



Bradford Metropolitan Borough Council
Waste Needs Assessment, Capacity Gap
Analysis and Site/Facility Requirements Study



PART A REPORT

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GLOSSARY OF TERMS

AD	Anaerobic Digestion
C&I Waste	Commercial and Industrial Waste
CDEW/CD&E	Construction Demolition and Excavation Waste
EfW	Energy from Waste
ELV	End of Life Vehicle
GVA	Gross Value Added
LACW	Local Authority Collected Waste
MBT	Mechanical Biological Treatment
ROCs	Renewable Obligations Certificates
RSS	Regional Spatial Strategy
WDA	Waste Disposal Authority
WEEE	Waste Electrical and Electronic Equipment

STAGE 1a: Compiling Baseline Waste Arisings for Bradford Council

This PART A Report reviews the robustness and limitations of the available information on current and expected arisings of waste from within the geographical boundary of the City of Bradford Metropolitan District Council (herein referred to as “Bradford”). The review has been thoroughly carried out for a range of waste streams.

The PART A Report provides information relating to the arisings for each of the following waste streams in Bradford:

- Commercial and Industrial;
- Local Authority Collected Waste;
- Hazardous Waste;
- Construction, Demolition and Excavation Waste;
- Agricultural;
- Low Level Non-Nuclear Radioactive Wastes; and
- Water Waste/Sewage Sludge.

This report also provides information on the movement of wastes between Bradford and other waste planning authorities.

Details of data sources used to inform this PART A Report are provided in Appendix 1.

1. Commercial and Industrial Waste Arisings Projections

1.1 Survey Data Sources

There have been no surveys of Commercial and Industrial (C&I) waste arisings in Bradford specifically, and there is no accurate method of estimating annual arisings of this stream in the authority. However, estimates of the quantities of C&I waste arisings can be extrapolated from surveys that have been undertaken at National and Regional (North West) levels. The relevant surveys which have been used for this study use data collected in the years 2009¹ and 2008/9².

The data from the National Report is from a national survey of 6,005 businesses gathered between June and October 2010, with estimates of waste arisings in 2009 and ONS data on business size and number from 2009. Of the interviews conducted for the survey, 54.5% were face-to-face, with the remaining data taken from telephone interviews, corporate data and PPC (Pollution Prevention Control) returns to the Environment Agency. In total, 7.77% of the surveys were within the Yorkshire and Humberside Region. PPC data is added in to the survey published totals and will therefore introduce distortions into any manipulation of published data. The published totals with PPC data added are not statistically derived and manipulation of the numbers using baseline survey and ONS statistics can distort the results.

The North West (NW) survey was completed through site visits to surveyed premises undertaken in 2009, and covered 1000 businesses. The North West survey was chosen as it is geographically close to Bradford (Yorkshire and Humberside Region) and data is published in sufficient detail to allow customisation for the Sub-Region. Details of waste arisings per C&I sector and business size enable estimates to be generated covering the number, sector and size of businesses in Bradford. The North West survey extrapolations correlate with the observed quantity of landfilled C&I waste from the EA Waste Data Interrogator, and this gives confidence that the survey results provide a sufficiently accurate method for estimating arisings in Bradford in the absence of alternative methods.

¹ Commercial and Industrial Waste Survey 2009 Final Report May 2011 (Jacobs, for Defra)

² North West of England Commercial and Industrial Waste Survey 2009 (For the Environment Agency , March 2010)

1.2 Commercial and Industrial Waste Arisings

Stage 1 – Extrapolations for Bradford

The first stage in determining C&I arisings for Bradford is to extrapolate data at a Regional level for Yorkshire and Humberside. Table 1 compares the quantity of wastes generated in Yorkshire and Humberside as estimated by the national survey (ONS businesses 2009, projections using ONS data on business size and number from 2008) with estimates from the NW Regional Survey (2008 ONS business data).

Note that these surveys are rarely able to generate full-year estimates directly. In practice, the survey will collect details from invoices or the quantity of waste on site in recent months (estimated by container sizes) which will be scaled up to provide an annual estimate. As a result, data collected in mid 2009 when the NW survey was completed is unlikely to be at significant variance within statistical margins of error to the Defra survey, for which field work was carried out in early 2010 for the year 2009/2010. Full details of the extrapolation method are provided in Appendix A of this report.

The high values for the power and utilities sector indicate that PPC data for ash disposal at power stations was factored into the national survey results. Projections from the NW survey exclude PPC (Pollution Prevention and Control) data. Exclusion of the Power and Utilities sector³ (due to treatment required at specialised, restricted user landfill) brings the totals closer, although there are still some significant variances within certain SIC (Standard Industrial Classification) categories.

Table 1 Comparison of C&I arisings using the published National Survey and the NW Regional Survey for Yorkshire and Humberside for 2009/10

Projected sector arisings for Yorkshire & Humberside	Published Arisings Projected* in the Defra National Survey (1000 Tonnes)	Arisings Projected* from the NW Survey (1000 Tonnes)
Food, and drink	690	526
Textiles/wood/paper/publishing	583	344
Power & Utilities	2,064	215
Chemical/non-metallic minerals manufacturing	571	428
Metal manufacturing	772	372
Machinery & equipment (other manufacturing)	268	459
Retail & wholesale	816	1,272
Other services	795	988
Public sector	387	528
Totals	6,944	5,132
Total minus Power & utilities	4,880	4,917
Difference between surveys: 1,812,000 or 37,000 if the Power and Utilities sector is excluded		

*Extrapolated figures

[Sources: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

³ Energy industry wastes deposited at restricted landfills require special management and disposal which cannot be undertaken at landfills receiving other C&I wastes. They are not considered along with the wastes generated from general commercial and industrial activity.

The national survey shows relatively high arisings for metal manufacturing, food & drink, and textiles/wood/paper/publishing sectors, whilst projections from the NW survey show a relatively high level of arisings from machinery & equipment (other manufacturing) sector, and the retail and wholesale sector. Variance between the national survey for the Yorkshire and Humberside and NW survey in specific sectors may be due to sampling methodology. For example, the National Survey included 54.5% face-to-face surveys, whereas the NW survey was mainly face-to-face with only PPC data added in as referred to previously. The national survey also reflects an average of all English regions whereas the NW Survey was for one region only. It is only by reviewing other data sets such as those derived from the EA Waste Data Interrogator that a judgement can be made as to which survey extrapolation is most appropriate for use.

Stage 2 – Comparison of Estimated Projections

The second stage of extrapolation is to project estimates for C&I arisings using the national survey data and compare this with projections extrapolated from the NW survey at Bradford level (see Appendix A for extrapolation method). Extrapolated figures are shown in Table 2.

Table 2 Comparison of C&I Arisings projected from the Defra Survey with a Projection from the NW survey by Standard Industry Classification for Bradford (tonnes) (2009/10)

Sectors	Projected from Defra National Survey (tonnes)	Arisings Projected from the NW Survey (tonnes)
Food, drink and tobacco	23,544	22,886
Textiles/wood/paper/publishing	45,448	41,709
Power & Utilities	38,819	28,356
Chemical/non-metallic minerals manufacturing	50,561	49,412
Metal manufacturing	19,677	17,867
Machinery & equipment (other manufacturing)	31,529	59,543
Retail & wholesale	86,494	123,367
Other services	65,756	77,118
Public sector	42,497	53,829
Totals	<u>404,324</u>	<u>474,087</u>
Difference between surveys 69,763 tonnes		

[Sources: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

The projections using the national survey data show relatively high arisings for metal manufacturing, textiles/wood/paper/publishing and food & drink and sectors. The NW survey is generally lower in all sectors except machinery and equipment (other manufacturing) and higher in commercial waste, in particular from the retail and wholesale sector.

Published data from the national survey also included waste arisings by material type and method of management for Yorkshire and Humberside.

