD&E	Total (tonnes)
Waste originating North Yorkshire & York as a percentage of total waste deposited in the North Yorkshire Sub-Region	10%	139%	83%	Total arisings 1,598,105
Waste imported as a percentage of total waste deposited in the North Yorkshire Sub-Region	90%	12%	7%	Total Imports 138,988
Exports as a percentage of the total managed in North Yorkshire and York	414%	40%	7%	Total Exports 316,355

Source: EA WDI 2014

12.2 Table 28 shows activity at transfer stations within the North Yorkshire Sub-region. The difference between waste deposited and waste removed is just over 3,000 tonnes i.e. only slightly more waste is deposited than removed.

**Table 28 Waste Deposited at Transfer Stations and subsequently removed for onward Waste Treatment, North Yorkshire Sub-region (2014)**

	Total	Household Industrial & Commercial	Inert	Hazardous
<b>Waste deposited at Waste Management Sites in North Yorkshire &amp; York</b>	489,282	361,234	122,376	5,672
<b>Waste Removed from Waste Management Sites in North Yorkshire &amp; York</b>	485,911	346,490	139,421	10,359*

\*Data taken from EA WDI as no data for waste removed from Transfer facilities is recorded in the EA HWDI

12.3 A list of planning authorities for which there have been cross border waste movements is shown in Appendix 8.

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

- 13.1 Tables 29-32 show the predicted future capacity gaps/surplus for the North Yorkshire Sub-region for each of the recycling scenarios for the 'Growth' rate option. Figures shown in negative represent a capacity surplus, meaning no new facilities are required; positive figures represent a capacity gap, for which new facilities may be required.

### Recycling requirements

- 13.2 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.
- 13.3 There is a requirement for additional recycling capacity for CD&E waste during the plan period. The requirement varies between the different recycling scenarios. With the exception of the baseline option, for which a gap does not appear until 2023, there is an immediate gap for recycling facilities to handle CD&E waste. By 2030, this gap is in the region of 471,000 tonnes under scenario 2 and around 381,000 tonnes under scenarios 3 & 4. This gap is based on the known recycling capacity for CD&E waste *only*. Some facilities also accept other waste streams, such as C&I waste and LACW, alongside CD&E waste which would go some way to reducing the capacity gap for the recycling of this waste stream.

### Energy and treatment requirements

- 13.4 There is a short term requirement for energy from waste until 2018 when a new facility comes on stream. After which point, there is a surplus throughout the plan period.
- 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.
- 13.6 The tables show a capacity gap across all scenarios for 'treatment', which includes Anaerobic digestion, specialized treatment of biodegradable liquids and wastes and organic waste treatment by distillation for C&I waste. There are facilities with planning permission which have not yet been developed (North Selby Anaerobic Digestion Facility) which would go some way to meeting this gap should they 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.

### Landfill requirements

- 13.7 Under all scenarios, there is a requirement for hazardous waste landfill, this is because there are currently no hazardous waste landfill facilities within the plan area. The current waste management option is to export this waste to existing hazardous landfill facilities within the Yorkshire region and this is expected to continue.
- 13.8 There is sufficient non-hazardous landfill capacity throughout the plan period under all scenarios until 2025. From 2026 a gap appears under Scenario 1 Baseline of over 25,000 tonnes (No Growth) up to 31,000 tonnes (Growth). Under Scenarios 2-4 the gap in 2030 is around 5,000 tpa.
- 13.9 There is a gap in inert landfill capacity throughout the plan period under scenario 1 and again throughout the plan period with the exception of two years under Scenarios 3 and 4. The requirement drops as higher recycling levels are achieved, and under Scenario 2, which has the highest recycling requirements, this gap becomes prominent from 2022. There are however two existing sites which

have consent, but are currently not operational; these would go some way to meeting this forecast need. In addition, inert waste is used as daily cover and as part of restoration on non-hazardous landfill sites with the EA estimating that this could be around 25% of the permitted capacity of non-hazardous sites. Should the existing mothballed sites come forward and account taken of the amount of inert waste which could be beneficially used at non-hazardous sites, the requirements for this waste stream could be met locally without the need for additional facilities. In addition, there is also significant capacity available within the Yorkshire and Humber Region through existing operational landfill facilities which could assist in meeting this requirement.

**Table 29 Waste Management Capacity Requirements by waste stream and management method – Scenario 1 (BASELINE) / Growth Factor GROWTH**

<b>Waste Management Method</b>	<b>Gap/Surplus 2016</b>	<b>Gap/Surplus 2020</b>	<b>Gap/Surplus 2025</b>	<b>Gap/Surplus 2030</b>
Recycling (C&I, LACW, Agricultural)	-233,035	-456,819	-420,482	-359,549
Recycling (CD&E)	-119,373	-38,249	18,685	22,769
Treatment Plant	52,534	90,615	111,350	124,564
Composting	-134,199	-133,483	-117,558	-103,265
Energy from Waste	43,241	-112,649		-98,699
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632
Landfill (C&I, LACW, Agricultural)	-253,590	-40,362	-19,305	30,890
Landfill (Hazardous)	7,252	23,464	24,379	25,266
Landfill (CD&E)	32,995	318,839	529,827	544,561
<b>TOTAL</b>	<b>-590,543</b>	<b>-335,012</b>	<b>140,528</b>	<b>200,169</b>

**Table 30 Waste Management Capacity Requirements by waste stream and management method – Scenario 2 (MAXIMISED RECYCLING) / Growth Factor GROWTH**

<b>Waste Management Method</b>	<b>Gap/Surplus 2016</b>	<b>Gap/Surplus 2020</b>	<b>Gap/Surplus 2025</b>	<b>Gap/Surplus 2030</b>
Recycling (C&I, LACW, Agricultural)	-227,139	-438,651	-401,693	-337,528
Recycling (CD&E)	16,672	386,458	456,283	471,418
Treatment Plant	52,534	90,615	111,350	124,564
Composting	-134,199	-133,483	-117,558	-103,265
Energy from Waste	45,206	-106,594	-99,176	-94,813
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632
Landfill (C&I, LACW, Agricultural)	-261,451	-64,585	-44,356	4,983
Landfill (Hazardous)	7,252	23,464	24,379	25,266
Landfill (CD&E)	-103,050	-105,868	92,229	95,912
<b>TOTAL</b>	<b>-590,543</b>	<b>-334,012</b>	<b>32,108</b>	<b>200,169</b>

Table 31 Waste Management Capacity Requirements by waste stream and management method – Scenario 3 ('ALTERNATIVE' MEDIAN RECYCLING) / Growth Factor GROWTH

Waste Management Method	Gap/Surplus 2016	Gap/Surplus 2020	Gap/Surplus 2025	Gap/Surplus 2030
Recycling (C&I, LACW, Agricultural)	-228,319	-442,284	-405,451	-342,710
Recycling (CD&E)	-10,537	301,517	368,763	381,688
Treatment Plant	52,534	90,615	111,350	124,564
Composting	-134,199	-133,483	-117,558	-103,265
Energy from Waste	46,386	-102,961	-95,418	-89,631
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632
Landfill (C&I, LACW, Agricultural)	-261,451	-64,585	-44,356	4,983
Landfill (Hazardous)	7,252	23,464	24,379	25,266
Landfill (CD&E)	-75,841	-20,927	179,749	185,642
<b>TOTAL</b>	<b>-590,543</b>	<b>-335,012</b>	<b>35,090</b>	<b>200,169</b>

Table 32 Waste Management Capacity Requirements by waste stream and management method – Scenario 4 (MEDIAN RECYCLING) / Growth Factor GROWTH

Waste Management Method	Gap/Surplus 2016	Gap/Surplus 2020	Gap/Surplus 2025	Gap/Surplus 2030
Recycling (C&I, LACW, Agricultural)	-228,319	-442,284	-405,451	-344,005
Recycling (CD&E)	-10,537	301,517	368,763	381,688
Treatment Plant	52,534	90,615	111,350	124,564
Composting	-134,199	-133,483	-117,558	-103,265
Energy from Waste	46,386	-102,961	-95,418	-88,336
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632
Landfill (C&I, LACW, Agricultural)	-261,451	-64,585	-44,356	4,983
Landfill (Hazardous)	7,252	23,464	24,379	25,266
Landfill (CD&E)	-75,841	-20,927	179,749	185,642
<b>TOTAL</b>	<b>-590,543</b>	<b>-335,012</b>	<b>35,090</b>	<b>200,169</b>

## **APPENDIX 1: Waste Management Capacity Gap/Surplus for North Yorkshire Sub-region 2016-2031**

The tables below show the predicted future capacity gaps/surplus for the North Yorkshire Sub-region 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'.

Source updated September 2016 Waste Needs Assessment Model. All figures are in tones.

**Modifier Factor: No Growth**
**Baseline / No Growth**

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-234,347	-233,117	-493,997	-492,756	-460,810	-433,846	-432,365	-430,886	-429,408	-427,931	-376,458	-374,984	-373,514	-372,044	-370,577	-369,109
Recycling (CDE)	-122,344	-122,344	-122,344	-122,344	-47,344	-47,344	-32,884	4,826	4,826	4,826	4,826	4,826	4,826	4,826	4,826	4,826
Treatment plant	47,104	47,104	70,590	70,590	70,590	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614
Composting	-134,550	-134,550	-134,550	-134,550	-134,550	-119,550	-119,550	-119,550	-119,550	-119,550	-106,214	-106,214	-106,214	-106,214	-106,214	-106,214
Energy from waste	43,197	43,438	-115,197	-113,984	-112,782	-111,015	-109,682	-108,350	-107,021	-105,691	-104,365	-103,039	-101,716	-100,393	-99,072	-97,752
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-253,941	-252,736	-99,691	-24,449	-42,326	-42,130	-23,235	-23,087	-22,939	-22,792	25,291	25,438	25,585	25,732	25,879	26,025
Landfill (Hazardous)	7,165	7,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165
Landfill (CDE)	22,272	267,458	267,458	267,458	286,021	359,021	454,822	479,821	479,821	479,821	479,821	479,821	479,821	479,821	479,821	479,821

Maximised Recycling / No Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+, LACW, Agri)	-228,530	-224,392	-482,364	-478,215	-443,359	-416,395	-414,914	-413,435	-411,957	-410,480	-359,007	-357,533	-356,063	-354,593	-350,799	-349,331
Recycling (CDE)	11,021	77,702	144,385	211,068	352,749	352,749	367,209	404,919	404,919	404,919	404,919	404,919	404,919	404,919	404,919	404,919
Treatment plant	47,104	47,104	70,590	70,590	70,590	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614
Composting	-134,550	-134,550	-134,550	-134,550	-134,550	-119,550	-119,550	-119,550	-119,550	-119,550	-106,214	-106,214	-106,214	-106,214	-106,214	-106,214
Energy from waste	45,136	46,346	-111,319	-109,136	-106,965	-105,198	-103,865	-102,533	-101,204	-99,874	-98,548	-97,222	-95,899	-94,576	-95,582	-94,262
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+, LACW, Agri)	-261,697	-264,369	-115,202	-43,838	-65,594	-65,398	-46,503	-46,355	-46,207	-46,060	2,023	2,170	2,317	2,464	2,611	2,757
Landfill (Hazardous)	7,165	7,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165
Landfill (CDE)	-111,093	67,412	729	-65,954	-114,072	-41,072	54,729	79,728	79,728	79,728	79,728	79,728	79,728	79,728	79,728	79,728

### 'Alternative' Median Recycling and Recovery / No Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-229,693	-226,137	-484,690	-481,123	-446,849	-419,885	-418,404	-416,925	-415,447	-413,970	-362,497	-361,023	-359,553	-358,083	-355,453	-353,985
Recycling (CDE)	-15,652	37,693	91,039	144,385	272,731	272,731	287,191	324,901	324,901	324,901	324,901	324,901	324,901	324,901	324,901	324,901
Treatment plant	47,104	47,104	70,590	70,590	70,590	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614
Composting	-134,550	-134,550	-134,550	-134,550	-134,550	-119,550	-119,550	-119,550	-119,550	-119,550	-106,214	-106,214	-106,214	-106,214	-106,214	-106,214
Energy from waste	46,299	48,091	-108,993	-106,228	-103,475	-101,708	-100,375	-99,043	-97,714	-96,384	-95,058	-93,732	-92,409	-91,086	-90,928	-89,608
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-261,697	-264,369	-115,202	-43,838	-65,594	-65,398	-46,503	-46,355	-46,207	-46,060	2,023	2,170	2,317	2,464	2,611	2,757
Landfill (Hazardous)	7,165	7,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165
Landfill (CDE)	-84,420	107,421	54,075	729	-34,054	38,946	134,747	159,746	159,746	159,746	159,746	159,746	159,746	159,746	159,746	159,746



