North Yorkshire Sub Region

Waste Arisings and Capacity Evidence

Waste Arisings and Capacity Requirements

Addendum Report

May 2015

urbanvision

Date	Details	Prepared by	Reviewed and approved by
15.05.15	Draft Report	Paul Knott	Carolyn Williams
27.05.15	Final Report *	Paul Knott	Carolyn Williams
08.07.17	Expanded Report ‡	Paul Knott	Carolyn Williams

* Changes made to finalise the report included a minor expansion of comments in the table in Chapter 4, revision of certain values in Table 5, and further minor clarificatory changes to the text in Chapter 5.

‡ It was subsequently identified that the proposed modification of the Maximised Recycling scenario for C&I waste did not alter the original assumptions. As a result the modification has been changed to model a continuing increase in the rate to 2030 which is documented in the box following paragraph 5.25. A small number of other text changes were made to clarify the percentage assumptions used.

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1 INTRODUCTION & CONTEXT

1.1. In 2013 North Yorkshire County Council (in conjunction with City of York Council and the North Yorkshire 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 created in the North Yorkshire sub-region.

1.2. The findings of the initial study were presented in two reports:

- Part 1 report: assessment of waste arisings;
- Part 2 report: summary of the earlier report, assessment of local waste capacity; presentation of forecast scenarios; capacity gap assessment and identification of gaps.

1.3. The assessment focused on arisings in the principal waste streams:

- Local Authority Collected Waste (LACW) which is primarily that generated by households as well as material such as park wastes, street sweepings, etc.;
- Commercial and Industrial (C&I) waste generated by business activities;
- Construction, Demolition and Excavation (CD&E) wastes generated by new development and regeneration projects; and also
- Hazardous wastes which are a component of all the above streams.

1.4. A range of forecast scenarios were evaluated based on three different assumptions about future growth in arisings in these streams which were combined with three different assumptions about future changes in the proportion of wastes that would be recycled, composted, re-used, recovered or disposed. These parameters were referred to as Growth and Behaviour factors respectively.

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

1.6. Copies of both reports are accessible via the Council's website and comment was invited on the content.

1.7. The Council has now commissioned Urban Vision to prepare a short addendum which documents the results of the following tasks:

- 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;
- Identify the 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 should focus on changes to the C&I and CD&E streams as management of LACW will continue to be based on the private procurement contract between the partner authorities in the sub-region and AmeyCespa Ltd.

1.8. Subsequent chapters of this Addendum report address these matters in this order.

2 RELEVANT WASTE POLICY DEVELOPMENTS

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 – ie. developments relating to 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 report was 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 capacity review reports were published.

European and national policy developments

2.3 There are very limited developments of direct relevance at either level.

Principal development	Implications
EU Review of Waste Framework Directive Recycling Targets – Consultation Document July 2014[1]	
• Additional target of recycling (composting) and preparing for re-use of 70% of LACW by 2030 • Increase target for recycling packaging waste to 80% by 2030 • Phase out landfilling of all recyclable materials by 2025 • Reduce food waste by 30% by 2025 compared to current levels	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; (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
Waste Management Plan for England December 2013	
• Promotes high-quality recycling to support the development of a circular economy • 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	Not necessarily a direct impact but could justify assumptions about further improvement in LACW and C&I recycling rates though improvement in householder and employee buy-in to recycling initiatives will be essential also. PRNs would only have an extremely indirect impact
• Encouragement for separate collection of biowaste (food waste) but decision to be left to local authorities	Regarded as a vital means of pushing up recycling and composting of household waste, especially in urbanised authorities. Scale of roll-out in the 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

[1] In December 2014, the Commission announced the withdrawal of its legislative proposal for the review of waste legislation, to be replaced by a new, more ambitious, initiative for the promotion of the circular economy by the end of 2015.

	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[2]
• 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

National Planning Policy for Waste (& Technical Guidance) October 2014

In spite of its wider significance, NPPW has few implications for the matters addressed by the capacity 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.

National Infrastructure Plan December 2014

The relevant chapter in the Plan is largely 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.

UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry January 2015 – Consultation Document

• Encourage planning authorities to provide more support for local storage / disposal to relieve pressure on limited national infrastructure	No impact for this revision but may impact need for dialogue with authorities currently receiving these wastes (though in practice the scope for new infrastructure is limited)

Local and 'larger than local' policy developments

Leeds City Region Enterprise Partnership – Strategic Economic Plan 2014

• 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 AmeyCespa contract)
• The Plan recognises the City Region under-performs in that levels 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 review)

North Yorkshire County Council Municipal Waste Management Strategy and residual waste management contracts

• Key developments are conclusion of a Judicial Review into the proposal to develop facilities at Allerton Quarry, issue of planning permission for the site (September 2014), award of contract to AmeyCespa (October 2014), and breaking of ground at the site (March 2015)[3]	The current model anticipates the operation of the plant which drew comments during consultation on the capacity assessment study (see Chapter 4). The main implication is to alter the details in the model to reflect the revised opening date following delays caused by the legal challenge
• The Council is in the process of awarding interim contracts for the disposal of residual LACW covering the period before the Allerton	As above, the implications of these contracts for managing LACW may need to be reflected in amendments to the capacity assessment model

[2] The review of CD&E 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 of waste creation and management to the Environment Agency. Therefore it is likely that local rates will appear to be lower because this contribution cannot be identified independently.

[3] It is recognised this issue and that below are not policy developments but they will impact any future revision of the capacity assessment study and therefore need to be stated here.

facilities are in operation

3 WASTE ARISINGS, MANAGEMENT & CAPACITY

Review of Waste Arisings and Management Methods

3.1 This section of the Addendum report updates information about total waste arisings across the four principal streams and the relative proportions that are recycled, re-used, recovered or disposed to landfill. The updated information is compared with the baseline figures and forecasts in the original Evidence Project reports. This information can inform a subsequent decision on the extent to which the baseline in the capacity assessment model should be updated.

3.2 The update addresses the LACW, C&I, CD&E and hazardous waste streams only. The position taken with regard to the other streams is as follows:

- *Agricultural waste*. The original work was based on information over a decade old (2001 and 2003) and, in the absence of more recent statistics, the assumption that the number of farm holdings and mix of management methods had not changed significantly over the intervening period. As a result the quantity of arisings had not changed and that less than 1% of arisings would continue to be managed where they arose, making no use of third party-provided facilities that the Waste Plan might need to bring forward.
- *Low-level radioactive wastes and sewage sludge*. The requirements for this update focus on the C&I and CD&E streams. The original work identified very limited quantities of radioactive wastes were produced locally and managed mainly in an adjacent authority. The Environment Agency is no longer publishing further details of the quantity and fate of these materials and therefore it is not possible to update this information. Management of sewage sludge is the responsibility of Yorkshire Water and the principal issue will be whether completion of the AMP6 planning cycle has identified a need for additional land outside of existing waste water and sewage sludge treatment works. These matters lie outside the scope of this update but can be checked through ongoing liaison with the company.

LOCAL AUTHORITY COLLECTED WASTE

3.3 Table 1 overleaf updates Table 7 from the original report. The following points should be noted:

- Total arisings have fallen by 2.64% over the intervening period (note that the previous estimate reported on the 2011/12 financial year whereas figures in Table 1 refer to the 2013 calendar year so the period is around 21 months)[4];
- This table distinguishes between household and LACW performance in order that progress on the former can be compared with the relevant national target. These estimates indicate performance of 45.4% for household wastes which implies the national target of 50% by 2020 should be achievable in principal and which is slightly higher than the corresponding national figure of 44.2%[5];
- Figures for national parks are estimated using the procedure used previously, however the latest figures for Craven and Richmondshire indicate waste per

[4] Table 7 in the original report includes the trade and hazardous waste components of LACW and therefore should be compared with the total figure in Table 1.

[5] Source: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/375945/Statistics_Notice_Nov_2014_Final__3_.pdf.

household in 2013 has risen to 0.48te per year resulting in an increase on the previous estimates[6];

- Management route statistics are not available for most of the national park areas and therefore the distribution of LACW arisings in North Yorkshire and City of York has been used to estimate the quantities involved as these figures are lower than those for household wastes. This approach therefore may under-estimate landfill diversion rates.

Table 1: Estimated Arisings and Management Routes for LACW and Household Wastes in the Sub-Region in 2013

		Arisings	Recycled, Composted or Re-Used	To Energy Recovery	To Landfill	Inert Waste
North Yorkshire	LACW	330,346	139,805	12,876	171,111	6,554
	Household	305,650	138,323	11,086	149,687	6,554
City of York	LACW	92,134	39,338	0	52,796	0
	Household	83,868	38,662	0	45,206	0
Principal authorities - arisings	LACW	422,480	179,143	12,876	223,907	6,554
	Household	389,518	176,985	11,086	194,893	6,554
Principal authorities - management	LACW		42.4%	3.0%	53.0%	1.6%
	Household		45.4%	2.8%	50.0%	1.7%
North Yorks Moors National Park	LACW only	11,325	4,802	345	6,002	176
Yorkshire Dales National Park (Lakeland)	LACW only	2,254	956	69	1,195	35
Yorkshire Dales National Park (N Yorks)	LACW only	7,272	3,083	222	3,854	113
Sub-regional LACW arisings (estimated)		**443,331**	**187,984**	**13,511**	**234,958**	**6,877**

Source: Defra WasteDataFlow

3.4 It is also necessary to correct the total arisings to take account of two issues:

- The previous report contained figures indicating that local authority-collected trade waste accounted for 6.2% of all LACW. As this material is counted separately as C&I waste it must be deducted from LACW arisings to prevent double-counting. It has not been possible to identify an updated figure for this review but if the previous ratio is used the figure above falls to 415,747 tonnes;
- LACW also contains a small amount of hazardous waste which will also be double-counted if it is ignored. Estimates provided later in this chapter propose a total of 533 tonnes, which would reduce overall arisings to **415,214 tonnes**.

COMMERCIAL & INDUSTRIAL WASTE

3.4 Estimating the size of the C&I stream remains very problematic due to the lack of accurate and up-to-date information. The original study report referred to three sources: a survey of the North West region (2009); a national survey undertaken for Defra based on the North West survey methodology (2009/10); and a further estimate prepared for AmeyCespa in conjunction with the proposed development of the Allerton Waste Recovery Park (AWRP) (2012). The latter estimate was believed to have been interpolated from regional results reported by the Defra survey.

3.5 The original study referred to a number of known shortcomings with the Defra survey in terms of the limited use of face-to-face surveys and amalgamation of results with data from other sources, both of which increased the risk of introducing inaccuracies into the results. As a result the original work was based on estimates extrapolated from the North West regional survey.

[6] This approach assumes no overall growth in households in the areas which is relatively realistic as their protected status implies there would be significant controls to limit this.

3.6 No other surveys have been undertaken in the intervening period, and the only alternative is to use information in the EA WDI, however this too is problematic for two reasons:

- The WDI reports a category of "HIC" (Household, Industrial and Commercial) waste, amalgamating the LACW and C&I streams. This approach reflects the similarity of their contents and the scope to co-treat them, but also makes it difficult to use other information in the WDI to distinguish which individual records refer to which stream;
- The WDI dataset continues to be hampered by the lack of consistent recording of the source of wastes. Substantial quantities have their origin only recorded at the regional level (eg. shown as 'Not Coded (Yorks and Humber)') which means that some locally arising wastes cannot be identified.

3.6 Analysis of the latest WDI output indicates estimated arisings of 837,113 tonnes of HIC waste. However, once the estimate of LACW arisings shown above is removed, the total C&I arisings would be only 421,889 tonnes. Table 2 in the original report shows the three surveys referred to above estimated total C&I waste arisings in the range 707,000 tonnes to 916,000 tonnes. While the range illustrates the problems of forecasting this stream reliably it also suggests that using the WDI outputs produces a significant underestimate of this stream.

3.7 The approach adopted here is to project forward the arisings estimated from the 2009 survey based on employment data taken from the Experian econometric model developed for the Leeds City Area Economic Partnership. Extrapolation has been based on employment rather than output (measured in terms of GVA). Experience from other capacity assessments has suggested that using output growth to drive waste growth results in much higher rates than those based on employment growth. In some cases the rate of increase – accumulated over the Plan period – leads to net growth that may appear excessive at a time when waste reduction and minimisation initiatives are expected to limit the rate of change.

3.8 It might also be argued that the desired uncoupling of the rates of economic activity and waste growth makes projection from output less appropriate than that using other econometric series, although either approach implies some form of continuing relationship between levels of business activity and waste generation.

3.9 Tables 2 and 6 in the original study estimate total C&I arisings across broad industry sectors as summarised in Table 2 below.

Table 2: Forecasts of C&I Waste Arisings in the Sub-Region in 2009

Industry sector	Arisings
Food and drink	134,686
Textiles / wood / paper / publishing	38,702
Power and utilities	29,241
Chemicals / non-metals manufacturing	36,581
Metal manufacturing	39,312
Machinery and equipment	40,278
Retail and wholesale	205,703
Other services	168,102
Public sector	81,817
TOTAL	**774,421**

[Source: North Yorkshire Sub-Region Waste Arisings and Capacity Evidence Project, Interim report, October 2013 - all figures in tonnes]

3.10 The Experian model documents employment growth over the period 2009 to 2014 and forecasts from 2015 onwards (to 2031 for the purposes of this study) which are summarised in Table 3.