Evaluation of C&I arisings also needs to consider that part of Local Authority Collected Waste which is classified as trade waste. This waste is very similar in composition to household waste and is collected under contract by the local authority typically from very small businesses. The C&I surveys referred to previously estimate total waste generated by business activities, creating a risk that these materials will be double-counted.

Table 3 identifies the quantity of LACW trade waste generated in Bradford (source: Defra Waste Data Flow reporting system).

Table 3 Trade Waste Collections for Bradford

Trade Waste Local Authority Collections (2009/10)	
Local Authority	Tonnes
Bradford	2,855

[Source: Defra WasteDataFlow]

It is also possible to analyse the two survey results by waste management method at regional and local levels. The results are shown in Tables 4 and 5

Table 4 Comparing Defra Survey C&I Arisings with a Projection for Yorkshire and Humberside from the NW survey by Disposal Method (2009/10)

Estimated Waste Arising by Management Method	Yorks and Humber from Defra National Survey (000s tonnes)	Yorks and Humber Arisings Projected from the NW Survey (000s tonnes)
Land disposal (Landfill)	1,997	1,077
land recovery	238	82
Thermal Energy recovery	107	96
Incineration	205	77
Non Thermal treatment	332	169
Transfer Station	78	84
Recycling	3,143	3,256
Composting	92	33
Reuse	213	Included in recycling
Unknown	539	258
Total	6,944	5,132
Total minus Power & Utilities	4,880	4,917
Difference between surveys 37,000 tonnes (without Power and Utilities)		

[Source: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

Table 5 Comparing C&I Arisings projected from the Defra Survey with a Projection for from the NW survey by Disposal Method at Bradford level (2009/10)

Estimated Waste Arising by Management Method	Projected from National Survey Using Yorks and Humberside data (tonnes)	Arisings Projected from the NW Survey (tonnes)
Land disposal (Landfill)	116,278	93,823
land recovery	13,858	6,412
Thermal Energy recovery	6,230	11,519
Incineration	11,936	8,089
Non Thermal treatment	19,331	14,702
Transfer	4,542	9,305
Recycling	183,006	302,718
Composting	5,357	5,272
Reuse	12,402	Included in recycling

Unknown	31,384	22,247
Totals	404,324	474,087
Differences between the two surveys 69,763 tonnes		

[Source: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

Table 6 Comparing C&I Arisings projected from the Defra Survey with a Projection for from the NW survey by Sector at Bradford level, tonnes (2009/10)

C&I Arisings	Projected from National Survey Using Yorks and Humberside data	Arisings Projected from the NW Survey (tonnes)
Food, drink and tobacco	23,544	22,886
Textiles/wood/paper/publishing	45,448	41,709
Power & Utilities	38,819	28,356
Chemical/non-metallic minerals manufacturing	50,561	49,412
Metal manufacturing	19,677	17,867
Machinery & equipment (other manufacturing)	31,529	59,543
Retail & wholesale	86,494	123,367
Other services	65,756	77,118
Public sector	42,497	53,829
Total	404,324	474,087

[Source: Defra National C&I Waste Survey, 2009; Environment Agency Survey of C&I Wastes in North West England, 2009]

The National Survey estimates the quantity of waste sent to landfill to be almost twice that predicted by the extrapolated NW survey. Landfill data from the EA Waste Data Interrogator shows a total of 1,164,383 tonnes of commercial and industrial waste landfilled in the Yorkshire and Humberside region (EA Household, Industrial & Commercial waste minus reported municipal waste landfilled 2008/9). It is only for landfill that comparable data from the EA Waste Data Interrogator can be used.)

Analysis by management method indicates that the higher levels of arisings shown in the NW projection are predominantly accounted for by higher estimates of recycling.

1.3 Conclusion regarding C&I arisings for Bradford

Although there are variations in extrapolating data for C&I from the two data sources used here, similar results are obtained with the extrapolated NW survey showing a higher level of recycling. This can be expected because the surveys used different methodologies (mixtures of face to face, PPC data, telephone surveys and corporate data). However, when empirical Environment Agency data about landfilling of C&I wastes is compared with the extrapolations from the national and NW surveys it is clear that the latter provides a closed estimate. This outcome suggests that the NW survey offers a more reliable approach to estimate the quantity of wastes generated than using the national survey and any regional data within it.

The model used by this needs assessment therefore uses the NW survey results as a basis for extrapolating comparative estimates for Bradford, although it has been built to allow the option of extrapolation from the national survey results as an alternative.

2. Local Authority Collected Waste

2.1 Data Sources

Detailed waste arisings and waste growth forecasts, which are more than adequate to inform the needs assessment modelling process, have been provided by officers from Bradford's Waste Disposal Authority (WDA).

As noted in the previous section, part of the LACW stream comprises trade waste collected from businesses. The other two components are household waste and other non-household waste, the latter being material collected from parks and gardens, street litter bins and street sweeping / cleansing activities. In order to prevent double-counting, the approach subtracted the estimated quantity of trade waste (see Table 3) from total LACW arisings.

The methodology of the needs assessment is based on calculating the average waste produced by each household currently, and then projecting this forward based on forecast growth in households.

Table 7 summarises the principal estimates.

Table 7 Local Authority Collected Waste for Bradford in 2011/12 – 2013/14

Baseline Data Local Authority Collected Waste (LACW)	2011/12	2013/14
Total Number of Households	186,000	216,612
Population	523,100	528,200
Total household waste reported	197,058	196,522
Tonnes of non-household waste collected reported	27,449	29,563
Total LACW reported	224,507	226,085

[Sources: Defra WasteDataFlow; Bradford City Council]

Management Allocations	2011/12 Tonnes	2013/14 Tonnes	Notes
Waste collected from the Kerbside & HWRC for recycling	38,401	20,753	
Composted waste	17,130	30,175	
Residual Mechanical Treatment	141,527	170,518*	(*includes 19,589 tonnes of trade waste deducted from C&I wastes in subsequent modelling process)
HWRC rubble		3,840	Recycling C&D
Reuse		799	
Total	197,058	226,085	
Secondary Treatment Product Allocations for the model			

Recycling	46,641	56,761	
Energy recovery (RDF* from treatment exported)	51,504	66,639	
Residual Disposal Landfill	43,382	41,616	
Total	141,527	165,016	

[Sources: Defra WasteDataFlow; Bradford City Council]

Residual Waste is sent to a local merchant facility which uses mechanical and hand sorting to extract recyclates. The quantity of material derived is identified in the row titled 'Waste Treatment' in Table 7. The remaining material is mechanically processing into *RDF which is sent to Holland or Denmark for energy recovery. These are interim waste treatment arrangements currently in place up to 2016/17 until the Council adopts a more suitable longer term arrangement which it is currently seeking to procure.

2.2 Summary

Projections of LACW arisings will be used to inform the Model. The data published in the national Waste Data Flow website made available through Defra has been confirmed/supplemented by Bradford officers and there are no significant variations in arisings between the two data sources which would impact on modelling projections.

3. Hazardous Waste

3.1 Data Sources

Data on hazardous waste is taken from the 2013 Environment Agency Hazardous Waste Interrogator. This is considered by the Environment Agency to be the most accurate source on this waste stream and is used to inform the needs assessment model in preference to data from its standard site Waste Interrogator.

3.2 Hazardous Waste Arisings

Bradford recorded 19,084 tonnes of hazardous waste arisings (Table 8) and 4,258 tonnes of hazardous waste were managed at sites in Bradford in 2013 (Table 10).