Median Recycling / No Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-229,693	-226,137	-484,690	-481,123	-446,849	-419,885	-418,404	-416,925	-415,447	-413,970	-362,497	-361,023	-359,553	-358,083	-356,616	-355,148
Recycling (CDE)	-15,652	37,693	91,039	144,385	272,731	272,731	287,191	324,901	324,901	324,901	324,901	324,901	324,901	324,901	324,901	324,901
Treatment plant	47,104	47,104	70,590	70,590	70,590	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614	77,614
Composting	-134,550	-134,550	-134,550	-134,550	-134,550	-119,550	-119,550	-119,550	-119,550	-119,550	-106,214	-106,214	-106,214	-106,214	-106,214	-106,214
Energy from waste	46,299	48,091	-108,993	-106,228	-103,475	-101,708	-100,375	-99,043	-97,714	-96,384	-95,058	-93,732	-92,409	-91,086	-89,765	-88,445
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-261,697	-264,369	-115,202	-43,838	-65,594	-65,398	-46,503	-46,355	-46,207	-46,060	2,023	2,170	2,317	2,464	2,611	2,757
Landfill (Hazardous)	7,165	7,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165	22,165
Landfill (CDE)	-84,420	107,421	54,075	729	-34,054	38,946	134,747	159,746	159,746	159,746	159,746	159,746	159,746	159,746	159,746	159,746

## Modifier Factor: Growth

### Baseline / Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-233,035	-231,141	-491,354	-489,441	-456,819	-429,174	-427,006	-424,834	-422,660	-420,482	-368,304	-366,120	-363,934	-361,743	-359,549	-357,350
Recycling (CDE)	-119,373	-117,865	-116,342	-114,803	-38,249	-36,680	-21,427	17,080	17,880	18,685	19,493	20,306	21,122	21,943	22,769	23,598
Treatment plant	52,534	55,284	83,012	87,304	90,615	100,972	103,579	106,147	108,728	111,350	113,985	116,632	119,282	121,944	124,564	127,201
Composting	-134,199	-134,022	-133,843	-133,663	-133,483	-118,301	-118,117	-117,932	-117,746	-117,558	-104,033	-103,843	-103,652	-103,459	-103,265	-103,069
Energy from waste	43,241	43,504	-115,109	-113,874	-112,649	-110,858	-109,501	-108,145	-106,792	-105,438	-104,088	-102,738	-101,391	-100,044	-98,699	-97,354
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-253,590	-252,207	-98,602	-22,792	-40,362	-39,856	-20,651	-20,206	-19,759	-19,305	29,085	29,540	29,994	30,449	30,890	31,334
Landfill (Hazardous)	7,252	7,296	22,780	23,272	23,464	23,655	23,846	24,021	24,196	24,379	24,562	24,744	24,924	25,103	25,266	25,429
Landfill (CDE)	32,995	283,622	289,118	294,669	318,839	397,502	496,163	524,036	526,924	529,827	532,744	535,676	538,623	541,585	544,561	547,552

Maximised Recycling / Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-227,139	-222,239	-479,404	-474,402	-438,651	-410,884	-408,594	-406,298	-403,996	-401,693	-349,389	-347,078	-344,763	-342,442	-337,528	-335,179
Recycling (CDE)	16,672	88,244	161,216	235,615	386,458	392,274	409,673	450,335	453,301	456,283	459,279	462,291	465,317	468,360	471,418	474,490
Treatment plant	52,534	55,284	83,012	87,304	90,615	100,972	103,579	106,147	108,728	111,350	113,985	116,632	119,282	121,944	124,564	127,201
Composting	-134,199	-134,022	-133,843	-133,663	-133,483	-118,301	-118,117	-117,932	-117,746	-117,558	-104,033	-103,843	-103,652	-103,459	-103,265	-103,069
Energy from waste	45,206	46,472	-111,125	-108,862	-106,594	-104,762	-103,363	-101,966	-100,572	-99,176	-97,783	-96,391	-95,001	-93,612	-94,813	-93,442
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-261,451	-264,077	-114,536	-42,843	-64,585	-64,242	-45,201	-44,921	-44,643	-44,356	3,865	4,151	4,433	4,716	4,983	5,251
Landfill (Hazardous)	7,252	7,296	22,780	23,272	23,464	23,655	23,846	24,021	24,196	24,379	24,562	24,744	24,924	25,103	25,266	25,429
Landfill (CDE)	-103,050	77,513	11,560	-55,749	-105,868	-31,452	65,063	90,781	91,503	92,229	92,958	93,691	94,428	95,168	95,912	96,660

### 'Alternative' Median Recycling and Recovery / Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-228,319	-224,020	-481,794	-477,410	-442,284	-414,542	-412,275	-410,005	-407,729	-405,451	-353,173	-350,886	-348,596	-346,304	-342,710	-340,396
Recycling (CDE)	-10,537	47,022	105,706	165,532	301,517	306,484	323,453	363,683	366,216	368,763	371,321	373,894	376,478	379,076	381,688	384,311
Treatment plant	52,534	55,284	83,012	87,304	90,615	100,972	103,579	106,147	108,728	111,350	113,985	116,632	119,282	121,944	124,564	127,201
Composting	-134,199	-134,022	-133,843	-133,663	-133,483	-118,301	-118,117	-117,932	-117,746	-117,558	-104,033	-103,843	-103,652	-103,459	-103,265	-103,069
Energy from waste	46,386	48,253	-108,735	-105,854	-102,961	-101,104	-99,682	-98,259	-96,839	-95,418	-93,999	-92,583	-91,168	-89,750	-89,631	-88,225
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-261,451	-264,077	-114,536	-42,843	-64,585	-64,242	-45,201	-44,921	-44,643	-44,356	3,865	4,151	4,433	4,716	4,983	5,251
Landfill (Hazardous)	7,252	7,296	22,780	23,272	23,464	23,655	23,846	24,021	24,196	24,379	24,562	24,744	24,924	25,103	25,266	25,429
Landfill (CDE)	-75,841	118,735	67,070	14,334	-20,927	54,338	151,283	177,433	178,588	179,749	180,916	182,088	183,267	184,452	185,642	186,839

Median Recycling / Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-228,319	-224,020	-481,794	-477,410	-442,284	-414,542	-412,275	-410,005	-407,729	-405,451	-353,173	-350,886	-348,596	-346,304	-344,005	-341,700
Recycling (CDE)	-10,537	47,022	105,706	165,532	301,517	306,484	323,453	363,683	366,216	368,763	371,321	373,894	376,478	379,076	381,688	384,311
Treatment plant	52,534	55,284	83,012	87,304	90,615	100,972	103,579	106,147	108,728	111,350	113,985	116,632	119,282	121,944	124,564	127,201
Composting	-134,199	-134,022	-133,843	-133,663	-133,483	-118,301	-118,117	-117,932	-117,746	-117,558	-104,033	-103,843	-103,652	-103,459	-103,265	-103,069
Energy from waste	46,386	48,253	-108,735	-105,854	-102,961	-101,104	-99,682	-98,259	-96,839	-95,418	-93,999	-92,583	-91,168	-89,750	-88,336	-86,921
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-261,451	-264,077	-114,536	-42,843	-64,585	-64,242	-45,201	-44,921	-44,643	-44,356	3,865	4,151	4,433	4,716	4,983	5,251
Landfill (Hazardous)	7,252	7,296	22,780	23,272	23,464	23,655	23,846	24,021	24,196	24,379	24,562	24,744	24,924	25,103	25,266	25,429
Landfill (CDE)	-75,841	118,735	67,070	14,334	-20,927	54,338	151,283	177,433	178,588	179,749	180,916	182,088	183,267	184,452	185,642	186,839

## Modifier Factor: Minimised Growth

### Baseline / Minimised Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-242,351	-236,379	-493,261	-487,946	-474,122	-447,898	-445,921	-444,160	-442,408	-440,547	-388,692	-386,843	-385,039	-383,241	-381,671	-380,090
Recycling (CDE)	-122,344	-122,344	-122,344	-122,344	-47,344	-47,344	-32,884	4,826	4,826	4,826	4,826	4,826	4,826	4,826	4,826	4,826
Treatment plant	43,378	41,542	64,678	64,374	63,083	68,831	69,316	69,748	70,178	70,635	71,090	71,544	71,987	72,428	72,813	73,201
Composting	-135,064	-135,317	-135,568	-135,817	-136,063	-121,306	-121,306	-121,306	-121,306	-121,306	-107,970	-107,970	-107,970	-107,970	-107,970	-107,970
Energy from waste	184,219	190,378	-124,181	-118,639	-116,847	-115,062	-113,251	-111,640	-110,036	-108,332	-106,633	-104,940	-103,288	-101,642	-100,205	-98,758
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-453,488	-453,741	-140,611	-65,472	-65,591	-65,708	-46,835	-46,723	-46,611	-46,492	1,561	1,679	1,794	1,909	2,009	2,110
Landfill (Hazardous)	7,165	7,165	22,605	23,053	23,200	23,346	23,492	23,622	23,751	23,888	24,025	24,161	24,294	24,426	24,542	24,658
Landfill (CDE)	22,272	267,458	267,458	267,458	286,021	359,021	454,822	479,821	479,821	479,821	479,821	479,821	479,821	479,821	479,821	479,821

**Maximised Recycling / Minimised Growth**

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-236,649	-227,911	-482,086	-474,116	-457,693	-431,634	-429,657	-427,896	-426,144	-424,283	-372,428	-370,579	-368,775	-366,977	-363,238	-361,657
Recycling (CDE)	11,021	77,702	144,385	211,068	352,749	352,749	367,209	404,919	404,919	404,919	404,919	404,919	404,919	404,919	404,919	404,919
Treatment plant	43,378	41,542	64,678	64,374	63,083	68,831	69,316	69,748	70,178	70,635	71,090	71,544	71,987	72,428	72,813	73,201
Composting	-135,064	-135,317	-135,568	-135,817	-136,063	-121,306	-121,306	-121,306	-121,306	-121,306	-107,970	-107,970	-107,970	-107,970	-107,970	-107,970
Energy from waste	186,118	193,199	-120,455	-114,030	-111,371	-109,640	-107,829	-106,218	-104,614	-102,910	-101,211	-99,518	-97,866	-96,220	-96,952	-95,505
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-461,089	-465,030	-155,512	-83,911	-87,496	-87,394	-68,521	-68,409	-68,297	-68,178	-20,125	-20,007	-19,892	-19,777	-19,677	-19,576
Landfill (Hazardous)	7,165	7,165	22,605	23,053	23,200	23,346	23,492	23,622	23,751	23,888	24,025	24,161	24,294	24,426	24,542	24,658
Landfill (CDE)	-111,093	67,412	729	-65,954	-114,072	-41,072	54,729	79,728	79,728	79,728	79,728	79,728	79,728	79,728	79,728	79,728

### 'Alternative' Median Recycling and Recovery / Minimised Growth

Waste Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Recycling (C+I, LACW, Agri)	-237,789	-229,606	-484,320	-476,883	-460,979	-434,887	-432,910	-431,149	-429,397	-427,536	-375,681	-373,832	-372,028	-370,230	-367,576	-365,995
Recycling (CDE)	-15,652	37,693	91,039	144,385	272,731	272,731	287,191	324,901	324,901	324,901	324,901	324,901	324,901	324,901	324,901	324,901
Treatment plant	43,378	41,542	64,678	64,374	63,083	68,831	69,316	69,748	70,178	70,635	71,090	71,544	71,987	72,428	72,813	73,201
Composting	-135,064	-135,317	-135,568	-135,817	-136,063	-121,306	-121,306	-121,306	-121,306	-121,306	-107,970	-107,970	-107,970	-107,970	-107,970	-107,970
Energy from waste	187,258	194,894	-118,221	-111,263	-108,085	-106,387	-104,576	-102,965	-101,361	-99,657	-97,958	-96,265	-94,613	-92,967	-92,614	-91,167
Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Landfill (C+I, LACW, Agri)	-461,089	-465,030	-155,512	-83,911	-87,496	-87,394	-68,521	-68,409	-68,297	-68,178	-20,125	-20,007	-19,892	-19,777	-19,677	-19,576
Landfill (Hazardous)	7,165	7,165	22,605	23,053	23,200	23,346	23,492	23,622	23,751	23,888	24,025	24,161	24,294	24,426	24,542	24,658
Landfill (CDE)	-84,420	107,421	54,075	729	-34,054	38,946	134,747	159,746	159,746	159,746	159,746	159,746	159,746	159,746	159,746	159,746