Table 3: Employment Totals and Forecasts – 2009 to 2031

Industry sector	2009	2015	2031
Food and drink	11.4	10.8	11.6
Textiles / wood / paper / publishing	3.9	3.9	2.9
Power and utilities	4.1	4.1	4.2
Chemicals / non-metals manufacturing	3.1	3.4	3.1
Metal manufacturing	4.3	4.5	4.3
Machinery and equipment	9.0	10.3	8.3
Retail and wholesale	66.8	61.9	65.4
Other services	159.6	172.0	186.6
Public sector	101.0	103.4	116.9
Construction, demolition and engineering	26.5	26.1	30.5

[Source: Leeds City Area Economic Partnership Econometric Model, Experian, 2015 – all figures in thousands]

3.11 These forecasts have been used to estimate growth rates (annual and in total) which have been used to project forward the 2009 results to the present, and then to identify potential arisings growth over the Plan period which can form the basis of an alternative scenario as required by the brief for this study.

3.12 This approach is based on projecting growth for the individual sectors above, then amalgamating them to derive an aggregate rate for the whole stream. While detailed, this approach ensures that the substantial differences in sector size, together with differences in growth or decline, have a proportionate impact on the estimated future growth rate.

3.13 As a result this approach suggests the following growth rates:

- 2009-2015: +0.08% per year (+0.47% over the whole period);
- 2015-2031: +0.89% per year (+2.98% over the whole period).

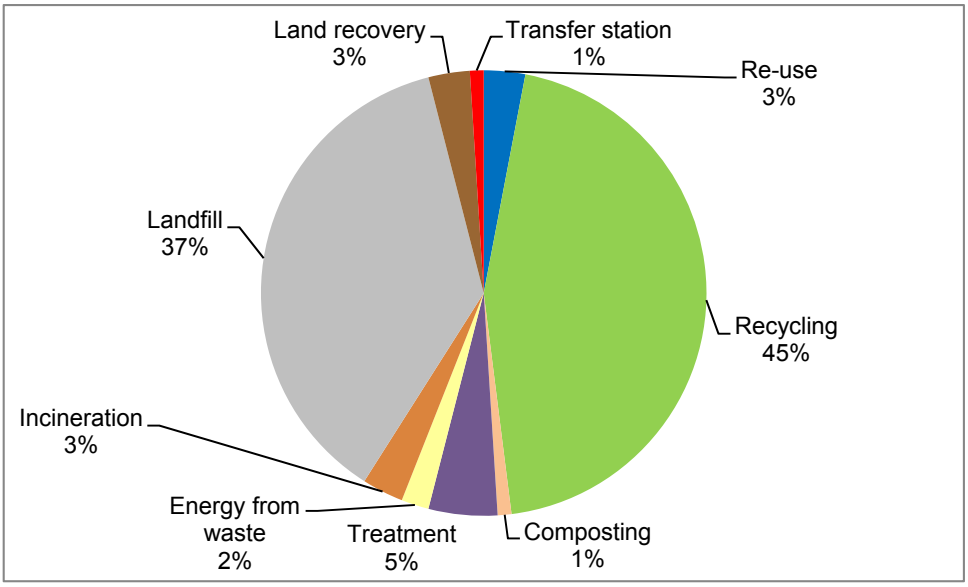
3.14 The approach is clearly more pragmatic than one based on output growth and the limited change between 2009 and the present reflects the stagnation of large parts of the economy during recession, and estimates arisings in 2015 of 778,031 tonnes. However, once the estimated hazardous components of these streams (see text below) are removed to prevent double-counting, **total arisings are estimated to be around 758,000 tonnes**[7]. When split down this equates to 588,000 tonnes for North Yorkshire County Council and 170,000 tonnes for City of York Council.

3.15 Figure 1 overleaf shows the estimated mix of management methods for the stream based on the 2009 survey results. It implies just under 50% of these materials were re-used, recycled or composted, which is a little lower than the corresponding national average of 54% estimated by the Defra survey referred to previously.

[7] Note that the arisings shown in Table 2 above include hazardous wastes but which are subtracted to give the total stated in paragraph 3.14.

However it should be noted that this survey identified almost 62,000 tonnes (8% of total arisings) with no known fate. Figure 1 includes this total in landfill (as the lowest level in the Waste Hierarchy) so that the recycling performance is not over-stated.

Figure 1: Management of C&I Wastes, 2009



[Source: North Yorkshire Sub-Region Waste Arisings and Capacity Evidence Project, Forecasting model, October 2013]

3.16 For the reasons stated above, the WDI output does not provide an alternative and reliable indication of what happened to all C&I waste reported as arising in 2013. A comparison has been made during this study but it implies that 46% of these wastes went to landfill while only 23% were recycled or composted. The accurately reported performance statistics for LACW (Table 1) suggest a much higher level of recycling which would imply a correspondingly poor rate for C&I wastes, but this is not consistent with the survey results shown in Figure 1. One possible explanation is that there is a substantial quantity of locally arising material which is only identified as arising at the regional level, and that this waste is being recycled or re-used.

3.17 As a result any revision of the capacity assessment model will have to assume that the original management mix (Figure 1) has not changed over the intervening period. This is unlikely to be a true reflection of the current position but there is little option to alter it as it cannot be measured accurately by other means.

3.18 While the WDI output cannot provide an accurate estimate of C&I waste arisings it does provide a relatively accurate picture of the pattern of waste movements of this stream (together with LACW as 'HIC').

3.19 Appendix A identifies the level of movement to 64 authorities that received HIC wastes in 2013 to inform any future work liaising with other authorities with regard to the Council and its partners' obligations under the Duty to Cooperate. The analysis identifies those authorities receiving >1000 tonnes of these wastes, reflecting the emerging consensus of the threshold for waste movements that could be considered to be 'strategic' and which therefore falls within the scope of the Duty[8].

[8] The threshold reflects discussions at a PAS seminar on Duty to Cooperate held at Leeds in September 2014 which members of the Council's waste planning team attended.

3.20 Appendix A also contains a corresponding analysis of the origin of the HIC wastes imported to the sub-region. This analysis indicates 19 authorities sent quantities that exceed the 'strategic' threshold referred to above. Appendix A also summarises the fate of materials (recycling, composting, treatment, etc.) for both exports and imports.

CONSTRUCTION, DEMOLITION & EXCAVATION WASTE

3.21 Complications also persist when attempting to estimate the quantity of locally arising CD&E wastes for three principal reasons:

- EA-reported statistics exclude material handled on exempt sites;
- Material recycled or re-used at source is not reported either;
- The management of these streams typically involves movement of quantities of wastes between transfer stations – sometimes through more than one site – with each outgoing movement being registered separately, leading to a risk of double-counting. Transfer stations close to the edge of the sub-region may also take in wastes from adjacent authorities only for this to be re-exported and reported as waste apparently arising within North Yorkshire.

3.22 The first two reasons have few implications for the capacity assessment because exempt sites typically function over short periods and handle limited quantities of wastes, while material recycled at source makes no demands of the merchant capacity that is central to the needs assessment.

3.23 Table 4 updates Table 12 in the original report, summarising the total amount of material deposited in the sub-region (recognising the issue of double-counting at transfer stations). As stated in the original report there are fewer management options for the latter and so it is prudent to report them separately.

Table 4: CD&E Waste Deposits in the Sub-Region in 2013 by Material

Material stream	C&D	E	Total
Concrete, bricks and gypsum waste	125,505		125,505
Copper waste	293		293
Ferrous metal waste and scrap	8,368		8,368
Glass packaging	4,854		4,854
Lead waste	179		179
Mixed construction wastes	75,263		75,263
Other glass wastes	63		63
Other metal wastes	308		308
Other mixed metallic wastes	7,542		7,542
Other plastic wastes	6,491		6,491
Other waste aluminium	1,010		1,010
Other wood wastes	22,134		22,134
Soils		777,689	777,689
Waste from waste treatment	18,138		18,138
Waste hydrocarbonised road-surfacing material	1,326		1,326
Waste of naturally occurring minerals		1,184	1,184
Grand Total	**271,474**	**778,873**	**1,050,347**

Source: EA WDI, 2013 – all figures in tonnes

3.24 Table 4 indicates a significant increase in the level of imported material which is primarily in the form of waste soils. Imports of dredged materials have ceased and those in 2011 may reflect short-term contracts, illustrating the importance of recognising this analysis can only characterise the position at one point in time. Compared to the 2011 figures, C&D waste deposits have increased by almost 56,000

tonnes (+26%) but E waste deposits have increased by around 225,000 tonnes (+41%).

3.25 Of these 287,500 tonnes originated locally but almost 423,000 originated somewhere in the former Yorks & Humber region but the exact origin was not recorded, reflecting a further problem with this waste stream.

3.26 Table 5 updates Table 13 in the original report, summarising the type of local facilities that handled the deposited material. I

Table 5: CD&E Waste Deposits in the Sub-Region in 2013, by Destination

Row Labels	C&D	E	Total
CA Site	12,722		12,722
Car Breaker	2,506		2,506
Composting	9,360	219	9,579
Deposit of waste to land (recovery)	225	46,126	46,351
Hazardous Waste Transfer	14,528	7,972	22,500
Hazardous Waste Transfer / Treatment	1,801	697	2,497
Inert Landfill	21,948	455,652	477,600
Inert Waste Transfer	9,821	7,618	17,439
Inert Waste Transfer / Treatment	1,583	14,744	16,327
Material Recycling Facility	38,702	18,300	57,002
Metal Recycling	16,095		16,095
Non Hazardous Landfill	36,219	92,307	128,526
Non-Hazardous Waste Transfer	70,407	15,179	85,586
Non-Hazardous Waste Transfer / Treatment	11,158	22,655	33,813
Physical Treatment	20,647	43,767	64,414
Reclamation		53,637	53,637
Timber Manufacturing (Recycling)	3,753		3,753
Grand Total	**271,474**	**778,873**	**1,050,347**

Source: EA WDI, 2013 – all figures in tonnes

3.27 Table 5 shows that much of the excavation waste was sent to landfill (primarily inert facilities) though it cannot be substantiated how much was used 'beneficially' for engineering and landform restoration and how much was deposited in void space as residual waste. Table 5 also shows significant quantities of these wastes arrived at transfer stations. Some of these facilities also provide treatment (likely to be in the form of aggregates reprocessing, but possibly also separation of mixed bulky C&D wastes comprising glass, plastics, wood, metal and other rubble) but it is not possible to establish what proportion of material was merely bulked then sent to another site, and what proportion was re-used or recycled.

3.28 Table 6 provides a simplified summary of the fate of these materials.

Table 6: CD&E Waste Deposits by Fate in the Sub-Region in 2013

	Tonnages			Performance		
Fate	C&D	E	Total	C&D	E	Total
Transfer	107,477	30,769	138,246	40%	4%	13%
Recycling	64,440	33,741	98,181	24%	4%	9%
Composting	9,360	219	9,579	3%	0%	1%
Treatment	31,805	66,422	98,227	12%	9%	9%
To land	58,392	647,723	706,115	22%	83%	67%
Total	271,474	778,873	1,050,347	100%	100%	100%

[Source: EA WDI, 2013 – all figures in tonnes]

3.29 If the uncertainty about transfer stations is ignored, diversion performance (recycling + composting + treatment) is only 39% for C&D wastes and 13% for Excavation wastes. In the latter case the deposit 'to land' (whether for reclamation or in a landfill) is likely to be the only feasible management option if there are a limited number of development sites which offer increased scope for land recovery. However if the deposits at transfer stations are ignored as being unrepresentative of the eventual fate of the materials, the diversion performance improves to 64% for C&D wastes but only slightly to 14% for Excavation wastes.

3.30 Table 7 summarises the management method, destination and quantities of C&D and E streams reported as arising in the sub-region. In both parts of the stream the sub-region appears to be achieving a high level of self-sufficiency. To some extent this is to be expected since CD&E wastes are bulky and typically of relatively low value so in many cases movement over long distances will not be economical[9].

Table 7: Management of CD&E Wastes Arising in the Sub-Region in 2013

C&D WASTES

	Total	Managed locally	Exported	Including WTS	Excluding WTS
Land recovery	1,225	225	1,000	19%	35%
Landfill (hazardous)	17	-	17		
Landfill (inert)	20,850	20,757	93		
Landfill (non-hazardous)	12,764	5,593	7,171		
Recycling (C&D)	16,277	8,011	8,266	17%	31%
Recycling (metals)	14,388	7,444	6,944		
Composting	196	96	100		
Treatment (non-hazardous)	17,987	15,650	2,337	11%	20%
Treatment (hazardous)	1,856	1,801	56		
Transfer (C&D)	65,862	52,661	13,201	53%	
Transfer (hazardous)	16,451	14,245	2,206		
Transfer (non-hazardous)	12,731	12,722	10		
All materials	180,606	139,205	41,400		
Self-sufficiency		77%			
Excluding transfered	100,977				

EXCAVATION WASTES

	Total	Managed locally	Exported	Including WTS	Excluding WTS
Land recovery	48,360	46,126	2,234	85%	92%
Landfill (hazardous)	39	-	39		
Landfill (inert)	190,266	187,804	2,463		
Landfill (non-hazardous)	23,833	17,549	6,284		
Recycling (C&D)	12,217	9,295	2,922	4%	4%
Recycling (metals)	446	-	446		
Composting	24	24	-		
Treatment (non-hazardous)	8,373	8,242	131	3%	3%
Treatment (hazardous)	697	697	-		
Transfer (C&D)	18,652	11,349	7,303	8%	
Transfer (hazardous)	7,621	7,601	20		
Transfer (non-hazardous)		-	-		
All materials	310,527	288,686	21,841		
Self-sufficiency		93%			
Excluding transfered	291,578				

[Source: EA WDI, 2013]

[9] However experience on other needs assessments identifies a surprising number of instances when soils are moved over fairly long distances to landfill sites, though this may represent situations in which the operator waives gate fees in order to attract material to complete infilling of the remote site.