Table 8 Hazardous Waste Arisings in Bradford by Substance (2013)

Hazardous Waste Substances Arising in Bradford	Total Arising in Bradford (tonnes)
Organic Chemical Processes	4,752
C&D Waste and Asbestos	3,548
Not Otherwise Specified	3,183
Oil and Oil/Water Mixtures	1,859
Metal Treatment and Coating Processes	1,644
Healthcare	1,134
Shaping/Treatment of Metals and Plastics	1,125
Municipal and Similar Commercial Wastes	692
Packaging, Cloths, Filter Materials	312
Solvents	290
MFSU Paints, Varnish, Adhesive and Inks	275
Inorganic Chemical Processes	117
Photographic Industry	90
Waste/Water Treatment and Water Industry	47
Thermal Process Waste (inorganic)	18
Total	19,084

[Source: Environment Agency Hazardous Waste Data Interrogator, 2013]

Table 9 Hazardous Waste Managed in Bradford 2013 (tonnes)

Hazardous Waste Classification	Recovery	Transfer (D)	Transfer (R)	Treatment
Inorganic Chemical Processes	5	0		
MFSU Paints, Varnish, Adhesive and Inks			8	
Oil and Oil/Water Mixtures	5	1	99	
Solvents			1	
Packaging, Cloths, Filter Materials		0	10	
Not Otherwise Specified	378	10	532	
C&D Waste and Asbestos		477		
Healthcare		241		2,185
Municipal and Similar Commercial Wastes	275	2	27	
Total by Management Method	664	732	677	2,185
Total Managed in Bradford				4,258

[Source: Environment Agency Hazardous Waste Data Interrogator, 2013]

The movement of hazardous waste reflects the management of these specialised wastes at regionally or nationally significant facilities. Whilst some 3,214 tonnes are seen to be imported

(Table 10), Bradford is a net exporter of hazardous waste with 18,039 tonnes exported in 2013 (Table 11).

Table 10 Hazardous Waste Imports to Bradford by waste type and treatment method 2013 (tonnes, rounded)

Hazardous Waste Classification	Recovery	Transfer (Disposal)	Transfer (Recovery)	Treatment
MFSU Paints, Varnish, Adhesive and Inks			8	
Oil and Oil/Water Mixtures			95	
Packaging, Cloths, Filter Materials			10	
Not Otherwise Specified	55		166	
C&D Waste and Asbestos		242		
Healthcare		233		2135
Municipal and Similar Commercial Wastes	266		4	
Total by Management Method	321	475	283	2,135
Total Imported to Bradford	3,214			

[Source: Environment Agency Hazardous Waste Data Interrogator, 2013]

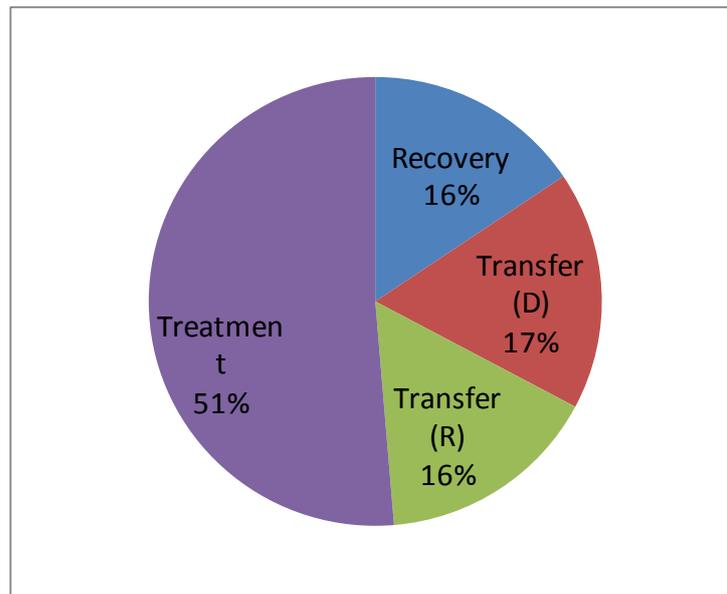
Table 11 Hazardous Waste Exported from Bradford showing treatment method (2013)

Methods used to Manage Hazardous Waste	Hazardous Waste Exports from Bradford (tonnes)
Treatment	4,532
Recovery	4,135
Landfill	2,969
Transfer (R)	2,766
Incineration without energy recovery	2,756
Transfer (D)	850
Incineration with energy recovery	30
Total Exports	18,039

[Source: Environment Agency Hazardous Waste Data Interrogator, 2013]

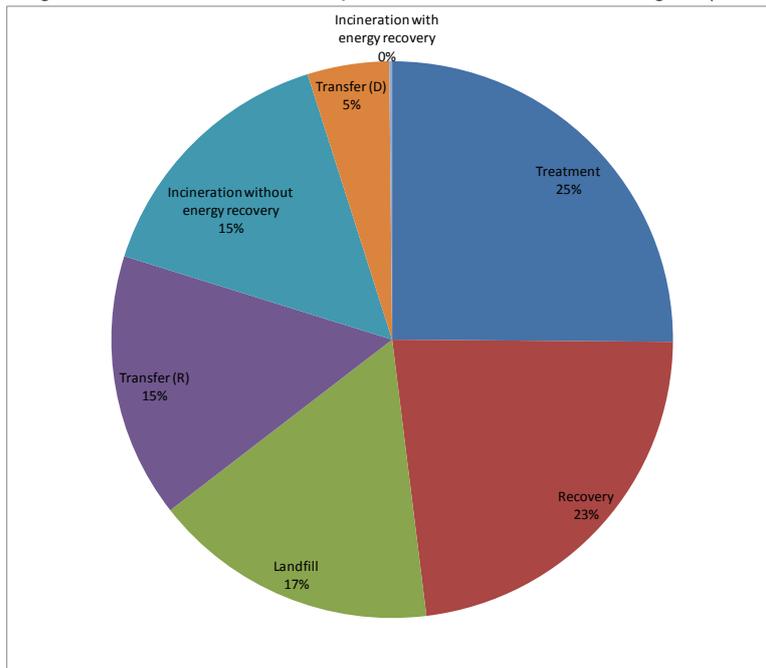
Figure 1 shows the proportion of hazardous waste managed at different types of facility in Bradford. The main treatment facility for hazardous waste in Bradford is for healthcare waste. Hazardous waste is also managed through transfer facilities (either for onward disposal or recycling). There are no hazardous landfill facilities within Bradford.

Figure 1 Hazardous Waste Managed in Bradford (2013)



[Source: Environment Agency Hazardous Waste Data Interrogator, 2013]

Figure 2 Hazardous Waste Exported from Bradford Sub-Region (2013)



[Source: Environment Agency Hazardous Waste Data Interrogator, 2013]

Figure 2 shows the proportion of hazardous waste managed at different types of facility once it has been exported from Bradford. 25% of hazardous waste is exported for treatment, 23% for recovery, with a further 20% being exported to transfer facilities and onward disposal or recycling. Table 12 shows hazardous waste categories exported from Bradford. Organic Chemical Processes is the largest single category by substance and is removed to mainly Cheshire West and Chester and also Lancashire together with 17 other WPAs. C&D waste contaminated with asbestos the second largest category is disposed of mainly in Kirklees.

Table 82 Main Exported Hazardous Waste by Substance from Bradford (2013)

Waste Substance	Tonnes
Organic Chemical Processes	4,752
C&D Waste and Asbestos	3,312
Not Otherwise Specified	2,483
Oil and Oil/Water Mixtures	1,849
Metal Treatment and Coating Processes	1,644
Shaping/Treatment of Metals and Plastics	1,125
Healthcare	1,075
Municipal and Similar Commercial Wastes	657
Packaging, Cloths, Filter Materials	312
Solvents	288
MFSU Paints, Varnish, Adhesive and Inks	275
Inorganic Chemical Processes	112
Photographic Industry	90
Waste/Water Treatment and Water Industry	47
Thermal Process Waste (inorganic)	18
Agricultural and Food Production	<1
Total	18,039

[Source: Environment Agency Hazardous Waste Data Interrogator, 2013]

Table 13 shows the destination WPA's that receiving in excess of 100 tonnes of exported hazardous waste from Bradford (95% of hazardous waste exports), a full list of waste planning authorities for which there have been cross boarder hazardous waste movements are contained in Appendix C.