CI and CDE	Transfer stations (non-hazardous)	232,198	232,198	232,198	232,198	224,798	224,798	169,620	169,620	169,620	169,620	169,620	169,620	169,620	169,620	169,620	169,620
CI and CDE	Transfer stations (hazardous)	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000	12,000
CI and CDE	Transfer stations (construction & demolition)	62,671	62,671	62,671	62,671	62,671	62,671	62,671	62,671	62,671	62,671	62,671	3,360	3,360	3,360	3,360	3,360
CI and CDE	Transfer stations (C and D plus asbestos)	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400	400
CI and CDE	Composting	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000
CI and CDE	Recycling (MRFS)	375,254	375,254	375,254	375,254	362,654	337,654	337,654	337,654	337,654	337,654	337,654	287,654	287,654	287,654	287,654	287,654
CI and CDE	Recycling (reprocessors)	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505	7,505
CI and CDE	Recycling (Metals)	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651	19,651
CI and CDE	Landfill (non-hazardous)	66,682	66,682	66,682	66,682	66,682	66,682	47,935	47,935	47,935	47,935	47,935	0	0	0	0	0
CI and CDE	Treatment facility	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411	14,411
CI and CDE	Recycling (aggregates, other C and D)	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000	26,000
CDE only	Transfer stations (non-hazardous)	31,330	31,330	31,330	31,330	31,330	31,330	31,330	31,330	26,352	26,352	26,352	26,352	26,352	26,352	26,352	26,352
CDE only	Transfer stations (hazardous)	259	259	259	259	259	259	259	259	259	259	259	259	259	259	259	259
CDE only	Transfer stations (construction & demolition)	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430	7,430
CDE only	Recycling (MRFS)	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917	8,917
CDE only	Landfill (inert)	438,186	193,000	193,000	193,000	174,437	174,437	78,636	53,637	53,637	53,637	53,637	53,637	53,637	53,637	53,637	53,637
CDE only	Landfill (restoration)	6,900	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CDE only	Treatment facility (C and D)	30,426	30,426	16,940	16,940	16,940	16,940	16,940	16,940	16,940	16,940	16,940	16,940	16,940	16,940	16,940	16,940
CDE only	Recycling (aggregates, other C and D)	244,243	244,243	244,243	244,243	169,243	169,243	154,783	117,073	117,073	117,073	117,073	117,073	117,073	117,073	117,073	117,073
Restricted	Landfill (inert)	41,875	41,875	41,875	41,875	41,875	41,875	41,875	0	0	0	0	0	0	0	0	0
Restricted	Land spreading	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Restricted	Treatment facility	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635	56,635

### APPENDIX 3: Waste Management Capacity Requirements by waste stream and management method 2016 – 2031

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 the North Yorkshire Sub-region. This table shows the waste output from the Allerton Waste Recovery Park, which will form a sub-set of C&I waste (landfill and treatment), and hazardous waste (hazardous landfill).

#### Waste Management Capacity Requirements by waste stream and management method 2016 – 2031

##### No Growth, Baseline Scenario (tonnes)

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+I, LACW, Agri)	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717	1,717
Industrial waste	Energy from waste	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212	212
Industrial waste	Recycling (C+I, LACW, Agri)	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303	5,303
Industrial waste	Composting (IVC)	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697
Industrial waste	Treatment plant	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303
<b>Total Industrial</b>		<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>
Commercial waste	Landfill (C+I, LACW, Agri)	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131
Commercial waste	Energy from waste	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017	3,017
Commercial waste	Recycling (C+I, LACW, Agri)	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410	75,410
Commercial waste	Composting (IVC)	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131
Commercial waste	Treatment plant	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951
<b>Total Commercial</b>		<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>
AWRP (output) C&I	Landfill (C+I, LACW, Agri)			13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
AWRP (output) C&I	Treatment plant			50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
<b>Total C&amp;I</b>		<b>322,872</b>	<b>322,872</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>	<b>364,640</b>
CDE waste	Landfill (CDE)	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458
CDE waste	Recycling (CDE)	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727
CDE waste	Treatment plant	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520
<b>Total CDE</b>		<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+I, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+I, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+I, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165
Hazardous waste	Energy from waste	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Hazardous waste	Incineration without Energy Recovery	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Hazardous waste	Recycling (C+I, LACW, Agri)	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Agri)																
Hazardous waste	Recycling (CDE)	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Hazardous waste	Treatment plant	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073
AWRP (Output) C&I	Landfill (Hazardous)			15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
<b>Total Hazardous</b>		<b>33,143</b>	<b>33,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>

**Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 No Growth, Maximised Recycling Scenario (tonnes)**

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+I, LACW, Agri)	1,249	1,015	781	547	312	312	312	312	312	312	312	312	312	312	312	312
Industrial waste	Energy from waste	329	388	446	505	563	563	563	563	563	563	563	563	563	563	423	423
Industrial waste	Recycling (C+I, LACW, Agri)	5,654	5,829	6,005	6,180	6,357	6,357	6,357	6,357	6,357	6,357	6,357	6,357	6,357	6,357	6,497	6,497
Industrial waste	Composting (IVC)	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697
Industrial waste	Treatment plant	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303
<b>Total Industrial</b>		<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>
Commercial waste	Landfill (C+I, LACW, Agri)	16,843	13,200	9,556	5,912	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268
Commercial waste	Energy from waste	4,839	5,749	6,661	7,572	8,483	8,483	8,483	8,483	8,483	8,483	8,483	8,483	8,483	8,483	6,296	6,296
Commercial waste	Recycling (C+I, LACW, Agri)	80,876	83,609	86,341	89,074	91,807	91,807	91,807	91,807	91,807	91,807	91,807	91,807	91,807	91,807	93,994	93,994
Commercial waste	Composting (IVC)	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131
Commercial waste	Treatment plant	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951
<b>Total Commercial</b>		<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>
AWRP (output) C&I	Landfill (C+I, LACW, Agri)			13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
AWRP (output) C&I	Treatment plant			50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
<b>Total C&amp;I</b>		<b>322,872</b>	<b>322,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>
CDE waste	Landfill (CDE)	400,093	333,412	266,729	200,046	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365
CDE waste	Recycling (CDE)	281,092	347,773	414,456	481,139	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820
CDE waste	Treatment plant	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520
<b>Total CD&amp;E</b>		<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+I, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+I, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+I, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165
Hazardous waste	Energy from waste	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Hazardous waste	Incineration without	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Energy Recovery																
Hazardous waste	Recycling (C+I, LACW, Agri)	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039
Hazardous waste	Recycling (CDE)	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Hazardous waste	Treatment plant	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073
AWRP (output) C&I	Landfill (Hazardous)			15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
<b>Total Hazardous</b>		<b>33,143</b>	<b>33,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>

### Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 No Growth, Alternative Median Recycling Scenario (tonnes)

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+I, LACW, Agri)	1,249	1,015	781	547	312	312	312	312	312	312	312	312	312	312	312	312
Industrial waste	Energy from waste	399	493	586	680	774	774	774	774	774	774	774	774	774	774	704	704
Industrial waste	Recycling (C+I, LACW, Agri)	5,584	5,724	5,865	6,005	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,216	6,216
Industrial waste	Composting (IVC)	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697
Industrial waste	Treatment plant	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303
<b>Total Industrial</b>		<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>
Commercial waste	Landfill (C+I, LACW, Agri)	16,843	13,200	9,556	5,912	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268
Commercial waste	Energy from waste	5,932	7,389	8,847	10,305	11,762	11,762	11,762	11,762	11,762	11,762	11,762	11,762	11,762	11,762	10,669	10,669
Commercial waste	Recycling (C+I, LACW, Agri)	79,783	81,969	84,155	86,341	88,528	88,528	88,528	88,528	88,528	88,528	88,528	88,528	88,528	88,528	89,621	89,621
Commercial waste	Composting (IVC)	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131
Commercial waste	Treatment plant	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951
<b>Total Commercial</b>		<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>
AWRP (output) C&I	Landfill (C+I, LACW, Agri)			13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
AWRP (output) C&I	Treatment plant			50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
<b>Total C&amp;I</b>		<b>322,872</b>	<b>322,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>
CDE waste	Landfill (CDE)	426,766	373,421	320,075	266,729	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383
CDE waste	Recycling (CDE)	254,419	307,764	361,110	414,456	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802
CDE waste	Treatment plant	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520
<b>Total CDE</b>		<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+I, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+I, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+I, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Hazardous waste	Energy from waste	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Hazardous waste	Incineration without Energy Recovery	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Hazardous waste	Recycling (C+I, LACW, Agri)	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039
Hazardous waste	Recycling (CDE)	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Hazardous waste	Treatment plant	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073
AWRP (output) C&I	Landfill (Hazardous)			15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
<b>Total Hazardous</b>		<b>33,143</b>	<b>33,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>

**Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 No Growth, Median Recycling Scenario (tonnes)**

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+I, LACW, Agri)	1,249	1,015	781	547	312	312	312	312	312	312	312	312	312	312	312	312
Industrial waste	Energy from waste	399	493	586	680	774	774	774	774	774	774	774	774	774	774	774	774
Industrial waste	Recycling (C+I, LACW, Agri)	5,584	5,724	5,865	6,005	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146	6,146
Industrial waste	Composting (IVC)	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697	1,697
Industrial waste	Treatment plant	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303	12,303
<b>Total Industrial</b>		<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>	<b>21,232</b>
Commercial waste	Landfill (C+I, LACW, Agri)	16,843	13,200	9,556	5,912	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268	2,268
Commercial waste	Energy from waste	5,932	7,389	8,847	10,305	11,762	11,762	11,762	11,762	11,762	11,762	11,762	11,762	11,762	11,762	11,762	11,762
Commercial waste	Recycling (C+I, LACW, Agri)	79,783	81,969	84,155	86,341	88,528	88,528	88,528	88,528	88,528	88,528	88,528	88,528	88,528	88,528	88,528	88,528
Commercial waste	Composting (IVC)	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131	24,131
Commercial waste	Treatment plant	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951	174,951
<b>Total Commercial</b>		<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>	<b>301,640</b>
AWRP (output) C&I	Landfill (C+I, LACW, Agri)			13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000	13,000
AWRP (output) C&I	Treatment plant			50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
<b>Total C&amp;I</b>		<b>322,872</b>	<b>322,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>	<b>385,872</b>
CDE waste	Landfill (CDE)	426,766	373,421	320,075	266,729	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383
CDE waste	Recycling (CDE)	254,419	307,764	361,110	414,456	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802
CDE waste	Treatment plant	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520
<b>Total CDE</b>		<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+I, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+I, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+I, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Hazardous waste	Energy from waste	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Hazardous waste	Incineration without Energy Recovery	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Hazardous waste	Recycling (C+I, LACW, Agri)	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039
Hazardous waste	Recycling (CDE)	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Hazardous waste	Treatment plant	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073
AWRP (output) C&I	Landfill (Hazardous)			15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
<b>Total Hazardous</b>		<b>33,143</b>	<b>33,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>	<b>48,143</b>

### Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 Growth, Baseline Scenario (tonnes)