3.31 Table 8 provides detail on the movement of wastes into and out of transfer stations.

Table 8: Movements of CD&E Wastes Through Transfer Stations in 2013

Nature of movement	C&D tonnes	E tonnes
Locally arising wastes managed at local WTSs	79,628	18,950
Wastes imported from identifiable authorities	13,150	-
Wastes imported from unidentified sources	27,848	11,820
Wastes removed from local WTSs	97,666	28,494

[Source: EA WDI 2013]

3.32 The quantity of C&D waste removed compared to that received either from local sources or imported differs by 5%. The corresponding comparison for E wastes is more problematic as there is a discrepancy of around 10,500 tonnes. The two figures are much closer if all the material received from unspecified (non-codeable) sources is taken into account. This does not explain the fate of the corresponding amount of 28,000 tonnes of C&D wastes however these materials are more suitable for recycling than E wastes. As a result some locally arising waste and some imported materials may be recycled into secondary aggregates, at which point they are no longer legally classified as waste and in effect disappear from the figures in the WDI. Therefore a pragmatic conclusion is that the quantity of local arisings should be estimated based on figures that exclude transfer station movements.

3.33 Total apparent arisings in 2013 were 180,606 tonnes of C&D waste and 310,527 tonnes of E waste (total: ca. 491,100 tonnes). However if transfer stations are excluded **total arisings are estimated to be 101,000 tonnes of C&D waste and 291,600 tonnes of E waste (total: ca. 392,600 tonnes)**. Analysis later in this section identifies that around 8000 tonnes of these materials were hazardous wastes and the combined CD&E stream total should be reduced by this amount, this would give a figure of 384,664 tonnes.

3.34 Finally it should be recognised that the data in the 2013 WDI indicates that almost 1.54 million tonnes of CD&E waste was recorded as arising in the former Yorks & Humber region but with the identity of the originating authority unrecorded. Some of this is material identified in the third row of Table 8 and it is almost certain that an unknown proportion of it originated in the North Yorkshire sub-region. Given this limitation, the uncertainty about the fate of material passing through transfer stations, and the lack of information about exempt sites, the estimates above should be regarded as a minimum estimate of the quantity of local arisings.

3.35 Appendix B provides additional detail on the origin of these deposits. It also summarises the destination of wastes originating in North Yorkshire that were exported and which may need to be reviewed as part of the Council's actions on meeting its Duty to Cooperate obligations. As with HIC wastes, a threshold of 1000 tonnes has been used to identify movements that might be considered 'strategic'[10].

HAZARDOUS WASTE

3.36 Total quantities of hazardous waste arisings, exported and imported have been identified using the EA's Hazardous Waste Data Interrogator (HWDI) containing waste movements in 2013. Table 9 summarises the composition and quantities of

[10] Note that some authorities use a combined threshold of 1000 tonnes for all non-hazardous wastes. If this approach is used then additional authorities may need to be contacted if the combined quantities of HIC and CD&E wastes received exceeds this threshold.

locally arising wastes which totalled 29,515 tonnes, and represents an increase of 9.2% on the previous figure.

Table 9: Hazardous Waste Arisings in the North Yorkshire Sub-Region in 2013

Materials	Tonnes
Construction, demolition & excavation wastes	7,936
Not otherwise specified	5,892
Oils and fuel wastes	4,606
Municipal and similar commercial wastes	3,032
Healthcare wastes	2,422
Waste water treatment	2,007
Paints, varnishes, sealants and inks	875
Waste packaging, cloths, etc.	769
Treatment and coating of metals	501
Organic chemical processes	471
Inorganic chemical processes	392
Waste solvents, etc.	264
Shaping and treatment of metals and plastics	260
Photographic industry wastes	81
Thermal process wastes	2
Petrol, gas and coal refining and production	2
Agricultural, horicultural and forestry waste	2
Mining and quarrying waste	1
Total	**29,515**

[Source: EA HWDI, 2013 – all figures in tonnes]

3.37 The recent figures show that the sub-region continues to be a net exporter of hazardous waste, recognising that management facilities typically serve regional or national catchments and the limited quantities of local arisings mean it is unlikely that a facility serving the sub-region would be economically viable[11]. The principal movements are as follows:

- Total arisings: 29,515 tonnes
- Arisings managed locally: 3,406 tonnes[12]
- Arisings exported: 26,109 tonnes
- Wastes imported: 8,671 tonnes
- **Total wastes managed locally: 12,077 tonnes**.

3.38 Table 10 overleaf shows how the wastes exported from North Yorkshire are managed. The mix of management methods is very similar in terms of the relative proportions apart from a slight reversal of the relative importance of transfer prior to recovery and treatment.

3.39 Table 11 (also overleaf) then summarises the methods used locally to manage local arisings and imported wastes. Again, the relative proportions are very similar and the total quantity has fallen only slightly from 12,575 tonnes two years ago.

[11] While many facilities handle much smaller quantities than the total arisings, most of the material streams require very different management methods (except for disposal by incineration or to landfill) hence a range of several facilities would be needed to serve local requirements and very small quantities of local arisings mean this is unlikely to be economically viable.

[12] Of this total, 1,988 tonnes originated in North Yorkshire and the rest in the City of York.

Table 10: Fate of Hazardous Arisings Exported from the Sub-Region in 2013

Management method	Exports	
Incineration with energy recovery	125	~%
Incineration without energy recovery	491	2%
Landfill	5,261	20%
Recovery	8,967	34%
Transfer prior to disposal	2,185	8%
Transfer prior to recovery	4,165	16%
Treatment	4,915	19%
Total	**26,109**	

[Source: EA HWDI, 2013 – all figures in tonnes]

Table 11: Hazardous Waste Management in the North Yorkshire Sub-Region in 2013

Management method	Arising locally	Imported	Total managed	
Incineration with energy recovery	1	301	301	2%
Landfill		~	~	
Recovery	1,925	4,681	6,606	55%
Transfer prior to disposal	475	254	729	6%
Transfer prior to recovery	728	2,573	3,301	27%
Treatment	278	862	1,139	9%
Totals	3,406	8,671	12,077	

[Source: EA HWDI, 2013, all figures in tonnes]

3.40 A final analysis was undertaken to estimate the contribution of these wastes to total arisings in the other principal streams. This approach was based on interpretation – using professional judgement – of the description of each material according to the European Waste Classification[13]. The main problem was distinguishing between materials that were part of the commercial and household streams and it has been necessary to use a simplifying assumption that the latter represents 5% of the former as it was not possible to make a clearer distinction from the descriptions. There were similar difficulties in distinguishing between commercial and industrial components.

3.41 The estimated quantities of locally arising hazardous wastes are therefore as follows:

- Hazardous LACW: 533 tonnes
- Hazardous Commercial waste: 10,037 tonnes
- Hazardous Industrial waste: 9,901 tonnes
- Hazardous CD&E waste: 7,936 tonnes
- Hazardous agricultural waste: 2 tonnes
- Hazardous water treatment waste: 1,107 tonnes.

3.42 These quantities should be deducted from total arisings for the corresponding streams to prevent double-counting (and has been reflected in the estimates quoted in previous chapters). A combined figure for C&I waste should be used due to the difficulties of distinguishing between them and should also included the totals for agricultural waste and waste water treatment.

[13] See: environ.ie/en/Publications/Environment/Waste/WEEE/FileDownLoad,1343,en.pdf.

3.43 Appendix C contains details of the 85 planning authorities that received hazardous waste arisings from North Yorkshire in 2013 which can inform the Council's ongoing activities with regard to the Duty to Cooperate obligation. In this case a threshold of 100 tonnes has been used to identify potentially 'strategic' movements. Appendix C also contains details of the 61 authorities that imported waste to the sub-region and applies the same threshold.

Review of Waste Management Capacity

3.44 North Yorkshire County Council undertook a review and update of licensed waste management sites and their capacities in late 2014 and therefore this aspect of the original work has not been repeated as part of this revision.

3.45 Capacity analysis in other recent Needs Assessment work has identified an issue regarding classification of certain sites. The site category identified in EA records reflects the generic type of permit issued to the site. Unless the site is specifically identified as a Materials Recycling Facility, Car Breaker, Metal Recycler or Timber Manufacturer it will be categorised by the EA as a transfer facility unless it performs a specific alternative function (eg. biological treatment, composting).

3.46 Waste transfer is an important aspect of the waste industry but it does not contribute directly to recycling, composting, re-use or recovery. Many sites classified in this way only provide transfer capacity but others also perform recycling functions that contribute to achieving statutory, non-statutory and aspirational targets in national and local waste plans. It is therefore legitimate to count the capacity at these sites as recycling capacity operating alongside – but not instead of – transfer capacity. Such sites represent an efficient use of land resource as they combine two management functions on a single plot.

3.47 This approach assumes recycling capacity is equivalent to the estimated throughput of the site. It does not necessarily over-estimate the capacity available as separating mixed materials into recyclate streams can generate revenues for the site operator that do not arise from transfer activities (ie. storing and bulking mixed waste) alone. Therefore there is a clear financial incentive for the site operator to recycle as much waste as possible and the risk of significantly over-stating recycling is limited.

3.48 The Council supplied a revised copy of the original needs assessment model updated to contain details of all sites operating or permitted within the sub-region at the end of 2014 as referred to above. The functionality of those sites identified as transfer stations has been reviewed based on checking the operators' websites to establish the functions they claim to perform. The time available for the review has limited this work to a web search only and the Council may wish to consider further work to substantiate site functions, perhaps by telephone survey.

3.49 Appendix D summarises the results of this review which covered 60 transfer stations handling different combinations of waste streams. A limited number of sites could not be identified using the approach referred to above but the quantity of management capacity they offer is limited. The survey identified 16 sites that could be reclassified one of the following categories of recycling facility:

- Recycling (MRFs) - facilities handling mixed wastes – ie. LACW and/or C&I and/or CD&E wastes;
- Recycling (C+D) – facilities handling inert wastes only;
- Recycling (metals) – facilities handling scrap metal, ELVs or WEEE.

3.50 Two other sites were identified as plastics recyclers but the assessment model does not include a category for this type of facility. However it is important to recognise that while these sites contribute recycling capacity they do not accept mixed wastes and therefore need to be distinguished from the other transfer sites that have been affected by this reclassification.

3.51 If taken forward the effect of this process would be to add around 306,000 recycling capacity (mostly handling mixed non-hazardous wastes).

4 SUMMARY OF CONSULTATION RESPONSES

4.1 The Council received 14 responses from various sources including the Environment Agency, representative groups (CPRE, Friends of the Earth), neighbouring county councils, district and parish councils within the sub-region, one company active in the waste and energy sector (Peel Environmental) and a small number of individuals. With the exception of Peel no comments were received from other organisations active in the sub-regional waste sector.

4.2 Appendix E reproduces the comments received and their implications for this review and update. A number of respondents supported the approach taken however there were a substantial number of comments proposing changes to the scenarios and other aspects of the work that can be summarised as shown below.

COMMENT RECEIVED	RESPONSE
Additional scenarios should consider the impact of non-delivery of the ARWP facility	No longer necessary now permission for the facility has been granted and work on the site has begun
Recycling performance should be more ambitious (by implication across all streams)	LACW performance must reflect contracted rates with AmeyCespa although it would be prudent to assess the impact of an increase in the 2020 household recycling/composting target. The maximised recycling target for C&I waste is considered to be close to the maximum that can be achieved (based on the materials in this stream). Anecdotal evidence suggests that the level of CD&E recycling already exceeds the assumption for maximised recycling and this could be addressed in a further scenario
Scenarios should be based on lower rates of arisings growth	LACW growth must, by necessity, reflect the expectations and commercial commitments of the WDA. Growth for other streams can be reduced but there is no way of knowing for certain that this will occur and the need for waste facilities must reflect a 'worse case' outcome. While significant over-provision would be unacceptable, monitoring of the adopted waste plan can establish whether a capacity surplus has developed and site allocations can be removed as necessary through review of the Plan. However under-provision is much more difficult to correct
Appropriate assumptions should be used and stated for managing all parts of the C&I waste stream, not just the mixed ordinary components	The approach used will be checked however it is accepted that way the definition of Change of Practice modifiers Table 3 could be clearer. The results of the North West survey used to generate the forecasts identify the proportion of C&I waste still going to landfill that is unsuitable for recycling or recovery. This material is almost wholly mixed waste that is contaminated (eg. paper/card impregnated with fat or oil from food waste) and which is not technically or economically feasible to separate and recycle. The survey results indicate this represents 10% of the combined stream and relative rates of recycling and energy recovery apply to all other material (eg. non-metallic waste such as glass and plastics, oils, solvents, etc.) can be managed at a higher level in the Waste Hierarchy.

5 SCOPE FOR FURTHER SCENARIO ANALYSIS

5.1 The final task of the brief for the addendum involves a review of whether it would be appropriate to develop further scenarios assessing future waste requirements. This matter takes account of:

- Latest estimates of stream arisings and management performance and whether they show changes that have implications for the projection of forecasts;
- Significant policy developments affecting growth and performance targets;
- Addressing comments made by consultees as appropriate.

5.2 Table 12 compares the forecast arisings for 2013/14 for the three principal streams with the figures identified in the relevant chapters of this report. The comparison is made with the forecasts for two scenarios - Growth + Maximum Recycling and Minimised Growth + Median Recycling - as they define the extremes of the arisings forecasts if the 'no change' scenarios are ignored.