Table 9 Destination WPA's of Hazardous Waste exported from Bradford (2013) (tonnes)

Deposit WPA	Tonnage
Kirklees	4,126
Cheshire West and Chester	2,597
Leeds	2,339
Lancashire	1,686
Wakefield	1,164
Bradford City	1,045
Rotherham	933
Salford	792
York, City of	493
Derbyshire	478
Stockton-on-Tees	417
Sheffield	389
Walsall	385
Knowsley	315
Cheshire East	253
North Yorkshire	243
Nottinghamshire	226
Kent	108
Staffordshire	103

[Source: Environment Agency Hazardous Waste Data Interrogator, 2013]

4.3 Conclusion

Bradford recorded 19,084 tonnes of hazardous waste arisings and 4,258 tonnes of hazardous waste were managed at sites in Bradford in 2013. Bradford is a net exporter of hazardous waste with 18,039 tonnes exported in 2013, whilst only 3,214 tonnes are seen to be imported.

The movement of hazardous waste reflects the need to manage these specialised wastes at regionally or nationally significant facilities. This reflects the fact that economies of scale are required for such facilities and is it impractical to provide such specialised facilities at a local level. It will remain the case that management requirements for most hazardous waste arisings from Bradford will be met in specialised facilities outside of the Bradford area.

4. Construction, Demolition and Excavation Waste

4.1 Data Sources

Accurate data on the quantity of construction demolition and excavation (CD&E) waste arisings has historically been poor. Since 1999, CLG has conducted periodic national surveys of arisings and use of alternatives to primary aggregates. The most recent of these (2005) suggested that the production of recycled aggregate in the region had increased slightly since the previous 2003 survey. However, due to the limited level of returns, the apparent changes between this and the

previous (2003) survey suggest this is not a robust source of data even if the differences were not statistically significant.

CD&E waste can be separated into construction demolition (C&D) waste and excavation waste. The majority of the former is mixed construction waste and most of this material is non-hazardous and is handled at transfer stations or treatment facilities. Virtually all excavation wastes are soils which are predominantly used for reclamation with the rest sent to waste transfer stations where they are subsequently re-used.

Some CD&E waste is managed under exemptions from the Environmental Permitting process. This material is predominantly excavation waste (specifically soil and stones) which is spread on land for reclamation or improvement. Waste managed under exemptions is not reported to the Environment Agency and therefore is not included in the Waste Data Interrogator.

Review of Construction Demolition and Excavation Arisings from Bradford

The PART A Report is based on data from the EA WDI. A total of just over 133,600 tonnes of CD&E waste is recorded as deposited in Bradford, with over 110,500 tonnes of this being construction and demolition waste and just over 22,100 tonnes being excavation waste. The EA WDI also showed 57,724 tonnes of CD&E waste as originating in Bradford deposited in adjacent waste planning authority areas. These totals represent a minimum, as more CD&E will be coded generally as Yorkshire and Humberside waste or managed through exempt facilities. Given that most CD&E waste is managed through transfer stations in Bradford or may be removed directly to sites outside the plan areas, this review examines validity of previous estimates of CD&E. The management of CD&E waste within the whole Yorkshire and Humberside region is then analysed on the basis that this will essentially capture most CD&E waste deposits in the region and thus be more representative of arisings. The impact of double counting (as waste is often moved to more than one site through waste transfer operations) can be assessed and an estimate of regional arisings arrived at. An apportionment of CD&E arisings is made based on population and GVA.

Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005

Previous estimates have been based on a Survey of Arisings and Use of Alternatives to Primary Aggregates in England, 2005 undertaken for the DCLG.

Table 14 Survey of Arisings and Use of Alternative to Primary Aggregates in England, 2005

English Region Yorkshire & the Humber	Tonnes
Adjusted estimate of population of recycling crushers	106
Estimated production of recycled graded aggregate (tonnes)	3,071,057
Estimated production of recycled ungraded aggregate (tonnes)	2,184,463
Estimated production of recycled soil (excl. topsoil) (tonnes)	549,951
Total	5,805,577
Estimated tonnage of unprocessed CDEW entering licensed landfills, and its use / fate	
Clean hard C&D waste	236,183
Contaminated hard C&D waste	10,050
Clean excavation waste	2,589,067
Contaminated excavation waste	214,433
Clean 'mixed' CDEW	377,561
Contaminated 'mixed' CDEW	206,493
Other	272,696

Total	3,906,482
Exempt sites (tonnes)	784,947
Total estimated arisings of CDEW in 2005 (tonnes)	10,496,900

The outputs from this survey were based on firstly the estimated number of recycling crushers in a regional and the estimated throughput of these recycling crushers (the survey had a 21% response rate). The use of mobile crushers at demolition sites means that a significant proportion of CD&E materials managed through this process will not show in EA Interrogator records. In statistical terms the low response rate makes grossing up problematic. It is also possible that responses were obtained from the most active plant operators.

The 2005 survey takes no account of CD&E management through transfer facilities or treatment plant other than recycling crushers.

The other data source was from a survey of landfill operators where landfills were grouped into 4 landfill categories. The data from the 39% of operators who responded were averaged out and grossed up to reflect tonnage disposed of at the total number of landfills in each category in each region. The Yorkshire and Humberside region (population 5.3 million) recorded 188 landfills compared with the NW region's total of 98 (population 6.9 million). This methodology would therefore tend to inflate CD&E landfilling in Yorkshire and Humberside such that the estimated figure landfilled in this survey was 3,906,482 tonnes whereas the NW region was estimated at only 2,666,260. The EA WDI shows a total of CD&E waste disposed of to landfill in 2011 as 2,065,584 tonnes about half that suggested by the 2005 survey. This analysis indicates that the 2005 survey should not be relied on to provide an adequately robust indication of CD&E arisings.

Data from 2013 EA Interrogator

The EA Interrogator 2013 shows a total of 4,921,222 tonnes deposited at permitted sites in Yorkshire and Humberside with 2,075,663 tonnes C&D waste and 2,845,559 tonnes of excavation waste. However, as significant quantities of waste are moved through transfer and treatment facilities these headline figures include double counting. Whilst 1,460,822 tonnes were recorded as deposited at transfer facilities and 1,297,185 at treatment plants in 2013, data on waste removed from these waste facilities indicate that only 932,764 tonnes of waste were removed from transfer facilities and 659,206 tonnes from treatment facilities in 2013 (this would indicate that over 40% of CD&E waste deposited at transfer and treatment facilities is not recorded as removed from these sites, which is consistent with an analysis of C&D and excavation waste undertaken with 2011 data). These records also show the type of site that the waste is removed to. This allows some of the double counting to be taken into account (e.g. waste sent via transfer and treatment and then deposited at permitted facilities within Yorkshire & Humberside – 540,000 tonnes) thus the total managed through permitted sites in Yorkshire & Humberside was in the order of 4.4 million tonnes made up of 2.6 excavation 1.8 C&D

If 4.4 million tonnes is taken as the total managed, then landfill would be in the order of 1.3 million tonnes (C&D 114,095 tonnes & E 1,173,111 tonnes with the remainder reused or recycled).

Proportion of Regional Waste arising from Bradford

Based on population, ONS (2015) gives a Yorkshire and Humberside total of 5.36 million (ONS 2014) and Bradford 528,200. The proportion of waste arisings would be approximately 10%.

Based on GVA the Yorkshire and Humberside region GVA 2013 was £101.7 billion whereas Bradford's total GVA (2013) was almost £8.7 billion.

Using a factor of 10% of Yorkshire and Humberside CD&E arisings, this would give C&D arisings for Bradford in the order of 180,000 tonnes and excavation arisings of 260,000 tonnes, giving a total of 440,000 tonnes.

This estimate using 2013 data is an increase on the estimates for the previous study based on 2011 data (150,000 tonnes and excavation arisings of 200,000). This may well reflect increasing economic growth following the recession.