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+I, LACW, Agri)	1,763	1,787	1,811	1,835	1,859	1,884	1,909	1,934	1,960	1,986	2,012	2,038	2,065	2,092	2,119	2,148
Industrial waste	Energy from waste	216	218	220	222	225	228	231	234	237	240	243	246	249	252	255	258
Industrial waste	Recycling (C+I, LACW, Agri)	5,445	5,518	5,591	5,665	5,740	5,816	5,894	5,973	6,053	6,133	6,214	6,296	6,380	6,465	6,551	6,638
Industrial waste	Composting (IVC)	1,743	1,766	1,790	1,814	1,838	1,862	1,887	1,912	1,937	1,963	1,989	2,015	2,041	2,068	2,095	2,123
Industrial waste	Treatment plant	12,632	12,800	12,971	13,144	13,319	13,496	13,675	13,856	14,040	14,227	14,417	14,609	14,803	15,000	15,199	15,401
<b>Total Industrial</b>		<b>21,799</b>	<b>22,089</b>	<b>22,383</b>	<b>22,680</b>	<b>22,981</b>	<b>23,286</b>	<b>23,596</b>	<b>23,909</b>	<b>24,227</b>	<b>24,549</b>	<b>24,875</b>	<b>25,204</b>	<b>25,538</b>	<b>25,877</b>	<b>26,219</b>	<b>26,568</b>
Commercial waste	Landfill (C+I, LACW, Agri)	24,436	24,590	24,745	24,901	25,057	25,215	25,374	25,534	25,695	25,857	26,020	26,184	26,349	26,515	26,682	26,850
Commercial waste	Energy from waste	3,055	3,074	3,093	3,112	3,131	3,151	3,171	3,191	3,211	3,231	3,251	3,271	3,291	3,311	3,331	3,352
Commercial waste	Recycling (C+I, LACW, Agri)	76,363	76,844	77,328	77,815	78,305	78,798	79,294	79,794	80,296	80,802	81,311	81,823	82,338	82,857	83,379	83,904
Commercial waste	Composting (IVC)	24,436	24,590	24,745	24,901	25,057	25,215	25,374	25,534	25,695	25,857	26,020	26,184	26,349	26,515	26,682	26,850
Commercial waste	Treatment plant	177,163	178,279	179,402	180,532	181,669	182,813	183,964	185,123	186,289	187,463	188,644	189,832	191,028	192,232	193,443	194,661
<b>Total Commercial</b>		<b>305,453</b>	<b>307,377</b>	<b>309,313</b>	<b>311,261</b>	<b>313,219</b>	<b>315,192</b>	<b>317,177</b>	<b>319,176</b>	<b>321,186</b>	<b>323,210</b>	<b>325,246</b>	<b>327,294</b>	<b>329,355</b>	<b>331,430</b>	<b>333,517</b>	<b>335,617</b>
AWRP (output) C&I	Landfill (C+I, LACW, Agri)			13,381	13,769	13,896	14,023	14,149	14,261	14,373	14,492	14,610	14,728	14,843	14,958	15,078	15,199
AWRP (output) C&I	Treatment plant			51,467	52,961	53,450	53,937	54,422	54,854	55,284	55,741	56,196	56,650	57,093	57,534	57,919	58,307
<b>Total C&amp;I</b>		<b>327,252</b>	<b>329,466</b>	<b>396,544</b>	<b>400,671</b>	<b>403,546</b>	<b>406,438</b>	<b>409,344</b>	<b>412,200</b>	<b>415,070</b>	<b>417,992</b>	<b>420,927</b>	<b>423,876</b>	<b>426,829</b>	<b>429,799</b>	<b>432,713</b>	<b>435,651</b>
CDE waste	Landfill (CDE)	544,181	549,622	555,118	560,669	566,276	571,939	577,799	577,673	580,561	583,464	586,381	589,313	592,260	595,222	598,198	601,189
CDE waste	Recycling (CDE)	150,696	152,203	153,725	155,263	156,816	158,384	159,176	159,972	160,771	161,575	162,382	163,194	164,009	164,829	165,654	166,482
CDE waste	Treatment plant	142,324	143,747	145,185	146,637	148,104	149,585	150,333	151,085	151,841	152,600	153,363	154,130	154,901	155,675	156,454	157,236
<b>Total CDE</b>		<b>837,201</b>	<b>845,572</b>	<b>854,028</b>	<b>862,569</b>	<b>871,196</b>	<b>879,908</b>	<b>884,308</b>	<b>888,730</b>	<b>893,173</b>	<b>897,639</b>	<b>902,126</b>	<b>906,637</b>	<b>911,170</b>	<b>915,726</b>	<b>920,306</b>	<b>924,907</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+I, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+I, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+I, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,252	7,296	7,340	7,384	7,429	7,474	7,519	7,564	7,610	7,656	7,702	7,748	7,795	7,842	7,889	7,936
Hazardous waste	Energy from waste	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179



Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Hazardous waste	Incineration without Energy Recovery	538	541	544	547	550	553	556	559	562	565	568	571	574	577	580	583
Hazardous waste	Recycling (C+I, LACW, Agri)	18,256	18,366	18,476	18,587	18,698	18,810	18,923	19,037	19,151	19,266	19,381	19,497	19,614	19,731	19,850	19,969
Hazardous waste	Recycling (CDE)	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189
Hazardous waste	Treatment plant	7,158	7,201	7,244	7,287	7,330	7,374	7,418	7,462	7,507	7,552	7,598	7,644	7,690	7,736	7,782	7,829
AWRP (Output) C&I	Landfill (Hazardous)			15,440	15,888	16,035	16,181	16,327	16,457	16,586	16,723	16,860	16,996	17,129	17,261	17,377	17,493
<b>Total Hazardous</b>		<b>33,542</b>	<b>33,744</b>	<b>49,386</b>	<b>50,037</b>	<b>50,388</b>	<b>50,740</b>	<b>51,093</b>	<b>51,431</b>	<b>51,770</b>	<b>52,118</b>	<b>52,467</b>	<b>52,816</b>	<b>53,164</b>	<b>53,511</b>	<b>53,844</b>	<b>54,178</b>

### Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 Growth, Maximised Recycling Scenario (tonnes)

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+I, LACW, Agri)	1,282	1,056	823	584	338	343	348	352	356	361	366	371	376	381	386	391
Industrial waste	Energy from waste	336	401	467	534	605	613	622	630	637	646	655	663	671	679	515	521
Industrial waste	Recycling (C+I, LACW, Agri)	5,806	6,066	6,332	6,604	6,881	6,972	7,064	7,159	7,257	7,352	7,448	7,546	7,647	7,749	8,024	8,132
Industrial waste	Composting (IVC)	1,743	1,766	1,790	1,814	1,838	1,862	1,887	1,912	1,937	1,963	1,989	2,015	2,041	2,068	2,095	2,123
Industrial waste	Treatment plant	12,632	12,800	12,971	13,144	13,319	13,496	13,675	13,856	14,040	14,227	14,417	14,609	14,803	15,000	15,199	15,401
<b>Total Industrial</b>		<b>21,799</b>	<b>22,089</b>	<b>22,383</b>	<b>22,680</b>	<b>22,981</b>	<b>23,286</b>	<b>23,596</b>	<b>23,909</b>	<b>24,227</b>	<b>24,549</b>	<b>24,875</b>	<b>25,204</b>	<b>25,538</b>	<b>25,877</b>	<b>26,219</b>	<b>26,568</b>
Commercial waste	Landfill (C+I, LACW, Agri)	17,056	13,451	9,799	6,101	2,355	2,370	2,385	2,401	2,415	2,431	2,446	2,462	2,477	2,493	2,508	2,524
Commercial waste	Energy from waste	4,900	5,859	6,830	7,812	8,806	8,862	8,918	8,974	9,031	9,087	9,144	9,201	9,259	9,316	6,957	7,001
Commercial waste	Recycling (C+I, LACW, Agri)	81,898	85,198	88,537	91,915	95,332	95,932	96,536	97,144	97,756	98,372	98,992	99,615	100,242	100,874	103,927	104,581
Commercial waste	Composting (IVC)	24,436	24,590	24,745	24,901	25,057	25,215	25,374	25,534	25,695	25,857	26,020	26,184	26,349	26,515	26,682	26,850
Commercial waste	Treatment plant	177,163	178,279	179,402	180,532	181,669	182,813	183,964	185,123	186,289	187,463	188,644	189,832	191,028	192,232	193,443	194,661
<b>Total Commercial</b>		<b>305,453</b>	<b>307,377</b>	<b>309,313</b>	<b>311,261</b>	<b>313,219</b>	<b>315,192</b>	<b>317,177</b>	<b>319,176</b>	<b>321,186</b>	<b>323,210</b>	<b>325,246</b>	<b>327,294</b>	<b>329,355</b>	<b>331,430</b>	<b>333,517</b>	<b>335,617</b>
AWRP (output) C&I	Landfill (C+I, LACW, Agri)			13,381	13,769	13,896	14,023	14,149	14,261	14,373	14,492	14,610	14,728	14,843	14,958	15,058	15,159
AWRP (output) C&I	Treatment plant			51,467	52,961	53,450	53,937	54,422	54,854	55,284	55,741	56,196	56,650	57,093	57,534	57,919	58,307
<b>Total C&amp;I</b>		<b>327,252</b>	<b>329,466</b>	<b>396,544</b>	<b>400,671</b>	<b>403,546</b>	<b>406,438</b>	<b>409,344</b>	<b>412,200</b>	<b>415,070</b>	<b>417,992</b>	<b>420,927</b>	<b>423,876</b>	<b>426,829</b>	<b>429,799</b>	<b>432,713</b>	<b>435,651</b>
CDE waste	Landfill (CDE)	408,136	343,513	277,560	210,251	141,569	142,985	143,699	144,418	145,140	145,866	146,595	147,328	148,065	148,805	149,549	150,297
CDE waste	Recycling (CDE)	286,741	358,312	431,283	505,681	581,523	587,338	590,276	593,227	596,192	599,173	602,168	605,179	608,204	611,246	614,303	617,374
CDE waste	Treatment plant	142,324	143,747	145,185	146,637	148,104	149,585	150,333	151,085	151,841	152,600	153,363	154,130	154,901	155,675	156,454	157,236
<b>Total CDE</b>		<b>837,201</b>	<b>845,572</b>	<b>854,028</b>	<b>862,569</b>	<b>871,196</b>	<b>879,908</b>	<b>884,308</b>	<b>888,730</b>	<b>893,173</b>	<b>897,639</b>	<b>902,126</b>	<b>906,637</b>	<b>911,170</b>	<b>915,726</b>	<b>920,306</b>	<b>924,907</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+I, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+I, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+I, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,252	7,296	7,340	7,384	7,429	7,474	7,519	7,564	7,610	7,656	7,702	7,748	7,795	7,842	7,889	7,936
Hazardous waste	Energy from waste	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
Hazardous waste	Incineration without	538	541	544	547	550	553	556	559	562	565	568	571	574	577	580	583

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Energy Recovery																
Hazardous waste	Recycling (C+I, LACW, Agri)	18,256	18,366	18,476	18,587	18,698	18,810	18,923	19,037	19,151	19,266	19,381	19,497	19,614	19,731	19,850	19,969
Hazardous waste	Recycling (CDE)	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189
Hazardous waste	Treatment plant	7,158	7,201	7,244	7,287	7,330	7,374	7,418	7,462	7,507	7,552	7,598	7,644	7,690	7,736	7,782	7,829
AWRP (output) C&I	Landfill (Hazardous)			15,440	15,888	16,035	16,181	16,327	16,457	16,586	16,723	16,860	16,996	17,129	17,261	17,377	17,493
<b>Total Hazardous</b>		<b>33,542</b>	<b>33,744</b>	<b>49,386</b>	<b>50,037</b>	<b>50,388</b>	<b>50,740</b>	<b>51,093</b>	<b>51,431</b>	<b>51,770</b>	<b>52,118</b>	<b>52,467</b>	<b>52,816</b>	<b>53,164</b>	<b>53,511</b>	<b>53,844</b>	<b>54,178</b>

### Waste Management Capacity Requirements by waste stream and management method 2016 - 2031 Growth, Alternative Median Recycling Scenario (tonnes)