Table 12: Comparison of Assessment Arisings Forecasts at 2013/14

	Growth / Maximised Recycling 2013/14 forecast	Minimised Growth / Median Recycling 2013/14 forecast	Addendum report 2013/14 estimate
LACW	413	413	415
C&I	803	763	758
CD&E	431	422	392

[Source: Arisings and Capacity Evidence Study model – all figures in thousand tonnes]

5.3 These comparisons suggest that the assumptions for LACW growth are accurate and that the Council's request that they should be unchanged will not overlook changes in arisings.

5.4 The moderate difference in C&I arisings between the model output and the estimate from this review implies that the rate assumed under the 'Growth' scenario has not materialised whereas the lower rate under the 'Minimised Growth' scenario uses a growth rate similar to that applied in this review and therefore it is unsurprising that the two should be so similar. The modest differences between the CD&E estimates may have the same cause. However the problems of estimating arisings from the WDI output referred to previously should be recognised. The accuracy of recording may vary from one year to the next and this may contribute to the difference between the estimates. Nevertheless, in both cases it is not certain that what has happened over the last two years will continue over the Plan period and some modified growth assumptions are proposed later in this chapter as a series of sensitivity tests.

5.5 Table 13 overleaf provides the corresponding comparison of the mix of management routes evident in the results from the two scenarios as forecast by the original model. The principal differences arise in the two waste streams that are most difficult to calibrate accurately – C&I and CD&E wastes. In both cases the principal difference is between the quantities of waste forecast or estimated to be going to land disposal (comprising landfill and land recovery operations).

5.6 In the circumstances it is difficult to draw any conclusions about whether the streams are growing faster or slower, and whether landfill diversion is improving better or worse, than the rates applied through growth and behaviour assumptions. However information suggests that certain parameters might be revised in new scenarios.

Table 13: Comparison of Management Route Forecasts at 2013/14

	Growth / Maximised Recycling 2013/14 forecast	Minimised Growth / Median Recycling 2013/14 forecast	Addendum report 2013/14 estimate
LACW	Recycling: 45% Recovery: -[14] Land disposal: 55%	Recycling: 45% Recovery: - Land disposal: 55%	Recycling: 41% Recovery: 9% Land disposal: 50%
C&I	Recycling: 58% Recovery: 12% Land disposal: 30%	Recycling: 55% Recovery: 15% Land disposal: 30%	Recycling: 50% Recovery: 10% Land disposal: 40%
CD&E	Recycling: 16% Recovery: 3% Land disposal: 47% Transfer: 33% [15]	Recycling: 11% Recovery: 2% Land disposal: 53% Transfer: 34%	Recycling: 7% Recovery: 5% Land disposal: 68% Transfer: 20%

[Source: Arisings and Capacity Evidence model, 2013]

5.7 The overall conclusion of this part of the work is that there is no clear reason to develop one or more completely new scenarios, but that it would be prudent to modify the existing ones to reflect some of the issues discussed previously. Leaving aside the no change scenarios, the intention is to model an 'envelope' of future outcomes and the proposals which follow aim to widen the range of what was covered in the original work while attempting to be both pragmatic and realistic about how arisings and management will change over the next 15-16 years[16].

5.8 The rest of this section explains the rationale and proposes certain modifications.

Growth Scenarios

5.9 Table 14 summarises the growth assumptions for the two growth scenarios.

Table 14: Comparison of Growth Modifier Assumption Sets[17]

Waste stream	Growth	Minimised Growth
LACW	Varies between +0.8% and +2.9%	As for Growth scenario
Commercial	+0.6%	No change
Industrial	+1.3%	-1%
CD&E	+0.6%	No change

[Source: Arisings and Capacity Evidence model, 2013 – all figures are annual growth rates]

[14] The original version of the model assumed the Allerton EfW facility would be in service by 2014 and the sites list will need to be updated to reflect delays following the legal challenge. These figures are from the 2013 forecast which excluded an energy recovery forecast due to the lack of local capacity at that time so that they can be compared directly.

[15] Outputs from the model suggest that virtually all of the material passing through transfer stations is either recycled at that point or sent to another facility where it is recycled and virtually none of this material goes to landfill.

[16] Once the envelope is identified in terms of the most realistic optimistic and pessimistic forecasts (in terms of diversion rates), the subsequent waste management strategy in the Plan could seek to meet landfill needs implied by the pessimistic forecast and also the built capacity needs of the optimistic one as a way of addressing uncertainties about which one will materialise eventually.

[17] These growth rates are not specified in the original report (which refers to a proportion of GVA growth instead) and are taken from the capacity assessment model outputs.

LACW

5.10 The Council has advised that attention should focus on streams other than LACW as growth assumptions should reflect the strategy that the Waste Collection/Disposal Authority is pursuing. The assumptions may need to be revised if a revision of the Municipal Waste Management Plan is published.

C&I Waste

5.11 Chapter 3 projects C&I waste forward using employment growth forecasts rather than a proportion of the growth in GVA. However the aggregate figure over the period 2015 to 2031 is a rate of +0.89% which is roughly comparable to the median value of the 'Growth' rates for the two streams, taking account of their respective sizes.

5.12 The original report clarifies that the Council and its partners decided the Minimised Growth scenario should assume no increase in commercial (and other) wastes to reflect the impact of waste minimisation initiatives. It is assumed the corresponding reduction in industrial wastes reflects continuing effects of rebalancing the sub-regional economy from manufacturing, etc. to the service sector.

5.13 However the clear intention of EU and UK policy initiatives, and the Courtauld Commitment, is to effect a net reduction in waste growth not to just arrest it. Modelling these effects is complicated because many of the impacts will be evident in the reduction of LACW arisings as well as greater scope to recycle more material. However it is not unreasonable to expect similar effects in business-to-business trade which would be reflected in the commercial stream.

5.14 One uncertainty is how long such changes will be apparent. While the Courtauld Commitment has broadened three times since it was introduced in 2005 but it is probably unrealistic to assume innovations in packaging technology and reduction will continue throughout the Plan period. Equally, it is not possible to say no further change will occur.

5.15 Although Table 12 indicates that the Minimised Growth rate reflects what is happening to this stream currently the points above suggest it would be prudent to modify growth assumptions as a sensitivity test on arisings growth as follows:

Growth: re-set both commercial and industrial growth to 0% throughout the Plan period. In effect this implies that any growth in waste creation from increasing business activity would be offset by the effects of reducing packaging wastes and other waste reduction initiatives.
Minimised Growth: set commercial waste growth to the same rate as industrial waste (-1%) also but in this case reflecting the impact of waste reduction initiatives. Apply this rate to 2021 on the assumption that most of the possible improvements will have occurred by then and there is limited scope for further change.

CD&E Waste

5.16 The bottom row in Table 3 identifies the Experian forecasts for growth in employment in the construction and engineering sectors of the sub-regional economy, corresponding to a shrinkage of -0.25% per year over the period 2009-2015 and growth of +0.98% per year over the period 2015-2031.

5.17 Reduction in waste creation rates is most likely to occur if the economy goes back into recession. Current levels reflect the operation of a sector which – according to

Defra – already outperforms most of the rest of Europe – in terms of recycling materials and therefore future growth is most likely to reflect the levels of new development and regeneration projects each year. In turn these are likely to be reflected in employment levels.

5.18 As a result one possible modification is proposed:

Growth: re-set growth to +1% per year over the period 2015-2021 and then to +0.5% per year over the rest of the Plan period. This assumption implies that the above growth figure (+0.98%) is an average of a higher rate in the immediate future as the sub-regional economy recovers from recession and the regeneration of public and private sector investment, but that growth will not be sustained at the same rate over the next decade.
Minimised Growth: no clear rationale for adjusting the assumptions which assume a modest but steady reduction in Industrial waste arisings; LACW growth at the same rate as for the Growth scenario, and no change in the other streams.

5.19 Given the substantial proportion of this stream that is disposed to landfill or land recovery operations, this scenario modification represents a 'worst case' outcome in terms of landfill capacity[18].

Practice Scenarios

5.20 Table 15 summarises the assumptions for the two scenarios that propose changes to the mix of management routes. In all cases the assumed performance is achieved by 2020.

Table 15: Definition of Change of Practice Assumption Sets

Waste stream	Maximised	Median
LACW	Both scenarios apply recycling and recovery targets that reflect the long-term contract for managing this stream	
Commercial	75% recycled or composted 25% to energy recovery	50% recycled or composted 50% to energy recovery
Industrial	75% recycled or composted 25% to energy recovery	50% recycled or composted 50% to energy recovery by
CD&E	75% recycled	50% recycled

[Source: Arisings and Capacity Evidence model, 2013]

[18] This comment does not necessarily contradict the reference to Defra above it. Disposal to landfill predominantly involves excavation wastes for which there are limited recycling options. Defra's performance comparison is also believed to refer primarily to C&D wastes though the (usual) greater quantity of Excavation wastes masks the better recycling performance of the former. It probably also reflects the high levels achieved at exempt sites and as a result of recycling at source which the capacity assessment cannot measure as these quantities are not reported via the Data Interrogators.

LACW

5.21 Again, the Council has advised that attention should focus on streams other than LACW as the assumed management strategy is set by the terms of the long-term contract with AmeyCespa.

5.22 However, it remains unclear whether the EU proposals to recycle, compost or re-use 70% of household waste are realistic. As this report was being completed, the Local Government Association expressed concerns about whether authorities in England could boost performance from an average of around 45% currently to 50% by 2020 and therefore it remains unclear whether they could deliver a further four-fold improvement on this gain over the following 10 years. The scope to achieve this will depend heavily on significant further improvements in packaging in terms of the quantities per item, the materials used, the proportion that is recyclable, and continuing householder commitment to recycling initiatives.

Maximised Recycling: achievement of the 70% target for recycling/composting household waste proposed by the EU.
Median Recycling: no change proposed.

C&I Waste

5.23 Model outputs indicate between 55% and 58% of the combined stream is being recycled already, suggesting that the Median Recycling assumption is untenable as it would result in poorer performance. Similarly, both scenarios achieve the target rates for recycling and energy recovery by 2030, not sooner.

5.24 In practice both streams contain substantial proportions of mixed and non-metallic wastes that are suitable for recycling. Any further improvement in recycling performance is more likely to occur sooner rather than later and new facilities to achieve this are likely to be easier to deliver financially compared to energy recovery facilities.

5.25 The existing modelling assumed that at least 10% of these materials would continue to go to landfill. As a result the following modifications are proposed with the percentages applying to the proportions of the waste capable of being diverted from landfill.

Maximised Recycling: achievement of 75% recycling by 2020, rising to 85% by 2030 with the remaining material going to energy recovery[19].
Median Recycling: recycling remains unchanged (65%); the energy recovery share improves to 35% by 2030[20].

[19] The implications of the comments in paragraph 5.25 are that by 2030 10% of material will still be going to landfill with 85% of the remaining 90% (ie. 76.5%) being recycled and 15% of the remaining 90% (ie. 13.5%) going to energy recovery.

[20] This proposal reduces the difference between the scenarios compared to the original study, but this is unavoidable given the high existing level of recycling and since a reduction in diversion rates should not be modelled. The focus on continuing reduction in packaging waste and waste reduction suggests a higher residual level of landfilling should not be modelled.

CD&E Waste

5.27 Model outputs show a baseline recycling rate for this stream of 39% although this figure actually masks a significant difference between the handling of the C&D and E streams with the high level of land disposal of the latter skewing the total figure.

5.28 The model currently applies a steady increase in recycling performance over the Plan period whereas the current high level referred to by Defra implies any further improvement will be front-loaded - ie. it will occur sooner rather than later as the construction industry seeks to maximise the value of the waste materials it generates. However, given the size of the Excavation waste stream is does not appear prudent to assume the higher rate assumed under the Maximised Recycling scenario could be improved.

5.29 For these reasons the use of a 50% assumption for the Median Recycling scenario appears unduly pessimistic and implies limited further improvement would be delivered.

5.30 As a result the following modifications are proposed:

Maximised Recycling: no change.
Median Recycling: achievement of 60% by 2020 with no further improvement beyond that point.

5.31 The proposals could be implemented as variants on the existing scenarios in the model. The number of potential changes gives rise to a very large number of potential scenario combinations and it is not the intention to over-complicate the analysis. All of the proposed changes that are taken forward will need to be made to the model. However in subsequent analysis it would be prudent to focus on the combination of the Growth / Maximised and Minimised Growth / Median Recycling scenarios as these are most likely to define the maximum requirements for landfill and built capacity – ie. the extremes of the envelope of possible outcomes as referred to earlier in the text and footnotes.