Table 15 shows how this estimate of CD&E waste would be managed at permitted waste management sites if deposited in the same proportions as CD&E managed for the whole Yorkshire & Humberside region.

Table 10 CD&E Deposits in Bradford 2013 (rounded)

	CDE waste	% of Total
Land recovery	50,584	11
Landfill (C+D)	118,689	27
Reclamation	30,492	7
Recycling (C+D)	120,627	27
Treatment plant	119,609	27
Total	440,000	100

4.2 Construction, Demolition and Excavation Waste Deposits & Arisings

Information on how much CD&E waste was managed in Bradford at permitted sites can be obtained from the Environment Agency Waste Data Interrogator database (WDI). This source gives quantities of CD&E waste deposited at sites which are operating under an extant Environmental Permit. It provides some information on the origin of wastes and where they moved to and therefore provides some information on CD&E waste "exported" from the Bradford plan area. However, data for waste origin by Waste Planning authority is incomplete as some of these details are not fully recorded at all permitted sites.

Table 16 shows deposits of CD&E in Bradford. A total of 214,307 tonnes of CD&E waste is deposited in Bradford, with over 174,049 tonnes of this being construction and demolition waste and over 40,258 tonnes being Excavation waste.

Table 11 CD&E Deposits in Bradford (2013) (rounded)

Construction & Demolition Wastes	Tonnes	Excavation Wastes	Tonnes
Asbestos	880		
Concrete bricks & gypsum	57,259	Soils	40,258
Mixed construction waste	98,464		
Other wood waste	10,716		
Waste from carbonised road planings	6,731		
Construction & Demolition Total	174,049	Excavation Total	40,258
CD&E Total	214,306		

[Source: Environment Agency Waste Data Interrogator, 2013]

Tables 17 shows how CD&E is managed and at what type of sites in Bradford.

Table 12 CD&E Deposits in Bradford Managed by Waste Management Facility (2013)

Facility Type	Construction & Demolition Tonnes	Excavation Tonnes
Household Waste Recycling Centres	5,236	3,595
Hazardous Waste Transfer	707	
Hazardous Waste Transfer / Treatment	2,305	
Inert Waste Transfer / Treatment	24,206	
Non-Hazardous Waste Transfer	75,160	10,935
Non-Hazardous Waste Transfer / Treatment	35,230	1,823
Reclamation		11,570
Deposit of waste to land	5,024	1,280
Physical Treatment	24,791	11,054
Biological Treatment	1,390	
Totals Tonnes	174,049	40,258

[Source: Environment Agency Waste Data Interrogator, 2013]

The new “Duty to Co-operate” requirements mean it is essential that evaluation is made of the movement of waste between authorities⁴.

The baseline data gathered for Bradford (Tables 18-20) is taken from the Waste Data Interrogator extracting information on imports to Bradford by originating WPA, on deposits of waste which originated in Bradford.

Table 13 CD&E deposits at permitted sites in Bradford by origin (2013)

WPA origin	Tonnes
Origin Yorkshire and Humberside	140,208
Leeds	1,400

⁴ Localism Act, paragraph 110.

Calderdale	3,110
(Originating from Bradford)	69,589
Total	214,306

[Source: Environment Agency Waste Data Interrogator, 2013]

From the data gathered it can be seen that only 2% of the total of CD&E waste managed in Bradford is definitely imported from 2 other WPAs. The remaining material may be imported but the origin is stated as Yorkshire and Humberside only (known or estimated) and therefore it is impossible to determine whether it was imported or originated locally.

Table 14 CD&E removed from permitted sites in Bradford to other WPA's (2013)

Destination WPA	Tonnes
Yorks & Humberside	33,940
Bradford	15,399
Leeds	1,292
Doncaster	804
Manchester	787
Calderdale	703
Wakefield	383
Lincolnshire	275
Stockton-on-Tees	197
York UA	131
Kirklees	120
Sheffield	94
Lancashire	3
London	1

Destination WPA	Tonnes
Total	54,128

[Source: Environment Agency Waste Data Interrogator, 2013]

Table 15 Exports of CD&E from Bradford to other WPA's (2013) – Origin recorded at the site of deposit

WPA	Tonnes Originating in Bradford
Calderdale WPA	29,992
Kirklees WPA	10,675
Leeds	9,346
North Yorkshire WPA	4,658
Rotherham	1,816
County Durham WPA	580
Doncaster	536
East Riding of Yorkshire WPA	131
Sheffield	100
Wakefield	1,345
Manchester WPA	18
Total	57,893

[Source: Environment Agency Waste Data Interrogator, 2013]

Whilst 214,306 tonnes of CD&E waste are managed in Bradford in 2013 only 54,128 tonnes are recorded as removed from these permitted sites. However, management of CD&E waste at facilities in Bradford would appear to be very variable as data for year 2010 show deposits of 76,884 tonnes and removals (exports) of 124,002 tonnes. It appears that the discrepancy between deposits and removals may reflect a quantity of waste which remains on these sites in short or medium-term storage or some inaccuracy in data recording.

Of waste removed from permitted sites in Bradford almost 33,940 tonnes (62%) is recorded as being deposited at sites within Yorkshire and Humberside with the remaining waste deposited as shown in Table 19.

Data from waste removed from sites in Bradford shows that 58% (31,684 tonnes) of CD&E is recorded as removed for recovery (recycling) and only 4,391 tonnes for landfill, with the remaining materials sent for transfer, treatment or an unknown fate.

The Waste Data Interrogator can provide an estimate of the amount of CD&E waste recorded as originating in Bradford which waste deposited at permitted sites outside the authority. However this analysis is complex as waste could be exported by two routes:

- Material taken directly from the source in Bradford to an external permitted site;
- Material moved from the source to a transfer station within Bradford (where it may be stored for some time) and then sent for management outside the authority.

Where the origin is recorded, 86% of the waste is sent to 3 nearby authorities in the former Yorkshire and Humberside region as shown in Table 20. This situation reflects the relative low value and considerable bulk of these wastes which mean it is unlikely to be economically viable to move them over long distances for recycling, re-use or disposal.

4.3 Conclusion

The only data available for CD&E wastes is for waste deposited at and removed from permitted waste management sites which are entirely transfer facilities.

The PART A Report is based on data from the EA WDI identifying that just over 214,306 tonnes of CD&E waste is deposited in Bradford, with 174,049 tonnes of this being construction and demolition waste and 40,258 tonnes of excavation waste. The EA WDI also showed 57,893 tonnes of CD&E waste originating in Bradford was deposited in adjacent waste planning authority areas. As stated previously, these figures represent a minimum estimate as a significant amount of CD&E wastes were recorded as arising in Yorkshire and Humberside – whereas they may have arisen in Bradford specifically – and other wastes were managed at exempt facilities and therefore went unrecorded.

This data shows that about 60% of CD&E waste removed from transfer facilities is destined for “Recovery” (the classification recovery in the EA Waste Data Interrogator includes recycling and for CD&E waste can be interpreted as a recovery operation).

In conclusion, the absence of significant treatment outlets and landfill options for excavation waste within Bradford is likely to significantly under estimate CD&E arisings in Bradford. Additionally an unknown proportion of material will be re-used where it arises and therefore goes unreported.

The use of a proportional estimate based on the CD&E waste managed in the whole of Yorkshire & Humber side would give C&D arisings for Bradford in the order of 180,000 tonnes and excavation arisings of 260,000.

5. Agricultural Waste

5.1 Data Sources

Estimates have been extrapolated from the regional data for Yorkshire and the former Humberside based on the area of land in agricultural use and the number of farm holdings. The analysis draws on the Defra annual agricultural census by region and farm type (published in 2013 for 2010), the Environment Agency Agricultural Waste and By-Products Survey 2003, and a further Environment Agency survey (‘Towards Sustainable Agricultural Waste Management’) published in 2011.