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+I, LACW, Agri)	1,282	1,056	823	584	338	343	348	352	356	361	366	371	376	381	386	391
Industrial waste	Energy from waste	409	511	616	722	833	844	855	867	878	890	902	913	924	937	862	873
Industrial waste	Recycling (C+I, LACW, Agri)	5,733	5,956	6,183	6,416	6,653	6,741	6,831	6,922	7,016	7,108	7,201	7,296	7,394	7,491	7,677	7,780
Industrial waste	Composting (IVC)	1,743	1,766	1,790	1,814	1,838	1,862	1,887	1,912	1,937	1,963	1,989	2,015	2,041	2,068	2,095	2,123
Industrial waste	Treatment plant	12,632	12,800	12,971	13,144	13,319	13,496	13,675	13,856	14,040	14,227	14,417	14,609	14,803	15,000	15,199	15,401
<b>Total Industrial</b>		<b>21,799</b>	<b>22,089</b>	<b>22,383</b>	<b>22,680</b>	<b>22,981</b>	<b>23,286</b>	<b>23,596</b>	<b>23,909</b>	<b>24,227</b>	<b>24,549</b>	<b>24,875</b>	<b>25,204</b>	<b>25,538</b>	<b>25,877</b>	<b>26,219</b>	<b>26,568</b>
Commercial waste	Landfill (C+I, LACW, Agri)	17,056	13,451	9,799	6,101	2,355	2,370	2,385	2,401	2,415	2,431	2,446	2,462	2,477	2,493	2,508	2,524
Commercial waste	Energy from waste	6,007	7,530	9,071	10,632	12,211	12,289	12,366	12,444	12,523	12,601	12,681	12,759	12,839	12,920	11,792	11,866
Commercial waste	Recycling (C+I, LACW, Agri)	80,791	83,527	86,296	89,095	91,927	92,505	93,088	93,674	94,264	94,858	95,455	96,057	96,662	97,270	99,092	99,716
Commercial waste	Composting (IVC)	24,436	24,590	24,745	24,901	25,057	25,215	25,374	25,534	25,695	25,857	26,020	26,184	26,349	26,515	26,682	26,850
Commercial waste	Treatment plant	177,163	178,279	179,402	180,532	181,669	182,813	183,964	185,123	186,289	187,463	188,644	189,832	191,028	192,232	193,443	194,661
<b>Total Commercial</b>		<b>305,453</b>	<b>307,377</b>	<b>309,313</b>	<b>311,261</b>	<b>313,219</b>	<b>315,192</b>	<b>317,177</b>	<b>319,176</b>	<b>321,186</b>	<b>323,210</b>	<b>325,246</b>	<b>327,294</b>	<b>329,355</b>	<b>331,430</b>	<b>333,517</b>	<b>335,617</b>
AWRP (output) C&I	Landfill (C+I, LACW, Agri)			13,381	13,769	13,896	14,023	14,149	14,261	14,373	14,492	14,610	14,728	14,843	14,958	15,058	15,159
AWRP (output) C&I	Treatment plant			51,467	52,961	53,450	53,937	54,422	54,854	55,284	55,741	56,196	56,650	57,093	57,534	57,919	58,307
<b>Total C&amp;I</b>		<b>327,252</b>	<b>329,466</b>	<b>396,544</b>	<b>400,671</b>	<b>403,546</b>	<b>406,438</b>	<b>409,344</b>	<b>412,200</b>	<b>415,070</b>	<b>417,992</b>	<b>420,927</b>	<b>423,876</b>	<b>426,829</b>	<b>429,799</b>	<b>432,713</b>	<b>435,651</b>
CDE waste	Landfill (CDE)	435,345	384,735	333,070	280,334	226,510	228,775	229,919	231,070	232,225	233,386	234,553	235,725	236,904	238,089	239,279	240,476
CDE waste	Recycling (CDE)	259,532	317,090	375,773	435,598	496,582	501,548	504,056	506,575	509,107	511,653	514,210	516,782	519,365	521,962	524,573	527,195
CDE waste	Treatment plant	142,324	143,747	145,185	146,637	148,104	149,585	150,333	151,085	151,841	152,600	153,363	154,130	154,901	155,675	156,454	157,236
<b>Total CDE</b>		<b>837,201</b>	<b>845,572</b>	<b>854,028</b>	<b>862,569</b>	<b>871,196</b>	<b>879,908</b>	<b>884,308</b>	<b>888,730</b>	<b>893,173</b>	<b>897,639</b>	<b>902,126</b>	<b>906,637</b>	<b>911,170</b>	<b>915,726</b>	<b>920,306</b>	<b>924,907</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+I, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+I, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+I, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,252	7,296	7,340	7,384	7,429	7,474	7,519	7,564	7,610	7,656	7,702	7,748	7,795	7,842	7,889	7,936
Hazardous waste	Energy from waste	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
Hazardous waste	Incineration without Energy Recovery	538	541	544	547	550	553	556	559	562	565	568	571	574	577	580	583
Hazardous waste	Recycling (C+I, LACW, Agri)	18,256	18,366	18,476	18,587	18,698	18,810	18,923	19,037	19,151	19,266	19,381	19,497	19,614	19,731	19,850	19,969

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Agri)																
Hazardous waste	Recycling (CDE)	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189
Hazardous waste	Treatment plant	7,158	7,201	7,244	7,287	7,330	7,374	7,418	7,462	7,507	7,552	7,598	7,644	7,690	7,736	7,782	7,829
AWRP (output) C&I	Landfill (Hazardous)			15,440	15,888	16,035	16,181	16,327	16,457	16,586	16,723	16,860	16,996	17,129	17,261	17,377	17,493
<b>Total Hazardous</b>		<b>33,542</b>	<b>33,744</b>	<b>49,386</b>	<b>50,037</b>	<b>50,388</b>	<b>50,740</b>	<b>51,093</b>	<b>51,431</b>	<b>51,770</b>	<b>52,118</b>	<b>52,467</b>	<b>52,816</b>	<b>53,164</b>	<b>53,511</b>	<b>53,844</b>	<b>54,178</b>

**Waste Management Capacity Requirements by waste stream and management method 2016 - 2031 Growth, Median Recycling Scenario (tonnes)**

Waste Stream	Management Type	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+I, LACW, Agri)	1,282	1,056	823	584	338	343	348	352	356	361	366	371	376	381	386	391
Industrial waste	Energy from waste	409	511	616	722	833	844	855	867	878	890	902	913	924	937	948	960
Industrial waste	Recycling (C+I, LACW, Agri)	5,733	5,956	6,183	6,416	6,653	6,741	6,831	6,922	7,016	7,108	7,201	7,296	7,394	7,491	7,591	7,693
Industrial waste	Composting (IVC)	1,743	1,766	1,790	1,814	1,838	1,862	1,887	1,912	1,937	1,963	1,989	2,015	2,041	2,068	2,095	2,123
Industrial waste	Treatment plant	12,632	12,800	12,971	13,144	13,319	13,496	13,675	13,856	14,040	14,227	14,417	14,609	14,803	15,000	15,199	15,401
<b>Total Industrial</b>		<b>21,799</b>	<b>22,089</b>	<b>22,383</b>	<b>22,680</b>	<b>22,981</b>	<b>23,286</b>	<b>23,596</b>	<b>23,909</b>	<b>24,227</b>	<b>24,549</b>	<b>24,875</b>	<b>25,204</b>	<b>25,538</b>	<b>25,877</b>	<b>26,219</b>	<b>26,568</b>
Commercial waste	Landfill (C+I, LACW, Agri)	17,056	13,451	9,799	6,101	2,355	2,370	2,385	2,401	2,415	2,431	2,446	2,462	2,477	2,493	2,508	2,524
Commercial waste	Energy from waste	6,007	7,530	9,071	10,632	12,211	12,289	12,366	12,444	12,523	12,601	12,681	12,759	12,839	12,920	13,001	13,083
Commercial waste	Recycling (C+I, LACW, Agri)	80,791	83,527	86,296	89,095	91,927	92,505	93,088	93,674	94,264	94,858	95,455	96,057	96,662	97,270	97,883	98,499
Commercial waste	Composting (IVC)	24,436	24,590	24,745	24,901	25,057	25,215	25,374	25,534	25,695	25,857	26,020	26,184	26,349	26,515	26,682	26,850
Commercial waste	Treatment plant	177,163	178,279	179,402	180,532	181,669	182,813	183,964	185,123	186,289	187,463	188,644	189,832	191,028	192,232	193,443	194,661
<b>Total Commercial</b>		<b>305,453</b>	<b>307,377</b>	<b>309,313</b>	<b>311,261</b>	<b>313,219</b>	<b>315,192</b>	<b>317,177</b>	<b>319,176</b>	<b>321,186</b>	<b>323,210</b>	<b>325,246</b>	<b>327,294</b>	<b>329,355</b>	<b>331,430</b>	<b>333,517</b>	<b>335,617</b>
AWRP (output) C&I	Landfill (C+I, LACW, Agri)			13,381	13,769	13,896	14,023	14,149	14,261	14,373	14,492	14,610	14,728	14,843	14,958	15,058	15,159
AWRP (output) C&I	Treatment plant			51,467	52,961	53,450	53,937	54,422	54,854	55,284	55,741	56,196	56,650	57,093	57,534	57,919	58,307
<b>Total C&amp;I</b>		<b>327,252</b>	<b>329,466</b>	<b>396,544</b>	<b>400,671</b>	<b>403,546</b>	<b>406,438</b>	<b>409,344</b>	<b>412,200</b>	<b>415,070</b>	<b>417,992</b>	<b>420,927</b>	<b>423,876</b>	<b>426,829</b>	<b>429,799</b>	<b>432,713</b>	<b>435,651</b>
CDE waste	Landfill (CDE)	435,345	384,735	333,070	280,334	226,510	228,775	229,919	231,070	232,225	233,386	234,553	235,725	236,904	238,089	239,279	240,476
CDE waste	Recycling (CDE)	259,532	317,090	375,773	435,598	496,582	501,548	504,056	506,575	509,107	511,653	514,210	516,782	519,365	521,962	524,573	527,195
CDE waste	Treatment plant	142,324	143,747	145,185	146,637	148,104	149,585	150,333	151,085	151,841	152,600	153,363	154,130	154,901	155,675	156,454	157,236
<b>Total CDE</b>		<b>837,201</b>	<b>845,572</b>	<b>854,028</b>	<b>862,569</b>	<b>871,196</b>	<b>879,908</b>	<b>884,308</b>	<b>888,730</b>	<b>893,173</b>	<b>897,639</b>	<b>902,126</b>	<b>906,637</b>	<b>911,170</b>	<b>915,726</b>	<b>920,306</b>	<b>924,907</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+I, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+I, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+I, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,252	7,296	7,340	7,384	7,429	7,474	7,519	7,564	7,610	7,656	7,702	7,748	7,795	7,842	7,889	7,936
Hazardous waste	Energy from waste	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179
Hazardous waste	Incineration without Energy Recovery	538	541	544	547	550	553	556	559	562	565	568	571	574	577	580	583
Hazardous waste	Recycling (C+I, LACW, Agri)	18,256	18,366	18,476	18,587	18,698	18,810	18,923	19,037	19,151	19,266	19,381	19,497	19,614	19,731	19,850	19,969

Waste Stream	Management Type	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Hazardous waste	Recycling (CDE)	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189
Hazardous waste	Treatment plant	7,158	7,201	7,244	7,287	7,330	7,374	7,418	7,462	7,507	7,552	7,598	7,644	7,690	7,736	7,782	7,829
AWRP (output) C&I	Landfill (Hazardous)			15,440	15,888	16,035	16,181	16,327	16,457	16,586	16,723	16,860	16,996	17,129	17,261	17,377	17,493
<b>Total Hazardous</b>		<b>33,542</b>	<b>33,744</b>	<b>49,386</b>	<b>50,037</b>	<b>50,388</b>	<b>50,740</b>	<b>51,093</b>	<b>51,431</b>	<b>51,770</b>	<b>52,118</b>	<b>52,467</b>	<b>52,816</b>	<b>53,164</b>	<b>53,511</b>	<b>53,844</b>	<b>54,178</b>

### Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 Minimised Growth, Baseline Scenario (tonnes)

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+, LACW, Agri)	1,683	1,666	1,649	1,632	1,615	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598	1,598
Industrial waste	Energy from waste	208	206	204	202	200	198	198	198	198	198	198	198	198	198	198	198
Industrial waste	Recycling (C+, LACW, Agri)	5,198	5,146	5,095	5,044	4,994	4,944	4,944	4,944	4,944	4,944	4,944	4,944	4,944	4,944	4,944	4,944
Industrial waste	Composting (IVC)	1,663	1,646	1,629	1,612	1,595	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579
Industrial waste	Treatment plant	12,058	11,937	11,818	11,700	11,583	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467
<b>Total Industrial</b>		<b>20,810</b>	<b>20,601</b>	<b>20,395</b>	<b>20,190</b>	<b>19,987</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>
Commercial waste	Landfill (C+, LACW, Agri)	23,651	23,415	23,181	22,949	22,720	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493
Commercial waste	Energy from waste	2,957	2,927	2,897	2,868	2,839	2,810	2,810	2,810	2,810	2,810	2,810	2,810	2,810	2,810	2,810	2,810
Commercial waste	Recycling (C+, LACW, Agri)	73,909	73,170	72,439	71,715	70,998	70,288	70,288	70,288	70,288	70,288	70,288	70,288	70,288	70,288	70,288	70,288
Commercial waste	Composting (IVC)	23,651	23,415	23,181	22,949	22,720	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493
Commercial waste	Treatment plant	171,470	169,755	168,057	166,377	164,714	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067
<b>Total Commercial</b>		<b>295,638</b>	<b>292,682</b>	<b>289,755</b>	<b>286,858</b>	<b>283,991</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>
AWRP (output) C&I	Landfill (C+, LACW, Agri)			13,381	13,769	13,896	14,023	14,149	14,261	14,373	14,492	14,610	14,728	14,843	14,958	15,058	15,159
AWRP (output) C&I	Treatment plant			51,467	52,961	53,450	53,937	54,422	54,854	55,284	55,741	56,196	56,650	57,093	57,534	57,919	58,307
<b>Total C&amp;I</b>		<b>316,448</b>	<b>313,283</b>	<b>374,998</b>	<b>373,778</b>	<b>371,324</b>	<b>368,897</b>	<b>369,508</b>	<b>370,052</b>	<b>370,594</b>	<b>371,170</b>	<b>371,743</b>	<b>372,315</b>	<b>372,873</b>	<b>373,429</b>	<b>373,914</b>	<b>374,403</b>
CDE waste	Landfill (CDE)	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458	533,458
CDE waste	Recycling (CDE)	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727	147,727
CDE waste	Treatment plant	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520
<b>Total CDE</b>		<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165
Hazardous waste	Energy from waste	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Hazardous waste	Incineration without Energy Recovery	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Hazardous waste	Recycling (C+, LACW, Agri)	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039
Hazardous waste	Recycling (CDE)	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172