APPENDIX A: MOVEMENT OF HOUSEHOLD, INDUSTRIAL & COMMERCIAL WASTES

Movement of Locally Arising HIC Wastes

Receiving authority	Waste received (tonnes)	Receiving authority	Waste received (tonnes)
North Yorkshire WPA	**565,422**	Leicestershire WPA	67
York, City of WPA	**25,253**	St Helens WPA	59
Leeds WPA	**60,362**	Cumbria WPA	52
East Riding of Yorkshire WPA	**60,183**	Wigan WPA	41
Redcar and Cleveland WPA	**24,194**	Staffordshire WPA	40
Stockton-on-Tees WPA	**23,653**	Lincolnshire WPA	29
Hartlepool WPA	**21,807**	Northamptonshire WPA	22
North East Lincolnshire WPA	**10,363**	Knowsley WPA	21
Rotherham WPA	**7,811**	Bolton WPA	21
Doncaster WPA	**4,290**	Dudley WPA	20
North Tyneside WPA	**3,375**	Walsall WPA	11
Sunderland WPA	**3,258**	Birmingham City WPA	10
Kingston Upon Hull City WPA	**3,190**	Cheshire West and Chester WPA	10
County Durham WPA	**3,185**	Warrington WPA	10
Barnsley WPA	**3,136**	Bristol City WPA	8
Sheffield WPA	**3,085**	Nottinghamshire WPA	8
Nottingham City WPA	**2,272**	Liverpool WPA	6
Warwickshire WPA	**2,047**	Dorset WPA	6
Worcestershire WPA	**1,918**	Milton Keynes WPA	4
Stoke-on-Trent City WPA	**1,308**	Buckinghamshire WPA	3
Wakefield WPA	**1,212**	Peterborough WPA	3
Darlington WPA	939	South Tyneside WPA	2
Derbyshire WPA	893	Halton WPA	2
Kirklees WPA	729	Wokingham WPA	2
Sandwell WPA	561	Cambridgeshire WPA	2
Lancashire WPA	474	Hampshire WPA	1
Wolverhampton WPA	462	Leicester City WPA	0
Bradford City WPA	363	Southampton City WPA	0
Manchester WPA	269	Essex WPA	0
Gateshead WPA	256	Reading WPA	0
Trafford WPA	208	Rochdale WPA	0
City of Derby WPA	89	Telford and Wrekin WPA	0
Devon WPA	82	Hertfordshire WPA	0
		Total	837,113

Note [1]: mid-grey cells identify those authorities that received more than 1000 tonnes of waste in 2013. This figure is considered to be the threshold above which movements can be regarded as 'strategic'. The main report provides further explanation of this matter.

Note [2]: this analysis only includes wastes known to have originated in the North Yorkshire sub-region. A further 3.06 million tonnes of these wastes are shown as arising somewhere in the former Yorkshire & Humberside region illustrating the problem of accurately identifying arisings and management performance.

Sources of Imported HIC Wastes Managed Locally

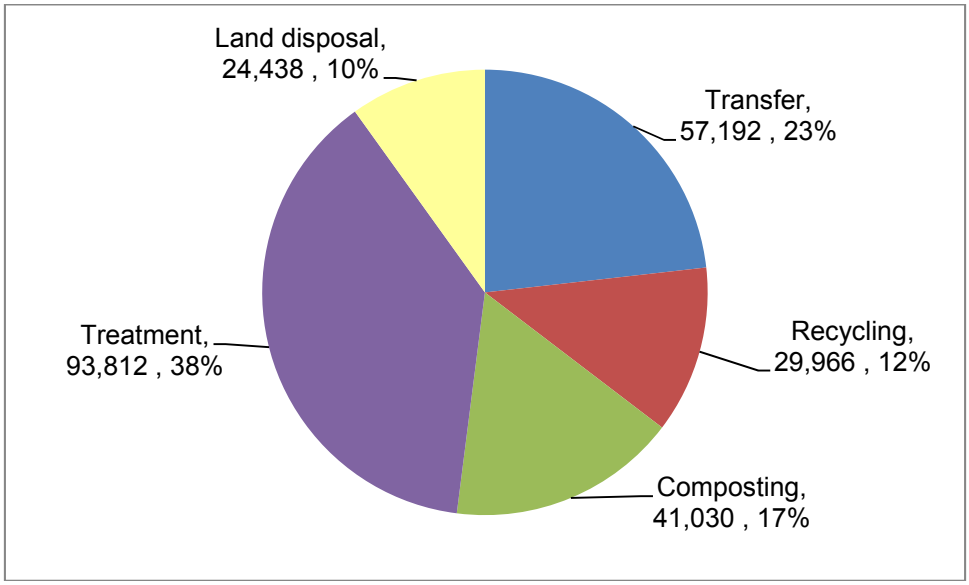
Originating authority	Waste received (tonnes)
WPA not codeable (Yorks & Humber)	1,312,816
Leeds	44,861
Wigan	11,202
Lincolnshire	8,890
East Riding of Yorkshire UA	4,758
Rotherham	3,907
Bradford City	3,828
Derby UA	3,258
Bristol UA	2,862
Derbyshire	2,847
Redcar & Cleveland UA	2,653
West Sussex	2,514
WPA not codeable (South East)	2,248
Manchester	2,056
Wakefield	1,445
Liverpool	1,363
Sheffield	1,292
Cardiff UA	1,277
Essex	1,274
WPA not codeable (North East)	1,152
Doncaster	1,141
Lancashire	1,136
WPA Not Codeable (Not Codeable)	1,134
WPA not codeable (South Yorkshire)	982
WPA not codeable (South London)	805
Barnsley	794
Blackburn with Darwen UA	705
Cumbria	650
Leicester UA	639
Scottish WPA	633
Calderdale	542
Bolton	488
Nottinghamshire	466
Northern Ireland	464
Kingston Upon Hull UA	443
Hackney	370
Croydon	346
Darlington UA	345
Wrexham UA	282
Staffordshire	255
Leicestershire	248
Wirral	233
Northamptonshire	215

Originating authority	Waste received (tonnes)
Cambridgeshire	213
Hampshire	181
Devon	142
Hartlepool UA	122
Cheshire West and Chester	117
Birmingham City	112
Kirklees	110
Caerphilly UA	91
WPA not codeable (London)	90
City of London	90
Wandsworth	86
Northumberland	62
WPA not codeable (West Midlands)	58
Gloucestershire	57
North Somerset UA	52
Stockton-on-Tees	49
Oxfordshire	48
County Durham UA	47
Gateshead	45
Norfolk	34
Coventry	31
North Tyneside	29
Thurrock UA	26
WPA not codeable (Cheshire)	25
North Lincolnshire UA	21
Kent	20
Walsall	19
Shropshire	17
Sunderland	9
Nottingham UA	9
Cheshire East	8
North-East Lincolnshire UA	6
Stockport	5
Greenwich	4
Swindon UA	4
Newcastle Upon Tyne	4
Buckinghamshire	3
Bury	3
Middlesbrough UA	2
WPA Not Codeable (East Midlands)	1
Milton Keynes UA	1
Rochdale	0
Plymouth UA	0

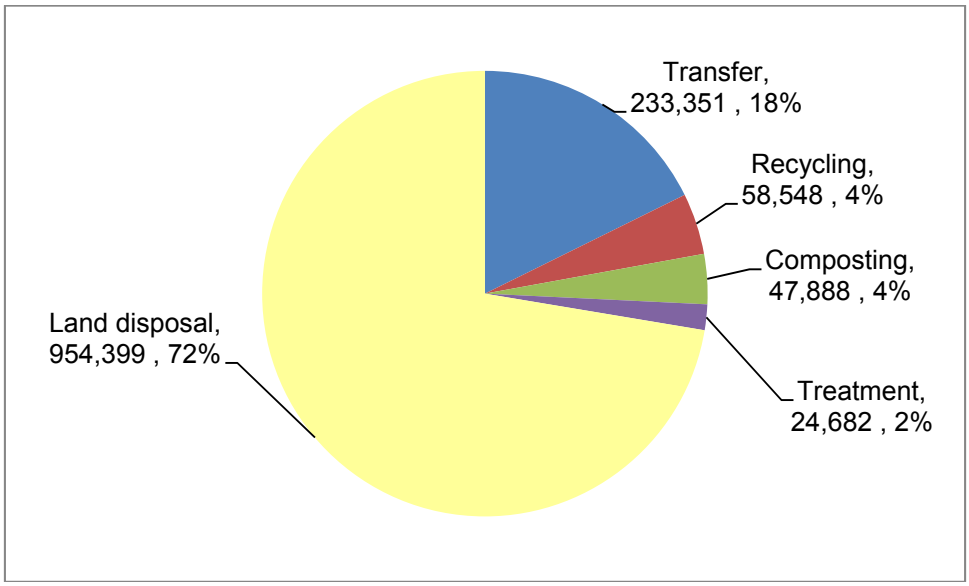
Note [3]: this analysis illustrates the problem of calibrating the size of these streams using the WDI because of the large amount of waste with no clearly specified origin. A separate analysis of the nature of these materials suggest that in 2013 they included almost 720,000 tonnes of “thermal process wastes” (possibly some form of slag classified as the product of an industrial process) and over 530,000 tonnes of mixed municipal/commercial wastes or similar.

The pie charts overleaf summarise how the exported materials were managed (illustrating local capacity shortages in some cases) and what local capacity was used to manage the imported wastes.

Management of Exported Locally Arising Materials



Local Management of Imported Materials



APPENDIX B: MOVEMENT OF CONSTRUCTION, DEMOLITION & EXCAVATION WASTES

Destination of CD&E wastes Exported from the Sub-Region

Receiving Authority	C&D	E	Total
Leeds WPA	**10,475**	**8,747**	**19,222**
East Riding of Yorkshire WPA	**1,527**	**5,575**	**7,102**
Wakefield WPA	**6,828**	**62**	**6,890**
Gateshead WPA	**5,584**	**218**	**5,802**
Lancashire WPA	**1,771**	**2,850**	**4,621**
Rotherham WPA	**2,987**	**820**	**3,806**
County Durham WPA	**1,072**	**2,377**	**3,449**
Newcastle Upon Tyne WPA	**2,389**		**2,389**
Doncaster WPA	**2,119**	**2**	**2,121**
Stockton-on-Tees WPA	**1,588**	**63**	**1,652**
Redcar and Cleveland WPA	**740**	**449**	**1,189**
Liverpool WPA	761		761
Essex WPA	704		704
Kirklees WPA	328	305	633
Hartlepool WPA	611		611
Darlington WPA	530		530
Calderdale WPA	496		496
Bradford City WPA	320		320
Northumberland WPA		194	194
Kingston Upon Hull City WPA	189		189
Nottinghamshire WPA	124	19	143
Barnsley WPA	83	13	95
Manchester WPA		90	90
Barking and Dagenham WPA	64		64
Derbyshire WPA	38		38
Buckinghamshire WPA		34	34
St Helens WPA	32		32
Trafford WPA	17		17
Sheffield WPA	5	6	11
Cumbria WPA	1	8	8
North Lincolnshire WPA	0	8	8
Worcestershire WPA	8		8
Bristol City WPA	4		4
Hampshire WPA		2	2
North Tyneside WPA	2		2
Knowsley WPA	1		1
Norfolk WPA	1		1
South Tyneside WPA	1		1
Sunderland WPA	1		1
Warrington WPA		1	1
Blackburn with Darwen WPA	0		0
Hertfordshire WPA	0		0
Sandwell WPA	0		0

Source: EA WDI, 2013 – all figures in tonnes – zero values indicate movements of less than 0.5 tonnes; grey cells identify authorities received tonnages that exceed the strategic threshold referred to in the main report.

Origin of CD&E Wastes Deposited in the Sub-Region

Originating authority	Tonnes received
North Yorkshire	339,726
York UA	88,166
WPA not codeable (Yorks & Humber)	439,587
WPA not codeable (North East)	96,620
Leeds	**20,266**
Wakefield	**14,700**
East Riding of Yorkshire UA	**14,452**
Darlington UA	**13,078**
WPA Not Codeable (Not Codeable)	11,877
Bradford City	**4,658**
Kirklees	**2,216**
Cambridgeshire	**1,886**
Hampshire	751
Gloucestershire	747
WPA not codeable (South Yorkshire)	628
Derbyshire	391
County Durham UA	362
Hackney	163
Suffolk	34
WPA Not Codeable (East Midlands)	23
Lincolnshire	15
Newcastle Upon Tyne	2
Northumberland	0
Redcar & Cleveland UA	0

Source: EA WDI 2013, all figures in tonnes – zero values identify movements of less than 0.5 tonnes; grey cells identify authorities received tonnages that exceed the strategic threshold referred to in the main report

APPENDIX C: MOVEMENT OF HAZARDOUS WASTES

Table 1 – Wastes Arising in the Sub-Region and Exported

Receiving authority	Tonnes	Receiving authority	Tonnes	Receiving authority	Tonnes	Receiving authority	Tonnes
Stockton-on-Tees	**3,385**	**Wolverhampton**	**241**	Barnsley	35	Peterborough	3
Wakefield	**2,784**	**Doncaster**	**189**	Hertfordshire	34	Cumbria	2
Kirklees	**2,602**	**Kingston Upon Hull City**	**188**	Trafford	34	Kent	2
Leeds	**1,991**	**Newcastle Upon Tyne**	**153**	Birmingham City	32	Surrey	2
Cheshire West & Chester	**1,843**	**Stoke-on-Trent City**	**132**	Northamptonshire	30	Shropshire	2
Derbyshire	**1,497**	**Sandwell**	**111**	Staffordshire	26	Blackburn with Darwen	2
Redcar and Cleveland	**1,329**	**Liverpool**	**104**		25	Devon	2
Hartlepool	**1,038**	North Lincolnshire	97	East Riding of Yorkshire	23	Essex	2
Rotherham	**969**	Bury	90	Bolton Cambridgeshire	20	Herefordshire	1
Sheffield	**922**	Warwickshire	75	Lincolnshire	19	Leicester City	1
North East Lincolnshire	**857**	Northumberland	75	East Sussex	18	Hammersmith and Fulham	1
Nottinghamshire	**808**		71	Wigan	15	Hampshire	1
Salford	**656**	Nottingham City	68	Worcestershire	12	Calderdale	0
Lancashire	**546**	Warrington Dudley	60	Manchester	11	Oxfordshire	0
Walsall	**494**	Cheshire East	57	Bristol City	8	Halton	0
County Durham	**414**		52	Norfolk	7	Dorset	0
Knowsley	**373**	Bradford City	49	Tameside	7	Medway	0
Gateshead	**345**	Stockport	47	Leicestershire	6	South Tyneside	0
Suffolk	**316**		43	Milton Keynes	5	North Tyneside	0
Sunderland	**310**	Middlesbrough Darlington	39	West Sussex	5	Gloucestershire	0
Sefton	**254**	St Helens Rochdale	36	Poole	4	Havering	0
						South Gloucestershire	0

Source: EA HWDI, 2013. Zero values identify movements of <0.5 tonnes; grey cells identify authorities received tonnages that exceed the strategic threshold referred to in the main report.