The two principal sources on agricultural waste management methods are now over a decade old, however, this approach assumes that the on-farm activities that generate wastes will not have changed significantly over the intervening period. Furthermore, the estimates given below have been derived from regional information and scaling them down to provide a representative figure for the Bradford area alone will introduce some inaccuracy.

The Environment Agency’s 2001 survey included a subjective assessment of the likely accuracy of the estimates it generated, categorising them as ‘High’, ‘Medium’ or ‘Low’ accuracy. Agricultural waste arisings figures shown at regional level were estimated at predominantly medium accuracy level.

5.2 Agricultural Waste Deposits & Arisings

There are 12,025 farm holdings in Yorkshire and the Humber, compared to 427 holdings in Bradford⁵. Table 21 shows extrapolated waste arisings for the whole of Yorkshire and Humber based upon farm holdings number using the 2001 and 2003 Environment Agency Agricultural Waste and By-Products Surveys.

⁵ Source: (DEFRA Local Authority breakdown for key crop areas and livestock numbers on agricultural holdings 2014 and DEFRA stats Food Farm Land use Livestock Results National Park Nov 2014.

Table 16 Estimates of Agricultural Waste Arisings in Yorkshire and the Humber, 2003
(Extrapolated 2003 Environment Agency Agricultural Waste and By-Products survey based upon 12,035 farm holdings (2014 DEFRA)).

Waste type	Quantity (tonnes) Yorkshire and the Humber
Plastic Packaging	2,495
Cardboard and paper packaging	770
Metal, glass, wood and rubber packaging	195
Other non-packaging plastics	6381
Agrochemicals	7098
Animal Health Products	7276
Machinery Waste (oils, batteries, tyres, redundant machinery)	7776
CD&E Waste (Asbestos Cement Bonded Roof Sheeting)	2160
Organic by-products waste (slurry, waste milk, straw)	8,186,371
Animal By-products	24,260

[Source: Environment Agency survey, 2003]

Table 22 shows the extrapolations of waste arisings for Bradford (based upon the assumption that each farm holding produces the same proportion and quantity of each waste type). The potential waste management treatment options for each waste type has also been estimated based upon current practice.

Table 17 Extrapolations of waste arisings (rounded) for Bradford based upon the number of farm holdings

Waste Type	Potential Waste Management Treatment Route	Quantity within Bradford (Tonnes)
Plastic Packaging	Recycling/Landfill	89
Cardboard and paper packaging	Composting on site/Recycling/Landfill	27
Metal, glass, wood and rubber packaging	Recycling/Landfill	7
Other non-packaging plastics	Recycling/Landfill	226
Plastic films and containers	Recycling	139
Card packaging bales	Recycling	2
Agrochemicals	Treatment/Incineration	252

Waste Type	Potential Waste Management Treatment Route	Quantity within Bradford (Tonnes)
Animal Health Products	Incineration	258
Machinery Waste (oils, batteries, tyres, redundant machinery)	Recycling/treatment	272
Organic by-products waste (slurry, waste milk, straw)	Composting/Land Recovery/Treatment on site	294,769
Animal By-products	Specialised Treatment	861
Total Arisings		296,902

[Sources: Defra survey of farmholdings (Yorks & Humber region), 2010; Environment Agency report on Agricultural Wastes, 2001 and surveys of Agricultural Waste and By-Products,2003]

Table 23 summarises the waste arisings into common treatment routes, choosing for each category of waste the highest potential management route from the waste hierarchy i.e. identifying recycling in favour of landfill. This has recorded waste that is currently managed on site within the farm holding and that which should be managed off site.

Table 18 Potential Treatment routes for Extrapolated Waste Arisings in Bradford

Waste Management Route (optimum route within the waste hierarchy has been chosen)	Bradford Agricultural Wastes (rounded tonnes)
<i>Management within farm holding</i>	
Composting on site/ Land recovery/treatment on site	294,769
<i>Management off site (type of facility receiving wastes)</i>	
Recycling	490
Treatment plant/Incineration	782
Animal By-Products incineration	861
Landfill	0
Hazardous Landfill	0
Total management off site	2,133

Waste Management Route (optimum route within the waste hierarchy has been chosen)	Bradford Agricultural Wastes (rounded tonnes)
Total arisings	296,902

[Sources: Defra survey of farmholdings (Yorks & Humber region), 2014; Environment Agency report on Agricultural Wastes, 2001 and surveys of Agricultural Waste and By-Products,2003]

For the purpose of planning for future capacity requirements the significant areas are to provide for off farm site waste management. The quantities involved are very small at 2,133 tonnes. If the optimum route, according to the waste hierarchy for waste management is assumed there will be a requirement for capacity at specialist treatment facilities, Animal By-products incineration and recycling as shown in Table 23.

5.3 Conclusion

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

In addition to any effect of the new exemption regulations, it is likely that in the future more waste may be diverted from landfill to recycling due to the increasing awareness of the potential to recycle. However the quantity of material will be so small that it will have limited significance in the context of the total need to manage waste arisings in the Plan area. It is recommended that the situation be reviewed post 2013 once all the registrations have come into force.

It is likely that the majority of agricultural waste will still be managed within the farm holdings via land treatment/spreading and composting. The Waste Plan should include a capacity allowance that takes account of the need for specialised treatment for certain types of agricultural waste such as animal by-products incineration and hazardous landfill. It should also be borne in mind that the analysis assumed management occurs at the highest practicable level in the Waste Hierarchy though it may not be practicable or cost effective to divert them from landfill.

6. Low Level Non-Nuclear Radioactive Wastes

6.1 Data Sources

The Environment Agency collects data from sites regulated under the Radioactive Substances Act. This data is reported annually and has been provided in response to a specific data request.

6.2 Low Level Non-Nuclear Radioactive Waste Arisings

The EA were contacted to provide a list of sites permitted to handle LLW in Bradford. The results of this work identified just two facilities: Bradford Royal Infirmary and Bradford University.

The information received indicates that levels of LLW produced in Bradford are minimal. This waste includes general items such as gloves, overshoes and tissues which are disposed of as general laboratory waste, as well as glassware and sharps which are contained in sharpsafes and assigned as radioactive and disposed of as radioactive.

There is a further category – Very Low Level Non-Nuclear Radioactive Wastes – however management of these wastes is covered by a wide-ranging exemption as the extremely low level of radioactive content means they can be disposed with non-hazardous wastes.

7. Waste Water/Sewage Sludge

Yorkshire Waste operates the Waste Water Treatment Works (WWTW) serving the Bradford area, and they were contacted to gain a broad overview of their future capacity requirements as far into the future as possible. The response received explained that they cannot give any indication of what future requirements are likely to be with regard to waste water, especially not for the Plan period.

Waste water companies are only regulated on a 5 year cycle through Asset Management Plans (AMPs). The current AMP (AMP 5) ran until the end of March 2015. The programme for AMP6 will be driven by water quality requirements (yet to be finalised by the Environment Agency) which aim to achieve compliance with the Water Framework Directive, and respond to forecast capacity demand from growth in households and business premises.

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

At present it is not envisaged that sites will be identified within the Waste Management DPD for future use as WWTW as there is no current known requirement for additional facilities. Yorkshire Water should be kept informed of progress with preparation of the Plan and invited to comment at consultation stages.

Waste currently managed on site

The amount of Trade Effluent discharged to Esholt Sewage Treatment Works (STW) is currently at a rate of 989,105 m³ per annum. The site serves a domestic population of 353,182 with a typical rate of 140 litres per day per person. The consented dry weather (normal) flow is 130 tcmd (thousand cubic metres per day).

8. Cross Border Waste Movements

An analysis, using the 2013 EA Waste Data Interrogator has taken place to review cross boundary movements to and from Bradford. Background data has been gathered to review the total deposits of all C&I, LACW, CD&E and Hazardous waste in Bradford and assess the impact of imports and exports.