Waste Stream	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Hazardous waste	Treatment plant	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073
AWRP (Output) C&I	Landfill (Hazardous)			15,440	15,888	16,035	16,181	16,327	16,457	16,586	16,723	16,860	16,996	17,129	17,261	17,377	17,493
<b>Total Hazardous</b>		<b>33,143</b>	<b>33,143</b>	<b>48,583</b>	<b>49,031</b>	<b>49,178</b>	<b>49,324</b>	<b>49,470</b>	<b>49,600</b>	<b>49,729</b>	<b>49,866</b>	<b>50,003</b>	<b>50,139</b>	<b>50,272</b>	<b>50,404</b>	<b>50,520</b>	<b>50,636</b>

**Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 Minimised Growth, Maximised Recycling Scenario (tonnes)**

Waste Type	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+, LACW, Agri)	1,224	984	750	520	294	291	291	291	291	291	291	291	291	291	291	291
Industrial waste	Energy from waste	322	376	429	480	530	525	525	525	525	525	525	525	525	525	394	394
Industrial waste	Recycling (C+, LACW, Agri)	5,543	5,658	5,769	5,878	5,985	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	5,924	6,055	6,055
Industrial waste	Composting (IVC)	1,663	1,646	1,629	1,612	1,595	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579
Industrial waste	Treatment plant	12,058	11,937	11,818	11,700	11,583	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467
<b>Total Industrial</b>		<b>20,810</b>	<b>20,601</b>	<b>20,395</b>	<b>20,190</b>	<b>19,987</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>
Commercial waste	Landfill (C+, LACW, Agri)	16,509	12,808	9,179	5,622	2,136	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114
Commercial waste	Energy from waste	4,742	5,578	6,398	7,199	7,985	7,905	7,905	7,905	7,905	7,905	7,905	7,905	7,905	7,905	5,867	5,867
Commercial waste	Recycling (C+, LACW, Agri)	79,266	81,126	82,940	84,711	86,436	85,572	85,572	85,572	85,572	85,572	85,572	85,572	85,572	85,572	87,610	87,610
Commercial waste	Composting (IVC)	23,651	23,415	23,181	22,949	22,720	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493
Commercial waste	Treatment plant	171,470	169,755	168,057	166,377	164,714	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067
<b>Total Commercial</b>		<b>295,638</b>	<b>292,682</b>	<b>289,755</b>	<b>286,858</b>	<b>283,991</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>
AWRP (output) C&I	Landfill (C+, LACW, Agri)			13,381	13,769	13,896	14,023	14,149	14,261	14,373	14,492	14,610	14,728	14,843	14,958	15,058	15,159
AWRP (output) C&I	Treatment plant			51,467	52,961	53,450	53,937	54,422	54,854	55,284	55,741	56,196	56,650	57,093	57,534	57,919	58,307
<b>Total C&amp;I</b>		<b>316,448</b>	<b>313,283</b>	<b>374,998</b>	<b>373,778</b>	<b>371,324</b>	<b>368,897</b>	<b>369,508</b>	<b>370,052</b>	<b>370,594</b>	<b>371,170</b>	<b>371,743</b>	<b>372,315</b>	<b>372,873</b>	<b>373,429</b>	<b>373,914</b>	<b>374,403</b>
CDE waste	Landfill (CDE)	400,093	333,412	266,729	200,046	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365	133,365
CDE waste	Recycling (CDE)	281,092	347,773	414,456	481,139	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820	547,820
CDE waste	Treatment plant	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520
<b>Total CDE</b>		<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165
Hazardous waste	Energy from waste	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Hazardous waste	Incineration without Energy Recovery	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Hazardous waste	Recycling (C+, LACW, Agri)	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039
Hazardous waste	Recycling (CDE)	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Hazardous waste	Treatment plant	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073

Waste Type	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
AWRP (output) C&I	Landfill (Hazardous)			15,440	15,888	16,035	16,181	16,327	16,457	16,586	16,723	16,860	16,996	17,129	17,261	17,377	17,493
<b>Total Hazardous</b>		<b>33,143</b>	<b>33,143</b>	<b>48,583</b>	<b>49,031</b>	<b>49,178</b>	<b>49,324</b>	<b>49,470</b>	<b>49,600</b>	<b>49,729</b>	<b>49,866</b>	<b>50,003</b>	<b>50,139</b>	<b>50,272</b>	<b>50,404</b>	<b>50,520</b>	<b>50,636</b>

**Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 Minimised Growth, Alternative Median Recycling Scenario (tonnes)**

Waste Type	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+, LACW, Agri)	1,224	984	750	520	294	291	291	291	291	291	291	291	291	291	291	291
Industrial waste	Energy from waste	391	479	563	647	728	721	721	721	721	721	721	721	721	721	656	656
Industrial waste	Recycling (C+, LACW, Agri)	5,474	5,555	5,635	5,711	5,787	5,728	5,728	5,728	5,728	5,728	5,728	5,728	5,728	5,728	5,793	5,793
Industrial waste	Composting (IVC)	1,663	1,646	1,629	1,612	1,595	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579
Industrial waste	Treatment plant	12,058	11,937	11,818	11,700	11,583	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467
<b>Total Industrial</b>		<b>20,810</b>	<b>20,601</b>	<b>20,395</b>	<b>20,190</b>	<b>19,987</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>
Commercial waste	Landfill (C+, LACW, Agri)	16,509	12,808	9,179	5,622	2,136	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114
Commercial waste	Energy from waste	5,813	7,170	8,498	9,799	11,073	10,962	10,962	10,962	10,962	10,962	10,962	10,962	10,962	10,962	9,943	9,943
Commercial waste	Recycling (C+, LACW, Agri)	78,195	79,534	80,840	82,111	83,348	82,515	82,515	82,515	82,515	82,515	82,515	82,515	82,515	82,515	83,534	83,534
Commercial waste	Composting (IVC)	23,651	23,415	23,181	22,949	22,720	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493
Commercial waste	Treatment plant	171,470	169,755	168,057	166,377	164,714	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067
<b>Total Commercial</b>		<b>295,638</b>	<b>292,682</b>	<b>289,755</b>	<b>286,858</b>	<b>283,991</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>
AWRP (output) C&I	Landfill (C+, LACW, Agri)			13,381	13,769	13,896	14,023	14,149	14,261	14,373	14,492	14,610	14,728	14,843	14,958	15,058	15,159
AWRP (output) C&I	Treatment plant			51,467	52,961	53,450	53,937	54,422	54,854	55,284	55,741	56,196	56,650	57,093	57,534	57,919	58,307
<b>Total C&amp;I</b>		<b>316,448</b>	<b>313,283</b>	<b>374,998</b>	<b>373,778</b>	<b>371,324</b>	<b>368,897</b>	<b>369,508</b>	<b>370,052</b>	<b>370,594</b>	<b>371,170</b>	<b>371,743</b>	<b>372,315</b>	<b>372,873</b>	<b>373,429</b>	<b>373,914</b>	<b>374,403</b>
CDE waste	Landfill (CDE)	426,766	373,421	320,075	266,729	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383
CDE waste	Recycling (CDE)	254,419	307,764	361,110	414,456	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802
CDE waste	Treatment plant	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520
<b>Total CDE</b>		<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165
Hazardous waste	Energy from waste	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Hazardous waste	Incineration without Energy Recovery	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Hazardous waste	Recycling (C+, LACW, Agri)	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039
Hazardous waste	Recycling (CDE)	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Hazardous waste	Treatment plant	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073
AWRP (output) C&I	Landfill (Hazardous)			15,440	15,888	16,035	16,181	16,327	16,457	16,586	16,723	16,860	16,996	17,129	17,261	17,377	17,493

Waste Type	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
<b>Total Hazardous</b>		<b>33,143</b>	<b>33,143</b>	<b>48,583</b>	<b>49,031</b>	<b>49,178</b>	<b>49,324</b>	<b>49,470</b>	<b>49,600</b>	<b>49,729</b>	<b>49,866</b>	<b>50,003</b>	<b>50,139</b>	<b>50,272</b>	<b>50,404</b>	<b>50,520</b>	<b>50,636</b>

**Waste Management Capacity Requirements by waste stream and management method 2016 – 2031 Minimised Growth, Median Recycling Scenario (tonnes)**

Waste Type	Management Method	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Industrial waste	Landfill (C+, LACW, Agri)	1,224	984	750	520	294	291	291	291	291	291	291	291	291	291	291	291
Industrial waste	Energy from waste	391	479	563	647	728	721	721	721	721	721	721	721	721	721	721	721
Industrial waste	Recycling (C+, LACW, Agri)	5,474	5,555	5,635	5,711	5,787	5,728	5,728	5,728	5,728	5,728	5,728	5,728	5,728	5,728	5,728	5,728
Industrial waste	Composting (IVC)	1,663	1,646	1,629	1,612	1,595	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579	1,579
Industrial waste	Treatment plant	12,058	11,937	11,818	11,700	11,583	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467	11,467
<b>Total Industrial</b>		<b>20,810</b>	<b>20,601</b>	<b>20,395</b>	<b>20,190</b>	<b>19,987</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>	<b>19,786</b>
Commercial waste	Landfill (C+, LACW, Agri)	16,509	12,808	9,179	5,622	2,136	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114	2,114
Commercial waste	Energy from waste	5,813	7,170	8,498	9,799	11,073	10,962	10,962	10,962	10,962	10,962	10,962	10,962	10,962	10,962	10,962	10,962
Commercial waste	Recycling (C+, LACW, Agri)	78,195	79,534	80,840	82,111	83,348	82,515	82,515	82,515	82,515	82,515	82,515	82,515	82,515	82,515	82,515	82,515
Commercial waste	Composting (IVC)	23,651	23,415	23,181	22,949	22,720	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493	22,493
Commercial waste	Treatment plant	171,470	169,755	168,057	166,377	164,714	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067	163,067
<b>Total Commercial</b>		<b>295,638</b>	<b>292,682</b>	<b>289,755</b>	<b>286,858</b>	<b>283,991</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>	<b>281,151</b>
AWRP (output) C&I	Landfill (C+, LACW, Agri)			13,381	13,769	13,896	14,023	14,149	14,261	14,373	14,492	14,610	14,728	14,843	14,958	15,058	15,159
AWRP (output) C&I	Treatment plant			51,467	52,961	53,450	53,937	54,422	54,854	55,284	55,741	56,196	56,650	57,093	57,534	57,919	58,307
<b>Total C&amp;I</b>		<b>316,448</b>	<b>313,283</b>	<b>374,998</b>	<b>373,778</b>	<b>371,324</b>	<b>368,897</b>	<b>369,508</b>	<b>370,052</b>	<b>370,594</b>	<b>371,170</b>	<b>371,743</b>	<b>372,315</b>	<b>372,873</b>	<b>373,429</b>	<b>373,914</b>	<b>374,403</b>
CDE waste	Landfill (CDE)	426,766	373,421	320,075	266,729	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383	213,383
CDE waste	Recycling (CDE)	254,419	307,764	361,110	414,456	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802	467,802
CDE waste	Treatment plant	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520	139,520
<b>Total CDE</b>		<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>	<b>820,705</b>
Agricultural waste	Incineration (Specialist High Temp)	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632	13,632
Agricultural waste	Recycling (C+, LACW, Agri)	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767	7,767
Agricultural waste	Treatment plant	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387	12,387
<b>Total Agricultural</b>		<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>	<b>33,786</b>
Local Authority Collected Waste	Landfill (C+, LACW, Agri)	199,034	200,238	40,282	40,525	22,647	22,844	22,992	23,140	23,288	23,435	23,583	23,730	23,877	24,024	24,171	24,317
Local Authority Collected Waste	Energy from waste	39,807	40,048	201,412	202,625	203,827	205,594	206,927	208,258	209,589	210,918	212,244	213,570	214,893	216,216	217,537	218,857
Local Authority Collected Waste	Recycling (C+, LACW, Agri)	203,457	204,688	205,888	207,127	226,474	228,438	229,919	231,398	232,876	234,353	235,827	237,300	238,770	240,240	241,708	243,174
<b>Total LACW</b>		<b>442,298</b>	<b>444,974</b>	<b>447,582</b>	<b>450,277</b>	<b>452,948</b>	<b>456,876</b>	<b>459,838</b>	<b>462,796</b>	<b>465,753</b>	<b>468,706</b>	<b>471,654</b>	<b>474,600</b>	<b>477,540</b>	<b>480,480</b>	<b>483,416</b>	<b>486,348</b>
Hazardous waste	Landfill (Hazardous)	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165	7,165
Hazardous waste	Energy from waste	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162	162
Hazardous waste	Incineration without Energy Recovery	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532	532
Hazardous waste	Recycling (C+, LACW, Agri)	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039	18,039
Hazardous waste	Recycling (CDE)	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
Hazardous waste	Treatment plant	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073	7,073
AWRP (output) C&I	Landfill (Hazardous)			15,440	15,888	16,035	16,181	16,327	16,457	16,586	16,723	16,860	16,996	17,129	17,261	17,377	17,493
<b>Total Hazardous</b>		<b>33,143</b>	<b>33,143</b>	<b>48,583</b>	<b>49,031</b>	<b>49,178</b>	<b>49,324</b>	<b>49,470</b>	<b>49,600</b>	<b>49,729</b>	<b>49,866</b>	<b>50,003</b>	<b>50,139</b>	<b>50,272</b>	<b>50,404</b>	<b>50,520</b>	<b>50,636</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 North Yorkshire County Council, Yorkshire Dales National Park (YDNP), North York Moors National Park (NYMNP) and City of York Council, hereon referred to as the NY Sub-region.