Origin of Wastes Imported to the Sub-Region

Originating authority	Tonnes	Originating authority	Tonnes	Originating authority	Tonnes	Originating authority	Tonnes
West Yorkshire	**4,659**	Glasgow and Clyde Valley	64	Bath, Bristol and S Gloucs	21	Northamptonshire	14
Former Humberside	**758**	Norfolk	52	Wiltshire	20	Somerset	14
Tyne & Wear	**367**	Buckinghamshire	51	Surrey	19	Gloucestershire	13
Tees Valley Unitary Authorities	**335**	Western Riverside Waste Authority	46	Central London	18	South West Wales	13
Greater Manchester	**270**	Essex	45	West London Waste Authority	17	Suffolk	12
County Durham	**181**	South London	45	Berkshire	17	East Sussex	10
Lancashire	**163**	South East Wales	36	Hampshire	17	Worcestershire	9
Merseyside	**161**	Ayrshire Dumfries and Galloway	32	North East	17	West Sussex	8
Kent	**131**	Lincolnshire	32	Hertfordshire	17	Dorset	8
Leicestershire	**122**	Staffordshire	30	South East London	17	Warwickshire	8
South Yorkshire	**115**	North Wales	26	Bedfordshire	16	Cornwall	8
Nottinghamshire	**109**	North London Waste Authority	26	Shropshire	15	Herefordshire	5
Derbyshire	**109**	Lothian and Borders	24	Cumbria	15	East London Waste Authority	5
Northumberland	90	Devon	21	Oxfordshire	14	Tayside	4
Cheshire	86	Cambridgeshire	21	(Unknown)	14	Forth Valley	0
West Midlands Met Districts	61						

Source: EA HWDI, 2013. Zero values identify movements of <0.5 tonnes.

APPENDIX D: REVIEW OF TRANSFER STATIONS

Site identity	Classification	Estimated capacity (tpa)	Wastes handled	NYCC comments	UV review comments	Change?
Unit 2, Moxon Court, Thurston Road, Northallerton Business Park, DL6 2NG	Transfer stations (C and D plus asbestos)	400	CI and CDE	Clarke's Environmental Ltd	Asbestos removal firm so transfer activities only	
Tancred Transfer Station, Brompton Road, Scorton DL10 6AB	Transfer stations (construction & demolition)	45000	CI and CDE	Yorwaste Ltd. Site Capacity amended as a result of response to Dec 2014 Waste Operator Letter. 75,000 tonnes permitted capacity	Appears to be transfer station only	
Seamer Carr IWMF - Recycling Facility, Dunslow Road, Eastfield, Scarborough YO2 4QA	Transfer stations (construction & demolition)	25000	CI and CDE	Yorwaste Ltd. Site Capacity amended as a result of response to Dec 2014 Waste Operator Letter.	Recycle dry mixed and wood wastes	Yes
Inert Recycling Facility, Outgang Lane, York, YO19 5UP	Transfer stations (construction & demolition)	6450	CDE only	Martins of York Ltd. Site Added as a result of Dec 2014 Waste Operator research.	Claim to recycle 90% of incoming waste and sell secondary aggregate	Yes
CW Skips Ltd, Station Road, Cattal, York YO26 8EB	Transfer stations (construction & demolition)	5000	CDE only		Appears to be skip hire only	
Wharton Skips, Former Council Refuse Depot, California Road, Whitby	Transfer stations (construction & demolition)	3118	CI and CDE		Appears to be skip hire only	
The Highways Depot, Snaygill Industrial Estate, Keighley Road, Skipton, North Yorkshire, BD23 2QR	Transfer stations (construction & demolition)	1250	CDE only		Council depot so likely to be transfer only	
Selby Highways Depot, Canal Road, Selby YO8 8AG	Transfer stations (construction & demolition)	692	CDE only		Council depot so likely to be transfer only	
Leyburn Highways Business Unit, Leyburn, North Yorkshire, DL8 5LA	Transfer stations (construction & demolition)	243	CDE only		Council depot so likely to be transfer only	
Thirsk Highways Depot, Thirsk Industrial Park, York Road, Thirsk, North Yorkshire, YO7 3BX	Transfer stations (construction & demolition)	242	CI and CDE		Council depot so likely to be transfer only	
Boroughbridge Depot, Stump Cross, Boroughbridge YO51 9HU	Transfer stations (construction & demolition)	199	CDE only	Balfour Beatty	Council depot so likely to be transfer only	
Highways Divisional Depot, Old Railway Station, Garth End Road, West Ayton YO13 9JH	Transfer stations (construction & demolition)	33	CDE only		Council depot so likely to be transfer only	
Highways Divisional Depot, Cholmley Way, Whitby YO22 4NQ	Transfer stations (construction & demolition)	9	CDE only		Council depot so likely to be transfer only	
Highways Depot Pateley Bridge, Millfield Street, Pateley Bridge HG3 5AX	Transfer stations (construction & demolition)	4	CDE only		Council depot so likely to be transfer only	
Todds Waste Management, Todd's Green, Thirsk Industrial Estate, Thirsk YO7 1AB	Transfer stations (hazardous)	36080	CI and CDE	Subsequently assessed as handling non-hazardous waste only	Claim to recycle large quantity of incoming waste	Yes

Site identity	Classification	Estimated capacity (tpa)	Wastes handled	NYCC comments	UV review comments	Change?
Hazel Court Household Waste Recycling Centre, The Ecodepot, James Street, York YO10 3DS	Transfer stations (hazardous)	14633	CI and CDE		Accepts asbestos so likely to be transfer facility only	
Treacle Jug Farm, Ferrensby, Knaresborough HG5 0QJ	Transfer stations (hazardous)	12000	CI and CDE		Not identified	
Unit 8, Marsdon Business Park, Rudgate,Tockwith YO26 7QF	Transfer stations (hazardous)	1359	CI only	Leading Solvent Supplies Ltd	Refer to site as transfer station only	
Genta Environmental Ltd, Unit 17D, Marston Business Park, Tockwith YO26 7QF	Transfer stations (hazardous)	1121	CI only		Refer to site as transfer station only	
Dean Road Depot, Dean Road, Scarborough YO12 7QS	Transfer stations (hazardous)	700	CDE only	Scarborough Borough Council	Council depot so likely to be transfer only	
Land to rear of Motoscope, Standard Way, Standard Way Business Park, Northallerton, DL6 2XE	Transfer stations (non-hazardous)	75000	CI and CDE	Updated 3.2.2014 first year date from 2010 to 2013	Not identified	
David Mercer, Mercer & Challis, Sutton Road, Wigginton, York YO32 2RB	Transfer stations (non-hazardous)	74999	CI and CDE	Updated 3.2.2014 region from North Yorkshire to York	Operates as nursery so assume transfer activities only	
Sandhutton Air Field, Sandhutton, Thirsk	Transfer stations (non-hazardous)	66420	CI only	Peacock Brothers. Site Capacity amended as a result of response to Dec 2014 Waste Operator Letter. EA Permit for 75,000 but restricted by space and vehicle movement.	Appear to recycle – but main waste handled appears to be CD&E	Yes
Alne Material Recycling, Forest Lane, Alne, Easingwold, YO61 1TU	Transfer stations (non-hazardous)	51605	CI and CDE		Not identified	
Hessay Recycling Centre, New Road, Hessay Industrial Estate, Hessay YO26 8JS	Transfer stations (non-hazardous)	49000	CI and CDE	Yorwaste Ltd	Recycle dry mixed and wood wastes	Yes
Tofts Road, Kirby Misperton, North Yorkshire, YO17 6BG	Transfer stations (non-hazardous)	45000	LACW, CI and CDE	Added 10.9.2014 as planning permission granted. Est. Start 2017	Not identified	
Seamer Carr IWMF - Transfer Facility, Dunslow Road, Eastfield, Scarborough YO12 4QA	Transfer stations (non-hazardous)	40000	LACW, CI and CDE	Yorwaste Ltd. Site Capacity amended as a result of response to Dec 2014 Waste Operator Letter. 75,000 tonnes permitted capacity	3rd record in table appears to refer to recycling capacity; this one to transfer capacity only	
Halton East Works, Low Lane, Halton East, North Yorkshire, BD23 6AD	Transfer stations (non-hazardous)	38800	LACW, CI and CDE	Updated 16.5.14 now includes LACW, capacity increased from 33000 (Time limited, reverts to 33000 in 2019). Updated 3.2.2014 first year date from 2010 to 2012. Yorwaste Ltd	Company clearly names those sites operating as MRFs so assume this is a transfer station	
Tockwith Transfer Station, Unit 13, Marston Moor Business Park, Rudgate, Tockwith YO26 7QF	Transfer stations (non-hazardous)	31405	CI only	Biffa	Operates regional MRFs outside N Yorks so assumed to be transfer station	

Site identity	Classification	Estimated capacity (tpa)	Wastes handled	NYCC comments	UV review comments	Change?
Wetherby Road, Boroughbridge	Transfer stations (non-hazardous)	30000	CI only	Peacock Brothers, not implemented yet	Appear to recycle - main business appears to be CD&E	Yes
Martins Of York, Outgang Lane, Osbaldwick, York YO19 5UP	Transfer stations (non-hazardous)	25771	CI and CDE		A separate record identifies recycling facility at this address so this is assumed to correctly identify transfer capacity	
Whitby Recycling Facility, Fairfield Way, Whitby YO22 4PU	Transfer stations (non-hazardous)	25000	LACW, CI and CDE	Yorwaste Ltd. Site Capacity amended as a result of response to Dec 2014 Waste Operator Letter.	Recycle dry mixed and wood wastes	Yes
Knapton Quarry, Malton, North Yorkshire, YO17 8JA	Transfer stations (non-hazardous)	23951	CI and CDE		Not identified	
Mytum & Selby Waste Recycling, Mill Cross Quarry,Garden Lane, Sherburn in Elmet, Leeds LS25 6AT	Transfer stations (non-hazardous)	22671	CI and CDE		Have picking line to separate recyclables	Yes
Station Yard, Ripley, Harrogate HG3 3BA	Transfer stations (non-hazardous)	20383	CI and CDE	Biffa UK Waste Management Ltd	Regional operations feed waste to MRFs outside N. Yorkshire	
Land at Gatherley Road Industrial Estate, Brompton on Swale, Richmond DL10 7JQ	Transfer stations (non-hazardous)	20000	LACW, CI and CDE	Updated 13.2.2014 first year date from 2010 to 2012	Skip hire but claim to sort and separate incoming waste	Yes
Shawl Quarry, Moor Road, Leyburn DL8 5LA	Transfer stations (non-hazardous)	20000	CI and CDE	Biker Wenwaste Ltd	Moor Park facility (this one presumably) is a recycling facility	Yes
Plot 2, Whitemoor Business Park, Selby, North Yorkshire, YO8 6EG	Transfer stations (non-hazardous)	12109	LACW and CI	Van Werven UK Ltd. Site Added as a result of Dec 2014 Waste Operator research.	Plastics recycler	Yes but as re-processor[21]
Ecoplas, Whitemoor Business Park, Cliffe Common, Selby YO8 6EG	Transfer stations (non-hazardous)	10244	CI and CDE		Plastics recycler	Yes but as re-processor
Claro Road, Harrogate HG1 4AT	Transfer stations (non-hazardous)	10000	LACW only	Updated 13.2.2014 first year to 2010 from 2015 operated by Yorwaste for Harrogate BC	Council facility so likely to be transfer only	
Taperell Environmental, Common Lane, Burn, Selby YO8 8LB	Transfer stations (non-hazardous)	10000	CI only		Claim to recycle but describe site as a transfer station	
Went Edge Quarry and Waste Transfer Station, Went Edge Road, Kirk Smeaton WF8 3LU	Transfer stations (non-hazardous)	9161	CDE only	Wentvalley Aggregates Ltd.	Aggregates recycler	Yes
Whitewall Quarry, Welham Road, Norton YO17 9EH	Transfer stations (non-hazardous)	8250	CDE only		Operator not identified	
Greystones Aggregates and Recycling, Goldsborough, Knaresborough HG5 8NJ	Transfer stations (non-hazardous)	6835	CDE only		Only refer to skip hire service in spite of name	

[21] Such facilities are not expected to accept mixed wastes and therefore this site and the one below have been classified as re-processors instead.