8.1 Imports to the Sub-Region

The EA Waste Data Interrogator includes data on waste origins and the destinations of waste removed from permitted sites. This enables some estimation of cross boundary movements but must be treated with caution as the data recording by site operators is incomplete. Data on waste origin can be entered at District, Waste Planning Area and Regional Levels. Some operators only enter at regional level i.e. Yorkshire and Humberside. A total of 817,399 tonnes of waste recorded as deposited at sites in Bradford in 2013, whilst 405,201 tonnes were only recorded at Yorkshire and Humberside level. Thus 50% of waste deposited in Bradford cannot be traced at a Waste Planning Authority or District level.

Waste deposits not coded to a WPA deposited in Bradford include 256,204 tonnes recorded as "household industrial and commercial" (HIC). Examination of the sites submitting these records includes Associated Waste Management Ltd, which is known to have accepted LACW from Bradford totalling 166,414 tonnes in year 2012/13 and it is likely that a significant proportion of this total actually arises within Bradford.

For CD&E waste coded at Yorkshire & Humberside level (140,208 tonnes) it is likely that most of this waste is of local origin in Bradford with some from bordering authorities of Leeds, Calderdale and Kirklees.

Hazardous deposits are mainly healthcare waste (2,408 tonnes Hazardous Waste Data Interrogator data see Hazardous waste section 3 of this report).

Table 24 shows the origin of waste deposited at permitted sites in Bradford in 2013. Data for waste arising from any one WPA of less than 0.5 tonnes is not shown in the table as these deposits are minimal, representing only 12 tonnes of waste in 2013.

Table 19 Waste Imports to Bradford in 2013 (rounded to the nearest tonne)

Origin WPA	Hazardous	Hhold/Ind/Com	Inert/C+D	Total
Barnsley	1	16	0	17
Bedfordshire	2	0	0	2
Berkshire	0	28	0	28
Birmingham City	6	63	0	69
Blackburn with Darwen UA	4	30	0	34
Blackpool UA	1	24	0	26
Bolton	8	142	0	150
Buckinghamshire	28	101	0	128
Bury	477	4	0	481
Calderdale	106	1,074	3,825	5,006
Cambridgeshire	1	2	0	3
WPA not codeable (Cheshire)	1	19	0	20
Cheshire West and Chester	0	1	0	1
Derbyshire	1	18	0	18
City and County of Swansea UA	0	1	0	1
Essex	0	2	0	2
Coventry	0	1	0	1
Cumbria	9	1	0	9
Derbyshire	1	9	0	11
Doncaster	116	141	0	257
Dorset	0	1	0	1
Scottish WPA	0	1	0	1
County Durham UA	3	26	0	30
Cheshire West and Chester	0	2	0	2
Essex	38	83	0	121
Devon	3	82	0	86
Hampshire	0	2	0	2
North Yorkshire	43	228	320	591
Hertfordshire	5	9	0	14
Kent	0	1	0	1
Kingston Upon Hull UA	0	24	0	24
Kirklees	272	1,291	0	1,563
Lancashire	32	345	0	377

Origin WPA	Hazardous	Hhold/Ind/Com	Inert/C+D	Total
Lancashire	28	8	0	35
Leeds	518	19,952	1,400	21,870
Leicester UA	0	2	0	2
Leicestershire	0	2	0	2
Lincolnshire	0	1	0	1
Lincolnshire	9	75	0	84
Liverpool	2	0	0	2
WPA not codeable (London)	0	52	0	52
Manchester	6	229	0	235
Northumberland	0	20	0	20
Nottinghamshire	0	4	0	4
Medway UA	0	25	0	25
WPA not codeable (Merseyside)	0	1	0	1
Middlesbrough UA	0	2	0	2
Nottinghamshire	0	488	0	488
Newcastle Upon Tyne	2	0	0	2
WPA not codeable (North East)	4	0	0	4
WPA Not Codeable (North East)	91	13,093	0	13,184
WPA not codeable (North West)	649	141	0	790
North Yorkshire	2	9	0	11
Northamptonshire	0	3	0	3
Northamptonshire	0	16	0	16
Norfolk	1	0	0	1
WPA Not Codeable (Not Codeable)	1,001	85,939	2,486	89,426
Nottingham UA	178	156	0	333
Nottinghamshire	0	379	0	379
Oldham	2	0	0	2
Oxfordshire	0	3	0	3
Oxfordshire	0	1	0	2
Lancashire	0	1	0	1
Powys UA	0	1	0	1
Lancashire	0	830	0	831
Reading UA	0	2	0	2

Origin WPA	Hazardous	Hhold/Ind/Com	Inert/C+D	Total
Rotherham	108	46	0	154
Sandwell	0	1,794	0	1,794
North Yorkshire	1	6	0	7
Sheffield	4	1,032	0	1,036
Somerset	8	11	0	19
WPA not codeable (South East)	0	1	0	1
South Tyneside	2	4	0	6
WPA not codeable (South Yorkshire)	0	1	0	1
Staffordshire	3	1	0	4
Staffordshire	0	1	0	1
Stoke-on-Trent UA	2	6	0	9
Warwickshire	1	5	0	5
Gloucestershire	7	0	0	7
Suffolk	0	1	0	1
Surrey	1	12	1	14
Wakefield	73	1,543	0	1,616
Warrington UA	2	74	0	76
Scottish WPA	1	0	0	1
Wigan	0	5	0	6
Wiltshire	0	1	0	1
Hampshire	53	47	0	100
Wolverhampton	1	11	0	12
York UA	4	120	0	124
WPA not codeable (Yorks & Humber)	2,151	256,204	146,846	405,201
Totals	11,743	587,971	217,678	817,393

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2013]

Household industrial and commercial waste imports exceeding 1,000 tonnes in 2013 were received from Leeds, Sandwell, Wakefield, Kirklees, Calderdale and Sheffield WPAs, with 13,184 tonnes recorded as from the North East region.

8.2 Exports from Bradford

Table 25 shows confirmed exports from Bradford to sites located in England and Wales. These totals do not include wastes for which the origin was recorded as Yorkshire and Humberside. Some of these materials may have originated in Bradford and been exported to other authorities but the available records do not allow the quantity to be identified. Table 26 may therefore underestimate the quantity of waste exported to an unknown extent.

Table 20 Exported Waste from Bradford (2013) (tonnes)

	Tonnes Exported	Hazardous Tonnes	Household/Industrial & Commercial Tonnes	Inert C&D Tonnes
Exports from Bradford	148,627	10,656	70,463	67,508

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2013]

Table 26 lists the WPAs receiving over 90% of waste recorded as originating in Bradford.

Table 21 WPAs Receiving >500 tonnes of Waste Originating in Bradford in 2013 (tonnes).

Facility WPA	Hazardous	Hhold/Ind/Com	Inert/C+D	Totals
Leeds WPA	1,609	26,345	10,719	38,673
Wakefield WPA	43	10,622	7,433	18,097
Calderdale WPA	15	8,568	30,013	38,597
Nottingham City WPA	20	5,157		5,177
East Riding of Yorkshire WPA		4,048	131	4,180
North Yorkshire WPA	95	3,828	4,658	8,580
Sheffield WPA	520	2,004	100	2,624
Barnsley WPA	6	1,326	368	1,700
Northamptonshire WPA	13	1,236		1,249
Oldham WPA		982		982
North East Lincolnshire WPA	0	925		925
Leicestershire WPA	0	810		810
Kingston Upon Hull City WPA	3	749		753
Trafford WPA		742		742
Kirklees WPA	5,026	618	10,681	16,325
Rotherham WPA	1,112	319	2,093	3,524

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2013]

Appendix B provides further detail of authorities and sites that received wastes originating in Bradford.

Records of the destination of waste leaving from permitted facilities (mostly transfer and recycling) from Bradford shows a total of 766,191 tonnes in 2013 which was removed to unspecified destinations in Yorkshire and Humberside (303,251 tonnes) or “estimated Yorkshire and Humberside” (129,895 tonnes). As a result the destination WPA of 56% of the waste exported from Bradford cannot be identified.