In 2014, Defra employed consultants Jacobs to prepare a methodology for calculating arisings of C&I waste. The Defra report<sup>18</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 NY Sub-region 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 the NY Sub-region 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 the NY Sub-region 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 the NY Sub-region.

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
- EA data waste received at Incineration facilities

### 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 the NY Sub-region; and
- estimate the amount of 'unknown' waste arisings that are likely to be C&I waste arisings managed at facilities within the NY Sub-region.

#### Calculating 'Known' Arisings

Information used to calculate arisings sent to permitted facilities within the NY Sub-region 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 the NY Sub-region that also arose in the Sub-region, as well as how much waste arose in the Sub-region

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<sup>18</sup> New Methodology to Estimate Waste Generation by the Commercial and Industrial Sector in England, DEFRA, Project Report, Final, EV0804, August 2014



and was managed elsewhere. This gives a total figure for the amount of waste produced in the NY Sub-region.

#### 'Unknown' Arisings

Within the WDI dataset there is a level of 'unknown' waste arisings managed in the NY Sub-region which arose within the Yorkshire and Humber Region. However, the dataset does not reveal how much of this waste actually originated in the NY Sub-region. There is also an 'unknown' amount of waste arisings managed outside Yorkshire and Humberside (Y&H) Region but which originate from within the Region. It is likely that some of these 'unknown' arisings are from the NY Sub-region and therefore a methodology for attributing some aspects of the arisings to the NY Sub-region is required.

The proposed approach to calculating these unknown arisings is to look first at the make up 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 as shown below. 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.

Table A4.33 Total known Yorkshire & Humberside Waste Arisings that are managed within North Yorkshire Sub-region (2014)

<b>Uncoded Yorkshire &amp; Humberside managed in NY sub region</b>	<b>Tonnage</b>
Municipal Waste total	470,653
Eggborough Power Limited	375,252
CD&E	472,848
Other waste	93,717
Total Y&H coded	1,412,470

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 Waste data flow. Waste arisings for LACW have been obtained from Waste Data Flow and will need to be removed from this figure to prevent double counting of this waste stream.
- The waste from Eggborough Power station is managed at a restricted landfill site, the capacity at which is reserved solely for managing waste from the power station. Therefore, this waste does not need to be added to this figure.
- The 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<sup>19</sup>.
- For C&I waste, this leaves the above 'other waste' figure of 93,717 tonnes. This figure is added to the C&I arisings figure for the NY sub-region obtained during Step 1 (a).

#### Adjustments

The information used to calculate a) and b) above will include records for LACW. Therefore information taken data from waste data flow, which records information on levels of LACW managed by authority, is also used. This allows for the total amount of LACW managed in the sub-region to be removed from the total calculations to ensure that the estimates are not incorporating this waste stream.

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

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The CD&E element of the uncoded Yorkshire and Humberside waste is added to the total CD&E calculations

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 the NY sub-region and its arisings and therefore this is not an issue for this assessment.

Hazardous waste arisings are also removed from the total arisings figure as these are recorded within the EA's hazardous Waste Data Interrogator (HWDI).

A breakdown of the arisings for C&I waste in the NY Sub-region and how this has been calculated using the approach above is set out in Appendix 3.

### **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.

### **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 for NY sub-region, the actual throughputs can be used.

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. The same approach will be applied in the case of NY Sub-region.

The Defra approach uses an estimate of 19% of the total arisings as being managed through exempt facilities. This would be 60,276 tonnes. However, the Defra approach shows that these sites last a maximum of 3 years and some sites will not take waste for the entire period, therefore adding the sites to the model would mean numerous changes on a regular basis, also there is no annual input for the sites to attribute to each site. It is therefore estimated that exempt sites will be used to managed this 60,276 tonnes estimated arising produced currently and it is expected that this will continue through the plan period

#### **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 the NY Sub-region.

#### **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 the NY Sub-region 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 NY Sub-region.

## APPENDIX 5: Review of Waste Transfer Stations

As part of the assessment of available operational waste management capacity, a review was undertaken of existing waste transfer stations.

Waste information for transfer stations has been taken from the EA WDI (2012-2014 data). Waste figures were obtained for both waste received and waste removed for all facilities categorised as transfer stations. A comparison of the amount of waste received and removed from each site was undertaken to see if there was any difference. In most cases the figure was the same or slightly lower, however there are a few sites for which the figures are higher. This indicated that more waste was removed from the site than taken in, and it is assumed that this was waste that was being stored on these sites in accordance with their Licence.

Following completion of the above task, a further analysis was undertaken to see what the fate of the waste leaving the site was. This information was used to remove any sites for which it was clear that waste simply came to the site and was moved on again to transfer as it was clear no other activities were happening on site.

Sites for which the fate was shown to not be simply transferred were reviewed in more detail to see what was happening with waste and to identify if recycling or other processing of waste was taking place. A review of data over 3 years was undertaken to assess if there was a trend for establishing a recycling rate.

As a result of this exercise a total of 21 Waste Transfer Stations have been reclassified (out of a total of 59 Waste Transfer Stations) as undertaking both transfer and recycling of waste, with an average of 67% recycling identified. The Capacity Model has therefore been amended to include duplicate sites for the identified facilities splitting the identified capacity by 67/33 for recycling/transfer respectively. For individual sites the rates may be marginally different but for ease of assessment the average rate has been applied.

The full list of sites amended as potentially carrying out recycling are included in table 1 below.

**Table 1 – Waste Transfer Stations identified as carrying out recycling.**

Permit Number	Site Name	Operator	Permit Type	Facility Type
AP3996ZY (66189)	Taperell Environmental	Mr Christopher Taperell And Mr Stewart Taperell	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
BP3690LN (68712)	Todds Waste Management Facility	F D Todd & Sons Ltd	A9 : Haz Waste Transfer Station	Haz Waste Transfer
BP3790ZX (60047)	Leading Solvent Supplies	Walker Derek	A9 : Haz Waste Transfer Station	Haz Waste Transfer
EP3296ZF (66157)	Givendale Head Farm	Mr R E & Mrs S E Gwilliam	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
FP3596ZA (66103)	Seamer Carr Materials Recycling Facility	Yorwaste Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
GP3292SJ (60177)	Whitby Waste Treatment & Transfer Facility	Yorwaste Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
GP3696ZY (66042)	Dean Road Transfer Station, Scarborough	Scarborough Borough Council	A9 : Haz Waste Transfer Station	Haz Waste Transfer

Permit Number	Site Name	Operator	Permit Type	Facility Type
HP3296ZN (66094)	Ryedale Skip Hire	Ryedale Skip Hire Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
HP3798EG (100381)	Whitewall Quarry	W Clifford Watts Ltd	A14 : Transfer Station taking Non-Biodegradable Wastes	Inert Waste Transfer
HP3890ZN (60158)	Knapton Gravel Quarry	F D Todd & Sons Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
JB3230RH (104447)	Whitemoor Business Park	Van Werven U K Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
LB3337AF (60219)	Millcross Quarry Materials & E L V Facility	Mytum & Selby Waste Recycling Ltd	A9 : Haz Waste Transfer Station	Haz Waste Transfer
MB3636RT (60051)	Harrogate Transfer Station	H A C S Environmental Llp	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
PP3090NA (68689)	Cleveland Carr Lane	Harpers Environmental Ltd	A9 : Haz Waste Transfer Station	Haz Waste Transfer
QP3795EH (100215)	Whitemoor Business Park	Ecoplas Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
UP3596ZT (66016)	Tockwith Recycling Centre	Biffa Waste Services Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
CP3693VG (100951)	Ebor Skip Hire	Barker Lea	S0801 : HCI Waste Transfer Station	Non-Haz Waste Transfer
HP3396ZV (66077)	Hessay Recycling Centre	Yorwaste Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
NP3796ZX (66150)	K & D Skip Hire & Waste Management Ltd	K & D Skip Hire & Waste Management Ltd	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
RP3395EL (100153)	Woodhouse Farm	Mr Eric William Swiers & Mrs Rowena Grainger	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer
WP3096ZB (66176)	D Boswell & Sons	Boswell John	A11 : Household, Commercial & Industrial Waste T Stn	Non-Haz Waste Transfer

## APPENDIX 6: Details of Scenarios for Modelling Purposes

The scenarios modelled are illustrated in the table below.

1. **Baseline** - this models the current position as at 2016 for all waste streams except LACW, which is managed in accordance with existing and planned arrangements and in accordance with agreed targets in the JMWMS and delivery of AWRP facility (minimum recycling or composting of 50% of household waste by 2020 and diversion of 95% of municipal waste from landfill when AWRP facility operational).

2. **Maximised Recycling Scenario** - Scenario targets have been set for 2020 and 2030.

By 2020, for CDE waste, 75% of the waste stream currently going to landfill is diverted to recycling. Of the remainder, 20% will go to treatment and 5% to landfill. The overall position at 2020 with regard to waste management for CDE wastes is landfill 16%, recycling 67% and Treatment 17%. This target and percentages remain the same for the whole plan period (tonnages will vary according to applying no growth, growth and minimised growth).

By 2020, for Commercial waste, 90.6% of commercial waste that is currently going to landfill is diverted. Of the remainder, 75% will go to recycling and 25% to Energy from waste. The overall position at 2020 with regard to waste management for commercial waste is Landfill less than 1%, energy from waste 3%, recycling/composting 39% and Treatment 58%. This changes by 2030 so that of the 90.6% of commercial waste that has been diverted away from landfill, the management route split changes in favour of recycling now at 85% and Energy from Waste at 15%. This has a slight effect on overall position at 2030; landfill is minimal, Energy from waste at 2% and recycling increased to 40%. Tonnages will vary in the model according to the application of no growth, growth and minimised growth.

By 2020, for Industrial waste, 81.8% of industrial waste that is currently going to landfill is diverted. Of the remainder, 75% will go to recycling and 25% go to Energy from Waste. The overall position at 2020 with regard to waste management for Industrial waste is Landfill less than 1%, energy from waste 3%, recycling/composting 38% and Treatment 58%. This changes by 2030 so that of the 81.8% of industrial waste that has been diverted away from landfill, the management route split changes in favour of recycling now at 85% and Energy from Waste at 15%. This has a slight effect on overall position at 2030; landfill is minimal, Energy from waste at 2% and recycling increased to 40%. Tonnages will vary in the model according to the application of no growth, growth and minimised growth.

No targets are set for Hazardous or agricultural wastes.

LACW waste is managed in accordance with existing and planned arrangements and in accordance with agreed targets in the JMWMS and delivery of AWRP facility (minimum recycling or composting of 50% of household waste by 2020 and diversion of 95% of municipal waste from landfill when AWRP facility operational)

3. **Alternative Median Recycling Scenario** - targets are set for 2020 and 2030

By 2020 for CDE waste 60% of the waste stream currently going to landfill is diverted to recycling. Of the remainder, 20% will go to treatment and 20% to landfill. The overall position at 2020 with regard to waste management for CDE wastes is landfill 26%, recycling 57% and Treatment 17%. This target and percentages remain the same for the whole plan period (tonnages will vary according to applying no growth, growth and minimised growth).

By 2020, for Commercial waste, 90.6% of commercial waste that is currently going to landfill is diverted. Of the remainder, 65% will go to recycling and 35% to Energy from waste. The overall position at 2020 with regard to waste management for commercial waste is Landfill less than 1%, energy from waste 4%, recycling/composting 37% and Treatment 58%. This changes by 2030 so that of the 90.6% of commercial waste that has been diverted away from landfill, the management route split changes in favour of recycling now at 65% and Energy from Waste at 35%. This has a slight effect on overall position at 2030; landfill is minimal, Energy from waste at 4% and recycling increased to 38%. Tonnages will vary in the model according to the application of no growth, growth and minimised growth.