Site identity	Classification	Estimated capacity (tpa)	Wastes handled	NYCC comments	UV review comments	Change?
Palm Recycling Ltd, Showfield Lane, Malton YO17 6BT	Transfer stations (non-hazardous)	6000	CI only	Yorwaste Ltd. Site Capacity amended as a result of response to Dec 2014 Waste Operator Letter.	Not listed as location on Yorwaste website	
The Potter Group, Barlby Road, Selby YO8 5DZ	Transfer stations (non-hazardous)	6000	CI only	Site capacity amended as a result of response to Dec 2014 Waste Operator Letter.	Haulage company so assumed to be transfer only	
Ryedale Skip Hire, 11 Enterprise Way, Pickering YO18 7NA	Transfer stations (non-hazardous)	5455	CI and CDE		States Pickering site is central recycling centre	Yes
Rufforth Airfield Transfer Station, The Airfield, Rufforth, York YO23 3QA	Transfer stations (non-hazardous)	5027	CI and CDE		Claim to recycle large quantity of incoming waste	Yes
Givendale Head Farm, Ebberston, Snainton, Scarborough, YO13 9PU	Transfer stations (non-hazardous)	4287	CI and CDE		No information - very small scale facility	
K & D Skip Hire & Waste Management Ltd, Westfields, Hull Road, Dunnington, York, YO19 5LP	Transfer stations (non-hazardous)	4033	CI and CDE		Skip hire only	
Moverley's Yard, Carr Lane, Sutton-on-the-Forest, York Y061 1EB	Transfer stations (non-hazardous)	3950	CI only		Not identified	
Addyman's Plant And Skip Hire, Addymans scrap yard, Ripley Road, Scotton, Harrogate HG5 9HU	Transfer stations (non-hazardous)	3599	CDE only		Includes ELV facilities but not clear it is at this site	
A1 Skip Hire, High Field Farm, Boroughbridge Road, Ferrensby, HG5 OPZ	Transfer stations (non-hazardous)	2484	CI and CDE		Supply some secondary products but not clear they recycle	
Woodhouse Farm, Rufforth, York YO23 3QA	Transfer stations (non-hazardous)	1861	CI only		Not identified	
Ebor Skip Hire, Parkers Pig Farm, Malton Road, Stockton on the Forest, York YO32 9TL	Transfer stations (non-hazardous)	1839	CI and CDE		Claim to recycle waste	Yes
Settle Coal Co. Ltd, Station Road, Settle BD24 9AB	Transfer stations (non-hazardous)	1800	CDE only		No indication of recycling facilities	
Harpers Waste Management Ltd Cleveland, Carr Lane, Sutton on the Forest YO61 1EY	Transfer stations (non-hazardous)	1513	CI only		Primarily tank cleaner - no indication of recycling capability	
Anytime Waste Transfer Station, Newbridge Farm, Selby Road, North Duffield, Selby, YO8 5DG	Transfer stations (non-hazardous)	865	CI and CDE		Licensed as waste carrier to must be transfer station only	
Olivers Mount, Moor Road, Tunstall DL10 7RF	Transfer stations (non-hazardous)	500	CI only		Deal with agri. wastes - no sign of recycling activity	
Busby Stoop Waste Transfer Station, Thirsk, North Yorkshire, YO7 4EQ	Transfer stations (non-hazardous)	125	LACW and CI	Site Added as a result of Dec 2014 Waste Operator research.	Metal recycler	Yes

If proposals are implemented, total additional recycling capacity estimated as around 306,000 tonnes.

APPENDIX E: CONSULTEE COMMENTS ON ORIGINAL REPORT

Tockwith & Wilstrop Parish Council 911 0084 The Baseline scenario is flawed in that it is based on the premise that the proposed AWRP contract is implemented, when it has yet to be built. A contingency should be incorporated into the scenarios to cater for a situation in which the AWRP is not developed.

Individual 157 0138 The future scenarios are outdated, unrealistic and cover a very narrow range of possibilities. The scenarios should include a much lower rate of increases in waste arisings. Take account of legal demands or national government recycling rates of 60% and 70%. Explore the possible future taxation regimes in order to understand the effect of financial viability. Criteria should be used to explore the difference between the various scenarios.

Scarborough, Whitby and Ryedale Green Party 2841 0224 Minimised growth: maximised recycling and recovery. Things will not continue as they are now, even if the 'green 'argument does not win, the economic circumstances. Particularly energy sources, will probably lead to these scenarios.

Peel Environmental 2180 0259 Supports the options for growth within the Plan, but do not support any of the options for future waste management practices. Agree that a degree of flexibility should be built into the Plan. It is our view that future capacity requirements within the Plan should be based upon a worst case scenario which adopts the higher level of ‘Growth' and the 'Baseline' / 'Median' Scenario for waste management practice. It is noted that the 'Baseline' Scenario allows for LACW to be managed in line with the new residual waste management contract (AWRP). However the contract is yet to be signed and the delivery of the AWRP remains uncertain. In light of this, in order to ensure that full objectively assessed needs are met and in order to be flexible enough to deal with changes as required by national planning policy, the MWJP should plan for all of the required capacity to be met through a variety of options.

Objects to the fact that targets for C&I waste within the 'median' and 'high' recycling scenarios only relate to 'mixed C&I waste' This represents only circa 30% of the overall amount of C&I waste arising in the Plan area and it is not clear what recycling, recovery or landfilling targets are being applied to the remainder waste stream.
The grouping of C&I waste with C&D waste in these scenarios is not supported as they are distinctly different waste streams with very different characteristics an the assumed level of recycling for each should be presented separately in any assessment of any future capacity gap.

It should be noted that whilst broad support can be applied to some scenarios, it should not be inferred that support is given to the findings of the two Waste Arising's and Capacity Requirements evidence base documents."

Green Hammerton Parish Council 585 0517 Do not have sufficient expertise to comment on the scenarios.

Marton-cum- Grafton Parish Council 766 0541 No, do not agree. There is no need to divert such a high % of waste from landfill, especially if it is biologically inert and can be

used to enable effective remediation of minerals extraction activity. To assume a minimum household waste diversion target of 50% is far too low. Propose a target recycling rate for household waste via kerbside collection should be a minimum of 60% and aspire to 70% by 2020. Strongly support the maximum recycling scenario, plus higher household targets.

Bilton-in-Ainsty with Bickerton Parish Council 422 0719 Unable to comment due to lack of expertise

North Yorkshire Waste Action Group (NYWAG) 171 1025 The scenarios are unrealistic and cover too narrow a range of possibilities. Future scenarios should be more extensive and include lower rates of increase in waste arising's than projected. Need to take into account legal, EU and Government demands for recycling rates and financial implications. Regret criteria should be used to explore the difference between the various scenarios."

CPRE (Harrogate Branch) 2197 1113 All scenarios are reasonable.

Environment Agency 121 1293 Unclear as to the purpose of the recycling scenarios, need to be more clearly explained. It is useful to set down potential scenarios for the management of waste in North Yorkshire if the objective is to steer it in a particular direction. The maximum scenario of 75% recycling and 25% waste to energy is unlike the better performing countries in the EU where at present there is greater reliance on energy recovery. Achieving these levels would require strict adherence to the waste hierarchy in priority order, and would represent an aspirational target, if option 2 of ID42 was followed. Eunomia predict a rise to 65% recycling across the UK by 2020 in their November 2013 summary report, however it should be taken into account that to progress to higher levels of recycling is progressively more challenging as the ‘easy to recycle’ wastes have been removed from the waste stream.

Current UK construction waste recycling rates are thought to already be in excess of the 70% target set by the EU, but evidence of this needs to be investigated and verified. In light of currently available data on construction waste 75% recycling is attainable. The median scenario is achievable in the short term and is close to being met in some sectors. It is acknowledged that North Yorkshire has particular challenges presented by low population densities and long travel distances with limited transport infrastructure which are not found elsewhere in the Yorkshire and Humber Region. Could future scenarios be informed by looking at similar situations elsewhere, for example the Scottish zero waste plan has stated targets of 70% recycling and 5% landfill by 2025?"

Friends of the Earth- Yorkshire & Humber and North East 2753 1768 All of these scenarios are significantly weak in ambition for increased recycling rates. The Plan area has one of the highest amounts of household waste per household, and a recycling rate in the mid 40%s (compared to best WPAs in England exceeding 60% and Flanders exceeding 75%). Wish to see greater efforts from NYCC and CYC (in collaboration with the Districts) on waste minimisation and recycling, composting and AD.

Durham County Council 92 1799 The growth scenarios seem reasonable.

Individual 213 1902 No, do not agree. NYCC mineral industry required landfill to achieve re-instatement. There is no need to divert such a percentage of waste from landfill,

especially inert waste which can be used for mineral restoration. Consider a scenario which maximises reuse and recycling of all waste types.

Individual 3013 **2037** Recycle/recovery Scenario.

Individual 231 **2150** Projections of LACW growth have been inaccurate in CYC and NYCC waste policies since 2005. There is no indication of recent trends nor a scenario of 'reduced waste arising's' which would present a policy in favour of reuse and reclamation. Waste arising's have fallen since 2006 with changes in their composition. If these trends are not encouraged it will be a missed opportunity.

Individual 1355 **2184** These are reasonable scenarios.

Craven District Council 94 2327 These appear to be reasonable scenarios. Minimised growth may not be realistic. There are high levels of uncertainty and sufficient flexibility needs to be in place.

North Yorkshire Sub Region

Waste Arisings and Capacity Evidence

Waste Arisings and Capacity Requirements

Supplementary Note to Addendum Report

urbanvision

July 2015

Date	Details	Prepared by	Reviewed and approved by
09.07.15	Draft Note	Paul Knott	Carolyn Williams

CONTEXT

1. In 2013 North Yorkshire County Council (in conjunction with City of York Council and the North Yorkshire 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 created in the North Yorkshire sub-region.

2. The assessment forecast 9 scenarios based on a combination of 3 sets of growth assumptions (No Growth, Growth and Minimised Growth) and 3 sets of assumptions about recycling and landfill diversion rates (Baseline – ie. no change, Maximised Recycling and Median Recycling).

3. Following consultation on the original work the Council received representations suggesting that higher rates of recycling performance and lower rates of waste growth should be taken into account when assessing future waste capacity needs.

4. In Spring 2015 the Council commissioned the consultants to update and revise these estimates. The resulting work was documented in an addendum to the original assessment which was completed in late May and which proposed certain changes to the assumptions used previously. The Council then asked for these matters to be reflected in a revision of the needs assessment forecast model and for the results to be presented in this short supplementary note.

5. The addendum report compared estimated arisings in 2013 (the latest year for which data were available with those estimated by the original report which were projected from estimates in 2011. It concluded that the original forecasts were fairly close to the updated figures in all but one case identified later in this note. Any change in the results is therefore the result of other changes which were:

    - Growth rates for Commercial & Industrial (C&I) rates were reduced from 0.6% to 0% annually for the 'Growth' scenario and from 0% to -1% over the period to 2020 for the 'Minimised Growth' scenarios;
    - Recycling performance for C&I wastes does not stop at 75% by 2020 but continues to rise to 85% by 2030 (with a corresponding reduction in the amount of waste going to energy recovery);
    - Growth rate for Construction, Demolition & Excavation (CD&E) wastes were slightly increased over the period to 2020 but no growth was assumed thereafter to reflect the possible effects of economic recovery being concentrated in the current decade;
    - Recycling performance for CD&E wastes increased from 50% to 60% by 2020 for the 'Median Recycling' scenario only as the assumption for the 'Maximised Recycling' scenario was considered to reflect a realistic maximum rate;
    - Increase in recycling capacity due to the recognition of recycling taking place at transfer which was identified through a brief desk based review of their apparent function[1].

6. No changes were made to assumptions about Local Authority Collected Waste as the revised estimated arisings were very close to the level originally forecast and assumptions about future growth and recycling performance continue to reflect those

[1] Site functions were originally based on the type of Environmental Permit. However this does not always reflect the current activities which may have broadened since the original permit was issued. A number of local waste transfer stations were identified as providing recycling facilities and a further addition to the needs assessment model was made to include a recycling facility at this locations in addition to their function as transfer stations.

in the Joint Municipal Waste Management Strategy. Therefore the forecasts for this stream should not change significantly.

RECYCLING C&I WASTES

7. Information about the size of the C&I stream and how it is managed has been poor historically. The original assessment compared estimates derived from a 2009 regional survey for the North West (in the expectation this would be representative of the situation in North Yorkshire once corrected for differences in demographics and area) and those derived from a 2010 national survey which also provided estimates for the former Yorkshire and Humberside region. The original assessment provided results for North Yorkshire based on both sources which produce substantially different results, with those from the North West source being generally about 10% lower than those from the national source. The assessment below presents the results of assessment extrapolated from the former only as it is considered to be more accurate.

8. Table 1 below compares the revised capacity gaps. Negative figures indicate a capacity surplus.

Table 1: Comparison of Capacity Gaps for Recycling LACW, C&I and Agricultural Wastes[2]

BASELINE	*2015*	*2020*	*2025*	*2030*
Growth - original	471,808	518,690	548,357	578,574
Growth - 2015 update	- 26,972	- 263,483	- 199,571	- 140,229
Minimised Growth - original	447,632	469,782	474,088	478,181
Minimised Growth - update	- 43,858	- 296,447	- 236,068	- 177,249
MAXIMISED RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	548,427	679,020	716,157	754,184
Growth - 2015 update	56,354	- 96,831	- 32,919	26,423
Minimised Growth - original	519,493	610,860	612,651	614,355
Minimised Growth - update	35,384	- 145,728	- 86,858	- 28,039
MEDIAN RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	522,588	625,576	660,224	695,626
Growth - 2015 update	31,847	- 145,846	- 81,934	- 22,592
Minimised Growth - original	495,540	563,835	566,465	568,964
Minimised Growth - update	12,079	- 190,058	- 130,743	- 71,924

[Source: Revised Capacity Assessment model, 2015 – all figures in tonnes]

9. Table 1 shows a very significant shift in requirements across all scenarios with the previously-forecasts gaps replaced by small surpluses (assuming the baseline scenario is the least likely to materialise). Since the addendum revision concluded that the most recent arisings were close to the original forecast these changes must be due to the recognition of recycling taking place at transfer which was identified through a brief desk based review described earlier.