Table 27 shows the destination of waste removed from permitted sites in Bradford by WPA, sub region or region (if not codeable to a specific WPA) in 2013.

Table 22 Destination of Waste Removed from Permitted Sites in Bradford by WPA (Tonnes)

Destination WPA	Hazardous	Hhold/Ind/Com	Inert/C+D
WPA not codeable (Yorks & Humber)	538	353,193	94,225
WPA Not Codeable (Not Codeable)	253	88,958	7,270
Leeds	459	58,742	1,056
Rotherham	15	16,827	
Liverpool	13	16,285	771
York UA	572	12,096	
WPA not codeable (Cheshire)	20	9,307	
Leicestershire		8,725	
Sheffield	144	8,374	1,508
Stockton-on-Tees		5,852	
Barnsley		5,239	98
North Yorkshire		5,207	
Kingston Upon Hull UA	3	4,889	804
Manchester	79	3,108	33
Nottingham UA		3,054	
Kirklees	120	1,882	
Calderdale	179	1,746	703
Doncaster	12	1,138	
Lincolnshire		1,076	275
WPA Not Codeable (Yorks & Humber)	6	931	535
Wakefield	618	731	
Nottinghamshire	42	635	
Lancashire	21	322	
WPA not codeable (North East)	4	295	
North Yorkshire	506	267	
Walsall		237	
Birmingham City	52	129	
North Yorkshire		125	
Lancashire		115	
WPA not codeable (West Midlands)		88	
Darlington UA	1	76	
County Durham UA		51	
Bolton		45	

Destination WPA	Hazardous	Hhold/Ind/Com	Inert/C+D
WPA Not Codeable (North East)		44	
Lincolnshire	20	44	
Milton Keynes UA		33	
North Lincolnshire UA		25	
Denbighshire UA		25	
Derby UA		25	
Newcastle Upon Tyne	15	10	
Shropshire		8	
Cambridgeshire		7	
Kent	101	7	
Cambridgeshire	10	7	
Hartlepool UA	32	6	
Leicester UA		6	
WPA not codeable (London)		3	
Rochdale	1	3	
Berkshire	9	0	
Bristol UA	3		
Cheshire West and Chester	8		
Cheshire East	1		
Scottish WPA	18		
WPA not codeable (Merseyside)	1		
Northumberland	17		
WPA not codeable (Wales)	123		
Warrington UA	1		

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2013]

9. Subsequent Stages in Modelling Capacity Requirements

As stated previously, the purpose of the work summarised in this report is to establish the baseline estimates of how wastes are currently being managed and how much waste is being created locally. Table 28 gives total recorded waste deposits at sites in Bradford.

Table 23 Total recorded waste deposits at sites in Bradford (2013)

Facility Type	Tonnes Received	Hazardous	HIC	Inert
Biological Treatment	48,380	0	48,380	0
CA Site	32,252	932	27,302	4,017
Car Breaker	1,775	1,653	122	0
Chemical Treatment	36	36		
Deposit of waste to land (Recovery)	6,304			6,304
Hazardous Waste Transfer	829	730	98	1
Hazardous Waste Transfer / Treatment	65,723	128	65,364	231
Inert Transfer Station	24,206	0	0	24,206
Metal Recycling	154,970	2,336	147,704	4,930
Non-Hazardous Waste Transfer	345,380	7	258,234	87,139
Non-Hazardous Waste Transfer / Treatment	61,089		24,036	37,053
Physical Treatment	45,591	2,228	1,136	42,226
Reclamation	11,570			11,570
WEEE treatment facility	19,272	3,691	15,581	0
Vehicle De-Pollution facility	22	3	20	0
Totals	817,399	11,744	587,976	217,678

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2013]

Table 28 may double-count some waste for two reasons. Parts of the HIC stream are taken to a treatment facility so that recyclable material can be separated with the residual material turned into a secondary product (RDF). The recyclable material is no longer considered to be waste and therefore any further management lies outside the scope of the Waste Plan, but the secondary product will remain waste which requires further management. Therefore it is legitimate to count it twice to that the capacity needed for initial and secondary management can be identified.

Some waste is deposited initially (and possibly for a short period only) at transfer stations before it is bulked into larger loads and sent to a treatment or disposal facility. This material may be included in Table 29 but it has been excluded from the analyses detailed earlier in this report and from the arisings estimates that are used in the subsequent forecasting and gap analysis

Table 29 summarises the baseline arisings estimates that are passed to the forecasting work.

Table 24 Summary of Baseline Estimates of Waste Arisings by Stream, 2013 (tonnes)

Principal Waste Arisings Year 2013	Tonnes
Commercial Waste	254,314
Industrial Waste	219,773
CD&E	214,306
LACW	226,085
Hazardous	19,084
Total arisings – principal streams	933,562

[Source: Environment Agency Waste Data and Hazardous Waste Data Interrogators, 2013, Waste data Flow and Bradford City Council]

Completing the Needs Assessment will involve further stages which are summarised below.

Stage 1b: Establishing Modification Assumptions for Waste Growth and Management

The purpose of this stage is to determine the growth and waste management practice modifiers to be applied within the Model to generate estimates of future arisings for the range of waste streams within Bradford.

LACW growth modifiers have been requested. Yorkshire and Humber Regional econometric model (produced by Leeds city Region Local Enterprise Partnership) data has been obtained and will be used in subsequent forecasting. The proposed modifiers to be used will be discussed and agreed with the Council.

Stage 2: Estimating the Capacity of Waste Infrastructure in Bradford

Work has been undertaken in compiling the capacity sites database with information updates supplied by Bradford. The work has resulted in a production of a definitive list, which has been agreed by the Council for use in the model.

Stage 3: Generating Forecasts of Future Waste Arisings and Gap Analysis

Following an interim meeting with the Council, work will commence on the bespoke model.

Detail of these stages and the resulting estimates of future waste management capacity requirements will be documented in the final report on the Needs Assessment.

Appendix 1: Data Source References

Commercial and Industrial Waste

Defra, *Commercial and Industrial Waste Survey 2009*, prepared by Jacobs; final version published May 2011.

Environment Agency *North West of England Commercial and Industrial Waste Survey 2009*, prepared by Urban Mines; final version published March 2012.

Data from these surveys have been used in conjunction with forecasts of employment growth to project estimates for 2009 forward to 2012, which are used in the model.

Environment Agency Waste Data Interrogator 2013 - <http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Due to inconsistencies in recording the Data Interrogator has not been used to estimate arisings of this stream. It has been used to identify how these wastes were managed and the movement of wastes between Bradford and other authorities.

Local Authority Collected Waste

Waste Data Flow - www.wastedataflow.org

Data are entered by waste collection and disposal authorities. They are available annually (latest data for 2013 when this report was finalised) or quarterly.

Environment Agency Waste Data Interrogator 2013 - <http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Due to inconsistencies in recording the Data Interrogator has not been used to estimate arisings of this stream. It has been used to identify how these wastes were managed and the movement of wastes between Bradford and other authorities.

Information on waste growth forecasts was being provided by the Council at the time this report was finalised.

Hazardous Waste

Environment Agency Hazardous Data Waste Interrogator 2013 - <http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Construction, Demolition and Excavation Waste

Environment Agency Waste Data Interrogator 2013 - <http://www.environment-agency.gov.uk/research/library/data/142777.aspx>

Agricultural Waste

Defra Annual Agricultural Census, 2013 - <https://www.gov.uk/government/statistical-data-sets/structure-of-the-agricultural-industry-in-england-and-the-uk-at-june>

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

http://agwasteplastics.org.uk/Images/Reports/agricultural_waste_survey_2003.pdf

Environment Agency, *Towards Sustainable Agricultural Waste Management*, 2001.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/291600/geho0003bieo-e-e.pdf