By 2020, for Industrial waste, 81.8% of industrial waste that is currently going to landfill is diverted. Of the remainder, 60% will go to recycling and 40% to Energy from waste. The overall position at 2020 with regard to waste management for Industrial waste is Landfill 1%, energy from waste 4%, recycling/composting 37% and Treatment 58%. This changes by 2030 so that of the 81.8% of industrial waste that has been diverted away from landfill, the management route split changes in favour of recycling now at 65% and Energy from Waste at 35%. This has a slight effect on overall position at 2030; landfill is 1%, Energy from waste at 3% and recycling increased to 39%. Tonnages will vary in the model according to the application of no growth, growth and minimised growth.

No targets are set for Hazardous or agricultural wastes.

LACW waste is managed in accordance with existing and planned arrangements and in accordance with agreed targets in the JMWMS and delivery of AWRP facility (minimum recycling or composting of 50% of household waste by 2020 and diversion of 95% of municipal waste from landfill when AWRP facility operational)

**4. Median Recycling Scenario-** Targets are set at 2020 for recycling and recovery.

By 2020 for CDE waste 60% of the waste stream currently going to landfill is diverted to recycling. Of the remainder, 20% will go to treatment and 20% to landfill. The overall position at 2020 with regard to waste management for CDE wastes is landfill 26%, recycling 57% and Treatment 17%. This target and percentages remain the same for the whole plan period (tonnages will vary according to applying no growth, growth and minimised growth).

By 2020 for Commercial waste 90.6% of commercial waste that is currently going to landfill is diverted. Of the remainder, 60% will go to recycling and 40% to Energy from waste. The overall position at 2020 with regard to waste management for commercial waste is Landfill less than 1%, energy from waste 4%, recycling/composting 38% and Treatment 58%.

By 2020 for Industrial waste 81.8% of industrial waste that is currently going to landfill is diverted. Of the remainder, 60% will go to recycling and 40% to Energy from waste. The overall position at 2020 with regard to waste management for Industrial waste is Landfill 1%, energy from waste 4%, recycling/composting 37% and Treatment 58%.

Tonnages will vary in the model according to the application of no growth, growth and minimised growth.

No targets are set for Hazardous or agricultural wastes.

LACW waste is managed in accordance with existing and planned arrangements and in accordance with agreed targets in the JMWMS and delivery of AWRP facility (minimum recycling or composting of 50% of household waste by 2020 and diversion of 95% of municipal waste from landfill when AWRP facility operational).

Waste Stream	Scenario	Practice Assumption		Comment
LACW	All scenarios	Waste is managed in accordance with existing and planned arrangements and in accordance with agreed targets in the JMWMS and delivery of AWRP facility (minimum recycling or composting of 50% of household waste by 2020 and diversion of 95% of municipal waste from landfill when AWRP facility operational)		Reflects current approach by the York and North Yorkshire Waste Partnership and implementation of the AWRP facility.
C&I Waste		<b>Commercial waste</b>	<b>Industrial waste</b>	
	Scenario 1 Baseline Recycling Scenario	No change from baseline position	No change from baseline position	
	Scenario 2 Maximised Recycling Scenario	By 2020: 10% to landfill Of the remainder: 75% recycling	By 2020: 18% to Landfill Of the remainder: 75% Recycling	Maximised targets are set for CDE, Commercial and Industrial waste at 2020 and 2030. These

		25% EfW By 2030: 10% to Landfill Of the remainder: 85% Recycling/ 15% EfW	25% EfW By 2030: 18% to Landfill Of the remainder: 85% Recycling 15% EfW	seek to divert waste from current landfill management to favour recycling and EfW.
	Scenario 3 Alternative Median Recycling Scenario	By 2020: 10% to landfill Of the remainder: 60% recycling 40% EfW  By 2030: 10% or below to landfill Of the remainder: 65% recycling 35%EfW	By 2020: 18% to landfill Of the remainder: 60% recycling 40% EfW  By 2030: 18% or below to landfill Of the remainder: 65% recycling 35%EfW	Additional recycling targets set for Commercial and Industrial waste at 2020 and 2030. These seek to divert waste from current landfill management to favour recycling and EfW.
	Scenario 4 Median Recycling Scenario	By 2020: 10% to Landfill Of the remainder: 60% Recycling 40% EfW	By 2020: 18% to Landfill Of the remainder: 60% Recycling 40% EfW	Median targets for C&I are set for at 2020 only. These seek to divert waste from current landfill management to favour recycling.
CD&E Waste	Scenario 1 Baseline Recycling Scenario	No change from baseline position		
	Scenario 2 Maximised Recycling Scenario	By 2020 75% recycling 20% treatment 5% landfill		Maximised targets are set for CDE at 2020 and 2030. These seek to divert waste from current landfill management to favour recycling.
	Scenario 3 Alternative Median Recycling Scenario	By 2020 60% recycling 20% treatment 20% landfill		Additional recycling targets set for CDE, at 2020 and 2030. These seek to divert waste from current landfill management to favour recycling.
	Scenario 4 Median Recycling Scenario	By 2020: 60% recycling 20% treatment 20% landfill		Median targets are set for CDE at 2020 only. These seek to divert waste from current landfill management to favour recycling.



## APPENDIX 7: Movement of Household, Commercial and Industrial Wastes

Imports exceeding 1,000 tonnes – (Total 64,806) Source EA WDI 2014

Facility WPA	EWC Chapter	Recorded Origin	Origin WPA	Origin Region	Tonnes Received
North Yorkshire WPA	19 - WASTE AND WATER TREATMENT WASTES	Leeds	Leeds	Yorks & Humber	9,684
North Yorkshire WPA	20 - MUNICIPAL WASTES	Redcar & Cleveland UA	Redcar & Cleveland UA	North East	8,564
North Yorkshire WPA	20 - MUNICIPAL WASTES	Lincolnshire	Lincolnshire	East Midlands	6,553
North Yorkshire WPA	20 - MUNICIPAL WASTES	Leeds	Leeds	Yorks & Humber	3,562
North Yorkshire WPA	20 - MUNICIPAL WASTES	East Riding of Yorkshire UA	East Riding of Yorkshire UA	Yorks & Humber	2,093
North Yorkshire WPA	19 - WASTE AND WATER TREATMENT WASTES	Doncaster	Doncaster	Yorks & Humber	2,080
North Yorkshire WPA	02 - AGRICULTURE AND FOOD PROCESSING WASTES	Leeds	Leeds	Yorks & Humber	2,075
North Yorkshire WPA	20 - MUNICIPAL WASTES	Derbyshire	Derbyshire	East Midlands	1,754
York, City of WPA	20 - MUNICIPAL WASTES	Darlington UA	Darlington UA	North East	1,411
North Yorkshire WPA	02 - AGRICULTURE AND FOOD PROCESSING WASTES	East Riding of Yorkshire UA	East Riding of Yorkshire UA	Yorks & Humber	1,350
North Yorkshire WPA	20 - MUNICIPAL WASTES	Darlington UA	Darlington UA	North East	1,059

Exports exceeding 1,000 tonnes (Total 212,142 tonnes) Source EA WDI 2014

Facility WPA	EWC Chapter	NYP
Redcar and Cleveland WPA	16 - WASTES NOT OTHERWISE SPECIFIED IN THE LIST	49,103
Leeds WPA	20 - MUNICIPAL WASTES	42,458
Middlesbrough WPA	20 - MUNICIPAL WASTES	21,365
East Riding of Yorkshire WPA	02 - AGRICULTURE AND FOOD PROCESSING WASTES	20,368
Hartlepool WPA	20 - MUNICIPAL WASTES	13,474
Kingston Upon Hull City WPA	20 - MUNICIPAL WASTES	13,126
East Riding of Yorkshire WPA	16 - WASTES NOT OTHERWISE SPECIFIED IN THE LIST	7,096
Leeds WPA	16 - WASTES NOT OTHERWISE SPECIFIED IN THE LIST	6,574
Rotherham WPA	20 - MUNICIPAL WASTES	3,547
Stockton-on-Tees WPA	20 - MUNICIPAL WASTES	3,414
Leeds WPA	03 - FURNITURE, PAPER AND CARDBOARD MANUFACTURING WASTES	3,317
East Riding of Yorkshire WPA	20 - MUNICIPAL WASTES	3,164
Stockton-on-Tees WPA	16 - WASTES NOT OTHERWISE SPECIFIED IN THE LIST	2,968
Redcar and Cleveland WPA	20 - MUNICIPAL WASTES	2,408
County Durham WPA	02 - AGRICULTURE AND FOOD PROCESSING WASTES	1,687
Doncaster WPA	15 - PACKAGING, ABSORBENTS , WIPING CLOTHS ETC N.O.S.	1,422
Doncaster WPA	20 - MUNICIPAL WASTES	1,420
Wakefield WPA	20 - MUNICIPAL WASTES	1,392
Leeds WPA	07 - ORGANIC CHEMICAL PROCESS WASTE	1,280
North Lincolnshire WPA	02 - AGRICULTURE AND FOOD PROCESSING WASTES	1,199
Barnsley WPA	20 - MUNICIPAL WASTES	1,083
Salford WPA	20 - MUNICIPAL WASTES	1,016

## APPENDIX 8: Movement of Construction and Demolition Wastes

Imports exceeding 1,000 tonnes – (Total 142,210) Source EA WDI 2014

EWC Chapter	CONSTRUCTION AND DEMOLITION WASTES
WPA not codeable (North East)	100,388
East Riding of Yorkshire UA	15,836
Wakefield	10,254
Bradford City	9,472
Leeds	3,516
Doncaster	1,520
Darlington UA	294
Kingston Upon Hull UA	220
WPA not codeable (South Yorkshire)	196
Sheffield	112
Kirklees	80
Manchester	60
Lincolnshire	40
Derbyshire	34
Stockton-on-Tees	16
WPA Not Codeable (East Midlands)	3

Exports exceeding 1,000 tonnes (Total 65,041 tonnes) Source EA WDI 2014

Facility WPA	EWC Chapter	NYP
County Durham WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	13,533
Gateshead WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	11,838
Leeds WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	9,771
Redcar and Cleveland WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	8,863
Stockton-on-Tees WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	4,867
Darlington WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	3,505
Rotherham WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	2,753
Lancashire WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	2,295
East Riding of Yorkshire WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	2,194
Wakefield WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	1,370
Hartlepool WPA	17 - CONSTRUCTION AND DEMOLITION WASTES	1,165

## APPENDIX 9: Movement of Hazardous Wastes for the North Yorkshire Sub-Region

Imports exceeding 100 tonnes – (Total 8,173 tonnes)

Arising WPA	Tonnage
Wakefield	1,428
Leeds	1,259
North Lincolnshire	607
Bradford City	564
East Riding of Yorkshire	501
Lancashire	279
County Durham	199
Nottinghamshire	156
Kent	150
Sunderland	145
Southampton City	143
Redcar and Cleveland	139
Stockton-on-Tees	129
Leicestershire	116
Gateshead	111
Derbyshire	106
Calderdale	103
Barnsley	100

Exports exceeding 100 tonnes (Total 27,259 tonnes)

Deposit WPA	Tonnage
Wakefield	3,356
Kirklees	2,844
Leeds	2,494
Redcar and Cleveland	2,086
Stockton-on-Tees	1,749
North East Lincolnshire	1,361
Stoke-on-Trent City	1,224
Derbyshire	1,094
Lancashire	1,019
Rotherham	919
Nottinghamshire	896
Salford	854
Sheffield	820
Kingston Upon Hull City	698
Knowsley	687
Hartlepool	679
Gateshead	678

County Durham	628
Walsall	471
Sefton	431
Trafford	390
Wolverhampton	382
Suffolk	214
North Lincolnshire	202
Doncaster	175
Newcastle Upon Tyne	153
Darlington	127
Sandwell	127
St Helens	126
Cheshire West and Chester	119
Liverpool	112
Cheshire East	109
Warrington	103
Staffordshire	103
Bury	102

## APPENDIX 10: Glossary

AD	Anaerobic Digestion
AWRP	Allerton Waste Recovery Park
C&I Waste	Commercial and Industrial Waste
CD&E	Construction Demolition and Excavation Waste
EfW	Energy from Waste
ELV	End of Life Vehicle
GVA	Gross Value Added
LA	Local Authority
LACW	Local Authority Collected Waste
MBT	Mechanical Biological Treatment
NYCC	North Yorkshire County Council
WDA	Waste Disposal Authority
WEEE	Waste Electrical and Electronic Equipment

## **APPENDIX 11: 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.