[2] Note that the management contract for LACW provides sufficient capacity to recycle that stream while the quantity of agricultural waste requiring recycling is extremely small. The title of this table reflects the working of the capacity assessment model but in practice the gaps and surpluses refer to the C&I stream alone.

RECYCLING CD&E WASTES

10. Information about CD&E waste arisings is derived from a database published annually by the Environment Agency. Although some wastes are not reported to this source it represents the single most accurate way of estimating the level of wastes created which will need to be managed in commercially operated waste facilities.

11. Table 2 summarises the site requirements as a result of the changes noted above

Table 2: Comparison of Capacity Gaps for Recycling CD&E Wastes

BASELINE	*2015*	*2020*	*2025*	*2030*
Growth - original	4,761	6,768	10,181	12,312
Growth - 2015 update	- 157,201	- 78,488	- 60,373	- 58,393
Minimised Growth - original	2,811	2,811	4,156	4,156
Minimised Growth - update	- 160,690	- 85,646	- 69,824	- 69,810
MAXIMISED RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	129,944	264,735	275,981	286,183
Growth - 2015 update	- 1,348	249,119	277,177	287,680
Minimised Growth - original	124,305	245,799	247,144	247,144
Minimised Growth - update	- 12,401	210,931	226,753	226,767
MEDIAN RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	88,216	178,746	187,381	194,892
Growth - 2015 update	- 47,187	152,764	177,898	185,894
Minimised Growth - original	83,807	164,803	166,148	166,148
Minimised Growth - update	- 47,187	152,764	177,898	185,894

[Source: Revised Capacity Assessment model, 2015 – all figures in tonnes]

12. The estimates in Table 2 reflect the combination of three factors. First, the Spring 2015 review produced an increased estimate of local arisings of these materials and, second, as noted above the growth rate was modified to assume a faster increase over period to 2020 than that applied previously. Finally, available capacity has been increased as a result of the recognition of recycling taking place at transfer which was identified through a brief desk based review described previously.

13. The results in Table 2 suggest the third of these factors has eliminated the short-term capacity gap. However this has been offset by the assumed increased growth over the rest of this decade so that there a reduced but still substantial gap by 2020 in the two scenarios that model continuing improvement in recycling performance.

LANDFILL REQUIREMENTS

14. The revisions described above have had knock-on effects on landfill requirements for most of the streams. Tables 3, 4 and 5 summarise the revised gap forecasts for the three main facility types at five year intervals.

Table 3: Comparison of Capacity Gaps for Non-Inert Landfill

BASELINE	*2015*	*2020*	*2025*	*2030*
Growth - original	- 103,345	60,462	96,069	113,720
Growth - 2015 update	- 149,784	169,516	188,263	188,263
Minimised Growth - original	- 123,268	20,123	34,772	30,877
Minimised Growth - update	- 160,831	147,965	164,673	164,673
MAXIMISED RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	- 205,504	- 153,311	- 127,665	- 120,505
Growth - 2015 update	- 247,815	- 26,545	- 7,798	- 7,798
Minimised Growth - original	- 219,083	- 167,982	- 149,980	- 150,689
Minimised Growth - update	- 254,057	- 29,351	- 10,869	- 10,869
MEDIAN RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	- 205,504	- 153,311	- 127,665	- 120,505
Growth - 2015 update	- 247,815	- 26,545	- 7,798	- 7,798
Minimised Growth - original	- 219,083	- 167,982	- 149,980	- 150,689
Minimised Growth - update	- 254,057	- 29,351	- 10,869	- 10,869

[Source: Revised Capacity Assessment model, 2015 – all figures in tonnes]

Table 4: Comparison of Capacity Gaps for Inert Landfill

BASELINE	*2015*	*2020*	*2025*	*2030*
Growth - original	- 18,553	170,670	336,030	346,791
Growth - 2015 update	- 381	163,326	338,598	362,004
Minimised Growth - original	- 28,390	150,698	305,614	305,614
Minimised Growth - update	- 18,596	126,008	289,505	302,884
MAXIMISED RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	- 143,736	- 87,297	70,230	72,920
Growth - 2015 update	- 156,234	- 164,281	1,048	15,931
Minimised Growth - original	- 149,884	- 92,290	62,626	62,626
Minimised Growth - update	- 166,885	- 170,569	- 7,072	6,307
MEDIAN RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	- 102,008	- 1,308	158,830	164,211
Growth - 2015 update	- 110,395	- 67,926	100,327	117,717
Minimised Growth - original	- 109,386	- 11,294	143,622	143,622
Minimised Growth - update	- 123,270	- 83,341	80,156	93,535

[Source: Revised Capacity Assessment model, 2015 – all figures in tonnes]

Table 5: Comparison of Capacity Gaps for Hazardous Landfill

BASELINE	*2015*	*2020*	*2025*	*2030*
Growth - original	7,405	7,593	7,786	7,985
Growth - 2015 update	8,427	8,683	8,946	9,217
Minimised Growth - original	7,216	7,216	7,216	7,216
Minimised Growth - update	8,170	8,170	8,170	8,170
MAXIMISED RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	7,405	7,593	7,786	7,985
Growth - 2015 update	8,427	8,683	8,946	9,217
Minimised Growth - original	7,216	7,216	7,216	7,216
Minimised Growth - update	8,170	8,170	8,170	8,170
MEDIAN RECYCLING	*2015*	*2020*	*2025*	*2030*
Growth - original	7,405	7,593	7,786	7,985
Growth - 2015 update	8,427	8,683	8,946	9,217
Minimised Growth - original	7,216	7,216	7,216	7,216
Minimised Growth - update	8,170	8,170	8,170	8,170

[Source: Revised Capacity Assessment model, 2015 – all figures in tonnes]

OVERALL CAPACITY REQUIREMENTS

15. For completeness, the appendix which follows presents the revised capacity gap summaries for all waste streams and management routes for the nine scenarios defined in the model, but with the revisions to growth and recycling performance assumptions referred to previously.

APPENDIX – REVISED CAPACITY GAPS[3]

Table A1: Capacity Gap Forecasts – No Growth Scenario; Baseline Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 151,129	169,516	188,263	188,263
Landfill (Hazardous)	8,170	8,170	8,170	8,170
Landfill (C+D)	- 18,180	126,820	290,394	303,773
Energy from waste	83,555	- 481,067	- 481,067	- 481,067
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	- 32,082	- 294,162	- 240,034	- 190,034
Recycling (C+D)	- 160,697	- 85,697	- 69,892	- 69,892
Composting	- 84,055	- 84,055	- 69,055	- 55,719
Treatment plant	- 139,911	- 239,911	- 238,885	- 238,885
Transfer station	- 971,905	- 1,046,905	- 963,100	- 918,100
Land recovery	14,847	14,847	14,847	14,847
Not in model	85,588	85,588	85,588	85,588

Table A2: Capacity Gap Forecasts – No Growth Scenario; Maximised Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 249,160	- 26,545	- 7,798	- 7,798
Landfill (Hazardous)	8,170	8,170	8,170	8,170
Landfill (C+D)	- 166,469	- 169,757	- 6,183	7,196
Energy from waste	98,260	- 451,658	- 451,658	- 451,658
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	51,244	- 127,510	- 73,382	- 23,382
Recycling (C+D)	- 12,408	210,880	226,685	226,685
Composting	- 84,055	- 84,055	- 69,055	- 55,719
Treatment plant	- 139,911	- 239,911	- 238,885	- 238,885
Transfer station	- 971,905	- 1,046,905	- 963,100	- 918,100
Land recovery	14,847	14,847	14,847	14,847
Not in model	85,588	85,588	85,588	85,588

Table A3: Capacity Gap Forecasts – No Growth Scenario; Median Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 249,160	- 26,545	- 7,798	- 7,798
Landfill (Hazardous)	8,170	8,170	8,170	8,170
Landfill (C+D)	- 122,854	- 82,529	81,045	94,424
Energy from waste	122,767	- 402,643	- 402,643	- 402,643
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	26,737	- 176,525	- 122,397	- 72,397
Recycling (C+D)	- 56,023	123,652	139,457	139,457
Composting	- 84,055	- 84,055	- 69,055	- 55,719
Treatment plant	- 139,911	- 239,911	- 238,885	- 238,885
Transfer station	- 971,905	- 1,046,905	- 963,100	- 918,100
Land recovery	14,847	14,847	14,847	14,847
Not in model	85,588	85,588	85,588	85,588

[3] All figures in this appendix as expressed in tonnes. Negative figures identify capacity surpluses.

Table B1: Capacity Gap Forecasts – Growth Scenario; Baseline Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 149,784	169,516	188,263	188,263
Landfill (Hazardous)	8,427	8,683	8,946	9,217
Landfill (C+D)	- 381	163,326	338,598	362,004
Energy from waste	86,527	- 456,390	- 448,676	- 441,341
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	- 26,972	- 263,483	- 199,571	- 140,229
Recycling (C+D)	- 157,201	- 78,488	- 60,373	- 58,393
Composting	- 84,055	- 84,055	- 69,055	- 55,719
Treatment plant	- 137,474	- 234,920	- 232,248	- 230,813
Transfer station	- 971,865	- 1,046,825	- 962,980	- 917,940
Land recovery	14,847	14,847	14,847	14,847
Not in model	85,588	85,588	85,588	85,588

Table B2: Capacity Gap Forecasts – Growth Scenario; Maximised Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 247,815	- 26,545	- 7,798	- 7,798
Landfill (Hazardous)	8,427	8,683	8,946	9,217
Landfill (C+D)	- 156,234	- 164,281	1,048	15,931
Energy from waste	101,232	- 426,981	- 419,267	- 411,932
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	56,354	- 96,831	- 32,919	26,423
Recycling (C+D)	- 1,348	249,119	277,177	287,680
Composting	- 84,055	- 84,055	- 69,055	- 55,719
Treatment plant	- 137,474	- 234,920	- 232,248	- 230,813
Transfer station	- 971,865	- 1,046,825	- 962,980	- 917,940
Land recovery	14,847	14,847	14,847	14,847
Not in model	85,588	85,588	85,588	85,588

Table B3: Capacity Gap Forecasts – Growth Scenario; Median Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 247,815	- 26,545	- 7,798	- 7,798
Landfill (Hazardous)	8,427	8,683	8,946	9,217
Landfill (C+D)	- 110,395	- 67,926	100,327	117,717
Energy from waste	125,739	- 377,966	- 370,252	- 362,917
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	31,847	- 145,846	- 81,934	- 22,592
Recycling (C+D)	- 47,187	152,764	177,898	185,894
Composting	- 84,055	- 84,055	- 69,055	- 55,719
Treatment plant	- 137,474	- 234,920	- 232,248	- 230,813
Transfer station	- 971,865	- 1,046,825	- 962,980	- 917,940
Land recovery	14,847	14,847	14,847	14,847
Not in model	85,588	85,588	85,588	85,588

Table C1: Capacity Gap Forecasts – Minimised Growth Scenario; Baseline Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 160,831	147,965	164,673	164,673
Landfill (Hazardous)	8,170	8,170	8,170	8,170
Landfill (C+D)	- 18,596	126,008	289,505	302,884
Energy from waste	84,633	- 460,088	- 452,737	- 445,417
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	- 43,858	- 296,447	- 236,068	- 177,249
Recycling (C+D)	- 160,690	- 85,646	- 69,824	- 69,810
Composting	- 84,438	- 84,799	- 69,870	- 56,534
Treatment plant	- 141,629	- 243,262	- 242,553	- 242,553
Transfer station	- 972,225	- 1,047,530	- 963,784	- 918,784
Land recovery	14,118	13,428	13,294	13,294
Not in model	81,392	77,404	76,629	76,629

Table C2: Capacity Gap Forecasts – Minimised Growth Scenario; Maximised Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 254,057	- 29,351	- 10,869	- 10,869
Landfill (Hazardous)	8,170	8,170	8,170	8,170
Landfill (C+D)	- 166,885	- 170,569	- 7,072	6,307
Energy from waste	98,617	- 433,491	- 426,405	- 419,085
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	35,384	- 145,728	- 86,858	- 28,039
Recycling (C+D)	- 12,401	210,931	226,753	226,767
Composting	- 84,438	- 84,799	- 69,870	- 56,534
Treatment plant	- 141,629	- 243,262	- 242,553	- 242,553
Transfer station	- 972,225	- 1,047,530	- 963,784	- 918,784
Land recovery	14,118	13,428	13,294	13,294
Not in model	81,392	77,404	76,629	76,629

Table C3: Capacity Gap Forecasts – Minimised Growth Scenario; Median Recycling

Stream and function	Gap2015	Gap2020	Gap2025	Gap2030
Landfill (C+I, LACW, Agri)	- 254,057	- 29,351	- 10,869	- 10,869
Landfill (Hazardous)	8,170	8,170	8,170	8,170
Landfill (C+D)	- 123,270	- 83,341	80,156	93,535
Energy from waste	121,922	- 389,161	- 382,520	- 375,200
High temperature incineration	13,632	13,632	13,632	13,632
Recycling (C+I, LACW, Agri)	12,079	- 190,058	- 130,743	- 71,924
Recycling (C+D)	- 56,016	123,703	139,525	139,539
Composting	- 84,438	- 84,799	- 69,870	- 56,534
Treatment plant	- 141,629	- 243,262	- 242,553	- 242,553
Transfer station	- 972,225	- 1,047,530	- 963,784	- 918,784
Land recovery	14,118	13,428	13,294	13,294
Not in model	81,392	77,404	76,629	76,629